SYSTEM USERS

Customer
Plumber
Service manager

USE CASES

Complaint registration
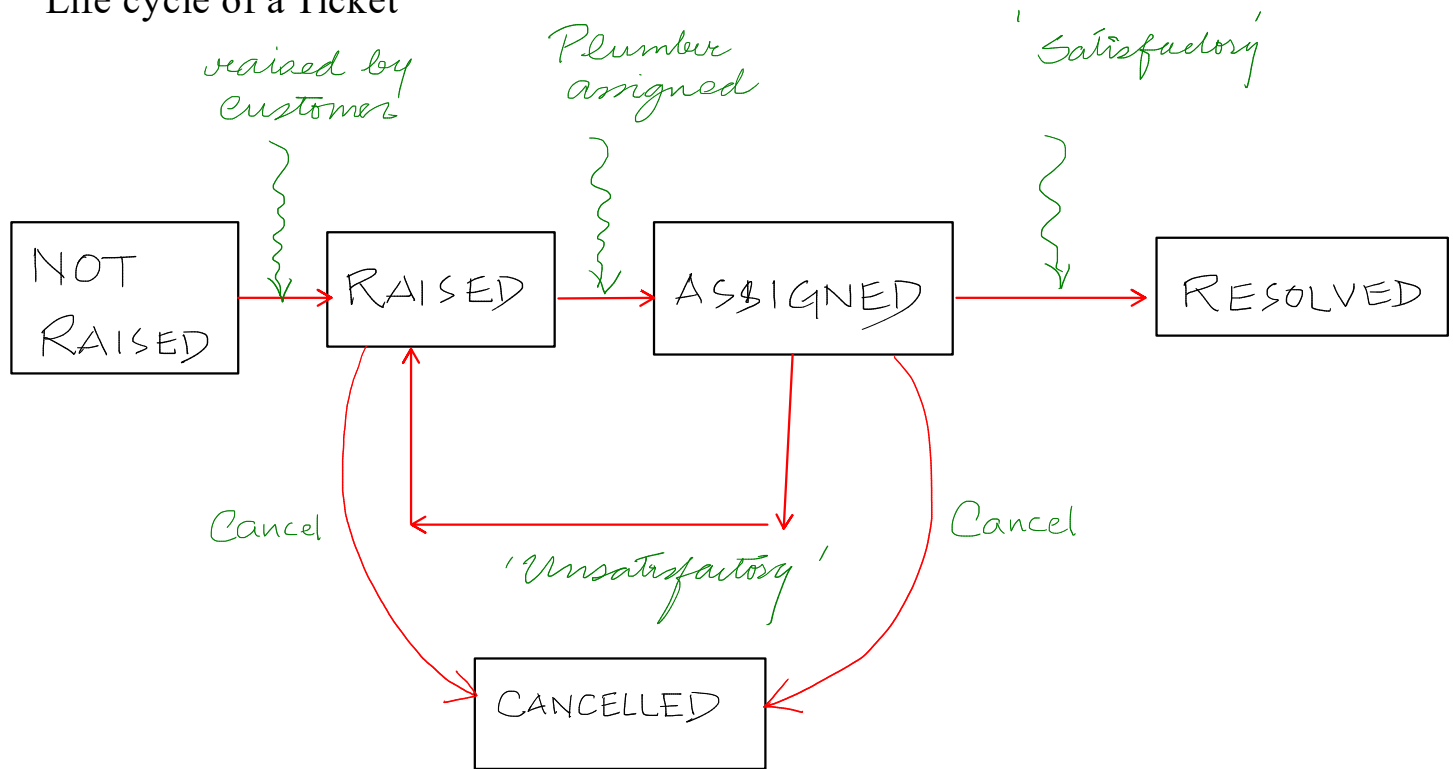Complaint allocation
Complaint processing
Complaint closure
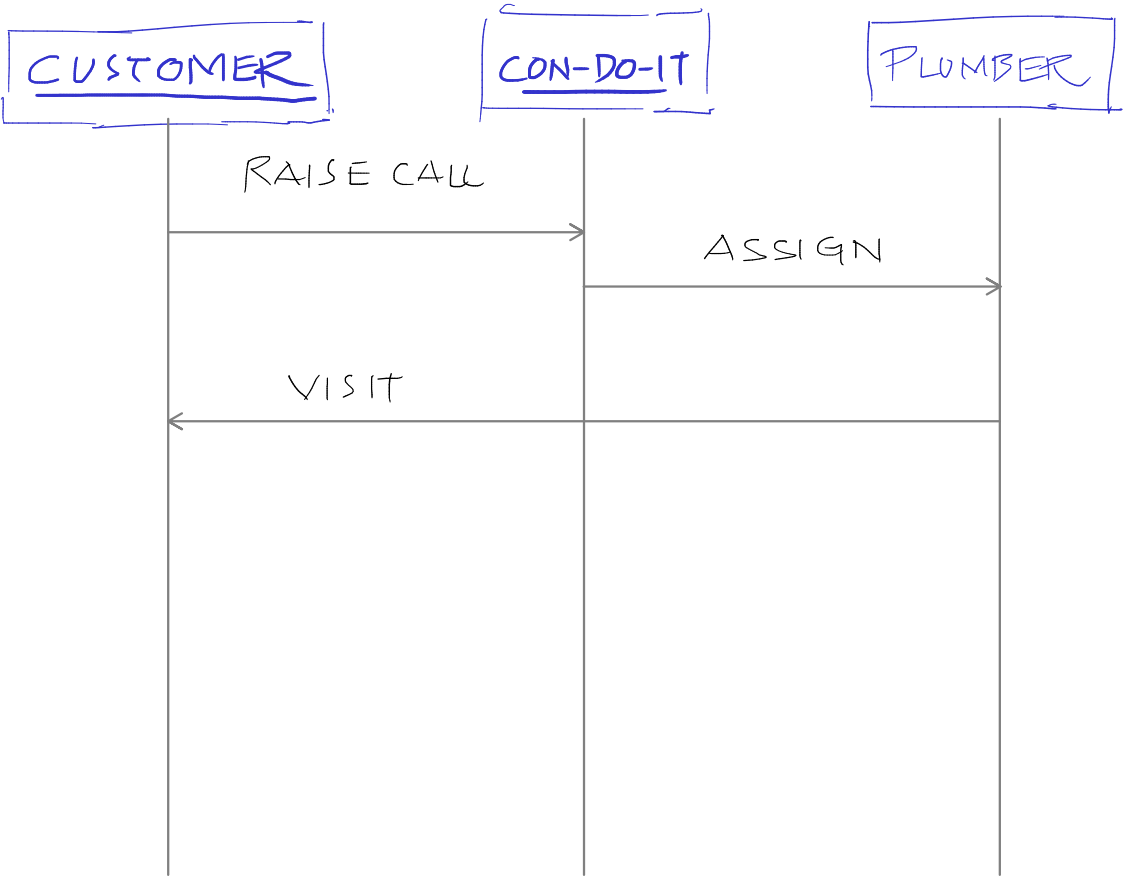Feedback recording and redressals

