

**MASTER'S THESIS** Using Blockchain Techniques to Create an Opinion-Based Whitelisting Procedure

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# Using Blockchain Techniques to Create an Opinion-Based Whitelisting Procedure

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POPULAR SCIENCE PAPER **David Johansson and Simon Alm Nilsson**

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Ever downloaded a program and wondered if it was safe to run? Can blockchains, the technology behind Bitcoin, be useful in an application for collectively voting on and whitelisting software? This thesis builds one such application and evaluates the limitations and scalability of the blockchain technology.

How do you know if a program you just downloaded is safe to run, or if it is a virus? Perhaps you use your gut feeling, an anti-virus software, or a tech-savvy relative? In all of those cases you blindly trust one single party. If the judgment of said party is off, you might end up running a virus on your computer. This Master's Thesis investigates how *blockchains* can be used to allow multiple people to electronically vote on whether a certain program is good or bad. Furthermore, the thesis assumes there are ill-advised and villainous users swaying the opinion on software in the wrong direction — both upvoting viruses and downvoting harmless programs.

Think of a blockchain as a sturdy chain with information. It is impossible to remove a link once it has been attached to the chain. You can easily point to a link and everyone else is able to verify that it is indeed in the chain. By utilizing this property and storing votes on the chain, a blockchain with verifiable votes was created.

Blockchain is one of many technologies with the purpose of storing data, so-called *databases*. Blockchain is a new technology with many interesting properties. It is still not clear where

blockchains should be used, and the judgement of many is clouded by the recentness of the technology. A comparison to databases was made with regards to properties such as; performance, security, and cost. Blockchains have interesting properties, but often scale negatively with the amount of users or have substantial delay. The thesis includes a table which shows how blockchains and databases scale, as well as a decision tree. This can be used to help developers decide on whether blockchain is a good fit for their application or not.

The proof of concept would be able to handle up to a third of the users acting in a malicious way before they would be able to sway the opinion in the wrong direction. However, it would not support more than a hundred users. If users would be willing to fully trust a single individual or organization, a program using a more traditional database would be able to have millions of users instead.