# INMOVE User Requirements
## Focus Groups and Scenarios

INFORM Workshop

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# INMOVE project

- 'Intelligent Mobile Video Environment'
- starts September 2002
  ends September 2004
- Project goals:
  - to create a software toolkit to facilitate the transmission of video and video-related data over mobile networks
  - demonstrate the toolkit with trial applications in sports viewing and intelligent monitoring

# Project Objectives

To design a toolkit that provides general and modular solutions for video-related mobile applications. The toolkit will be based on open standards and technologies and combine and enhance the range of the existing technologies in an open and easy-to-deploy platform.

To validate and demonstrate the relevance of the toolkit by constructing a few versatile **end-user oriented** applications. The **aim is to verify how flexible the toolkit is** for combining multimedia elements together with other essential elements when building attractive and intelligent applications.

To validate the usability and enhance the **user acceptance** of the INMOVE applications and toolkit by introducing a **user-centred design process** covering all stages of the development work, starting with work on requirements and finishing with end-user trials activities.

# INMOVE Toolkit

- Expandable set of software tools enabling the provision of a new range of intelligent video based services over wireless networks
- A hierarchy of tools from mathematical algorithms to complete video networking solutions
- Toolkit framework includes a web-based user interface to allow developers good access to the tools that they need
- The toolkit uses open source and commercial thirdparty libraries, and will further include intelligent tools for video compression, processing, transmission and analysis created by project partners.

# Sports Viewing Application

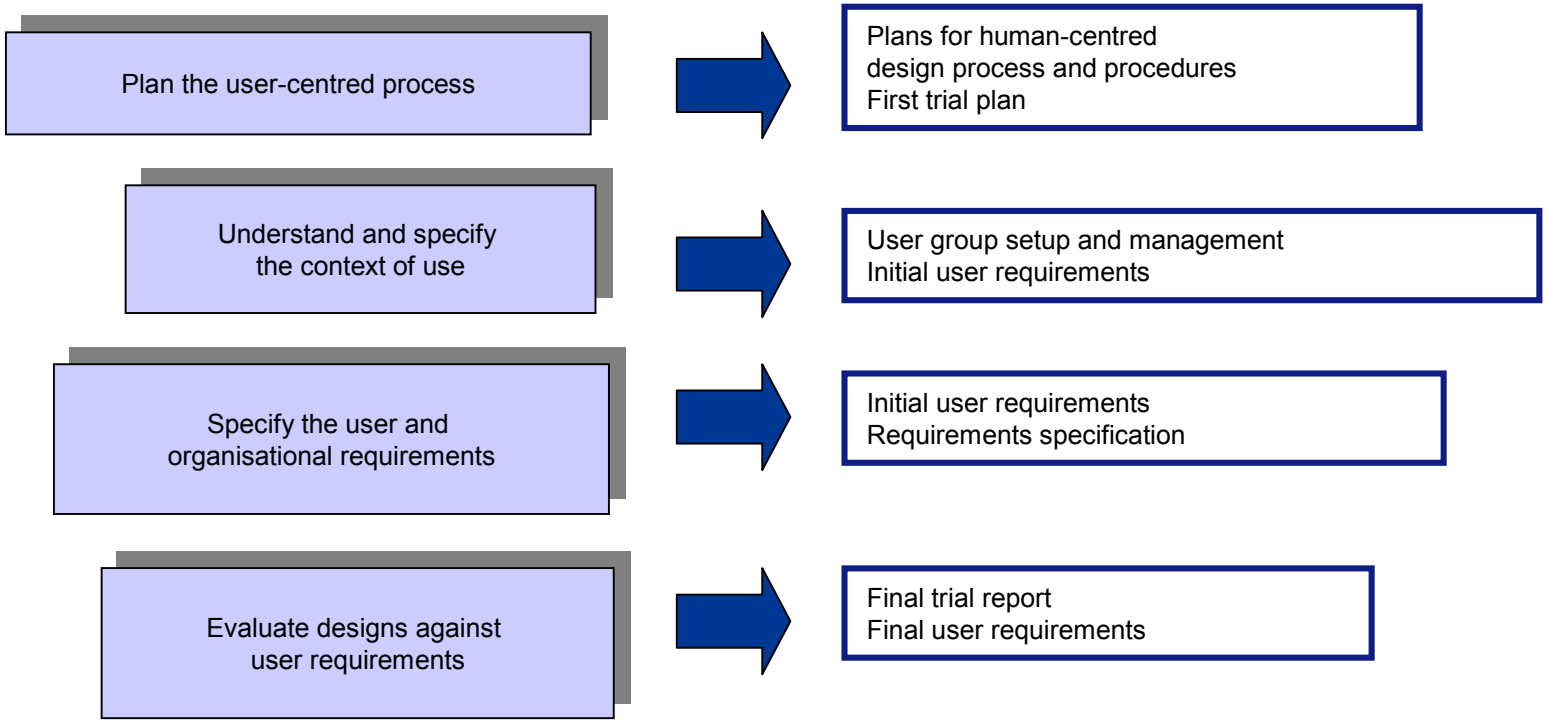
- Intelligent system tracks the positions of players and ball using video data.
- Low-bandwidth transmission of this data to display on mobile device.
- Related features:
  - video clips
  - audio commentary
  - text commentary
  - archive/chat etc

