



AL-AZHAR UNIVERSITY  
FACULTY OF ENGINEERING  
COMPUTERS & SYSTEMS ENGINEERING  
DEPARTMENT

## Devault:

*A Blockchain-based, self-hosted, and end-to-end encrypted cloud storage.*

A PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE  
REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE  
IN SYSTEMS AND COMPUTERS ENGINEERING

*Submitted by:*

**Abd El-Twab M. Fakhry** 504055

**Hossam A. Eissa** 504042

*Supervised by:*

**Dr. Abdurrahman Nasr**

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# Letter of Approval

The undersigned certify that they have read, and recommended to the Faculty of Engineering for acceptance, a project entitled “Devault: A Blockchain-based, self-hosted, and end-to-end encrypted cloud storage” submitted by **Abd El-Twab M. Fakhry** and **Hossam A. Eissa** in partial fulfillment of the requirements for the degree of Bachelor of Science in Systems and Computers Engineering.

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Examiner Committee President:

Dr. Abdurrahman Nasr

SYSTEMS & COMPUTERS ENGINEERING DEPARTMENT

---

Project Supervisor:

Dr. Abdurrahman Nasr

SYSTEMS & COMPUTERS ENGINEERING  
DEPARTMENT

---

Examiner Member:

Dr. Abdurrahman Nasr

SYSTEMS & COMPUTERS ENGINEERING  
DEPARTMENT

*Date of Approval:*

# Statement of Originality

This statement is to certify that to the best of our knowledge, the content of this thesis is our work. This thesis has not been submitted for any degree or other purposes.

We certify that the intellectual content of this thesis is the product of our work and that all the assistance received in preparing this thesis and sources has been acknowledged.

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*Abd El-Twab M. Fakhry*  
*Hossam A. Eissa*

July 19, 2022

To the person who helped...

# Acknowledgements

In successfully completing this project, many people have helped me. I would like to thank all those who are related to this project.

Primarily, thanks to ALLAH (s.w.t), the Greatest, the Most Merciful, and the Most Gracious, Whose countless blessings bestowed upon me were kind, talented, and wise teachers, who provided me with sufficient opportunities and enlighten me towards this project.

I would like to express my deepest and most sincere gratitude to my family for everything they have done for me and all the love they gave to me. My mother, father, sisters, and brother. No words can express my love for them.

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Last but not least, I would like to thank my friends, specially Al-Azhar ICPC Community (AIC) committee, who have helped me with their valuable suggestions and guidance and have been very helpful in various stages of project completion.

Thank You.

# Abstract

The abstract should identify clearly and succinctly the purpose of the project, the methods used, the results obtained and the significance of the results or findings. The abstract must not exceed 300 words. Abstract section gives readers a brief idea about your project, which briefly presents your problem statement and how you can solve it. paragraph. Leave tab with 4 spaces when you start.

KEYWORDS: *Blockchain; Cryptography; Cloud Computing; Peer-to-Peer; DApps.*

# Contents

Letter of Approval	i
Statement of Originality	ii
Acknowledgements	iv
Abstract	v
<b>1 Introduction</b>	<b>1</b>
1.1 Background and Motivation . . . . .	1
1.2 My Dream . . . . .	1
<b>2 Literature Review</b>	<b>2</b>
2.1 Proof . . . . .	2
<b>3 Methodology</b>	<b>3</b>
3.1 IPFS gateway . . . . .	3
<b>4 System Development Methodology</b>	<b>4</b>
<b>5 Result and Analysis</b>	<b>5</b>
<b>6 Future Work</b>	<b>6</b>
<b>7 Limitations</b>	<b>7</b>
 <b>Appendix</b>	 <b>9</b>
<b>Glossary</b>	<b>9</b>
<b>Lists</b>	<b>10</b>
List of Figures . . . . .	10
List of Tables . . . . .	11
<b>References</b>	<b>12</b>



# Chapter 1

## Introduction

### 1.1 Background and Motivation

In this section, you should describe the problem that you set out to solve with the project. An introduction might, for example, begin by stating, "The aim of the work described in the Report was to provide a software tool with which people can arrange meetings." Avoid starting a Report with an irrelevant history of information technology.

Explain whatever background the reader will need in order to understand the problem. The background might refer to previous work in the academic literature that provides evidence that the problem is a real and significant problem worth solving. Include a clear and detailed statement of the project aims and provide an overview of the structure of the solution. Please note that the GP2 report (492) should have more literature material than the GP1 (491).

Conventionally, the last part of the introduction outlines the remainder of the Report, explaining what comes in each section. Your report should be organized as follow:

### 1.2 My Dream

I once had a dream, I was doing big brain stuff in that dream [4].

# Chapter 2

## Literature Review

### 2.1 Proof

See below for irrefutable proof, extreme care and rigour has been shown in this proof by Ethereum Virtual Machine (EVM).

