#58

ROIDIALOG

WELCOME TO CRYPTONIA

Manufacturing and logistics in the age of blockchain

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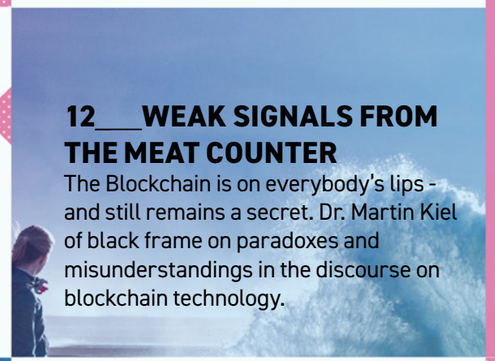

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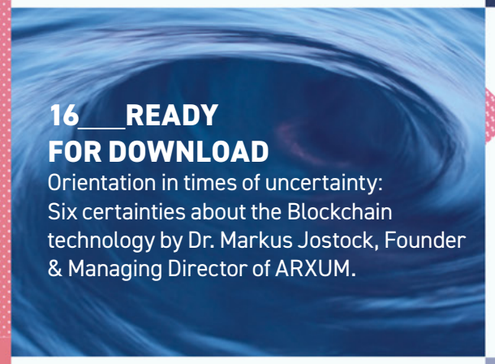

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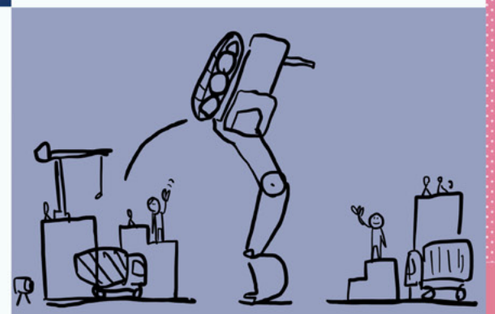


WELCOME TO CRYPTONIA

„Toto, I've a feeling we're not in Kansas anymore. We must be over the rainbow."

By Hans-Georg Scheibe, Managing Partner

DOROTHY GALE IS A YOUNG GIRL WHO LIVES WITH HER FAMILY AND DOG TOTO ON A REMOTE FARM IN KANSAS.

A sheltered, hard-working life that offers few surprises and is fairly easy to plan ahead. Until one day a huge cyclone comes up and hits the Gales' house with full force. Time and again the population in Kansas suffers from these cruel weather phenomena – and has learned to deal with them.

But this storm is different. He pulls the Gales' house, including girl and dog, from the anchorages and carries it away. In the classic 1939 film adaptation of the "Wizard of Oz", Dorothy, played by young Judy Garland, looks out the window and sees the points of reference of her life swirl past her like a panopticon without direction: her grandmother in a rocking chair, trees, farm animals, neighbors.

When the house finally lands back on solid ground, Dorothy and Toto step out and find themselves in a completely new, strange world. That's when it gets interesting. Because Dorothy realizes quite quickly that she has to act differently in this other world. She has a team of multi-layered, contradictory companions around her, proves courage, situational creativity and leadership qualities and manages to set herself a great goal and pursue it. Dorothy doesn't do two things in particular as she steps out of her house and into the world of Oz – she doesn't try to continue to be the carefree little farm girl – and she keeps moving.

The new country we might enter tomorrow is called Cryptonia. It works according to rules and laws that radically differ from our usual ideas. Blockchain technology is currently automating trust – in banking, public administration, commerce, or law.

In order to understand how huge the blasting potential of the blockchain is, one should consider how the big four – Google, Amazon, Facebook and Apple – are threatened by the new technology. According to the author and investor Matt Ward, today's avant-garde digital economy will have to defend every aspect of its business models against attackers from the blockchain world. Against concepts that require neither the powerful matchmaker platforms nor the services financed by advertising and that are not suspected of covering the world with filter bubbles.

The contours of change are also beginning to emerge in the supply chain. From the extraction of raw materials to purchasing, logistics and manufacturing, new blockchain use cases and solutions are being created, some of which we would like to show you in this issue of ROI DIALOG. Opinions differ, however, as to how high and acute their potential for disruption in the manufacturing industry is.

But this debate is not very fruitful, because in the end nobody knows today how serious the changes triggered by the blockchain will be. That's why we should be prepared if another world is waiting outside our factory gates after the storm.

BLOCKCHAIN IN THE DIGITAL SUPPLY CHAIN

THOSE WHO HAVE A NOTARIALLY CERTIFIED LAND REGISTER ENTRY IN THE WEST CAN SLEEP PEACEFULLY. For the end of the world must already be at hand in order to call into question the validity of such a paper.

Things are different in many countries around the world. Because there, supported by corrupt authorities, large landowners and corporations can ensure comprehensive expropriations. In case of doubt, an entry in the land register has never existed – or the expropriator has always been in it. Blockchain technology could radically change these centuries-old conditions within a short time. The information recorded in a distributed ledger – a digital, decentralized account book – cannot be deleted or manipulated. And even the most corrupt official and the most brazen landlord could not change that.

SOMETIME THEY'LL BUILD A BANK AND NOBODY WILL COME

The potential of the blockchain to change established patterns in one fell swoop is, of course, dramatic in the industry in the industry and in our daily lives. A few facts may help to understand this. By using the blockchain, the infrastructure costs in banking can be reduced by 30 percent. The global market volume of this ten-year-old technology could grow to over 20 billion dollars in just five years. IBM is investing about a quarter of a billion dollars in blockchain-based IoT solutions– and is working with Wal-Mart, for example, to use blockchain to track the origin of food and organize product recalls. In just two seconds, Wal-Mart can determine where bad food comes from. An analogous application for the control of retrofits and recalls in the automotive industry is obvious. But the outlook is particularly striking in the financial sector: suddenly a complex global financial system can be imagined without central and commercial banks, without insurers, PayPal and credit card companies. You have children? Just don't let them do an apprenticeship as a bank clerk ...