# Intelligent Monitoring Application

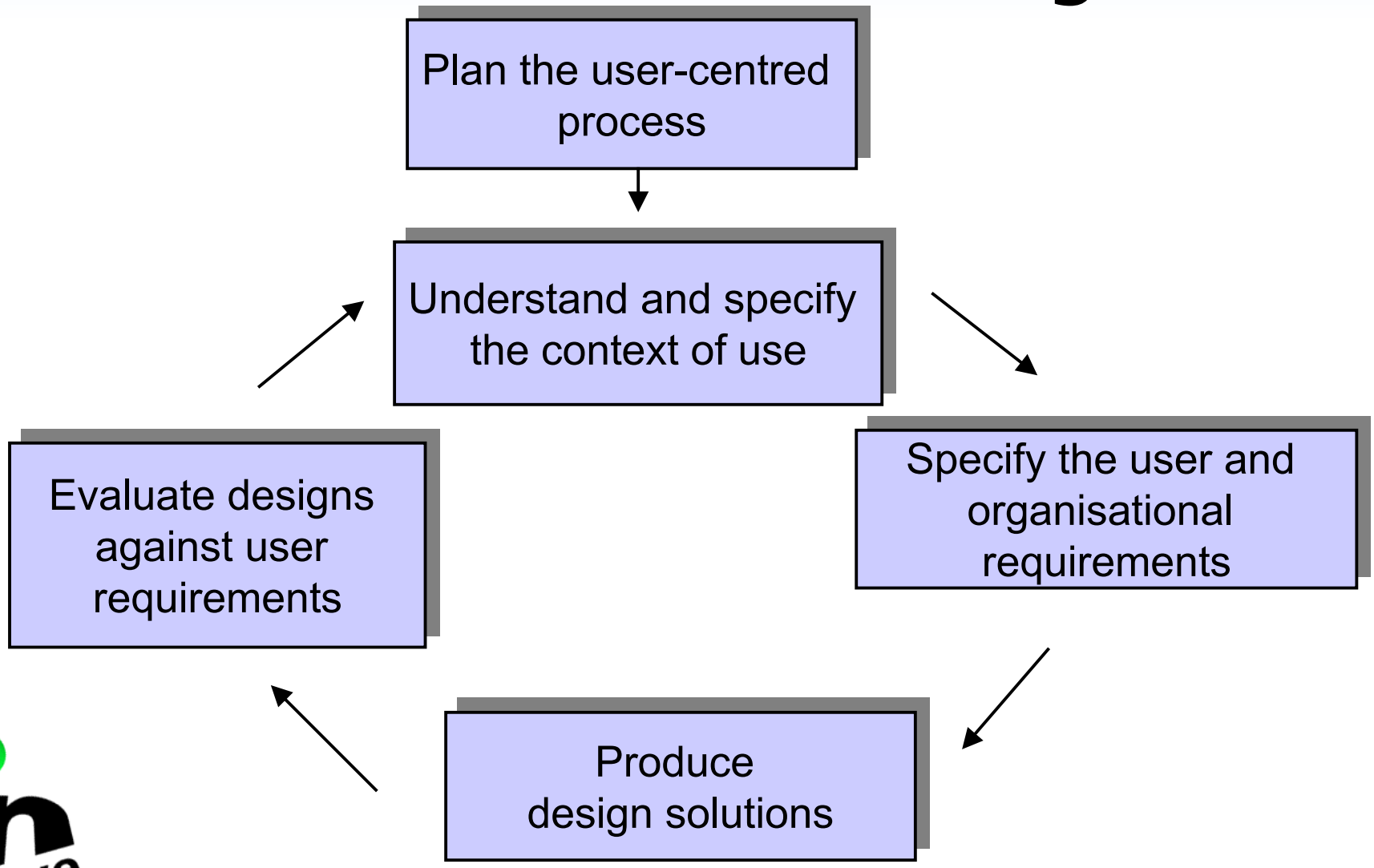
- Home Monitoring (e.g. everything at home is OK)
- Mobile Security (e.g. checking that your valuable cargo remains in the right hands)
- Destination Monitoring (e.g. guiding people/vehicles to their destination)
- Industrial Monitoring (e.g. video/image supported monitoring/surveillance in general)

Two applications of these categories, with relevance to INMOVE key technology, will be chosen later, to be implemented at the technical level required by user trials.

