

Blockchain Technology and Applications

Tutorial Abstract

Leo van Moergestel and Ander de Keijzer

HU University of Applied Sciences, Utrecht, Netherlands

leo.vanmoergestel@hu.nl, ander.dekeijzer@hu.nl

Abstract. A blockchain is a public ledger to which everyone has access but without a central authority having control. It is an enabling technology for individuals and companies to collaborate with trust and transparency. One of the best known applications of blockchains are the cryptographic currencies such as Bitcoin and others, but many other applications are possible. Blockchain technology is considered to be the driving force of the next fundamental revolution in information technology. Many implementations of blockchain technology are widely available today, each having its particular strength for a specific application domain. The tutorial provides the participants with insights and practical experience on Blockchain technology and applications in practice, as well as theory based exploration of possible business cases.

Keywords: Blockchain, Bitcoin, Cryptographic currency, Blockchain applications

1 Introduction

A blockchain is a public ledger to which everyone has access but without a central authority having control. It is an enabling technology for individuals and companies to collaborate with trust and transparency. One of the best known applications of blockchains are the cryptographic currencies such as Bitcoin and others, but many other applications are possible. Blockchain technology is considered to be the driving force of the next fundamental revolution in information technology. Many implementations of blockchain technology are widely available today, each having its particular strength for a specific application domain.

The tutorial provides the participants with insights and practical experience on Blockchain technology and applications in practice, as well as theory based exploration of possible business cases.

2 Theme and Topics

The target audience will be students and researchers interested in Blockchains, the underlying concepts and technologies, its impact on business models and possibilities for

process improvement, as well as practitioners aiming to learn theory and practice on Blockchains.

The tutorial is self-contained and derived from a winter school/summer school organized by HU University of Applied Sciences Utrecht

The tutorial will cover the following topics:

- Introduction to blockchains: what is a blockchain, what cryptographic technologies are used, why does it work?
- Digital currency: how are blockchains used as the backbone technology for digital currencies like Bitcoin?
- Smart contracts: what is a smart contract, how can it be used?
- Ethereum and solidity: a short introduction to Ethereum and its programming language solidity.
- Discussion: wrap-up and discussion about the topics presented.

3 Related Courses

The material presented in this tutorial is also taught in a 5 day track at our Winter and Summer schools. One may refer to <https://www.utrechtsummerschool.nl/courses/business/blockchains-theory-and-practice> for a more detailed information. The tutorial contains information presented during these 5 days, but is of course much more limited in detail.