Life cycle of a Ticket

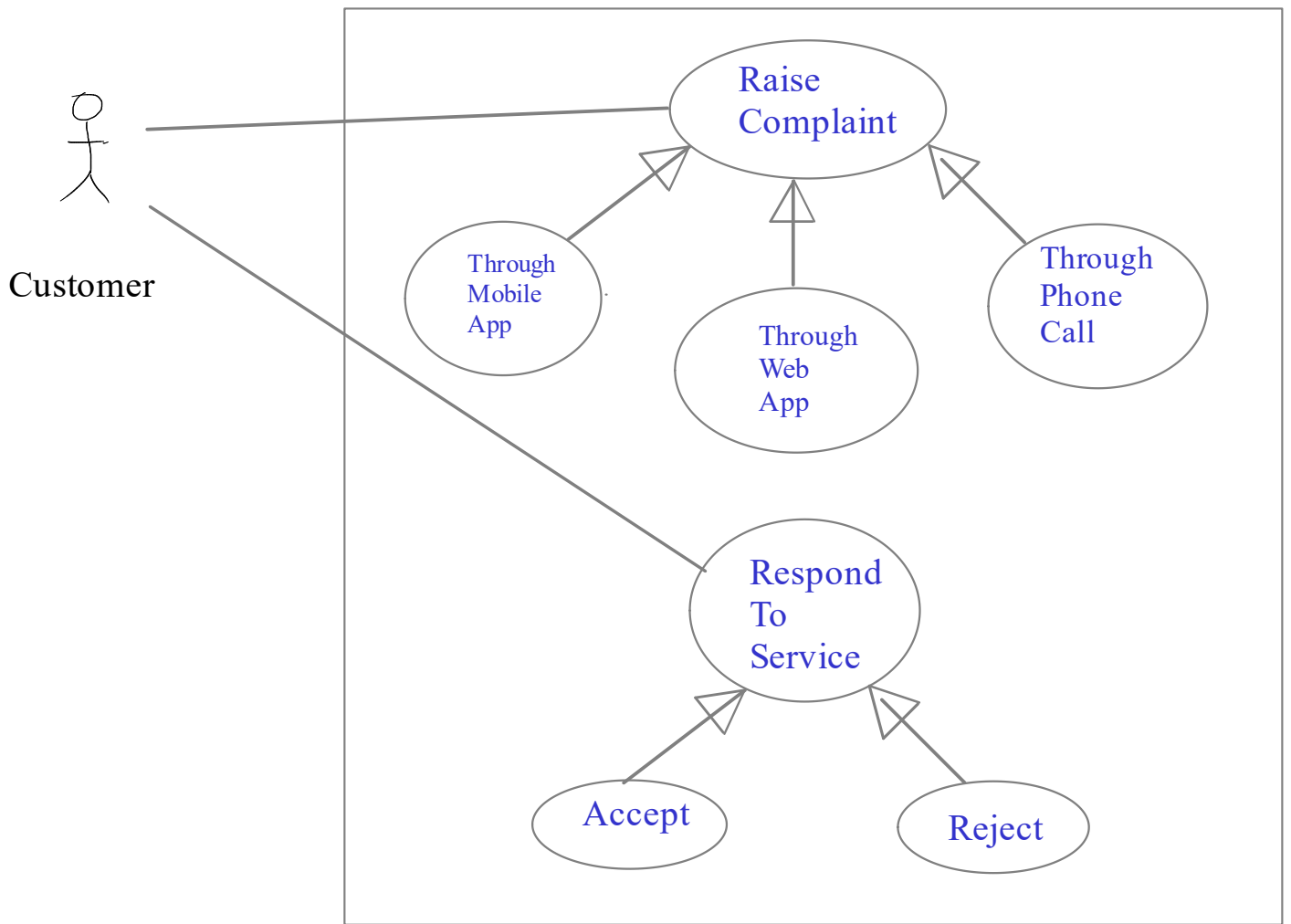NOT RAISED → *raised by customer* → RAISED → *Plumber assigned* → ASSIGNED → *'Satisfactory'* → RESOLVED

RAISED → Cancel → CANCELLED

ASSIGNED → 'Unsatisfactory' → RAISED

ASSIGNED → Cancel → CANCELLED

Customer

Plumber

Service Manager

Ticket

Invoice

Purchase Order

Basic workflow

CUSTOMER	CON-DO-IT	PLUMBER

RAISE CALL

ASSIGN

VISIT

Service
Manager

Assign
Plumber

Process
Escalation

Plumber

Enter
Service
Report

Accept
Service
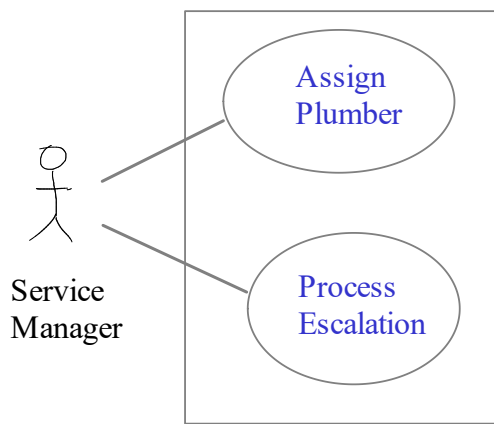Request
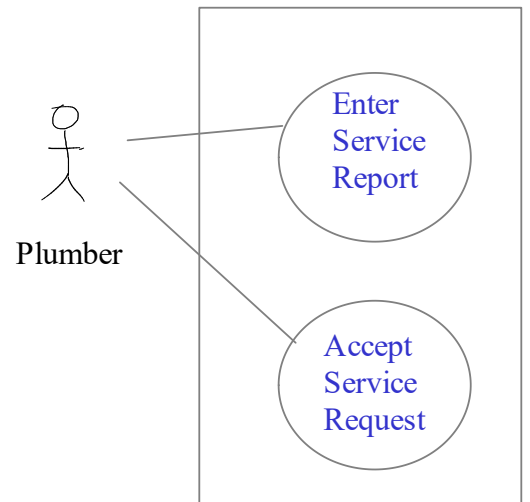
USER INTERFACE

LOGIN

user id

Password

Error_Login

Error Logging
Please try Again

Try again

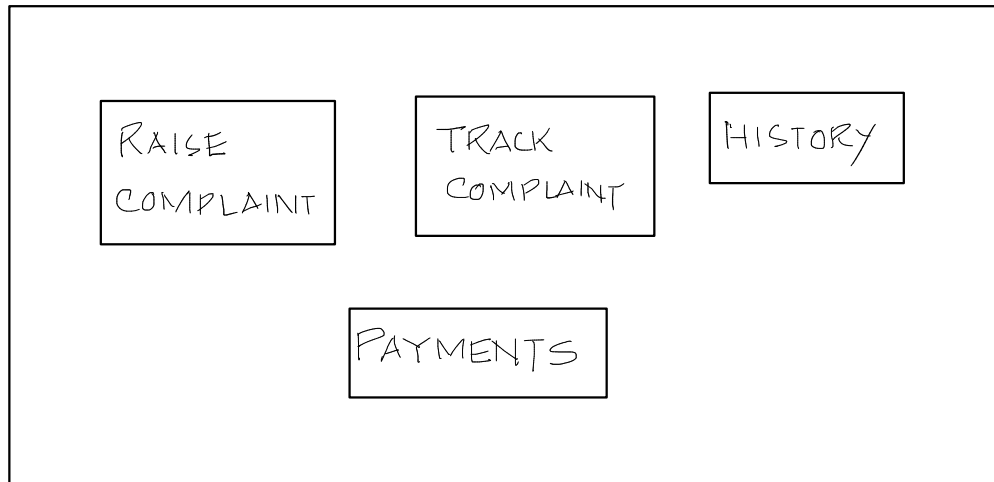CHOOSE ROLE

Choose your role

Plumber
Customer
Service Manager

Customer Interface

DASHBOARD_CUSTOMER

RAISE COMPLAINT

TRACK COMPLAINT

HISTORY

PAYMENTS

RAISE COMPLAINT

Problem Description

[ ]

Submit

COMPLAINT_ACK1

Your complaint has been successfully lodged. The tracking ID of this complaint is XXXX. You can track the status of this complaint through the 'Track Complaint' option on your dashboard.

Plumber YYYY has been assigned this job.

OK

COMPLAINT_ACK_2

Your complaint has been successfully lodged. The tracking ID of this complaint is XXXX. You can track the status of this complaint through the 'Track Complaint' option on your dashboard.

You will be intimitated the details of the plumber once assigned.

