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## Outpaced by the chain – How Blockchain is being promoted in East Asia

Blockchain is one key technology that will dominate the economy in the near future. China, Japan and South Korea protect their blockchain innovations with patents. By the time German players wake up, the field will have been staked out. Applications can be bought, but others will have the control and the earnings. The private sector and government in Germany should drop their skeptical attitude, invest in research and test practical applications, argues Finn Mayer-Kuckuk.

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### Relevance



**Relevance**  
Why we care

Together with artificial intelligence and robotics, blockchain is part of a triad of key technologies that will dominate the economy in the near future. Economic powerhouses in the Far East are currently playing a leading role here.

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## Focus



### **Focus**

Which developments we should follow

Practical applications for blockchain technology are currently being developed outside of public view, at companies in the IT and financial sectors. But anyone who follows the news beyond reports on bitcoin will have heard of numerous success stories – each of which is a building block restructuring the economy.

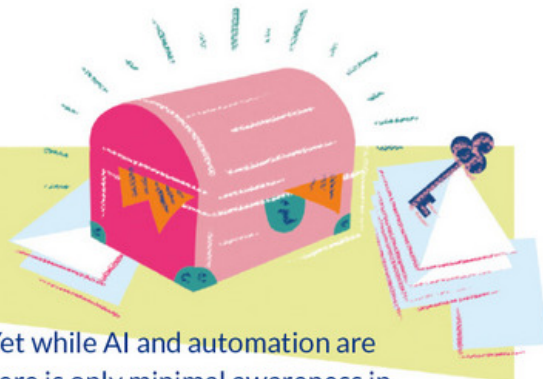
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## Information

### **Information**

Where we know too little

The coming disruptions will accelerate Asia's ascent vis-à-vis the EU and the US. Yet while AI and automation are hotly debated in Germany, there is only minimal awareness in the country of blockchain's importance.



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## Forecast



### **Forecast**



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## Options



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## Attack on upscale jobs

Together with artificial intelligence and robotics, blockchain is one of the key technologies that analysts believe will have the greatest impact on tomorrow's economy. These three technologies dovetail, complementing each other. As a result, complex economic activity will increasingly shift from being done by humans to machines.

There have been rapid advances in automation in the past. This time, however, surprises await. Current developments could also affect jobs that were previously thought safe. These include positions at banks and insurance companies, at legal practices and public authorities. At the same time, the efficiency of the economy as a whole is increasing, since machines are

becoming more adept at handling processes – within milliseconds – that were previously the purview of people.

Blockchain plays the role of the notary in the computer world. In other words, it is a secure and unchangeable data storage system, one that is also generally accessible. This may sound trivial: Can't any server do that? The idea makes much more sense, however, when we consider how little we trust previous forms of data storage. We constantly back up private and business data or expect in-house IT specialists to take care of it. Really relevant data lie behind several layers of firewalls and passwords. Highly sensitive information such as account balances are sequestered in special data centers. The same goes for the blueprints for protected technology. These systems are not freely accessible – and for good reason.

A blockchain, on the other hand, is open to a wide circle of participants for examination. Moreover, anyone can inscribe something – a Bitcoin payment, for example. Despite its open structure, a blockchain is as secure as the deeds registry down at the city clerk's office. In fact, it could soon become the publicly accessible part of the local court's file management system.

### **More than just a fad**

Among the public, blockchain is often understood as synonymous with cryptocurrencies such as bitcoin. These are technologies at different levels, however: The currencies are *applications* of blockchain, just as email, websites and video streaming are different applications of the Internet. The shortcomings of *individual* applications – in this case bitcoin – can by no means be used to deduce the unsuitability of the entire concept. Just because an email program is difficult to use does not mean that email in general is useless as a method of communication. It doesn't mean that the whole Internet was just a short-lived fad. Criticisms such as bitcoin's high energy consumption are therefore irrelevant for a basic assessment of blockchain technology. Similarly, the current wave of doubt concerning real life applications comes to early - the framework for the necessary paradigm shift still needs to adjust.

### **Intelligent money**

It is also possible to write short programs into a blockchain. These “scripts” are included forever, just like all other data in the blockchain, which can thereafter react to external circumstances. For example, an investment that is inscribed could contain a command to trigger a sell order at the next query if the commodity's price has fallen below a certain value. Many young companies are raising capital today by opening a kiosk on a blockchain, where a mini-program

sells something akin to company shares without further ado. It reacts to purchase offers from outside and credits the buyer with his or her shares.

The possibilities of such a dynamization of data are not yet foreseeable. These mini-programs could initially interact to form a network of secure virtual agents; they could subsequently maintain business relationships without human intervention. Thus, the financial industry is already imagining “smart contracts” that fulfill themselves.

