

Intro to Digital Banking & Payments

Objectives:

- Students will be able to provide an understanding of digital banking and payments
- Students will be able to explain the essential characteristics of rapid payment services that have an impact on their adoption

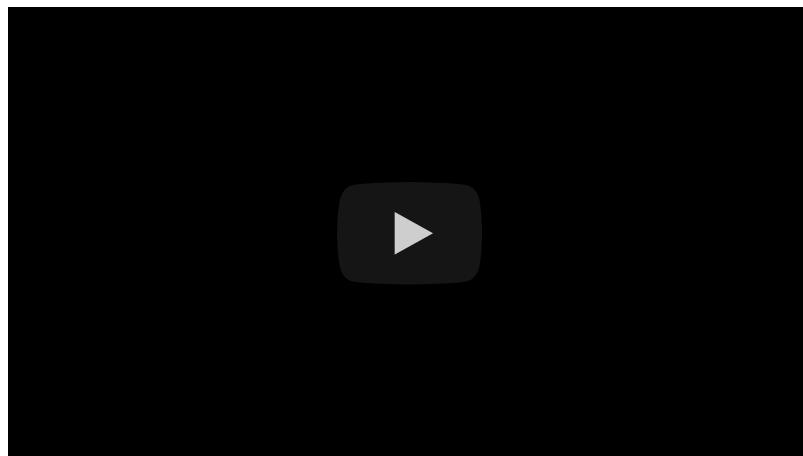


Although partnerships with FinTechs and in-house development are the two most popular options among industry players on a global scale, there are other desirable practices for the sector that, in addition to being part of a manual of good practices applicable to a hyper-technological and competitive environment, can serve as differentiators. One of them is a planned incorporation strategy, which aligns organizational goals while taking into consideration the resources and capacities of each unit individually.

Although some companies have taken steps in this regard, and there are

digital bank initiatives planned for the future, the development of digital banking is still in its early stages. Different chances to enhance the growth of the financial system and expand its economic and social advantages arise under this new paradigm. Financial inclusion, or the greater integration of individuals into the financial system (onboarding); the abolition or replacement of bureaucratic processes with more agile ones; the reduction of transaction costs, which will allow digital banking to offer its products at a lower price than traditional banking (creating more competition); and a focus on the customer.

FinTech adoption is not difficult, but it does need the bank's willingness to modify certain processes. A large majority of banking and financial services executives believe that digital technology will have a disruptive impact on their businesses.



The challenge for new digital banks is multi-faceted: on the one hand, adapting to the country's regulatory framework, which frequently acts as an entry barrier; on the other hand, having the financial capacity to cover all business risks, even in stressful scenarios, and to capture profitable sources of financing, all while working to earn the client's trust. Traditional banks, for their part, face a similar challenge: they must instill a customer-centric digital culture in their collaborators and employees, as well as integrate new digital processes into risk management and create an agile structure that allows them to adapt processes and developments at the same rate. In addition, if the financial institution decides to integrate a FinTech, it is critical that the

new company follows the same procedures and culture as the old one.

Loans, crowdfunding, investments, financial advice, insurance, payments and transfers, digital currencies/blockchain, and computer security are all part of the FinTech sector. One of the goals is to develop the connection with banks based on a cooperative partnership, offering services and complementing capabilities in order to achieve synergies between financial organizations and FinTechs, which would allow the market to open up and flourish. The world is changing, and the word FinTech keeps cropping up in that new wave that has already come owing to technology.

What are the essential characteristics of rapid payment services that have an impact on their adoption?

The stages for a bank to become a dynamic FinTech startup are as follows:

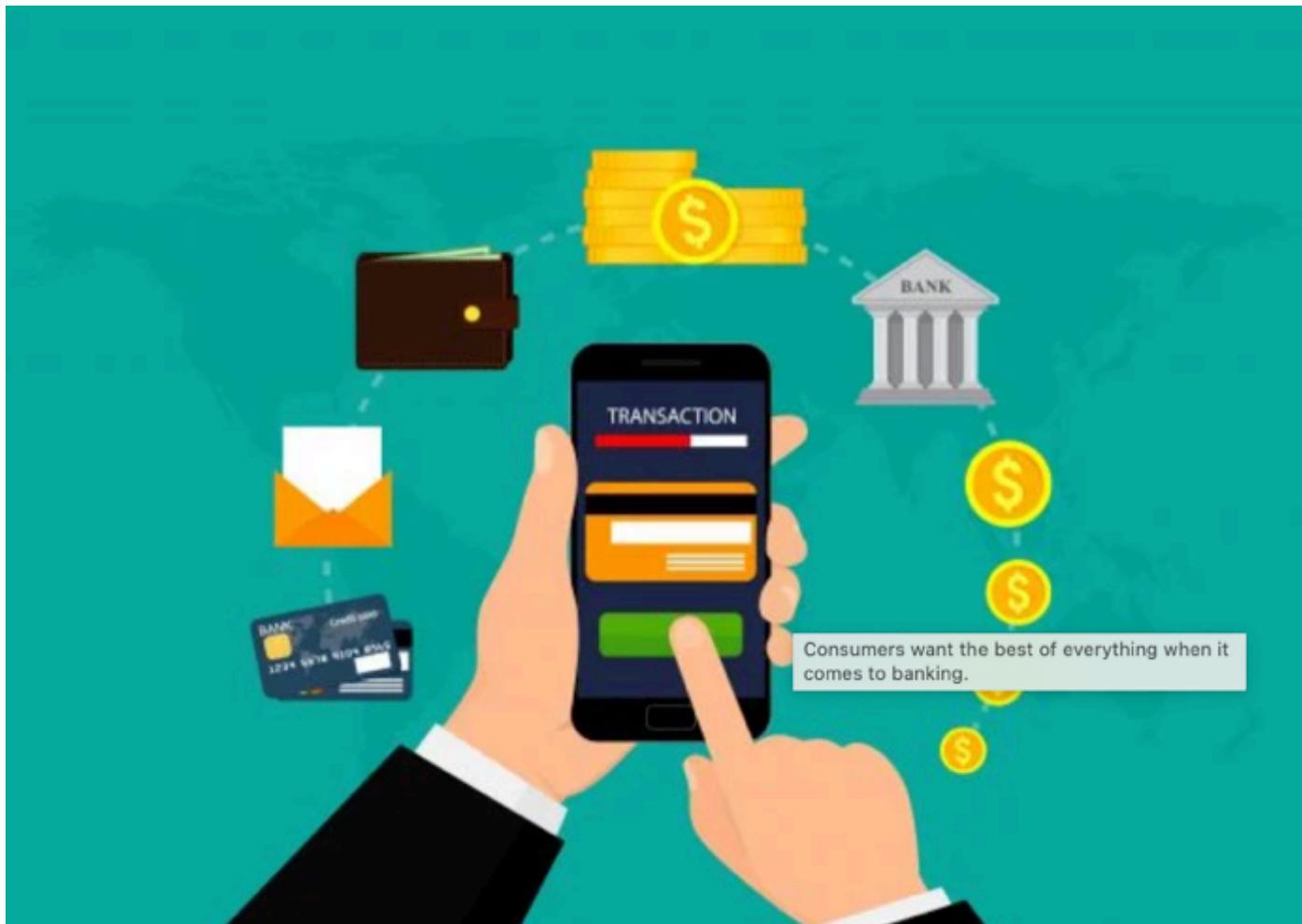


Clients must be properly understood: This guidance is crucial because, while serving a wide range of customers, banks must be clear about their capabilities. To put it another way, they're millennials, the microfinance industry, or auto loans. With a thorough understanding of who the client is, a plan can be developed to cater to that specific group and therefore specialize.

Banks must collaborate with technological firms in order to be more active in the market. Although collaborating with a startup is a fantastic idea, it's important to understand the competitive advantage that an alliance will bring, because an agreement isn't simply about shaking hands. When a bank collaborates with a startup, it must manage research and development resources and, as a result, create a new system. This does not ensure success, because the only way to know if you have favorable or bad outcomes is to commit a significant amount of time and money.

Banks that are devoted to financial disruption seek to energize their respective communities. What are their methods for accomplishing this? Creating a culture that values frequent input and encourages innovation. This appears to be an easy task, yet it necessitates the use of techniques.

Is FinTech and digital payments solely significant for consumer payments? What are the possibilities for Business-to-Business payments with digital payments and FinTech?



The Financial Stability Council defines FinTech as a technology-driven process of financial sector innovation. As a result, new procedures, apps, and business models are being developed to transform the way financial services are produced and distributed. Established businesses are transforming as a result of new technology, and new entirely technical financial services companies are emerging.

Market infrastructures are nuclei that enable multilateral relationships between economic players by facilitating transactions between them. Its worth is derived from the extent of its connecting power. However, given that the collapse of one entity might spread to others, disrupting numerous financial exchange activities with significant implications for the actual economy, this is also where its systemic importance resides. Payments, as previously indicated, are currently in the crosshairs owing to the current wave of innovation. As a result, several online trading platforms include

incorporated payment systems. Its usage is tied to the platform, but if it expands significantly or forms partnerships with other businesses, it may establish a virtual money circulation that runs parallel to legal money.

The usage of digital currencies connected to products distribution networks does not appear to be a fad in a world where online transactions are continually expanding and extend to non-durable items for daily use. Financial regulators and supervisors, as well as international organizations, are already keeping a close eye on technological advances, and the word FinTech is giving way to the term RegTech, which means that new technology will make it easier to oversee the financial sector.

Could FinTech play a key role in combating new payment fraud trends?



Technology has enabled a system revolution, and the financial industry is no exception. Many institutions have enhanced their services as a result of this progression, and users have benefited financially as a result of it. As a result of new technology advancements, FinTech businesses have produced disruptive and creative goods and services. Financial Fraud has also entered this revolution and has been evolving, which is why it has become increasingly sophisticated and complex, especially since it is no longer necessary to have a physical card to commit financial fraud. Issues such as

identity theft and the extraction of personal data are important points to combat.

Scammers and fraud detection systems are always at odds. Scammers perfect their art by researching new methods to get over any barriers put up to keep them out, while fraud control solution suppliers are continuously inventing new technologies. Mule scams, for example, used to be quite straightforward, with scammers relying on basic packet redirection to get their stolen items. Today's mule scams, on the other hand, use social engineering to target potential victims. Scammers are now focusing on three major e-commerce consumer touchpoints: shopping, payment, and recovery, as well as investing more time and money to grow their operations and enhance their return on investment. In each of these phases, they must look to be real clients, therefore they are focusing their efforts on identifying new weaknesses.

Lending & Borrowing

Objectives:

- Students will be able to provide a basic explanation of lending and borrowing as they relate to the FinTech Ecosystem
 - Students will be able to describe the new challenges in FinTech lending

Lending is another important aspect of the FinTech Ecosystem.