OK

COMPLAINT HISTORY

COMPLETED/CLOSED

FEEDBACK PENDING

OPEN

CANCELLED
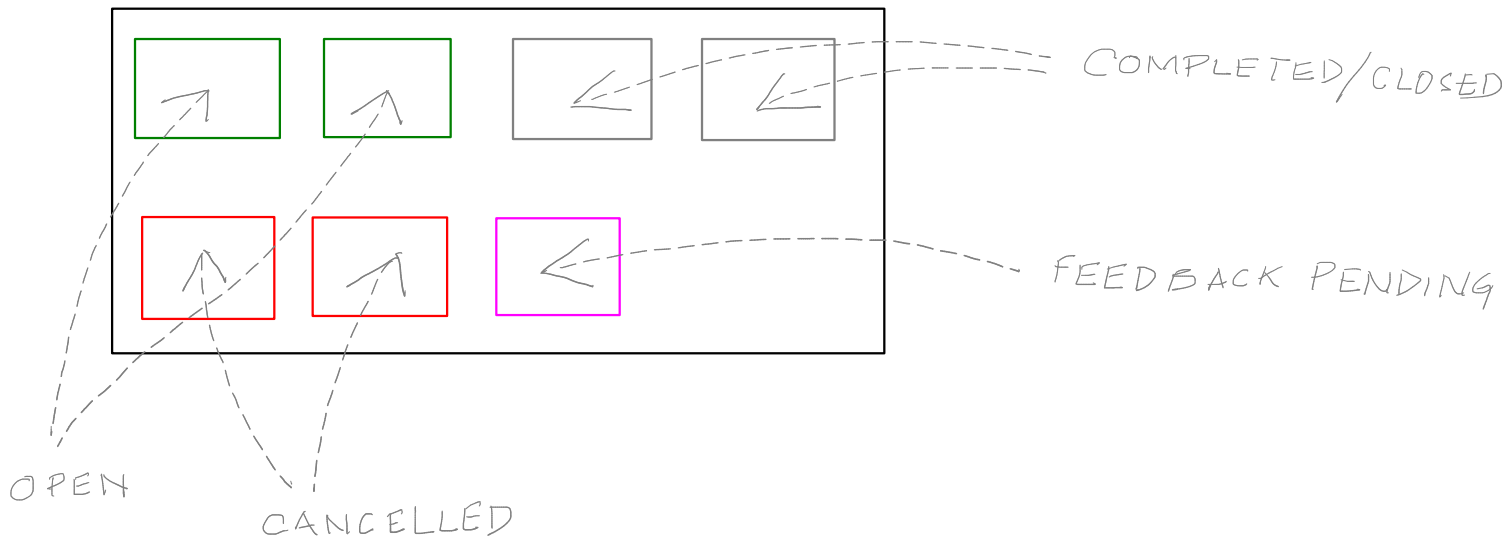
VIEW COMPLAINT (OPEN)

COMPLAINT ID   XXXX

Status   Open

CANCEL   OK

VIEW COMPLAINT (COMPLETED)

COMPLAINT ID   XXXX

Status   COMPLETED

OK

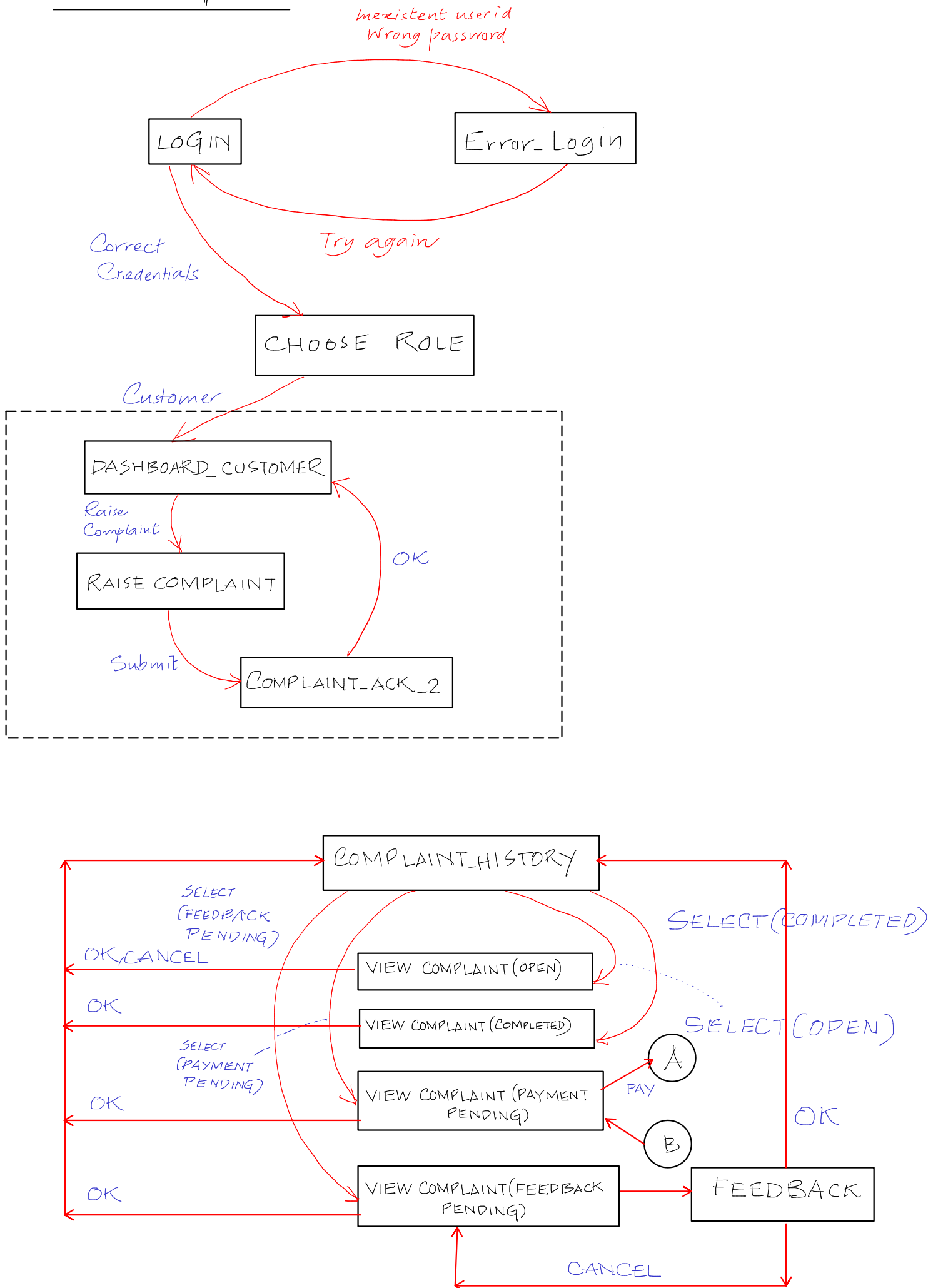## VIEW COMPLAINT (PAYMENT PENDING)

COMPLAINT ID   XXXX

Status   PAYMENT PENDING

PAY   OK

VIEW COMPLAINT (FEEDBACK PENDING)

COMPLAINT ID   XXXX

Status   FEEDBACK PENDING

SUBMIT FEEDBACK   OK

Dotted fields indicate disabled/non-editable fields.

