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Blockchain Immigration

OVERVIEW

"***The number of international migrants — people living in a country other than where they were born — reached 244 million in 2015 for the world as a whole, a 41 per cent increase compared to 2000, according to new data presented by the United Nations. This figure includes almost 20 million refugees. (United Nations Sustainable Development, 2018)***"

In Australia alone, we have 68% skilled migrants and 32% from family visa stream (Homeaffairs.gov.au, 2018). If we consider skilled migration visa (189 Skilled - Independent), 75% of the application were processed in 9 months and 90% of the application were processed in 12 months (Homeaffairs.gov.au, 2018). And this time do not include the time take by the applicant to prepare for all the documents to satisfy the visa conditions and guideline.

We believe that using a blockchain based solution we can make the process less painful for both the applicant and the immigration agency. We aim to use the blockchain to store immigration related documents which can then be verified by the third-party agencies and accessed by the immigration department in safe, secure and effective manner. With the help of block-chain we hope to streamline and fast track this entire process from months to days.

GOALS

1. Ability for the applicant to upload the immigration documents on the block-chain
2. Ability for the applicant to check the status of her application.
3. Ability for the verification agencies to access and verify the applicant documents
4. Ability for the immigration department to access and process the immigration application.

SPECIFICATIONS

The end-result will be a blockchain based application, which will be used to store the immigrant's application and all the related documents. The applicant can check the status of the application any time by exploring the block chain from their mobile devices and personal computers. These documents will be accessible by verification entities, which are authorized by immigration department. The verification entities, will verify the applicant documents and upload