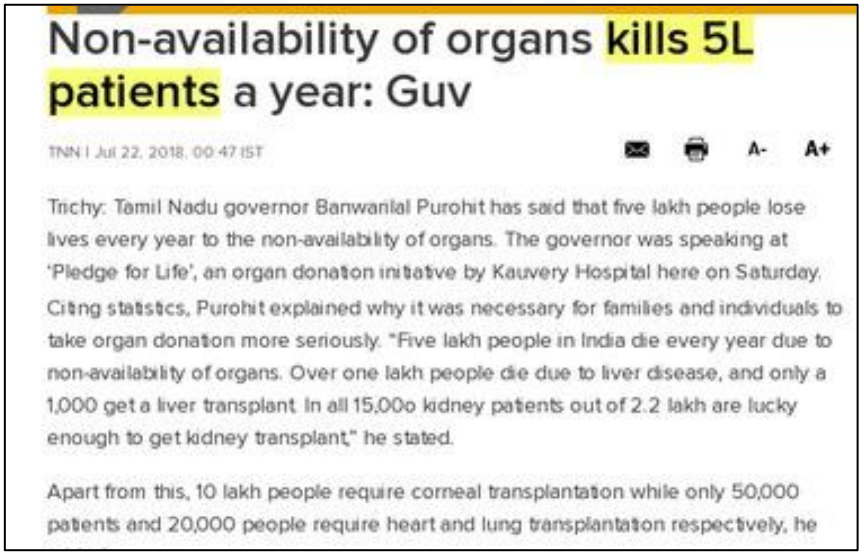
OrganChain

...connecting lives

Problem Statement

We aim to build a decentralized application to provide easy access to donated organs by putting organs on blockchain and hence eliminate paperwork, speed the process, improve security and make blackmarket sale impossible.

State of Organ Donation in India



Non-availability of organs kills 5L patients a year: Guv

TNN | Jul 22, 2018, 00:47 IST

A- A+

Trichy: Tamil Nadu governor Banwarilal Purohit has said that five lakh people lose lives every year to the non-availability of organs. The governor was speaking at 'Pledge for Life', an organ donation initiative by Kauvery Hospital here on Saturday. Citing statistics, Purohit explained why it was necessary for families and individuals to take organ donation more seriously. "Five lakh people in India die every year due to non-availability of organs. Over one lakh people die due to liver disease, and only a 1,000 get a liver transplant. In all 15,00o kidney patents out of 2.2 lakh are lucky enough to get kidney transplant," he stated.

Apart from this, 10 lakh people require corneal transplantation while only 50,000 patents and 20,000 people require heart and lung transplantaton respectively, he

Did you know In India every year nearly:

- 500,000 people die because of non-availability of organs
- 200,000 people die of liver disease
- 50,000 people die from heart disease
- 150,000 people await a kidney transplant but only 5,000 get one
- 1,000,000 lakh people suffer from corneal blindness and await transplant
- Nationally, with a population of 1.2 billion people, the statistic stands at 0.08 persons as organ donors per million population (PMP)