This innovation is transforming traditional consumer and business financing, such as acquiring a mortgage loan online. Many FinTech lenders find new

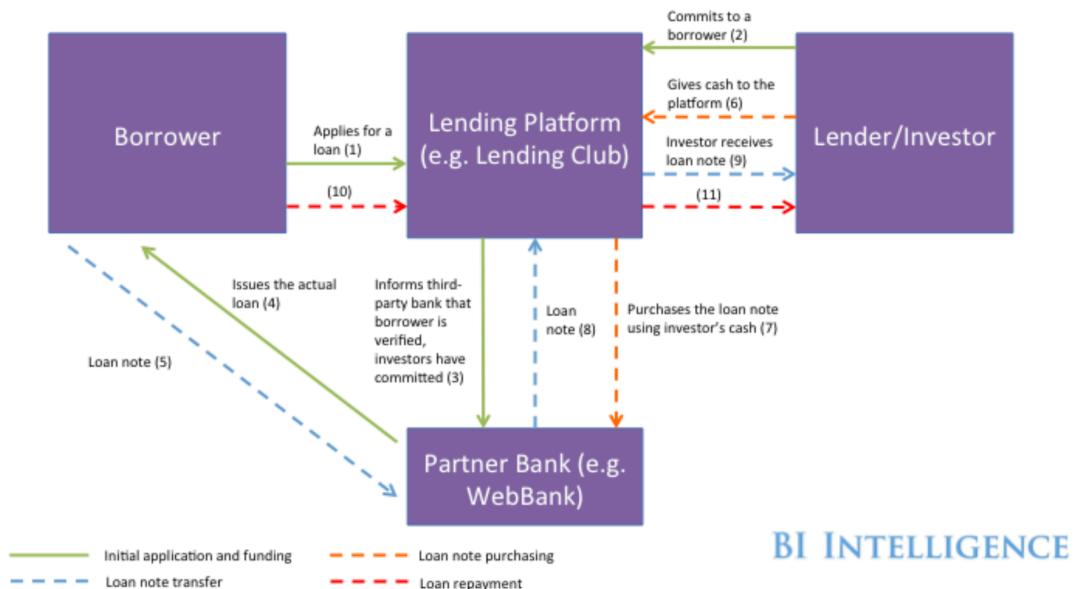
borrowers, assess their risk, and then establish loan conditions, including the interest rate, using proprietary technology, machine learning algorithms, and Big Data analytics. The wonderful thing is that this can frequently be accomplished in less time than it takes to prepare a pot of coffee.

This segment of the Ecosystem may be divided into three categories:

1. online exchanges (such as Lending Tree),
2. online lenders (such as Quicken Loans' Rocket Mortgage),
3. peer-to-peer (or P2P) lenders (such as Lending Club).

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How Peer-To-Peer Lending Works*

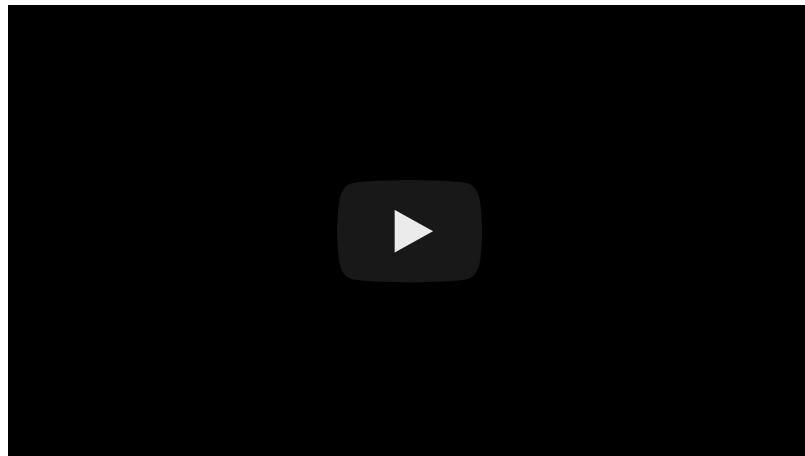


*This is a simplified graphic showing how a loan is processed through a peer-to-peer marketplace – revenue sources such as fees are not included

The third category represents a novel borrowing and lending method. Initially, P2P lenders provided a platform for individual borrowers to enter their funding requirements, and instead of going to a bank or other lender for a loan, the funds were borrowed directly from other individuals or groups of individuals who were looking for an alternative to buying stocks or bonds or

putting their money into a savings account. As a result, P2P lenders linked borrowers in need of money with “peer” lenders, or private investors. This is an example of disintermediation, which is an underlying principle in FinTech economics that should be taken into account while analyzing creative startup company strategies.

In recent years, there has been a movement toward what is known as reintermediation. Since its inception, the business model of these peer-to-peer lenders has evolved. Individual investors provide a tiny percentage of their funding in the form of micro-loans, but the loans are mostly supported by warehouse credit facilities from big financial institutions and then sold off as entire loans or packaged into asset-backed securities. As a result, peer-to-peer lenders are now referred to as Marketplace Lenders (or MPLs). This was referred to as reintermediation, as it reversed the process of disintermediation. CommonBond is a forward-thinking company that falls between an online lender and an MPL. That business uses technology, Big Data, algorithmic risk models, and the securitization market to assist college graduates refinance student loans at competitive rates.



FinTech lenders that are able to weather the storm will likely be in a strong position to raise more money and exit successfully once the global economy improves. While it is not the newest nor the trendiest vertical, there is a lot of exciting innovation going on in this sector, so it has a lot of room for growth.

Crowdfunding

Objectives:

- Students will be able to provide a definition for crowdfunding
- Students will be able to describe the different types of crowdfunding platforms and how they impact crowdsourcing respectively



Equity crowdfunding is the equity-based counterpart of peer-to-peer lending, as mentioned above. Indeed, we like to compare the differences between P2P lending and equity crowdfunding to the differences between debt and equity in capital markets. Unlike peer-to-peer lending platforms, which enable individuals to borrow money from others wanting to invest their money, equity crowdfunding platforms allow individuals and organizations to raise cash by offering investors a share in the project's success. The potential upside return on investing through these platforms ranges from a direct ownership position with profit sharing to "paid in kind" rewards, in which investors receive items or other prizes in exchange for supplying cash. The crowdfunding site may specialize in generating funds for philanthropic reasons in some circumstances.

Crowdfunding is defined as "an open request for financial resources, mostly over the Internet, in order to support initiatives for specified reasons." Crowdfunding is defined as the attempts of enterprising individuals and

groups—cultural, social, and for-profit—to raise funds for their enterprises by soliciting modest donations from a large number of people over the Internet. Crowdfunding is based on the concepts of microcredit and crowdsourcing. It is a unique type of fundraising in which capital seekers (fundraisers) are connected with capital givers (investors) via a crowdsourcing middleman (platform).



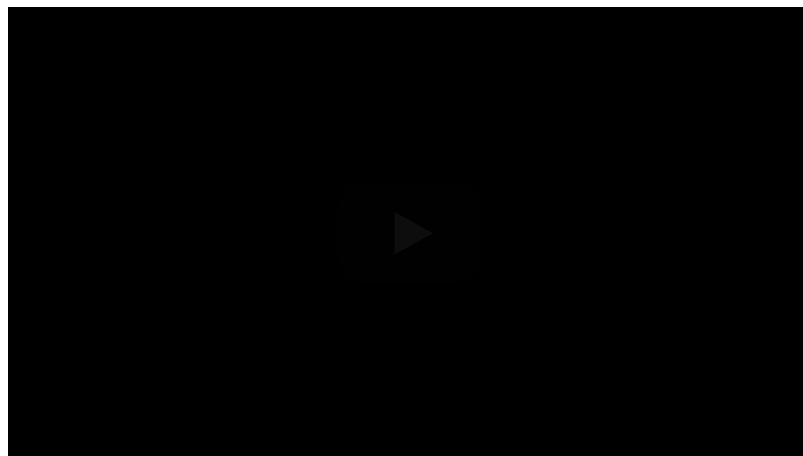
Various types of crowdsourcing have evolved during the last five years. We can distinguish between investment and non-investment crowdfunding methods based on the risk of funding for investors. Crowdfunding platforms may be further classified within these two types based on the rights of crowdfunders in the project's outcome:

- **Crowdfunding based on lending:** funds are repaid, and funders are entitled to a legally agreed-upon interest payout. This model is further divided into two sub-models: (1) peer-to-peer lending (P2P), which is defined by direct contact between the two parties, and (2) social lending, which is often utilized for small-scale entrepreneurial

initiatives.

- **Equity-based crowdfunding** is when money is given in return for a company's stock. If the firm does successfully, investors have the right to earn returns on their investments.
- **Funds are donated** in exchange for non-monetary advantages in reward-based crowdfunding. A modest gift (reward) or a reservation for a product that is still in development are common perks (pre-order).
- **Donation-based crowdfunding:** money is given without expectation of payment for charitable or sponsorship purposes.

Crowdfunding platforms may also be divided into broad categories. Vertical (or theme) platforms focus on crowdsourcing for initiatives within a certain subject or industry, whereas generalist platforms offer crowdfunding for any area of interest.



Finally, the various financing techniques used by crowdfunding sites may be differentiated. Platforms can set pledge levels, minimum investment quantities, and whether or not to finance on a "all or nothing" or "keep it all" basis. The "all or nothing" financing strategy ensures that project proponents receive cash only if the campaign meets its goal in full. Investors get their money back if the goal amount is not met. The "keep it all" funding model, on the other hand, permits project proponents to receive whatever amount gathered. Ironically, of all the FinTech sectors, crowdfunding businesses have raised the least amount of money. According to Venture Scanner, less than \$915.5 million was raised from 2010 to the first quarter of

2020. From 2016 through 2019, the annual average amount of financing was little over \$112 million. In the whole Venture Scanner database for crowdfunding companies, there have been no IPOs and just 65 acquisitions. Tilt.com, a crowdfunding website launched in 2011, was acquired by Airbnb in 2017, and Circle purchased SeedInvest, an equity crowdfunding platform started in 2011. Circle is a FinTech firm that specializes on blockchain and cryptoassets. Indeed, the realm of cryptoassets, which is sometimes mistakenly conflated with FinTech, despite our ecosystem demonstrating that this is not the case, may be regarded as a way in which FinTech is transforming capital markets.

