THINK
ACT

March 2017

Enabling decentralized, digital and trusted transactions

Why blockchain will transform the financial services industry

Roland Berger

THE BIG

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BLOCKCHAIN

A major opportunity for the financial services industry to create new business models and streamline internal processes.

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Enabling decentralized, digital and trans-actions: How blockchain is set to change the way the world does business. And why blockchain will transform the financial services industry.

Several years ago, Bitcoin upset the financial services industry, but now the pendulum has swung the other way and companies are focused on the promise of Bitcoin's underlying technology, blockchain. Financial services companies must move swiftly to define and implement the blockchain use cases that will bring them the most value. If they fail to do so, blockchain may indeed become a lasting threat with its power to disintermediate large parts of the industry.

INTRODUCTION
Blockchain has the potential to change the way the world does business. Given blockchain's ability to cut out powerful institutions and "middlemen," blockchain represents a fundamentally new opportunity for business. In particular, the data-rich, transaction-heavy financial services industry will see a disproportionately fast and strong impact on the way business is conducted. The highly decentralized and immutable blockchain concept uses mass collaboration and computer code to establish trust. This makes it possible for secure transactions to be verified and stored decentrally. In combination with "smart contracts," the potential for blockchain becomes endless. According to the World Economic Forum, 10% of global gross domestic product will be stored on blockchain technology by 2025.

For the financial services industry, blockchain applications are not only a challenge to traditional business models – they are also a major opportunity for creating new ones and streamlining internal processes.

At Roland Berger, we see this as the genius of the technology, as well as the reason companies need to move swiftly to understand and define use cases – within their organizations, and with external partners.

In this report, we want to contribute to the discussion on blockchain by considering why blockchain matters, how it will disrupt financial services in industry, and, most importantly, how organizations can launch an effective blockchain initiative in five steps.

We believe that those companies that begin exploring blockchain from the perspective of their customers' needs will be more successful than those that look for a blockchain use case at all costs.

WHAT IS BLOCKCHAIN AND WHY DOES IT MATTER IN FINANCIAL SERVICES?

Blockchain – a secure ledger of transaction history stored across participating computers – allows various types of transactions to be conducted with a high degree of trust without a middleman. In financial services, of course, there is a huge potential for blockchain: there are many instances of data-heavy, fault-prone internal and external reconciliation and there are many middlemen that take their cut of the action, such as clearing houses, brokers and payment networks. One disruptive area of impact will be new, decentralized business models, made possible by combining technologies such as blockchain and smart contracts.

One of the key aspects of blockchain is the seamless evidence of a sequence of transactions. Its historical antecedent is the good old "bill of exchange," the rear of which displayed the chain of endorsements (even back then it was called a "chain"), which enabled the owner (the bill creditor) to verify the sequence of transactions when the bill of exchange changed hands. It served as evidence to the bill debtor that the bill of exchange was justly owned. Just as a smart contract leads to automatic execution when predefined conditions are met, the bill of exchange similarly afforded the unconditional right to payment of a predefined amount when it was produced by the creditor.

A second sphere of impact is process automation, both inter- and intracompany. Already, many areas of the financial services sector are highly automated, but its data-driven nature and its constant production of new data make it ripe for further process automation. With blockchain capabilities applied to the clearing process, for instance, companies can save time and money on transactions.

The implications are far reaching indeed. Pundits estimate the savings achievable through blockchain in the banking sector over the next five years to be in the tens or even hundreds of billions of dollars. Interestingly, estimates are going up as the technology matures.

Early on, enthusiasm for Bitcoin currency was seen as a threat to financial services. But a closer look at the underlying blockchain technology later caused companies in the sector to embrace blockchain as an opportunity, while still monitoring Bitcoin-style applications as an ongoing threat.

JPMorgan Chase, a bank initially skeptical about blockchain, is reportedly developing its own blockchain service named "Quorum," based on a fork of a particular blockchain called Ethereum (see interview with Ethereum's creator Vitalik Buterin on page 14).

Remittance, trade finance, securities trading and insurance industry: <u>Four use cases for blockchain technology.</u>

Below we illustrate four use cases for blockchain applications that represent opportunities for companies in the financial services sector. They apply to all kinds of transactions and business models, including peer-to-peer (P2P), business-to-consumer (B2C) and business-to-business (B2B).

We have looked at various examples that can illustrate different important points about applying blockchain technology: first, remittance services and how they could deliver a better customer service and disrupt those companies that profit from being the go-between for international payments; second, trade finance, an area of huge opportunity due to the large number of transactions and pronounced need for reconciliation and trust among parties who are unfamiliar with one another; third, securities trading, a sector characterized by many intermediaries, in which the use of blockchain could result in significant savings in time and money by cutting out the middlemen. Finally, we lay out a use case for insurance, where data reconciliation, claims processing and keeping customer data up to date still represent a costly burden for companies.

