Generalizing the RFQ Transaction Infrastructure in SmartChainDB

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Outline

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- Background
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- Advantages
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Motivation

- To **eliminate** the need for a human mediator during process of acquisition of goods/services.
- To **generalize** the transaction process and to encompass all phases of procurement processes.
- To ensure that entire process is **transparent** and based on the '**No Trust**' Policy.
- To **improve** existing infrastructure and to cater to additional type of requests apart from RFQ.

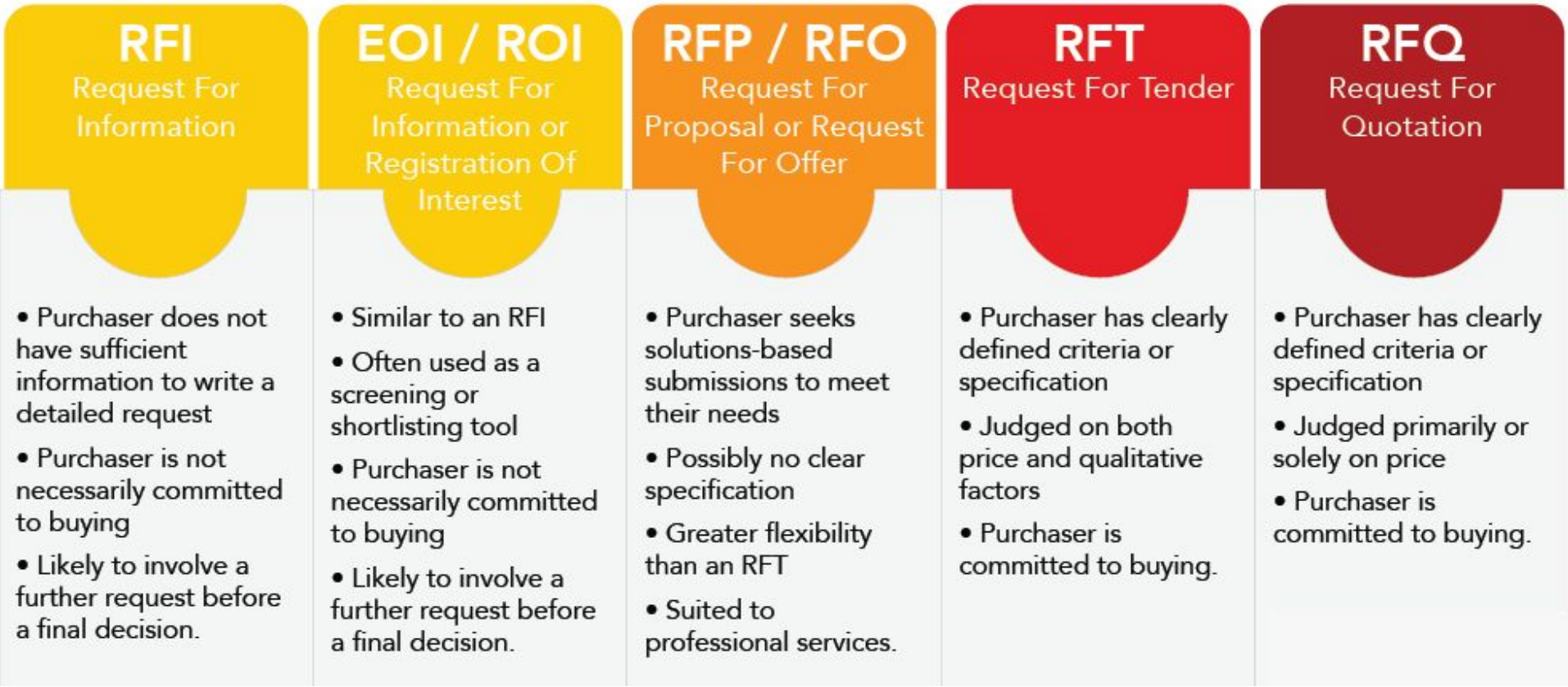
Background

- Request transaction
  - What are those?
  - Why do we need them?
  - Significance of each type of request
- MaRCO
  - Capabilities
  - Resources
- Smart Contract Vs SmartChainDB

Request

- Procurement process is a process of finding and agreeing to terms as well as acquiring goods/services from a external source via tendering
- This process is streamlined via a sending out a set of requests to interested parties in batches.
- Each of these requests narrow the scope successively to meet our needs

Type of Request and Significance



Request for Information

- Supplier facilities, finances, attitudes, and motivations
- The state of the supply market
- Supply market dynamics
- Trends and factors driving change
- Alternative pricing strategies
- Supplier competition
- Breadth and width of product/service offerings, by the supplier
- Supplier strategic focus, business, and product plans

Request for Proposal

- The specific items on which the suppliers are proposing
- Business needs
- Performance measures
- Information
- Ideas
- Instructions on how to reply
- Due date
- Technical and other training
- How will we evaluate how feedback will work
- Describe the process for selection
- Addressee—chosen carefully