DISRUPT THE DISRUPTOR

However, the storm is not only affecting the banks by far. The Israeli software boutique La`Zooz Uber & Co, for example, is attacking head-on with its juicy fees by building a blockchain-based, decentralized community platform. And the German start-up Slock.it uses the blockchain to develop a global, decentralized platform for intelligent locks. Almost incidentally, Slock.it talks about being able to fully automate the Airbnb apartments with its solution. Which raises the question of the viability of the Airbnb business model. Thanks to Blockchain, two of the world's largest Unicorns could go under the wheels even before they have completed their own disruption work and collected their wages through a successful IPO.

[1]https://www.accenture.com/us-en/insight-banking-on-blockchain

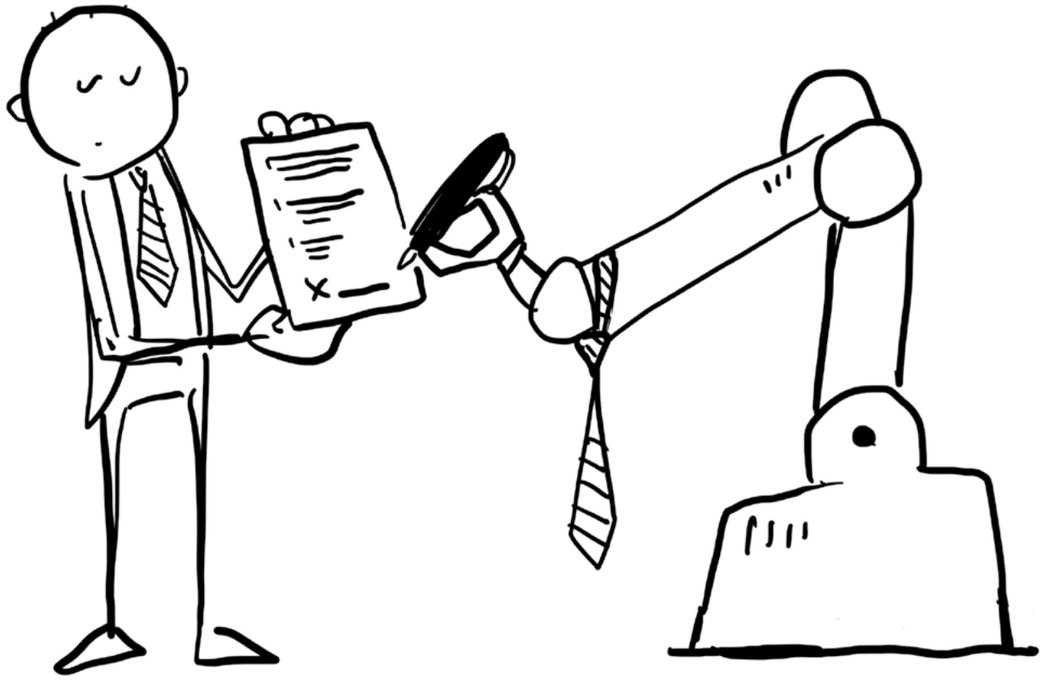
[2]https://www.transparencymarketresearch.com/sample/sample.php?flag=S&rep_id=18437

[3]https://www.coindesk.com/ibm-blockchain-iot-office/

[4]https://www.forbes.com/sites/rogeraitken/2017/12/14/ibm-walmart-launching-blockchain-food-safety-alliance-in-china-with-fortune-500s-jd-com/#787a24aa7d9c

[5]https://www.fool.de/2018/02/28/7-fakten-ueber-blockchain-die-fuer-investoren-interessant-sind/

[6]https://www.idgconnect.com/abstract/30525/blockchain-technologies-maturity



THE TRANSFORMATION TURBO

CRYPTO CURRENCIES ARE ONLY ONE FACET OF THE BLOCKCHAIN

So much dynamism makes you dizzy - and skeptical. Yet today hardly anyone doubts that the blockchain will be a powerful lever for profoundly changing systems and processes, making countless business models obsolete and making new ones possible. In particular, the fact that a blockchain replaces professional trust brokers and ideally systematically excludes any manipulation of - not only financial - transactions and any concealment lets the fantasies flourish. Virtual currencies such as Bitcoin, Ethereum or Ripple, whose value is no longer guaranteed by a central bank, are only one facet of this automated trust: their fungibility and quantity are limited, their use is problematic in many respects. This is why it is more important to focus on where real weights are being moved – in the financial and industrial transaction processes.

TECHNOLOGY FOR THE IOT AGE

And this is where it gets interesting because the blockchain promises maximum protection in a highly networked, automated and digitized world. Processes and business models based on the Internet of Things are often based on a large number of very small transactions and payment transactions. These can only be designed economically if, on the one hand, they are highly automated and, on the other hand, guarantee a high level of safety - at minimum cost. Blockchain technology is ideally suited for this - through de facto non-corruptible sophisticated cryptography, the distribution of copies of the "account book" over all participants connected to the blockchain, the inalterability of the documented transactions.

Even the smallest process step and the least important property of the objects recorded on the blockchain is unchangeably and indelibly documented, financial transactions are lean, inexpensive and fast to implement.

AGE OF ENLIGHTENMENT

Only, the thing is obviously not as simple as the information graphics of the advertising brochures. Only one in eight IT managers today has a clear idea of how their company could use the blockchain, as a recent IDG survey shows. Blockchain technology is a bit like teenage sex, says Vincent Doumeizel, VP at global auditing specialist Lloyd's Register: "Everybody is talking about it, not many are doing it, and those that are, are doing it badly". It seems that the blockchain is much harder to penetrate than other disruptive technologies such as AI, 3D printing, or robotics. The technological "growth pains" - such as the low speed, the high energy consumption, or the protocol confusion currently still prevailing - are not the decisive reason for this. Rather, it is the fact that blockchain-based processes are very different from ideas that have shaped our systems and process networks for decades.

