



HYPERLEDGER PROJECT

Meetup #4 – Interfaces Use case & Architecture

dcentrum Community

Connect | Collaborate | Create

Community Friends :



nagarro

DCentrum's 3 Month Blockchain Series: Hyperledger

Join to experience perfect way to learn and solve real world problems using Hyperledger Fabric with the group of highly motivated Blockchain enthusiasts

 Nov 2018 - Feb 2019

 Hyderabad

 Meeting Frequency BiWeekly

 Total Series Duration 3 Months

First and Second Meeting:

- ✓ Foundation
- ✓ Level Setting
- ✓ Concepts

During initial two meetings, we all will get to know each other and understand the basics of Blockchain to build solid foundation.



Third Meeting:

- ✓ Real World Use Case Selection
- ✓ Architecture Decisions

Will pick a real world use-case by looking at the domain expertise and interest of majority of participants. Group will also work to architect the solution to during this period.



Fourth and Fifth Meeting:

- ✓ Building Solution with collaboration

During this period of 45 days we all will build end-to-end robust enterprise level solution on chosen use-case



Sixth Meeting:

- ✓ Use Case Demo
- ✓ Hackathon

Will host and participate in an open Hackathon, which will be judged by esteemed jury of who's who of Blockchain World



Format for each meeting:

- Welcome and General Discussion: 30 mins
- Presentation from members: 60 mins
- Shared Learning and Discussion: 60 mins
- News Briefs: 10 mins
- Open discussions on general topics: 20 mins



Agenda



3 Sessions 20 mins each on below topics:

- Design Considerations for Hyperledger(continued..)
- Use Case Presentations from everyone with a 1 Slider
- Forming Teams & Voting / Deciding on Use Case(s)





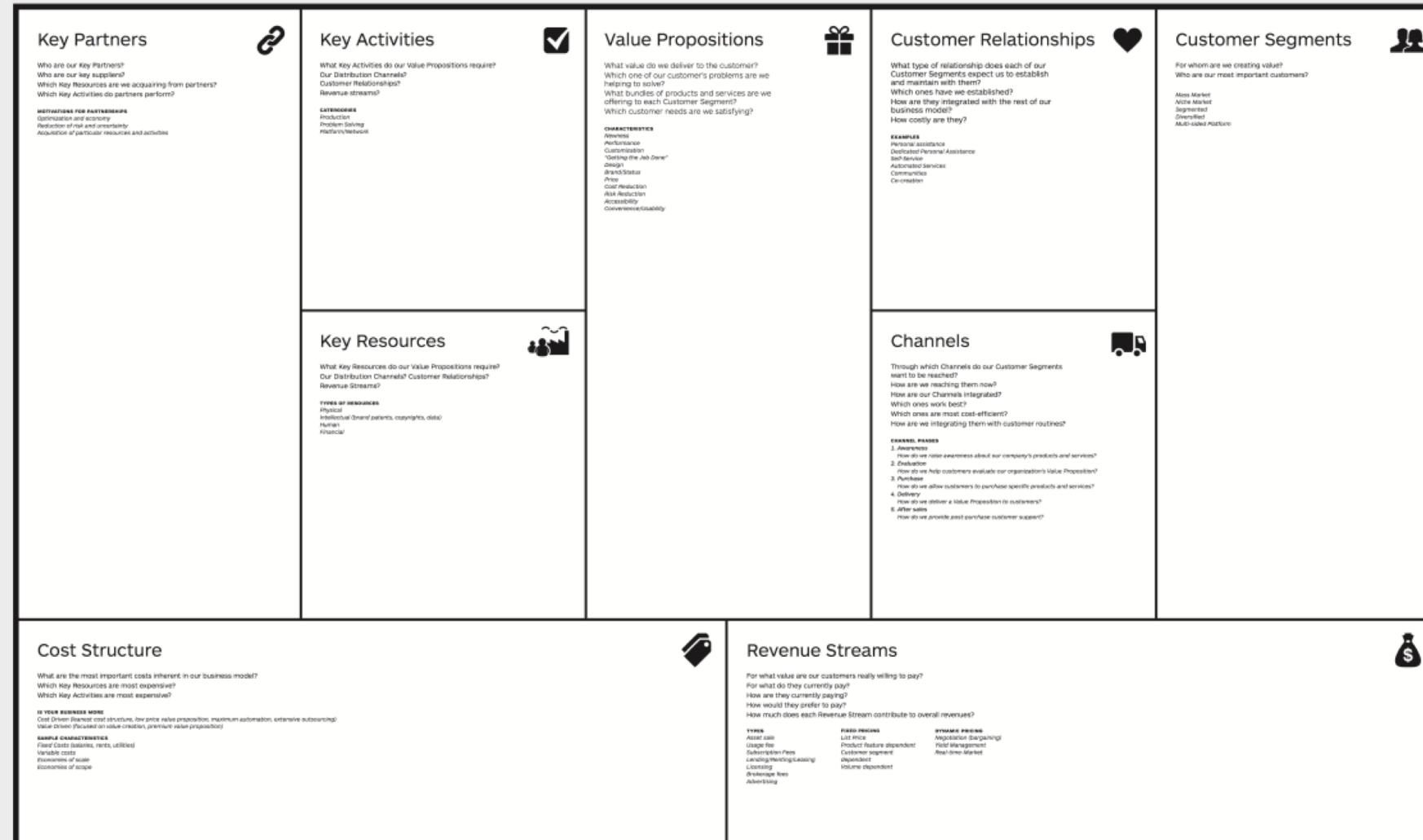
The Business Model Canvas

Designed for:

Designed by:

Date:

Version:



DESIGNED BY: Business Model Foundry AG
The makers of Business Model Generation and Strategyzer

