



## THE FINTECH REVOLUTION

# How Big Data, AI and Blockchain Are Changing Finance

By MIREIA GINÉ and MIGUEL ANTÓN

In late 2017, the struggling beverage company, Long Island Iced Tea Corp., suddenly changed its name to Long Blockchain Corp. At the time, the mania for all things blockchain – the technology on which bitcoin and other cryptocurrencies are based – was at a peak and bitcoin’s value was going through the roof. The mere announcement of a pivot into blockchain saw the unprofitable company’s stock rise nearly 300 percent. Although this prompted stern warnings from the U.S. Securities and Exchange Commission about cheap attempts to capitalize on crypto-

mania, the fact that blockchain would give any business such a bump just goes to show the market appetite for it.

Fintech is disrupting the financial industry, adding a glossary of exotic new terms to our business vernacular. What exactly is the fintech revolution all about? Is it a bubble or will it generate true, lasting value?

While *fintech* is a new term, the existence and use of financial technology is not. Financial technology has been around since at least the mid-1990s, with the banking industry being its largest buyer and user. Incumbents



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frequently used the technology as much to create market barriers and maintain their dominance as to provide better financial services.

Since then, things have changed. The mass use and adoption of the internet and smartphones, the emergence of cost-cutting technologies, greater regulatory flexibility and radical demographic shifts have all facilitated the entry of disruptive new players. These are what people refer to when they talk about fintechs today.

The arrival of these new market players has benefited not just the end user but also businesses, for whom banks have ceased to be the only access point to the financial system. For small and medium-sized enterprises (SMEs), fintechs offer a wide variety of solutions – from new forms of affordable financing, to faster, more efficient payment methods, to better customer service.

For the past few years, we have conducted research on this topic and interviewed fintech executives. In this article, we will look at the main drivers of this disruptive new phenomenon and analyze some of the potential benefits for companies of all sizes and sectors.

## EXECUTIVE SUMMARY

**The marriage of finance and technology** has given rise to new players that are transforming the financial industry. Many of these fintech firms deliver more economical, flexible, user-friendly services, disintermediating financial services and capturing a considerable part of traditional banks' market share. The days of banks serving as the only access point to the financial system are over. Instead, new

technologies are ushering in new forms of affordable financing; faster, more efficient payment methods; and better customer service. This article shows how pioneering fintech business models can afford greater speed and efficiency, personalization, automation and easier access, while reducing many of the problems that have long plagued traditional financial exchanges.

## The Fintech Ecosystem

Driving the fintech revolution are six key forces that interact within a dynamic ecosystem (see **Exhibit 1**). The first big driving force is consumerization. Technology is no longer the sole preserve of IT specialists. Today's consumers are increasingly well versed in technological tools, skills and language, forcing companies to adopt models that originate in the consumer space. The more that technology becomes democratized and consumerized, the less loyal people feel to traditional financial service providers.

A second force is startups – the fintechs themselves. These are the new, entrepreneurial, innovative market entrants that have taken an age-old industry by storm. They deliver more economical, flexible, user-friendly services, disintermediating financial services and capturing a considerable part of traditional banks' market share. According to a 2017 PwC Global Fintech Report, over 80 percent of incumbents believe their current business is at risk, with nontraditional financial service providers already offering payment solutions, transfer services and insurance to 84 percent, 68 percent and 38 percent of their customers, respectively.

Tech developers are the third force. These are the ones who develop the digital platforms and core technologies – such as artificial intelligence, data analytics and cloud computing – that have made it easier for fintech innovators to enter with alternative solutions.

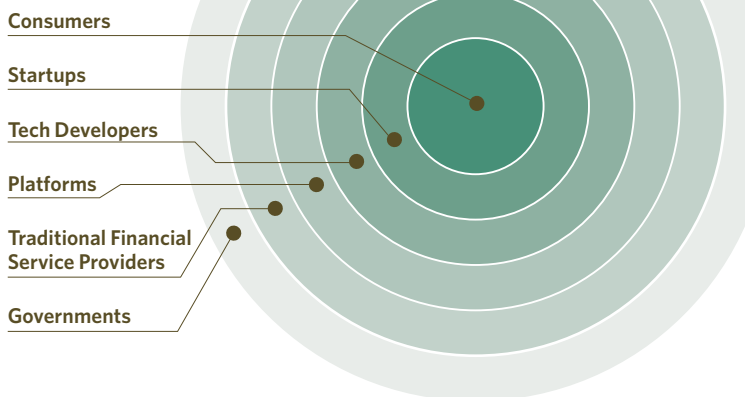
The next force is platforms. The dominant platforms of Facebook, Amazon, Apple and Google have been able to leverage the data they constantly accumulate on their users to offer ever more powerful services. These leading platforms, with their considerable experience and scale, make fearsome competitors, not just for small fintech startups but, disturbingly, for large, established institutions, particularly banks. In fact, these platforms seem to be



## The Fintech Ecosystem

EXHIBIT 1

SIX FORCES ARE DRIVING  
THE REVOLUTION, WITH THE USER  
AT THE CENTER OF IT ALL.



forming their own self-sufficient digital ecosystem that could well supplant that of banks.

