BLOCKCHAIN IN IOT AND SUPPLY CHAIN

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INTRO: Having the possibility to generate, sign and send transactions from the inside of a system enables any device capable of running the cryptography algorithms to directly take advantage of smart contracts, removing centralized gateways and points of failure. This can be applied to many different fields and increments trust from consumers and third parties.

For example, a supply chain can be monitored from the inside removing any single central authority storing the data and offering to final customers a certificate of the process goods is gone through. Going further, it can enable the economy of things, i.e. objects that can receive payments and offer services in exchange on-demand – like smart electricity meters offering a completely transparent service for the users.

ABOUT PROJECT:

How Blockchain (and IoT) Can Support the Supply Chain Industry?

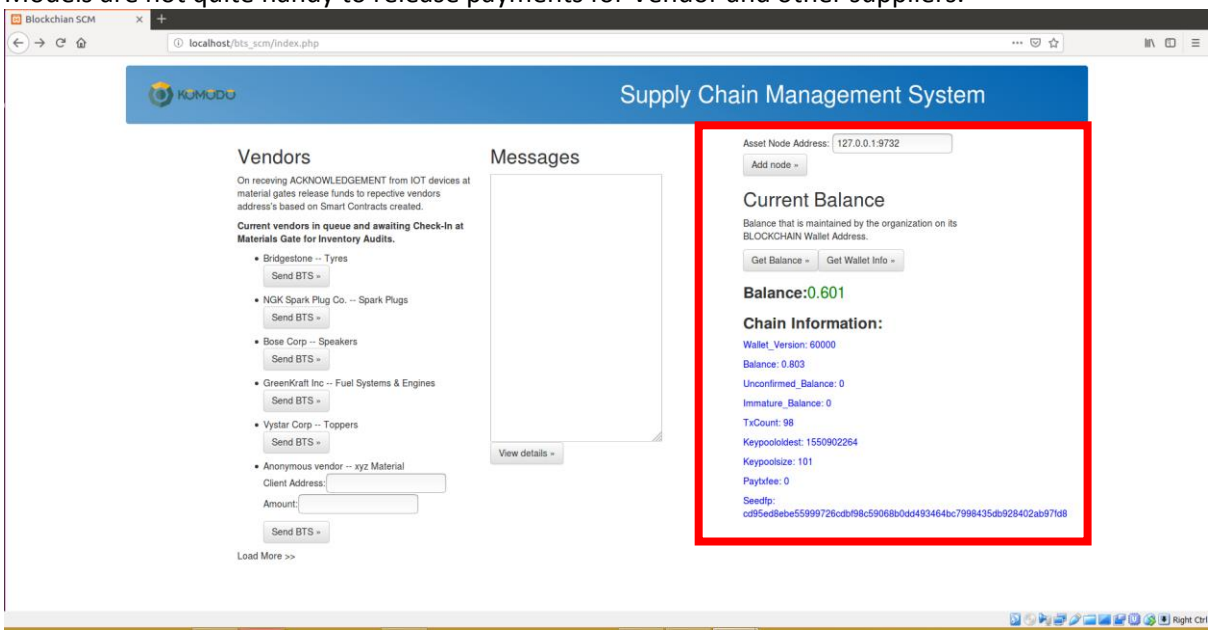
The biggest problems with the supply chain management industry can be addressed by improving access to data for all stakeholders in a trust-minimized way.

In commerce, supply chain management (SCM), the management of the flow of goods and services, involves the movement and storage of raw materials, of work-in-process inventory, and of finished goods from point of origin to point of consumption.