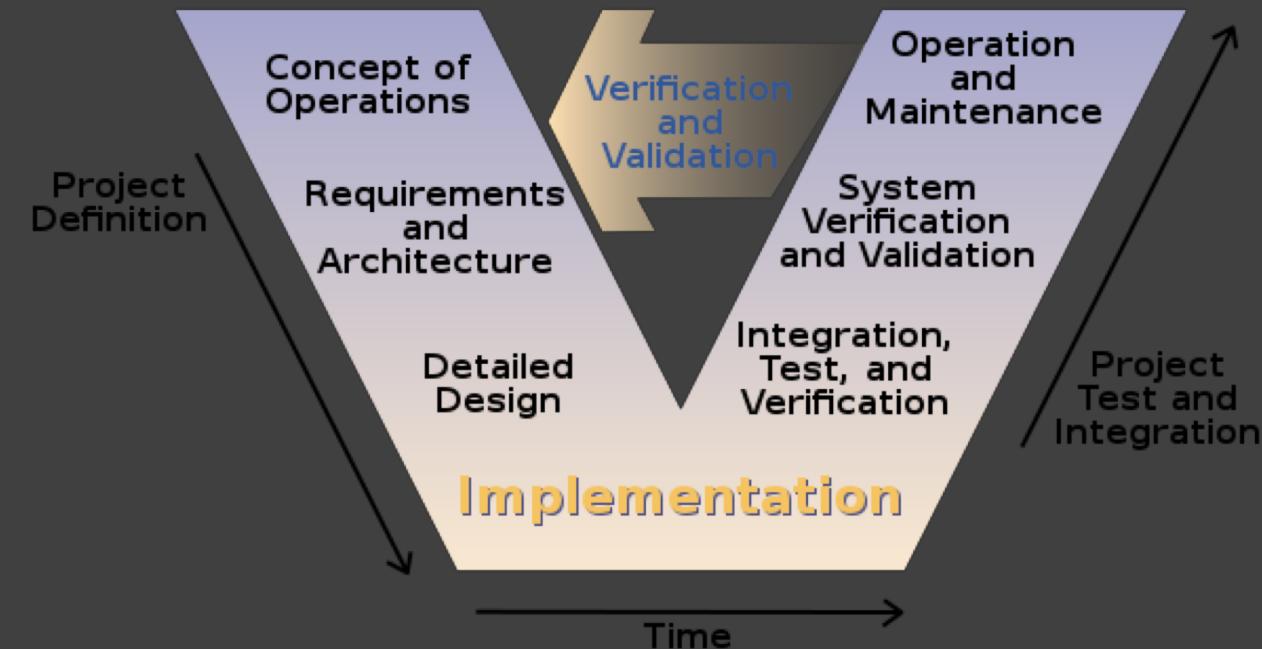
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Meetup#4 – Session#1

Hyperledger Fabric & Blockchain Design Considerations (contd..)

