CCT College Dublin

Assessment Cover Page

Module Title:	Distributed Digital Transactions
Assessment Type:	Group
Assessment Title:	CA Project
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Assessment Due Date:	4 / Dec / 2022
Date of Submission:	4 / Dec / 2022
Google Drive Video Link:	https://drive.google.com/file/d/1vN_WH6wK6neZ3KcuBIRiUUMoYGul1jt6/view?usp=share_link
GitHub Depository	https://github.com/XIAOHUI-WENG2020/DDT-GroupCA.git

Declaration

Motivation

In recent years, becoming an app driver has been associated with more than only avoiding unemployment. It has also been associated with getting involved in an activity you like or trying to escape the traditional work system and being your own boss. For example, professionals worldwide are looking for opportunities to create their own schedules. This is a dream for many, and they can now adjust their routine to suit their preferences or give priority to times when they can have the most number of consumers. Some people are only interested in making extra income, which is the best way since all they need to get started is their vehicle.

Supposing that taxi apps and Uber stop operating in the city, as indicated in the project description, drivers can quickly deliver vehicles to passengers when needed because of the blockchain's openness and trustworthiness. The on-demand transportation sector will be transformed by blockchain technology, which is getting more and more recognition in the industry.

Uber and other taxi app services do not technically provide lift-sharing services. Instead, they streamline the booking and payment for the services, which has broadened the definition of a cab in general. On the other hand, blockchain can enable true direct communication between users and drivers, in real-time, without needing a mediator to coordinate trip plans, prices, available seats, etc.

Blockchain benefits:

Professional growth:
This where we can consider that a good App driver could be recognized and then like this this driver could make loyal customers to do long distance trips.

Make your own schedule:
Making your own schedule is something amazing, a dream, more and more professionals around the have been looking for it for so long, now they are able to adapt their routine to their service region and then giving preference to the highest volume of customers.

Extra income:

For those that are interested to do extra income this is for sure the best way, because all that you need to have is your own car to start.

Secure trips & payments:

All technology implemented on this project to the trips and transactions will be based on blockchain technology smart contracts.

Blockchain Limitations:

Complexity:

We know that Blockchain technology involves a whole new vocabulary. It has made cryptography more popular, but there is specialized industry full of jargon, at the same time there are several efforts to provide glossaries and indexes that are complete and easy to understand.

Net size:

If a blockchain is not a robust network with a widely distributed grid of nodes, it will be harder to get the full benefit. There is some discussion and debate as to whether this is a fatal flaw for some allowed blockchain projects.

Transaction cost, Network speed:

Bitcoin currently has a notable transaction cost after so long being introduced to the market 'almost free' for the first years. As of late, it can only process about 7 transactions per second. There is also the politically charged aspect of using the bitcoin blockchain, not for transactions, but as an information repository. This is the "bloat" issue and is often frowned upon because it forces miners to perpetually reprocess and re-record information.

Human error:

If we use a blockchain as a database, the information that we are going to store in this database needs to be high quality. Data stored on a blockchain is not inherently reliable, so events need to be accurately recorded in the first place.

Inevitable security failure:

Although we know that Blockchain have a lot of security procedures, it's important to remember that most of the transactions made on Blockchain have endpoints that are far

less security, we can bring this example, the result of bitcoin trading or investment may be a large sum of bitcoin deposited in a wallet. These wallet accounts may not be as hacker-proof as the actual blocks within the blockchain.
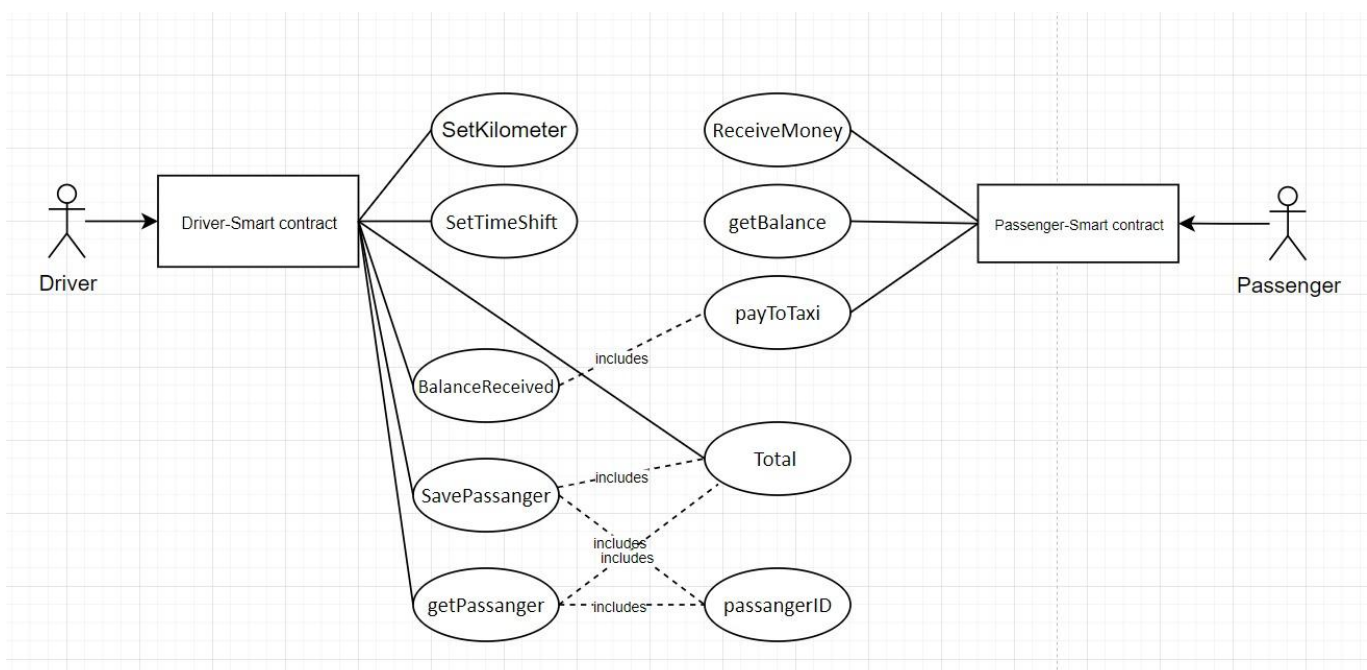
Plan

