Creating a Blockchain Network for Supply Chain Management within the organization

(Airworks India Pvt.Ltd)

19CSE495

Project Phase – 1 Report

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INTRODUCTION

1.1 Introduction

What is Blockchain?

- Blockchain is a shared, immutable ledger that facilitates the process of recording transactions and tracking assets across corporate networks. Assets can be tangible (houses, cars, cash, land) and intangible (intellectual property, patents, copyrights, trademarks). Almost anything of value can be tracked and traded on a blockchain network, reducing risk and lowering costs for everyone involved.
- Blockchain is a type of shared database that differs from common databases in the way information is stored. Blockchain stores data in blocks and links them together using cryptography.
- As new data comes in, it is entered into a new block. When a block is filled with data, it is concatenated with the previous block and the data is concatenated in chronological order.
- Blockchains can store many different types of information**,** but the most common use so far **is** as a ledger of transactions.
- In the case of Bitcoin, the blockchain is used in a decentralized way, so that all users collectively hold control, rather than being controlled by one individual or group.
- A decentralized blockchain is immutable. This means that the entered data cannot be undone. For Bitcoin, this means that transactions are permanently recorded and can be viewed by anyone.

Why blockchain is important?

- Business is information. The faster and more accurate the reception, the better the results. Blockchain is ideal for providing this information because it provides instant, shared and completely transparent information stored in an immutable ledger that can only be accessed by authorized network members. Blockchain networks can track orders, payments, accounts, production, and more. And because members share a unified view of truth, they can see every transaction detail from start to finish, resulting in greater confidence, new efficiencies, and opportunities.

What are Smart Contracts?

- A smart contract is a program stored on the blockchain and executed when certain conditions are met. They are typically used to automate the execution of contracts, so that all parties can see the results immediately, without intermediaries and wasted time. You can also automate workflows and trigger the next action when conditions are met.
- A smart contract is a self-executing contract in which the terms and conditions between a buyer and a seller are written directly in lines of code. The code and the contracts it contains live on a decentralized**,** decentralized blockchain network. Code controls execution and transactions are traceable and irreversible.
- Smart contracts work by following simple "if/when...then..." statements written in code on the blockchain. A network of computers takes action when certain conditions are met and verified.

1.2 Motivation

Why Use Blockchain over traditional Software SDLC?

A key property of blockchain technology, which distinguishes it from traditional database technology, is public verifiability, which is enabled by integrity and transparency.