- By Dharmen Dhulla



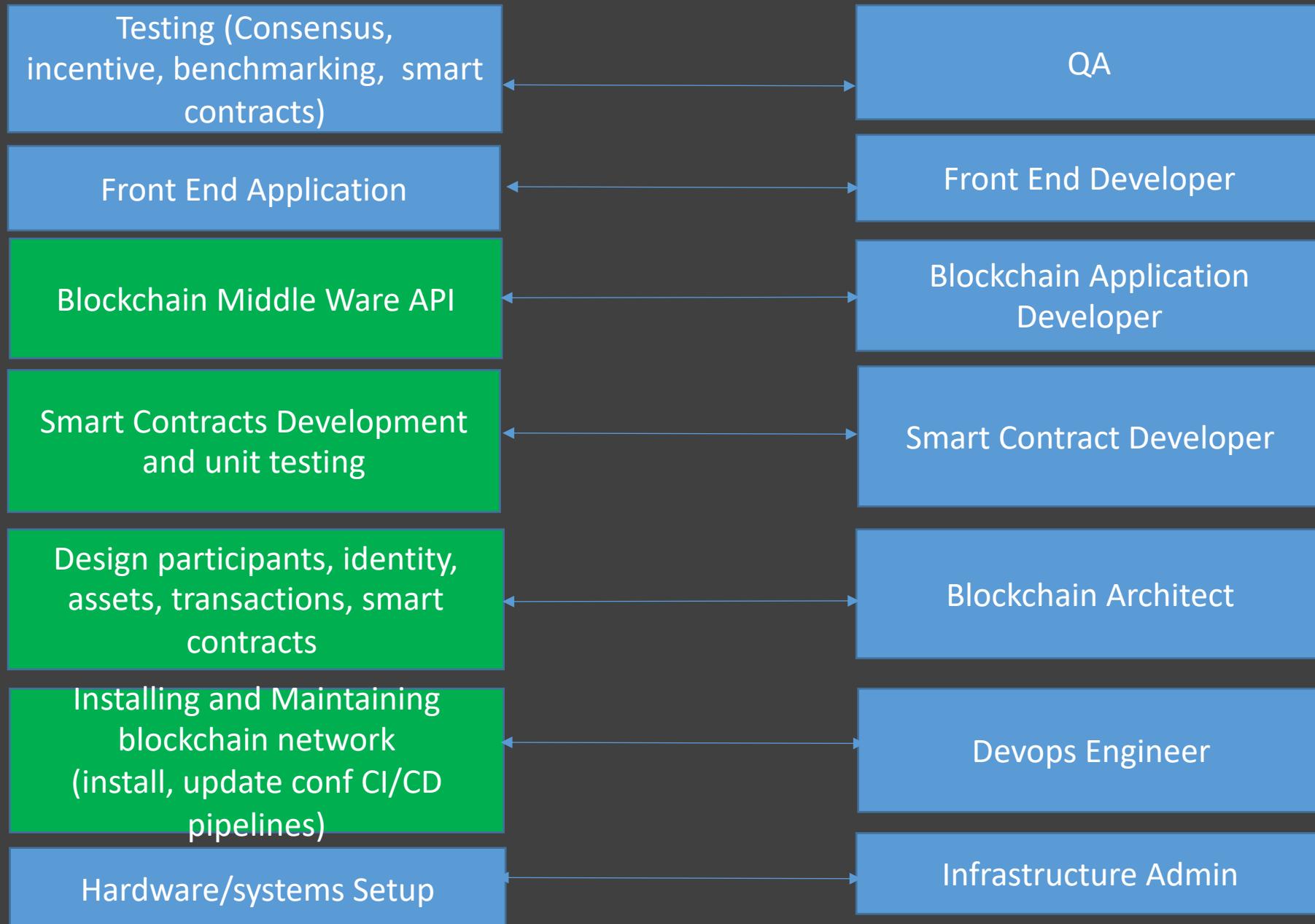
Agenda



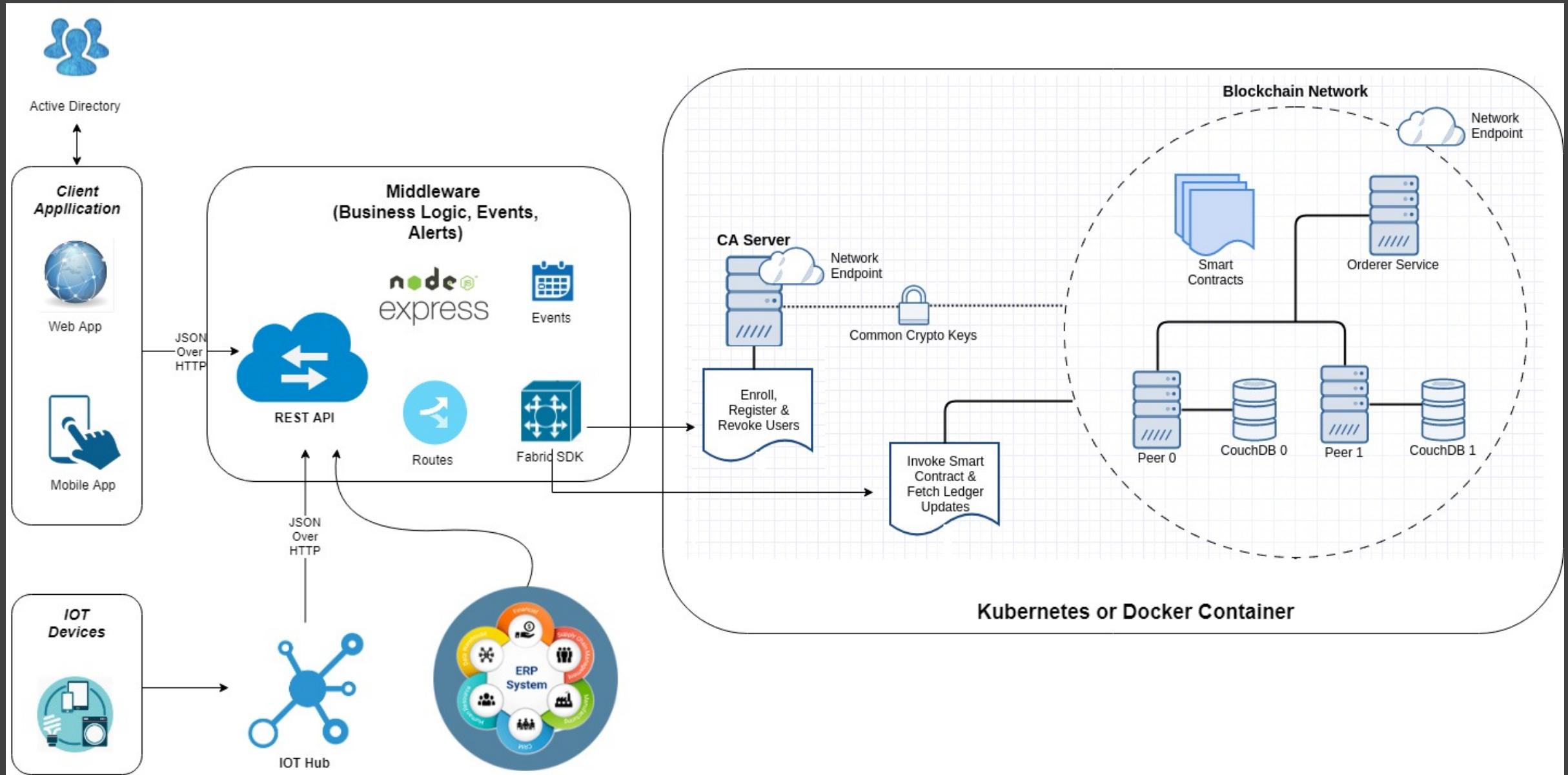
Let us continue to discuss about Hyperledger design considerations

- ❑ Blockchain Design Considerations
- ❑ Importance of Off Chain storage
- ❑ Integrating with Enterprise Systems