THE MOST IMPORTANT SCENARIOS FOR THE SUPPLY CHAIN

TRACEABILITY OF PRODUCTS, PROCESSES AND INFORMATION

The more complex our products and processes become and the higher the share of software in them, the more we depend on absolutely forgery-proof and uninterrupted documentation. The low depth and global distribution of value creation require trust mechanisms that today can only be made possible with enormous effort - if at all. This problem is compounded by the increasing skepticism with which both end customers, auditing bodies and government authorities are looking at the economy. Here the blockchain can help to create lasting trust and to enable a secure, purely fact-based and in a positive sense amoral business basis. On a technical level, a standardized API can be used to ensure that the sending and reading of information follows a defined process. In this way, all partners involved in the value-added process can be easily integrated and the supervisory authorities can be granted clearly defined data access - without the mountain of printed and digital documents that exists today.

ASSET TRACKING

Similar to the traceability example, asset tracking in the supply chain can also be reorganized using blockchain technology. For example, machines and systems can be connected directly to the blockchain. In this way, machine conditions can be recorded precisely and without human intervention, version statuses in the manufacturing process and product properties can be documented completely and in real time. At the same time, the software used in the production process can be effectively monitored and managed by Smart Contracts. All accesses are securely and completely recorded in a distributed ledger. Blockchain technology thus also provides central building blocks for the implementation of the Smart Factory concept - especially with regard to security, efficiency and autonomy.

SMART CONTRACTS

Perhaps the most promising application of the blockchain are Smart Contracts - software scripts that ultimately run automated if-then routines and allow actions to run automatically and not manipulable when certain parameters are received. The Smart Contract concept, already more than twenty years old, is gaining enormous importance with the security standards and documentation options of the blockchain. In the context of the supply chain, smart contracts - which control production events, routine transfers of ownership, payment transactions, or shipping notifications - can trigger a surge in rationalization and automation. In particular, the so-called “Ricardian Smart Contracts” can contain all contract and order-relevant data and thus ensure a high degree of procedural and legal transparency and security. Although many legal aspects of smart contracts have not yet been finally clarified, it can be assumed that national and international legislators will provide a clear legal basis in the coming years.

01 PRE-DEFINED CONTRACT

A company that produces exhaust systems for various manufacturers wants to start a new production series and is looking for a suitable supplier to procure a special component. Once this has been found, a smart contract is concluded when the component is ordered.

CONTRACT CONDITIONS BETWEEN THE PARTIES ARE STORED IN THE FORM OF A CODE.

02 DISTRIBUTED LEDGER

CODE IS ENCRYPTED AND SENT TO OTHER COMPUTERS OVER A NETWORK OF DISTRIBUTED LEDGERS - VISIBLE TO EVERYONE.

03 TRIGGERING EVENTS

This smart contract contains milestones that define the flow of the transaction. For example, delivery conditions (time, place, quantity, etc.), terms of payment (partial payments for delivery of X products, penalties for late delivery) or warranty claims (e.g. subsequent delivery in the event of poor quality) can be regulated.

PREDEFINED EVENTS SUCH AS AN EXPIRY DATE OR AN OVERRUN ARE ADDED TO THE CONTRACT ACCORDING TO THE "IF-THAN-THAT" LOGIC.

04 EXECUTION & VALUE TRANSFER

The first 30 components were delivered and passed the quality test - the in-house ERP system sends this information to the Smart Contract.

The remaining 30 components are delivered within the deadline, but five components fail the quality test - the smart contract complains about the faulty components

STORED CONTRACT REQUIREMENTS TRIGGER AN ACTION AS SOON AS THEY HAVE BEEN FULFILLED.

05 SETTLEMENT

The latter initiates the previously determined payment of more than 50 percent of the order value.

No payment is triggered - Instead, an appropriate subsequent delivery just in time requested.

AUTOMATIC BILLING AND PAYMENT PROCESS.

PROTECTION OF INTELLECTUAL CAPITAL AND MANAGEMENT OF PROPERTY RIGHTS

The more partners involved in product development worldwide, the more complex and confusing the legal situation and the determination of property rights become. This applies to both physical products and digital Smart Products & Services, whose origin and genesis are harder to determine and prove. The use of new technologies, such as 3D printing, also increases the IP risks when products are produced worldwide according to predefined digital sketches. Smart contracts can clearly regulate not only the financial transaction and product specifications, but also the IP and ensure clear manufacturer identification. Digital fingerprints of virtual and physical products can be securely stored in the blockchain and access to this data, including changes and versions, can be clearly documented.

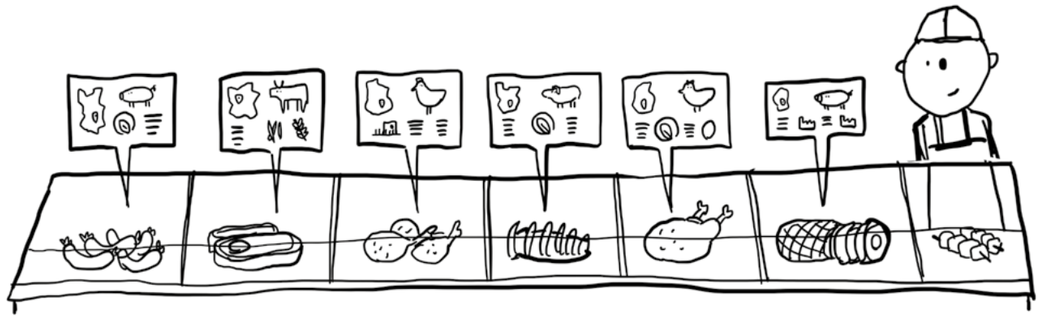
BEYOND THE HYPE

On Gartner's famous hype curve, the blockchain is currently at a critical point - namely almost exactly at the dividing line between the "peak of inflationary expectations" and the "valley of disillusionment". This transition is known to be associated with an implosion of expectations – and an incipient, intensive reality test. According to Gartner, it will take the blockchain five to ten years to develop a broad impact as a productive technology. Of course, even the blockchain will not turn the world upside down overnight and put established business models in a corner. And some have never reached the end of the valley – or are still on the road after ten years. But betting on this outcome is perhaps better left to the landlords of Latin America.

WEAK SIGNALS FROM THE MEAT COUNTER

ASSUMPTIONS ON THE RECEPTION OF BLOCKCHAIN TECHNOLOGY AND THE CONSEQUENCES FOR ADAPTATION.