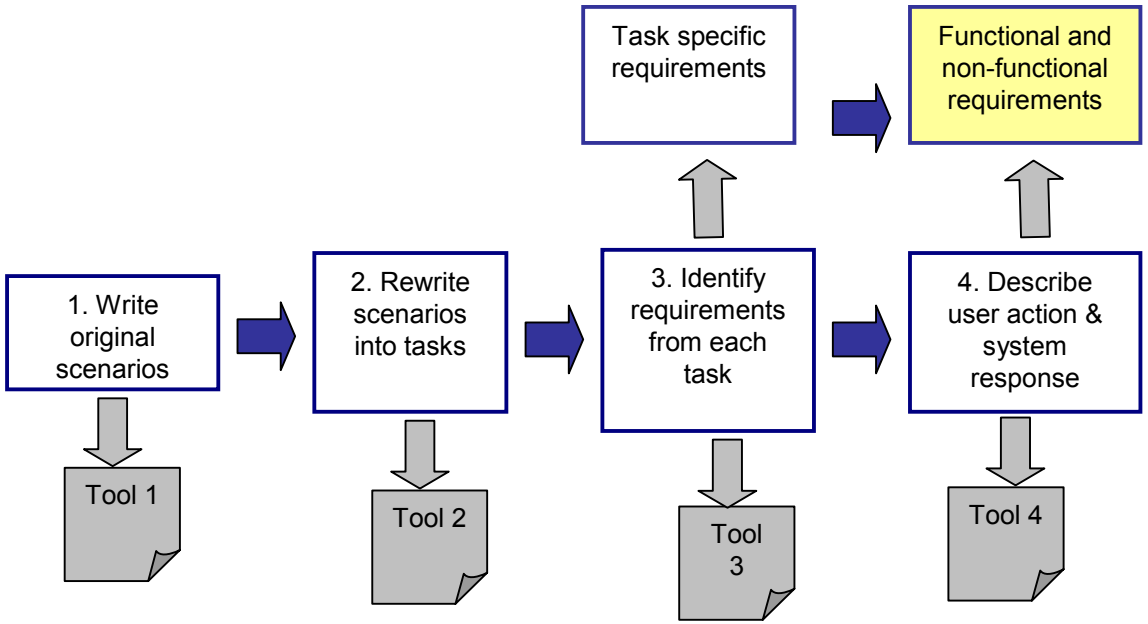
# User Requirements Analysis



# Human Centred Design



# Human Design Process Tools




- Each tool (1-4) is designed to capture the salient points from the corresponding stage of the process

# Tool 1: Scenario Descriptions

- Scenarios were compiled to describe situations in which target applications were used.
  - an individual user (age, gender, profession, technical skills, user's motivation)
  - interacting with a specific set of computer facilities (technical environment)
  - to achieve a specific outcome (goal of the use: what has to be done),
  - specific circumstances (physical environment, e.g. location, other persons involved)
  - over a certain time interval (a time dimension of what happens and when).

# List of written Scenarios

- Home care
- Viggo and the security van
- Olfert and his cherished automobile
- Janne and Friday party
- Optimize taxi services
- Simon in his first week at the university
- Marc and the "interactive" tutorial
- Ronald the clumsy salesman
- Minding the kids, but keeping in touch with the game
- A train journey on the last day of the season
- Examining suspicious characters
- Students making a network game (Toolkit)

# Focus Groups

- A: six students from Tampare University, Finland
  - Simon in his first week at the university (Sc5)
  - Marc and the "interactive" tutorial (Sc6)
  - Janne and Friday party (Sc4A)
- B: seven parents with young children from Finland
  - Home Care (Sc1)
  - Ronald the clumsy salesman (Sc7)
  - Olfert and his cherished automobile (Sc3)
- C: six football fans resident in United Kingdom
  - Minding the kids, but keeping in touch with the game (Sc8)
  - A train journey on the last day of the season (Sc9)

# Home care

- Intelligent camera sends messages e.g. “Susan has come home now”
- Also relevant for unwanted intruders
- False alarms created by pets?

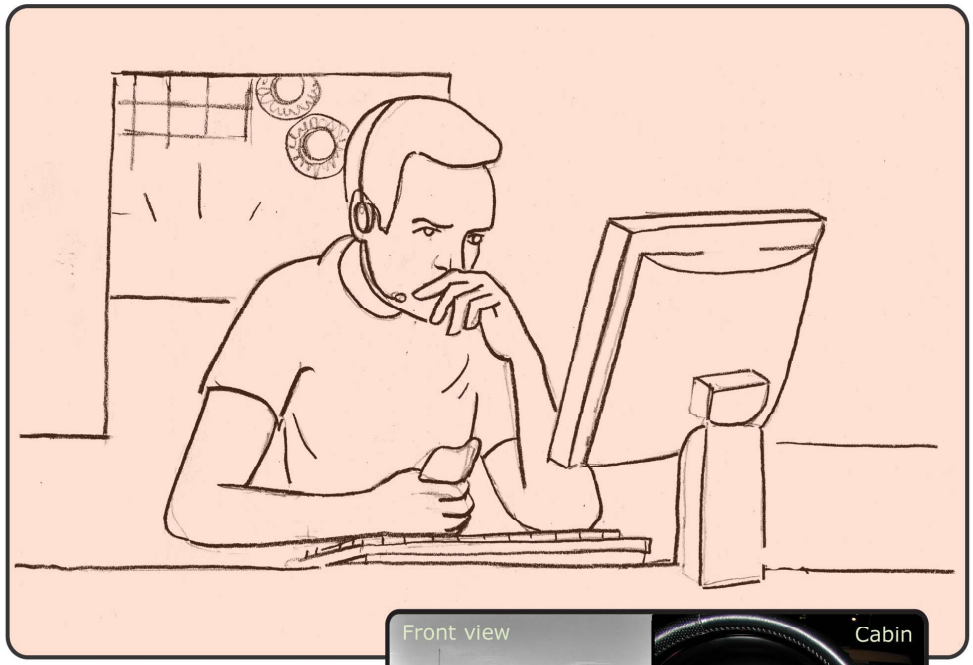
“Satu has entered home”

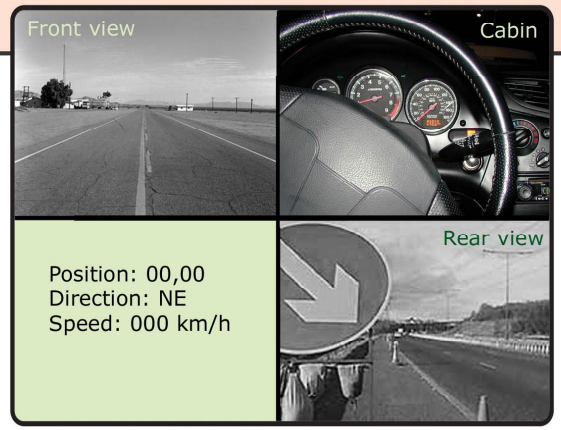
# Home care -- Focus Group Response:

- The general feeling was not positive:
  - children become less independent
  - no added value if the message is automatic
- less expensive door sensor alternative

# Olfert and his cherished automobile

- Olfert loves his car
- Cars can be stolen by taking the keys from his private house
- Video device inside car can transmit data about the identity and position of the car and its occupants.

