Blockchain Technology and Software Engineering for Blockchain

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Blockchain technologies and cryptocurrencies, such as Bitcoin, Litecoin, and Ethereum, have attracted significant attention in recent years. The Blockchain is a decentralized ledger, shared with a peer-to-peer mechanism with no central authority, which can hold any information and can set rules on how this information is updated. The addition of new information (transactions) to the Blockchain is made by the nodes of a network through various possible consensus mechanisms.

Despite such a huge growth of interests and enthusiasm around this new technology, for what concerns software development, the scenario is that of a sort of competition where development runs on a first-come-first- served basis, which does not assure neither software quality, nor that all the basic Software Engineering concepts are taken into account providing sometimes poor products in terms of maintainability, code quality, testing, security, reliability.

Specific design notations, macro architecture patterns, or meta-models may be defined for Blockchain Oriented Software development. To this purpose, software engineers should define criteria for selecting the most appropriate blockchain implementation, evaluating the adoption of sidechain technology, or the implementation of an ad-hoc blockchain. Blockchain-oriented systems may require specialised graphic models for representation. More specifically, existing models might also be adapted to Blockchain Oriented Software development. UML diagrams and design patterns might be modified or even created anew to account for the Blockchain Oriented Software development specificities.

References to recent work

Nakamoto, S., 2008. Bitcoin: A peer-to-peer electronic cash system.

Popov, S., 2016. The tangle. *IOTA*.

Buterin, V., 2014. Ethereum: A next-generation smart contract and decentralized application platform. *URL https://github. com/ethereum/wiki/wiki/% 5BEnglish% 5D-White-Paper*.