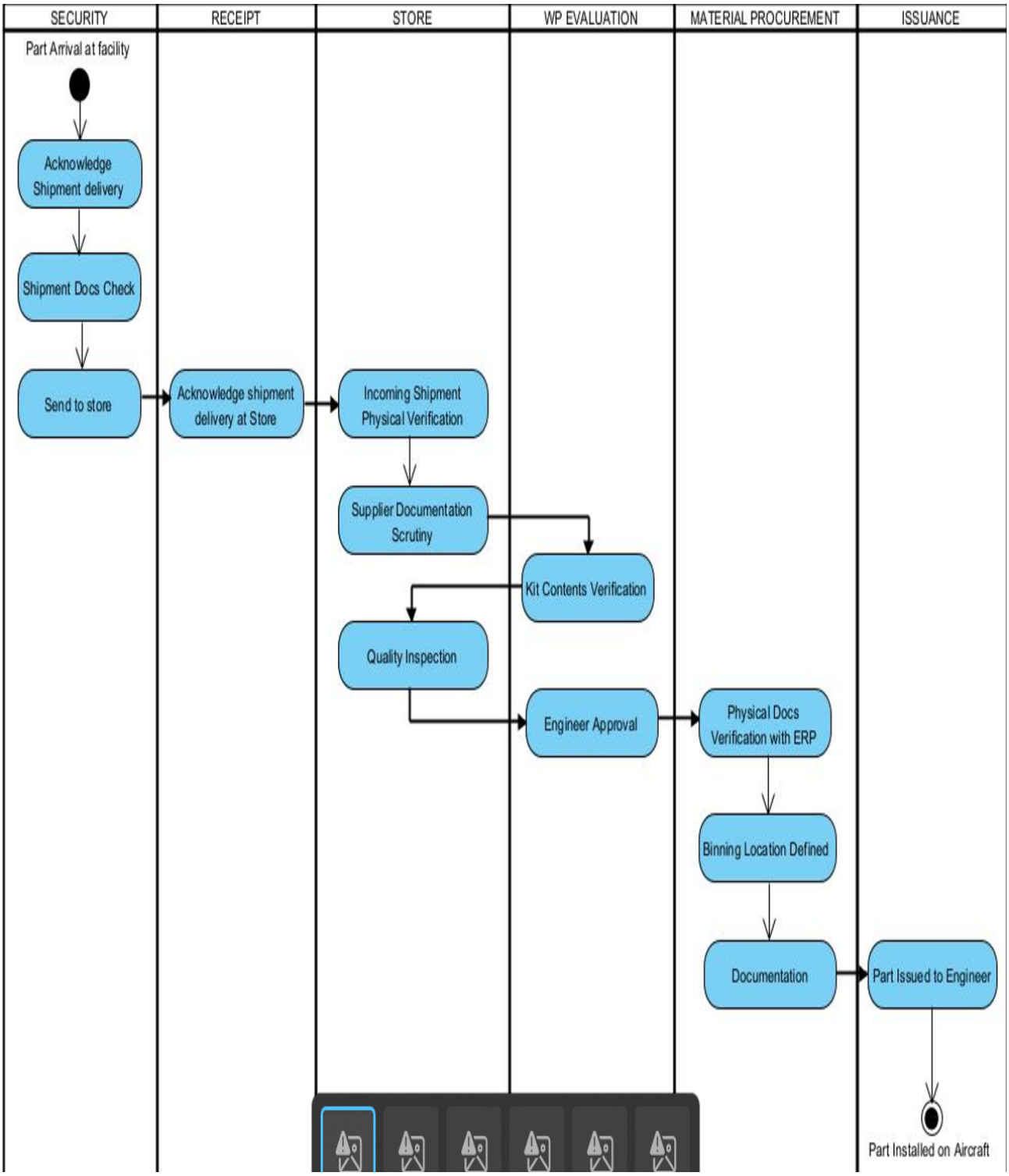
- **Integrity**: every user can be sure that the data they are retrieving is uncorrupted and unaltered since the moment it was recorded.