Blockchain Roles

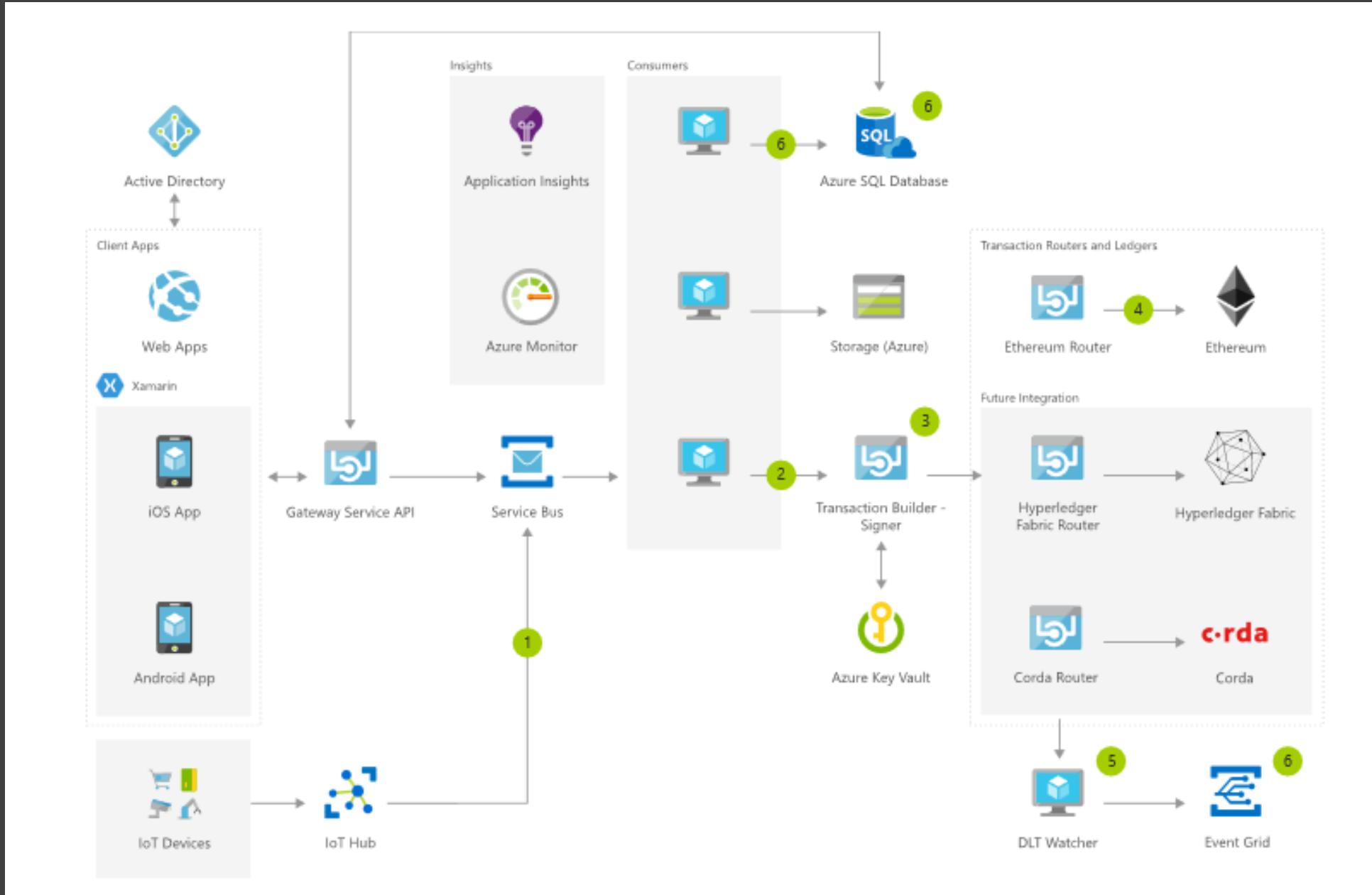


Reference Technical Architecture





Reference Solution Architecture





Designing Business Network

- Identify Participants
 - Individual
 - Orgs
 - systems/devices
- Design participants identity
- Design Number of Peers
- Design Orders
- Design Endorsers
- Design Channels
- Design Private Data (if needed)
- Design endorsement policy

Designing Assets, Transactions & Chaincode



- Designing Assets and Transactions
 - Identify what Assets to store
 - Design Asset Lifecycle
 - Design Transactions & Asset flow between participants
- Designing Chain code
 - Design what Chain codes and what functions to write
 - Design Access control mechanisms for Chaincode
 - Design Transactions & Asset flow between participants

Designing Assets, Transactions & Chaincode



- Assets
 - Prescriptions
 - LabReports
 - Insurance Claims
- Transactions
 - Create/update Prescription/Labreport
 - Request Permission for Prescription/Labreport
 - Approve/Reject/Revoke permission for Prescription/Labreport
 - Claim Insurance
 - Settle Insurance Claim
- Smart Contracts/Chaincodes
 - Prescription SmartContract
 - Create/update/request/approve/reject/revoke prescription
 - Labreport SmartContract
 - Create/update/request/approve/reject/revoke prescription
 - Insurance Claim Contract
 - Claim/Settle insurance

Assets

- Prescriptions
- LabReports
- Insurance Claims

Transactions

- Create/update Prescription/Labreport
- Request Permission for Prescription/Labreport
- Approve/Reject/Revoke permission for Prescription/Labreport
- Claim Insurance
- Settle Insurance Claim

Smart Contracts/Chaincodes

- Prescription SmartContract
 - Create/update/request/approve/reject/revoke prescription
- Labreport SmartContract
 - Create/update/request/approve/reject/revoke prescription
- Insurance Claim Contract
 - Claim/Settle insurance

Chaincode Attribute Based Access Control



- Only doctors should create/update prescriptions
- Only Lab Technicians can upload test reports
- Only Patients should Approve/Reject/Revoke access permissions to his/her medical records
- <https://github.com/hyperledger/fabric/blob/release-1.1/core/chaincode/lib/cid/README.md>



Blockchain Design considerations

- Designing Data Storage

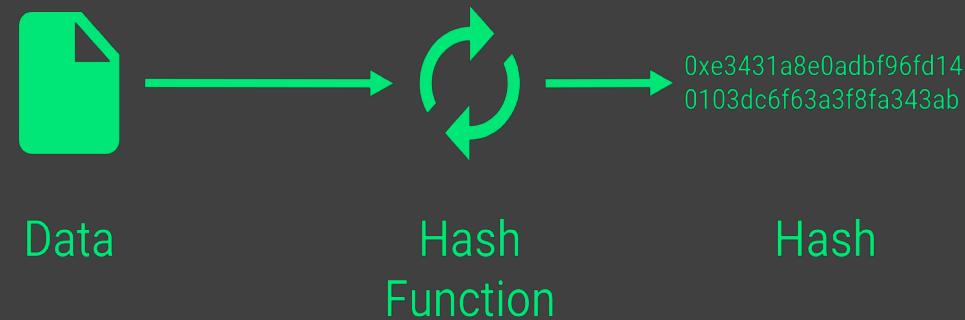
Blockchain ≠ Database

- On Chain
 - Store only the data that requires consensus among participants
 - Never store business sensitive data on-chain
- Off Chain
 - Store bulk data off chain and just store pointers to data on-chain