USE CASE 1
REMITTANCE
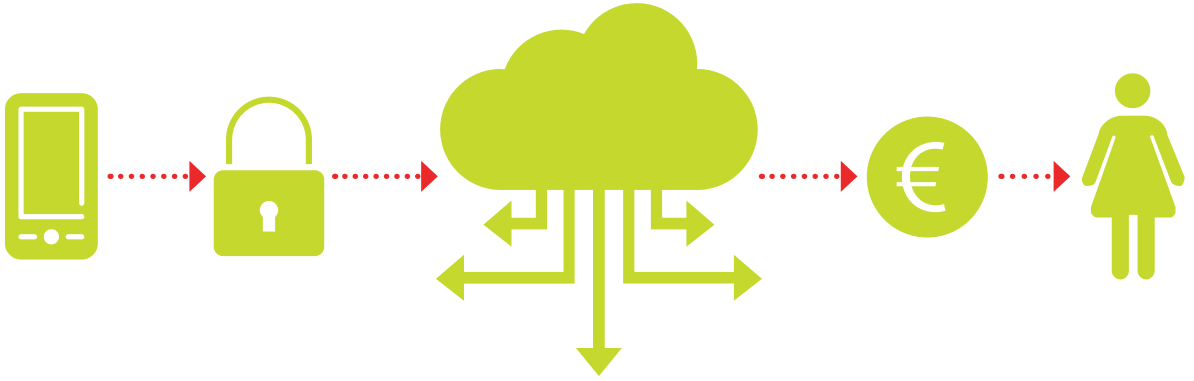
More than 247 million people, or 3.4 percent of the world's population, live outside their countries of birth. According to a 2016 World Bank report, migrants are now sending earnings back to their families in developing countries at levels above USD 441 billion a year, a figure three times the volume of official aid flows.

But sending earnings to the family back home remains a costly and complicated undertaking for many. The problem is not just on the sender's side, but also on the receiver's side. Often, the person receiving money from a loved one working abroad is "unbanked." Since blockchain reduces the need for fixed banking infrastructure, it allows anyone with access to a computer network to receive funds. Not only is this good for an individual who lives in a remote village far from any bank, it can essentially expand the number of people participating in the global economy and bring prices down through disintermediation.

Imagine a man named Jeff who left his home country, Botswana, to work in the US after studying. He wants to send a monthly amount to his family back home but is unhappy with the fees that wire transfer companies charge, as well as the time it takes for funds to actually become available for use.

Jeff's bank has recently introduced a new service, allowing consumers to conduct P2P payments using blockchain technology. He registers, goes through video identification, and uses a fingerprint to obtain service through an app. At the same time, his family receives login credentials for their new virtual account on their mobile phone via SMS. Jeff presses the button and sends money to his family. The transaction is encrypted in a smart contract, and Jeff's earnings are automatically converted to the local currency. Jeff's family receives a text message stating that the money has been received in their virtual account, and they can now make payments at online shops or receive cash from authorized partners (such as kiosks or retailers).

At first glance, it looks like a bank that enabled such a transaction would be cannibalizing its own wire transfer fees (according to the World Bank, the average global cost of sending remittances was 7.68% in 2015). But there are several upsides. First, the company could form new relationships with unbanked customers across borders without the need for costly banking infrastructure locally. Second, the security of transactions could be increased, and presumably the bank would face a smaller number of costly, fraudulent transactions. Finally, since blockchain-based transactions are faster than traditional wire transfers, the company would have an additional selling point to win more business.

USE CASE 2
TRADE FINANCE
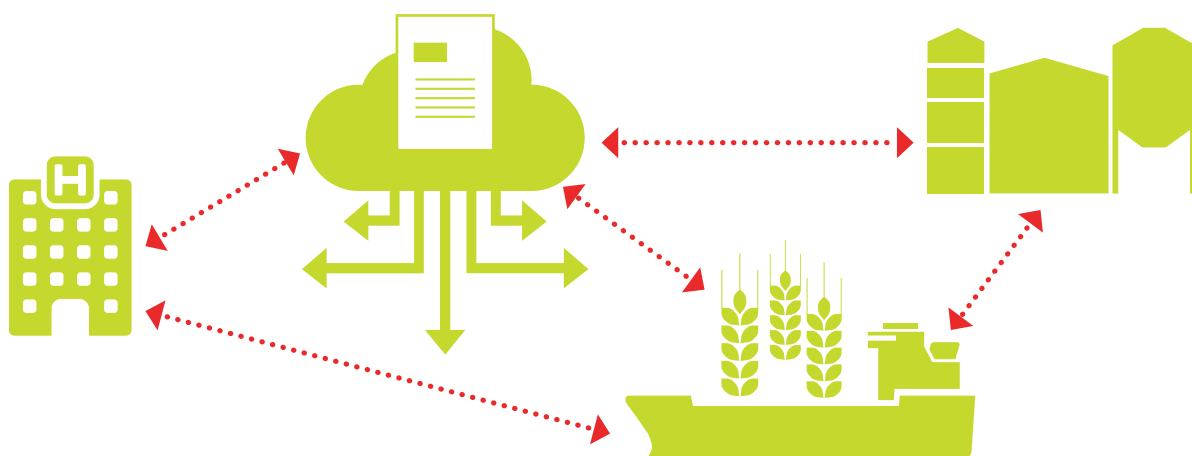
Throughout the lifecycle of corporate processes, blockchain technology can automate steps and take over the job of reconciling a wide variety of information across multiple parties. As Markus Hablizel, Head of the Data Tribe @ Allianz Deutschland, indicated, anywhere there's a platform accessed by multiple users, there's a chance blockchain could help in a faster, less costly way (see interview with Dr. Markus Hablizel on page 16).

A prominent example of the potential for blockchain applications is trade finance. Blockchain technology could fill the gap left by limited or no trust when two companies send high-value and large shipments internationally, such as a load of wheat. Both companies need to cover the potential risks related to transportation. The current means of conducting these transactions safely is paper-heavy: companies must manage agreements between the shipper's bank and the receiver's bank, as well as agreements on the value of the shipment and how it was loaded. And many of these documents need to be in the original form for verification purposes.

