A lot of hype surrounds blockchain, distributed ledgers and cryptocurrencies, but how will it benefit insurers?

By now most insurers are aware of blockchain technology and how it might impact the industry. Indeed, some insurers are already taking tentative first steps to apply it or engage in shared pilot projects. But if you’re still working out how it fits in with your technology development plans, you’re not alone, and there’s still time.

Blockchain’s impact on the wider InsurTech movement is likely long term compared with such technologies as artificial intelligence (AI) and the Internet of Things (IoT) (Figure 1). Nonetheless, the growing number of blockchain industry and InsurTech start-up ecosystem initiatives cannot be ignored.

What blockchain shares with more immediately anticipated technology developments, and what makes it relevant to insurers, is its link to three key global trends affecting the nature and business of risk (see “How blockchain works — in simple terms” on the next page).

1. **New social interaction paradigm:** New types of activism and social interaction (e.g., sharing economies, peer-to-peer [P2P] transactions and crowdfunding), the growth of individualism (e.g., personalization over mutualization and data self-sovereignty), and quicker adaptive behaviors to economic stimuli and to the perceptions of others are challenging established business methods and call for a different interaction with customers.

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**Figure 1. InsurTech technologies and when they’ll have an impact**

<table>
<thead>
<tr>
<th>Description</th>
<th>Examples of applications</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of computer systems to perform <strong>tasks and decision making</strong> that have historically required human intelligence, e.g., machine learning</td>
<td><strong>Automated risk to capital</strong> matching</td>
<td>&gt;2 years</td>
</tr>
<tr>
<td>Improved <strong>forecasting ability</strong></td>
<td><strong>Fraud</strong> detection</td>
<td></td>
</tr>
<tr>
<td>The interconnection of a plethora of everyday devices, enabling them to send and receive data that can be analyzed</td>
<td><strong>Chat robots</strong> for customer interaction</td>
<td></td>
</tr>
<tr>
<td><strong>An immutable digital ledger</strong> in which transactions are recorded through distributed consensus</td>
<td><strong>New data</strong> available to price risks and products, to understand customers, to map and incentivize behavior</td>
<td>&gt;5 years</td>
</tr>
<tr>
<td>Can be extended to host computer protocols capable of executing automated <strong>“smart contracts”</strong></td>
<td><strong>Secure, trusted and incorruptible</strong> information collection</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Smart contracts</strong> used to increase efficiency and <strong>lower costs</strong> through process automation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enabling the <strong>scale of trustless P2P</strong> networks to transact value</td>
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Disruptive potential

As with any aspect of InsurTech, insurers' key concern is very practical: blockchain's impact on existing business models and practices. In particular, they are concerned over what specific operational, analytic and, ultimately, business-defining opportunities and threats it might bring.

In our view, promising applications over the next 10 years are likely to allow insurers to reduce administration and claim processing costs; reach underserved business segments; and offer on-demand, self-issuing policies driven by a number of key blockchain characteristics (Figure 2).

Figure 2. Likely effects of blockchain over time

<table>
<thead>
<tr>
<th>Short term</th>
<th>Medium term</th>
<th>Long term</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operational improvements</strong></td>
<td><strong>Better data and measurement of risk</strong></td>
<td><strong>True disruption to the value chain</strong></td>
</tr>
<tr>
<td>Automation: Improved speed and cost-efficiency through self-executing smart contracts</td>
<td>Provenance and identity: Safeguarding data/asset provenance, and enabling data portability and auditability through its chronological and immutability attributes</td>
<td>P2P business models: Increased disintermediation through distributed and autonomous organizations of participants and networks</td>
</tr>
<tr>
<td>Distributed databases: Increased efficiency, transparency and fraud protection within and among insurers, reinsurers and regulators through shared blockchain-based relational databases</td>
<td>Risk transparency: Improved ability to calculate and price risk through new, verifiable and secure sources of data</td>
<td>Automated risk matching platforms between customer and carrier,* with more risk handled via smart contracts rather than traditional policies</td>
</tr>
<tr>
<td>IoT + blockchain + AI</td>
<td></td>
<td>Innovative new products for emerging risks</td>
</tr>
</tbody>
</table>

*For less complex risks, this may happen sooner.

Source: Willis Towers Watson analysis
Distributed relational databases
Blockchains are able to reduce human error and the costs and delays associated with the verification processes, and with the synchronization and reconciliation of multiple databases among the various players in a market or value chain – they increase efficiency, transparency and fraud protection. In the battle against fraud, for example, distributed ledgers using blockchains can be more effective than existing technologies due to their shared and distributed nature and the mechanisms to self-regulate in a network of multiple parties with conflicts of interest. In addition, the use of state-of-the-art encryption to protect data and guarantee confidentiality, combined with smart contracts that define data access to different parties in a very granular way, could help overcome issues related to data privacy and ownership.

Provenance and identity solutions
Some of the blockchain’s attributes – initially developed to track the origin and spending of cryptocurrency and avoid double spending – have become a great way of establishing provenance for (insurable) assets. This has already been demonstrated by Everledger in developing a mechanism that bridges the gap between a physical asset — diamonds — and its digital traceability.