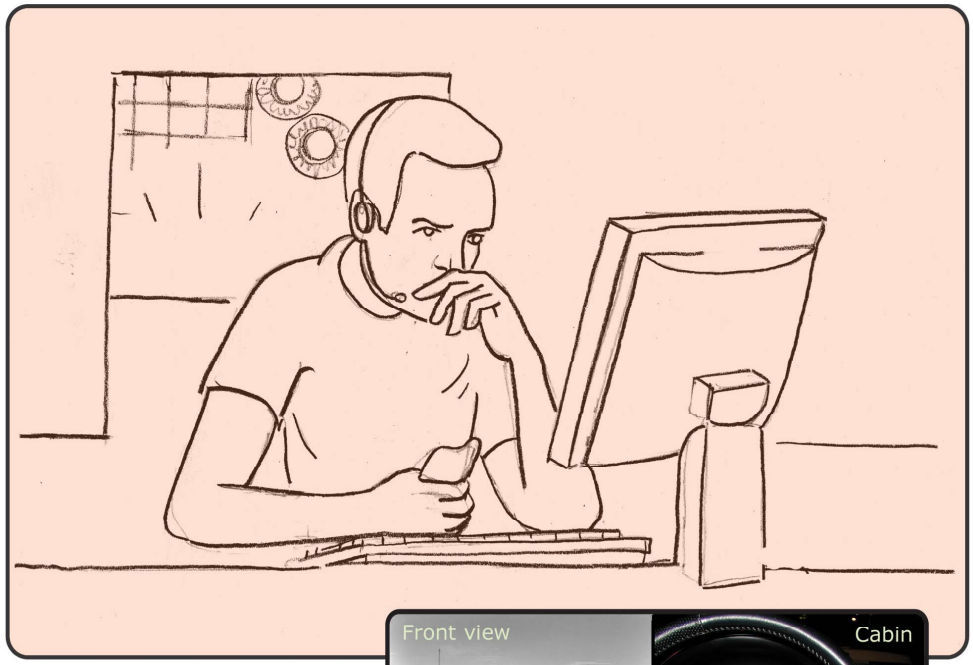


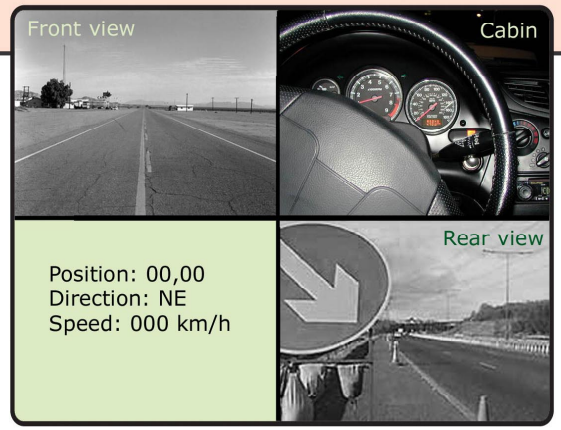


# Olfert and his cherished automobile

## Focus Group Response

- GPS/mobile sensor would be enough
- System should work across state boundaries
- Sounds too expensive for average car users