With a blockchain application, companies could put all the information and rights traditionally stored in paper documents on blockchain and store them in a way that cannot be altered. Once there, companies would have certainty that the documents were in a particular version on a particular date, which can be critical in the event of damage to a shipment. All the documents would be accessible quickly by all parties, bringing a high level of accountability, traceability and verifiability to the transaction. Indeed, a blockchain

encompasses all the necessary components that are vital to trade finance: time-stamping, immutability and traceability. Once the documents have been sent and received, the companies can make their payments via a smart contract on blockchain. In the contract, the parties would spell out when the payment can be triggered, for instance "Party A will pay for shipment N when condition X is fulfilled." In this way, blockchain enables the exchange of documents and the exchange of value.

Barclays has experimented with this possibility. In September 2016, it said it had completed the first live trial of blockchain for trade finance. The agri-food co-operative Ornua and the Seychelles Trading Company, a food distributor, were able to transfer the documentation related to a butter trade on a blockchain. While the payment of the trade itself remained "traditional," the use of a blockchain for the exchange of documentation reduced the time taken for the trade to complete from 10 days to only a few hours.

Of course, trade finance is only one small area of application for banks. Industry experts expect to see the first test of blockchain being conducted among the different entities of multinational banking organizations owing the huge amount of internal reconciliation required. But blockchain will go much further than that: Imagine the exchange of information taking place between banks as well as cross-border payments being made based on blockchain.

USE CASE 3
SECURITIES TRADING
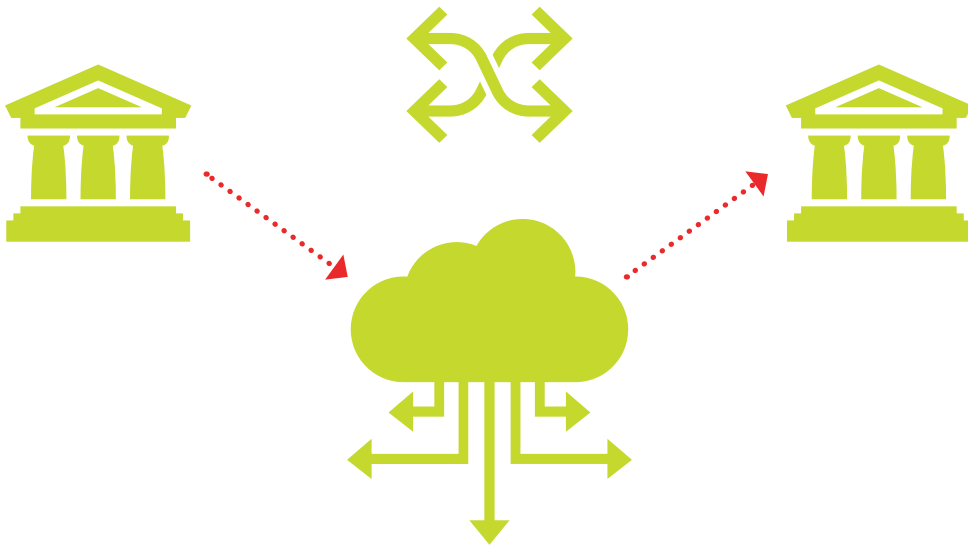
Securities markets are filled with intermediaries, be they exchanges, banks, clearing houses, or settlement houses. For each transaction conducted, intermediaries want to collect a fee. If blockchain were to be widely used, many or all of these intermediaries could be eliminated along with the associated costs and the time delays across the whole process.

Blockchain is already being used to improve the process of verification, accountability and tracking for OTC trading in a test by Nasdaq. The market was chosen because it has no intermediaries and lacks transparency. Today, participants trade OTC securities directly: they buy and sell bilateral agreements that can subject participants to counterparty risk, and the transactions typically include lots of paperwork that needs to be passed back and forth and verified. Another problem: sometimes investors have difficulties following up on trades that have been conducted, or companies do not know how many of their own shares have been issued for what part of their capital. In general, participants lack information about the market.

In November 2015, Nasdaq launched Linq, a blockchain-based platform destined to be used on the company's OTC market. Linq was the first prototype of its kind, both in terms of size and tangibility. Almost a year after the launch, the first results are quite positive. Fredrik Voss, Nasdaq's VP of Blockchain Strategy[1], said: "We now have a system that allows for issuance and transfer of shares without the legal entity, the CSD (central securities depository); without the legal entity, the CCP (central counterparty). It replaces the printing of a paper and keeping that paper in a vault, and sending it by courier. It keeps it electronically and it records it for posterity." While the OTC market provides an ideal playground for a first application, major hurdles remain for adopting blockchain-based solutions in other markets with more stringent regulations and in markets where traders wish to remain anonymous. At the same time, blockchain applications could make the life of regulators and tax authorities easier: the immutable nature and transparency of blockchain would help officials track ownership and transactions.

One of the major benefits to emerge from realizing this case for trading securities on blockchain would be the shortening of the time it takes to complete these transactions. The current standard in most capital markets is that trading, clearing and settlement take 3 working days, which feels like an eternity in today's world of instant results. A shared ledger across all participants would eliminate the need for checks and reconciliations and enable the full process to be completed in a matter of minutes.