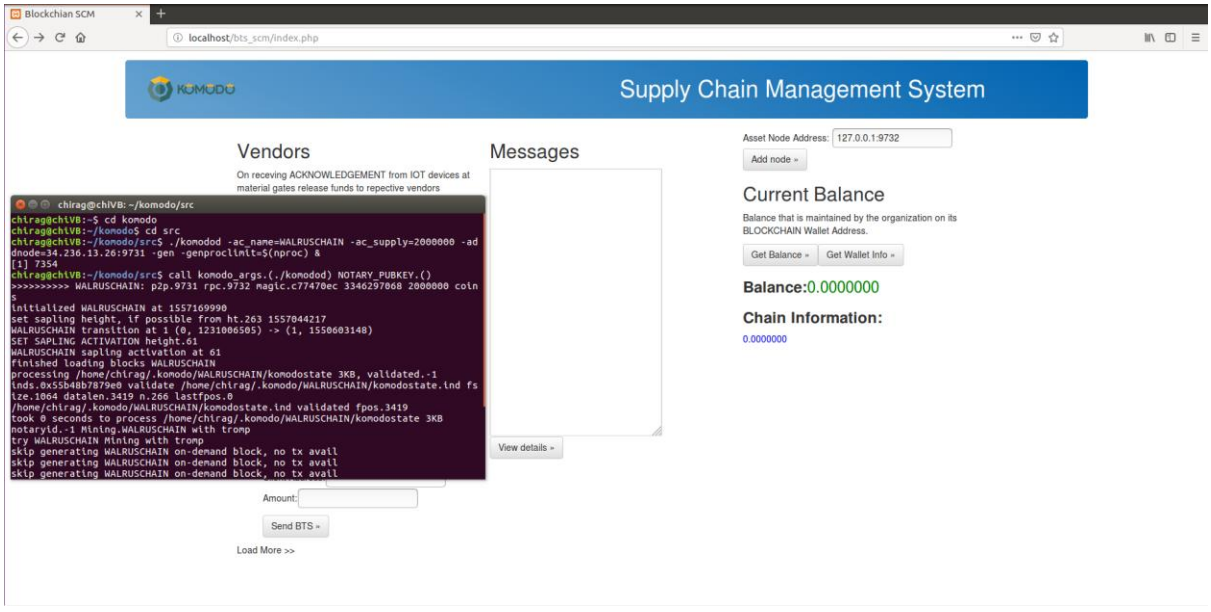
And within the supply chain management, a supply chain is the connected network of individuals, organizations, resources, activities, and technologies involved in the manufacture and sale of a product or service. A supply chain starts with the delivery of raw material from a supplier to a manufacturer and ends with the delivery of the finished product or service to the end consumer. (Source: Wiki & Investopedia)

WALKTHROUGH ON PROJECT:

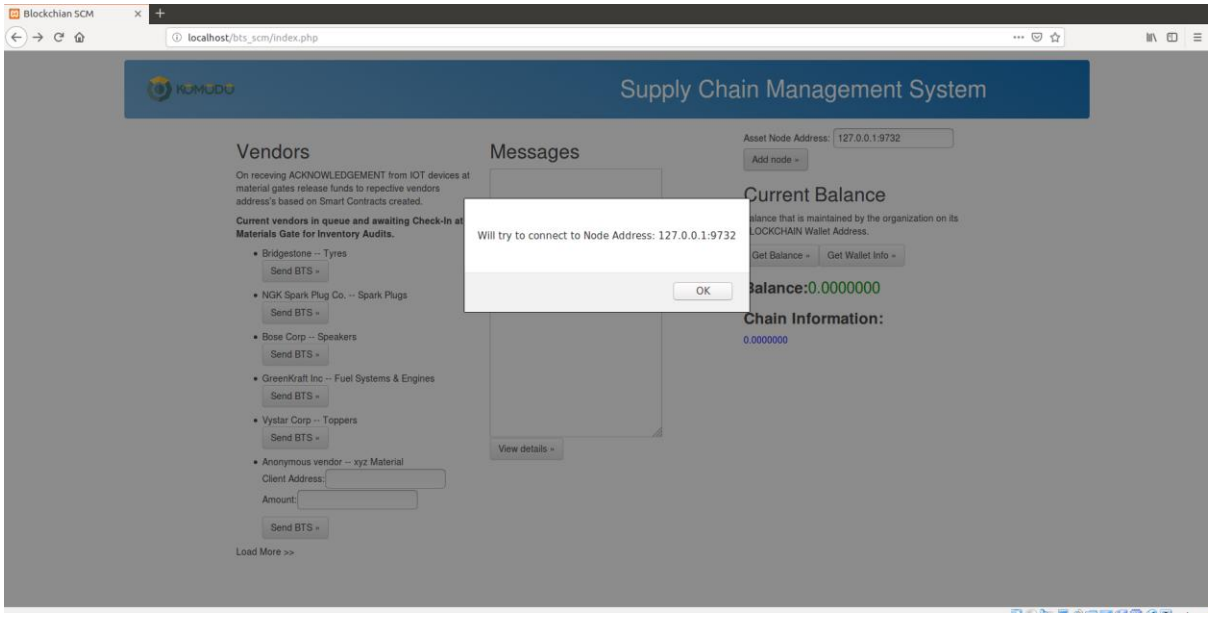
A portal is designed for Production Supervisors and Planners where using certain ERP and BOM Models are not quite handy to release payments for Vendor and other suppliers.



