IN3015/INM311
Requirements Engineering Coursework
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Dispatching Aircraft
Stakeholder Requirements

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Stakeholder requirements

	Name of Use Case
Use Case ID	Unique ID for Use Case
Author	Name of author
Date	Date Use Case was written
Source	Source of Use Case
Actors	Actors involved in Use Case (from the Use Case Model)
Problem statement (now)	Description of current problem
Precis	Informal scenario description
Functional Requirements	Requirement that the use case **DECOMPOSES**
Non-Functional Requirements	Requirements that impose **CONSTRAINS** on the required behaviour in the use case
Added Value	Benefit of Use Case above and beyond the original scenario from the original system
Justification	Why is the Use Case needed?
Triggering event	Event or events that can trigger the Use Case
Preconditions	Necessary conditions for the Use Case to occur
Assumptions	Explicit statement of any assumptions made in writing the Use Case
Successful end states	Successful outcome(s) of the Use Case
Unsuccessful end states	Unsuccessful outcome(s) of the Use Case
Normal Course	2. The dispatcher requests the passenger list from the CHECK-IN system. **UR10:** The dispatcher shall be able to request the correct passenger list easily. **TR30:** The dispatcher shall be trained to use the system correctly
	3. The CHECK-IN system prints the passenger list. **RR10:** The CHECK-IN system shall print the passenger list at all times. **PR20:** The CHECK-IN system shall print the passenger list within a reasonable time. **AR30:** The CHECK-IN system shall be available for printing by authorised users at all agreed times.
	4. The dispatcher enters the aircraft
	5. The dispatcher communicates the number of passengers on the aircraft to the cabin crew.
	6. The cabin crew count the number of passengers on the aircraft.
Variations	1. If [condition] then [variation statement] (related to Action 1)
	…
Alternatives	1. If [condition] then [alternative course statement] (related to Action 1)
	…

Identitfier: **UR10**
Description: The dispatcher shall be able to request the correct passenger list easily.
Type: Usability requirement

Fit criterion:

The fit criterion applies to all authorised users of the CHECK-IN system. The system satisfies the requirement if 9 of the 10 tested novice users are able to successfully complete the task of 'requesting the correct passenger list' in under 2 minutes and if 5 of the 10 experienced users are able to successfully complete the distinct task of 'requesting the passenger list for flight x' in under 1 minute.

We define novice users as users with medium domain knowledge (on average 5 years professional experience in dispatching aircraft), but without any previous experience in using PDA based dispatching systems. Experienced users are users who have medium domain knowledge (on average 5 years professional experience in dispatching aircraft), and have used PDA based systems for dispatching aircraft during the past two years of their professional life.

We define the correct passenger list as the list whose data corresponds to the given flight x.

We will measure the system's ease of learning is a usability test in a controlled laboratory environment. We will test a total of 20 selected users all of which have professional experience in dispatching aircraft for a minimum of 5 years. 10 of the 20 participants have previous experience in using PDAs for their work and while the remaining 10 have worked with traditional desktop systems. All participants will be asked to carry out the distinct task of 'Requesting a specified passenger list file from the system for flight x'.

We test the requirement by measuring successful task completion times with a manual timer. The percentages are interpreted relative to the sample of 10 persons. 9 of the 10 experienced users must be able to request the correct list successfully within 2 minutes. 5 of the 10 novice users must be able to request the correct list successfully within 2 minutes.

We will test the intuitive quality of the system in a second usability test. We will test a sample of 20 dispatchers who have medium domain knowledge (5+ years professional experience in dispatching aircraft) and no prior experience with PDA-based or CHECK-IN systems. 15 of the 20 selected participants shall be able to produce the correct passenger list within 3 minutes of encountering the system for the first time without referring to external help such as written instructions, other than the help or guidance instructions offered by the immediate system screen.

Identitfier: **RR10**
Description: The CHECK-IN system shall print the passenger list at all times.
Type: Reliability requirement.

Fit criterion:

The requirement is satisfied if the system suffers a mean-time between failure (MTBF) rate of less than 0.1 failure per 1000 power-on-hours of operation under normal conditions and use over a period of the first 5,000 hours of normal operation.

An individual failure is defined as: (a) the failure of the system to interpret a user's 'print selected list' instruction; (b) the failure of the system to carry out the printing of the list after the instruction has been given; (c) an absolute failure of the system (apart from power failure), and; the failure of the system to print the selected list in acceptable quality.