Interview with Dr. Martin Kiel, Codecentric AG / the black frame



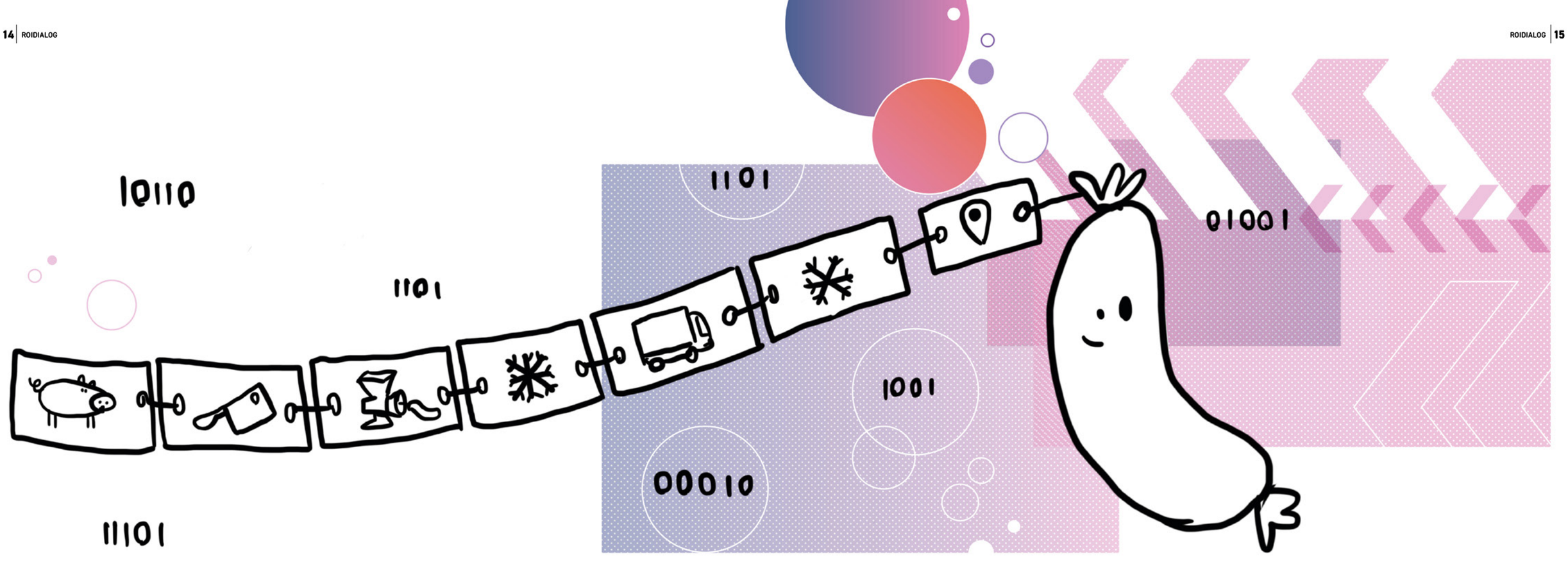
ABOUT THE INTERVIEWEE

Dr. Martin Kiel *has been visiting professor for communication theory and verbal communication at the University of the Arts Berlin since 2015. His research focuses on strategy development and narration in cultural studies, digital transformation, investigative aesthetics and maker thinking. For codecentric AG he heads the Dortmund site and is director of the think tank the black frame.*

Mr. Kiel, the topic of blockchain was lately discussed by a broad public, triggered by the Bitcoin hype. You have long been involved in the reception of new technologies as part of a university project. How do you assess the current debate?

The discourse about "the blockchain" is characterized on many levels by paradoxes and contradictions. Take the subject of cryptocurrencies, for example, which promise greater security and transparency in payment transactions on the one hand, but which still have a certain wickedness on the other. Interestingly, it is precisely this paradox that is driving the trend and its spread. It is therefore no wonder that this application of blockchain technology has received such public attention. But we also experience similar effects with the blockchain technology itself: On the one hand, there is the promise of trust and transparency and, on the other, a lack of understanding of the technology itself. Because what "happens in the blockchain" usually remains a black box for the user. And yet - or precisely because of this - the confidence in this black box seems to be almost boundless. This can be seen critically, but I think it shows that today we are much further in discourse and in the use of technology than we were 20 years ago, in that we are prepared to approach new technologies and allow such paradoxes. One could throw in critically: It is only because there is so little trust in the world that there are the blockchain and smart contracts that secure this trust. But it seems to be the other way around, that nevertheless there seems to be a trust in technology. So in this respect, I would rather see the current discourse as a discourse of trust, although that sounds a little strange, because it is precisely the lack or the securing of trust that blockchain is concerned with.

Another common narrative with regard to the blockchain is that of total disruption. Banks, insurance companies and industry – the blockchain revolution is being propagated everywhere. What do you think?



I think such statements are exaggerated. For me the blockchain technology has nothing to do with Disruption, but is rather a logical further development. The American economist Shoshana Zuboff already formulated a law on the influence of information technology in the 1980s, which consists of three stages: Firstly. Everything that can be automated is automated. Secondly, anything that can be converted into information becomes information. And thirdly, it is finally monitored. Blockchain technology is, so to speak, an omnipotent redemption of this three-stage law. It is therefore not disruptive, but rather the logical step of digitizing entities to make them comprehensible. A development that, incidentally, has been emerging for some time.

How can you tell?

Well, we come across the topic of provenance again and again in everyday life, whether this is the art of prey or the schnitzel at the meat counter. Questions such as "Where does my steak come from" or "Were these jeans produced sustainably" are, as the trend researcher would say, weak signals for the desire for transparency. Because as a consumer or as a contractual partner I have the choice: I can either trust that a product has been fairly traded or that the right component has been installed in the right place, or I can demand proof of this. Compliance regulations or state regulations, such as the GDPR, already function according to the principle of the duty of proof and are thus the precursors of a development in which transparency replaces trust to a certain extent. Right in the middle of this development, blockchain is now the first comprehensive solution that is no longer linked to proprietary systems to secure trust - and that is almost a postmodern promise, that is, to tear down these boundaries that are no longer based on trust and proprietary knowledge, but on transparency and traceability.

