# ABSTRACT

# INTRODUCTION

## PURPOSE

Our project Truth, is a news verification system. It focuses on the integrity of the voting of news articles with Blockchain technology. Verified news articles are added to a database and then displayed under verified articles, while false articles are discarded. A user builds credibility by verifying articles.

## SCOPE

Truth consist of a web service, a mobile application and a website working in unison. The mobile application and website communicates with the web service to access data on the database and the blockchain. The mobile application only display the verified articles. The website registers new clients, displays articles and gives the users the opportunity to verify the article by giving it a rating out of four. The admin of the page are the only users who can add new articles. All of the components are hosted on an EC2 instance. Our project is designed for an audience with little technical knowledge.

# BACKGROUND

# SOFTWARE SPECIFICATION AND IMPLEMENTATION

## MOBILE APPLICATION

Our mobile application is written in Java through Android Studio. The application does not allow registration or login. These features are available on the website only. The application does however display verified articles.

## 4.2 WEBSITE

The website is written in HTML and makes use of JavaScript to call php functions and so on, and CSS. The website has two sections: the general users’ section and the admin section. The general user can read and then validate the articles by placing a vote with values ranging from 0(Absolutely False) to 4(Very True) on the desired article. The admin is the only user with the ability to add new articles. The articles are added to the database in a certain format such as Author, Title, Description and Article. The votes associated with the article, are added to the blockchain so the votes aren’t tampered or changed.

## WEBSERVICE

The webservice is written in PHP and makes use of JSON output for certain values obtained from the (MySQL)database. The webservice handles all communication (requests and posts), from:

* The website to the database,
* The website to the blockchain and
* The mobile application to the database.

## CLOUD

Our project is on Amazon’s Webservice (AWS) on an EC2 instance. The EC2 hosts an Ubuntu server. All of our files are added to the EC2’s localhost directory(/var/www/html/) to load the files from a remote computer via a web browser. Our main blockchain chain is also hosted on the EC2. The instance is loaded with a LAMP stack and multichain software. There are special security groups formed for this instance as well as Elastic IP’s.

## 4.3 BLOCKCHAIN

We used Multichain as our Blockchain creator. Multichain is a very flexible tool, allowing developers to create their own chain with streams and assets. Multichain also offers the feature to mine and customize the chain’s parameters to suit your needs.

# TECHNICAL DETAILS

## TECHNOLOGIES USED

We have used AWS’s EC2, PHP, HTML, Javascript, Java, CSS and Multichain. The group had prior experience of HTML and Java but had to learn the rest of the languages.

## PROBLEMS FACED

The multichain software has little online support and tutorials, leaving us with many problems and questions that we had to answer ourselves. This took a lot of our time. Another time consuming task was the fact that we had to learn a lot of new programming languages to create our project. We also struggled with the connection of the chains through the AWS instance that we have created. Another problem was the creation of the web service, it was difficult and all the online tutorials was rather complicated to understand. Sometimes the group experienced problems with communication, and struggled to reach each other for a progress report.

# LESSONS LEARNED

## IMPORTANCE OF EFFECTIVE TIME MANAGEMENT

During the project, we constantly struggled with time management. The time assigned to each task was not enough, so the phases overlapped each other.

## TEAM WORK

When the whole team is not working effectively, the phases are not met in time. The project is a project with a very steep learning curve, making it impossible for only one person. The work has to be divided in manageable pieces for each member. The work breakdown structure has changed through the project and each member adjusted quickly with the new sections assigned to them. The team spirit was positive for most of the project, creating a peaceful, respectful environment for all.

## FAILING FAST

During the project we continuously struggled to fail fast, in other words we kept on struggling with the same problems. This will have to improve to be able to complete future projects more successfully.

# BUSINESS CASE

## EXECUTIVE SUMMARY

## OBJECTIVES OVERVIEW

## MARKET ANALYSIS

## ASSESMENT OF BENEFITS

This project could increase the reputation of any news providing business, because people will know that the news provided, are valid. The journalists still writes the articles and the community will verify it. A high reputation will lead to more online views and higher profits. It will also set the standard very high for every other news reporting businesses, because the technology used in this project is an absolute must-have in the world where false news are increasing daily. The following section will discuss the possible options and give a recommended option.

## OPTION ANALYSIS WITH THE RECOMMENDED OPTION

There are multiple options when it comes to news reporting. In this section we will look at two options and suggest the best option, according to us.

Option one: The news are stored in a database and displayed in a website without the use of a blockchain. The disadvantage is that the users have no way to verify the news.

The second option entails using Blockchain: News could be verified through the use of the community votes and then the validated articles could be printed or posted online. This blockchain technology is still fairly new and not many businesses have this technology yet, giving you the opportunity to stand out. This is a very secure way to do the verification. The users would require little additional training, if any at all.

In our opinion, the best option is to choose option two, even if option one do not have many disadvantages. The security is better.

## KEY DEPENDENCIES AND ASSUMPTIONS

## RISK AND SENSITIVITY ANALYSIS

* Political,
* Operational
* Economic / Financial and
* Technical

## RESOURCE REQUIREMENTS AND COSTS

# RECOMMENDATION FOR FURTHER RESEARCH

The Truth project has tremendous potential that can still be developed and refined. Our project covered only a small amount of possible opportunities when it comes to Blockchain. Truth only validates the votes associated with the article validation. Further studies could possibly be based on adding articles to the blockchain, along with the votes and login information of the users. Due to the limited resources and no prior experience with blockchain, the project had a small scope, which could be broaden with additional knowledge and training on Blockchain.

Things that could have been done with extra resources:

* Validation for voting. Making sure a user doesn’t sabotage the verification process, an example would be like voting false on every article.
* Users can have a reputation. Each user has a reputation which comes with a certain weight. Other users can vote for that users reputation, giving them a heavier weight in the voting system.
* Groups can be formed to improve security and certainty of the validation of each article. Groups would obviously carry a larger weight in the voting system.
* Blockchain can be used to secure the system and make it virtually impenetrable. Because it is a distributed database it cant be hacked from, lets say 50 locations.

# CONCLUSION

# BIBLIOGRAPHY

# APPENDICES

## APPENDIX A: TEAM INFORMATION AND WORK BREAKDOWN STRUCTURE

* the work-breakdown structure of the entire project through every phase.
* a section dedicated to how your group used *git* and *slack* to facilitate group development. How did it work for you? What were the benefits/challenges? Should it be a requirement next year? What tools/technologies would you like to see used in this module. Discuss and give feedback.
* a section dedicated to self-review:
  + what did your group learn in this development project (technical and non-technical)?
  + what development methodology did you use (if any), how effective was it. Would you choose a different approach if you could re-do the project?
  + how did the experience affect the way you'll approach development projects in future?
* a section evaluating your own product:
  + What are its best characteristics?
  + Given more time, what would you improve?
  + How effective is it in solving the problem you identified initially?

## APPENDIX B: USER MANUAL