

## MOOSE : Matlab Tool for STPA Evaluation

Report created on : 26-Mar-2023 09:25:22

Table 1: The Losses identified are

|         |                                   |
|---------|-----------------------------------|
| Loss 01 | Loss of Money                     |
| Loss 02 | Loss of Reputation                |
| Loss 03 | Loss of Certification/Permissions |
| Loss 04 | Loss to Organisation              |

Table 2: The Hazards identified are

|                           |           |                                     |                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------|-----------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Loss 01                   | Hazard 01 | Wrong receipt                       | <p>The app should ensure that payment is made to the right recipient</p> <p>The app should ensure that the right recipient is in the database</p> <p>The app should cross check with the user before payment is made, of correct recipient</p>                                                                                                      |
| Loss 02, Loss 01          | Hazard 02 | Invalid amount sent/received        | <p>The app should ensure that payment of the right amount is made</p> <p>The app should check that amount is available to the user before making payment</p> <p>The app should cross check with the user before payment is made, of correct amount</p> <p>The app should ensure that enough money is in account to handle the donation amounts.</p> |
| Loss 02, Loss 03, Loss 04 | Hazard 03 | non compliance of local regulations | <p>The app should follow the requirements provided by the statutory bodies</p> <p>The app development team shall use an expert to certify the system and check compliance.</p>                                                                                                                                                                      |
| Loss 02, Loss 01, Loss 04 | Hazard 04 | Money provided to Bad donatee       | <p>The app should provide a system for checking the validity and existence of the donor, through different means. (method for rating based donatee checking)</p>                                                                                                                                                                                    |
| Loss 04                   | Hazard 05 | Low use of the app                  | <p>The app should be designed keeping in mind ease of use and simplicity.</p>                                                                                                                                                                                                                                                                       |
| Loss 02, Loss 03          | Hazard 05 | Delays in Transaction               | <p>The app and the associated server processes should be performed within specified time frames.</p>                                                                                                                                                                                                                                                |

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| <b>Responsibility</b>                       | <b>Not providing causes hazard</b>                   | <b>Providing causes hazard</b>                                  | <b>Too early, too late, out of order</b>                         | <b>Stopped too soon, applied too long</b>                           |
|---------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------|------------------------------------------------------------------|---------------------------------------------------------------------|
| Responsible<br>Block : User                 |                                                      |                                                                 |                                                                  |                                                                     |
| Provide feedback on the app                 | [#H5] Not providing any issues with app              | [#H5] Providing wrong feedback on the app                       | [#H5] Providing feedback on old issues already fixed             | [#H5] Providing the same feedback on realised issue                 |
| Provide recipient data and amount           | [#H5] Not providing data in the app                  | [#H1][#H2] Providing incorrect data                             | [#H6] Providing data when unprompted                             | [#H6] Stopped data entry too soon (scanning quickly)                |
| Provide rating for donatee                  | [#H4][#H5] Not providing details of bad donatee      | [#H5] Providing wrong feedback for donatee                      | [#H4] Providing feedback late and list late                      | [#H4][#H3] providing donatee list and removing within month         |
| Responsible<br>Block : Money Transfer       |                                                      |                                                                 |                                                                  |                                                                     |
| Send transaction details to server          | [#H6][#H5] Not providing the request for transaction | [#H1][#H2][#H6] Providing incorrect/unauthorised data to server | [#H6][#H5] Providing request late or early without authorisation | [#H6] Continuously send request, or stop request too soon           |
| Responsible<br>Block : Donatee Addition     |                                                      |                                                                 |                                                                  |                                                                     |
| Send donatee list                           | [#H5][#H4] Not providing list approved by user       | [#H4][#H5] Providing a list not approved by the user            | [#H6][#H5] Providing donatee list too late after user approves   | [#H5] Updated donatee list not refreshed/old list continuously sent |
| Responsible<br>Block : Government Dept / IT |                                                      |                                                                 |                                                                  |                                                                     |
| Provide guidelines to follow                | [#H3][#H5] Not providing guidelines to follow        |                                                                 | [#H3] Providing guidelines too late                              |                                                                     |
| Audit the system                            | [#H3][#H5] Not providing audits of system            | [#H6] Providing audits which affect business processes          | [#H3] providing audit too late                                   |                                                                     |
| Responsible<br>Block : Server Controller    |                                                      |                                                                 |                                                                  |                                                                     |
| Monitoring metrics                          | [#H5][#H3] Not providing metrics for app improvement |                                                                 | [#H5] Providing metrics too late                                 |                                                                     |
| Check receipt correctness                   | [#H1] Not checking the correct recipient             | [#H1] Providing a check for incorrect                           | [#H6][#H1] Checking the                                          | [#H6] Request for check timed out or                                |