Digital Banking

Objectives:

- Students will be able to provide a basic explanation of digital banking & payments
- Students will be able to describe essential characteristics of rapid payment services that have an impact on their adoption



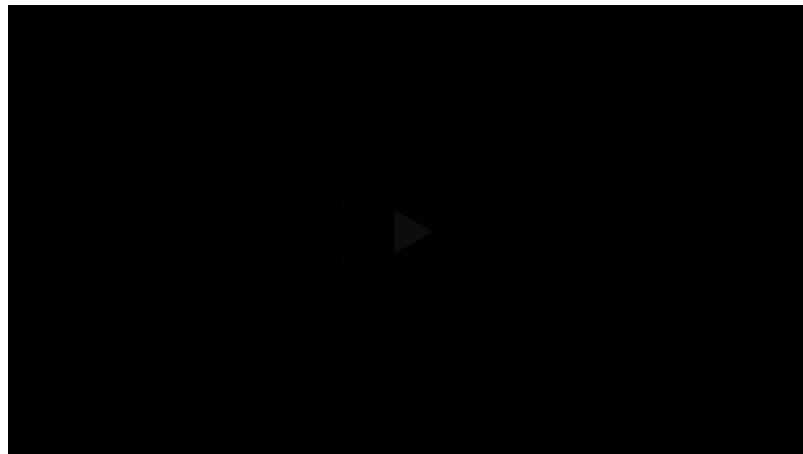
The digital banking revolution is only getting started. We are currently in phase one, in which most conventional banks provide high-quality online and mobile sites/apps to their clients. Customers may use their smartphones or tablets to accomplish anything from creating a new account and making payments to settling credit-card billing issues, all without ever having to step foot in a physical branch, in a different approach.

This is something that a growing number of customers throughout the world are requesting. More than 80% of respondents we polled in established Asian economies stated they would be ready to move part of their assets to a bank that offered a compelling digital-only offering. Consumers in growing

Asian economies accounted for more than half of the total. Many sorts of accounts are at risk, with respondents predicting that 40 to 45 percent of savings-account deposits, 45 to 55 percent of credit-card balances, and 40 to 50 percent of investment balances, such as mutual fund balances, will be affected. By 2022, digital sales might account for 55% or more of new deposits in the most progressive locations and client groups.

Many financial technology companies are already capitalizing on these opportunities by providing streamlined banking services at lower rates and with less fuss and paperwork. Some newcomers are offering totally new services, such as Digit in the United States, which allows users to locate tiny sums of money to save safely.

While it is critical for banks to digitize their existing operations, developing a new digital-only banking firm can rapidly and efficiently satisfy changing consumer expectations. This is especially true in fast-growing emerging countries, where conventional solutions frequently fail to meet client demands. The usefulness of digital products is restricted, and customers typically cite poor branch customer service as a major source of frustration.



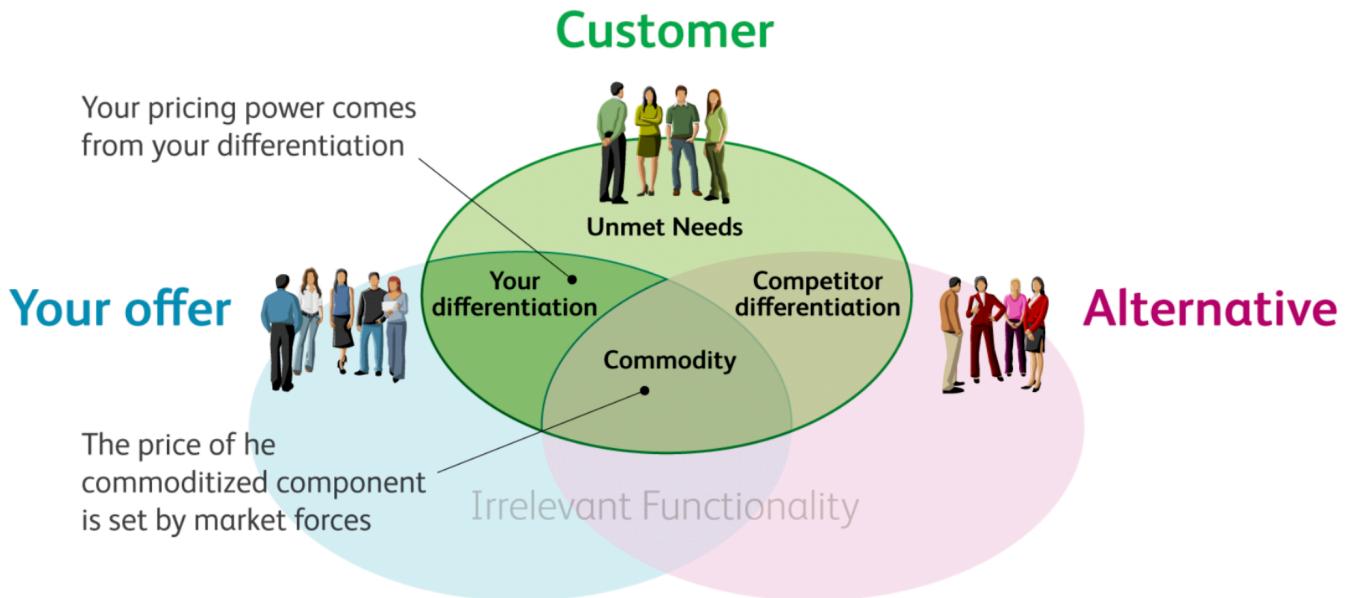
So, what are the pros and cons of a digital-only offer for banks?

Banking is a highly regulated sector with a conservative corporate culture, therefore there are significant internal complications that must be handled. The danger of current businesses being cannibalized, as well as the

necessity to develop a new, more flexible culture to support the incubation and growth of an in-house "start-up," are among them.

Six considerations to consider when starting a digital banking business:

1. Concentrate on the genuine worth.



To start a successful new firm, you need to know exactly what your value drivers are. While this may appear to be a no-brainer, we find that it is frequently ignored. The temptation is to imitate or reproduce established models instead. For example, mBank, Poland's first digital bank, has thrived by providing customers with unsecured personal loans and other straightforward products. It's a strategy that works in countries where credit cards aren't widely used, such as Poland and the Czech Republic, but it may not work in other areas.

Banks also have a tendency to believe that a single solution can be applied to a whole region. Regrettably, this strategy overlooks major value potential. For example, a thorough, country-by-country study of revenue per retail banking client indicates considerable product variations. When you break it down even further into different consumer groups or sub-segments, you'll see even more distinct characteristics that might help you formulate a

company plan. In Taiwan, for example, 45 percent of banking clients are receptive to digital investing possibilities, compared to only 20 percent in Australia.

2. Establish a cooperation ecosystem



To establish a new digital banking service successfully, you must immediately acquire a critical mass of clients. E-commerce marketplaces and telecoms are two businesses with a big number of digital consumers that may assist in the process. E-commerce players may be beneficial partners since they allow banks to offer financing services for the site's current clients, including consumers and small and medium-sized businesses. There is an obvious benefit for the e-commerce player as well, because simple access to finance on an e-commerce site entices working capital-strapped, quickly developing small enterprises to continue selling on that site.

The benefit of a bank/e-commerce union is demonstrated by Alibaba's Ant Financial in China, which services small companies and has developed into a \$20 billion industry in two years. Ant Financial has quickly risen to become one of China's largest lenders to small businesses, thanks to its

straightforward loan application process. Although it is presently controlled by Alibaba, it began in 2007 as a joint venture between CCB and ICBC.

Another important factor that differs by country is the status of legislation (for example, the requirements for paper-based documents and forms) and the infrastructure that supports them (such as the availability of a universal national ID). Because of its favorable regulatory environment, China, for example, has been a major pioneer in digital banking.

3. Plan for flexibility, inventiveness, and speed.

Building a business utilizing a continuous iterative approach necessitates a different style of thinking than most banks are accustomed to. There are three places where a new way of working must be cultivated.

- Collaboration between teams. The core team creating the digital bank should be well-versed in not just the new technological architecture, but also the bank's design and branding, as well as the economics of its business model. This comprises both full-time and temporary employees in essential areas like compliance. The team can then progressively expand to include more members from the technical divisions. For example, Activobank, a digital bank located in Portugal, began with a management team of six to eight individuals during the creation of its digital business model, then grew to more than 30 throughout implementation (excluding line/operational positions).
- A work setting that resembles a garage. While a real garage isn't required, a physical place that fosters creative thinking and prototyping is. This entails open areas, plenty of whiteboards and worktables where people can gather and collaborate, as well as behaviors that encourage creativity, such as sprints. All of the people engaged in the creation of a digital bank—developers, IT security, compliance, risk assessment, and marketing professionals who understand the customer's needs—gather in one room for multiple live brainstorming sessions during a sprint. Instead of the usual long back and forth between departments, this

enables for rapid and efficient choices on the product's technical requirements. This procedure has the potential to significantly improve working results. Sprints can take as short as four weeks to get from whiteboard to functioning version of the product. Orange Bank, for example, spent around eight months from concept to introduction of version 1.0 of its digital product, stressing time to market and limiting modifications to its core banking system. They were also able to rapidly expand up, gaining up to 800,000 subscribers in the first eight months of existence. One important need and benefit of this method for banks is that it allows compliance and risk-assessment professionals to enter the room early and act as enablers and issue solvers, rather than gatekeepers who are frequently brought in after plans are well underway or completed.

- A “control tower” crew in the center. Launching a digital bank is a balancing act, with many mini projects going at once, such as a new credit card, personnel choices, organizational structure development, and brand design. The control-tower team's role is to ensure that all of these projects are coordinated by swiftly deploying resources to appropriate teams or prioritizing efforts in order to meet deadlines. The team must try to identify bottlenecks—such as vendors that don't respond quickly enough to requests or IT not having adequate data storage capacity—and then either address them immediately or submit the issues to the CEO or the board of directors.

This team should consist of excellent project managers with large-scale project management expertise, a high degree of familiarity with agile development and sprints, a solid working knowledge of the broad picture, and a clear grasp of applicable regulatory concerns.

4. Conduct frequent tests to improve the customer experience.



A mix of traditional consumer research and comprehensive, real-time understanding of individual customers' behavior and pain points is necessary to start a successful new digital-banking business. This includes creating a constant stream of prototypes, starting with the Minimum Viable Product (MVP) and on through iterations, to see what would improve the customer experience across all touchpoints. This sort of "real-world" testing is critical for discovering what consumers actually value, not just what they pretend to value. It also leads to a decrease of up to 80% in errors and omissions.

For example, one company approached the establishment of a digital-banking business aimed towards emerging-markets millennials with the idea that allowing consumers to sign in with their social-media accounts would be important. Customer interviews and many prototype versions (100 to 200

screens for structured consumer research and feedback loops) indicated that this was not the case. On the contrary, any relationship between their financial and social networks causes substantial security and privacy worries among urban and educated millennials. Instead of using social media to log in, the team decided to incorporate visual security indicators into the client onboarding process.

5. Establish a two-speed IT operational paradigm.



Two different yet integrated IT systems are required to implement the test-and-learn approach and short release cycles that are so critical for launching and operating a competitive digital bank: a traditional, slower, secure, and stable transaction-focused legacy back end and a rapid, flexible, customer-centric front end.

Small, product teams (often less than 10 people) should design the consumer front end utilizing an agile, sprint-based development strategy. These customer-facing aspects' software release cycles should be modular and intended for rapid deployment, with a focus on a minimum viable solution that will grow over time.

A mix of customized and out-of-the-box features can be utilized to shorten the time it takes to create the two-pronged system. One innovative digital player combines established front-end functionality, such as peer-to-peer payments, with new features that customers want but don't have much access to, such as personal-finance modules that let them to track their spending and create savings goals.