UI Navigation

LOGIN

Error_Login

Inexistent userid
Wrong password

Try again

Correct Credentials

CHOOSE ROLE

Customer

DASHBOARD_CUSTOMER

Raise Complaint

RAISE COMPLAINT

OK

Submit

COMPLAINT_ACK_2

COMPLAINT_HISTORY

SELECT (FEEDBACK PENDING)

OK,CANCEL

VIEW COMPLAINT (OPEN)

SELECT(COMPLETED)

OK

VIEW COMPLAINT (COMPLETED)

SELECT (PAYMENT PENDING)

SELECT(OPEN)

OK

VIEW COMPLAINT (PAYMENT PENDING)

A

PAY

B

OK

OK

VIEW COMPLAINT(FEEDBACK PENDING)

FEEDBACK

CANCEL

PAYMENT PAGE

AMOUNT   XXXX

SELECT PAYMENT METHOD   ▽

NETBANKING

UPI

CANCEL   PAY

(A) → PAYMENT PAGE —CANCEL→ (B)

PLUMBER INTERFACE

A plumber deals with installation and repair requests originating from customers or otherwise. A plumber would be able to view all complaints assigned to him so far. The plumber can respond to live complaints assigned to him. He can order spares from the company warehouse. He can communicate with the customer and seek his approval to use any spares required for a repair job. He would be allowed to check out spares only if the customer has consented to pay for the spares/components.

-SOME SCENARIOS OF COMPLAINT PROCESSING BY PLUMBER

1. Plumber sees a new complaint assigned to him.

2. Accepts

3. Customer gets notified about the plumber details.

4. System looks at plumber's earlier available slots and comes up with a list of possible visit schedules. The same is shared with the customer.

5. Customer selects a visit slot from among

the provided slots. In case the customer doesn't find any of the slots suitable the system has to suggest more alternatives based on the customer's preference. For example, if the job is deemed urgent by the customer then later slots may not work for him. In such case other plumbers should be considered. On the other hand if the customer is okay with later slots and/or is keen to get serviced by the same plumber, then later slots will be suggested while retaining the plumber.

At the time of raising a complaint, the customer may be asked to provide some helpful inputs, e.g.:
- Preferred times
- Plumber preference
- Urgency
- ...

The need to provide these details should be optional. It should be possible for the customer to go ahead with the complaint raising with/without providing any piece of information that the system solicits. The system algorithmically does the plumber and time allocation based on the information provided by the customer.

There are two types of services provided:
- installation service
- Repair and maintenance

Installation service involves components and procedures that are predictable. Hence, a quotation and payment can be done right up front at the time of raising the complaint. However, repair and maintenance work may incur unforeseeable costs. Hence, the final charges of a repair/maintenance work can be determined only after the completion of the task.

Repair and maintenance can be done for two types of customers: existing customers and outside customers. Pricing will be different for these two categories. Existing customers (who are availing service for equipments under warranty) will not be charged for visit.

For outside customers, visiting charges will be mandatory.

If the spare parts costs are deemed too high by the customer, and he wants not to go ahead with the service, the ticket will be closed as satisfactory.

No wallet option provided.

Charges will be decided based on various rules (e.g. location etc.) for any service/component. The service department will have an interface which will be used to define these rates.

1. View assigned tasks
2. Accept/reject assigned tasks
3. Accept appointment
4. Contact customer (external)
5. Insert appointment manually
6. Report at the customer site (external)
7. Examination (external)
8. Provide quotation
9. Carry out repair maintenance
10. Receive payment
11. Collect satisfaction code

Once the customer approves the quotation (after step 8), the plumber will carry out the job rightaway if all components/spares/tools are with him. Otherwise, he will set up another appointment with the customer and revisit with the required components.

The states of a complaint object may be described in more detail through additional states.
Initial
Raised
Assigned
Accepted
Under examination
Quotation raised
Under execution
Task completed
Payment completed
Completed
Abandoned
Cancelled

C - Customer
P - Plumber
M - Manager
S - System
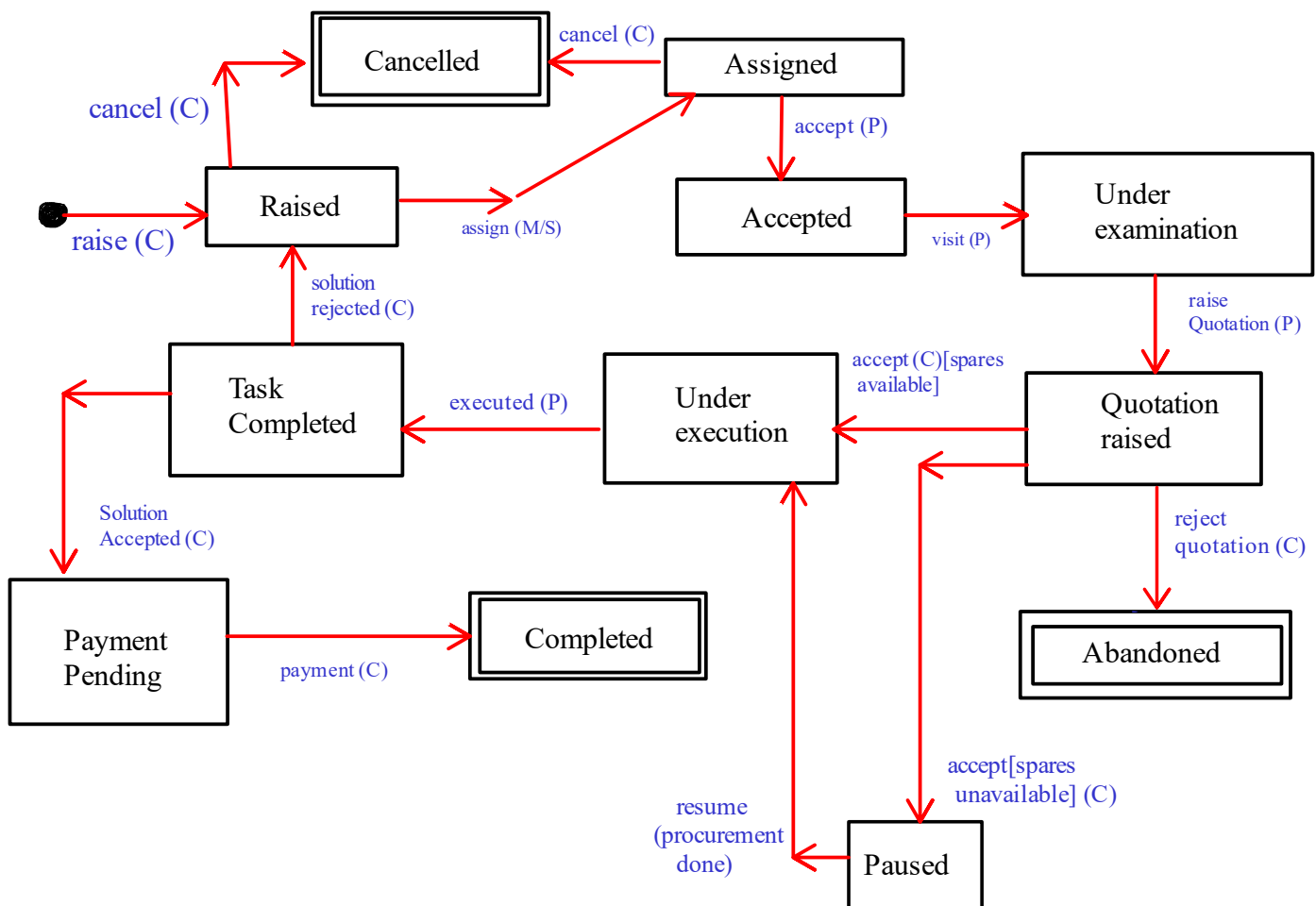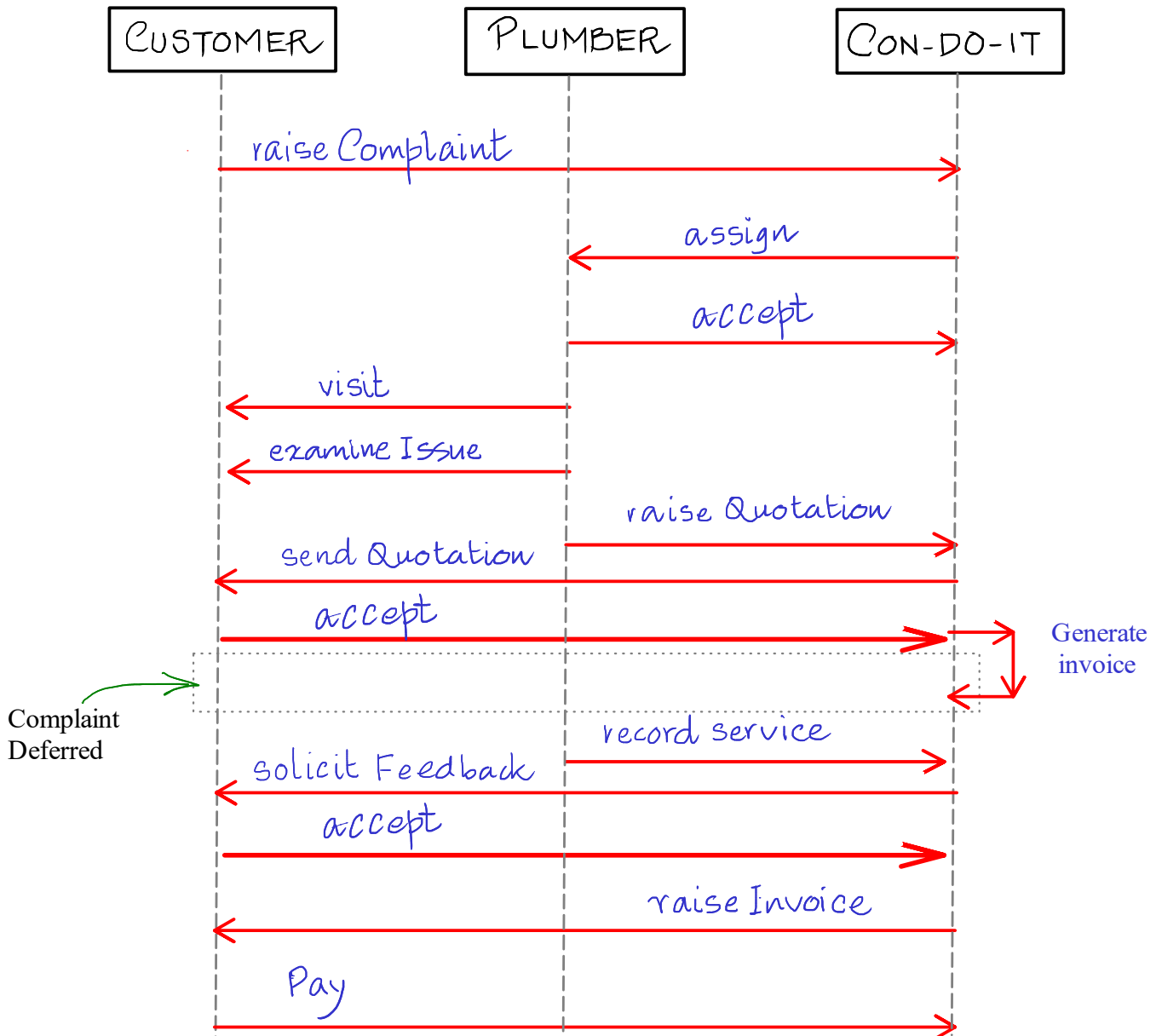
There can be a situation where the components or spares required to do a repair are not available with the plumber. In that case, the plumber would need to visit again. If the components are readily available in the warehouse or market, the next appointment can be fixed through an agreement between the plumber and the customer. If the component is not available, then the next appointment gets deferred. Once the required spares are available, the appointment can be fixed.