Equally, blockchains could track “risk provenance” on an individual basis by leveraging data from the IoT and wearable devices. Currently, expensive know-your-customer processes are duplicated across institutions, and their insights are not portable for individuals. This could change with blockchain time stamped and recorded portable identities. So-called identity wallets could hold information about an individual’s health, DNA, molecular decay, attitudes toward risk, driving ability and other personal information, and could further impact the design of models with near-real-time adaptive pricing, expanding the idea behind telematics and usage-based insurance into other areas. Key to this idea is the concept of data self-sovereignty and the fact that for the first time individuals are trusted as custodians of their own data, since those data now sit in an immutable, incorruptible ledger. These identity solutions, once well developed, could radically change the type of data insurers can access, store and use, as opposed to insurers only interrogating the data. The fact that individuals will govern their own data might also change the type of data they are willing to share and the economic incentives they will need to do so.
Emphasis 2018/1

Theory to reality — use cases

Indicative of the momentum building behind blockchain since 2014, 627 patents were filed (372 in 2017 alone) containing either blockchain or distributed ledger technology in their abstracts.
A number of broader FinTech collaborative initiatives are also flourishing. R3, founded in 2015, is the biggest of these with over 80 systemically important financial institutions. B3i, a consortium of major reinsurers, has been working on an excess-of-loss proof of concept and presented a prototype reinsurance post-placement platform at the 2017 Monte Carlo Rendez-Vous. Other consortia or industry groups looking into how to apply blockchain to insurance specific use cases include The Institutes RiskBlock™ Alliance, Hashed Health and the Financial Blockchain Shenzhen Consortium.

Most use cases being explored by incumbents have sought automation and back-end efficiency, either through the development of smart contract-enabled products for parametric insurance — cat swaps, crop or weather-index-based insurance, travel insurance and even life microinsurance products — or by using the technology to explore industry-wide solutions that use shared and near-real-time synchronized databases. These distributed relational databases are being explored to automate processes, like subrogation, and reduce costs and processing times by reducing friction and human errors.

However, while some start-ups have also ventured into the parametric insurance space like InsurETH and Fizzy on travel insurance or Etherisc with its Jamii Crop Insurance, others like Dynamis, ChainThat, Aigang or InsurePal are working on blockchain-enabled P2P risk transfer protocols that aim at disrupting the core of the insurance industry’s business model. Details of these protocols vary — type of risk, data or method used to provide trustworthiness scores and to generate risk pools, ways in which risk is carried (or not) and surplus is redistributed — but in essence they all share a similar type of framework, as depicted in Figure 5. In these frameworks, instead of a broker or carrier role, there is a tech platform that serves a “community administration” role — in a very Uber-like fashion — and where risk placement relies on multiple other blockchain-based solutions that tokenize social capital, behavior and, ultimately, risk.

**Risks and obstacles to address**

Despite all of this activity, the future of blockchain and the speed at which it progresses within the insurance industry will depend on a number of unanswered questions and issues.

First, there are matters of scale and scope. The development of the Internet provides some interesting parallels. When companies first tried to understand the Internet, intranets were built because it was impossible to conceive how everything would be connected. Similarly, the only way blockchain can be truly transformational is if it is employed at a scale, and with a depth and scope, where everyone is on board.

For that to happen though, such concepts as data self-sovereignty and the tokenization of assets — when sensitive data are replaced by nonsensitive equivalents — will require defined industry standards and safeguards. In particular, since a large part of the risk in smart contracts on distributed ledgers will reside with the information provider (oracle), there will be a need to define “safe oracles.” There is also the significant issue of the insurability of blockchains and the associated crypto ecosystem. Some elements — such as business interruption, and currency and third-party risks — will be familiar, while others around, for example, encryption, security and the value of cryptocurrency will not.
Potential next steps

In short, no one has all the answers when it comes to how blockchain will ultimately influence the insurance business — even those at the forefront of its development.

If there is one overriding piece of advice we would offer to insurers trying to define their place in a technology strategy, it would be to skim over the technicalities and concentrate on what the technology is going to solve.

In particular, the tendency in all industries, including insurance, is to focus on what is known. Applying new technologies in this way often results in a very poor prototype because current technology, say shared databases versus a blockchain, is far more developed and, consequently, superior.

Using a blockchain as a shared database only makes sense if you need data sharing or automation to reflect transactions that have multiple parties that either do not know or do not trust each other, or have a conflict of interest and they don’t want a central or third party overseeing their interactions.

Certainly, there is low-hanging fruit. Parametric and simple products can go on the blockchain. It’s a logical first approach to the technology, and it will help you to understand it. But to realize blockchain’s longer-term benefits, insurers should focus on reaching underserved markets or developing new products. It’s also worth considering where technology can complement changing the way things are currently done, which business models may become obsolete if blockchain solutions become widespread, and what are the regulatory implications and risks of blockchain-enabled insurance models.

Blockchain, in combination with AI and the IoT, could enable a future in which risks are calculated, pooled and placed automatically through smart contracts on a truly decentralized, P2P platform. The ability to access fully coded, decentralized information and place pooled risk vehicles in an also decentralized capital market moves the risk to the capital value chain.

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Current technologies make such a future possible but not plausible. There are many variables that still must be understood and worked out. For instance, underwriting without underwriters will surely be on regulators’ radar. This nascent technology makes forecasting its evolution nearly impossible. For simple risks, blockchain may become a reality sooner than we think, but for more complex risks, many challenges need to be overcome. The blockchain trail is sinuous and tricky, and insurers should work expediently to become proficient.

Insurers defining a technology strategy should skim over the technicalities and concentrate on what the technology is going to solve.