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How Blockchain Disrupts Business Model Innovation Counting on Lock-In Effects

**A conversation with Kilian Schmück
– interviewed by Christian Nielsen**

Kilian and I meet at Oliver Gassmann's office in St. Gallen at the Institute for Technology Management. Kilian, Oliver's former PhD student, focused on decentralised platform architectures. At the time of the interview, Kilian worked at Siemens to support their digital platform and data strategies. In the meantime, however, he has commenced his own start-up adventure.

The interview is opened with a short question: What is blockchain, and what does it do?

Certainly! When examining the concept of blockchain, it is beneficial to approach it from both a technical and a business standpoint.

From a technical perspective, blockchain is a distributed digital ledger technology that meticulously records and verifies transactions across a network of multiple nodes. This decentralised system systematically links blocks, which are individual records, securely through cryptographic techniques. Crucially, consensus mechanisms like proof of work or

proof of stake ensure unanimous agreement among participants regarding the legitimacy of recorded transactions, eliminating the need for a centralised authority (see also the discussion on regulation in Nielsen, 2023).

From a business standpoint, one particularly intriguing aspect arises. Implementing blockchain technologies facilitates the emergence of what is known as Web3 (Rosenstand et al., 2023), enabling the execution of digital ownership transactions throughout the network without the reliance on a central intermediary. In the previous iterations, Web1 and Web2, which were founded on the internet, only transactions of digital information could be carried out in a disintermediated and scalable manner. However, transactions involving the transfer of ownership always necessitate the involvement of a central authority. For instance, when utilising platforms like PayPal, users solely provide digital information to the platform regarding their desired transaction, while the execution itself becomes part of PayPal's accounting processes.

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Consequently, a challenging intermediary factor is present. However, this paradigm is being reshaped with the advent of Web3. Through blockchain, ownership transactions can now be decentralised and made scalable, paving the way for novel business opportunities, particularly in the realm of industrial Internet-of-things.

What is blockchain not, and what is the difference between blockchain and cryptocurrencies?

The topic of blockchain and its applications requires a nuanced understanding. It is important to note that blockchain is not a technology that should be indiscriminately implemented for all transactional processes, particularly within secure and trusted environments. For instance, when transactions occur within a company that maintains robust accounting practices and internal controls, the adoption of blockchain may be optional. In such cases, any fraudulent activity would be readily detectable and ultimately self-defeating, rendering blockchain implementation redundant. Therefore, the true value of blockchain technology lies in its ability to address trustless spaces, particularly in situations where different companies with conflicting interests are involved.

It is crucial to distinguish cryptocurrencies as just one facet of blockchain technology, specifically when the network is publicly accessible. Cryptocurrencies primarily serve as coordination tools or incentive mechanisms within the blockchain ecosystem. Unfortunately, the hype surrounding cryptocurrencies, especially during the COVID-19 pandemic, has had a detrimental effect and does not adequately encapsulate the full technological potential of blockchain. Regrettably, the largely unregulated market environment surrounding cryptocurrencies has been exploited for various fraudulent schemes. However, it is important to acknowledge legitimate representatives in the space, such as Bitcoin, Ethereum, or Polkadot. In these cases, the inherent tokens within the network serve as effective mechanisms for incentivisation or to support network governance, exemplifying the genuine value and purpose of cryptocurrencies beyond the negative connotations associated with fraud (Schmück, 2022).

What is the current development phase of blockchain, and which developments are expected in the near future?

I believe two parallel development streams are progressing concurrently in the blockchain space. Firstly, blockchain protocols have continued advancement, with a discernible process of technological refinement and a natural filtration of projects. Many blockchain protocols that gained momentum solely through hype are now facing financial challenges, while only the most serious and robust projects are persistently evolving. This selective process ensures that the focus remains on projects with genuine potential and technological merit.

Simultaneously, industrial companies are actively involved in implementing blockchain technology and preparing for the advent of Web3. They carefully examine and experiment with the most promising applications within a protected framework to optimise their potential benefits. This preparation entails considering the implications for their business models and corporate strategies as they recognise the transformative power of blockchain and the upcoming Web3 paradigm, possibly even spurred by 6G technologies (Ahokangas, 2023).

In my view, these two development streams will eventually converge. The most high-performing blockchain protocols, refined through rigorous selection, will align with the genuinely relevant industrial use cases. Particularly in the realm of B2B multi-party data sharing constellations, I anticipate a convergence where the best-performing blockchain protocols will be utilised. This convergence will pave the way for robust and secure solutions that facilitate efficient and trusted data sharing among multiple parties within the industrial landscape.

Concerning the general perception of recent developments in Blockchain, what are the apparent research gaps we need to explore further in the relationships between Blockchain and Business Model Innovation?

As I indicated above regarding potential application areas, also relevant research gaps lie in the interplay

between companies rather than covering the internal perspectives of companies. This becomes significantly pronounced when companies find themselves in a competitive situation alongside the imperative for cooperation, thus giving rise to conflicting interests. In these complex constellations, commonly called "coopetition," blockchain may have a significant and positive impact.