In fixing the next appointment, the plumber may want to take help of the system for suggestions.
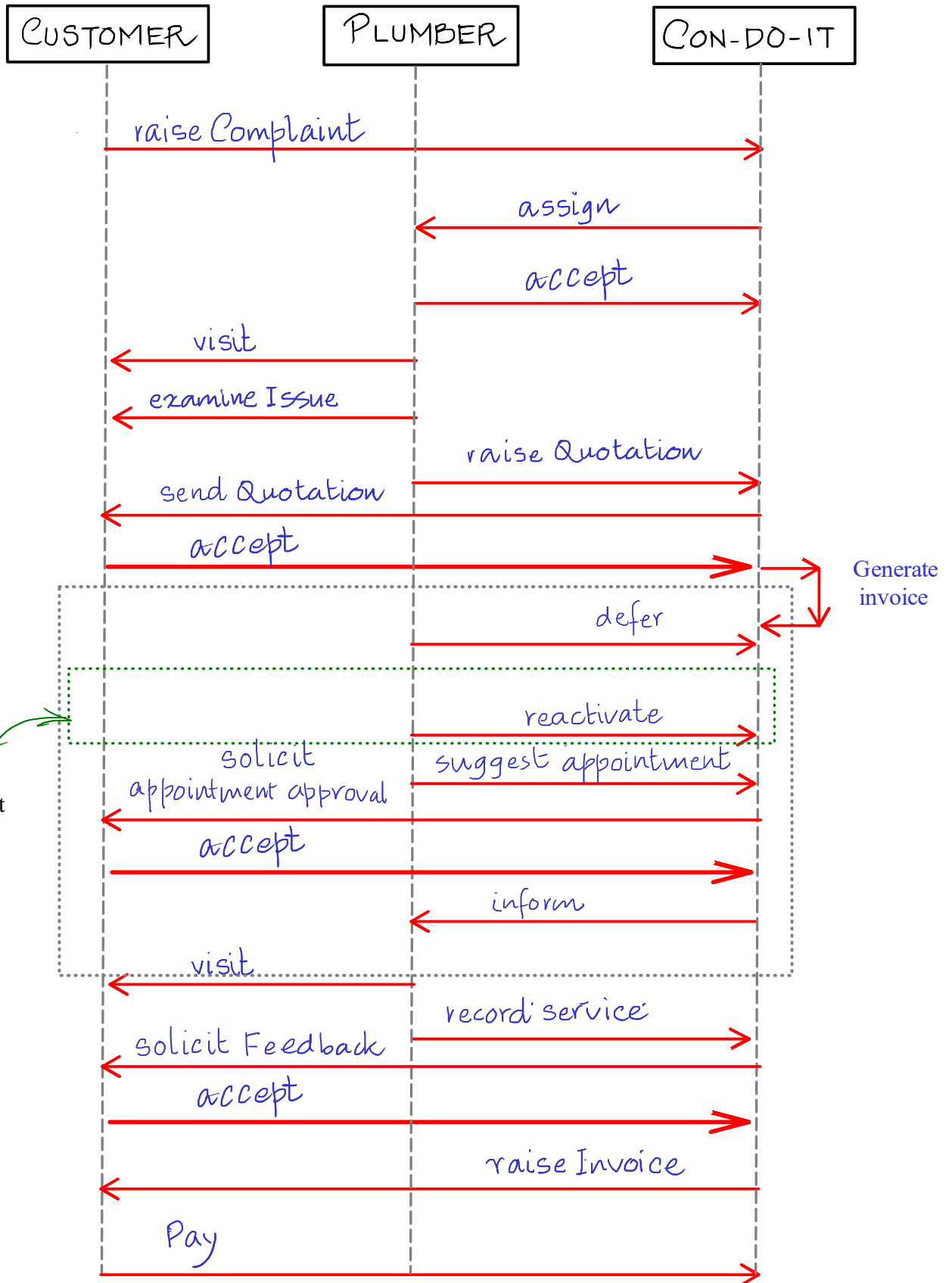
SPARE PART PROCUREMENT