Request for Tender

- Business needs
- Performance measures
- Information
- Ideas
- Due date
- Technical and other training
- Same as Request for Proposal but the tenders are placed against a detailed tender by the user

Request for Quotation

- Personnel skills, training level, or competencies
- Part descriptions/specifications or numbers
- Quantities/Volumes
- Description or drawings
- Quality levels
- Delivery needs
- Term of contract
- Terms and conditions
- Other value-added needs or terms
- Draft contract

Marco

- OWL-based manufacturing resource capability ontology (MaRCO), which has been developed to describe the capabilities of manufacturing resources.
- Why Marco?
  - MaRCO supports the representation and automatic inference of combined capabilities from the representation of the simple capabilities of co-operating resources.
- Resource vendors may utilize MaRCO to describe the functionality of their offerings while the system integrators use for the fast identification of candidate resources

Why SmartChainDB ?

Traditional Smart Contracts

- Current Smart Contracts are limited to specific use-cases.
- These are not generalized enough to serve every kind of request.
- This leads to redundant designing of application architecture.
- If anyone posts a similar request, he/she has to implement an auction with similar behaviour separately.

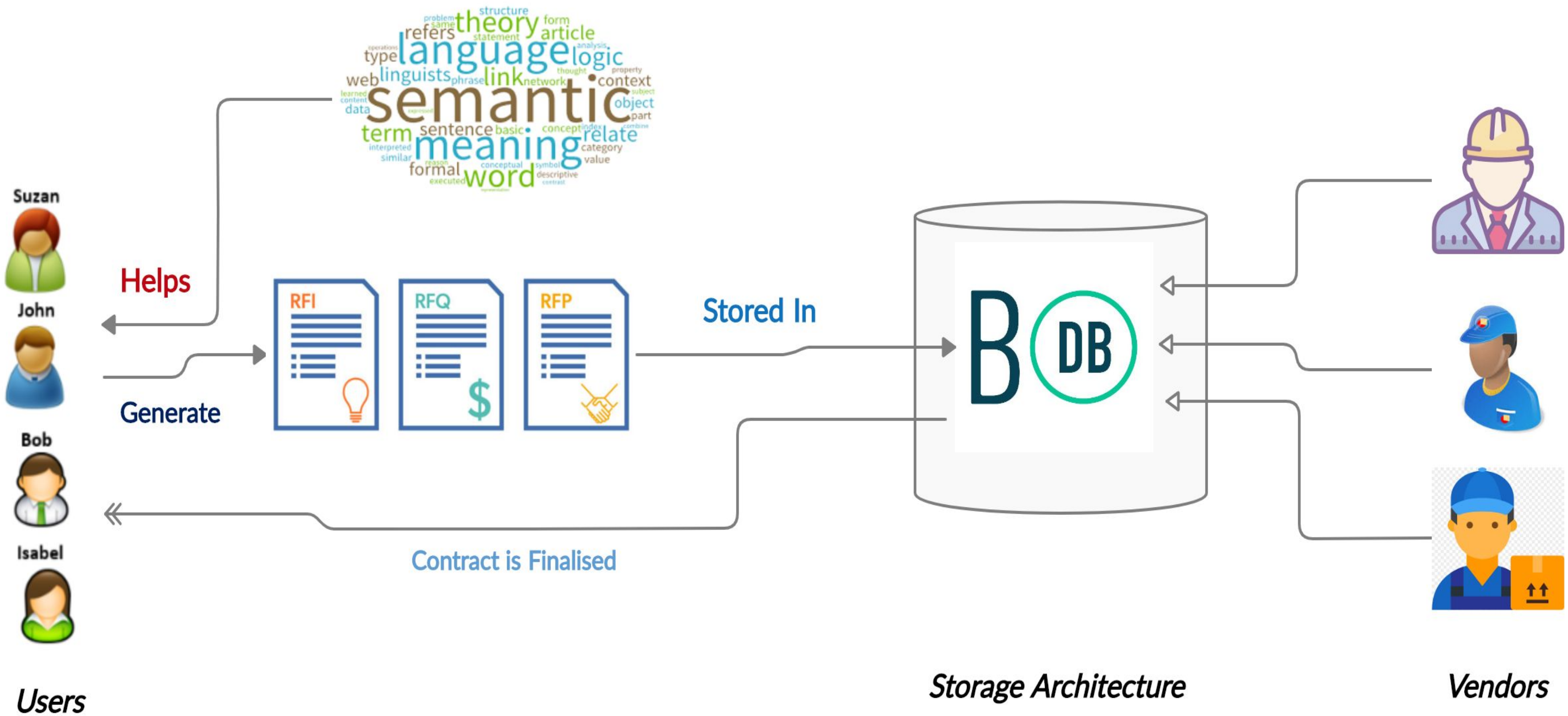
SmartChainDB

- We are able to develop an application that resembles a generalized setup.
- Modern blockchain platforms provide two core first-class services which are *create* and *transfer* assets. This functionality serves as a good base for our application.
- We can add additional features with ease by altering the ontology slightly.