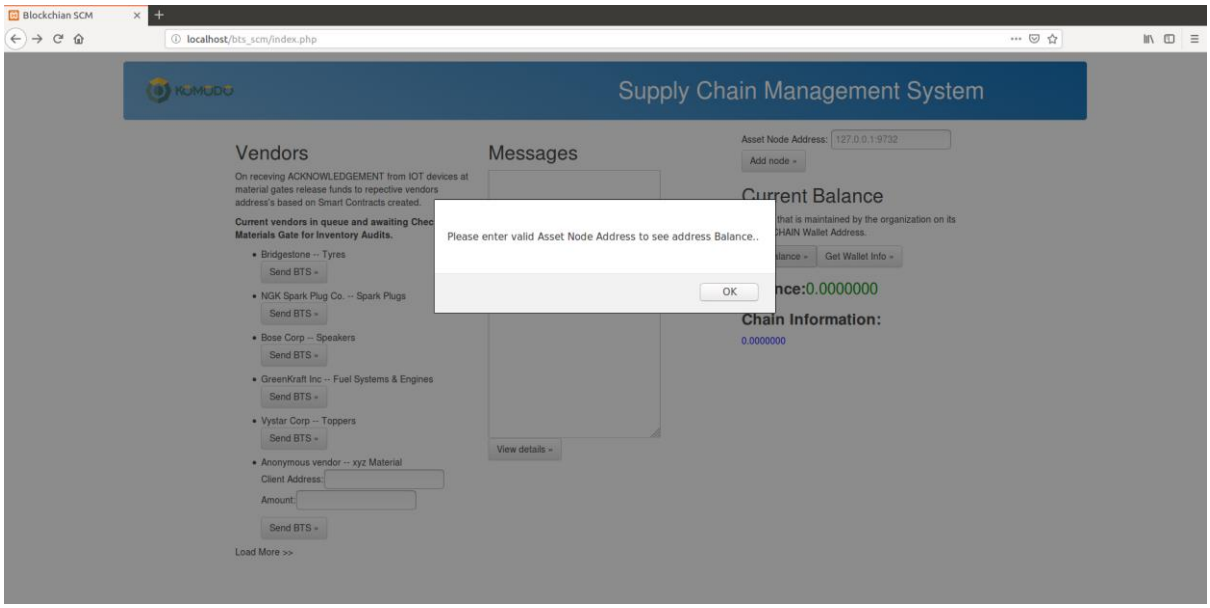
As shown in above image, a manger can check its organization balance and chain information; provided a node address where Blockchain Asset is running. Need to provide address and keep background server running.



After providing valid node address with rpc port to connect BTS system with the blockchain server.

