Computing and Information Technology
2022

Universitatea
Politehnica
Timișoara

Walman
A Virtual Wallet Management System

Candidate: David Daniel, Pava
Coordinator: Assoc. Prof. Razvan, Bogdan

Universitatea Politehnica Timișoara

ABSTRACT

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1 INTRODUCTION

1.1 CONTEXT

In the last 30 years, the number of tasks that are digitalized has increased exponentially. The most important part of the security systems of these tasks is user management and authentication. The password is the most widely spread form of user authentication and thus is often the prime target of attackers that want to impersonate someone else.

According to [2], a *"systematic literature review in the area of passwords and passwords security"*, there are many problems with password security and management ranging from weak passwords and password reuse, to users writing down passwords or sending them through unsecure channels. Most of these problems according to [2] are solved by using password recommendations. A good solution to most of these problems is a password management tool. A password manager is a piece of software designed for generating and managing passwords, in this way the user can have unique, complex and safely stored password without having to remember them.

Another area that has seen a considerable development recently is the cryptocurrency market. As of May 2022, the market cap of Bitcoin is around 565 billion USD, and the market cap of Ethereum is around 214 billion USD. In the case of Bitcoin, that is more than double of what it was in 2019 (around 211 billion USD), referenced in [1].

1.2 MOTIVATION

1.3 SIMILAR PRODUCTS AVAILABLE ON THE MARKET

2 FEATURES

2.1 USE CASES

2.2 PASSWORD MANAGEMENT

2.3 QR AND BARCODE MANAGEMENT

2.4 OTP AUTHENTICATOR

2.4.1 The HOTP algorithm

2.4.2 The TOTP algorithm

2.5 CRYPTOCURRENCY WALLET

2.6 BACKUP

2.6.1 Cloud Backup

2.6.2 Blockchain Backup

3 TECHNOLOGY STACK

3.1 FRONTEND

3.1.1 Dart

3.1.2 Flutter

3.2 FIREBASE

3.2.1 User Management

3.2.2 Firestore

3.3 BLOCKCHAIN

3.3.1 Ethereum

3.3.2 Smart Contracts

3.3.3 Solidity

3.4 DEVELOPMENT ENVIRONMENT

4 IMPLEMENTATION

4.1 SYSTEM ARCHITECTURE

4.2 REDUX

4.3 PASSWORD MANAGEMENT

4.4 QR AND BARCODE MANAGEMENT

4.5 OTP TOKEN MANAGEMENT

4.6 CRYPTOCURRENCY WALLET

4.7 BACKUP

4.7.1 Cloud Backup

4.7.2 Blockchain Backup

4.8 SECURITY

5 TESTS

5.1 TEST PIPELINE

5.2 UNIT TESTS

5.3 WIDGET TESTS

5.4 PERFORMANCE STATISTICS

6 CONCLUSIONS

6.1 POSSIBLE IMPROVEMENTS

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