By harnessing the inherent properties of blockchain, such as transparency, traceability, and immutability, alongside the implementation of smart contracts, decentralised relationships can effectively address complexities and foster trust, even amid competitive dynamics. This adaptability will be advantageous in a world where de- and re-internationalisation happens often (Sort et al., 2023). Notably, there is a discernible shift away from a paradigm of pure competition towards a more collaborative model, which finds resonance within platform ecosystems operating in the B2B context. An illustrative example of this shift can be seen in the co-development of federated platform ecosystems like Catena-X. Within such ecosystems, stakeholders must internally justify their resource investments while directing efficient and targeted contributions to the partner network (see also Silvi et al., 2023). However, the intricacies surrounding contribution games in these scenarios remain largely unexplored. This is where blockchain technology holds potential value, as it can provide valuable insights for measuring and evaluating contribution efficiency, thereby facilitating effective resource allocation (Schmück, 2022).

Furthermore, the matter of decentralised platform governance emerges as a pivotal consideration. As co-opetition intensifies within platform ecosystems, decision-making processes necessitate an approach that embraces democratic principles. Here, blockchain can serve as a neutral trustee, ensuring fairness and upholding integrity in decision-making while concurrently dispersing authority (Schmück et al., 2021).

So, where does that leave you regarding the core implications for practitioners regarding where to apply blockchain?

When considering the application of blockchain technology, we can distil it into three fundamental circumstances where it holds meaningful relevance. Firstly, it is pertinent in business constellations involving cross-organization value transfers and carrying potential conflicts of interest. In such scenarios, blockchain's inherent function of providing neutral trust becomes particularly valuable.

Secondly, blockchain technology's decentralised and neutral nature finds its natural fit within platform ecosystems, especially when addressing B2B relationships. Unlike end-consumers, businesses often have a heightened need for data sovereignty, which can be achieved by implementing data usage policies and their consistent enforcement via smart contracts. These smart contracts enable predefined and automatically executed if-then relationships within the decentralised network, ensuring data integrity and enhancing participant trust.

Lastly, blockchain-supported transactions should exhibit a comparatively higher ratio of value to volume. This consideration is crucial because it is only in such cases that the additional operational complexity of decentralised platforms or networks can be justified. By aligning the value-to-volume ratio, blockchain technology can demonstrate its efficiency and viability as a cost-effective solution for facilitating secure and transparent transactions.

As such, what are the core implications related to platform economics?

We are delving into the realm of decentralised platforms, where blockchain seamlessly integrates into the core operational mechanisms of these platforms. Blockchain truly unleashes its full potential within the

decentralised network structure (see also Lingens, 2023). Consequently, platforms themselves inevitably adopt a certain level of decentralisation. Thoughtful implementation of this approach can profoundly influence the power dynamics within a platform. For instance, a central platform sponsor can no longer amass the same level of information asymmetry, a shift that greatly benefits the remaining stakeholders, particularly in the B2B context. As a result, a strong incentive emerges to dismantle data silos, as the platform fosters greater trust and collaboration. In the Industrial Internet-of-Things realm, we are witnessing a notable shift away from centralised data monopolies towards federated or decentralised multi-party data sharing. However, it is vital to underscore the significance of platform governance in this context. A fitting analogy can be drawn to the realm of politics. Just as establishing more democracy necessitates a robust constitution, the same principle holds true for platforms. The more decentralised a platform becomes, the more pivotal platform governance becomes (Schmück and Gilgen, 2021). It must strike a delicate balance, ensuring optimal platform liquidity while safeguarding maximum user data sovereignty. The governance framework plays a crucial role in upholding these dual objectives.

Concluding Remarks

In conclusion, Blockchain technology introduces trusted and distributed interdependencies within ecosystems. Consequently, it mitigates the lock-in effects experienced by users, which influenced the success of network effects as a significant value driver in various digital business model configurations. As relationships transcend from a Web2 and

platform-centric to a Web3 and user-centric perspective (see also Rosenstand et al., 2023), value mechanisms and ecosystems incorporating blockchain must account for this transformative aspect.

The challenges associated with Blockchain predominantly lie in the organisation and governance structure (cf. Foss, 2023), presenting a range of game-changing dynamics for business model innovation. In the last few decades, the internet, platforms and ecosystems disrupted incumbent and non-digital firms with digitalisation and digital business models. Now, blockchains are disrupting platform business models and ecosystem management. In this context, blockchain technologies contribute to democratising platforms and ecosystems, providing them with reach and ease of access. Dal Mas et al. (2020) identify four ways blockchains can lead to more sustainable business models (see also Ricart, 2023). First, asset tokenisation allow for participative business models where stakeholders can take part in each other's decisions. Second, transparency creates social proof and can drive consumer behaviour. Third, reduced transaction costs through disintermediation allow for the utilisation of unused resources, reducing waste. Finally, the distributed ledger allows distributed investments and profits, allowing more people to participate in a given business idea investment.

In conclusion, blockchain is not the same as cryptocurrencies. Blockchain serves as a digitally compliant trustee for cross-organization relationships that may characterised by conflict of interest. It ensures secure and reliable management of digital assets, reinforcing the notion that blockchain encompasses more than just financial transactions.

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