Tutorial 1: Requirements Capture

A problem description is given below. The requirements for an interactive system for ferry bookings, to be installed in a travel agency and used by the travel agents, are to be defined. Who are the stakeholders in the system? From the description, identify initial lists of functional requirements and non-functional requirements for the system. Are there any functional or non-functional requirements that you think have not been explicitly identified in the description? Discuss how you would test the non-functional requirements you have identified as the system is developed.

A ferry company only accepts bookings from authorised travel agencies, situated in towns throughout Scotland. There is a computerised central booking system at the company's head office in Aberdeen. However, all transactions at the travel agencies are currently hand-written on special forms.

Travel agents, working in the travel agencies, use printed ferry timetables to answer customer enquiries. These timetables are updated by regular distributions from the ferry company head office, sent by courier. Customers enquire about the availability of bookings, which are checked by a travel agent telephoning Aberdeen. Customers may make a provisional booking, which is valid for three days, and they will be given a written quotation for this. A customer making a firm booking must pay a deposit at which time they receive a booking confirmation slip. Provisional and firm bookings are made by travel agents over the telephone to Aberdeen. Full payment must be made by the customer at least one week before the date of the first ferry sailing. Tickets are only issued when full payment has been made; these are printed at the head office and sent by first-class post to the travel agency.

The management of the ferry company has decided that it would be more efficient to have on-line systems in the larger travel agencies, directly connected to the central booking system. These agency systems will allow: provisional and firm bookings to be made directly; tickets to be printed at the travel agencies; and the central timetable to be accessed directly by travel agents, avoiding the need for distribution of timetable updates. The managers of several travel agencies have expressed concern that yet another booking system will cause them major problems unless it runs on hardware that they already have for airline bookings and other tour operators.

The systems in the travel agencies will have to be simple to use and robust, providing guidance at every stage of use and on-line help. High reliability of the communications between a travel agency and the head office is of vital importance to the business. Since the information transmitted from the head office for ticketing contains special booking codes, security of data transfer is an important consideration.

Requirements Specification Inspection Checklist

For each requirement, ask:

1 Will the client care? In other words, does it meet a client need?

2 Is this really part of the design? I.e., does it commit to a unique solution?

3 Is this really part of the management plan?

4 Is it complete? I.e., are there "to be decided" parts?

5 Is it verifiable? Does it use words like 'robust', 'user friendly', 'good'?

6 Is it traceable? Can you identify the reason for this requirement?

7 Is it a single requirement? I.e., have two or more distinct requirements been combined?

8 Is it verifiable? I.e., can you say how to test that the requirement has been met?

9 Is it comprehensible? I.e., does it use unknown, ambiguous or undefined technical terms?

10 Is it realisable? I.e., is this requirement unrealistic given known constraints?

Checklist of Non-Functional Requirements

This checklist can be used in different ways. When drawing up a list of requirements it could be used to check for points which might have been overlooked during analysis. During a formal review of a Requirements Definition, this list could be used by the review team to check for possible omissions in the definition document. In either case, there may be points which are not relevant to the system under consideration but at least you know that omissions are deliberate! The points enclosed in {} are examples and comments, and are not part of the Checklist.

User Interface
What type of user will actually be using the system? {Novice, expert; frequent, casual}
Will more than one type of user be using the system? {Alternative interfaces required?}
What are the desirable learning times for new users?
What is an acceptable error rate for a trained user?

Error handling
How should the system respond to input errors? {Error messages, error recovery}
How should the system respond to extreme conditions? {Too much input, file capacity
        exceeded}

Documentation
What sorts of documentation are required? {User manuals, on-line help, tutorials}
What audience is to be addressed by each document?

Performance
Are there any throughput requirements? {Number of transactions per hour}
Is response time critical in any circumstances?

Storage capacity
What are the storage requirements for the data currently held in the system?
What is the expansion potential for data storage? {Over several years.}

Compatibility with other systems
Is input coming from systems outside the proposed system?
Is output to go to systems outside the proposed system?
Are there restrictions on the format or medium that must be used for input or output? {Need
        to send data on tape to BACS for payroll transfers. Returns to the Scottish Higher
        Education Funding Council by Universities.}

Availability and Reliability
For what periods of time is the system needed? {At the extreme, the system may be required
        24 hours per day, 365 days per year!}
How long can the business survive without the system? {Time to repair.}
What is the maximum acceptable downtime per day?

Physical Environment
Are there any unusual operating conditions for the hardware? {System installed in workshop
      may be affected by dirt or temperature; public access systems}

Security of data
Must access to the data or system be controlled? {Use of passwords, user profiles}
Is the data subject to the provisions of the Data Protection Act?
How often should the system be backed up?
Who will be responsible for back up?
Is there a need for long-term archiving of data? {Medical records}
Is physical security an issue?

Resources
What is the budget for the system? {Development costs, installation and change over,
      training}
Are there any personnel constraints? {Availability of key staff}

(This checklist is adapted from material in *Software Engineering with Student Project
Guidance* by B Mynatt, Prentice Hall International 1990.)

Non-Functional Requirements Checklist

(based on B. T. Mynatt. Software Engineering with Student Project Guidance. Prentice-Hall. pp. 71-72)

HCI and User Interface Issues

Item	Relevant?	Covered?
users profiled (types, attributes)		
i/o devices specified (types, attributes)		
training needs described		
guessability		
learnability		
expert user performance (speed of task completion, error types, error rate)		
user subjective rating of system		

Documentation

Item	Relevant?	Covered?
documentation types identified		
audience for each document given		

Hardware/Software

Item	Relevant?	Covered?
target hardware		
hardware constraints (memory size, backing store)		
operating system(s)		
other required software		

Performance

Item	Relevant?	Covered?
speed		
throughput		
response time		
data to be process (size, capacity)		

Error Handling and Extreme Conditions

Item	Relevant?	Covered?
response to input errors		
response to extreme conditions		

System Interfacing

Item	Relevant?	Covered?
input from external systems		
output to external systems		
restrictions on input/output (format, medium)		

Quality Issues

Item	Relevant?	Covered?
reliability		
fault trapping		
restart time after failure		
acceptable downtime (e.g., per 24 hours)		
portability		

System Modifications

Item	Relevant?	Covered?
system components likely to need subsequent modification		
expected modifications		

Physical Environment

Item	Relevant?	Covered?
location(s) of target equipment		
unusual operating conditions (temperature, vibration, electromagnetic sources)		

Security Issues

Item	Relevant?	Covered?
system access control		
system backup (frequency)		
person(s) responsible for backup		
physical access & security		

Resources and Management Issues

Item	Relevant?	Covered?
resources to build, install & maintain system (materials, personnel, time, computer resources)		
skills and knowledge of developers		
project deadlines		
budget (hardware, software, personnel, other costs)		
responsibility for system installation		
responsibility for system maintenance		