As a team, we designed through the ClickUp platform the following tasks and steps to which each of the team members contributed:

- 1. Set up click up add group members
- 2.Check or have a look on the study case(and find more case, bring up ideas)
- 3. UML(before coding)
- 4. Coding
- 5. Each member 150-200 words
- 6. Recording a video
- 7. Google docs
- 8. after all have submitted, change git repository to public

Design

The design of this project has actors, the driver who will provide the service and the passenger who requires the service. Both actors will have connections with their respective Smart Contracts that will have attributes to provide a quality service for both parties, represented in the following Use Case Diagram:

Develop & implement

Driver and passenger smart contracts:
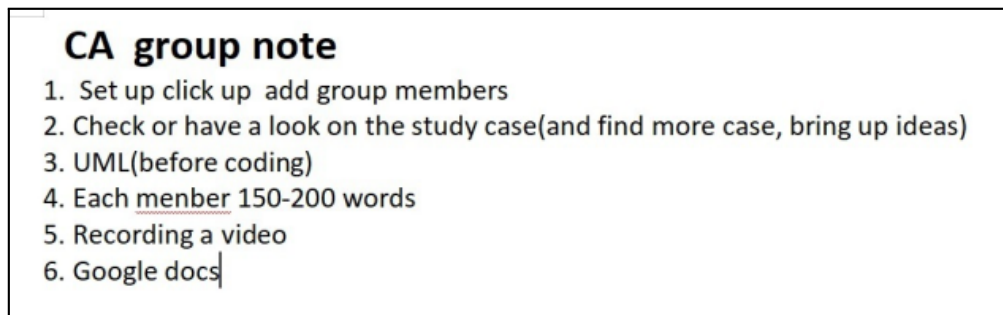

MetaMask accounts:

Truffle Ganache accounts:

Individual contributions

1. Xiaohui Weng 2020387:

As a team leader, it is my responsibility to help our team members participate and get the job done. In the first stage, we set up a basic scope to build the CA project. (Details below)

CA group note
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5. Recording a video
6. Google docs

First of all I created a WhatsApp group to better communicate with each other. Next, create a to-do list (using "clickUp",click the link to check out more) to make sure we finish our project on time.
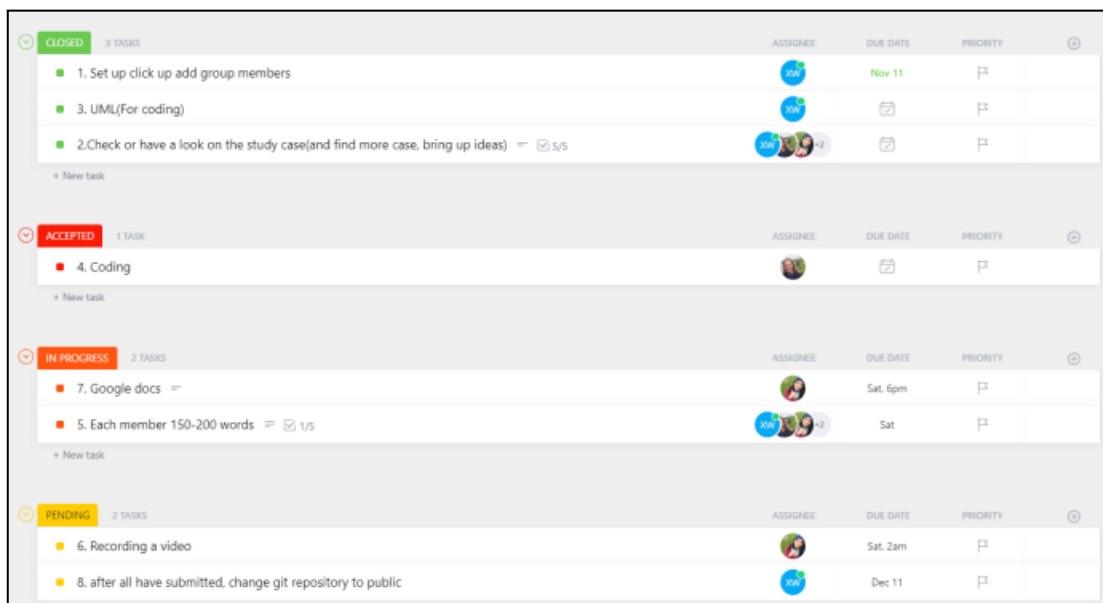
Next, set up the Github repository which helps us to collaborate while we are coding. After discussing the project idea, I helped another teammate edit and simplify the code. Finally, I created the UML diagram that represents the view of the smart contract.