This naturally also opens up numerous application possibilities for the industry with regard to compliance with quality and origin, for example through Smart SLAs in the sense of blockchain-based Smart Contracts - by solving the problem of trust and transparency beyond a permanent contractual review. We are just starting to think about new contracts between companies - that's exciting, of course.

Smart contracts are one of the best-known varieties of blockchain technology. But here, too, there are countless possibilities for implementation. How should companies that have no experience with the technology proceed with the implementation of blockchain solutions?

In my opinion, the challenge lies less in the technical implementation than in the development of suitable scenarios for the use of blockchain within the framework of existing and new business models and in their validation. Companies are often very technology-driven here. In such cases, it makes sense to take another step back and think thoroughly about the topics of one's own business model and which technologies are actually useful here. This can also lead to the realization that a conventional database is currently better suited for use in the company.

In principle, however, we try to find the first practical solutions in the form of Minimum Viable Products (MVPs) very quickly, namely within twelve days. This enables us to validate at an early stage whether the business model idea and the associated technical implementation are at all viable. Take the example of bicycle insurance, which we developed as a scenario for a customer: With the help of a unique number printed on the frame, the bicycle should be registered and secured in the blockchain. This is not a technical problem. However, the procedure had considerable weaknesses when playing through with test users. For example, it was no longer possible to give away or rent a bike without making a formal handover, as it was firmly registered in the blockchain. This means that the persistence of artifacts meant that simple trust-based actions were no longer possible. The example shows how important it is to reach a testable prototype as quickly as possible, which makes it possible to check not only the technical aspects but also the social acceptance on the market.

The example also shows that blockchain is not yet completely transparent for companies and end users. After the hype at the beginning of the year, when several companies wanted to develop their own crypto currency, things now seem to be quieter around the topic. Was the first wave too early?

We should distinguish between two perspectives here: Coming from a technology perspective, blockchain could also be regarded as a kind of database, i.e. an almost basic technology or IT solution. Blockchain gets this special nimbus only by the speculative elements, which are added by the almost pop cultural element of the crypto currencies. So on the one hand we have a controllable technology with which very concrete projects can already be implemented today and on the other hand, superseded by it, a pure object of speculation. That should be clearly separated in the discourse - but commonly it is usually thought together latently.

Your Industry 4.0 Infrastructure

Dealing with the services of blockchain is worthwhile for industrial companies if they concentrate on the right starting points. Six points to consider, explains Dr. Markus Jostock, Founder & Managing Director of ARXUM.

CERTAINTY 1: The blockchain is not a footnote in the history of technology

In many fields, the use of blockchain technology is still in its infancy. However, due to the degree of maturity, they have achieved in the financial sector so far, one thing is already certain: the blockchain will remain. Especially in the management of supply chain and production processes, it offers advantages that have to be implemented in other systems for a long time. Especially when hedging transactions, two advantages ensure that the blockchain is attractive to the industry in the long term. Firstly, it prevents the falsification of information in IT systems; secondly, it creates a protected information transparency at all stations of the value stream: for example, if a machine is connected to the blockchain in production, it can document the exact numbers produced and other process parameters for each product in a forgery-proof manner.

CERTAINTY 2: Smart Contracts coordinate the process steps in the supply chain

In this way, the machine can then communicate the completion of a component to the customer or the next station in the supply chain. Instead of connecting several different ERP / IT systems with each other under high time and cost expenditure, all participants only access one blockchain interface, which contains all externally relevant order data. "Smart Contracts", which work on the basis of protocols such as Ethereum, Æternity, EOS, NEO, Stellar or Iota, carry out many actions automatically. For example, they issue shipping orders to logistics service providers when a certain number of items is reached, so that the collection and delivery of the finished goods can be coordinated much more precisely and reliably.

CERTAINTY 3: Autonomous objects carry an individual life cycle signature

Of course, Smart Contracts are not limited to machines, but could in future provide every physical object in the supply chain with a blockchain framework contract. It contains the most important information about the product and automates process steps at the same time. Goods are thus transformed into "Distributed Autonomous Objects" (DAO). By means of "function orders", DAO can also require suppliers to continuously update information such as measured values, results from quality controls or the delivery status of the product. For this purpose, not the complete data, but only so-called "hash values", simple "fingerprints" of the data are exchanged, which additionally increases security. If the manufacturer permits, not only suppliers and partners, but also end customers could use this signature to trace the complete "life cycle" of a product on a smartphone or computer.

CERTAINTY 4: The human interface remains a risk zone

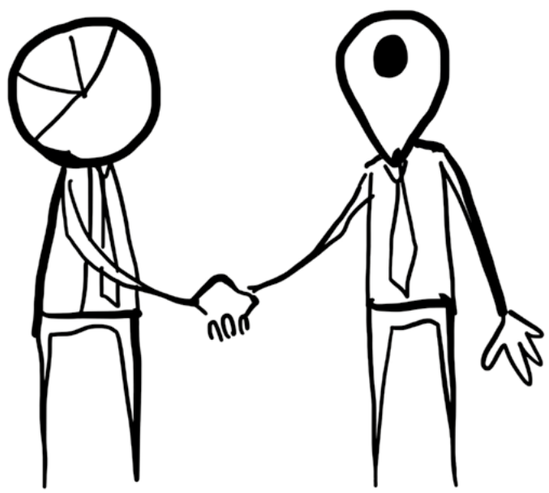
This transparency significantly improves control and compliance with quality standards, compliance guidelines and social governance standards. As soon as companies link corresponding obligations with forgery-proof blockchain technologies, they can no longer pay lip service. Audits of supplier conglomerates, for example to control quality and work standards, can thus also be carried out faster, more spontaneously and with clearer results - if one really wants to use this knowledge. However, blockchain technologies do not release people from any control and responsibility. Finally, you cannot distinguish whether the data entered is correct or manipulated. All interfaces between the blockchain and the "real" world, where people decide on the collection and transmission of information, thus remain risk zones for actual, complete transparency.

