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Blockchain Lab - Design, Implementation and Evaluation of Innovative Business and Process Models

by

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Blockchain is considered to be enabling technology that is going beyond the Bitcoin crypto currency. It replaces centralised transaction management by the distribution of transactions across a network of nodes with different methods for consensus finding. This major change of governance may change sectors of our societies far beyond digital currencies. Fraunhofer FIT established a Blockchain Lab in 2016 in order to explore its impact. It will serve as an experience lab for technical components, implementation platforms, application prototypes and blueprints for novel governance, process, and business models.

A blockchain is essentially an electronic ledger for digital records, events or transactions maintained by the participants in a distributed computer network. This distribution of transaction management across a peer-to-peer network of interested parties plus new forms of consensus finding to preserve global consistency will allow significant changes to well-established service process and governance patterns. A blockchain may be used not only to distribute transaction management, but also to automate processes, rules and organisational principles. Using smart contracts, consistency rules may be attached to each transaction. They specify what has to be checked in a transaction and which follow-up activities have to be triggered.

This built-in automation will allow the re-engineering of many processes and the elimination of intermediaries and agencies, as long as information consistency is safeguarded by smart contracts compliant to auditing requirements. It is increasingly being used in a number of commercial and administrative fields, to distribute the management of transactions across an open network.

Blockchains also enable fundamental organisational changes in governance, so they may be characterised as a disruptive innovation that breaks up established business models. For instance, a blockchain might be used to maintain estate property records in a peer-to-peer network eliminating institutional overhead. Generally speaking, several different classes of use-cases have been identified, conceivably triggering novel service processes and governance. Providing, auditing and preserving provenance information is, for instance, an important service today that is vital for a broad range of industries.

Thus, blockchain technology may have many different effects not just on the processes but also on the structures of governance, which may significantly change the distribution of tasks among the actors involved in a process. The new roles and governance changes directly raises the question of new business models for the new value chain established by re-engineering the process.

As a consequence, the different dimensions of blockchain technology require a multi-disciplinary approach to exploit the potential capabilities of distributed transaction management combined with novel consensus methods. This will be implemented in the Blockchain Lab established at Fraunhofer

FIT in 2016. It will serve as an experience lab for technical components, implementation platforms, application prototypes as well as blueprints for novel governance and business models. It is a multi-disciplinary unit rooted in three of FIT's research departments: Cooperation Systems for consensus methods, Decision Support for new governance and business models, and Information Systems for innovative applications. We will also look at the legal aspects of blockchain applications. Our aim is to showcase the state of the art in this fledgling research area using practical, integrative applications.

The work of the Blockchain Lab will be based on three cornerstones: business model, technology and legal / regulatory environment (see Figure 1). Business models will be developed together with individual partners or industry groups, focusing on potential analysis, evaluation and the design of disruptive solutions. Technology will focus on providing a development platform that includes different blockchain systems (P2P network, validation server etc.), implementation of blockchain solutions and evaluation of blockchain concepts. The relevant legal aspects and regulations are taken into account in our evaluation of business models and blockchain systems.

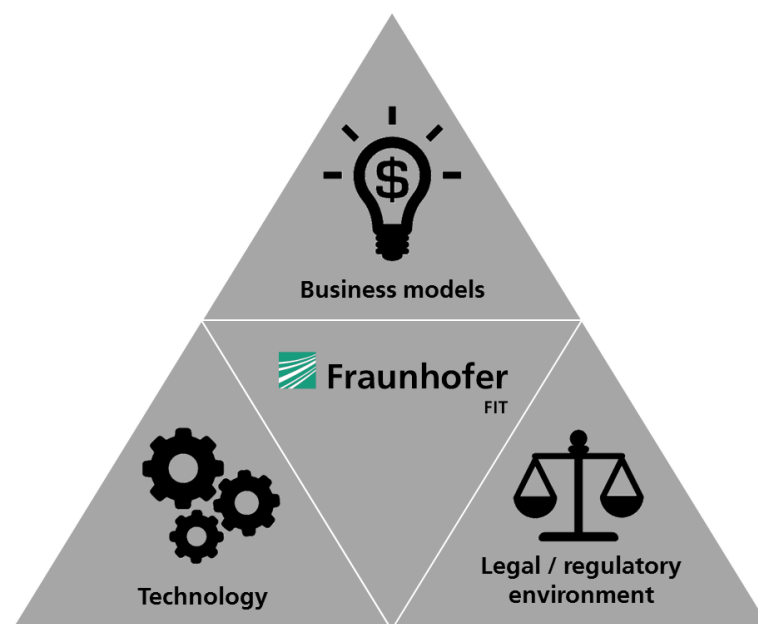


Figure 1: The multi-disciplinary approach of the Blockchain Lab.

We will focus on short development cycles, which are quick to implement, in close cooperation with our development partners. We aim to develop functional applications quickly and to build marketable products through iterative improvements. To build these bespoke systems we will organise workshops, bring together consortia of industrial partners and conduct R&D projects covering all necessary development steps.

References:

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Link:

<https://www.fit.fraunhofer.de/de/fb/csw/blockchain.html>

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