Fifth is the traditional financial service providers. Threatened with losing market share, they have been forced to reevaluate their business models in order to find new competitive strategies and attract millennial customers the way that innovators have done.

Monitoring all these constantly changing forces are governments, which try to formulate an appropriate regulatory framework for emerging market players without becoming so bureaucratic as to stifle their initiative.

### New Business Models

A common feature of many fintechs is their ability to generate new business models. As our IESE colleague Javier Zamora has pointed out, the reduced cost of tech allows fintechs to create value propositions with fewer resources than established companies require to launch new solutions onto the market. This democratizing phenomenon has given rise to what's known as unbundling, whereby different financial services are able to be offered by small, separate players, each of which can focus on very specialized propositions. These smaller businesses are integrated within a larger ecosystem, thanks to the coordinating possibilities resulting from greater connectivity among all the players involved in the value proposition.

As such, in each of the different segments of the fintech industry, we find advantageous solutions for companies of all sectors in their daily operations. Let's consider each of these advantages in turn.

### 1 SPEED AND EFFICIENCY

The payments industry is one of the core financial activities that has experienced the most disruption in recent years. Numerous companies have emerged whose solutions can carry out transactions with greater speed and efficiency.

From a consumer perspective, mobile wallets like Google Wallet or Apple Pay are gaining strength, providing a means of making credit or debit card payments using mobile phones. These mobile payment solutions are becoming ever more regularly used for loyalty cards, boarding passes, concert tickets, coupons and a host of other applications.

Likewise, peer-to-peer (P2P) platforms have proliferated, enabling users to transfer money between individuals more easily, more quickly (in some cases instantaneously) and at lower cost (in some cases free of charge). In the United States, the payment platform Venmo moved transactions worth \$14 billion dollars in the last reported second quarter of 2018, representing 78 percent year-on-year growth. Some of these P2P platforms are also being incorporated into social media networks.

Fintechs are also simplifying payments for businesses. An interesting example is Stripe, a third-party payment provider for online marketplaces, ranging from large vendors such as Amazon to small businesses that wouldn't otherwise be able to build their own infrastructure to sell their goods online and achieve such global reach.

The company supplies application programming interfaces (APIs) – the communications protocols – for e-commerce sites. These APIs are unique in that they function regardless of the payment method (Stripe partners with all the major card networks), the device involved (whether desktop or mobile) and the country in which the purchase is made (Stripe takes the pain out of foreign currency transactions and the complexities of foreign financial requirements). Because the API can be embedded directly into the e-commerce site



without redirecting customers to another site for checkout, the online payment experience is seamless from the customer's point of view. The business also benefits, given that most companies that set up their own checkouts often get things wrong or do it in less than intuitive ways. Stripe makes payment from a mobile device as easy as a single click.

The emergence of virtual currencies has also led to an increase in the speed and efficiency of payment systems. With even established giants like Microsoft experimenting with cryptocurrencies, it seems there is growing acceptance for currencies other than fiat money – that is, physical money (paper and coins) backed by governments as legal tender.

The largest and best known cryptocurrency – bitcoin – operates, like many others, via an end-to-end payment system known as blockchain, which facilitates transactions without the need for a centralized authority to certify and validate them. This reduces transaction costs and increases their speed. Moreover, given the way the transaction is time-stamped with immutable information through what is known as a shared or distributed ledger, there's no dispute about payment, and companies are able to exercise better control over returns and reimbursements.

Virtual currencies let funds be transferred directly, safely and economically to any person or company anywhere in the world, which is particularly useful for companies with a strong international presence or with employees located in remote locations. A recent *IESE Insight* article by IESE's Jorge Soley

explores the potential benefits of blockchain in general and the Ripple network in particular, whose transaction currency, XRP, has attracted the interest and participation of major global banks.

In this rapidly changing environment, security is paramount. To this end, many fintechs are innovating in the use of biometric data and tokenization – the process of replacing sensitive user data with a nonsensitive equivalent like a series of randomly generated numbers. Yet tokenization has broader applications than just making digital payments more secure. It can be used to represent things other than money, including patient information, property registration or identification of financial assets.

## 2 PERSONALIZATION OF SERVICES

Another benefit of the fintech revolution is the personalization of services, which is already gaining ground in the insurance industry. Several companies innovating to improve the efficiency of the traditional insurance model have given rise to the moniker “insurtech.”