A variable-cost approach, such as cloud-based systems or data-storage solutions, should be explored to the degree that the existing IT architecture and legal environment allow it. A number of solution providers are moving into emerging regions to provide cost-effective alternatives to high-capex data center expenditures. Adopting a cloud-based solution enables a new digital player to grow up its cost structure in tandem with income, allowing for a speedier breakeven point. It also provides more flexibility, especially if the architecture is built with open APIs to allow collaboration with potential financial-technology partners who currently work in the cloud.

6. Be inventive with your marketing

Because digital-only banks lack the same customer-acquisition options as traditional banks with branch networks, marketing is a significant investment, accounting for up to 30 percent of overall operating expenses. This is true even for legacy banks that develop digital start-ups, since if the new organizations are to succeed, they must clearly separate their brand and value proposition from the parent business. In comparison to incumbent banks, digital-only banks will most likely target a younger, more digitally aware consumer. For example, AirBank, which debuted in the Czech Republic without the support of a traditional bank, positioned itself as the "first bank you would like," promising that all client interactions would be jargon-free, and all costs would be clearly explained in a single document.

DIGITAL MARKETING TRANSFORMATION IN BANKING SECTOR



Banks must build word-of-mouth recommendations and feedback through social media to successfully express such specific selling features. This means pursuing clients in a far more focused manner than banks are accustomed to, both in terms of understanding how to optimize value based on regional disparities.

A campaign run by China's popular messaging app Tencent's WeChat over the Chinese New Year vacation in 2014 is one especially innovative marketing example. To advertise its WeChat Payment service, which allows for peer-to-peer transfers and electronic bill payment, the business released an app that allows users to send a certain amount of money to a set number of friends, with the money being distributed at random by the app. Recipients had to sign up for a WeChat account in order to redeem and see how much money they had been paid. WeChat's virtual envelopes became popular because they added a sense of anticipation to the New Year's custom of delivering money presents in red envelopes. In only two days, the firm managed to link 200 million current and new customers' bank cards to their accounts, an achievement that took Alibaba's Alipay eight years to achieve.

Asset Management

- Students will be able to provide a basic explanation of the benefits of asset management
- Students will be able to describe essential properties of DAMPS



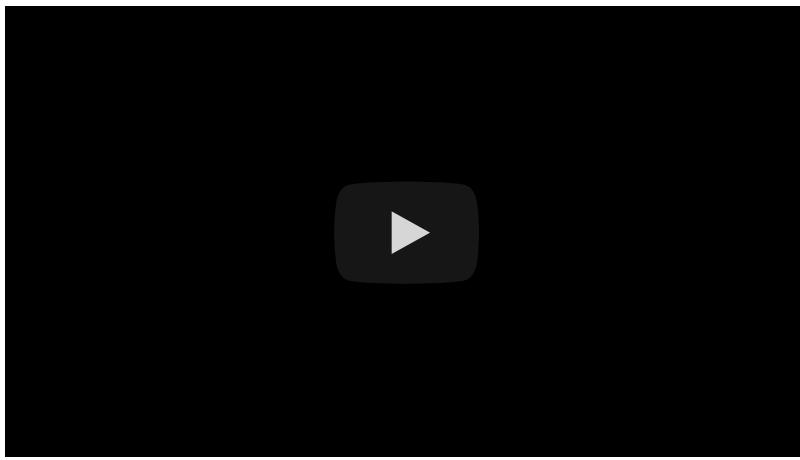
In recent years, the asset management sector has witnessed a lot of technology innovation and upheaval. The emergence of so-called robo-advisers, who utilize sophisticated algorithms to create financial advice and portfolio allocations for their customers with little or no human interaction, is one example of these advancements. Market leader in robo-advisory Betterment, Acorns (a micro-investing and robo-advisor platform), and Vanguard (an “incumbent” in the asset management business) are all examples of digital asset management innovators.

Between 2010 and the first quarter of 2020, the retail investment subsector

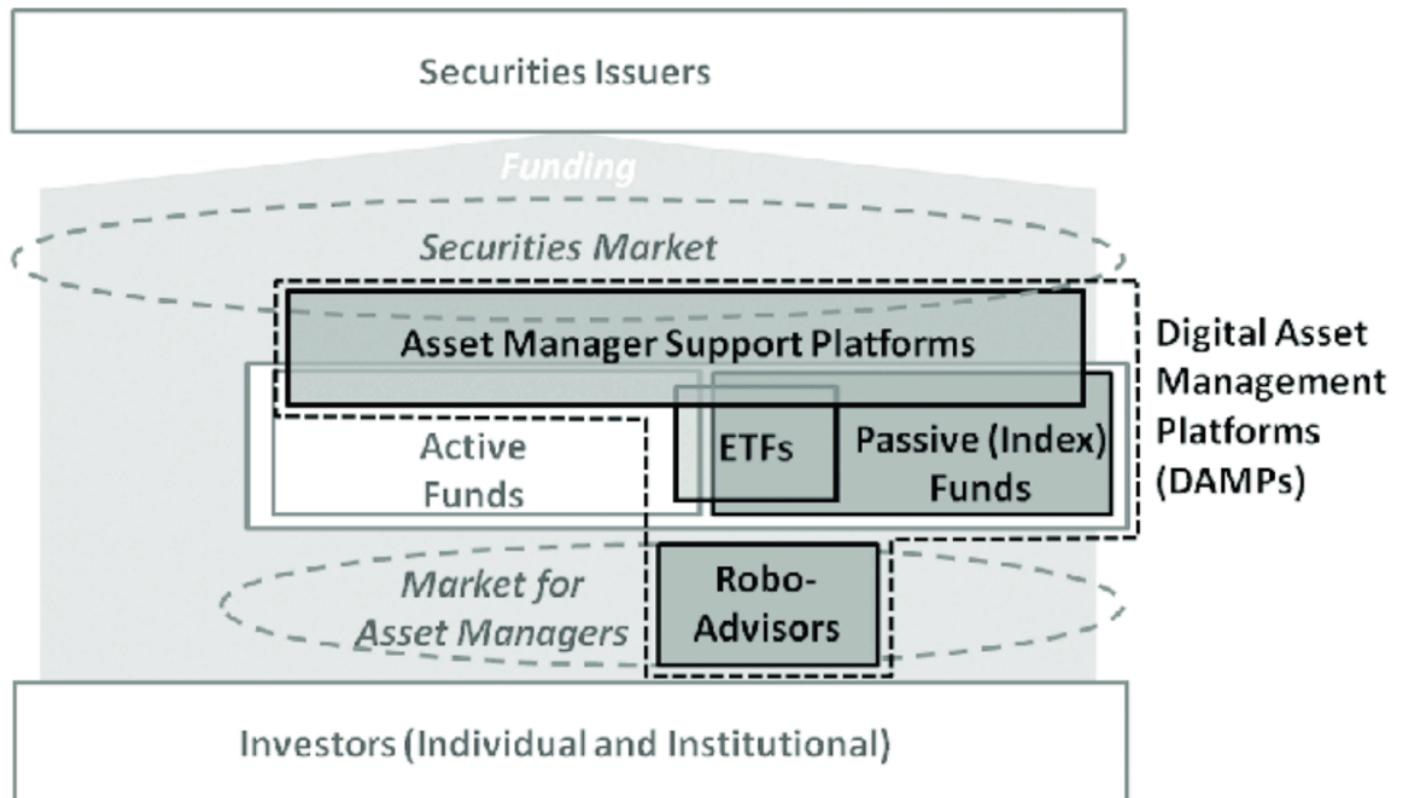
of this FinTech vertical raised 5 billion dollars. The amount raised each year increased dramatically in 2018, with almost 1.4 billion dollars raised in that year alone, nearly double the amount raised the year before. For at least three reasons, the coming year will be crucial for digital asset management.

- First, retail solutions in the digital asset management sector, such as those offered by the businesses mentioned above, are gaining traction, not just among digital natives (millennials and Gen-Z), but also among older, richer consumers who have come to embrace these goods.
- Second, during the COVID-19 pandemic, stay-at-home measures make utilizing a digital asset management solution more appealing, since customers are limited in their ability to meet in-person with their financial advisers and are more inclined to use online/digital solutions.
- Finally, robo-advisory start-ups like as Betterment and Acorns have never experienced a down market, which is a contrast to these favorable aspects. They often invest in broad-based ETFs, so their performance should not lag the market too much but proving to their customers and investors that they can weather a downturn will be a problem.

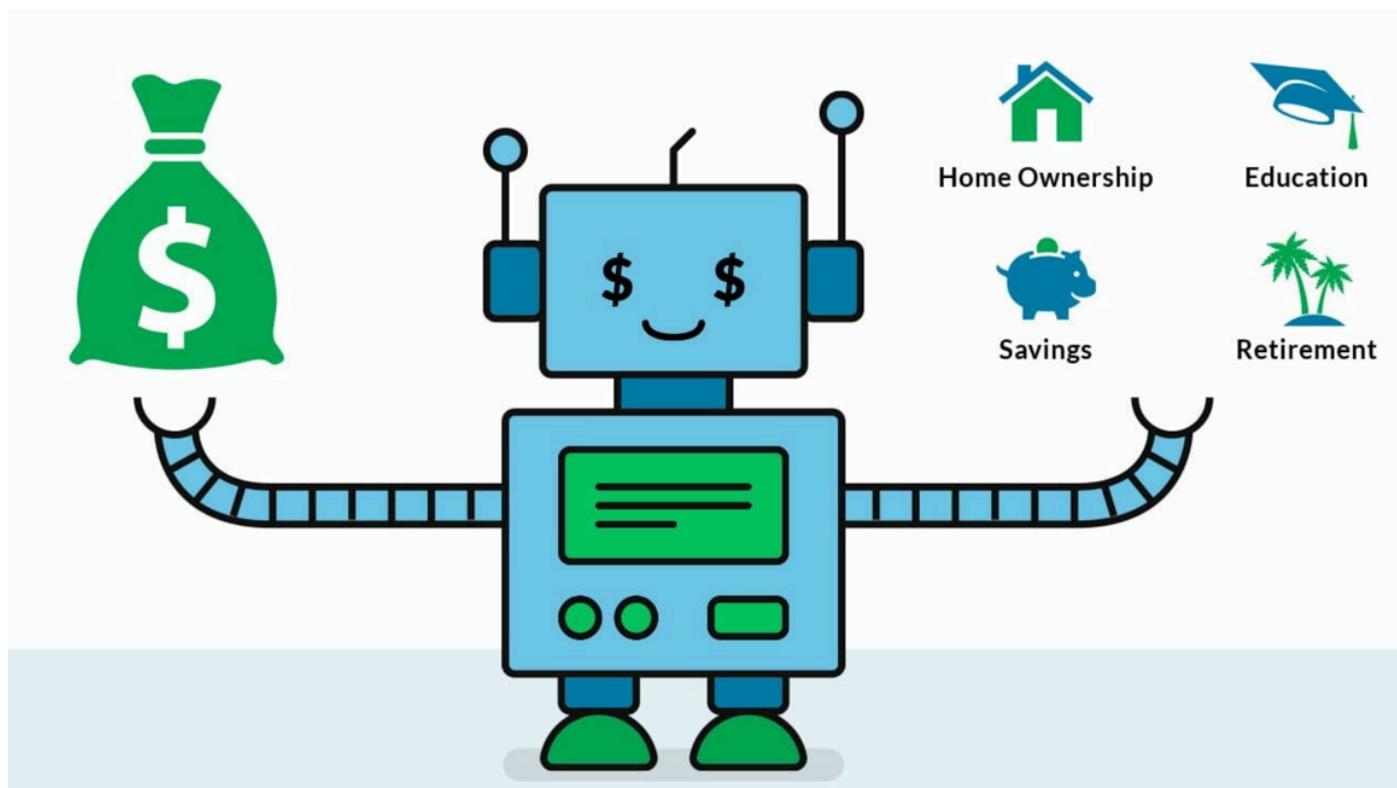
Asset management is a perfect fit for the digital platform economy in many ways, because asset managers do not operate as matchmakers between securities issuers and investors, but rather work as intermediaries between them. Until recently, however, this similarity to the platform economy model was obscured by an asset manager rivalry paradigm that is effectively the platform model's polar opposite. Rather from serving as low-cost, transparent conduits between investors and the securities market, managers have been charged hefty fees to cover significant costs—particularly highly-paid labor—incurred in an attempt to outperform their rivals.



