


Chapter 57

Scientific Paper Peer–Reviewing System With Blockchain, IPFS, and Smart Contract

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ABSTRACT

In general, peer reviewing is known as an inspection of a work that is completed by one or more qualified people from the same profession and from the relevant field to make the work more error-free, readable, presentable, and adjustable according to the pre-published requirements and also considered as the primary metric for publishing a research paper, accepting research grants, or selecting award nominees. However, many recent publications are pointing to the biasness and mistreatment in the peer-review process. Thus, the scientific community is involved to generate ideas to advance the reviewing process including standardizing procedures and protocols, blind and electronic reviewing, rigorous methods in reviewer selection, rewarding reviewers, providing detailed feedback or checklist to reviewers, etc. In this chapter, the authors propose a decentralized and anonymous scientific peer-reviewing system using blockchain technology. This system will integrate all the above concern issues and eliminate the bias or trust issues interconnected with the peer-reviewing process.

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INTRODUCTION

In general sense, peer-reviewing is known as an inspection of a work that is completed by one or more qualified people from the same profession and from the relevant field to make the work more error free, readable, presentable and adjustable according to the pre published requirements. Peer-reviewing is considered as the primary metric for publishing a research paper, accepting research grants, or selecting award nominees. However, many recent publications are pointing question to the biasness and abuse in peer-review process including author conflictions, authors from less prestigious institution, awarding women author, negative studies, idea stealing etc. Thus, scientific community is involved to generate ideas to advance the reviewing process (despite abandoning it) including standardizing procedures and protocols, blind and electronic reviewing, rigorous methods in reviewer selection, rewarding reviewers, providing detailed feedback or checklist to reviewers, and etc. In this chapter, we are proposing a decentralized and anonymous scientific peer-reviewing system using Blockchain technology with modified cryptocurrency (as reputation points) method. The system will integrate all the above concern issues, and able to eliminate the bias or trust issues interconnected with peer-reviewing process using decentralized authorities or without intermediaries, but improve reliability, transparency, and streamlining in the entire process. Publishing a research paper takes several steps from start to finish. Peer-reviewing process is one such step where a proposed article or work is evaluated or scrutinized by other experts in the matching subject to ensure quality of research contribution and to increase credibility. Experts play an important role in this process and help to validate a research, evaluate the method, establish the strengths and weaknesses and finally provide a reasonable judgment to publication. However, many recent publications are pointing question towards the biasness and abuse in peer-reviewing process including authors conflicts of interests, authors from less prestigious institution, awarding women author, negative studies, idea stealing etc. As a consequence, peer-reviewing is very successful in many instances however it also has few fail instances. Abandoning peer-reviewing may cause unreliability and less navigability in scientific article publication, and thus scientific community is involved to generate ideas to improve the reviewing process despite abandoning it. In this chapter, we will inspect different peer reviewing processes, applications, technological advancements, and drawbacks or challenges in existing peer reviewing system. Thereafter, we will propose an innovative decentralized and anonymous scientific peer-reviewing system using Blockchain, IPFS, cryptocurrency and smart contact technology.

EXISTING PEER REVIEWING SYSTEM, DRAWBACKS AND CHALLENGES

It is assumed that the first peer- reviewing process was archived in a book named “Ethics of the Physician”, written by a Syrian physician, Ishap bin Ali Al Rahwi (CE 854–931). Back then, other physicians used peer-reviewing on a given prescription to the patients to see if they are being treated according to the standards (Spier, 2002) or not. The idea of peer-reviewing was started from here. Later, many media, and literature societies started practicing the peer-reviewing system for their own development and improvement of knowledge. The societies submitted their works to the committee where the committee reviewed papers, accepted or recommended for any changes (kronick, 1990). In 1731, the Royal Society of Edinburgh instigated the peer-review system in Scholarly publication with a bunch of peer-reviewed medical papers. But the publication of articles was decided almost 100 years later after (Shema, 2014). In 1831, William Whewell of royal society of London proposed the *Proceeding of the Royal Society* where

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