Examples of possible blockchain applications include:

- The exchange of order information for just-in-time production between customers and suppliers
  - including, for example, requests for providing power within smart grids
  - or, more traditionally, supplying parts for the automotive industry.
- The recording of deeds, wills, laws, ordinances and administrative guidelines as well as personal data in areas such as health care.
- Copyrighted information, such as music rights, patents and intellectual property.
- The documentation of freight data for international trade, e.g. on container ships.
- And the visualization of entire insurance contracts.

A blockchain can handle this because even though it is possible to subsequently change data, it is inevitably noticeable. In other words, everyone would see if someone tried to alter an encoded patent or consignment note.

## **Disrupting the disruptors**

In view of these applications, blockchain falls into the category of disruptive technologies and has the potential to creatively destroy the functioning of a number of economic sectors. In the 20th century, the economist Joseph Schumpeter presciently described and named this process; here we see it unspooling before our eyes. Blockchain may not be as fundamental as electricity or computers, but it may become just as important as the World Wide Web or email.

Blockchain could cost many jobs, particularly in the financial sector. If transactions become both cheap and automatic, then there will be no more fees for banks to earn. “Transactions” here means not only standard check clearing, but also stock, bond and currency trading, hedging transactions, real estate financing, insurance and reinsurance. In the area of the traditional Internet, many observers even regard blockchain as the “disruptor of disruptors”: By

further automating secure transaction processing, it could even undermine the business models of young companies such as Uber and AirBnB.

## **Promotion of blockchain in East Asia**

The technocratic governments of East Asia are well aware of the importance of this innovation. China, Japan, South Korea and Hong Kong are investing a lot of money in promoting blockchain applications and are struggling to find the right regulatory framework for this novelty.

The extent to which the center of innovation has already shifted to Asia is reflected in the number of patents registered. The Chinese trade journal *IPR Daily* ([http://www.iprdaily.cn/article\\_19746.html](http://www.iprdaily.cn/article_19746.html)), continuously records global patent applications in order to keep track of developments. There are 62 East Asian companies among the top 100 organizations that have filed blockchain patents (as of August 2018). The US is also strongly represented, while European firms hardly appear at all. The distribution of all blockchain patents filed worldwide looks very similar: Asia accounts for two-thirds of the patents, the US for almost one-third, and the rest of the world is negligible.

## **China**

China is the front-runner here. Among Communist Party leaders, cadres with a scientific-technical background are overrepresented. The country wants to actively shape the future and has hardly any reservations about transforming nature and society. In addition to major physical projects such as the Three Gorges Dam, digital mega-projects such as the introduction of social scoring are now also emerging in China. The country's leaders have the burning desire to ensure China joins the ranks of the leading technology countries. Now China also wants to become the blockchain world champion.

President Xi Jinping explicitly praised blockchain in a speech to the Chinese Academy of Sciences in May 2018, alongside AI, quantum computers, mobile telecommunications and the Internet of Things, as belonging to the “new generation of information technology”. In China, the mere mention of a new idea by a top leader in an “important speech” is clearly an accolade. All levels of the hierarchy are now trying to outdo each other presenting results.

Government agencies in China are working flat out to set standards for blockchain use (<http://tech.sina.com.cn/it/2018-05-10/doc-ihachqz3607998.shtml>). The Ministry of Industry and Information Technology is bringing together experts from all departments to do exactly that. At the same time, China is the site of various innovative pilot projects. The city of Loudi, for example, wants to use blockchain technology to document real estate transactions and has

networked the relevant authorities for this purpose.

(<http://politics.people.com.cn/n1/2018/1113/c14562-30398709.html>) Each transaction is registered on a server and recorded in summary form in the blockchain. This enables each participating authority to verify the authenticity of the entry. In China, such projects, when successful, often serve as role models and are then expanded across the entire country.

Other public sector players are also eagerly experimenting with the new technology. Several blockchain research projects are underway at the country's central bank. It alone holds at least 45 blockchain patents. The state-owned commercial banks are also keen to participate.

The private sector is even more active. Internet vendor Alibaba alone accounted for 10 percent of all blockchain patents worldwide in 2017. Not only looking at applications for online sales, Alibaba is assiduously researching how it might automate Internet services of all kinds.

Members of the bitcoin scene read such news with astonishment, still traumatized as they are by the restrictions imposed by Chinese authorities in 2017. Since then, the Chinese government has virtually eradicated the use of crypto-currencies in China by declaring the relevant trading venues illegal. This seems at odds with the country's desire to promote blockchain, since bitcoin has been the technology's flagship application so far.