the verification details on to the blockchain. Once the verification is finished, the immigration department and user will be notified of the completion of the verification. Thereby, allowing the immigration department to review the immigration application. The outcome of the review, will be uploaded to the blockchain as well, by the immigration department and will be notified to the applicant.
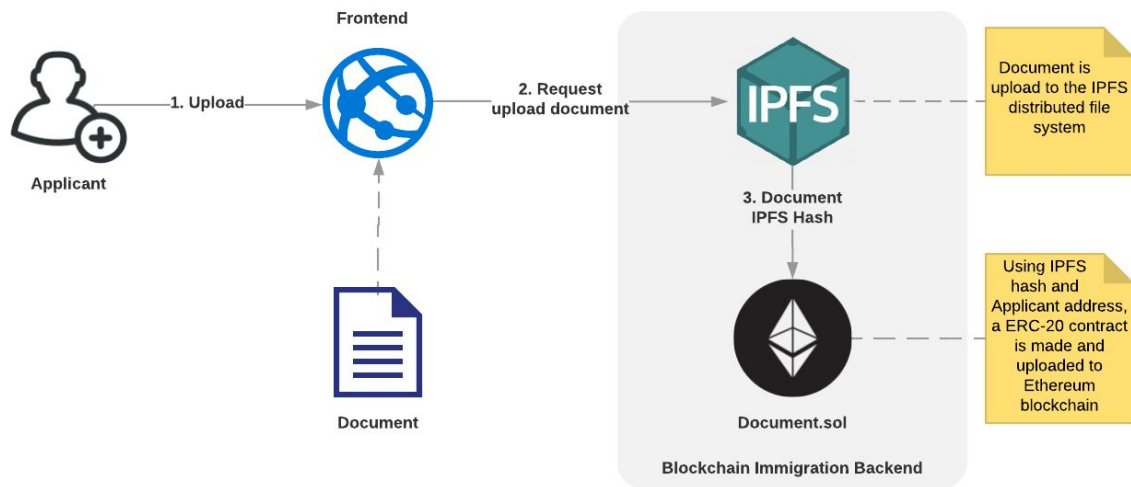
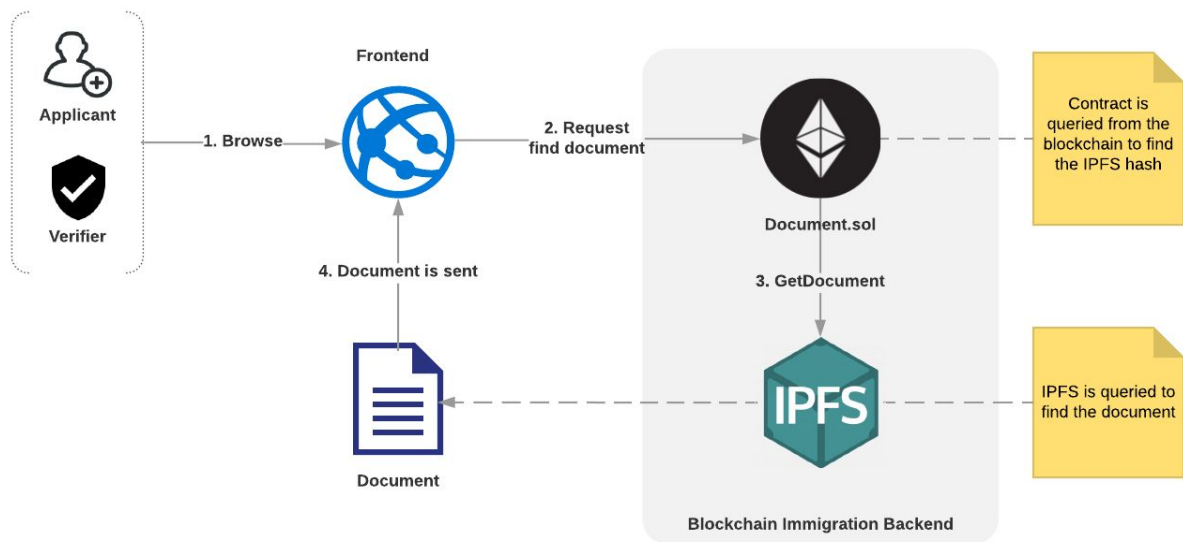## Use cases
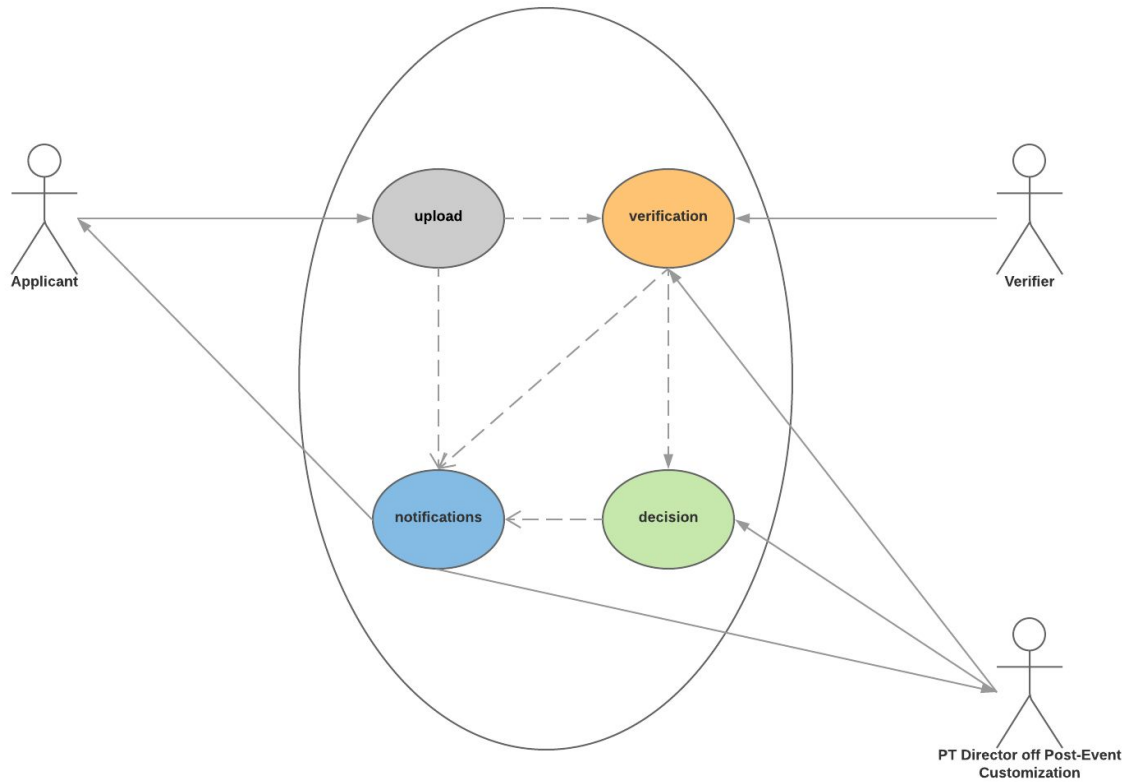
Entity Relationship Diagram
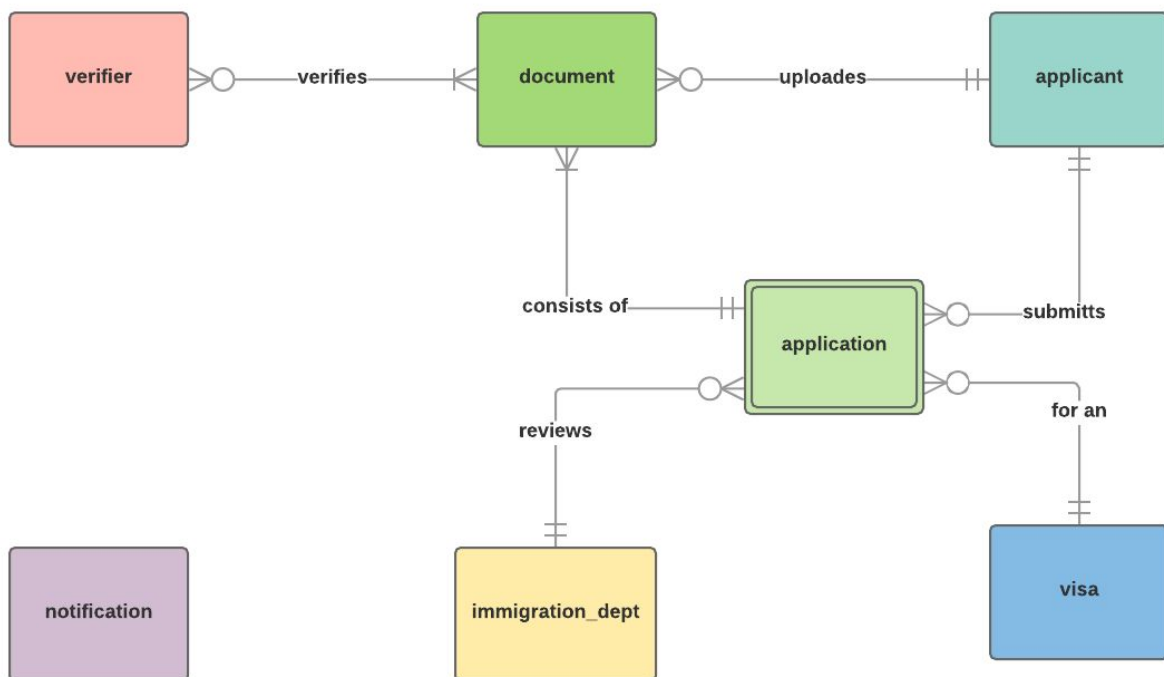
Interaction Diagram
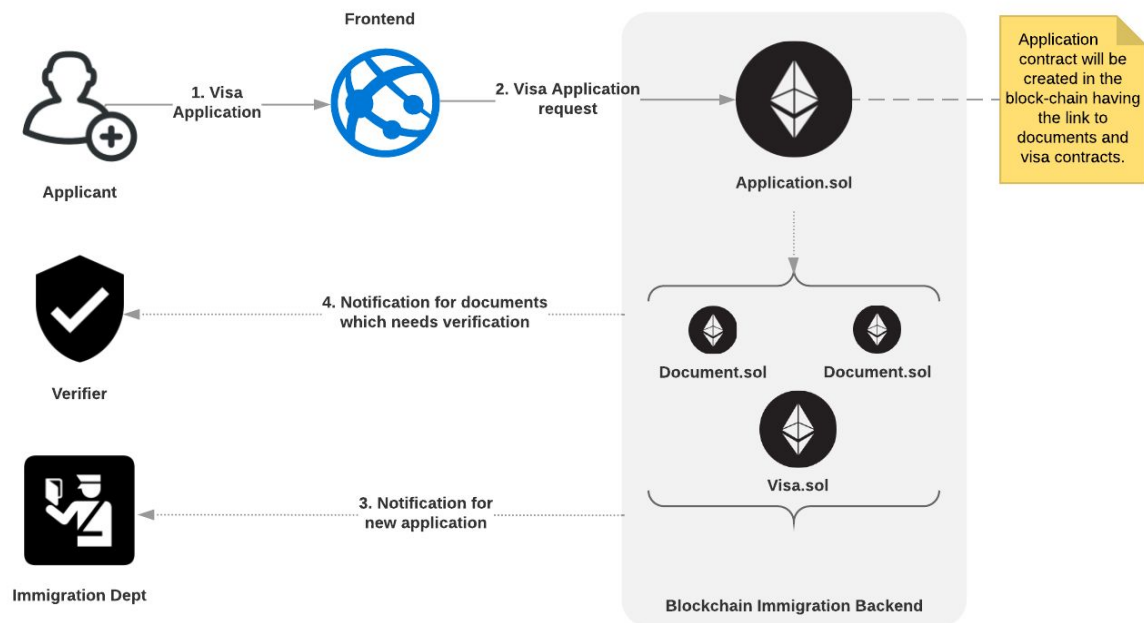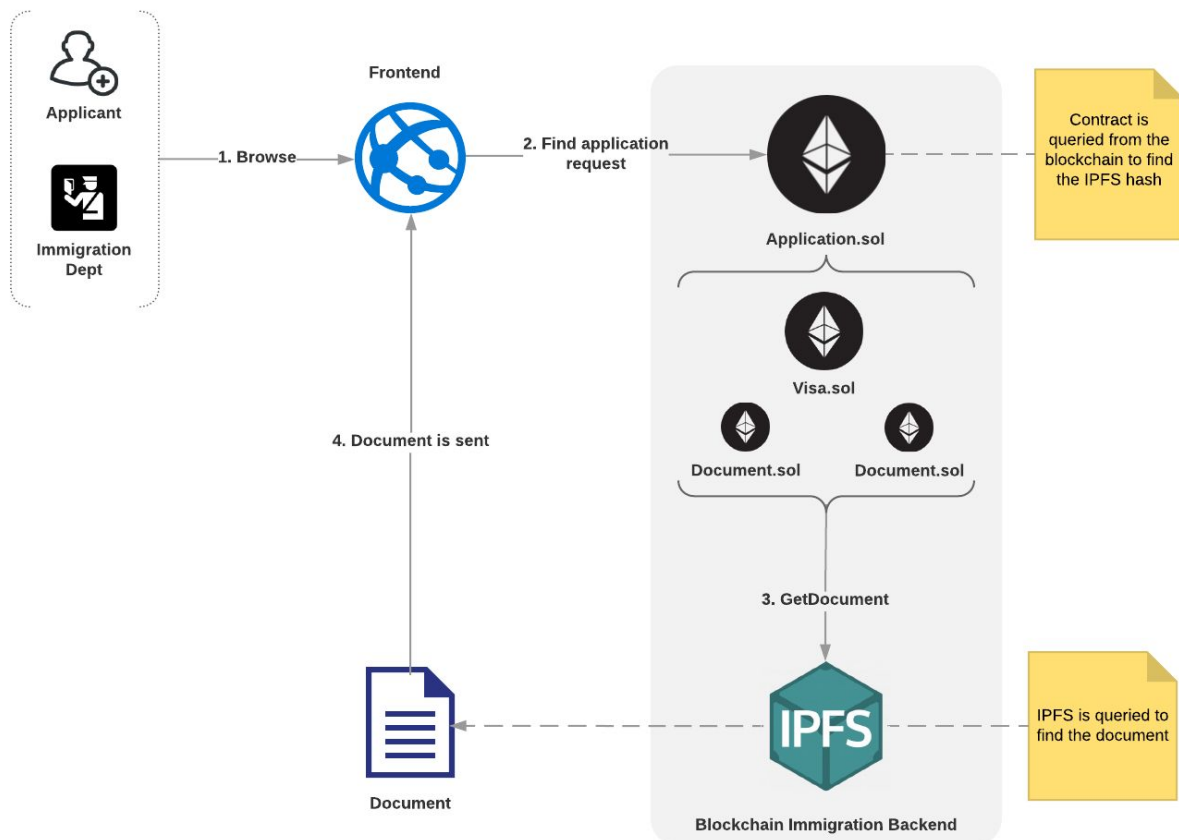Uploading documents