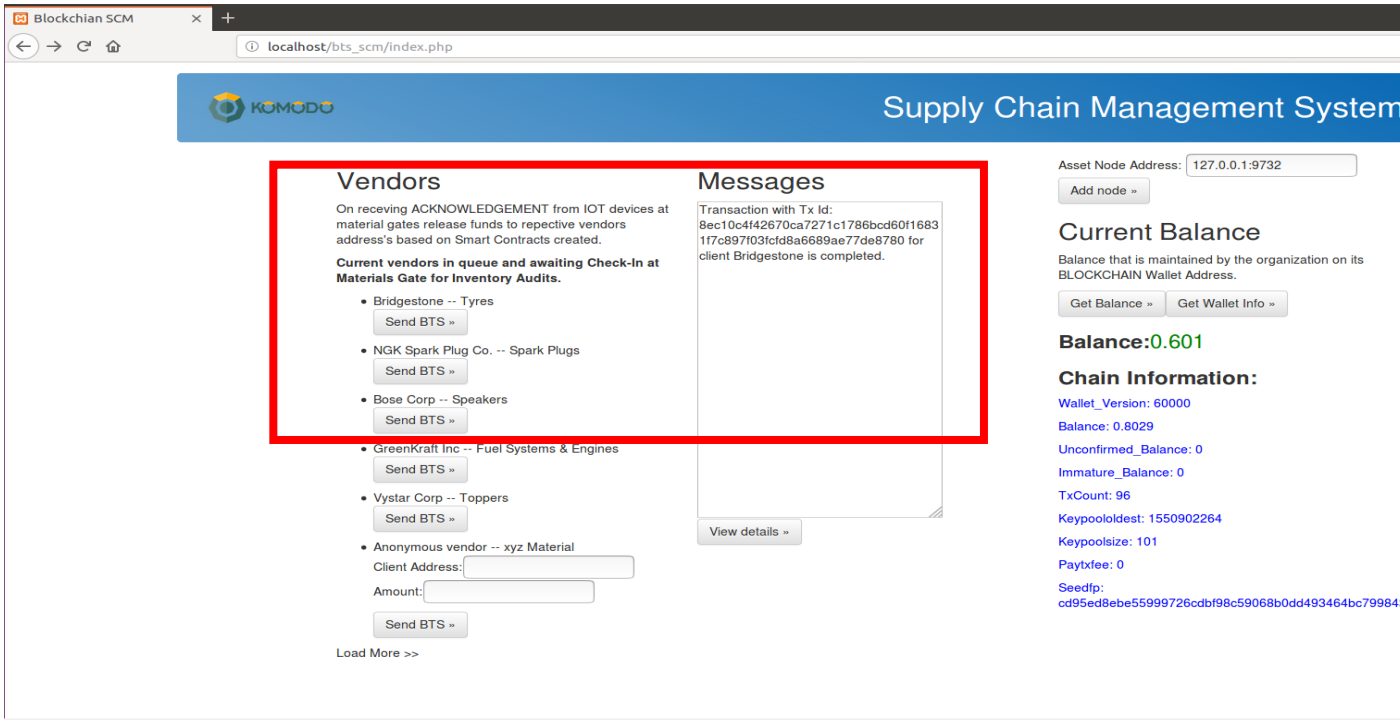


Cannot obtain any information if node Address is not entered.