Ultimately, however, the response is completely logical. The Chinese leadership feels money should be controlled by the state. The nominally communist government still does not allow their currency to be freely traded against the dollar and the euro, so they certainly cannot countenance competing forms of free-floating cash. With bitcoin, it would theoretically be possible to anonymously transfers billions from one location to another. It is therefore not a surprise that bitcoin became so popular in China in such a short time. A non-governmental alternative to storing wealth, no matter how it might have been gained, coupled with the chance to spirit funds surreptitiously across the border, not to mention the benefits of holding a speculative commodity rising in value – all of that was, in sum, irresistibly attractive to wealthy Chinese.

Thus, crypto-currencies like bitcoin are now virtually banned, while the government actively promotes the future of blockchain applications. It might be revolutionary technology, but it will unfold under state control.

Chinese thought leaders even expressly see blockchain as an opportunity to outpace the US. A segment in the “Dialogues” series ([https://www.youtube.com/watch?v=PeCHcAQ\\_ho](https://www.youtube.com/watch?v=PeCHcAQ_ho)) shown by state broadcaster CCTV

on the subject of blockchain was revealing here. The broadcast's takeaway: "Blockchain is worth ten times more than the Internet." Zhang Shoucheng, a physicist who has since passed away, saw blockchain as the next level of the Internet, beyond the business models implemented by Google and Facebook. While the latter centralized information, blockchain will decentralize it. Zhang was a highly respected influencer, a physics genius who enrolled at FU Berlin in 1980 at the age of 17 and taught in the US after graduating.

It remains to be seen whether the Chinese approach of control and promotion is optimal. In any event, it oscillates between extremes: Sometimes a start-up entrepreneur is threatened with prison because he has not scrapped his bitcoin app quickly enough. On the other hand, lavish grants are awarded to blockchain start-ups. The people involved are often unsure what to make of it.

The reason can be traced back to the country's government agencies, which often administrate independently of each other, insisting on their independence. The Ministry of State Security, for example, would prefer to ban all activities on the Internet, while the Ministry of Industry and Information Technology would ideally grant inventors complete freedom. The current compromise is that all companies processing information using blockchains must provide detailed annual reports of all their activities. [Creative freedom this is not](https://www.scmp.com/tech/blockchain/article/2169613/china-requires-blockchain-based-information-service-providers) (<https://www.scmp.com/tech/blockchain/article/2169613/china-requires-blockchain-based-information-service-providers>).

## Hong Kong

Meanwhile, Hong Kong is running a number of highly innovative projects of its own. The metropolis is located on Chinese soil, but is basically allowed to manage itself independently. This results in a freer climate. The private enterprise Hanson Robotics has been in the public eye again and again thanks to its media-friendly robot Sophia, who has already discussed [AI with German Chancellor Angela Merkel](https://www.faz.net/aktuell/wirtschaft/diginomics/angela-merkel-spricht-mit-roboter-sophia-ueber-ki-15663646.html) (<https://www.faz.net/aktuell/wirtschaft/diginomics/angela-merkel-spricht-mit-roboter-sophia-ueber-ki-15663646.html>).

What makes Sophia special is that her intelligence is intended to be driven by a blockchain. Hanson Robotics is pursuing a new approach here: Their AIs are connected to each other through a "Singularity Net." Sophia is not meant to be a single mind that, like us humans, thinks in isolation, but part of a network of AIs which exchange knowledge and experiences globally. The distribution mechanism for this would be a blockchain, [says Hanson founder Ben Goertzel](https://blog.singularitynet.io/joe-rogan-learns-about-blockchain-technology-with-dr-ben-goertzel-a9c17566d994) (<https://blog.singularitynet.io/joe-rogan-learns-about-blockchain-technology-with-dr-ben-goertzel-a9c17566d994>). In other words, it is the telepathic medium for the machine beings of the future.



## Japan

In Japan, the government wants to turn the country into a model nation for crypto-currencies – undoubtedly in clear contrast to dirigiste China. In October 2018, Prime Minister Shinzo Abe sent an unmistakable message by appointing digital specialist Takuya Hirai as Minister for IT Strategy, Intelligent Industry and Science Policy. ([https://www.kantei.go.jp/jp/98\\_abe/meibo/daijin/hirai\\_takuya.html](https://www.kantei.go.jp/jp/98_abe/meibo/daijin/hirai_takuya.html)). (He is also Minister for “Cool Japan”, i.e. comics, pop music and video games, so that his hybrid department can perhaps be described as overseeing everything “new-fashioned.”) Hirai has been preaching the doctrine of blockchain as a technology of the future for five years now and has always been an advocate within his party for not regulating bitcoin and other currencies.

In fact, it can be inferred from his most recent statements that he continues to support a highly liberal approach to crypto-technologies in the cabinet. Politicians should not be too distracted by cases of fraud and hacker attacks, he says. (<https://fintechonline.jp/archives/101758>), since the freedom of technology development is more important than protecting citizens from every conceivable danger. Not everyone may agree with him, but in fact crypto-exchanges in Japan operate largely unchallenged even after careful regulation.