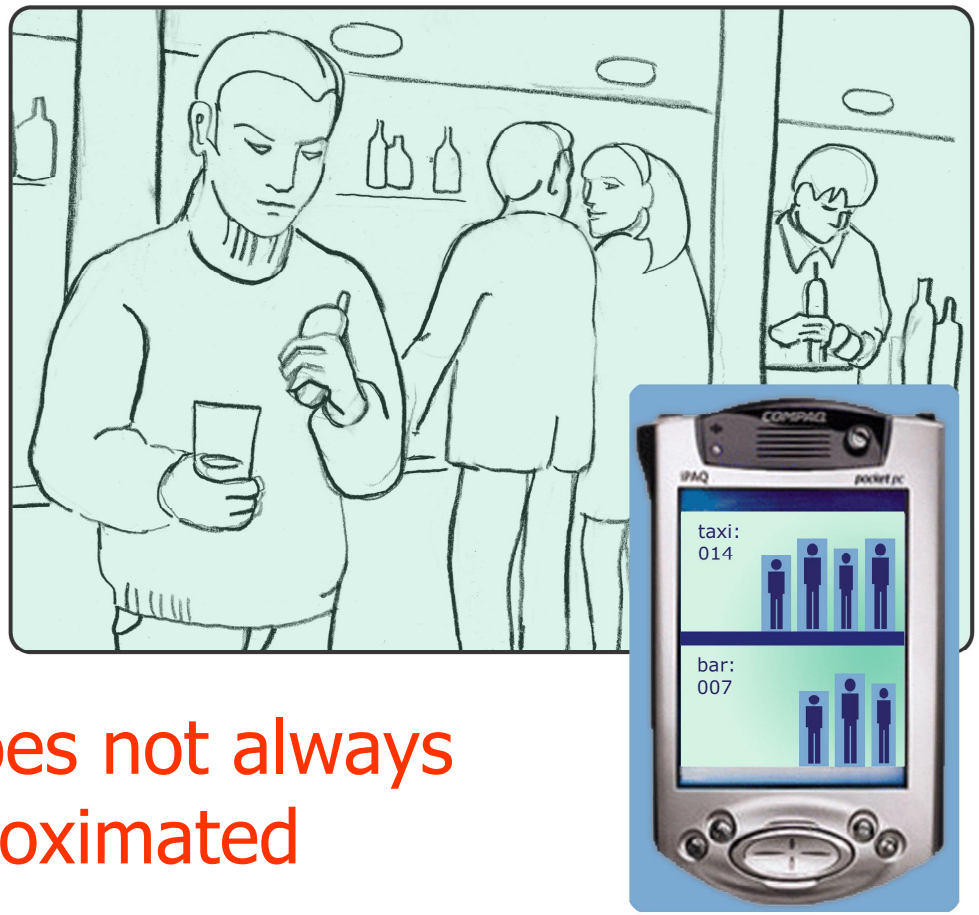


# Janne and Friday party

- Friday night often sees a mismatch between supply and demand:
  - long queues to get into late-night bars
  - long queues to get into a taxi going home
- mobile application to provide remote information about these

# Janne and Friday party - Focus Group Response

- Good idea, in cold climates especially
- Strong feelings about privacy of taxi queue
  - but silhouette is probably OK
- Length of the line does not always correlate to the approximated waiting time.



# Simon in his first week at the university

- Interactive guide to help around large new places
- Cameras to track and aid people (communicating via handset)
- Office camera to confirm presence to the supervisor

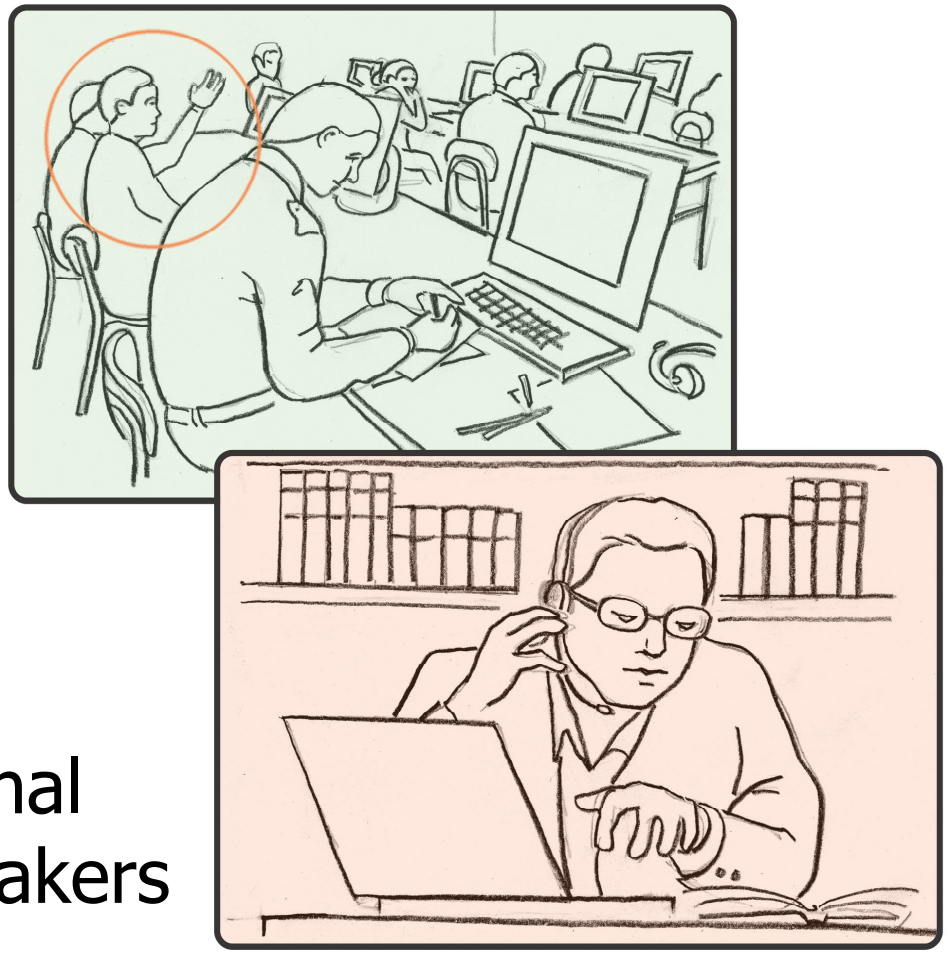
# Simon in his first week at the university - - Focus Group Response

- participants wanted to control privacy:
  - what information is public, and private
  - advertising control
  - output of guidance.
- doubts about 3D guidance


- New idea: an interactive 3D city map service.