Our Aim/Objectives

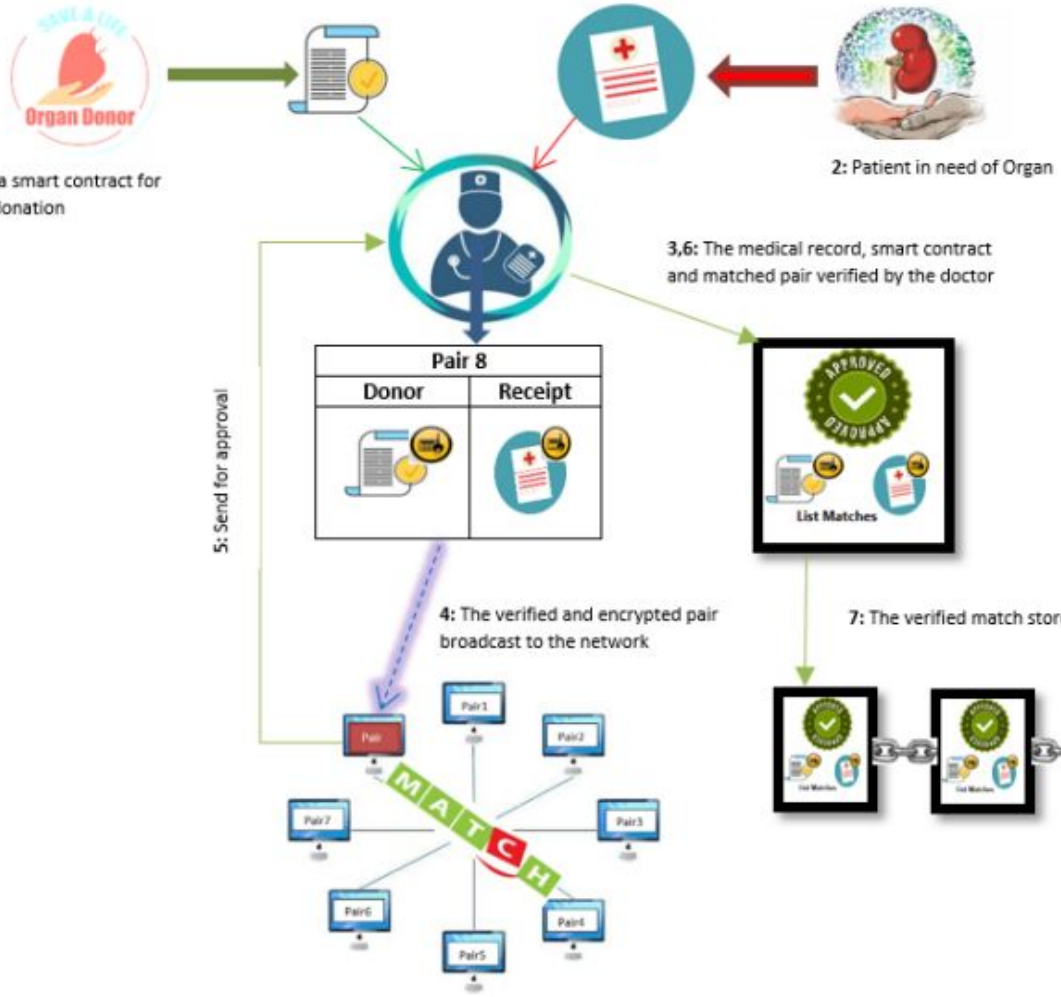
- To add security to records of donors and recipients
- Automation of process via smart contracts
- To resolve various problems faced by organ donor & recipient
- Minimizing bad activities like organ trafficking

Why blockchain?