Last but not least, I'm happy to work with all our wonderful teammates, we all participate in the project and we support each other. As an individual member, I'm learning a little better about managing the time of a team project, reminding the member of all our tasks in case something is forgotten, and I've learned how to strategize and track progress toward goals.

2. Leisly Pino 2020303:

In this project, I had the privilege of working with an incredible team. Each one of the members contributed knowledge and skills to be able to carry out this work on time and comply with each of the established delivery guidelines. My main task in this project was to make the presentation and the video where our code was explained and demonstrated.

The presentation shows a summary of our written work, where the motivation, benefits and limitations faced by implementing Blockchain technology in the transport industry are mentioned. Our plan that we followed and our Use Case Diagram is mentioned. In the video, the code of each contract is shown, and I explain each of the functions in the GitHub repository, demonstrating in Remix and Ganache the interaction of the blocks created in each transaction that the account makes and checking the balance of the account in MetaMask.

The presentation is on the link: 📄 GroupProject_2020303.pdf

3. Thiago Santos 2020327:

After brainstorming and dividing the tasks to be done with my teammates, my main responsibility was to be in charge of working on the motivation that people, who offer their vehicle for-hire services through the use of applications provided by third parties, would have to start using the blockchain technology.

I carried out a research on how the vehicle for-hire transport sector currently works and how the dissemination of the blockchain technology can change this market, both for drivers and passengers. This study helped us to better understand why people choose to enter the on-demand transport market and how the use of smart contracts can change their work.

Still through the research carried out, I was able to understand and raise the advantages and disadvantages of using blockchain and take them to discussion with other members of the group, so we could put our ideas together to write down the benefits and limitations of implementing the technology.

I am happy to have worked with my teammates and the assistance that I got from them, especially when discussing the code, as other members of the group have better understanding of coding than me.

4. Eliabe Bali 2022474:

On this DDT project we were required to implement all our acquired knowledge learned along our classes. As we splitted the task for each member, each member of the group could have more focus on particular tasks. As a member of the time, I could work, learn and bring some Ideas up to our group. Working with the code with my team members we could be able to understand the process to see how our smart contract was going to be, as it was mentioned previously each one of our group was focused for each part of this project, it was very helpful, for instance; in my case I could dedicate myself and do more researches to try to figure out to help each other and always update ourself in our sharing groupe. As I started work on this project, I found some issues to figure out some tasks, but most of the issues I could discuss with my colleagues in class and then find a solution to try to make some experiments to implement in our assignment if it was successful, one of these experiments was a calculator for our Driver class as you see bellow:.

```solidity
uint private kilometer;

    uint private nightRate = 5;
    uint private price_per_KLM = 2;
    string  private timeShift = "night";
    uint public total;


  function setKilometer(uint x) public  {
    kilometer = x;
  }

function setTimeShift(string memory  y) public  {

   // once you set the kilometers traveled by the drivers it will calculate the (number of kilometer * price_per_KLM)


  //if it is night shift so it will be  (kilometer * nightRate) adding more 5$ per kilometer as you see bellow
    if(keccak256(bytes(y)) == keccak256(bytes(timeShift))) {

    total = kilometer * price_per_KLM  + nightRate;

    }

      else{
        // if isnot night shift, than the price will be just (kilometer * price_per_KLM)
        total = total = kilometer * price per KLM;
```

5. Yuri Mendoca 2020347:

After almost two months of working on this project, I could not be happier. My team members helped me with all the issues we faced. In the beginning, it was quite challenging to decide how our DApp should work and behave without any previous experience. It took much time of researching and studying, however, the result was exactly what we pursued.

My main task in this project was to code the logic of the smart contract, which I used in the tutorials given in class to develop and enhance my code skills. The smart contracts were developed in Solidity programming language using the compile 0.6.9. They are divided into two main contracts, The driver's contract and the passenger's contract using simple functions to communicate with each other in the same chain. For this project, we used Truffle Ganache in order to set up a personal Ethereum blockchain as you can see in the figure below: