Assessed Exercise 1: Sample Solution

As usual there are several possible approaches. This is one solution but it is not the only one. Your grades for the assessed exercise will not be determined by how close your solution is to this one, but by the extent to which your solution is a reasonable, clearly explained and complete solution to the problem.

Stakeholders

Receptionist Manager Technician

Probably not the customer because he/she is not going to interact with the system directly. The system might be designed so that customers receive email confirmation of bookings, but as this is a very simple one-way interaction we would probably not bother to consult them about the details. We could imagine extending the system so that customers can book online, and then they would be stakeholders, but that is beyond the scope of the exercise.

Functional Requirements

Retrieve customer's details Update customer's details Add new customer Check availability of tools Make an advance booking Record an immediate hire Book out a tool Record return of a tool Produce management summary

Non-functional requirements

The fact that a hire is for a whole number of days could be seen as a non-functional requirement; alternatively this could lead to a new functional requirement to allow the minimum hire period to be specified. But probably the restriction to whole numbers of days would permeate the system when we get on to more detailed design, so it makes most sense as a non-functional requirement.

Missing requirements

It is possible to think of many functional and non-functional requirements that are likely to be important in a system of this kind.

Functional requirements could include recording damage to tools, allowing regular repeated bookings, recording late returns and penalties, changing or cancelling existing bookings, and no doubt many others. Of course there is the whole area of handling payments, but the question explicitly said that this is not included.

Obvious non-functional requirements would be compatibility with an existing computer system and the kind of user interface required.

Security could be important. If user names and passwords are required specifically for this system, then this would become a functional requirement. Alternatively it could be a non-functional requirement that the system must run on a computer that is adequately protected by passwords.

Backups of data could be important. This is probably considered a non-functional requirement, for example to say that the system must have a redundant disk system or make automatic backups at a certain frequency.

It would be useful to interview the client and raise these and other points, in order to be sure that all requirements are discovered. (Note that "client" means the tool hire company, not a customer of the tool hire company).

Actors

Receptionist: the main user of the system Technician: only involved in recording returns Manager: passive actor if summaries are produced automatically

If the customer only interacts with staff, not directly with the system, then there is no need to include the customer as an actor. The customer may be a passive actor if she receives email confirmations, for example.

Use cases

Make Booking: accept booking for tool from customer; may be new or existing customer

Record Hire: confirm booking or record immediate hire; customer for immediate hire may be a new or existing customer

Check Customer: check records for existing customer and update details if necessary; if no record exists then we have the extension Add New Customer

Add New Customer: allows a new customer to be added (this could be a separate use case included in Make Booking and Record Hire, or it could be included within Check Customer)

Record Return: records the return of a tool after hire

Request Summary: provides the daily summary required by the manager; as this is a regular report it could be initiated by a system timer rather than by a user request

Use Case Diagram

Assume that the customer does not interact directly with the system. Advance bookings are made by speaking to the receptionist by telephone, so it is the receptionist who interacts with the system. Similarly, when returning a van, the customer speaks to the receptionist or the mechanic, who then interacts with the system.



Primary Scenarios

Make Booking: Existing Customer

John Smith asks to book a power saw. Receptionist finds his details and he confirms or updates them. Receptionist obtains details of the desired booking. A van is available and is allocated to John Smith.

Make Booking: New Customer

Karen Jones asks to book a ladder. Receptionist finds that she is a new customer, so takes her details. Receptionist obtains details of the desired booking. A van is available and is allocated to Karen Jones.

Record Hire: Pre-Booked Van

John Smith arrives to collect his power saw. Receptionist finds his booking and records that the allocated van is being taken.

Record Hire: Immediate Request

Alan Brown arrives and asks for a cement mixer. Receptionist obtains details of the desired hire and finds that a cement mixer is available. Receptionist establishes whether or not he is an existing customer, and confirms or enters his details as appropriate.

Receptionist allocates a cement mixer and records that it is being taken.

Record Return

John Smith returns his power saw. Receptionist or mechanic records the return of the power saw.

Request Summary

At the beginning of each day, the system automatically generates the summary and sends it to the manager.

There are alternative scenarios in which the requested booking is not available. In these cases the scenario ends prematurely.

Activity Diagrams

As simple as possible. No need to detail the information obtained from the customer, for example. Focus on the interaction with the system. For example, "give tool to customer" is not an action. Finding out whether the tool should be returned to the receptionist or the technician is not part of the system: assume that there will be something like a notice on the office door.

Request Summary



Make Booking

The branch "Tool not available" is not in the original problem description. It is just a suggestion for dealing with the possibility that the customer requests a tool that is not available. In some cases it might make sense to offer an alternative; for example, if the customer has requested a ladder, maybe scaffolding would be acceptable instead.



Record Hire

Dealing with an immediate hire requires the process from the Make Booking use case. Diagrams are not very good at expressing this kind of re-use of sub-parts – it is clearer when pseudo-code is used (see Tutorial 3 Solution).