|                               |                                                            |                                                                |           |                                                                    |                                                                          |
|-------------------------------|------------------------------------------------------------|----------------------------------------------------------------|-----------|--------------------------------------------------------------------|--------------------------------------------------------------------------|
|                               |                                                            |                                                                | recipient | recipient requests                                                 | stopped too soon                                                         |
| Check amount availability     | [#H6][#H2] Not providing check for balance before withdraw | [#H6][#H2] Providing wrong check for balance                   |           | [#H6][#H2] Providing check too late, out of order                  | [#H6][#H2] Providing check of balance too late                           |
| Create audit reports          | [#H3] Not providing audit reports for analysis             | [#H3] Providing incorrect audit report                         |           | [#H3] Providing reports too late                                   |                                                                          |
| Perform delivery of donations | [#H3][#H5] Not providing donation money to donatees        | [#H5][#H4] Money provided to wrong donatees, or more than once |           | [#H5][#H6] Donation money provided too late/without enough balance | [#H4][#H5][#H2] Donation money provided to old donatees without updation |

Make a table and provide constraints for the UCA(s)

|      |                                   |    |                                                          |                                                                                                                                          |
|------|-----------------------------------|----|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| User | Provide feedback on the app       | 1  | NP: [#H5] Not providing any issues with app              | During development, the system shall request for feedback on the app operations from the user                                            |
| User | Provide feedback on the app       | 2  | P: [#H5] Providing wrong feedback on the app             | While analysing the feedback from the users, the system shall include a rating system or otherwise, to classify bad feedbacks from good. |
| User | Provide feedback on the app       | 3  | TE: [#H5] Providing feedback on old issues already fixed | The system shall provide a means to mark task status and timely updates                                                                  |
| User | Provide feedback on the app       | 4  | S: [#H5] Providing the same feedback on realised issue   | The system shall provide a way for users to track their feedback and check if it resolved.                                               |
| User | Provide recipient data and amount | 5  | NP: [#H5] Not providing data in the app                  | The system shall prompt the user to provide the required information.                                                                    |
| User | Provide recipient data and amount | 6  | P: [#H1][#H2] Providing incorrect data                   | The system shall confirm with the user on the data provided for transaction.                                                             |
| User | Provide recipient data and amount | 7  | TE: [#H6] Providing data when unprompted                 | The system shall ensure that data can be provided only when prompted and it is of the required type                                      |
| User | Provide recipient data and amount | 8  | S: [#H6] Stopped data entry too soon (scanning quickly)  | The system shall ensure that the prompt for data entry stays till data is entered, and shall provide additional prompts for ease of use  |
| User | Provide rating for donatee        | 9  | NP: [#H4][#H5] Not providing details of bad donatee      | While the user removes a donatee, The system shall enforce the user to provide a rating for a donatee or reasons for removal             |
| User | Provide rating for donatee        | 10 | P: [#H5] Providing wrong feedback for donatee            | The system shall ensure that donatee feedback is collated and averaged out before removal of donatee from the system                     |
| User | Provide rating for donatee        | 11 | TE: [#H4] Providing feedback late and list               | The system shall provide timely reminders to provide feedback if not                                                                     |

|                      |                                    |    |                                                                        |                                                                                                                                                 |
|----------------------|------------------------------------|----|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| User                 | Provide rating for donatee         | 12 | late<br>S: [#H4][#H3] providing donatee list and removing within month | provided.<br>The system shall provide a method for the calculation of donatee amounts to overcome any ambiguity                                 |
| Money Transfer       | Send transaction details to server | 13 | NP: [#H6][#H5] Not providing the request for transaction               | The system shall convey the transaction details to the server for execution                                                                     |
| Money Transfer       | Send transaction details to server | 14 | P: [#H1][#H2][#H6] Providing incorrect/unauthorised data to server     | The system shall confirm with the user and only on confirmation, provide the data to the server                                                 |
| Money Transfer       | Send transaction details to server | 15 | TE: [#H6][#H5] Providing request late or early without authorisation   | The system shall ensure that the request is authorised and will send the request to server within TBD time.                                     |
| Money Transfer       | Send transaction details to server | 16 | S: [#H6] Continuously send request, or stop request too soon           | The system shall wait for the acknowledgement from the server, for TBD time before time out.                                                    |
| Donatee Addition     | Send donatee list                  | 17 | NP: [#H5][#H4] Not providing list approved by user                     | The system shall provide the list of donatees approved by the user within TBD time from approval                                                |
| Donatee Addition     | Send donatee list                  | 18 | P: [#H4][#H5] Providing a list not approved by the user                | The system shall ensure that only the list approved by the user is sent to the server within TBD time.                                          |
| Donatee Addition     | Send donatee list                  | 19 | TE: [#H6][#H5] Providing donatee list too late after user approves     | The system shall ensure that the list approved by user is sent to server within TBD time                                                        |
| Donatee Addition     | Send donatee list                  | 20 | S: [#H5] Updated donatee list not refreshed/old list continuously sent | The system shall ensure that any changes to donatee list is updated within TBD time                                                             |
| Government Dept / IT | Provide guidelines to follow       | 21 | NP: [#H3][#H5] Not providing guidelines to follow                      | The developer shall obtain any related guidelines from official bodies                                                                          |
| Government Dept / IT | Provide guidelines to follow       | 22 | TE: [#H3] Providing guidelines too late                                | The developer shall obtain the guidelines before project start                                                                                  |
| Government Dept / IT | Audit the system                   | 23 | NP: [#H3][#H5] Not providing audits of system                          | The developer shall submit the audits reports obtained from the system and follow up with timely audits                                         |
| Government Dept / IT | Audit the system                   | 24 | P: [#H6] Providing audits which affect business processes              | The developer shall maintain and update any guidelines obtained and shall have a framework to ensure that the guidelines are latest and correct |
| Government Dept / IT | Audit the system                   | 25 | TE: [#H3] providing audit too late                                     | The developer shall submit the audits reports obtained from the system and follow up with timely audits                                         |
| Server Controller    | Monitoring metrics                 | 26 | NP: [#H5][#H3] Not providing metrics for app improvement               | The system shall perform monitoring of metrics of the app usage                                                                                 |