1 http://www.ibtimes.co.uk/nasdaq-shares-hands-experience-capital-markets-blockchains-1557151; Retrieved 14/10/2016
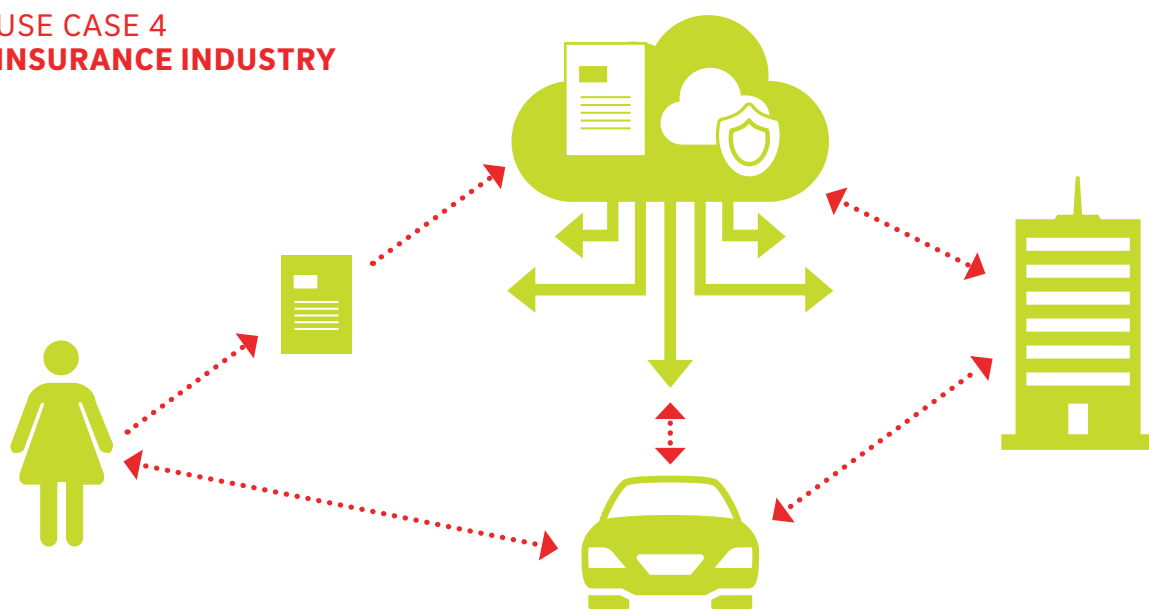
Blockchain represents a major opportunity for the insurance industry, since it offers a more efficient way of doing what insurance companies are already doing: providing mutual trust between affected parties.

For instance, blockchain could be used to improve risk recording, create better ways for the handling, storage and sharing of critical documentation and better manage how personal information is updated, stored and retrieved. There's also potential to reduce fraudulent claims due to the end-to-end transaction transparency provided by blockchain.

Let's consider the case of Sara. She just purchased a new car at the dealership downtown, and the virtual assistant comes up on the touchscreen to offer her several options for car insurance. The policy proposals are already tailored to Sara, since the insurance companies make their offers after accessing her driver history on a blockchain. The history includes past accidents, risk profiles and records of fines. The proposals also incorporate the technical details of Sara's new car, its security ratings from external agencies, and other data needed to make an offer.

Sara chooses the best option on the touchscreen. Her fingerprint is read and the system validates her identity via blockchain. Next, the system sets up a monthly direct debit from Sara's bank account to the insurance company, triggered through a smart contract. Sara is amazed by the simple and transparent

way she is able to insure her new car – a task that has caused her headaches in the past.

A few months later on a hot summer's day, the engine of Sara's new car fails and she pulls over in the breakdown lane. Before she is even off the highway, a smart sensor in the car's engine triggers a damage notification, information that is sent to a blockchain. A repair service technician from the insurance company's partner network comes to pick up Sara's car, after being notified that she has broken down. Sara automatically receives a message on her phone from her insurance company that a taxi is on its way to take her to the nearest repair shop, where she can pick up a rental car to use until her car is fixed.
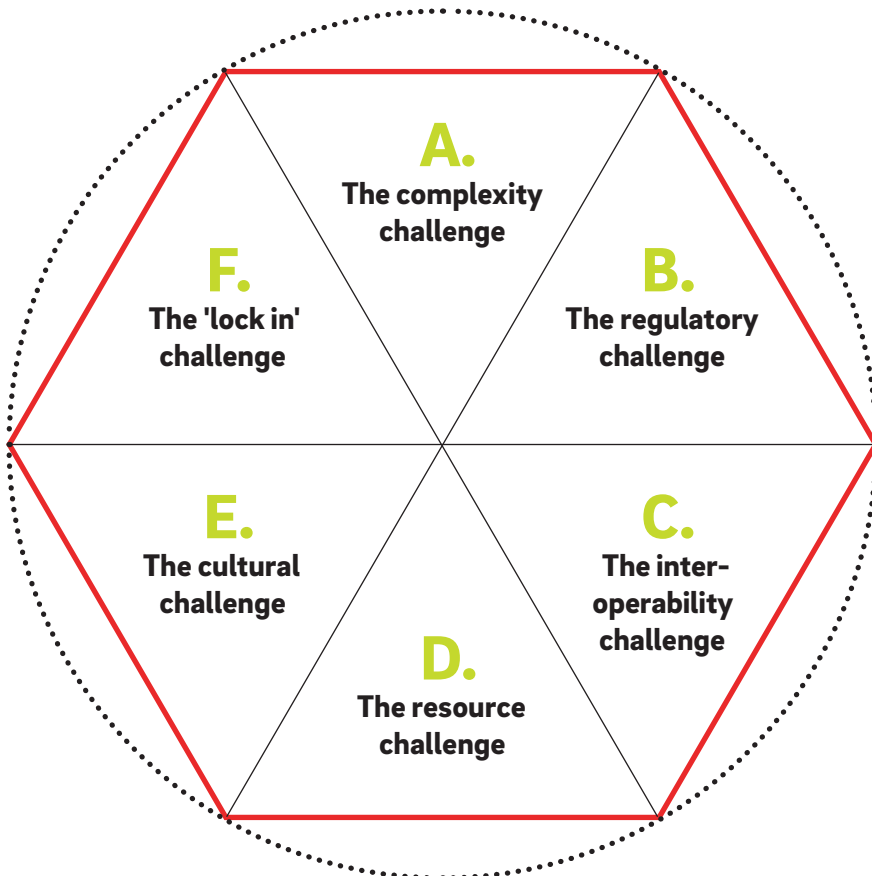
On her way to the repair shop, Sara realizes that while she was worrying about how to handle the insurance claim, the claim has already been submitted via blockchain, and the insurance company has approved it after performing a behind-the-scenes check to make sure the car was not insured with multiple carriers.