Browsing documents

NOTE: The applicant can only view her documents and Verifier will only be able to view the documents sent to them for verifications.

Submitting an application

Frontend

Applicant

1. Visa Application

2. Visa Application request

Application.sol

Application contract will be created in the block-chain having the link to documents and visa contracts.

4. Notification for documents which needs verification

Verifier

Document.sol   **Document.sol**

Visa.sol

3. Notification for new application

Immigration Dept

Blockchain Immigration Backend

Browsing Application

Applicant

Immigration Dept

1. Browse

Frontend

2. Find application request

Application.sol

Contract is queried from the blockchain to find the IPFS hash

Visa.sol

Document.sol   **Document.sol**

4. Document is sent

3. GetDocument

Document

IPFS

IPFS is queried to find the document

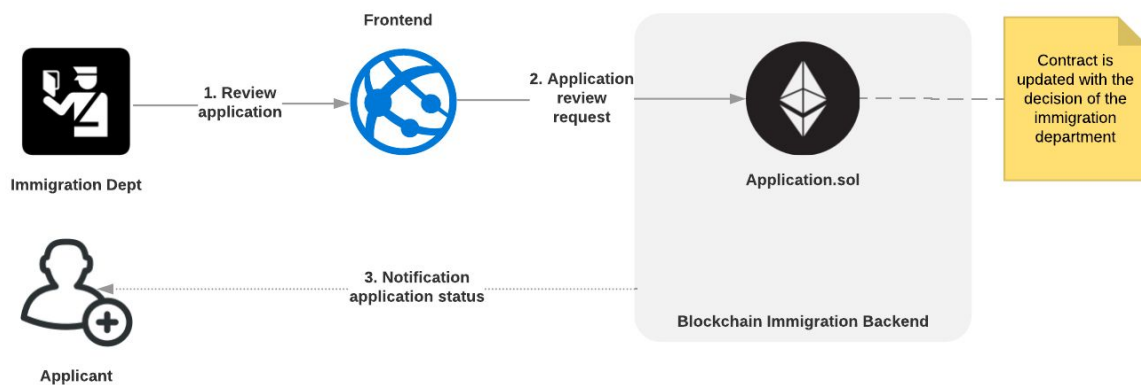**Blockchain Immigration Backend**

NOTE: Applicant will only be able to view her applications. Immigration department will be able to view all the applications.