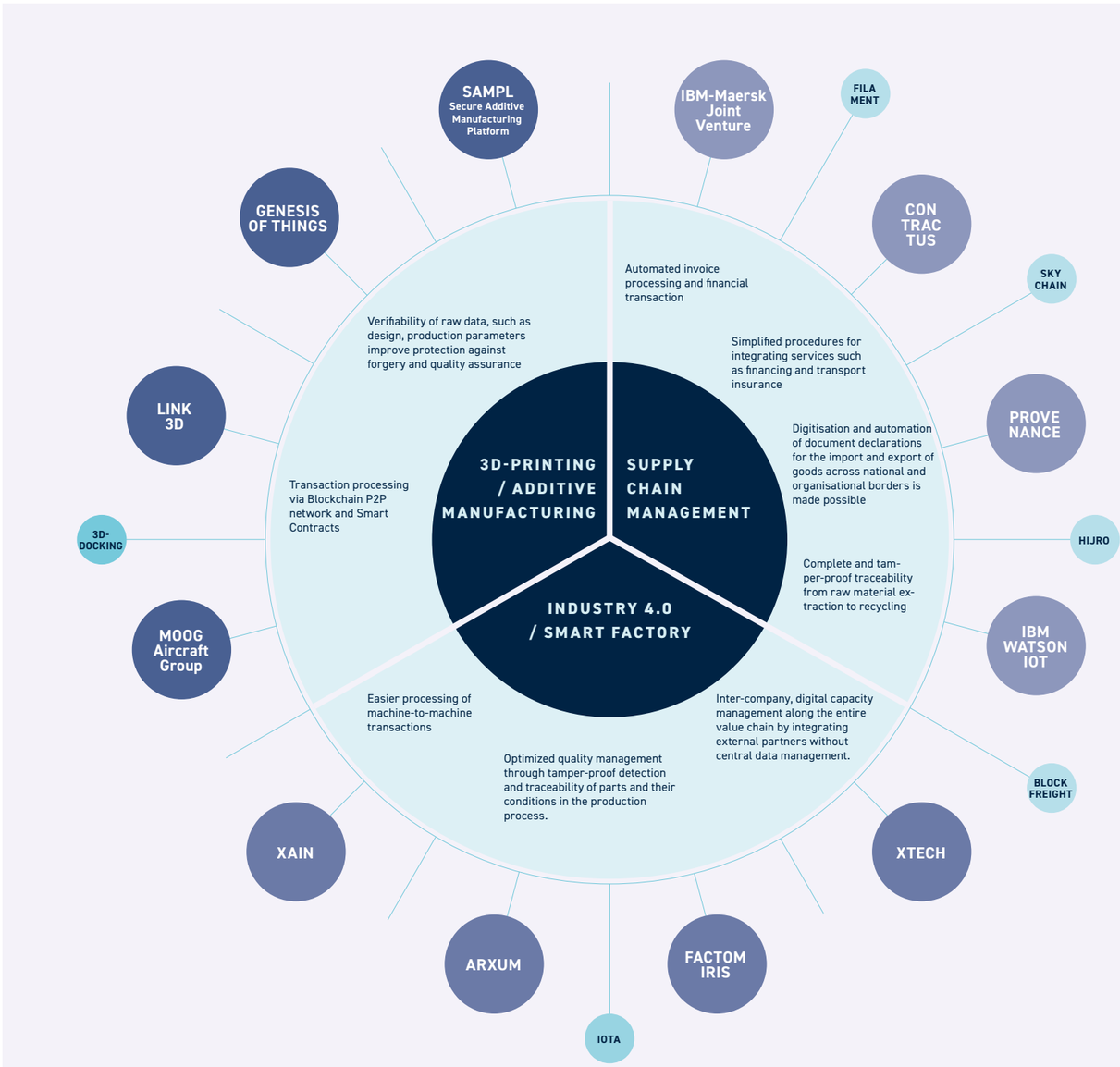
CERTAINTY 5: Blockchain Oracles validate information

At the same time, blockchain is equipping companies with a new arsenal of methods to detect manipulations in good time. Since blockchains themselves do not access information outside their chain, they require a separate instance to check whether the conditions of the "smart contracts" are met as agreed. One such instance is "Blockchain Oracles", which provide external information about the real world, such as payment transactions, price or weather changes in the blockchain. For example, if a certain value is reached for stock exchange raw material prices, the predefined algorithms in the smart contract can trigger price comparisons with suppliers. By using multiple sources of information, organizations try to achieve the best possible validity of the information.

CERTAINTY 6: Batch size 1 is possible at mass production conditions

Bicycles with the perfect frame height, tailor-made shirts or individually designed watches: Blockchain technology opens up realistic options for the consumer goods industry to produce very individual products at mass production costs. However, the prerequisite is a continuous digitization of all process steps from the collection of the first customer data to the delivery of the goods.





ARXUM WAS FOUNDED BY A TEAM OF EXPERIENCED INDUSTRIAL ENGINEERS

The company solves challenges in the manufacturing industry by connecting manufacturers, suppliers and customers in a blockchain-based network. Data can thus be transferred effortlessly between users and machines, enabling customized production at the price of mass production.

>> https://www.arxum.com

THE TRUST ENGINE

HOW DECENTRALIZED CORPORATE NETWORKS ENABLE NEW BUSINESS MODELS.

Interview with Thomas Müller,
CEO & Co-Founder EVAN GmbH

Mr. Müller, the International Data Corporation (IDC) recently wrote in its ITC industry forecasts for 2018 and beyond that that by 2021 at least 25 percent of Global 2000 companies will use blockchain services on a large scale as a cornerstone of their digital trust strategy. Developments in the context of blockchain technology will have a major influence on the design and implementation of digital business processes and public processes. What makes the blockchain so exciting for industry and business?

The digitization of real-world goods is one of the most interesting things in using blockchain technology for businesses, as it forms the basis for the ever-growing demand for digital business models around existing physical goods. I see two main drivers for this demand. One is the sharing economy trend, where things like cars, machines or tools are used by several users and the other is the industrial Internet or more specifically the ability to coordinate processes directly between the machines and products involved. The exciting question here is what happens if the machine itself could control the entire process? This is exactly the idea behind the digitization of goods. An important prerequisite for such digital communication is the direct participation of the machine in digital communication. With blockchain technology it is possible to provide a digital representation - I call this a "digital twin" - for a device like a machine. This digital twin enables the machine to participate in a digital transaction with a trusted identity that can then be used to coordinate the activities required for a process.

Another aspect concerns the way companies can create value in the future. Sales markets are changing with a previously unknown dynamism and demand a high degree of flexibility from companies. In the future, hardly any company will be in a position to serve customers completely on its own, which means that joint value-added processes with constantly changing and in some cases new partners will gain in importance. That is why we need to rethink the way in which we work together. What we need today, however, is dynamic cooperation in flexible partner networks in which companies interact with each other at eye level. This requires a strong rethink in the way companies interact with partners, but it also requires new methods of reliable, fast and dynamic collaboration in partner ecosystems. In these areas, the blockchain technology is an interesting alternative to today's existing solutions and that makes it so exciting.

The digitization of processes and transactions between companies is playing an increasingly important role in digitized business models. Blockchain technology makes it possible to develop such systems. To what extent is this point relevant?

In the area of process cooperation between companies we find many similarities with the digitization of goods. The main driver in this area is the ability to coordinate cooperation processes more efficiently and more flexibly. From today's perspective, these are completely contradictory goals. If you need more efficiency, you will probably start a cross-company system integration project using EDI-based data exchange, for example. Such cross-company integration projects usually incur high costs and are accompanied by a rigid coupling between the partners, which is completely inflexible.

In order to integrate partners more dynamically, more and more platforms were created with which processes can be flexibly integrated in a partner ecosystem. From the point of view of process integration, this is a big step, but from the company's point of view it adds an unprecedented dependence on third parties.

In recent years, much has been invested in the digitization of processes. During this time, a mass of IoT hubs, platforms and cloud solutions were created. But they all have a massive problem. A central platform for digitizing the company's own processes makes the core business dependent on third parties. This is a huge risk and the main reason why companies are reluctant to use such platforms. Blockchain solves this problem by allowing participants, as well as goods, to interact with each other by maintaining data sovereignty. Information is exchanged between partners as needed and initiated by the data owner. Companies do not have to rely on a central intermediary to provide data. Blockchain technology also makes it possible to develop systems in which trust and value can be exchanged between partners without having to rely on a powerful central mediator, as is normally the case today.

This is achieved through the use of smart contracts that define the rules of cooperation, such as agreed service levels, delivery times or quality criteria. Smart contracts can then be used as a digital representation of a specific value chain to exchange data between participants and automatically check compliance with the defined rules.

The topic of "enterprise-ready blockchains" is currently being discussed in the media. What's this all about?

When we launched Ethereum blockchain in 2014, we wanted to make it available to companies. It soon turned out that it didn't work that way. As beautiful as the idea of this architecture is, it provides so many problems for use in the company, it is only conditionally ready for operation. This starts with simple technical things. In the Public Blockchain you see everything, it's not really an anonymous system. Every member of the chain can look into a transaction. In the corporate environment this is an absolute "no go" and unacceptable. But who is the data processing unit in a decentralized system? A company that offers a blockchain solution for its customers must also be able to legally secure this, which is why a public blockchain is not really usable for companies today. Data privacy and compliance with data privacy standards are gaining massively in importance within the scope of the basic data protection regulation.

We have learned from this and have initiated the decentralized corporate network "evan.network". In principle, this is an open ecosystem that offers companies in almost every industry the opportunity to create individual digital business models based on blockchain technology. The big advantage here is that companies can map their processes very quickly. It is not necessary for companies to work at the blockchain transaction level, they can functionally use the service templates and the entire infrastructure to implement their business logic on a blockchain basis. This is the functional side behind the network. This gives us an operating platform and a service layer that allows a company-specific implementation very quickly. For us, this is the "enterprise ready" blockchain and can be used for any B2B business.

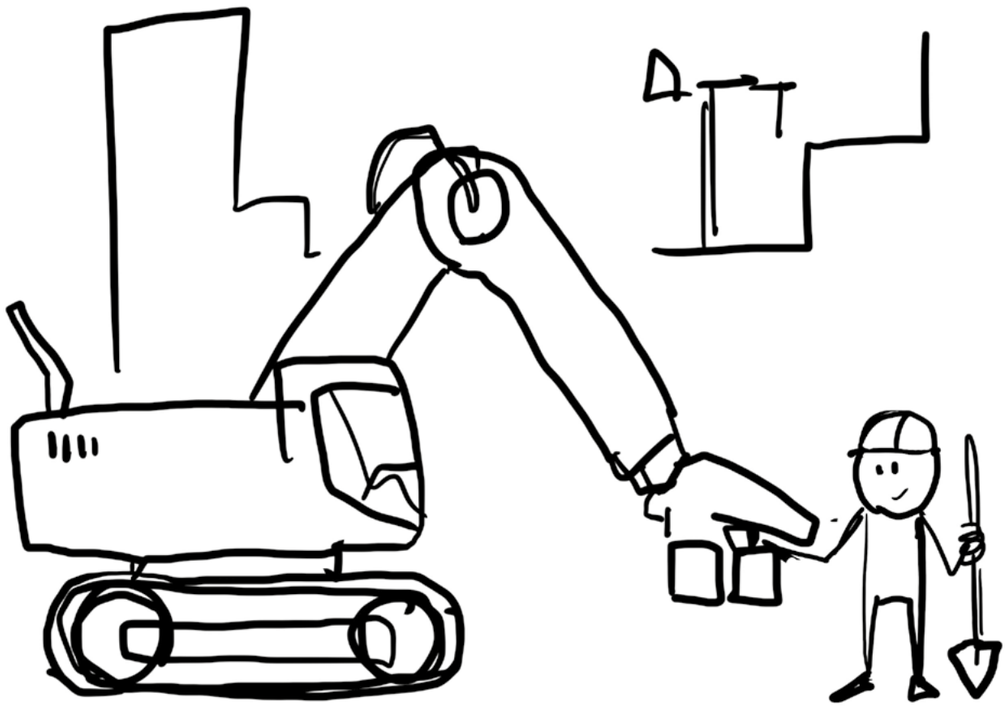
ABOUT THE INTERVIEWEE

Thomas Müller *(41) Co-Founder and CEO of EVAN. He is an expert in process optimization and strategic business development. After studying computer science and business administration, he gained extensive experience in an international technology consulting firm. As a member of the management of a medium-sized IT service provider, he was responsible for the development of new business areas for a further eight years. Since 2017, he has been working on efficient cooperation between companies using blockchain technology as part of the start-up EVAN. EVAN is the initiator of the decentralized corporate network evan.network. evan.network is the first consortium cross-industry blockchain and offers companies from almost all areas the possibility to build digital business models based on the blockchain technology. It paves the way for future-oriented business models in which the protection of one's own data sovereignty and flexible cooperation with partners are decisive factors for success.*

A mid-sized company rents out construction machinery and conveyor systems. The company is regionally positioned and plans to digitize the entire handling of the equipment rental. By using the blockchain technology, the rental process is to be automated and tamper-proof. At the same time, the foundation stone is to be laid for further digital services in order to be able to serve customers more individually and, above all, more quickly in the future.

WHEN THE EXCAVATOR LENDS ITSELF

a blockchain use case



CHALLENGE:
MANUAL COST DRIVERS & LOCAL LIMITATION

The rental of construction machinery consists of a vast number of individual process steps, most of which are still carried out manually or with paper support today and thus represent significant cost drivers. This includes, for example:

- *The customer's request and the comparison with the available devices.*
- *The Inspection of the machine by a service technician and documentation of its condition.*
- *Hiring a logistics company to transport the rented machine to the customer.*
- *Issuing insurance benefits etc.*

In addition, letting services are always regional, while construction companies usually operate on a supra-regional basis. If a customer wants a service in another region, he must look for a new partner ecosystem for each construction site. However, centrally managed rental platforms are at the expense of local landlords, as valuable customer relationships are lost here.

GOAL:
AUTOMATION & COOPERATION

Against this background, the use of blockchain technology offers concrete starting points for increasing efficiency in the rental process. This includes:

AUTOMATION OF ORDERS FROM CUSTOMER ENQUIRY TO INVOICING OF SERVICES

If a machine is logged off at the construction site, the logistics partner can be automatically commissioned digitally and simultaneously receives the required location data. In addition, the transfer of risk from the customer to the rental partner takes place upon deregistration of the device. Payment can also be triggered automatically. Manual typing of delivery notes and transport orders is also no longer necessary.

TAMPER-PROOF AND TRUSTWORTHY DATA STORAGE

For handling the transfer of risk, i.e. the time at which the economic ownership and thus responsibility for possible damages passes to the contractual partner, all relevant information such as the condition data of the machines and the time of handover is stored transparently and forgery-proof in the blockchain.

PLATFORM-BASED COOPERATION MODELS FOR THE MUTUAL PLACEMENT OF ORDERS

If a customer cannot be served by his service provider due to capacity bottlenecks, he has the possibility of requesting free capacities from other rental companies via a platform. Their capacity data is stored decentralized in the blockchain and automatically compared with the requests. Since no central authority exists to manage data and customer relationships, regional providers can interconnect at eye level and flexibly place orders with each other.

SOLUTION:
SELF-CONTROL THROUGH SMART CONTRACTS

To implement these process optimizations, Smart Contracts can be used in which all contract conditions relevant for automated rental processing, such as the equipment to be rented, the rental period and the agreed use, are stored. This enables various usage scenarios:

- *The logistics partner can confirm receipt of the machine with a smartphone app. The registration and deregistration of the devices on the construction site is also carried out in this way.*
- *From the planning system, a specific machine can be selected for rental and ordered digitally. The machine or its digital twin in the blockchain controls all further process steps independently.*
- *Other ecosystem partners, such as landlords in other regions, can also be invited to the smart contract. This serves as a link between all participants and contains the relevant data in an unchangeable form and independently triggers processes, such as payment or delivery of status information to dispatchers.*

RESULT:
BASIS FOR NEW BUSINESS MODELS

The prerequisite for using a Smart Contract in the sense of a digital twin is the automatic provision of all information necessary for processing the rental process. For this reason, all existing process steps in the present project first had to be mapped completely digitally. The transparency and automation created by this alone, for example in order processing, already ensured a significant increase in efficiency and made it possible to process letting to the customer in a more professional manner. At the same time, by integrating the processes into the decentralized corporate network "evan.network", an open ecosystem was provided, which serves as a basis for the integration of further letting partners and the realization of new or expanded business models. The following further business model innovations can already be implemented today with the existing blockchain infrastructure:

- *Generation of new sources of revenue away from the sale and rental of equipment, in the form of supplementary services, such as qualified machine operators, insurance and much more. The more partners need to be coordinated in the context of such additional service offers, the better the use of the blockchain.*
- *A direct connection of the machine to the blockchain within the scope of Smart Contracts for the control of access and type of use as well as their billing directly by the machine itself or its digital twin.*
- *Digital access to videos and instructions for operating and securing the machine via the digital twin of the construction machine during the rented period.*

building industrial future

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In order to make the multi-faceted topic of Industry 4.0 tangible and effectively usable in corporate practice, ROI runs an Industry 4.0 learning factory in which the technological foundations and principles of digitization are combined with the lean production approach and conveyed in a practical way. As initiator and co-organizer of the Industry 4.0 Awards, which were first presented in 2013, and 2017 in China, ROI actively promotes the development of technological innovation in Germany. Established in Munich in 1999, the ROI Group employs more than 150 people worldwide in Munich, Stuttgart, Beijing, Prague, Vienna, and Zurich. The spectrum of clients ranges from well-known, medium-sized companies to Dax-listed corporations.

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Person responsible for content under German press legislation: Hans-Georg Scheibe
ROI Management Consulting AG | Infanteriestraße 11 | D-80797 Munich | Germany
Tel. +49 (0)89 121590-0 | E-Mail: dialog@roi.de | Directors: Michael Jung, Hans-Georg Scheibe

www.roi.de