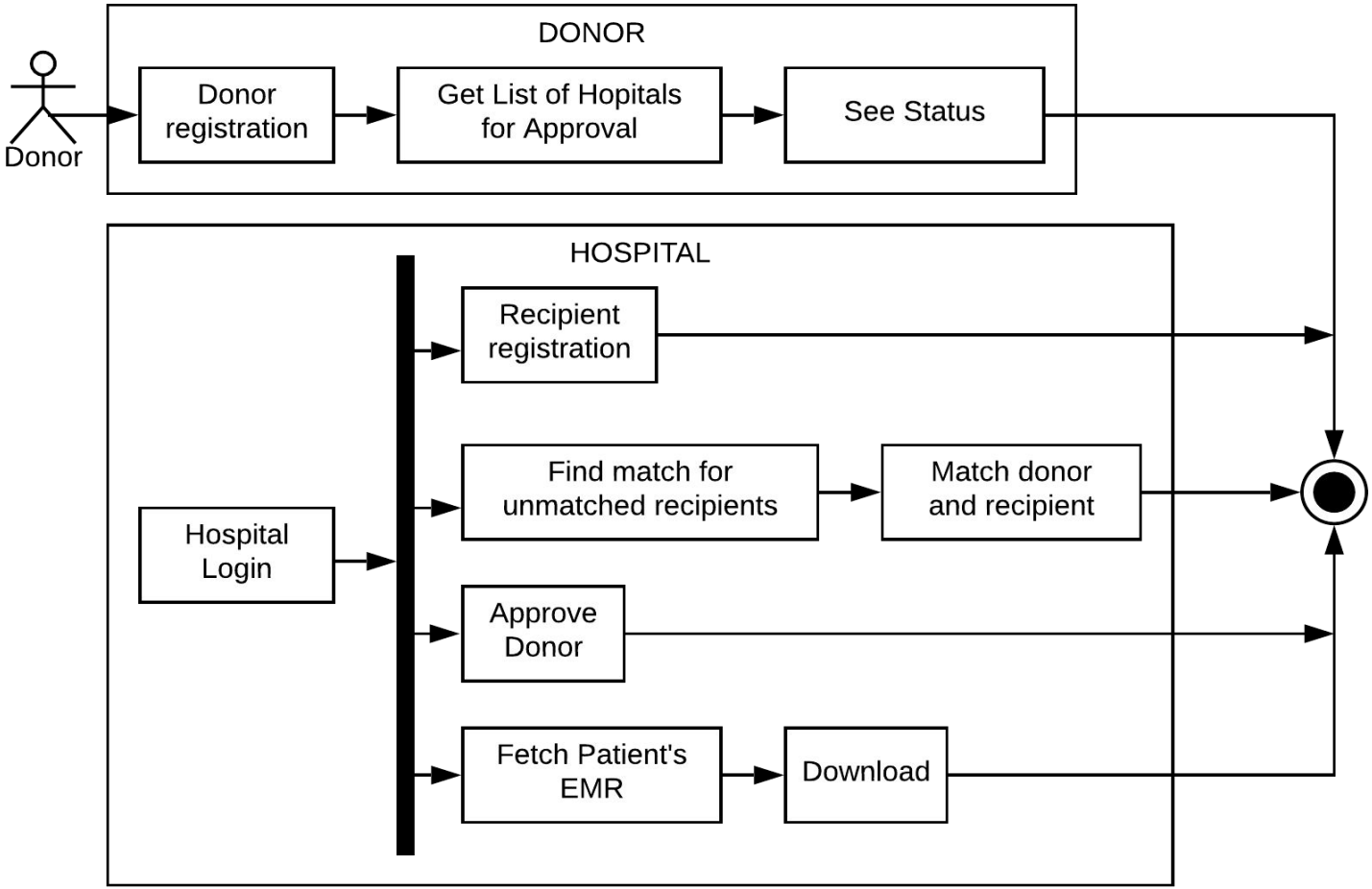
- Blockchain is a distributed, public ledger, recording transaction and tracking assets, and of which immutability is guaranteed by a peer-to-peer network of computers, not by any centralized authority.
- Privacy and confidentiality are preserved.
- The algorithm operates in real time and is decentralized.