These days in Tokyo, you hear of many blockchain startups working on what are some fairly wild ideas. One application that anticipates the combination of AI and blockchain has been developed by the recently founded company Couger: The “Virtual Human Agent” (<https://couger.co.jp/project/detail02.html>) is a typically playful idea from Japan. The software simulates a young woman who can be both an interface to a smart home and a personal assistant (<https://www.youtube.com/watch?v=RQeKM2XOmos>). The developers also want to use blockchain as a data-storage medium.

Even in the traditional core segments of Japanese industry, the willingness to give blockchain a chance is increasing. The leading robot manufacturers Fanuc, Mitsubishi Electric and DMG Mori will connect their computer systems in the coming months as preparation for participating in the economy of the future (<https://asia.nikkei.com/Business/Business-Trends/Japan-s-top-robot-makers-link-platforms-for-smart-factories>). The Ministry of Economics, Trade and Industry initiated this partnership among organizations that are otherwise competitors. The companies want to use a blockchain for the secure exchange of data. The ministry mentions not only US-based General Electrics, but also Siemens from Germany as important competitors.

## South Korea

In the dynamic technology-savvy nation of South Korea, citizens have been particularly enthusiastic supporters of crypto-currencies. A third of the population has invested money in bitcoin and other products, which led the government to regulate the market last year. It wanted to protect citizens from losses – and rightly so, as the current market weakness shows. In addition, several service providers have recently been the victims of hacker attacks, so the mood among investors is hardly upbeat.

The dissatisfaction with bitcoin as an asset has not, however, prevented the country's state-owned industrial complex from consistently promoting blockchain applications in many other areas. As is customary in South Korea, large corporations, such as Samsung, Hyundai and LG, are taking the lead. They have the money and the applications, while smaller start-ups in Seoul deliver the innovations.

The government is taking a page from the private sector's book by launching its own a forward-looking initiative: blockchain instead of ballot boxes. As an unalterable data storage system, it would be well suited for holding elections electronically. This is exactly what the Ministry of Science and the National Election Commission have now proposed.

Although South Korea already experimented with electronic voting, confidence in the technology was low. Blockchain now offers a new opportunity (<https://www.zdnet.com/article/south-korea-to-develop-blockchain-voting-system/>). If voters are registered on a chain and their votes are electronically signed using so-called private keys, falsifications of votes are viewed by IT experts as impossible. Moreover, a vote could not be attributed to a specific individual, because cryptography with private and public keys cannot be traced. Better yet, it would finally be possible to vote from home using a mobile phone. The same technologies that prevent bitcoin from being used to pay twice with the same money would ensure each voter only casts one vote. In any event, the project shows South Korea's considerable readiness to accept risks as it develops digitally.

## **Outlook and warning**

In Asia, as in Germany, digitization, as it progresses, must navigate between competing needs for freedom and regulation. Interestingly, the tensions between the two are even greater there than in Europe. Asian governments are very enamored of technology and, at the same time, very control addicted. Overall, however, they have done a better job recognizing the opportunities and are pushing ahead with the introduction of new technologies without any major reservations.

China and South Korea have already become the German economy's strongest competitors in recent years – well ahead of the US. Japan, on the other hand, remains stubbornly relevant. Take mechanical engineering: With a global market share of one-quarter, China is already the world's largest supplier, followed by Japan and Germany, each with one-sixth of the market; the US lags behind with only half of Germany's share. The situation is similar in the automotive industry. In both cases, Asia now has a world market share of around 50 percent. That means Asians are already the toughest competitors in exactly those fields where Germany earns its money.

Technological change will shake up the world economy in coming years – yet again. On its own, blockchain may not seem too impressive to observers so far; news about bitcoin dominates, portrayed as either an ecological catastrophe or investment bubble. Yet the fact that Asia is investing so aggressively should serve as a warning in itself. If it remains overly pessimistic or hesitates too long, Germany could diminish its appeal as a place to do business.

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## About the Author

Finn Mayer-Kuckuk was born in Bonn in 1974. After studying Japanese culture and literature, he attended the Holtzbrinck School of Journalism and served as the Tokyo correspondent for the Handelsblatt for several years. From 2010, he lived in Beijing and reported on Greater China for the Berliner Zeitung, Frankfurter Rundschau and Stuttgarter Zeitung, among others. The business journalist reports from Berlin since 2018.

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## What is a Blockchain?

Blockchain is a linked list that can be continually expanded. It serves to store a safe record of transactions. Transactions here are e.g. value transfers or contracts. To be able to store transactions in the blockchain, each participant creates its own key pair. Each new transaction is then appended to the end of the blockchain and signed with the author's private key. In addition, each transaction references the previous transaction. This way, each individual transaction and the chain as a whole are safe from manipulation, as long as no single individual controls more than half of the participants.



# Finn Mayer-Kuckuk

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