Work done so far

- Current implementation allows only for RFQ transactions to be posted
- Different type of request will need different types of transaction
- The data is fetched from a predefined set of parameters
- There is no dynamic creation of request

Solution


Suzan
John
Bob
Isabel
Users
Helps
Generate
RFI
RFQ
RFP
Stored In
Contract is Finalised
B DB
Storage Architecture
Vendors

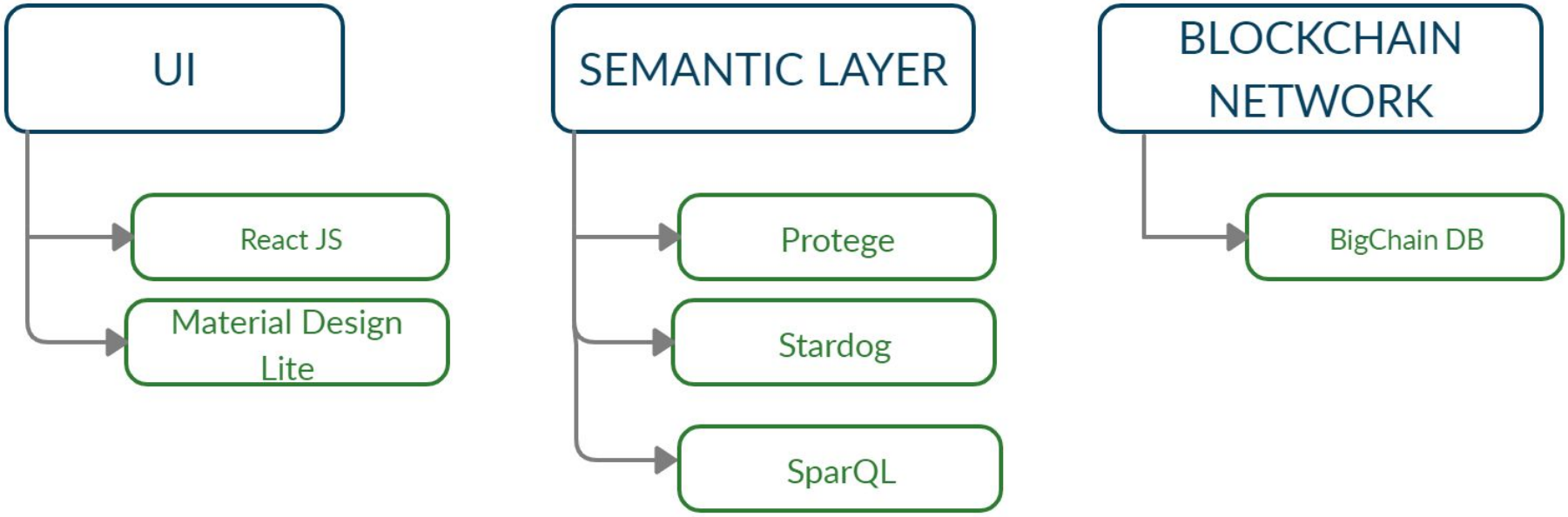
Semantic Layer

- Protege -
  - Open Source ontology editor and a knowledge management system

- Stardog -
  - A data-unification platform to connect to BigChainDB through the ontology verification.

- SparQL -
  - An RDF Query language or a semantic query language for databases to retrieve data stored in RDF (Resource Description Framework).

Technology Stack



Advantages of this approach

- Relieves the user from caring about granularities.
- Works on No Trust Policy as desired.
- Reduces the overhead for creating different types of transaction for each Request.
- Using SmartChainDB will promote fair and open competition for their business while minimizing risks such as exposure to fraud and collusion

Summary

- SmartChainDB and Ontology helps build smart, user-friendly, transparent, robust interfaces to ease procurement process
    - Cost-effective
    - Reduces human involvement
    - Highly Efficient
    - Transparent

Limitations

- Limited Knowledge of Manufacturing Domain
- Better User Interface
- Limited Ontology
- Validation of requests
- Limited to 4 types of Requests ie RFQ,RFP,RFT,RFI

Future Scope

- Expand the ontology with respect to manufacturing domain
- Enable bidding for the receivers to ensure that user receives the best bid for the goods/services.
- Mechanism to return a consolidated list of most likely bidders to the user(the creator of asset)
- Transferring the asset ownership on SmartChainDB after the asset the outsourcer is finalised
- Validation of assets that are being created

Course Reflection

The concepts applied in this project that were learnt in class

- Semantics ⇨ Ontology
- Blockchain ⇨ SmartChainDB

Acknowledgement

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Questions?