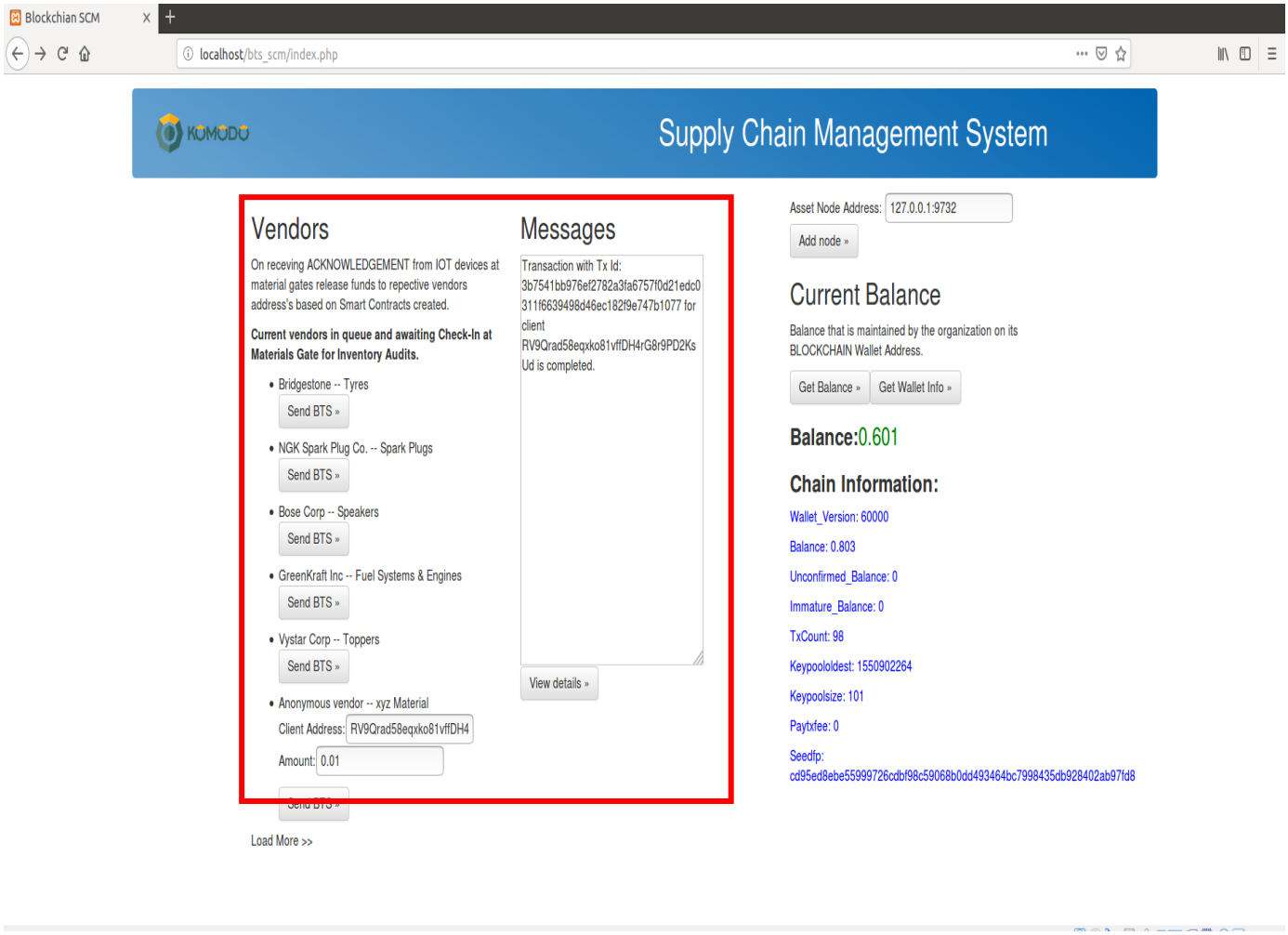


Based on RFID and IoT devices on entry gates of organizations. Audit is taken at inventories and alerts the BTS SCM system. Based on smart contracts logic and quantities that is received from respective vendors, amount is realised in bitcoins.

See the image below to have a clear idea and store the transaction id that is being generated.



In case there are temporary vendors that are still not registered in the system, but we still want to complete the transaction then provide the client address and enter the amount that needs to be transferred. This address is completely known to the manager or organization on their on-trust level.



Some backend snippets:

Using Php and JavaScript fundamentals connecting and making requests to the Blockchain server to get more information.

```
function showWalletInfo() {
  if(nodeAddress!=""){
    $.ajax({
          url: 'rpc_call.php',
          type: 'post',
          data: { "get_wallet_info": "getinfo", "nodeAddress":nodeAddress},
          success: function(response){
            //alert(response);
            document.getElementById("chain_info").innerHTML = response;
           }

    });
  }
  else{
    alert("Please enter valid Asset Node Address to see Wallet Info.. ");
  }
}
```

index.php | rpc_call.php

```
'params': [] }' -H 'content-type: text/plain;' http://127.0.0.1:9732/

if (isset($_POST['get_wallet_bal'])) {
        if(isset($_POST['nodeAddress'])){
            $nodeAddress = $_POST['nodeAddress'];
            $url = 'http://'.$nodeAddress.'/';
        }
        getReceivedByAddressInfo($_POST['get_wallet_bal'],$url);
}
elseif (isset($_POST['get_wallet_info'])) {
    if(isset($_POST['nodeAddress'])){
            $nodeAddress = $_POST['nodeAddress'];
            $url = 'http://'.$nodeAddress.'/';
        }
        getInfo($url);
}
elseif (isset($_POST['send_address_bal'])) {
    if(isset($_POST['nodeAddress'])){
            $nodeAddress = $_POST['nodeAddress'];
            $url = 'http://'.$nodeAddress.'/';
        }
        sendToAddress($_POST['send_address_bal'],$url);
}


function getInfo($url){
$data = array("jsonrpc" => "1.0", "id" => "curltest","method" => "method", "params"=> "[]");
$data_string="{\"jsonrpc\":\"1.0\",\"id\":\"gettingwalletinfo\",\"method\":\"getwalletinfo\",\"params\":[]}";
//json_encode($data);
$ch = curl_init($url);
curl_setopt($ch, CURLOPT_USERPWD, "user1647593239" . ":" . "pass7e6b0d8e6e6af354d69b0a4c4f90226aff7f48aaea912e7d

curl_setopt($ch, CURLOPT_CUSTOMREQUEST,  "POST");
curl_setopt($ch, CURLOPT_POSTFIELDS, $data_string);
curl_setopt($ch, CURLOPT_RETURNTRANSFER, true);
curl_setopt($ch, CURLOPT_HTTPHEADER, array('Content-Type: application/json'));
$result = curl_exec($ch);
//$result= json_encode($result);
$chain_info="No Wallet Information Available";
$response = json_decode($result,true);
foreach($response as $k=>$v){
    if($k == "result"){
        $chain_info = $v;
    }
}
echo "<div>";
echo "<p>Wallet_Version: ".$chain_info["walletversion"]."</p>";
echo "<p>Balance: ".$chain_info["balance"]."</p>";
echo "<p>Unconfirmed_Balance: ".$chain_info["unconfirmed_balance"]."</p>";
echo "<p>Immature_Balance: ".$chain_info["immature_balance"]."</p>";
echo "<p>TxCount: ".$chain_info["txcount"]."</p>";
echo "<p>Keypoololdest: ".$chain_info["keypoololdest"]."</p>";
echo "<p>Keypoolsize: ".$chain_info["keypoolsize"]."</p>";
echo "<p>Paytxfee: ".$chain_info["paytxfee"]."</p>";
echo "<p>Seedfp: ".$chain_info["seedfp"]."</p>";
echo "</div>";
}
```