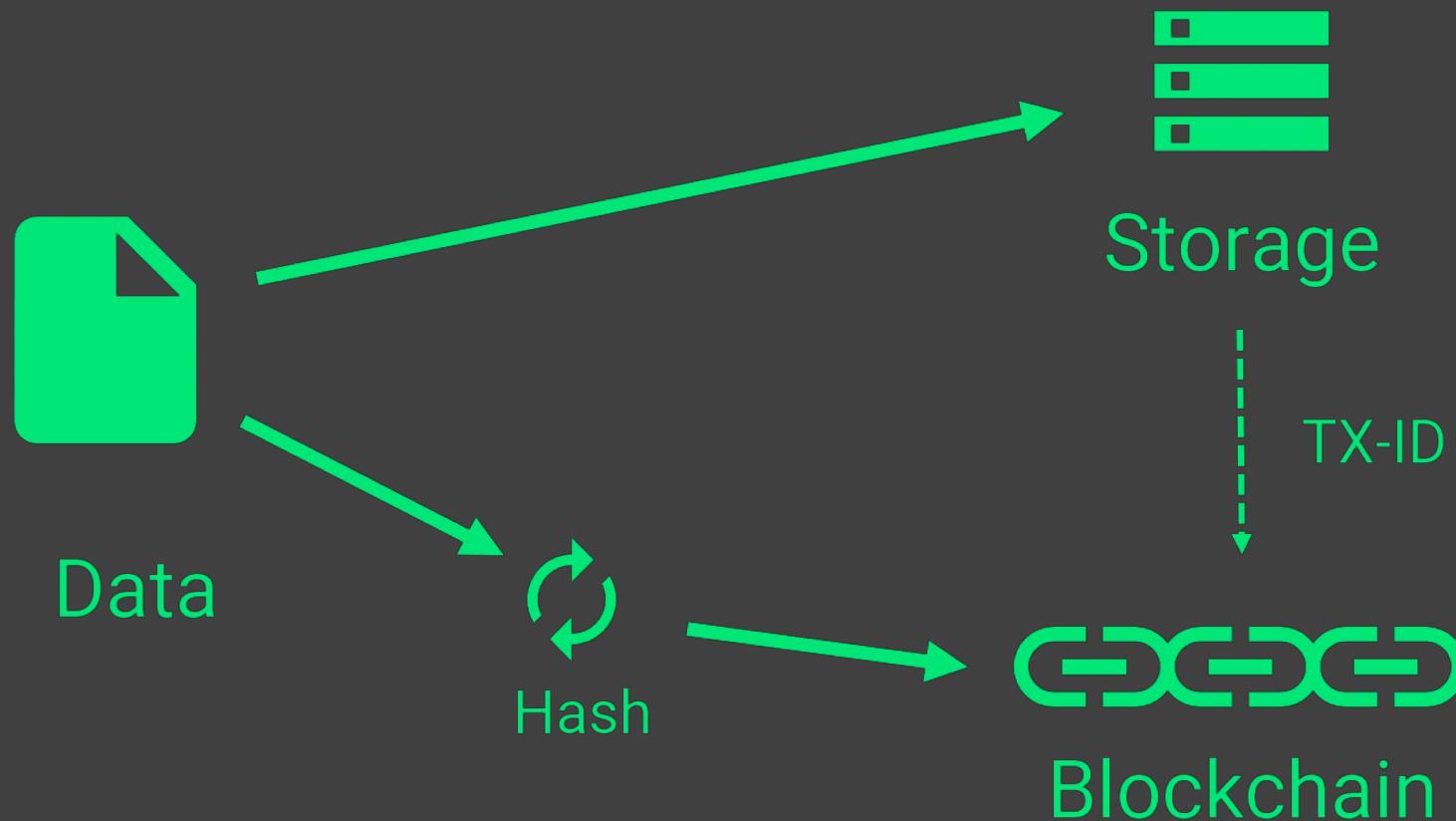
Off chain Storage

- Store only hashes in blockchain and actual content in other storage
- In case of sensitive contents encrypt the contents and store encrypted content hashes on blockchain.
- Hash protects the content from tampering