This example shows how blockchain technology could improve the customer journey for policy holders and dramatically simplify processes by eliminating administrative tasks and verification. This type of customer service could translate directly to more customers and reduced costs for insurance companies.

Rolling out the blockchain:
<u>Six key challenges.</u>

The use cases outlined above show great potential for blockchain technology. However, there are major challenges to overcome before widespread adoption of blockchain technology will be possible. We have identified six.

It's important to note that private blockchains will be less impacted than public blockchains by complexity, regulatory, and interoperability challenges; below we focus on public blockchains.

A.
The complexity challenge

B.
The regulatory challenge

C.
The inter-operability challenge

D.
The resource challenge

E.
The cultural challenge

F.
The 'lock in' challenge

A. THE COMPLEXITY CHALLENGE

For widespread application of blockchain technology, three major issues concerning complexity have to be overcome. First, the scalability of the underlying technological concept of a blockchain needs to be guaranteed in order to process hundreds of millions of transactions worldwide each day. Second, to run a massive blockchain, an enormous amount of computational power will be needed, which will consume an unprecedented amount of energy. Finally, the technological architecture of any blockchain system needs to be able to support and reflect the complexities of today's transactions (e.g. when trades are leveraged).

B. THE REGULATORY CHALLENGE

Besides the technological demands of blockchain, regulatory, legal, and security issues also pose potential hurdles for widespread adoption. Currently, no legal framework exists that regulates the application of blockchain technology for processing financial transactions. Here, the question is not only how regulators will handle changes to transaction processes, but also how common and harmonized legal standards, and the enforcement of these, can be ensured on a global scale.

C. THE INTEROPERABILITY CHALLENGE

Different blockchain models, and a wide variety of different blockchain ledgers for tailor-made banking or insurance solutions, could be a further obstacle to a holistic blockchain ecosystem. Without a standardized approach to blockchain, the technology would be hard to scale up and may lose its potential. To ensure interoperability of individual distributed ledger networks, banks and other financial service providers would have to collaborate intensely. They may need standardized protocols, the same blockchain models, and/or a joint governance body to create common standards and foster collaboration.

D. THE RESOURCE CHALLENGE

Implementing blockchain requires significant changes to the technological architecture of the financial services sector. Thus, even enthusiastic advocates of blockchain question whether the benefits justify the investments required. In addition to the actual cost of implementation, companies would have to spend time filling a blockchain talent gap.

E. THE CULTURAL CHALLENGE

Implementing blockchain also requires a significant cultural change within the industry as a whole. Often, banks have risk-averse cultures and focus on incremental optimization rather than embracing technological revolutions. To grasp the full disruptive potential of blockchain, they must be willing to take some risks even though short-term opportunities may not be apparent.

F. THE 'LOCK IN' CHALLENGE

A primary concern of many financial services companies right now is making their existing processes digital. A breakthrough in blockchain technology, however, could make a complete overhaul of current processes fruitless if those processes were eliminated by blockchain anyway. Companies run the risk of pouring money down the drain and having sunk costs that keep them from moving on to blockchain applications. This scenario should be addressed when designing new IT systems today so that they are compatible with blockchain technology and do not become obsolete in the near future, when blockchain comes into widespread use.

The challenges above are already being tackled and partial solutions have emerged. However, blockchain in financial services is still very much in a trial and experimentation phase. But full rollout of market-ready solutions is definitely on the horizon. Expect broad-scale adoption in 3-5 years from now.

<u>RECOMMENDATIONS</u>

Given the opportunities of blockchain, along with the challenges of adopting it, we recommend the following five-step approach:

1

PREPARE FOR BLOCKCHAIN INITIATIVES

It is all about creating a sense of urgency, educating stakeholders, and allocating resources. Just like other digital initiatives, blockchain should be part of the CEO agenda, and top management buy-in is crucial for success. Consider forming a dedicated blockchain task force made up of digital and functional experts who can help allocate the required capabilities and educate stakeholders on the implications of blockchain.

2

ANALYZE THE IMPACT OF BLOCKCHAIN

Focus on understanding the impact blockchain can have on your business. Companies must be able to answer three key questions:

a. What can blockchain do, and what can it not?

b. What is the main value blockchain adds?

c. What are the costs of implementing blockchain?