|                   |                               |    |                                                                             |                                                                                                                                                                         |
|-------------------|-------------------------------|----|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Server Controller | Monitoring metrics            | 27 | TE: [#H5] Providing metrics too late                                        | The system shall update the metrics in use for app development                                                                                                          |
| Server Controller | Check receipt correctness     | 28 | NP: [#H1] Not checking the correct recipient                                | The system shall check the correctness of the recipient internally and confirm the same with the user                                                                   |
| Server Controller | Check receipt correctness     | 29 | P: [#H1] Providing a check for incorrect recipient                          | The system shall ensure that the request for identity check is matched to the corresponding transaction.                                                                |
| Server Controller | Check receipt correctness     | 30 | TE: [#H6][#H1] Checking the recipient requests out of order                 | The system shall ensure that the request for identity check is matched to the corresponding transaction.                                                                |
| Server Controller | Check receipt correctness     | 31 | S: [#H6] Request for check timed out or stopped too soon                    | The system shall ensure that request for check is timed, and should wait for acknowledgement.                                                                           |
| Server Controller | Check amount availability     | 32 | NP: [#H6][#H2] Not providing check for balance before withdraw              | The system shall check internally for available balance before performing the transaction.                                                                              |
| Server Controller | Check amount availability     | 33 | P: [#H6][#H2] Providing wrong check for balance                             | The system shall check balance value for the required recipient obtained from the request                                                                               |
| Server Controller | Check amount availability     | 34 | TE: [#H6][#H2] Providing check too late, out of order                       | The system shall ensure that balance check is matched to appropriate transaction in the queue.                                                                          |
| Server Controller | Check amount availability     | 35 | S: [#H6][#H2] Providing check of balance too late                           | The system shall ensure that balance is checked and verified, before any type of transaction.                                                                           |
| Server Controller | Create audit reports          | 36 | NP: [#H3] Not providing audit reports for analysis                          | The system shall automate the process of providing audit reports.                                                                                                       |
| Server Controller | Create audit reports          | 37 | P: [#H3] Providing incorrect audit report                                   | The system shall provide the correct reports for the different users / donatees.                                                                                        |
| Server Controller | Create audit reports          | 38 | TE: [#H3] Providing reports too late                                        | The system shall provide timely reports for audit and other IT purposes                                                                                                 |
| Server Controller | Perform delivery of donations | 39 | NP: [#H3][#H5] Not providing donation money to donatees                     | The system shall ensure that donation money is delivered to the donatees in the appropriate time intervals                                                              |
| Server Controller | Perform delivery of donations | 40 | P: [#H5][#H4] Money provided to wrong donatees, or more than once           | The system shall mark the already paid donatees and keep track of which donatee gets what amount.                                                                       |
| Server Controller | Perform delivery of donations | 41 | TE: [#H5][#H6] Donation money provided too late/without enough balance      | The system shall ensure that there is sufficient balance on hand to provide the donatees money. It shall also make sure that the donation money delivery is not delayed |
| Server Controller | Perform delivery of donations | 42 | S: [#H4][#H5][#H2] Donation money provided to old donatees without updation | The system shall ensure that already paid donatees are not paid again.                                                                                                  |

## Additional Requirements

### Server - Money transfer/app – User loop

1. User should verify that the app installed is the correct app and obtained from valid sources.
2. Server should provide means for the user to check the app correctness and to check whether the correct server is being contacted
3. Server should provide a secure environment when installation of the app
4. Connection between app and server should be secure, and the protocol for the data in the messages should not be known outside the system.
5. Registration of the User should use AADHAR or any other government authentication measures.
6. The system can also use verified third party systems for determining validity of the app.

### Functional Requirements :

- 1.