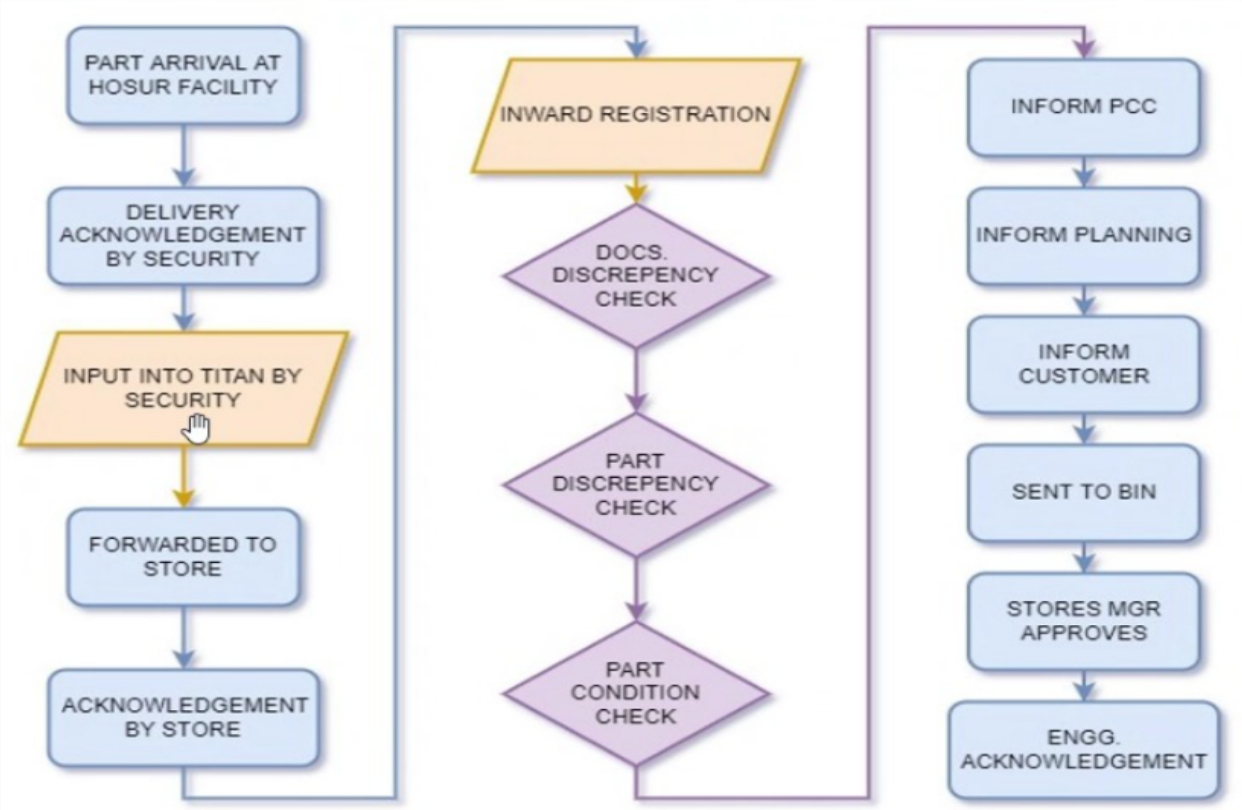
- **Transparency**: every user can verify how the blockchain has been appended over time.

1.3 Objective

- To get ready for deployment of the first track/trace/alert covering stores inward process from physical delivery of material at security checkpoint to binning. The target is that binning entails that a material is ready for issue in conformity with the process, with 1 hour as the design goal.
- To refine the above target and make it more engineering inspection compliant, with engineering inspection of incoming material and avoid work stoppage arising from missing items, especially items in kitted form.

FLOW DIAGRAM





CODE SNIPPETS

```
pragma solidity >=0.7.4;

contract Parts1{

    bytes32 public agreementFormIPFS;
    Parts public P1;
    address public Security;
    address public MaterialProcurement;
    address public Inspector;
    address public Planning;
    address public ProductionControl;
    address public TechServices;

    enum P1_State {NeedsSecurityAcknowledgement, PartReceived, PartNotReceived
, InTransitToStore, ImmediateReviewRequired,
    ProductionControlAppproved, PlanningApproved, TechServicesApproved, Custom
erNotified}
    uint256 time;
```

```
event PartReceivedAtGate();
event PartNotReceivedAtGate();
event PartInTransitToStore();
event PartNotReceivedAtStore();
event PartReceivedAtStore();
event NonDeferrableFaultFound();
event EvaluationApprovedByPlanning();
event EvaluationNotApprovedByPlanning();
event EvaluationApprovedByProductionControl();
event EvaluationNotApprovedByProductionControl();
event NotificationApprovedByTechServices();
event NotificationPendingByTechServices();
event DiscrepancyNotificationSentToCustomer();
```

Software/Tools Requirements

- Front End: React.js
- Back End: MongoDB, Solidity, Microsoft Azure
- H/W Requirements:
  Laptop with the following requirements:
  A minimum of 8GB RAM
  Integrated graphic card
  SSD 10GB
  VM

CONCLUSION

Once the application is developed and tested, it can be used to track, plan and alert the concerned users as per their privileges.