# Marc and the "interactive" tutorial

- Camera integrates image of face and ID information.
- Remote supervisor accessible by many distant students
- Student gestures are detected by camera systems with directional microphones & speakers

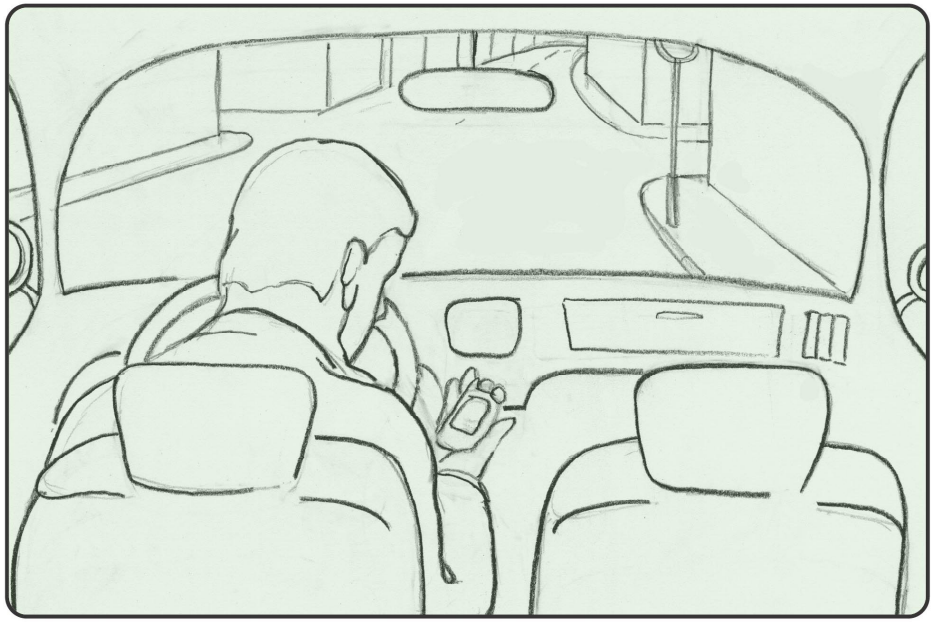


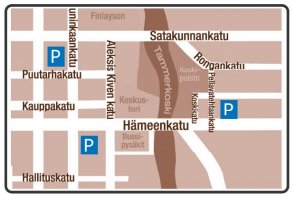
# Marc and the "interactive" tutorial - Focus Group Response

- face to face tutorials appreciated more.
- e-learning only advantageous when e.g. the supervisor is really famous and in another country.
- The usage metaphor was seen clumsy and senseless.

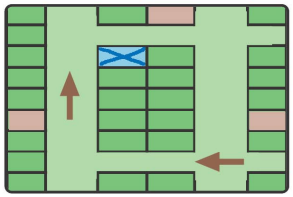
# Ronald the clumsy salesman

- Car Parks: a simple count at the entrance and exit provides basic information.
- The location of the free spaces monitored with cameras
- From the information a map is generated and sent to the mobile device of Ronald



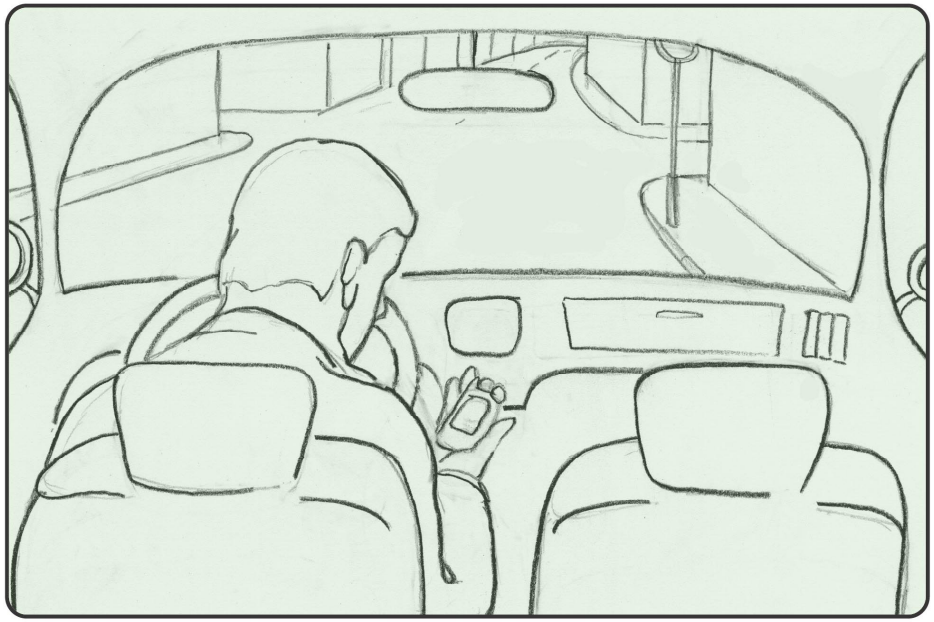


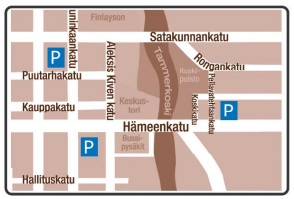




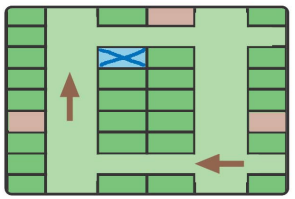
# Ronald the clumsy salesman
## - Focus Group Response

- Simple UI necessary
- Paying for the parking in advance was thought a good idea
- Could include a route guidance to the nearest car park
- Live video from main roads to avoid traffic jams.