The analysis must be repeated frequently, since blockchain technology is changing rapidly. The blockchain of yesterday and the blockchain of tomorrow may be very different.

3

COLLECT BLOCKCHAIN INSIGHTS AND BEST PRACTICES

Once you have decided that blockchain is the right technology for your situation, try to:

> Understand your customers' pain points up and down the entire value chain and seek to understand which shared-ledger technologies are most appropriate for you.

> Determine current middlemen that take part of the profits and look for fintechs and blockchain startups that can help you reclaim these margins.

> Learn from what other companies in your area of expertise are doing and what your business partners up and down the value chain are working on.

> Exchange insights in consortiums to discover what protocols and blockchain platforms are being built and which possible common standards for interoperability are being developed.

4

DESIGN AND TEST BLOCKCHAIN USE CASES

This is best done through an iterative ideation process, starting from a business perspective, to determine where blockchain could be useful.

> Test the initiatives on a small scale during an ideation phase by using rapid prototyping. This will also help to understand the benefits and constraints of the technology

> Prioritize according to the most promising and feasible ideas

> Determine whether the blockchain should be public or private, permissioned or permission-less

> Reevaluate the added value/cost trade-offs that have to be made

> Choose which use cases have the most disruptive potential

This will ultimately lead to a portfolio of blockchain initiatives and subsequent proof of concepts that will help develop an extra competitive edge.

5

IMPLEMENT AND ANCHOR BLOCKCHAIN INITIATIVES

This last step aims to identify the best strategy to put blockchain initiatives into practice.

Companies should focus on answering several questions:

> What business model should be operated to monetize the competitive advantage?

> What should the target organizational and governance model look like?

> What team inside my company should drive the blockchain initiative?

> Which fintechs and other partners should be cooperated with or bought to achieve the blockchain goals?

> And finally, are there any new products or services that can further leverage this shared-ledger technology?

When these questions are answered, companies can kick off blockchain initiatives. While implementation is ongoing, companies should continue to focus on streamlining and digitizing processes end to end, to increase implementation speed and avoid roadblocks.

Interview with Vitalik Buterin

Ten questions for the mind behind Ethereum

What drives you today in your development of Ethereum?
I think that Ethereum is a powerful technology that has the potential to make many things in the economy and society more inclusive, secure, efficient, trustworthy and free. I believe that decentralized technologies are a natural fit for many kinds of applications that currently have a central controller not because of any fundamental economic need for one but rather because of the limitations of yesterday; I also see the decentralized economy as a natural continuation of the best parts of what the sharing economy, Web 2.0 and modern information technology has brought us. I believe in making it easier for "the bottom three billion" to participate in society not just in their capacity as consumers but also in their capacity as producers.

Do you foresee a convergence of blockchain technologies or a coexistence of different types of blockchain in the future?
I think coexistence of different types of blockchains is inevitable; it's just impossible for one type of blockchain to satisfy all use cases and provide all desirable properties.

Can you imagine the blockchain failing to become widely used? What could be the drivers of such failure?
Depends what you mean by "the blockchain"; there are many of them. I think that it's very unlikely that absolutely no Bitcoin-inspired technology will find substantial use cases; on the

other hand, there are many blockchain applications that will die off because they simply do not provide sufficient value to their users. In general, I think that bridging the gap between the blockchain world and the real world is a major challenge.

Immutability is often cited as one of the blockchain's main advantages. However, it can also be seen as a two-fold obstacle to
> **Users: are users ready to commit to immutable transactions, with the risk of making mistakes and not being able to correct them?**
> **Developers: how does immutability restrict developers' ability to iterate on their programs (and smart contracts)?**

In the long term, I think both developer flexibility and preventing and recovering from mistakes cannot all be handled by the low-level blockchain platform; in the future, blockchains will have very many users, and we cannot expect the users of a blockchain protocol to reach a consensus every time a mistake happens and there is a choice of whether or not to revert it. Rather, I believe that such needs can be dealt with on the higher level, through a combination of having better programming languages and developer tools that make it harder to make mistakes as well as "escape hatches" that allow faults to be identified and resolved, without turning control of the application over to a centralized party in the normal case. In these early days,

these techniques are not mature and so it sometimes is best to resort to other measures, but in the long term this is the only realistic path forward.

How do you assess the implications from the recent DAO incidents?

I think a major one is that the community has started to take security much more seriously, and many solutions are being developed to support safer smart contract programming. I don't see the Ethereum Classic (ETC) token[2] as being problematic in the long term; if that community can come together and agree on a coherent roadmap and vision then it will find a place, otherwise it will fade, but in either case that is at this point a battle for them to fight.

"You should not see blockchains as just an add-on to existing systems, or as just a better kind of database."

Vitalik Buterin

As ever, and especially when thinking about applications in financial services, security is paramount. How would you ensure security on a blockchain application?

I think that security will ultimately always be a combination of various kinds of heuristics that each tackle parts of the problem. You can use automated verification tools to catch many kinds of bugs in computer code; you can design your code in such a way that it "fails gracefully" as much as possible; you can use "escape hatch" techniques that give a third party the ability to recover funds from a contract in the event that a fault is detected. I don't think there will be any one silver bullet; I think it will be a learning process of figuring out what the common classes of bugs are.

What are the key steps a bank or an insurer should take today regarding blockchain?

Start exploring what they can do with it. Think from the mindset of "if there was a startup doing a blockchain-based application in my industry, how could it disrupt me?".