The increasing computational complexity of asset management hasn't necessarily posed a threat to this long-standing economic model. However, in terms of the quantity of money involved, the growth of what we call "digital asset management platforms" has progressively overtaken this computerized reproduction of the conventional high-cost fund management approach (DAMPs). DAMPs fundamentally reorganize the securities market, providing substantial cost savings for investors and drastically upsetting conventional business models, rather than utilizing technology to gain a competitive edge inside the securities industry.



DAMP is divided into four categories. The oldest are index (passive) funds, which are relatively simple algorithmic funds that essentially "buy the market" to reduce investor expenses. These funds take use of securities markets' strong pre-existing information arbitrage efficiency to substantially improve market functional efficiency. ETFs (Exchange Traded Funds) are a type of index fund that improves functional efficiency by reorganizing the fund management process as a two-sided market platform. "Asset manager support platforms" sit between fund managers and the securities market, blurring the line between managers and the market. These services include portfolio risk management, trading optimization and execution, and regulatory compliance support for both active and passive managers. In contrast to index funds, they utilize advanced data-driven analytics to improve the securities market's fundamental valuation efficiency and functional efficiency. Finally, the most recent DAMPs are "robo-advisors," which are essentially ETF distributors. Robo-advisors are the most similar to digital platforms outside of finance in that they concurrently improve all elements of market efficiency in the retail market for fund managers—rather than the securities market itself—in a complimentary way.



As stated earlier, robo-advising is the newest field of DAMP development. This is aimed at the retail market for fund management solutions, rather than the securities market. Robo-advisors, at their most basic level, are online price comparison tools that direct customers to the lowest-cost investment products, which are generally ETFs. Robo-advisors, on the other hand, frequently create custom product portfolios depending on a client's condition and preferences. The industry is currently tiny, nevertheless, it has been increasing at a rate of 70–100% per year. Virtual "front offices" for large vertically integrated DAMP ecosystems are rapidly becoming robo-advisors.

Capital Markets

Objectives:

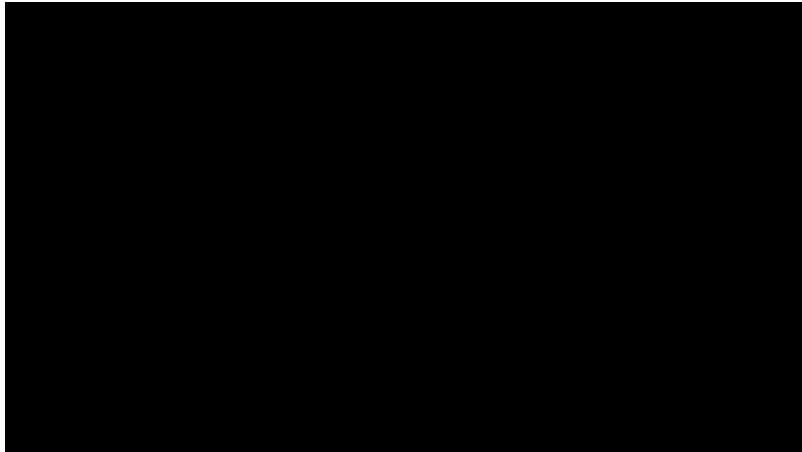
- Students will be able to provide a basic overview of capital markets
 - Students will be able to describe how FinTechs are affecting the capital markets value chain
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On the institutional side, traders who used to make buy and sell decisions on trading desks are now up against algorithms that can complete deals in a fraction of the time. Rather, behind-the-scenes data analytics businesses that serve capital markets have some of the most promising development prospects and overlap with some of the most intriguing FinTech horizontals discussed below.

The bank has always been at the heart of the financial world. FinTech businesses have been able to grab market share in conventional banking efforts such as payments, lending, investments, and financial planning because to a shifting regulatory climate and the proliferation of data. In their primary industries, companies with no asset base or traditional banking infrastructure have made considerable gains. Banks have responded to these issues in a number of ways, with varying degrees of success, but only those who actively collaborate with and assist FinTech entrepreneurs have earned a competitive advantage.

Connectivity, alternative models, and acceptability, along with seismic shifts in businesses' capacity to access finance and a global regulatory architecture that prioritizes risk mitigation, have created an ideal environment for disruptors to collaborate with capital market players. In the capital markets, FinTech is driven by the requirements of incumbent market players who want to learn more about new technology and business models. Recent financing and innovation have been focused on building a better and

more robust financial center, with implications for trading, markets, and security servicing – the full capital markets value chain.



In the search for a way to build a robust infrastructure, many of these FinTech disruptors are modeling entirely new conceptions of investing, trading, clearing, settlement, and custody; some of these players have created technology solutions in other verticals or parts of financial services and are bringing their solutions to the capital markets. Others are developing more efficient point solutions to address major pain spots in market infrastructure, post-trade, and access to finance.

As already said, FinTech refers to the influence of a new generation of cloud and mobile technology on financial services procedures. FinTech is linked to open service designs that use application programming interfaces (APIs) as well as internet-based business models. FinTech was once viewed as a threat to major, established financial institutions. Now that these firms and authorities are taking steps to improve client safety, we're on the verge of a new phase, in which financial stalwarts become platforms, hosting and collaborating with newer, smaller competitors. For exchanges, technology has been a source of structural transformation. The pace of change has accelerated in recent years as a confluence of regulatory, capital, and business model factors have disrupted the financial market ecosystem.

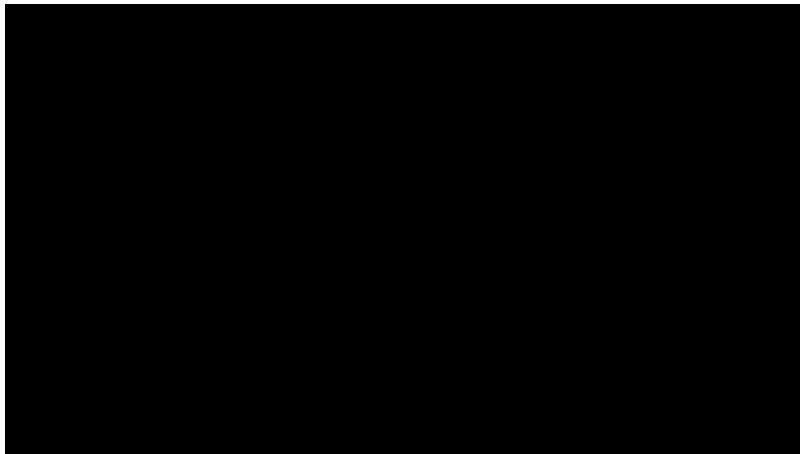
Funding for the subsector "Financial Research and Data" exhibited a dramatic increase in just a few years. For example, Kensho (launched in

2013) is a Massachusetts-based startup company that employs natural language processing (NLP) algorithms and Big Data Analytics to uncover hidden value for institutional investors. To this point, the company has managed to secure 67.5 million dollars. Some of Wall Street's biggest names, including Bank of America Merrill Lynch, Citigroup, JP Morgan Chase, Morgan Stanley, Wells Fargo, Standard & Poor's, have already invested in the startup. Another interesting business in this sector is PeerIQ, which specializes in risk analytics and pricing in the peer-to-peer lending market, as well as asset-backed securities issued by P2P lending firms. PeerIQ received 20.5 million dollars in seed funding from a group of venture capital firms and TransUnion.



The capital markets sector is still working hard to address a number of issues. Investment banks' returns on equity continue to underperform, due to persistently high structural expenses, stagnating revenues, and high capital charges. While efforts to change culture and reestablish trust are underway, success in these areas will take time. A part explanation is that they are largely focused on implementing changes that have been imposed by authorities or are prompted by external threats. However, this has its own set of issues: the combination of complexity and constant pressure to meet regulatory deadlines is causing organizational fatigue, as well as leaving

management with insufficient bandwidth to take a step back and look ahead in order to invest in initiatives that will improve return on equity. Simply put, the financial markets business model must change – and change soon. Evidence suggests that the sector has only been marginally successful in delivering transformation and controlling its cost base, necessitating a fresh approach. As a result, innovation has become a must. However, organic progression toward a new model would be extremely challenging for most companies in the sector.



A new FinTech ecosystem is emerging that has the potential to address many of the issues that today's investment banks face. Even better, the nascent FinTech sector is well-funded, eager to assist, and fueled by a mix of seasoned industry veterans and young talent unconstrained by the traditional ways of doing things. The forecast of industry decentralization is a recurring subject in FinTech talks, with incumbent giants perceived as challenged by creative and nimble start-ups. According to economists, the "new era of FinTech is defined not by the financial goods or services supplied, but by who delivers them."