If a spare part/component required for a specific service is not available immediately, it would have to be procured. There are a number of ways in which a component may be procured.
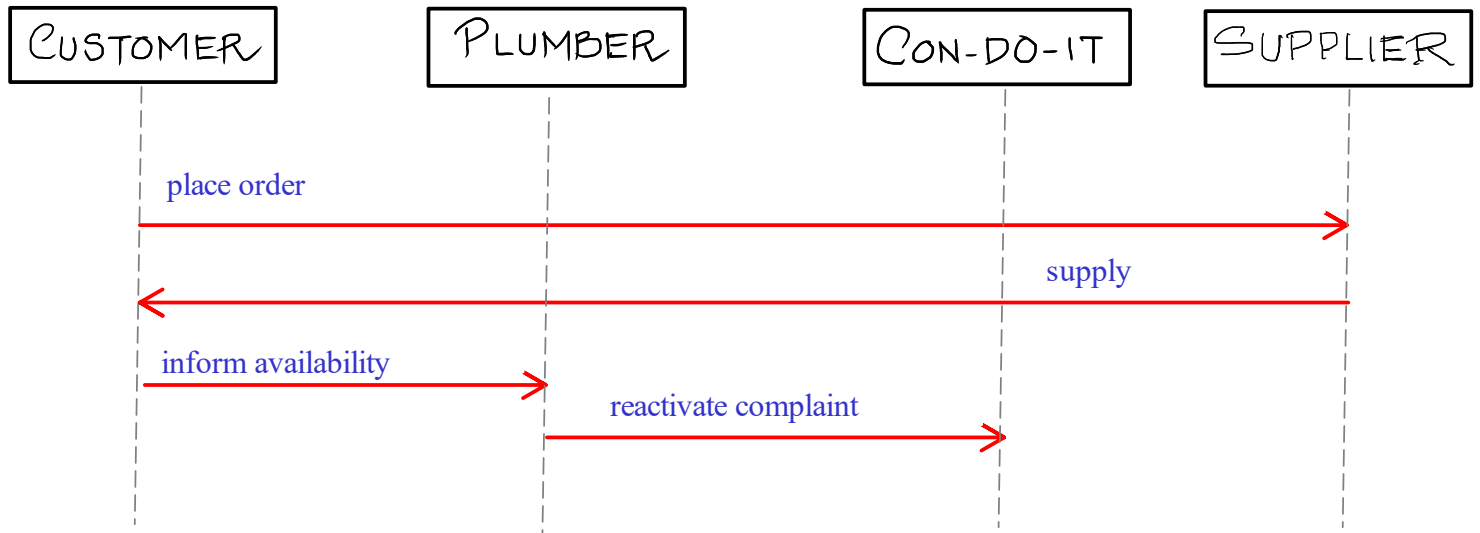
Available in company warehouse/store: In this condition, the plumber can order these from the company stores after taking approval from the customer. In such case, the corresponding cost will automatically get added to the invoice.

Outside purchase: In this case, the spare part may have to be procured from some other source. Here, the customer may purchase it from outside and provide the same to the plumber. No changes need to be done to the invoice. The other option is that the plumber purchases it on his own, and raises a reimbursement request to the company. The company, after ensuring that necessary approval from the customer has been obtained, releases the money. Another alternative could be to purchase the part through the company. In this case, the company verifies that necessary approval from the customer has been obtained, and then orders the part on behalf of the plumber.
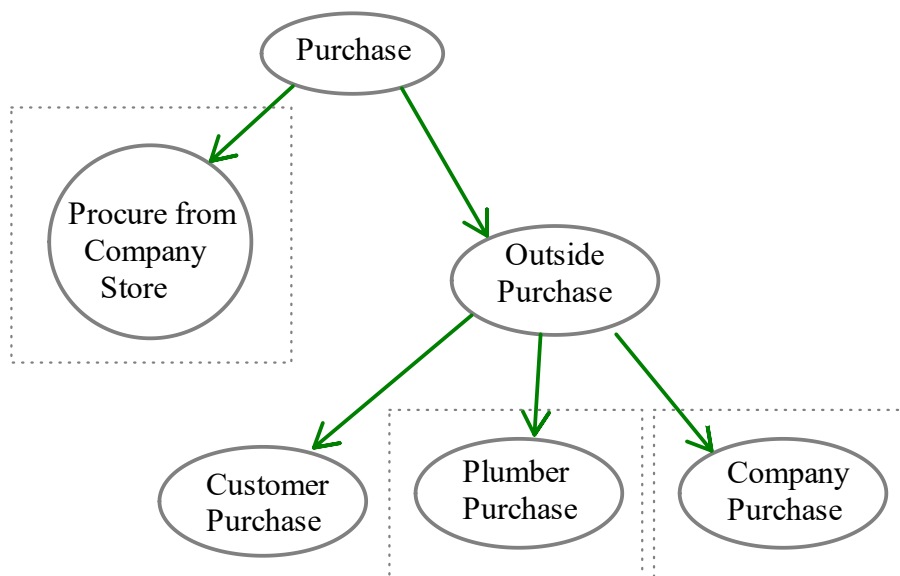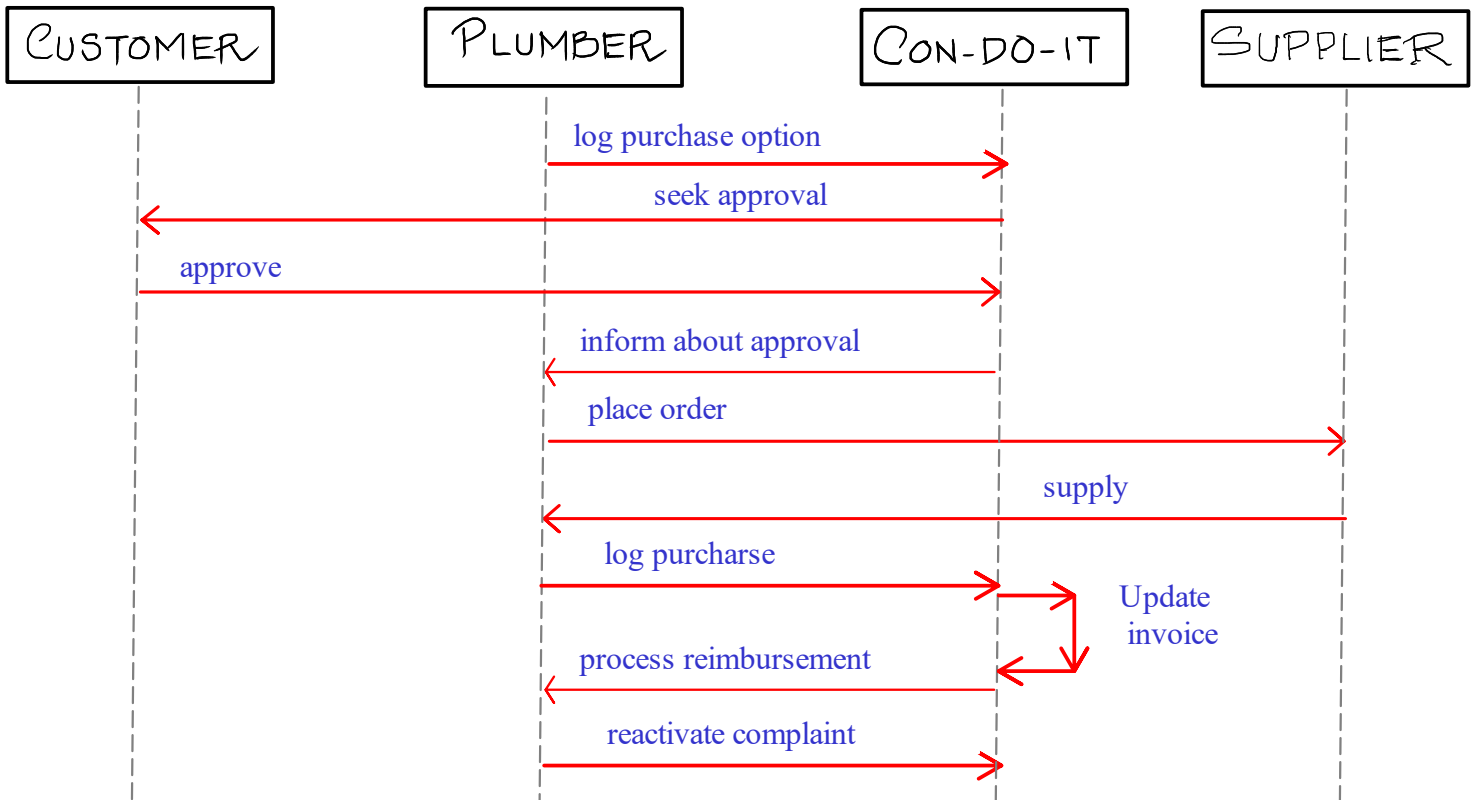