Solution

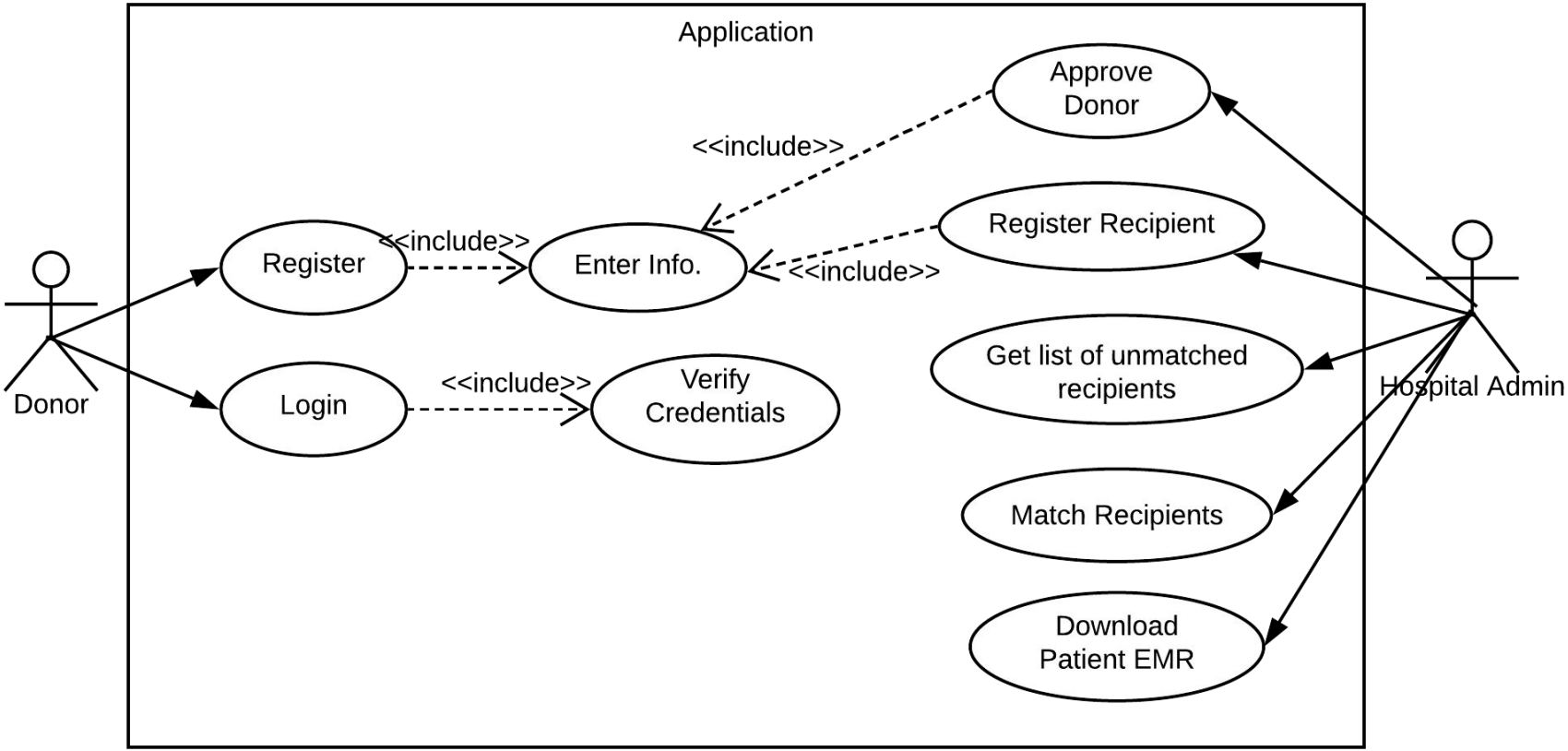
- We are proposing an ethereum decentralised application for keeping track of organ donors, recipients and organ transplants.
- Each submission is considered as an individual transaction and then stored in a block after validation.
- Therein limiting the number of middlemen and eliminating any and all existing vulnerabilities.
- Replacing paperwork generated in the transplant supply chain.
- In addition to this, increases the chance to find a proper match rapidly.


Organ Donor
1: Sign a smart contract for organ donation
2: Patient in need of Organ
3,6: The medical record, smart contract and matched pair verified by the doctor
Pair 8
Donor
Receipt
5: Send for approval
List Matches
4: The verified and encrypted pair broadcast to the network
7: The verified match stored on the blockchain
MATCH

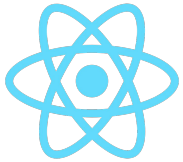
DATA FLOW DIAGRAM



USE CASE DIAGRAM



Technology Stack

- Frontend :  
- Backend : 
- Database : 
- Data Storage : 
- Smart Contracts : 
- Connectivity :  

Future work

- Here the matching of the donor and recipient is done so assuming that a donor, recipient having same organ type as well as blood type will be a direct match.
- But in a more of a real world scenario the matching of the same requires of various other parameters which is a pretty good scope for a ML algorithm.
- Hence we can ensure a pretty seamless match and reduce the issues in the likes of organ rejection.

References

- Alandjani, G. (2019). Blockchain based auditable medical transaction scheme for organ transplant services. 3C Tecnología. Glosas de innovación aplicadas a la pyme. Edición Especial, November 2019
- L. A. Dajim, S. A. Al-Farras, B. S. Al-Shahrani, A. A. Al-Zuraib and R. Merlin Mathew, "Organ Donation Decentralized Application Using Blockchain Technology," 2019 2nd International Conference on Computer Applications & Information Security (ICCAIS), Riyadh, Saudi Arabia, 2019, pp. 1-4.

Thank You!