We will test the MTBF frequency (a) and (b) in a stress test using a computerised log that will record all successful and unsuccessful print commands by the user and print cycles by the system. Additionally we will log all incidents of paper jams that prevent continuous printing for the first 5000 hours of operation, to record failures of type (b). We will maintain the log for the first 5000 hours of operation.

In a second test the test team will record date, time and nature of wider system failures for the first 1000 hours of normal operation, to record failures of type (c).

In a final test 4 we will conduct a print quality analysis and determine the output quality of a printing device against the defined Industry standard (Industry Standard X).

We will log all unacceptable print results and maintain the log for the first 1000 hours of normal operation. We define unacceptable result if the print shows fade, streaking or uneven density, as well as colour bleed or banding thus impacting the legibility of the printed information. Printed text is analyzed through the use of micro-photographic imaging to determine the fidelity of character formation versus an ideal standard.

Identitfier: **PR20**
Description: The CHECK-IN system shall print the passenger list within a reasonable time.
Type: Performance requirement.

Fit criterion:

The response time for printing a passenger list shall be no more than 20 seconds for 95% of the responses, and no more than 25 seconds for the remainder on all moderate files.

On all large files it shall be no more than 30 seconds for 95% of the responses, and no more than 25 seconds for the remainder.

On simple files the response time shall be 10 seconds or less.

The response time is defined as the interval from the time the OK button is clicked in the print dialog for the first time to the moment the last page enters the printer's output bin.

The system shall print up to 500cps (characters per second), 10cpi (characters per inch) in a high-speed mode; 400cps, 10cpi in a draft mode; 100cps, 10cpi in a letter-quality mode. A character set includes 96 ASCII characters, 14 international and 1 legal character sets.

We will carry out the performance testing by utilizing industry-standard test files. Test files are specifically designed for performance testing. They are categorised as simple files(up to 1000 characters at 10cpi), moderate files (up to 2000 characters at 10cpi) and large files (up to 3000 characters at 10cpi).

An embedded sensor unit will record printing and time measurements and log performance data into a database. For each print event, a time stamp is transmitted to the sensor, ensuring the accuracy of timing.

System requirements: The printer must use a CHECK-IN compatible drive from the Microsoft Hardware Compatibility list for the operating system of at least 50GB storage capacity with 20BG free space. Recommended system memory is 1GB (minimum 512 MB). Two serial ports or USB must be available.

Identitfier: **AR30**
Description: The CHECK-IN system shall be available for printing by authorised users at all agreed times.
Type: Availability requirement.

Fit criterion:

A dispatcher who is authorised to use the Check-In system shall be able to print the correct passenger list from a minimum of 2 hours before departure of the first aircraft until the departure of the final aircraft on any day that flights have been scheduled by the airline.

During this time the dispatcher is able to use the print function at a likelihood of success of 99.8% of all print attempts. At all other times the dispatcher is able to use the print function at a likelihood of success of 95% of all print attempts. A print attempt occurs whenever a dispatcher selects the 'print list' function designed to print a passenger list. A failed print attempt includes the failure to open the correct passenger list file, failure to print this file or failure to collect the printout from the system. A correct passenger list is defined as the list whose data corresponds to the data transmitted by the AXIS system for any given flight.

The requirement will be tested over a trial period of 2 months.

An embedded software monitor will record the date and time of all recorded print attempts over a selected 2 months period. Dispatchers will be provided with a log-sheet to record the number and type of failed print attempts. The analysis team will review the total number of print attempts and the failed print attempts in different time periods to determine whether the requirement has been met or not.

Identitfier: **TR30**
Description: Dispatchers shall be trained to use the system correctly
Type: Training requirement

Fit criterion:

The airline shall provide its dispatchers with effective information and training on the CHECK-IN system at the time of initial assignment, and whenever new updates to the system are introduced.

The airline is always ultimately responsible for ensuring that dispatchers are adequately trained.

The system meets the requirements if after a 1-day induction course to the system a **new** dispatcher at the beginning of his assignment with the airline passes a test with a 100% success rate, and if a currently employed dispatcher passes the same test with a 100% success rate.

We will test the users ability (a) instruct the system to provide all passenger list files for a given day and (b) identify the correct passenger list file for a particular flight. The test result is successful if the participant is able to carry out both task (a) and (b) in under 2 minutes.

A **current** dispatcher passes the training if he attends a 3 hour system update exercise from a system instructor selected by the airline and if he is able to carry about both tasks in under 2 minutes under the supervision of that instructor and a selected airline representative. The representative records the names of all successfully trained dispatchers as a basis for measuring the satisfaction or otherwise of the requirement.