Do you think the banking/insurance sector will be more heavily impacted and changed by blockchain, given that most of it is data?

Banking and insurance certainly will be heavily impacted by blockchain technology, and there are many applications in the banking and insurance sector already. The fact that finance is almost pure data certainly does make it very blockchain-friendly.

What is the biggest mistake a company can make regarding its blockchain strategy?

Seeing blockchains as being just an add-on to existing systems or just a better kind of database. I believe that the most valuable blockchain applications will necessarily involve more fundamental process reengineering – making business processes themselves more decentralized and more of a natural fit to the benefits that blockchain technology can provide.

If Ethereum was being built and pushed forward by someone other than yourself, what else would you have put your time, knowledge and passion into?

Possibly other things in cryptography or internet protocols. If that was not an option, machine learning. If anything in computer science was not an option, life extension – and I put it in third place only because I personally am not as talented in biology as I am in computer science; I think life extension research is incredibly important: if we succeed it can literally save billions of lives.

Interview by Stephan Janssens & Kevin de Patoul
from Roland Berger Brussels in November 2016

Interview with Dr. Markus Hablizel – Head of the Data Tribe @ Allianz Deutschland

Blockchain, the insurance industry and Allianz

Please tell us about your work and academic background.
Within Allianz, I head the so-called Data Tribe, which is an initiative for piloting new technologies to find out if there is value for Allianz. We focus on big data analytics, blockchain and other data-driven technologies.

I studied math/computer science and specialized in number theory, which is still my passion. Asymmetric cryptography, which is one of the main components of blockchain, is purely number theory.

Do you have broad support for your efforts within Allianz?
I created a blockchain community on the Allianz intranet roughly one year ago, and it now has more than 400 followers who enjoy discussing blockchain use cases and their implications for the insurance industry. The community is diverse and people are interested from different perspectives, including technology, compliance, regulatory, and the business.

What do you see as the potential for blockchain in insurance?
It is not a given that blockchain will always be better than other digital solutions. I think companies should digitize their existing processes and then consider carefully whether blockchain could fit their specific needs. Sometimes it is a good option and can be helpful; in other cases, it may not be suitable, for instance when a centralized system may be faster.

However, blockchain could enable business models that were not possible before. Think of peer-to-peer (P2P) business models, especially in insurance. It could bring insurance back to its origins, where a group of people looked each other in the eyes and said: "If you have some damage, we will cover you for it." And the other way around, of course.

What is the potential of blockchain for insurance companies?
Blockchain technology has three "layers" of applications, so to speak: intracompany, industry-internal and across industries. Regarding the intracompany layer: These applications focus on company-internal transactions as well as interfaces with customers or suppliers. The company can thereby develop blockchain products for its own use that can lead to competitive advantages.

Regarding the industry-internal layer: These blockchain applications focus on the exchange of information and other digital assets. An example is allowing insurers to exchange

claim history information when a customer wants to switch insurance companies. Blockchain can also make processes more efficient when insurance companies need to communicate with each other, for instance when a car is insured with multiple companies, or when they need to standardize information exchange within the industry.

Finally, there is potential across industries: Applications in this area focus on the exchange of assets through "meta-blockchains," e.g. by connecting energy ecosystems with smart home applications and e-mobility systems.

> # "The challenge is to constantly convince decision makers that the technology is able to deliver real business value."
>
> Dr. Markus Hablizel

What are insurance companies doing to collaborate?
At the beginning of 2016, Allianz started a blockchain roundtable with other insurance companies. As a result of these activities, B3i – the Blockchain Insurance Industry Initiative – was founded. Members of the B3i consortium are interested in making operations more efficient and ensuring better information exchange, which will reduce paperwork and errors, increase quality and lead to efficiency improvements.

There is already a positive response to our discussions as well as requests from other insurers to join the consortium. In principle, as we deploy this, we want to create prototypes and solutions for the whole industry.

One possible outcome could also be a set of standards for the insurance industry. There has been some progress on the well-known Rüschlikon Initiative, which aims to create a common standard for making processes faster, more

cost-efficient and streamlined between insurers so that customers can benefit, e.g. from faster settlement times. Blockchain could possibly help here, too.

What could still go wrong?
I see the most severe challenge in a possible loss of trust in the blockchain technology itself which could lead to limited thinking about the opportunities it offers. In other words, the challenge is to constantly convince decision makers that the technology is able to deliver real business value. Having said that, blockchain technology can only reach its full potential if implemented in a consistent and compatible way, based on minimum standards to exchange data and conduct transactions.

I am therefore happy to see that Aegon, Allianz, Munich Re, Swiss Re and others have agreed to cooperate on pilot projects. The founding members of the B3i consortium are conducting a feasibility study and want to explore whether blockchain can be used to develop standards and processes for industry-wide use and to catalyze efficiency gains in the insurance industry.

Interview by Sebastian Steger & Stephan Janssens from Roland Berger Munich in October 2016

To read the full interview with Dr. Hablizel about the origins and potential of blockchain, please see:
www.rolandberger.com/Hablizel

It covers asymmetric cryptography, a vision for multiple blockchains, scalability, computational power, immutability and advice to companies about getting started with blockchain.

BLOCKCHAIN DEFINED

At its core, blockchain is a peer-to-peer ledger or, more simply, a giant database of transactions that is maintained by anyone with a computer who chooses to participate. The term "blockchain" refers to the basic functioning of the technology: A group of transactions is put into a "block," which is then cryptographically linked to the "chain" of all previous blocks, becoming a history of all the transactions made.