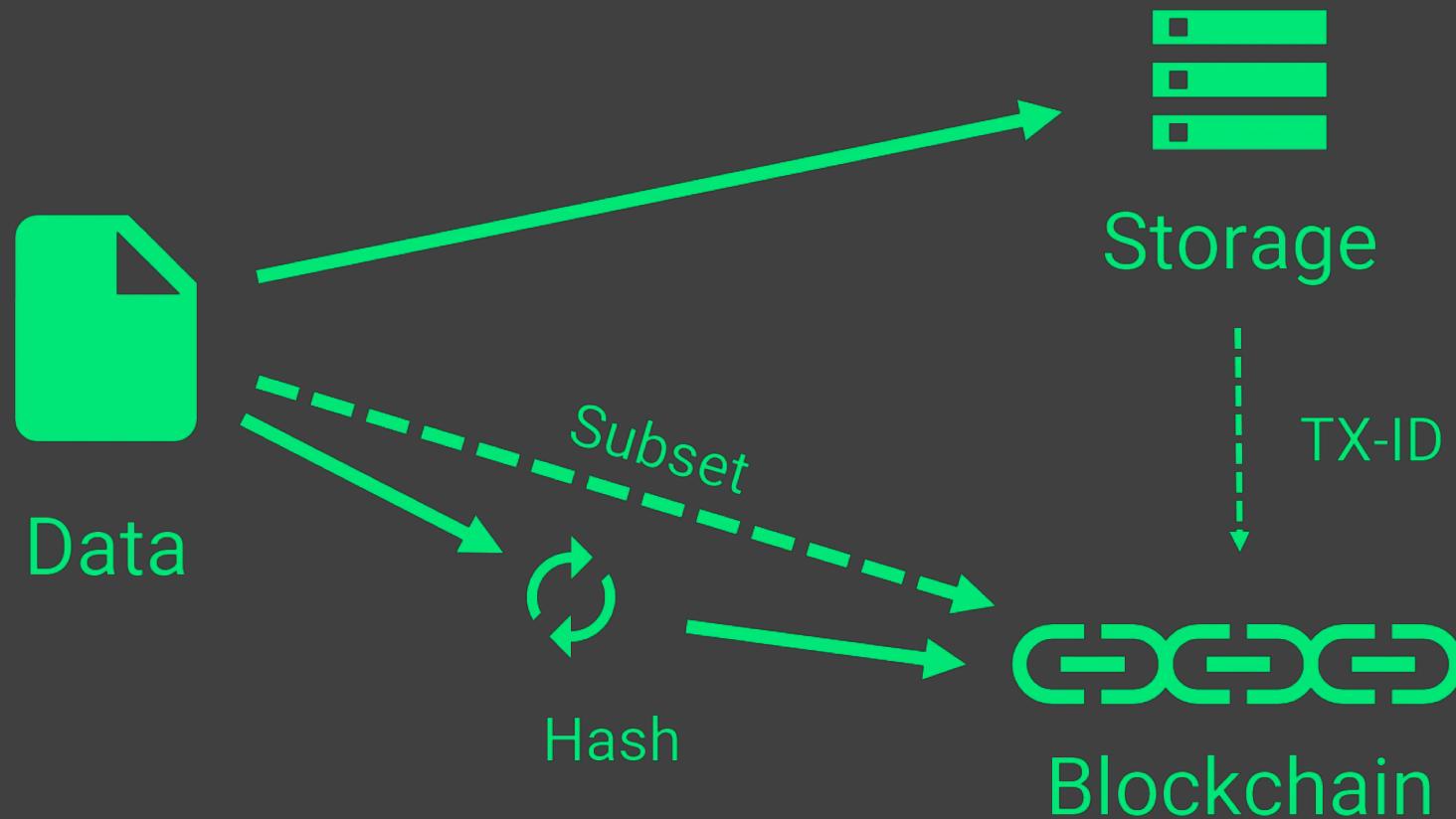


Storing Only Hash on blockchain





Storing Hash and Subset of data on blockchain





Off Chain storage

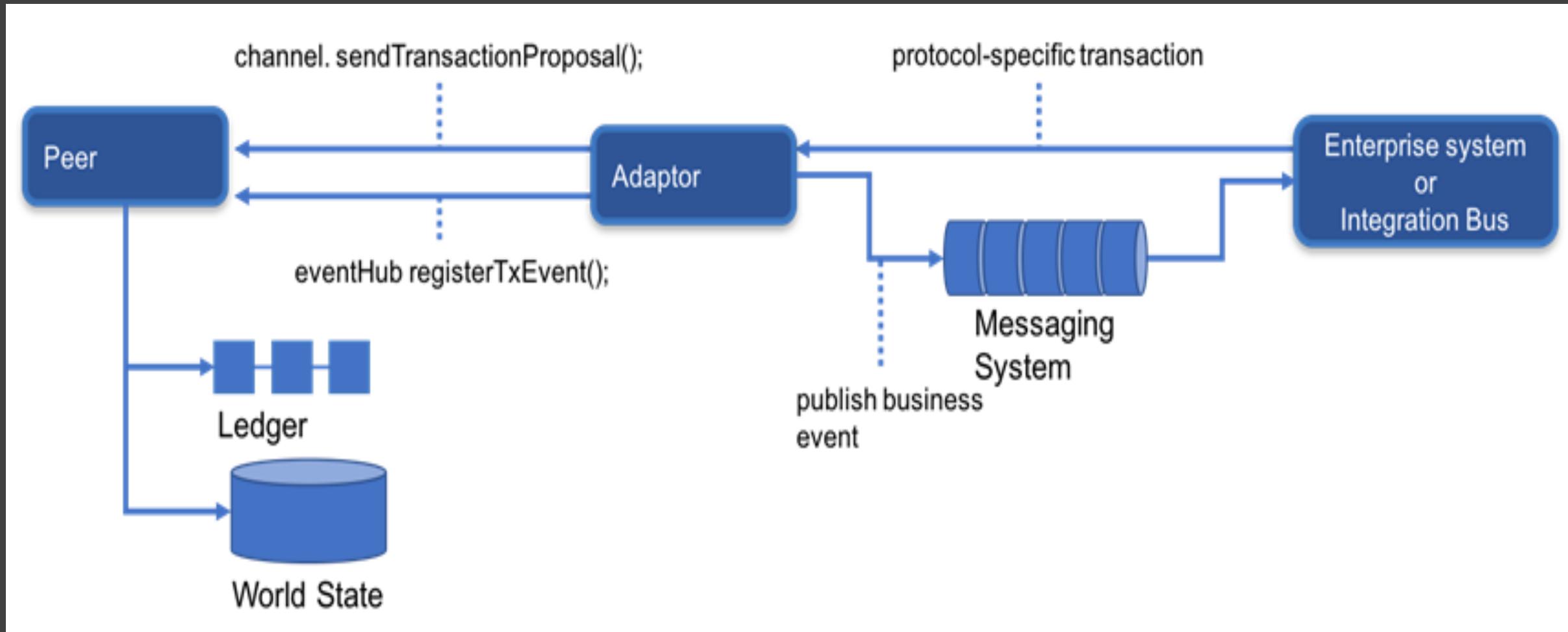
1. IPFS
2. IPDB
3. Swarm
4. BigChainDB
5. Storj
6. Sia
7. RDBMS
8. Distributed Databases

NOTE : RDBMS and Distributed databases controlled by central authorities and they are single point of failure



