1. This information system shall be able to fetch packages’ details that are marked to be delivered when date changes or allow SP to push respective packages’ details.
   1. The system shall be able to fetch package details if service providers (SP) are giving API to fetch details.
      1. The system shall fetch details within 10 minutes after 12am when date changes.
         1. This system shall repeat this process daily when date changes.
   2. The system shall provide it’s API to send details to be called by SP to send details to this Information System about packages to be delivered today.
      1. The system shall be able to refresh its list of packages to be delivered whenever SP will call API to send details.
2. The system shall analyze the states of delivery boxes within the region of address given by sender and will prepare list of available boxes.
   1. The system shall process the information of categories/compartments (Large, Medium, Small) of delivery box.
   2. The system shall prepare the queue of delivery boxes with empty compartments that matches the requirements of parcel.
      1. The system shall allow only those parcel that matches dimensions and weight bearing capacity of compartments of delivery box.
3. The system shall send notification to receiver to select his preferred delivery box within 5 hours.
   1. The system shall send notification at 9am when business day starts and will wait for 5 hours to get preference.
4. The system shall allow receiver to give his preferred delivery box within 5 hours after notification received.
   1. The system shall allow receiver to view list of available delivery boxes.
5. The system shall be able to assign delivery box after waiting for 5 hours if receiver does not send his choice within 5 hours.
   1. The system shall revoke the right to select delivery box from receiver.
   2. The system shall assign compartment of delivery box that is top in queue of QFC.
6. The system shall prepare the list of reserving delivery boxes’ compartments
   1. The system shall reserve the compartment in the suggested delivery box by changing its state from empty to reserved.
   2. The system shall add the preferred compartment to list of reserved compartments of delivery box.
7. The system shall be able to send details of selected delivery boxes to the SP warehouse
   1. The system shall call the SP’s API to send reserved list of compartments of delivery boxes if SP is providing API
   2. The system shall provide API to be called by SP to get list of reserved compartments of delivery boxes.
8. The system shall allow sender to send parcel through delivery boxes.
   1. The system shall allow sender to search for available delivery boxes by entering his required details.
   2. The system shall allow sender to temporarily reserve required compartment in delivery box for 5 hours.
      1. After 5 hours, reservation of compartment will be revoked, and sender will be notified.
   3. The system shall put information of parcel by sender in the queue of QIC after the placement of parcel in compartment of delivery box.
      1. The system shall prepare the list of parcels to be picked by SP to deliver at destination delivery box.
9. The system shall allow SP to get updated list of parcels to pick by SP for delivery.
   1. The system shall call the API if provided by SP at each time information enqueue in QIC.
   2. The system shall provide API if not provided by SP to call for getting updated list of parcels to deliver.
10. The system shall notify receiver when parcel will be delivered to the respective delivery box.
11. The system shall send OTP to SP, receiver and sender.
    1. The system shall send OTP to sender only if he is sending parcel thru delivery box after when he will reserve the compartment for 5 hours.
    2. The system shall send OTP to receiver only after the placement of parcel in the respective delivery box’s compartment.
    3. The system shall send OTP to SP for picking-up and delivering parcel time.
       1. The system shall send OTP to SP after placement of parcel in delivery box’s compartment by the sender.
       2. The system shall send OTP to SP after the finalization of destination delivery box’s compartment.
12. The system shall allow receiver to take his parcel by getting OTP as input.
13. The system shall update the state of delivery boxes after their state will be changed.
14. The system shall revoke the right from receiver to take parcel form delivery box.
    1. The system shall notify the receiver if he does not take parcel form delivery box for 2 days excluding the day when the parcel was delivered.
       1. The system shall prepare the queue of unpicked parcels (QUP) (parcels not received by receiver)
15. The system shall update the SP about unpicked parcels.
    1. The system shall provide API to SP for fetching QUP
16. The system shall allow receivers to reschedule their delivery process within 1 day of revocation of delivery.
    1. The system shall allow receivers to repeat the process of selecting delivery box. (FR 4)
    2. The system shall not allow receivers to reschedule their delivery if they do not schedule their delivery within 1 day.
       1. The system shall put the unpicked items’ details in queue of failed delivery Parcels (QFDP)
    3. The SP shall handle the delivery of failed delivery parcels according to their policies.
17. The system shall provide API to SP to get updated list of failed attempts (QFDP).
18. The system shall allow sender to cancel the reserved compartment within 5 hours of reservation.
19. The system shall allow receiver to edit the reserved compartment within 1 hour of reservation.

Nonfunctional requirements:

1. Availability

System shall be available on the internet for easy access in time other than maintenance time reported via notification

1. Performance

System shall response within 5-10 seconds of request

1. Usability

system shall be easy to use for anyone who can browse things easily

1. Maintainability

System shall be available within time given to user when it will go offline due to any reason

1. Testability

system shall be testable during whole phase of development

1. Compatibility

System shall be compatibility with the system of SPs

1. Security

Important data such OTP that involves risks or vulnerability shall be encrypted end-to-end.

1. Reliability

System shall not face critical failure when it is available.

1. Responsiveness

System shall be responsive for all devices including laptop, mobile, and tablet.

1. Portability

System shall be able to work on all operating systems that will support chrome, edge, or safari.

Quality attributes

1. Performance

System will perform effectively so that user will not feel any issue. It will be fast and quick in response. (NFR 2)

1. Usability

System will be easy to use and understand (NFR 3)

1. Security

Crucial data of user will be protected end-to-end for security from threats and risks. (NFR 7)

1. Maintenance

There will be no issue in maintaining any module of system. User will be notified about maintenance time for that user might not be able to use system. (NFR 4)

1. Compatibility

There will be no compatibility issue for user in terms of supporting and for SPs in terms of integration. (NFR 10 and 6)

1. Responsiveness

System will be easy to navigate for all users and will be intuitive to understand. (NFR 9)

Assumptions:

1. The delivery box we are expecting with minimum functionalities is available in market.
2. Working system of SP can be integrated with this system.
3. The embedded system of delivery box can easily be integrated with this system.
4. The delivery box is connected with internet 24/7.
5. The users must have knowledge of browsing over the internet.
6. The users will be connected to internet when using the internet.

Use Cases:

1. Reserving compartment for sending parcel
2. Selecting compartment for receiving parcel
3. Tracking parcel delivery
4. Canceling compartment reservation by sender
5. Editing compartment reservation by receiver
6. Receiving parcel
7. Placement of parcel

Diagrams:

1. ERD
2. UCD
3. DFD (Data Dictionary)