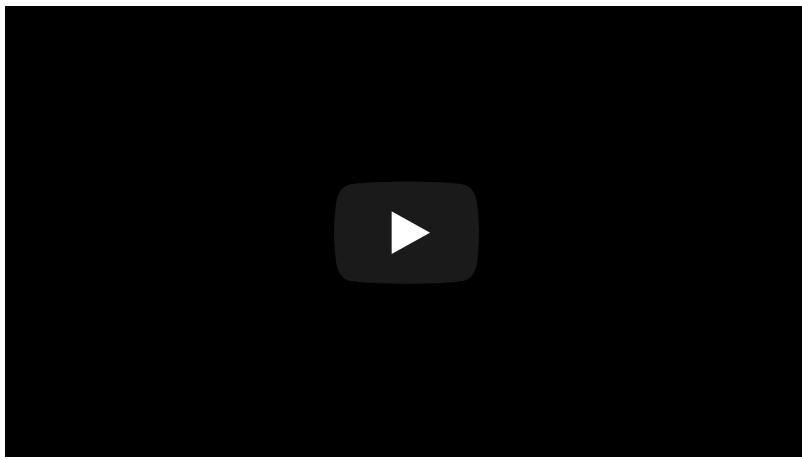
However, the development of DAMPs (as already discussed in previous chapters) has resulted in a typical digital platform contradiction of centralization via democratization in practice. On the one hand, ETFs and robo-advisors provide consumers with significantly lower fees, arguably leveling the playing field in favor of smaller investors. DAMPs, on the other hand, show noticeable rising returns, resulting in a winner-take-all

concentration of platform provider market share. Indeed, BlackRock, Vanguard, and State Street now control a disproportionately significant share of the asset management. These are increasingly acting as vertical monopolies that internalize control of all DAMP segments, rather than just horizontal monopolies/oligopolies inside particular DAMP segments.

FinTechs are affecting the capital markets value chain from top to bottom. FinTech platforms that facilitate securities issuance in primary markets have targeted instruments that are inefficiently dispersed. A system that connects dealers, issuers, and investors in private placements, such as in Europe's medium-term note market, is one example. Investment-grade bonds and equity capital markets have similar ambitions. The goal is to improve intermediation while maintaining transparency and electronic audit trails in accordance with regulations (e.g., fair allocations). Another emphasis area is the automation of manual processes in primary market intelligence, with software that may, for example, automatically give matchmaking forecasts to assist bankers in identifying prospects with the best conversion potential.

It should come as no surprise that for all of FinTech's advantages, there are an equal volume of potential dangers. With new disruptive technology, there are always certain drawbacks, and the impacts are amplified in the worlds of investment banking and capital markets.

The acceptance of technology in institutional banks is a cultural problem. The South Korean government, for example, recognizes that FinTech is altering the character of financial services. However, the sector is heavily regulated, and the government is concerned about the long-term viability of their current banking infrastructure; without FinTech innovation, is there a new risk of technological complacency and ultimate obsolescence in comparison to other countries? South Korean financial institutions risk losing competitive advantage if they do not take efforts to improve their financial technology, enabling their financial environment to become non-competitive on the world stage.



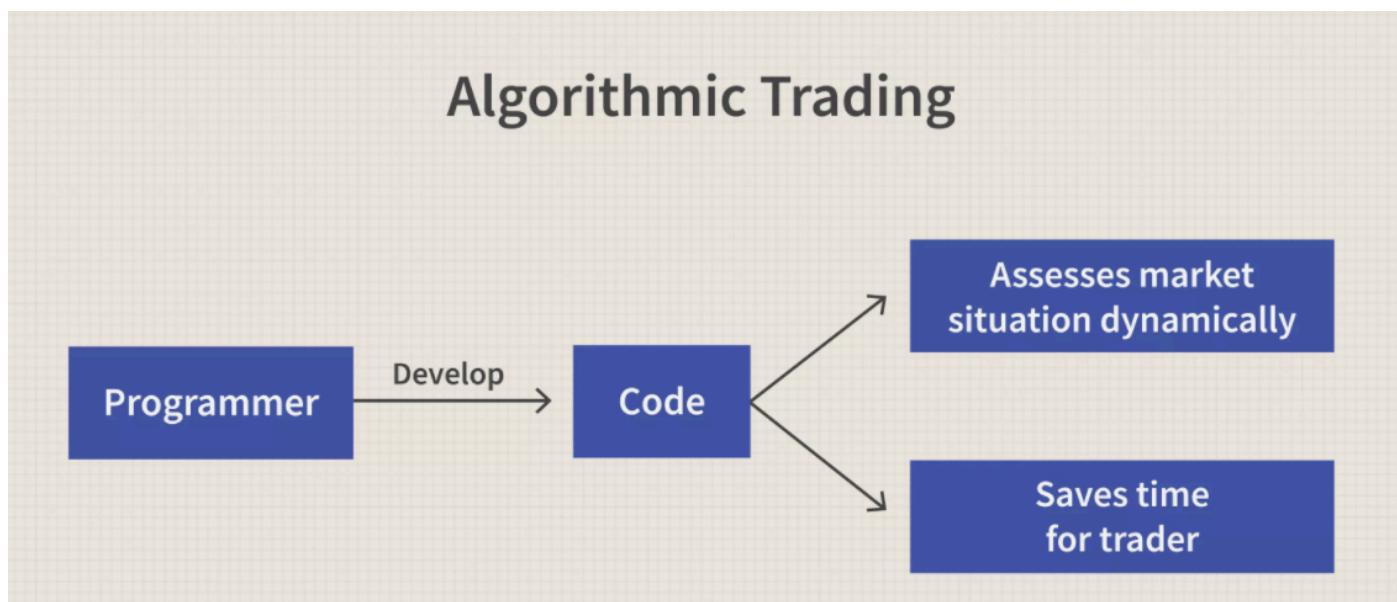
In the new world, there are new risk exposures. FinTech can open the virtual vault door to criminal activity, whereas banks and market suppliers believe themselves impregnable fortresses. Hackers' talents and resources grow in tandem with technological advancements. Today, we can observe how attackers have become more organized, even reaching the level of entire governments. We are only now beginning to understand the true magnitude of the threat to the sector, as well as whether or not the threats will stalemate FinTech's wider adoption.

When it comes to regulatory concerns, the risks to FinTech may be even greater and more urgent than the possibility for security breaches. In general, technology aids in the circumvention of conventional national borders. National borders may appear less significant in the case of FinTech, but regulatory authorities on both sides are keeping a careful eye on foreign sovereignty concerns, legal jurisdiction, consumer data protection, and taxes. While risk management is presently seen as a barrier to FinTech enterprises by regulators, we anticipate to see a better degree of cooperation among banks, FinTech businesses, and regulatory authorities in the future.

Algorithmic Trading

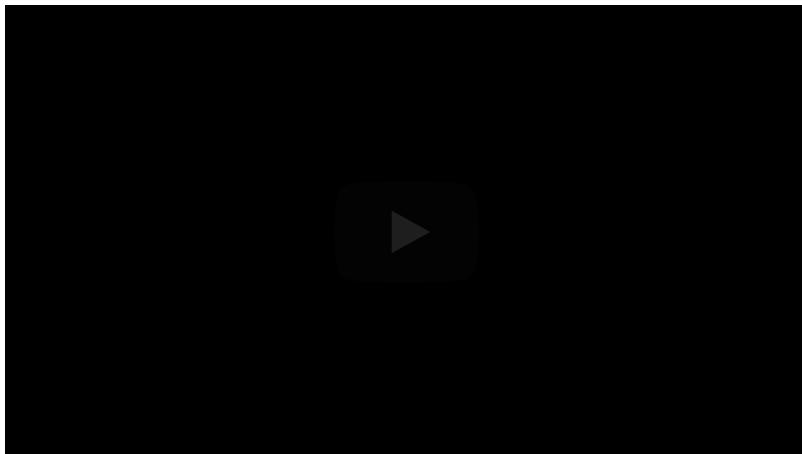
Objectives:

- Students will be able to provide a basic overview of algorithmic trading
- Students will be able to explain the advantages and disadvantages of algorithmic trading



Market players reveal their purchasing and selling interests before dealing with one another in an organized market system made up of many trading venues, such as regulated markets and multilateral trading facilities (MTF) — formerly known as alternative trading systems (ATS). The continuous double auction is the most common mechanism for price discovery used by equity markets, in which participants place market or limit orders for their trading offer and demand, and incoming orders are continuously matched against an order book made up of two queues of passive limit orders — one for buy (bid) and one for sell (ask) — sorted by price and time priori. To put it another way, the outstanding limit orders provide the liquidity required for aggressive, liquidity-taking market orders to be executed. The trading process, as well as the evolution of collateral prices, may be understood as a result of the interaction between order flow and persistent order book liquidity from this

perspective.

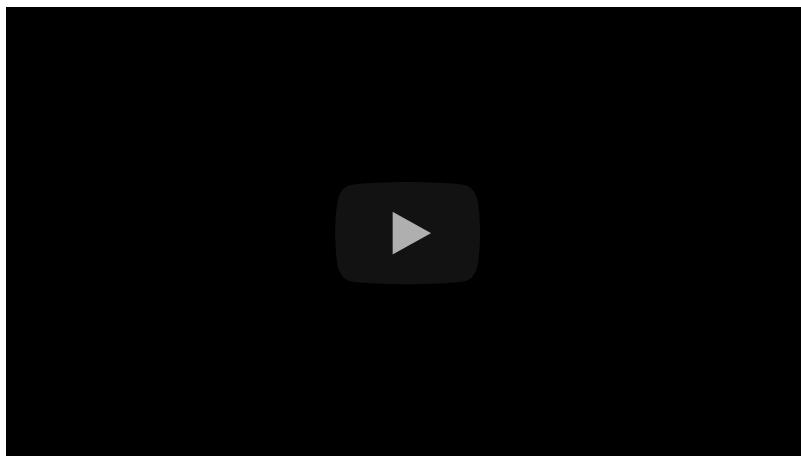


Because executing a large order is more difficult due to increased market effect and signaling risk, order size is crucial in trading. Slice big orders and spread their execution across time to reduce the related implicit transaction costs is one method to address these challenges. Algorithmic Trading (AT) refers to automated programs that implement order execution strategies. Regulators emphasize the automated and computer-based decision process – with no human interaction – of deciding individual order trading factors such as time, pricing, and quantity setting, as well as the management of orders once they are submitted – in their definitions of AT. To be clear, AT does not include any system that merely deals with automated order routing or order confirmation, i.e., no real selection of trading parameters.

Payment services, online loans, data analytics, and automated investing, according to Informilo.com, were the fastest-growing areas for big data in finance in 2015. The structure of capital markets has been altered by investing automation and other new associated technologies. The development of both co-location services and rapid trading platforms has reduced market-wide latency, allowing additional sophisticated investors to access the market. Algorithmic traders (AT) trade assets on the world's major stock exchanges utilizing high-speed and high-performance computing, complex tools, and algorithms. Both academics and politicians are paying close attention to these shifts and the behavior of market players. Many studies examine AT's position in capital markets, as well as its trading

methods and market quality implications. Similarly, market regulators have raised reservations about ATs' increasing engagement and the expense of monitoring their action.