Integrating with Conventional Enterprise Systems

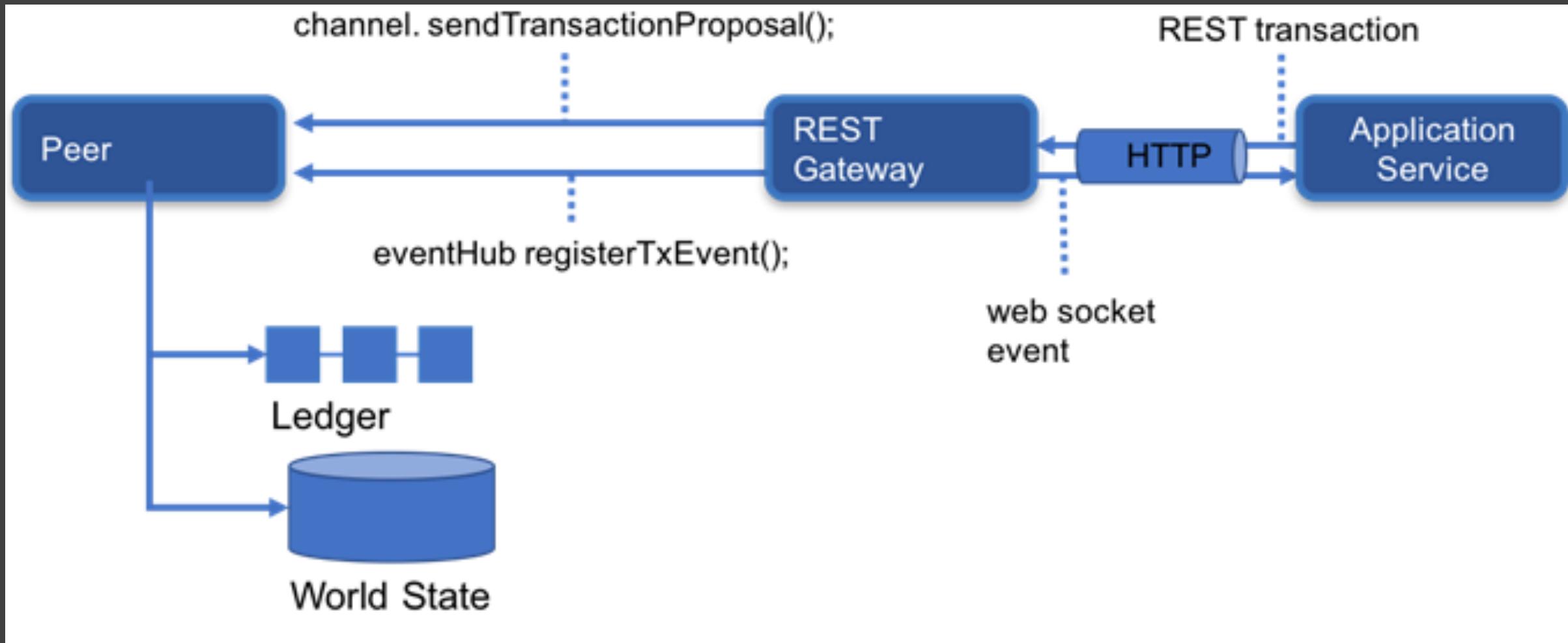
- Event Driven



Integrating with Conventional Enterprise Systems



- Microservices





Meetup#4 – Session#2

Members Present on their Use Cases using 1 Sliders

7 Use Cases Presented, and 2 were presented in the Meetup#3



Meetup#4 – Session#2

Idea#1 - Blockchain for Disaster Management - Rohit



The problem being addressed

- The Emergency of the situation.
- Lack of Food transport and Medical Treatment.
- Organizations unable to track to relocate them.

Stake Holders Involved

- Organisation
- Transport Agency
- Food market
- Hospitals

Proposed Solution

Using Blockchain as a Platform to Collaborate the basic need systems for the Employees during the emergency situations.

Applicable Industries

- Every Large Scale Organisation.

Benefits

“Customers will never love a company until the employees love it first.”

Competitors

- None

“ A Company Culture is the product of a company’s values”.



Meetup#4 – Session#2

Idea#2 - Let us fix our Country - Rishi



The problem being addressed	Stake Holders Involved
<ul style="list-style-type: none"> Most times when problems(eg: large pot hole) are seen in various public places they go unattended An Individual attending this problem is very difficult in terms of affordability We do not know whom to contact from the authority or their contact details 	<ul style="list-style-type: none"> Citizens Workers
Proposed Solution	Applicable Industries
<p>Let us employ a work force to fix the problem troubling you at a nominal cost to you</p> <ul style="list-style-type: none"> The work force will find who in the Government will fix the problem and chases the authority to fix the same In a case where there is no satisfactory response from Government money can be pooled together by the community This work force is not employed by one single person rather a community / area pays for that in a Decentralized way The solution will be enabled by some one from open community creating an issue This issue will be voted using Decentralization and once enough votes are garnered the work approval to release the fund will take place 	<ul style="list-style-type: none"> Government Pubic Sector
Benefits	Competitors
<ul style="list-style-type: none"> Catalogue is prepared about which city whom to contact and how to solicit proper response for problems Problems that bother some one are addressed at a nominal cost as no single individual pays for the fix Micro payments and shared economy ensure the burden is not too much on Individual 	<ul style="list-style-type: none"> Government



Meetup#4 – Session#2

Idea#3 - Hard to decide – Hanani



The problem being addressed

- The inadequacy of land held by vast majority of Indian Farmers, which is obviously leading to some many grievances.
- Faster way of transition to renewable energy through incentives
- Lack of infrastructure to enable community farming.
- Only 10% of food produced in India is processed, compared to 70% in United states.

Stake Holders Involved

- Farmer
- High-Tech Farmers
- Credit-givers
- Various Manufacturers

Proposed Solution

Leveraging the block chain technology not as a platform, but as a tool.
Providing incentives through novel methods.