Say a customer agrees to install a device that registers their activity when driving. That activity is relayed to the insurer using telematics or the internet of things. Such data could include car speed, brake times, mileage, times of day when the vehicle is used, weather conditions, as well as data related to the customer's general behavior and safety record. The more of this kind of data that insurers have on their customers, the more they can adjust their premiums accordingly. This takes customer segmentation and personalized service offerings to a whole new level.

Artificial intelligence makes it possible to analyze data at a granular level and fine-tune premiums to fit each customer, combatting the problem of homogenization. By being able to set prices in precise, personalized ways, companies can reduce their fixed costs and control the variables. It also positively reinforces desirable behaviors by customers.

The massive growth and availability of real-time data also improves the accuracy of risk assessments for timelier, more customized coverage. We already see this in the area of drone insurance, with Flock insuring drones under a pay-as-you-fly plan.

### ■ ABOUT THE AUTHORS

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An important feature of artificial intelligence is machine learning, whereby systems automatically learn and improve through trial and error without being explicitly programmed to do so. This enables firms not only to identify risks better but to actually anticipate and avoid them altogether. Tyche, an underwriting analysis tool for casualty insurance, does this well. Using machine learning, it crunches open and proprietary data to identify likely claims and then runs it through its own API to generate a claims avoidance model. Its website boasts that it can “concentrate over 30 percent of future claims into less than 1 percent of policies that would otherwise be bound under a carrier’s existing underwriting standards, allowing carriers to dramatically improve their bottom lines by declining the riskiest fraction of their books.”

Another area where we see personalization is in the trend for micro finance, reaching clients overlooked by big banks. Often these micro products are tailored for low-income people with limited resources or lower valued assets, and are priced proportionately. Micro-insurance, for example, puts insurance within reach of vulnerable or marginalized groups in emerging markets, so a poor farmer who has a bad year won’t be entirely wiped out and end up in worse poverty.

### 3 AUTOMATION OF PROCESSES

The advent of robo advisers, based on robotic process automation (RPA), affords another key benefit indicated in the name of the technology itself: automation. Policygenius, for example, is an insurance marketplace that has leveraged the affordances of automation to let consumers compare policies, receive quotes and purchase policies directly from the platform without the need of sales agents.

RPA can be incorporated at any stage, allowing firms to automate sales cycles,

increase process efficiencies and improve customer service. Many companies are already betting on the technology. When coupled with machine learning, RPA can help companies navigate increasingly complex situations, detecting patterns that analysts fail to see as well as refining or increasing the speed of calculations.

RPA has proliferated in capital management. There are numerous platforms that use algorithms and feed on big data to make considerably cheaper, more accurate financial recommendations. RPA has contributed to the democratization of financial services, particularly helping SMEs invest in assets that they normally wouldn’t be able to because they couldn’t meet the minimum capital requirements demanded by traditional financial advisers.

RPA can increase the reliability of accounting records by reducing manual errors and automatically collecting data from different registers. Its ability to process natural language and analyze data from social media networks has also helped insurers detect fraud. With RPA, many systems and platforms can be connected simultaneously. Humans could never perform such tasks. For companies, the cost reductions are huge and they are able to redirect their human talent. Freed from repetitive, systematic tasks, employees can expend their energies in areas where their skills are put to better use.

Smart contracts are another development that seem to be gaining ground. Like traditional contracts, smart contracts spell out the terms and conditions of a working relationship but, being computerized, they can be self-executed exactly as they have been programmed, without high transaction costs or ambiguity in the interpretation. As with other blockchain-based innovations, their strength is that they cut out the traditional middlemen. Verification and compliance happen



**Benefits of Fintech**

EXHIBIT 2

FINTECH BRINGS AN ARRAY OF BENEFITS & APPLICATIONS.

BENEFITS	ENABLING TECHNOLOGIES	APPLICATIONS
<b>1 SPEED AND EFFICIENCY</b>	Blockchain (virtual currencies, tokenization)	<ul style="list-style-type: none"> <li>Faster, cheaper, more secure way of conducting payments and other financial transactions</li> </ul>
<b>2 PERSONALIZATION OF SERVICES</b>	Internet of things Big data	<ul style="list-style-type: none"> <li>Capture data from customers and generate adaptive and predictive risk models</li> <li>Segment customers and personalize offerings</li> </ul>
<b>3 AUTOMATION OF PROCESSES</b>	Robotic process automation (RPA) Machine learning Smart contracts	<ul style="list-style-type: none"> <li>Reduce manual errors</li> <li>Collect data from across a range of platforms, devices and sources automatically and efficiently</li> </ul>
<b>4 REDUCTION OF TRADITIONAL PROBLEMS</b>	Machine learning Internet of things	<ul style="list-style-type: none"> <li>Reduce conflicts of interest, fraud, moral hazard and adverse selection</li> </ul>
<b>5 EASY ACCESS TO INCREASINGLY SOPHISTICATED TECHNOLOGIES</b>	Cloud computing	<ul style="list-style-type: none"> <li>Digitalize more firms, especially SMEs</li> <li>Generate credit history for those with none</li> </ul>