Depending on whether or not market players employ algorithms to make trading choices without human participation, overall trading activity may be divided into two categories: algorithmic trading (AT) and non-algorithmic trading activity (NAT) (ESMA 2014). High-frequency trading (HFT) and AT are defined differently in the European Markets in Financial Instruments Directive (MiFID II), with the former being a subset of the latter. AT is described as "trading in financial instruments in which a computer algorithm selects individual parameters of orders, such as whether to make an order or how to handle the order after it is submitted, with minimal or no human interaction." This does not include any system that is only for the purpose of routing orders to trading scenes, processing orders without assessing any trading factors, order confirmation, or post-trade processing of performed transactions. Furthermore, the MiFID II defines HFT as "an algorithmic trading technique characterized by an infrastructure that minimizes network and other types of latencies using specific facilities such as co-location, proximity hosting, or high-speed direct electronic access, as well as by a system determination of order initiation, generation, and execution for trades or orders without human intervention."



Although there is no universal definition of high-frequency trading (HFT), several regulatory agencies and academics have attempted to identify two

main characteristics and trading strategies of HFT: (i) the automation of the trading process, and (ii) the high speed of transactions and order submission (invalidation). Due to the fact that only a few datasets (such as E-Mini Data and NASDAQ Data) allow for the detection of HFT activity, most research use proxies to detect HFT activity and emphasize the implications of HFT on capital markets.

Algorithmic trading advantages

1. Quick and autonomous: The algorithm reacts to changes faster than any human, regardless of how long he spends trading. After the algorithm is built, it will be able to function without interference.
2. Removes the emotional component of trading: The most shocking exchange disappointments occur when traders allow their emotions to show signs of improvement. The frenzy and begin selling even in the most unfavorable conditions or become too hungry and opt to sell at a reasonable stock price.

Algorithmic trading disadvantages

1. Requires constant research: There is no system that will continue to benefit its constituents till the end of time. Since the goal is to maintain a strong portfolio, a significant amount of time needs to be devoted to learning about this subject, perfecting the code, and enhancing the trading approach.
2. Requires discipline: What was stated earlier regarding using it to eliminate the emotional aspects of trading may be true if an individual can totally trust his/her calculations and not interfere with them. This can be problematic, especially during expanded drawdowns. Techniques that have proven beneficial in back testing are frequently obliterated by human intervention.

Insurance

Objectives:

- Students will be able to provide a basic overview of the insurance sector
 - Students will be able to describe the value of a more complete digitization of the insurance industry
-

Insurance's intangible nature indicates that it should be completely digitizable, yet this promise is rarely realized today. The procedures that underpin the supply of insurance are based on the exchange of data and money. The insurance firm and its customer exchange information regarding the risks to be covered and the terms of their insurance, which finally provide the legal basis for the parties' rights and duties, which include premium payment and claims. Despite the promise for digitalization, paper-based procedures still dominate the insurance industry globally. This is due to the fact that insurance is a relatively new sector, with some of the major insurers going back to the nineteenth century. Much younger and smaller insurers also have legacy systems and procedures that are wary of significant change and, for the most part, focus on serving current markets. It's impossible to picture today's insurance industry without computers, although their widespread use coexists alongside manual paper-based operations. Because of the high cost, the maximum amount of an insurance policy that can be supplied sustainably is limited, and consumers must be patient. Other reasons for the limited digitalization of insurance include legal restrictions, cybersecurity and data protection, and acceptance by specific client groups who may suffer digital exclusion if paper-based procedures are replaced too rapidly by digital ones.

How Insurtech Will Better Protect People

			
PERSONAL SAFETY & PRIVACY Using advanced technologies, such as Blockchain smart-contracts, artificial intelligence, autonomous driving technologies, and new cyber security methods to protect consumer identity and coverage of new risks.	ALWAYS CONNECTED, ALWAYS PROTECTED Delivering a personalised and tailor-made coverage by engagement through IOT, data analysis and mobile innovations.	MORE BENEFITS FROM SHARING ECONOMY Leveraging the expertise and scale of strategic partners to anticipate changing consumer behaviours	ADDITIONAL ON-Demand SERVICES Providing customers with added services through their smartphone

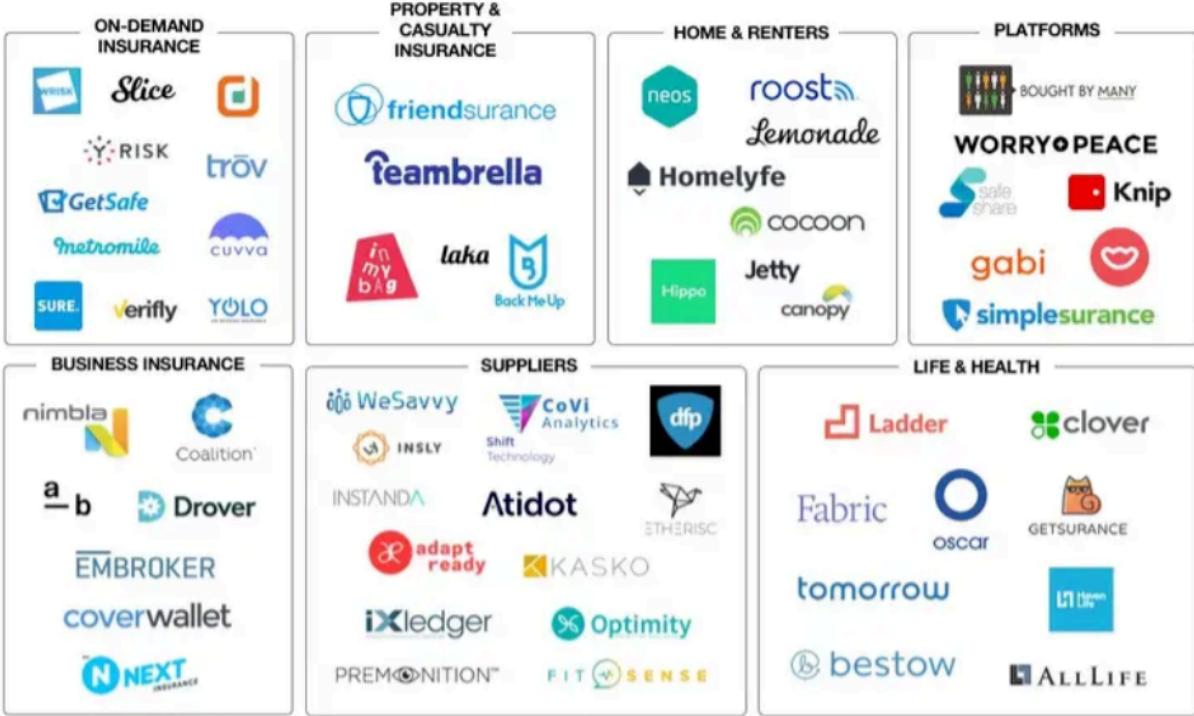
The FinTech Revolution in Insurance

Although the insurance business has embraced technological innovation in diverse ways, its influence on how it interacts with clients has been minimal. Leading reinsurance companies, for example, used artificial intelligence techniques available at the time to build computerized underwriting systems for life and disability insurance in the early 1990s. Highly specialized underwriters assess the insurability of people with bad medical histories or specific hobbies, and their scarcity has been a limiting issue for insurance's greater reach, particularly in developing countries. "Expert System" software allowed for the codification of these specialists' heuristics into decision-making algorithms that could then be deployed at the point of sale, bypassing the traditional exchange of special questionnaires for special conditions and allowing for the immediate insurance of large sums of money well before the internet's omnipresence. This technology was critical to the proliferation of improved annuity products, but it was only available in a few sectors. Several insurance-related enterprises sought to bring insurance advice and distribution online during the late 1990s dot-com bubble. From there, few internet comparison sites arose, but few companies lasted when funding became scarce.

link

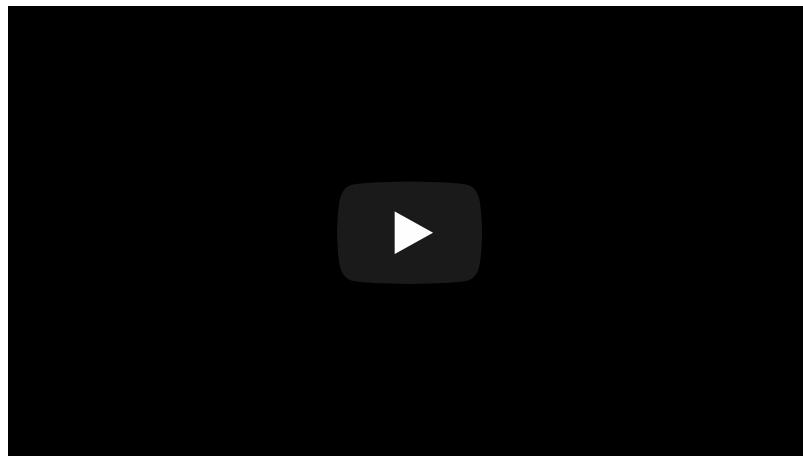
The term "InsurTech" refers to a current movement aimed at revolutionizing the insurance industry. Furthermore, InsurTech refers to the use of technology innovation to the insurance business in the FinTech Ecosystem. Insurance businesses of all types are depending on technology and complex data analytics more than ever before. Since the Great Recession, insurance, like other financial services industries, has seen a flood of technological and data-driven advances. Many of these ideas make use of linked gadgets. The idea is that insurance companies will have much more access to real-time and near-continuous data about our health, driving habits, and other behaviors thanks to data obtained from wearable sensors (e.g., an Apple Watch) or from the dashboard of an automobile (Progressive and State Farm offer these dongles that attach under the car's dashboard, referred to as an onboard diagnostic port). As a result, insurance firms may be able to dynamically reprice policies: safer and healthier behavior (e.g., working out frequently or driving within the speed limit) may result in lower life insurance or auto insurance rates. Insurance companies do not require the usage of these trackers; instead, they provide the customer with the choice to do so. We believe this has the potential to worsen the adverse selection problem that currently exists in insurance markets. Insiders in the insurance business have informed us that these impacts are washed out by pooling and aggregating data.

THE INSURTECH ECOSYSTEM



Statements like “The insurance sector is on the verge of massive technology-driven transformation” and “insurance will change more in the next 5 years than in the past 100 years” began to gain traction in 2015 — that year's InsurTech startup financing totaled 2.65 billion dollars. More than 1,300 worldwide startups are working on insurance-related technological solutions. The wider “FinTech” trend, to which The Economist dedicated a special article in May 2015, has fueled this excitement. FinTech is expected to not only challenge established company structures, but also to help people get access to financial services. Even before the COVID-19 epidemic, InsurTech was thought to be the most important FinTech vertical to monitor in the future. InsurTech startups got over 6.7 billion dollars in investment in 2019, according to Venture Scanner data, up from 3.87 billion dollars the year before and 3.7 billion dollars in 2017. The epidemic appears to have given this already promising field even greater impetus. The health and medical insurance segment of the InsurTech vertical is likely to see increased user metrics, revenue, and provide plenty of ammunition for capital raises and strong exits when the economy recovers, thanks to the growing use of telemedicine (which often integrates payments and insurance claims).

through none other than InsurTech solutions). There is also less of a need for car insurance because many people are on “stay-at-home” orders all over the world. For example, Pay-per-mile (or pay-per-distance) vehicle insurance is offered by several InsurTech firms, such as Metromile. In the short term, stay-at-home orders and local quarantines may make these items more appealing to the general public. It's likely that, if accepted, the improved customer experience provided by these InsurTech businesses will make it simpler to keep conventional carrier converts. Increased demand for these new and innovative automobile InsurTech companies will result in favorable numbers being reported by the P&C corner of the InsurTech vertical, likely paving the way for more investment opportunities and successful exits upon economic recovery, as we saw with health and medical insurance.