Applicable Industries

- Primary Sector
- Logistics
- Credit banking
- Food processing
- Renewable energy

Benefits

Competitors

India will be on its way to become a “Food Superpower”.
And the eradication of other obvious ills.

- None



Meetup#4 – Session#2

Idea#4 - Pharma Supply Chain – Tameem

The problem being addressed

- pharmaceutical companies deal with the complexity of production, quality assurance, distribution and tracking of products. There are four key challenges namely compliance, counterfeit drugs, healthcare data vulnerabilities and finally, tracking and traceability.

Stake Holders Involved

- Manufacture
- Distributer
- Wholesaler
- Pharmacy

Proposed Solution

Distributed Ledger ,Irreversibility , Immutability ,smart contract
Record each step on Ledger and produce an Hash File.

Applicable Industries

- Pharmacy

Benefits

Reduced complexity and costs:
– Supply chain becomes traceable and drugs are easier to track
– Information systems will hold expiry date details which improves stock control and rotation.

Competitors

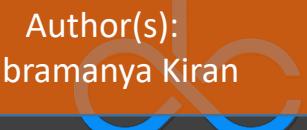
- Chronicled

Enhances transparency between authorized parties:
– All parties can see every stage of the drug journey to ensure the drug authenticity
– Regulators, such as pharmacy inspectors, can monitor the rate of counterfeit drugs entering the supply chain, with more accuracy



Meetup#4 – Session#2

Idea#5 - Piracy Mitigation – Kiran



The problem being addressed

- Movie producers are unable to identify the theft, sharing, illegal streaming of movies and online content
- The cost to produce is not recovered as people are watching freely instead of paying for the same
- Its very hard to identify and track the cyber crime as people are in remote areas

Stake Holders Involved

- Citizens
- Movie Directors/Producers
- Movie stars

Proposed Solution

The solution is to apply block chain technology to

- Watermark the online content and enable producers and distribution agencies to securely upload the files through our channel
- Track and catch the culprits who are streaming the content illegally

Applicable Industries

- Media
- Software
- Entertainment

Benefits

- Save millions of dollars in global movie industry
- Provide multiple job opportunities to the ethical hackers as well as online security services
- People watch good quality movies instead of pirated copies
- This technology can also be applied to software and other industries where online content piracy needs to be eliminated

Competitors

- Government



Meetup#4 – Session#2

Idea#6 - Charity Management – Pradeep

The problem being addressed

Donations from Billionaires, Millionaires and people are not reaching the poor due to lack of **transparency** in the way charity money is distributed. **Lack of Trust** on the charity organisations is another reason why donors are not donating

- Is money reaching the required members?
- How much Intermediaries are stealing?
- Donors are feeling will their help reach the required people or not?

Proposed Solution

BAAS Fabric solution for charity management where all transactions are **recorded Immutably** by saving the receipt of the transaction within WebApp\MobileApp. (Integration with PayPal API can also be done). HyperLedger Fabric through its endorsement policy and MSP can give access to the different stakeholders and make them participate in consensus about status of the money transfer and revert back If it's failed.

- Single **Reports dashboard** where the info related to Charity Money status would be seen.
- **Percentage of money spent** on charity, fundraising and administrative activities.
- Stake Holders will upload status(Sent, Transferred, Held and Received) of charity money.
- Every Stake Holder will have his own **ledger** checking status of the complete flow

Benefits

- All BlockChain benefits will be applicable for this use case
 - Faster Money conflict resolutions
 - Integrity of stake holders in utilising the
 - Transparency of Charity Money transfers
 - Trust to donors that money is utilised properly

Stake Holders Involved

- Citizens
- Banks
- NGO
- Government authorities
- Employers etc..

Applicable Industries

- Financial Aid
- Humanitarian needs
- Charity
- Philanthropy
- Government services
-

Competitors

- Donation planet
- JustGiving
- Charity Financials
- charitiesmanagement.com
- gofundme.com
- youcaring.com
- fundrazr.com



Meetup#4 – Session#2

Idea#7 - Blockchain in Logistics – Mohan

The problem being addressed

- proof of origin and ethical sourcing for high-value goods such as diamonds, wine, and even fine art. Paper based (not digital) and need to be carried physically.
- Sudden increase of price in logistics partner
- Current technology stores all database in individual proprietary databases (centralized security risk)
- Does not enable trust, control or sharing of data

Stake Holders Involved

- Manufacturers
- Retailers
- Suppliers
- Logistics partners

Proposed Solution

Distributed Logistics records for individual logistics partner through blockchain network

- Initially, create a Data Layer where existing (and future) software can plug into, creating a Secure Data/Records Chain
- Manufacturer and Supplier to record all Material and Logistics data on this network
- Other complementary blockchains can build on this network
- Retailers, Manufacturers and Logistic partners to interact with the network through a medium where the data will be a digital thumb-print for each individual Goods that's been supplied.

Applicable Industries

- Retail
- Supply Chain
- Logistics

Benefits

- It will enable supply chain companies to identify attempted fraud more easily.
- **TRANSPARENCY FOR AUDITORS.** Because the history of transactions is locked into each block, auditors will have an easier time understanding where items and resources have gone
- **Provenance Tracking :** record keeping and provenance tracking become easy as the product information can be accessed through the help of embedded sensors and RFID tags.

Competitors

- Existing Retail based Companies



Meetup#4 – Session#3

**After Member Presentations we started discuss
on the process of selection and voting.**

**Total 7 Use Cases Presented on Session #2, and 2
were presented in the Meetup#3**

Next - Roles



Which role you want to Pick?

- Blockchain Developer – Codes for Smart Contacts and configures network
- Front End Developer – Builds Web and Mobile Applications
- Integration Developer – Builds Middleware to facilitate existing integrations
- Product Manager / Business Analyst – Focuses on Business Aspects and Viability
- Architect / Designer – Thinks long term and provides technical solutions
- QA / Test – Validates requirements and tries to break the solution

