

Elicitation of Requirements on Site

Requirements Engineering 2 - Assignment 1

Outline

- Setting and objective
- Approach
- Results
- Lessons learned
- Conclusion

Setting and Objective

- Development of VANTAGE - air traffic management system to reduce environmental impact
- Five use cases about arrival, turn-around and departure of aircraft

ART-Scene

- Presents scenarios in text form
- Provides normal and alternative course events (“stimulation”)
- Stakeholders are better at recognizing incorrect events than recalling missing ones
- Three versions: desktop (text) desktop (visual simulation) and mobile

Use Cases

Approach/Arrival sequence control	Workshop
Ground movement control arrival	Workshop (visual)
Ground movement control departure	Workshop
Coordinate flight departures	Workshop
On-stand operations	Work context

Research Questions

- Do different stimulations generate **different** requirements?
- Does a walkthrough in work context lead to **more** requirements?

Desktop Version for Workshops

ART-SCENE Scenario Presenter - Microsoft Internet Explorer

Address: http://127.0.0.1/scenariopresenter/Show.asp

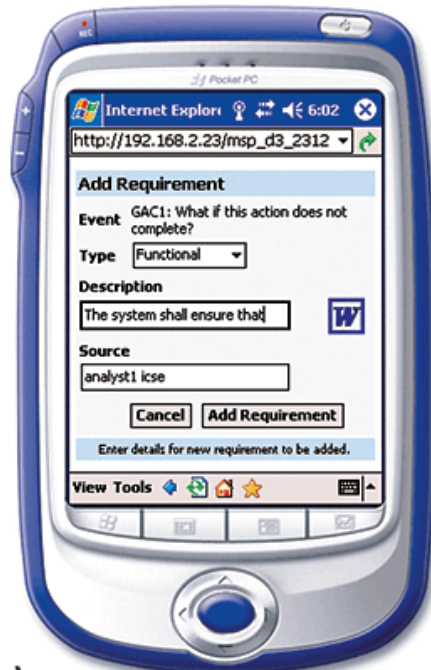
Domain Name: Countdown Use Case Name: Revised JC5 Make Travel Decision Use Case: 2 Scenario: 2 Context: Normal

Normal Course			Alternative Course for Event 1	
Event	Action Type	Description (Natural Language)	GEV	Description (Natural Language)
1	Cognitive	Start The passenger looks at the Countdown display	GEV1	What if this event does not occur in this scenario?
2	Cognitive	End The passenger looks at the Countdown display	GEV2	What if this event occurs earlier in time than expected in the scenario?
3	Physical	Start The Countdown display shows the bus information for the relevant route	GEV3	What if this event occurs later in time than expected in the scenario?
4	Physical	End The Countdown display shows the bus information for the relevant route	GEV4	What if this event occurs more than once in this scenario?
5	Physical	Start The passenger recognises which route number (s) will take them closest to their destinations	GEV5	What if this event occurs less frequently than expected in the scenario?
6	Physical	End The passenger recognises which route number (s) will take them closest to their destinations	GEV6	What if this event occurs more than once in the scenario?
7	Cognitive	Start The passenger decides which bus route to use	GEV7	What if a different event occurs instead of this event in the scenario?
8	Cognitive	End The passenger decides which bus route to use	GEV8	What if an unexpected intrusion occurs into the system during this event?
9	Physical	Start Every 30 seconds the AVL system transmits updated bus information to the Countdown displays	PE1.2	What if passenger has some unusual physical characteristics that affect his/her behaviour during this action?
10	Physical	End Every 30 seconds the AVL system transmits updated bus information to the Countdown displays	PE1.2.1	What if passenger is physically unable to undertake this action?
11	Cognitive	Start The passenger occasionally checks decision regarding bus routes when information on the indicator is updated	PE1.2.2	What if passenger is unusually young or old?
12	Cognitive	End The passenger occasionally checks decision regarding bus routes when information on the indicator is updated	PE1.2.3	What if passenger gender is different to what is expected during this action?

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http://127.0.0.1/scenariopresenter/Show.asp?m=1&ac=1&sc=207

Developed by Amit Toser

Mobile Scenario Presenter



(a)



(b)

Results

Scenario	Total number requirements documented	Number of requirements on use case and normal course event behaviour	Number of requirements on alternative case behaviour	Average number of requirements per normal course event
Sc2: Approach and arrival sequence control	32	30	2	1.19
Sc3: Ground movement control arrivals	28	27	1	2.44
Sc1: Ground movement control departure	16	15	1	0.70
Sc11: Coordinate flight departures	12	12	0	1.5
Sc4: On-stand operations	59	59	0	1.55
Total	147	143	4	

Performance of Work Context

- Identify forgotten stakeholders
- Facilitator acted as apprentice
- Identify special triggers
- Bad weather
- Higher communication bandwidth
(documents, observation, photography)

How should mobile technologies be used...

... for requirements elicitation on site?

What are the goals?

- Capture requirements where they emerge
→ reflect future user needs more precisely
- Free cognitive resources of analyst

General purpose vs. specific RE tool

Task	General	Specific
Input of text or voice material	✓	✓
User/Location tracking	✗	✓
Generated scenario questions	✗	✓
Question catalogues	✗	✓
Multiuser support / synchronisation with desktop RE tool	✗	✓

Define Target Audience

Analysts seek...

- many features
- explicit support for RE process
- large degree of control

System users seek...

- simple tool
- guidance
- feedback on input

Ensure Usability

- Not relevant on desktop RE tools
- For on site elicitation, a challenging use can lead to...
 - not observing a critical task
 - no time for appropriate question
 - bind cognitive resources

Challenging usage $\Rightarrow$ distortion from task

Consider Technical Challenges

- Possible Constraints:
 - Battery Life
 - Network connection
 - Performance
 - Background noise (audio recording)
- Objective:
Reasonable quality of experience for the user.

What information to capture?

- Analysts have competing demands:
 - Observing
 - Asking
 - Recording
- ⇒ Capture only the information needed to:
 - Accurately and consistently recall the requirements back at the desktop tool

Conclusion

- Work context adds
- and increases communication bandwidth
- Stakeholders are better at identifying errors of commission than omission
- Tools need to be usable and practical
- and support rather than distract analyst