The value of a more complete digitalization of the insurance industry varies depending on the situation. Despite increased customer centricity commitments, insurers in mature markets can continue to service their traditional client groups in the same way they have in the past. This covers the small sectors of society that insurers primarily service in underdeveloped nations, such as those with bank accounts, mailing addresses, and experience filling out forms. Their dissatisfaction with present insurance processes is modest, as is their desire to invest substantially in technology and risk the unpredictability of potential upheaval. Other client segments, on the other hand, will necessitate a different strategy. Millennials and

proponents of the "Sharing Economy" are examples of such populations in industrialized economies. However, in developing countries, they encompass a far larger number of prospective consumers, including the poor and the vast majority of the population who had hitherto been underserved by insurance: (emerging) middle classes, non-poor rural people, and women.

Real Estate

Objectives:

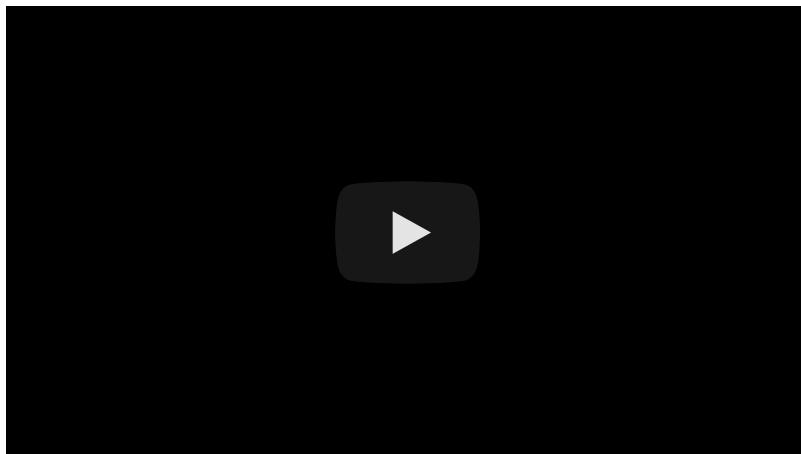
- Students will be able to provide a basic overview of the real estate as both an asset and enterprise
- Students will be able to describe the impacts on real estate through Fintech



Real estate, as an asset and as an enterprise, is not immune to the fourth industrial revolution's advances. PropTech, as it's been called, refers to the

digital revolution that's now going place in the real estate sector. PropTech's origins may be traced back to three distinct movements or impacts. Fintech, Smart Building Technologies, and the Shared Economy were the three topics discussed.

Smart Buildings are technology-based systems that make it easier to manage and operate real estate assets. Single property units or entire cities might be considered assets. The platforms might merely give information on the performance of a building or an urban center, or they could directly enable or regulate building services. This industry supports the management of real estate assets, properties, and facilities. We define PropTech as technology that aids in the design and/or construction of buildings or infrastructure (often referred to as ConTech).



Technology-based systems that allow the trade of real estate asset ownership are referred to as real estate FinTech. Buildings, shares or cash, debt or equity are all examples of assets. The platforms may merely give information to potential buyers and sellers, or they could help enable or effect asset ownership or lease transactions with a (negative or positive) capital value.

The Shared Economy refers to technology-based platforms that make real estate assets more accessible. Land or structures, including offices, stores, storage, housing, and other property kinds, can be used as assets. The platforms may merely give information to potential space buyers and sellers,

or they may arrange, or effect rent- or fee-based transactions more directly.

Real estate isn't renowned for being a change-resistant industry. The asset class's characteristics, which consists of vast, diverse assets exchanged in a mostly private market, may be a contributing factor. Homes may be too valuable a component of a private portfolio to take any chances with the process of trading, holding, or valuing them. It's also possible that there's an agency issue: the professional advisors who dominate the transaction process have a vested interest in preserving their income streams, so chartered surveyors, brokers, and lawyers might all be expected to resist tech-driven innovations that threaten their livelihoods.

Despite this, the real estate sector has gone through two significant technological shifts. Traditional advisers and a clear second wave of technology-based innovation are currently engaged in a struggle for market share. In the mid-1980s, the first wave (PropTech 1.0) occurred. It was all about data and processing power. Computing's creation in the 1930s and 1940s, as well as its subsequent 40 years of development, had little or no influence on real estate markets. The emergence of the personal computer in the late 1970s/early 1980s was a major catalyst for change. PropTech 2.0's exponential expansion began around 2008, when the series' growth began to pick up again. Exogenous technologies like cloud computing, mobile internet, lighter code, and broadband aided the late-stage 1.0 firms Rightmove, Zoopla, Trulia, and Zillow in achieving massive revenue growth. By 2010, the global financial crisis of 2007/8 had created a lack of trust in traditional procedures, and the advent of the smart phone and the multi-platform world, helped by open application programming interfaces (APIs), had permitted the invention of the 'app.' This provided consumers with free access to a plethora of real estate data in real time. New company models such as Airbnb and WeWork (both of which rapidly became unicorns) emerged as the victors of this second wave of innovation, best equipped to provide better customer experience and provide an alternative to big institutions in the aftermath of the Great Recession.

Barriers for adoption



As suggested by the relevant literature, there are operational, regulatory and social barriers for the adoption of PropTech.

Operational obstacles are procedural adjustments that must be made in legacy real estate systems or platforms built by digital start-ups. They are as follows:

1. Integration of software processes: Any new system must work with current legacy procedures and software.
2. Standardized digital data: Before technology can offer efficiencies, it needs to be up to date and correct.
3. Critical mass: efficiencies can only be realized if a new system has gained widespread use. In a network, one legacy actor can reduce the entire process to analogue approaches.

4. Transition costs: Upscaling the current software, hardware, and labor force comes at a significant financial cost. Technology should not only be concerned with the adoption of a new system, but also with the problems in discharging the old.
5. Data security: it's critical to make sure that new systems can withstand a natural disaster or a cyber-attack.

Regulatory barriers are legal concerns that new technologies have ignored or that the industry must address in order to achieve effective technological adoption.

They are as follows:

1. Legal framework: any solution must not circumvent existing legislation, and it is necessary to guarantee that present regulation does not suffocate innovation.
2. Transparency in technology: Technology solutions must be open about their data sources and the logic behind their results.

Behavioral and emotional opposition to the acceptance of any new system are referred to as social barriers. They are as follows:

1. Lost revenue: new technologies that aim to improve process efficiency must do so at the expense of their intended users. A technology's long-term financial benefits must be well recognized.
2. Disintermediation risk: we need a clear knowledge of who wins and who loses when a new technology is adopted, as well as matched incentives for potential adopters.
3. Confidence in innovation: There is a lack of trust in innovation due to a lack of knowledge of new technological solutions that can, nevertheless, enhance the efficiency of corporate operations. Many private sector data partnerships are hampered by multinational social media companies' abuse of data and a legitimate fear of fueling

- prospective data monopolists.
4. Collaborative attitude: real estate companies are hesitant or unable to share their data with the public.

Depending on the features specific to each real estate organization, these obstacles will manifest in various combinations and strengths. Many eager PropTech start-ups hoping to "disrupt" the sector will be able to do so only after a series of changes.



Credit Scores

Objectives:

- Students will be able to provide a basic overview of credit scores
- Students will be able to show an understanding of the usefulness of digital footprints for consumer financing



The development of the internet has left a trail of simple, easily available information on nearly every person on the planet. Even if no text about oneself is written, no financial information is uploaded, and no friendship or social network data is provided, the sheer act of visiting or registering on a webpage leaves significant information. In order to determine whether the digital footprint can be utilized to forecast customer payment behavior and defaults by supplementing information that is usually thought to be relevant for default prediction.

DIGITAL FOOTPRINTS

What do yours say?

BE CAREFUL ABOUT:

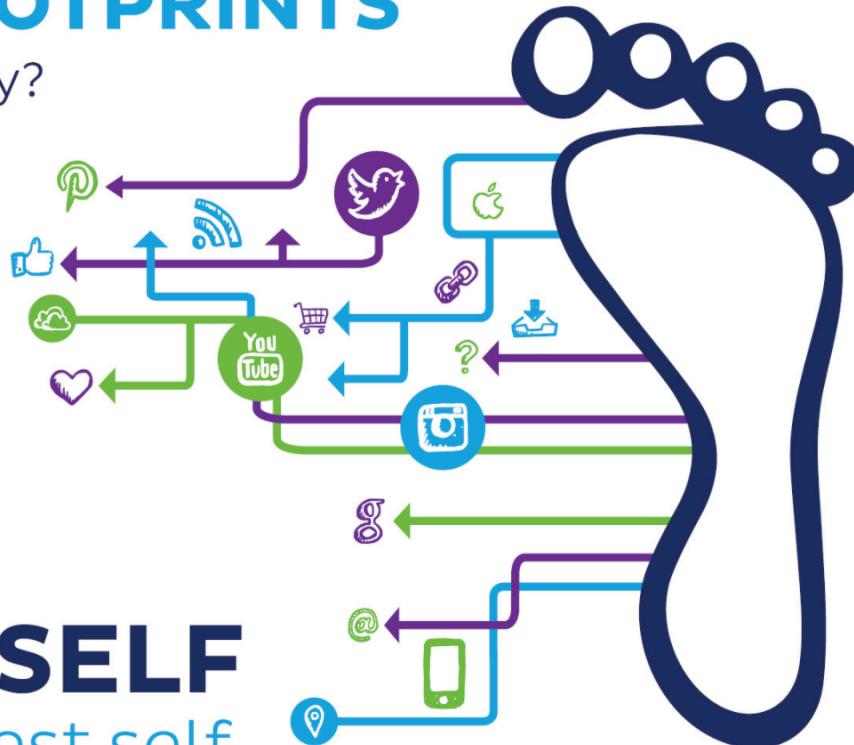
- What you share.
- Where you share.
- With whom you share.

BE SMART ABOUT:

- Sites you visit.
- Emails you open.
- Links you click.

BE YOURSELF

but be your best self.



Understanding the usefulness of digital footprints for consumer financing is crucial. The greater capacity of financial intermediaries to obtain and process information important to borrowers' screening and monitoring is one of the main reasons for their existence. If digital footprints offer substantial information on anticipating defaults, FinTech businesses, with their superior capacity to access and analyze digital footprints, may pose a danger to financial intermediaries' information advantage, and hence pose a threat to financial intermediaries' business models.