collect the royalties they are due. In the field of finance, they are used for the clearing and settlement of securities and the payment of coupons and insurance claims, allowing a claim to be activated automatically whenever a specific event, such as a car accident, occurs. The applications are endless, with businesses standing to benefit from greater transparency as well as reduced costs and execution times.

**4 REDUCTION OF TRADITIONAL PROBLEMS**

Conflicts of interest, fraud, moral hazard, adverse selection: stubborn problems that have long plagued the financial industry are effectively being tackled by fintech.

Insurance is a good example. Traditionally, insurers have incentives not to pay out claims while the insured have incentives to claim for as much as they can. This is what is known as moral hazard – the idea that your own behavior is changed when the risks or consequences of your actions are borne by others, or you are protected in some way from your own risky behavior. Emerging fintech business models can address such problems in innovative ways.

One startup, Lemonade, has developed a P2P platform to reduce conflicts of interest in home insurance. The time it takes to process claims is extraordinarily fast. Users simply go to the Lemonade app and submit their claim through a chatbot, which automatically checks the claim against the policy and runs it through various anti-fraud algorithms to decide whether to approve it. Claims can be approved and paid in as few as three seconds.

But it's not just the settlement speed that makes the platform so extraordinary. Lemonade also has a mission to “transform insurance from a necessary evil into a social good.” So, of the customer's premium, Lemonade keeps 20 percent and the remaining 80 percent is used for reinsurance and paying out claims; anything not paid out at the end of a year is donated to a charity of the customer's choosing. This “social good” component is one of the things that makes Lemonade so appealing, especially to millennials, and sets the tone for the business relationship. Indeed, the founders drew on insights from the well-known behavioral economist Dan Ariely to embed positive psychology into the

automatically, making fraud or unauthorized amendment extremely difficult or extremely obvious.

Smart contracts' ability to automatically record movements, measure standards, check quality and track the location of products makes them enormously useful for supply-chain management. Given that these contracts can be programmed as a series of if/then steps, no action will be triggered if your pre-stated conditions haven't been met.

We see smart contracts being employed across a range of industries, including music and other intellectual property subject to copyright, helping to ensure that authors

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The internet of things permits creative possibilities for coming up with more socially responsible alternatives that cut down on the adversarial tendencies inherent in traditional financial exchanges.

technology. For instance, claimants have to take a pledge of honesty and speak into a camera, which disinclines people to lie or commit insurance fraud.

Another company, Friendsurance, uses social ties and group accountability to achieve similar ends. Under its social business model, customers with the same insurance type are put into small groups. If no claims are made by any member of the group, everyone in the group receives some cash back. As claims are paid out, the group's reserves go down, but no one ever pays more than their premium. As the Friendsurance website explains: "Group performance, and its impact on the cashback, promotes responsible claims behavior."

As before, the internet of things permits companies to improve risk profiles and reduce adverse selection – when two parties each have information that the other side needs and they use that private knowledge at the expense of the other. The previous examples show the creative possibilities that exist for coming up with more socially responsible alternatives that cut down on the adversarial tendencies inherent in traditional financial exchanges.

#### 5 EASY ACCESS TO INCREASINGLY SOPHISTICATED TECHNOLOGIES

Perhaps the most important benefit of fintech is that a host of new businesses – and SMEs in particular – now have easy access to increasingly sophisticated technologies. Today, more and more businesses can access cloud-based applications to achieve greater integration between systems and enjoy quick, easy, affordable access to big data, thanks to the services of fintech firms. The first fintech wave has helped companies digitalize at remarkable speed and ease, and meet the higher expectations of digital natives.

Likewise, small businesses with no credit history can access new forms of fintech

financing. Given that financial institutions cannot properly assess the solvency of companies without records of their credit history, fintech innovations should help SMEs get more and better financing in the future.

#### Time to Join the Revolution?

As we can see, the opportunities of the new financial ecosystem (summarized in **Exhibit 2**) are virtually unlimited. For incumbents, not joining the revolution may put them at risk of being displaced from the market entirely. For companies that have been watching events unfold from the sidelines, maybe now is the time to join the fray. □

#### ■ TO KNOW MORE

- Miguel Antón and Mireia Giné teach the course "Fintech Revolution: How Big Data, AI and Blockchain Are Changing Finance" as part of IESE's MBA program.
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