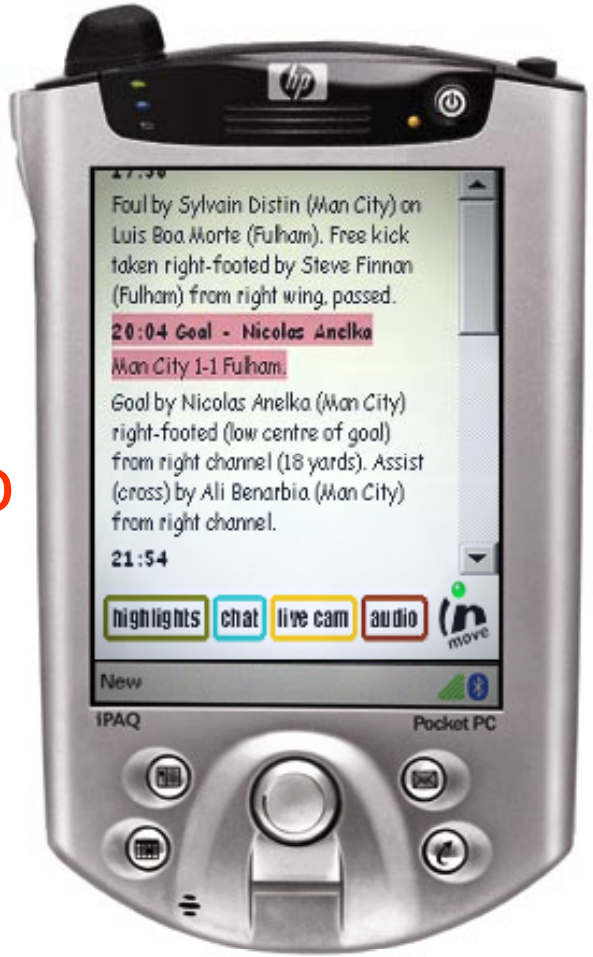


# Minding the kids, but keeping in touch with the game

- Application to provide text and video information about a football game
- Users can select video clips depending on the text description
- Alerts can be configured to notify the user about significant events

# Minding the kids, but keeping in touch with the game - Focus Group Response

- Wide range of habits associated with watching football - personalisation will be necessary.
- users will probably prefer to 'pull' video clips rather than be pushed them.
- Issues of timing appeared critical in some contexts.



# A train journey on the last day of the season

- Watch animation of game alongside audio commentary
- Receive alerts about interesting events from other matches
- Commentary can be specifically for a club, or a language

# A train journey on the last day of the season - Focus Group Response

- Novelty of the animation component was well received… but unsure of context
- Is it accompaniment or alternative to `an audio commentary?
- native language /favourite commentary option is popular

# Functional Requirements by Scenario

| **F-M**/Fixed-Mobile **M-F**/Mobile-Fixed **M-M**/Mobile-Mobile | **Scenario name** | **Rating by WP2** | **Face/ identity recognition in partially controlled environment** | **People/ vehicle (counting) behaviour recognition** | **Multi camera data fusion** | **Privacy oriented filters** | **Stabilisation self-calibration** | **Retrieval of information** | **Market potential / Consumers 3 years** | **Market potential / B-B** | **Technically interesting** | **Focus Group judgement** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 F-M | Home care | 4++ RL | x | x | x | ~ | ~ | x | - | + | + | - |
| 2 M-F | Viggo and the security van | 5++ ONAIR | | x | x | x | x | x | - | +? | + | |
| 3 | Olfert and his cherished automobile | 1+ ONAIR | | | | | | x | niche | - | - | + |
| 4A F-M | Janne and Friday party (Case A) | 3++ RL&M | | x | | x | | x | + | - | ~ | + |
| 4B F-M | Optimize Taxi services (Case B) | 3+ RL&M | | x | | x | | x | - | + | ~ | |
| 5 (new) F-M | Simon in his first week at the university | 4+++ DIBE | ~ | x | x | | x | x | - | +? | + | + |
| 6 F-M | Marc and the interactive tutorial | 4++ DIBE | ~ | x | x | | x | x | - | +? | + | - |
| 7 F-M | Ronald the clumsy salesman | 3++ TNO | | x | x | | | x | + | - | ~ | + |
| 8 F-M | Minding the kids, but keeping in touch | | ~ | x | x | | x | x | + | + | + | |
| 9 F-M | A train journey on the last day of the season | | ~ | x | x | | x | x | + | + | | |
| 10 F-M | Examining suspicious characters | 5++ KU | | x | x | x | x | x | - | + | + | |

# Modified Scenarios

- Viggo and the security van
- Kalle's service station
- Simon in his first year at the university
- Minding the kids, but keeping in touch with the game
- A train journey on the last day of the season
- INMOVE Toolkit

# Tool 2: List of Scenario *Tasks*

| Scenario Name | Scenario Name & ID | |
|---|---|---|
| Author | Author's name/organisation | |
| Goal | Short description of the scenario purpose. | |
| Users (1...N) | a | First user name: short description. |
| | b | Second user name: short description. |
| System Elements (1...N) | c | First system element name: short description. |
| | d | Second system element name: short description. |
| Assumptions | Pre-conditions that must be true for the scenario to take place. | |
| Task1 | 1 | User tasks in the scenario; interaction(s) between users and system. |
| | 2 | … |
| Deviation 1 | 1.1 | Any deviation in the corresponding tasks of the scenario. |
| Open Issues | List of issues that remain to be solved. | |
| Remarks | Other remarks. | |