The taxonomy of purchase mechanisms is presented pictorially above. The ovals enclosed within dotted boxes are those for which the Con-do-it application must have additional features. Customer purchase is beyond the purview of the application.
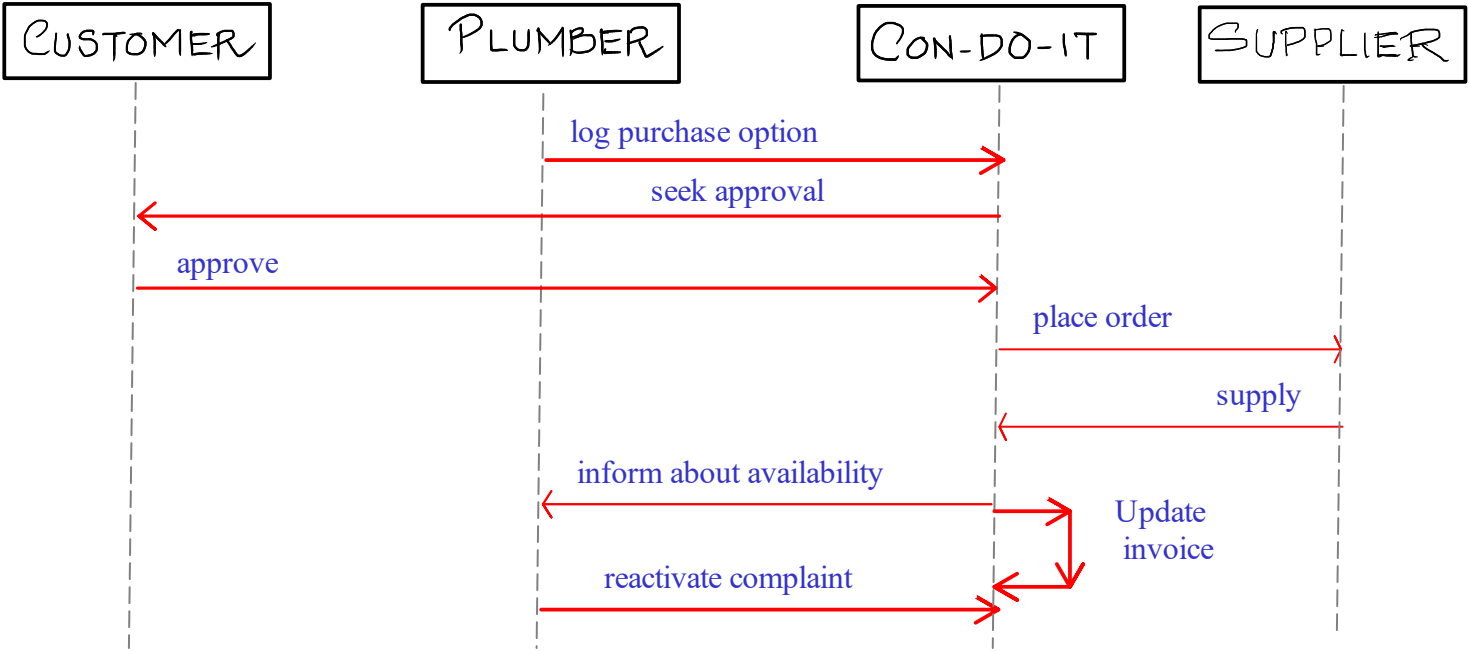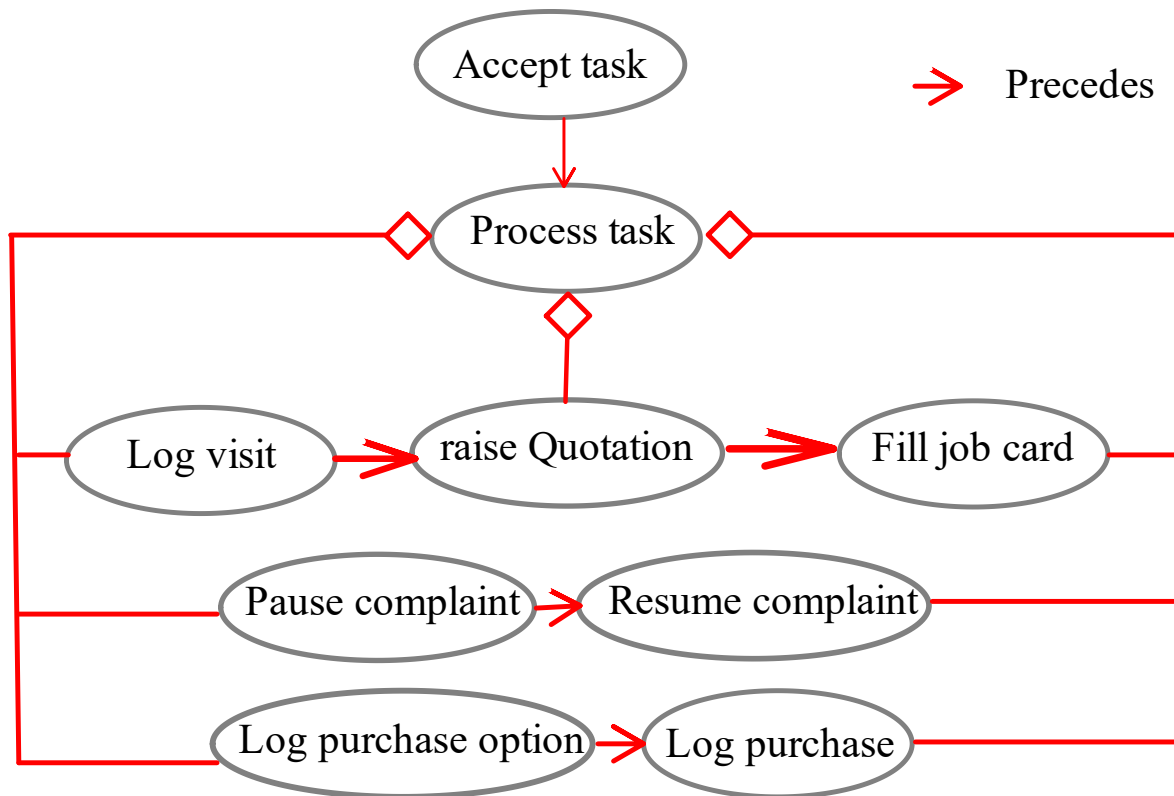
CUSTOMER PURCHASE

CUSTOMER	PLUMBER	CON-DO-IT	SUPPLIER

place order →

← supply

inform availability →

reactivate complaint →

PLUMBER PURCHASE

CUSTOMER	PLUMBER	CON-DO-IT	SUPPLIER

log purchase option →

← seek approval

approve →

← inform about approval

place order →

← supply

log purcharse →

Update invoice

← process reimbursement

reactivate complaint →

COMPANY PURCHASE

NOTE: Company purchase may bring in some financial benefits due to on-scale purchases.