The ledger of transaction history is not stored by a central authority in the network but distributed across all participating computers, which makes it less susceptible to hacking. The architecture also cuts out the middleman, which can bring down the cost and time needed for a secure transaction. On such a distributed ledger, any participant is able to add a new record which is then verified and stored in a way that cannot be changed, making that record "immutable."

To guarantee that only legitimate transactions are added, the network of computers must reach consensus on the validity of all the transactions within a new block. They do this by each analyzing the individual transactions to find out if a certain set of predefined rules and conditions are met. In this manner, the system verifies the validity of the transactions and ensures they are recorded only once.

A BRAVE NEW WORLD? THREE BROAD IMPLICATIONS OF BLOCKCHAIN

It is no exaggeration to say that blockchain allows trust to exist in decentrally organized transactions, much as the internet has placed information into the hands of masses. With blockchain, people can become part of a larger system for conducting business that goes beyond geopolitical restraints. Once on the network, they can conduct transactions at almost no cost and without the involvement of a central organization or authority. For example, an unbanked person in a rural area who has access to the network could conduct business and pay for transactions via blockchain.

A second critical implication of blockchain technology is its potential for enabling secure transactions at a time when the world faces an increasing number of cyberattacks. Blockchain is seen as a comparatively secure technology, since cybercriminals will need to go after every single node within the network at the same time when trying to attack it. This is obviously a far more complex and difficult job to accomplish.

Finally, blockchain essentially decentralizes consensus – e.g. it allows people who might not know each other and might not trust each other to agree on a particular version of information at a particular time. This can be critical for making final buy or sell agreements before any goods are shipped or payments transferred.

PUBLIC VS. PRIVATE BLOCKCHAINS –
WHICH IS BEST FOR FINANCIAL SERVICES?

When it comes to blockchain standards, there is no one size fits all solution that can be applied to every use case. Besides public blockchains and private blockchains, there are various hybrid versions and on top of that, a broad array of permutations that combine elements of the different types of blockchain. Financial services institutions have to define a set of criteria such as the desired number of participants, the transparency and the transaction speed, and derive the right standard for the individual use case or proof-of-concept.

Public blockchains are fully decentralized networks, and there is no permission by an authorized gatekeeper needed to join this peer-to-peer network. A private blockchain, sometimes called a permissioned blockchain, is administered by a single entity or a group of entities, and therefore includes a gatekeeper function. Private blockchains could turn out to be less resource-intensive than public blockchains, since the involved parties are not anonymous and do not need to be identity checked and verified.

In a nutshell, public blockchains can be compared to the internet as they are open to all users, while private blockchains are more like an intranet, where every participant needs to receive authorization from a gatekeeper. In late 2016, more and more financial services institutions and consortiums indicated that private, permissioned ledgers would serve their purpose better than open, public ones, yet at this point in time, it is still too early to solely bet on private blockchains in finance. The technology is still developing at a rapid pace and a dominant design has yet to emerge.

In the future, we do expect to see several standards for different fields of application coexisting within financial services and beyond.

ABOUT US

Roland Berger, founded in 1967, is the only leading global consultancy of German heritage and European origin. With 2,400 employees working from 34 countries, we have successful operations in all major international markets. Our 50 offices are located in the key global business hubs. The consultancy is an independent partnership owned exclusively by 220 Partners.

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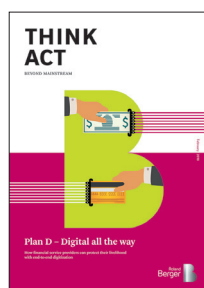
PLAN D – DIGITAL ALL THE WAY
How financial service providers can protect their livelihood with end-to-end digitization

The recipe for success is digitization from start to finish. And finance is one of the industries with the greatest potential for all things digital. Why? Because data – client and transaction data, to be precise – is the raw material that every bank and insurer gathers, sorts, processes and links together. In principle, almost every aspect of their business could be digitized in its entirety. Which makes one wonder why many incumbent financial service providers are still essentially analog operations.
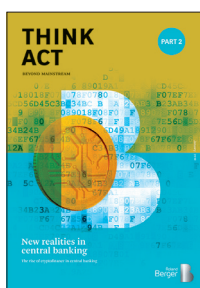
NEW REALITIES IN CENTRAL BANKING
The rise of cryptofinance in central banking

Digital currencies are a hot topic of central bank debate. They can reduce the cost of printing banknotes, cash storage and transportation, speed up the financial integration of emerging markets and reduce the cost of complying with "Know-your-Customer" requirements. But central banks need effective organizational structures, relevant skills, a clear road map and a flexible approach to deployment. A massive effort is therefore required on the part of central banks to adopt measures now and actively help in shaping these developments.

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STEPHAN JANSSENS
Partner
+32 2 6610-350
stephan.janssens@rolandberger.com

SEBASTIAN STEGER
Partner
+49 30 39927-3488
sebastian.steger@rolandberger.com

URS ARBTER
Partner
+41 43 336-8610
urs.arbter@rolandberger.com

WOLFGANG HACH
Partner
+49 89 9230-8724
wolfgang.hach@rolandberger.com

MICHAEL HILBERT
Partner
+43 53602-300
michael.hilbert@rolandberger.com

DAVID LECEA
Principal
+971 4 446-4080
david.lecea@rolandberger.com

Main contributors
MANUEL KELLER
MICHAEL MUELLER
KEVIN DE PATOUL

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