# Football App (Sc16) : Tool 2

| Scenario Name | Sc16 - A Train Journey on the last day of the season |
|---|---|
| Author | Martin Colbert and Liam Lowey |
| Goal | Enjoy the last day of the English Football season |
| Users | a. Dipak (male, 20-30, Thai national, knowledgeable about the game, probably frequent visitor to football web sites (once a week), probably uses interactive tv). |
| | |
| System Elements | A. video based tracking system providing a stream of positional data. |
| | B. system to provide video clips of recent highlights in appropriate format. |
| | C. audio commentary stream, possibly in multiple languages. |
| | D. database of football related information (players, scores, tables, fixtures etc). |
| | E. hardware and software to serve elements A, B, C and D over an appropriate network and in a suitable format. |
| | F. a mobile device with software to display elements A, B, C and D. |

# Football App (Sc16) : Tool 2 (second half)

| | |
|---|---|
| **Assumptions** | Dipak has a fully charged phone battery, an appropriate wireless network is working fine on the train. |
| **Tasks** | 1. Dipak follows the progress of several football games while on a train journey.<br>2. Dipak hears about his chosen matches in his preferred language.<br>3. Dipak wants to know where the all the players are at any given moment.<br>4. Dipak would like to receive updates on other games he is interested in, while watching one particular game. |
| **Deviation** | - |
| **Markets** | Football (and selected other sports) fans world-wide. |
| **Open Issues** | - |
| **Remarks** | - |

# Tool 3: List of *user requirements* per task

| Scenario name | | Scenario Name & ID |
|---|---|---|
| **Tasks** | **Users** | **Requirements descriptions** |
| 1 | **User *a* name** | Description of user's needs and requirements related to the user tasks in the scenario step, from the user's point of view. |
| | **User *b* name** | … |
| | **Requirements** | List of both functional and non-functional requirements (brief description) emerging from the different perspectives related to this scenario step. |
| 2 | **User *a* name** | … |
| | **Requirements** | … |
| **Remarks** | | Other remarks |

# Football App (Sc16) : Tool 3

| Scenario name | | Sc16 - A train journey on the last day of the season |
|---|---|---|
| **Tasks** | **Users** | **Requirements descriptions** |
| **1** | **Dipak** | Wants to follow the progress of several football games while on a train journey. |
| | **Requirements** | A service for a mobile that delivers a wide range of information about football matches, in a number of formats. |
| **2** | **Dipak** | Wants to hear a commentary for his chosen team in his preferred language. |
| | **Requirements** | F: A service that includes an audio stream where the user has the ability to choose the language of delivery.<br>NF: *The crowd noise could be an optional component to the delivery in each language.* |

# Football App (Sc16) : Tool 3 (second half)

| Scenario name | | Sc16 - A train journey on the last day of the season |
|---|---|---|
| 3 | Dipak | Wants to follow the positions of the players over a low bandwidth connection. |
| | Requirements | F: A service for a mobile device that delivers a low bandwidth stream of information that enables the device to represent the current positions of the players in a graphical, animated format.<br>NF: *User can select different views of the game.* |
| 4 | Dipak | Wants to be alerted when there are important events in matches that he is interested in. |
| | Requirements | F: The application can receive and display information about a number of different games at once.<br>NF: *He can control the nature of the alerts, e.g. swich to audio commentary, text-based message, downloaded video clip.* |
| Remarks | | - |
| References | | - |

# Tool 4: List of *functional requirements* per User Requirement.

| Req.ID | Requirement Name | Priority (1-3) | User Action | System Response | Non-Functional Requirement Related | Originating Scenario Code |
|---|---|---|---|---|---|---|
| **1** | **Primary Requirement** | | | | | |
| *1.1* | *Secondary Requirement* | | | | | |
| 1.1.1 | 2nd level Secondary Requirement | | | | | |

# Football App (Sc16) : Tool 4

| Req. ID | Req. Name | User Action | System Response | Non-Functional requirement related | Originating Scenario Code |
|---|---|---|---|---|---|
| R1 | Match Animation. | User requests to view animation. | The server sends stream of game state information which is received and displayed by the handset. | NF1.1 Configurable display.<br><br>NF1.2 Synchronised audio.<br><br>NF1.3 Switch between different matches. | SC15, SC16 |
| R2 | Match commentary. | User requests audio commentary of match. | The server sends a stream of audio information which is received and played by the handset. | NF2.1 Different commentary for each team.<br><br>NF2.2 Different languages available.<br><br>NF2.3 Switch between different matches. | SC16 |

# Football App (Sc16) : Tool 4

| Req. ID | Req. Name | User Action | System Response | Non-Functional requirement related | Originating Scenario Code |
|---|---|---|---|---|---|
| R3 | Match Video Clip. | User requests video clips of significant match events. | The server sends a video file which is received and displayed by the handset. | NF3.1 The user can select prior or “on-demand” downloading.<br><br>NF3.2 Different bit-rate video clips are available. | SC15, SC16 |
| R4 | Match Text | User requests on-going textual match commentary. | The server sends packets of text data which are received and displayed by the handset. | NF4.1 User can filter textual messages by match, or event type. | SC15, SC16 |
| R5 | Match Alert | User requests to be alerted in the manner of their choosing, in response to match events. | System is then configured to provide the chosen type of alert for all chosen match events. | | SC15, SC16 |
| R6 | Fan Chat | User interacts with discussion board dedicated to match events. | System sends, receives and displays messages. | | |