Document Verification
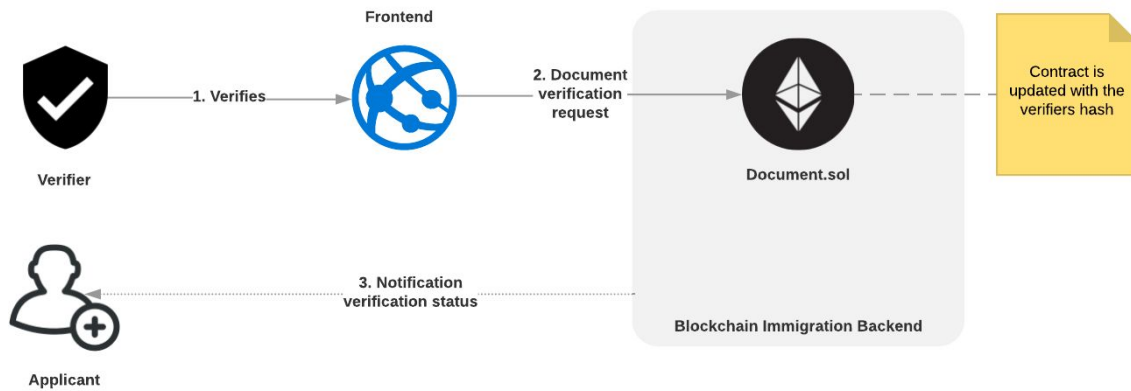
Application Review

MILESTONES

ACTIVITY	PLAN START IN DAYS	PLAN DURATION IN DAYS
Inception	1	10
Project Outline	6	5
Project Proposal	11	1
Design - Use Case	12	3
Design - Entity Relationship Diagram	15	3
Design - Interaction Diagrams	18	6
Design - UI Prototyping	24	10
Development - Smart Contract	34	10
Development - Desktop Application	44	10
Development - Mobile Application	54	10
Development – Testing	44	20
Project Presentation	64	5
Project Report	69	10

MONITORING AND EVALUATION

Weekly meetings will be held to gauge the progress of the application. Apart from that, we will also deliver some artifacts as described below at each phase completion.

Phase One

The phase one will be evaluated by generation following artifacts
1. Use Case Diagram
2. Entity-Relationship Diagrams
3. Interaction Diagrams
4. UI Design

Phase Two

The phase two will be evaluated by generating following artifacts
1. Working desktop application
2. Working mobile application

Phase Three

The phase three will be evaluated by generating following artifacts
1. Project report
2. Working code base via GitHub

TECHNOLOGY

Following are the technologies and frameworks which will be adopted to implement the solution

Ethereum Blockchain

We will be using ethereum blockchain as the backbone of out solution to keep out smart contracts and other domain specific data.

Solidity

Solidity will be used to implement the smart contract on ethereum blockchain.

IPFS (Interplanetary File System)

IPFS will be used to store the documents which the applicant will be uploading, in distributed way.

ReactJS

ReactJS will be used to implement the desktop frontend application

React Native

React Native will be used to implement mobile application.

AWS (Amazon Web Service)

AWS will be used to host the desktop and mobile application.

BIBLIOGRAPHY

Homeaffairs.gov.au. (2018). *Global visa and citizenship processing times*. [online] Available at:
https://www.homeaffairs.gov.au/about/access-accountability/service-standards/global-visa-citizenship-processing-times [Accessed 9 Mar. 2018].

Homeaffairs.gov.au. (2018). *Migration programme statistics*. [online] Available at:
https://www.homeaffairs.gov.au/about/reports-publications/research-statistics/statistics/live-in-australia/migration-programme [Accessed 9 Mar. 2018].

United Nations Sustainable Development. (2018). *Number of international migrants reached 244 million in 2015*. [online] Available at:
http://www.un.org/sustainabledevelopment/blog/2016/01/244-million-international-migrants-living-abroad-worldwide-new-un-statistics-reveal/http://www.un.org/sustainabledevelopment/blog/2016/01/244-million-international-migrants-living-abroad-worldwide-new-un-statistics-reveal/http://www.un.org/sustainabledevelopment/blog/2016/01/244-million-international-migrants-living-abroad-worldwide-new-un-statistics-reveal/ [Accessed 9 Mar. 2018].