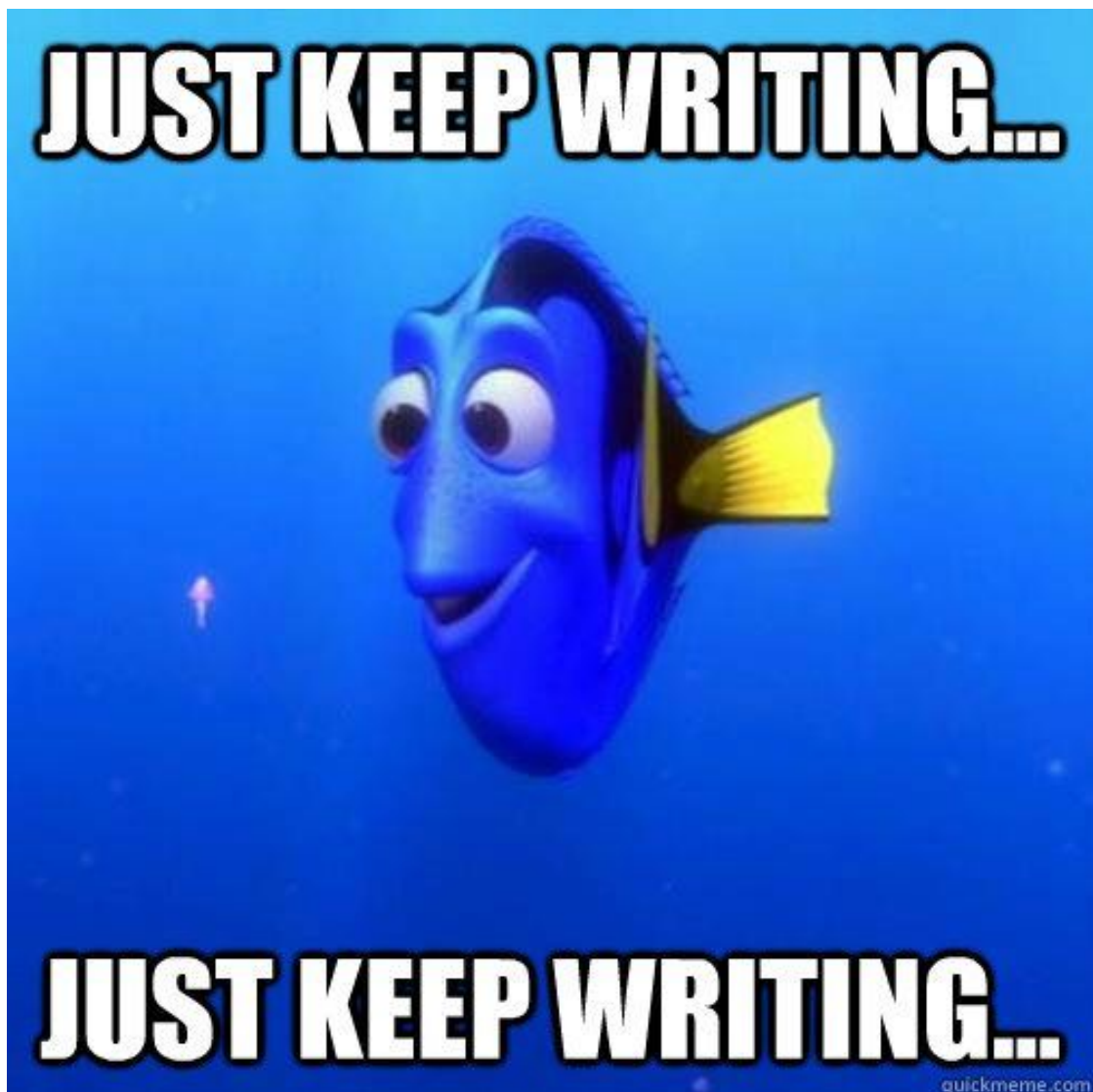


Figure 2.1: Clear proof of theorem.

As stated in the Decentralized Application (DAPP) theorem, I'm right.

# Chapter 3

## Methodology

### 3.1 IPFS gateway

IPFS deployment seeks to include native support of IPFS in all popular browsers and tools. Gateways provide workarounds for applications that do not yet support IPFS natively. For example, errors occur when a browser that does not support IPFS attempts access to IPFS content in the canonical form of `ipfs://CID/optional path to resource`. Other tools that rely solely on HTTP encounter similar errors in accessing IPFS content in canonical form, such as Curl (opens new window) and Wget (opens new window).

Tools like IPFS Companion (opens new window) resolve these content access errors. However, not every user has permission to alter — or be capable of altering — their computer configuration. IPFS gateways provide an HTTP-based service that allows IPFS-ignorant browsers and tools to access IPFS content.

Decentralized Application Ethereum Virtual Machine (EVM) Smart Contract (SC) Transaction

Bitcoin Cryptocurrency Blockchains

# Chapter 4

## System Development Methodology

# Chapter 5

## Result and Analysis

# Chapter 6

## Future Work

# Chapter 7

## Limitations

genesis consensus blockchain nonce

# Appendix



# Glossary

## Acronyms

<b>AIC</b>	Al-Azhar ICPC Community
<b>DAPP</b>	Decentralized Application
<b>EVM</b>	Ethereum Virtual Machine
<b>SC</b>	Smart Contract
<b>TX</b>	Transaction

## Terminology

<b>bitcoin</b>	A cryptocurrency that uses a blockchain network to regulate the generation of coins/tokens and transfer of funds. Bitcoin is the most widely used cryptocurrency and is the most widely traded currency in the world.
<b>blockchain</b>	A blockchain is a distributed database that is shared among the nodes of a computer network. As a database, a blockchain stores information electronically in digital format.
<b>consensus</b>	The process used by a group of peers, or nodes, on a blockchain network to agree on the validity of transactions submitted to the network. Dominant consensus mechanisms are Proof of Work (PoW) and Proof of Stake (PoS).
<b>cryptocurrency</b>	Digital money which uses encryption and consensus algorithms to regulate the generation of coins/tokens and transfer of funds. Cryptocurrencies are generally decentralized, operating independently of central authorities.
<b>genesis</b>	The first block in a blockchain network.

**nonce**

A nonce is an abbreviation for “number only used once,” which, in the context of cryptocurrency mining, is a number added to a hashed—or encrypted—block in a blockchain that, when rehashed, meets the difficulty level restrictions. The nonce is the number that blockchain miners are solving for. When the solution is found, the blockchain miners are offered cryptocurrency in exchange.

# List of Figures

2.1	Clear proof of theorem. . . . .	2
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# List of Tables

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