PLUMBER USE CASES

Accept task

Process task

Precedes

Log visit → raise Quotation → Fill job card

Pause complaint → Resume complaint

Log purchase option → Log purchase

PLUMBER INTERFACE

The plumber's dashboard's most important item is the "My Complaints". When the plumber selects this option, the list of complaints will be shown to the plumber. The complaints may be sorted as per different criteria, e.g. name of the customer, date of raising, date of acceptance, date of completion, state (e.g. raised, completed etc.)

When the plumber selects a particular complaint, what gets shown to him depends on the state of the complaint. For example, if a complaint has already been accepted, there should be no option provided to accept/reject it. If a complaint has been paused, the plumber should not be allowed to do anything in it unless it is resumed.

This restriction of available choices will limit the number of decisions or choices the plumber has to make at any point in time. This will lead to increased usability.

Assigned Complaint (PComp1)

[Accept]   [Cancel]

Active Complaint (PComp2)

[Log visit]   [Cancel]

Visited Complaint (PComp3)

[Raise Quotation]   [Cancel]

To-be-Executed Complaint (PComp4)

[Pause]   [Done]   [Cancel]

Paused Complaint (PCom5)

[Resume]   [Cancel]

Executed Complaint (PCom6)

[Cancel]

Job Card (PCom7)

[Resume]   [Cancel]

PLUMBER UI NAVIGATION

My Complaints

Select
Complaint(C)

C.state = RAISED → PComp1 — Cancel

accept

C.state = ACCEPTED → PComp2 — Cancel

log visit

C.state = VISITED → PComp3 — Cancel

raise
quotation

C.state = TO-BE-EXECUTED → PComp4 — Cancel

PComp7

Done

pause   resume

C.state = PAUSED → PComp5 — Cancel

C.state = EXECUTED → PComp6 — Cancel

Fill Job Card
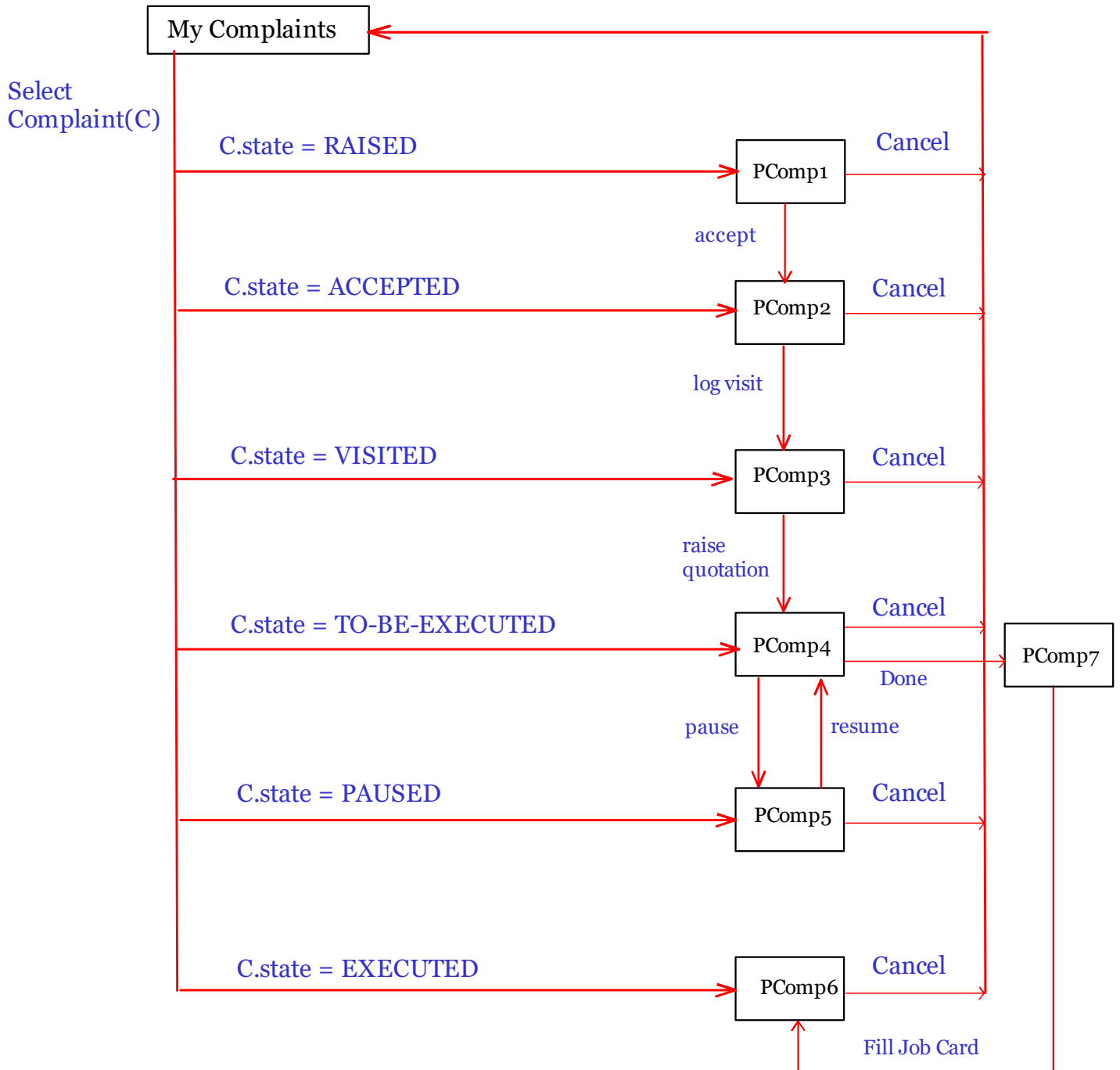
SOFTWARE ARCHITECTURE
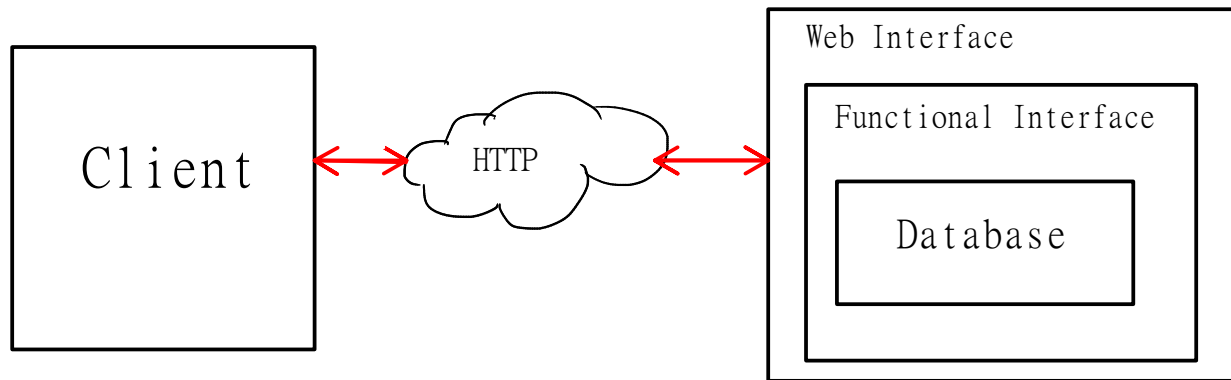
The system will be architected to allow incremental prototyping. We would like to provide facility to use and test the system at the following layers:

Data model: Test cases directly interact with the DB

Functional interface (business model interface): Test case interact with the system through API defined in the programming language to be used for the server implementation

Web interface: Interaction through HTTP requests but from local machine

UI/Client: Manual testing through UI interaction

The UI itself will be designed to be loosely coupled with the backend so that its testing can happen with a placeholder for the server side.

ALGORITHMS

1. Appointment setting
2. Plumber assignment
3. Quotation generation