

Information Society for All



Baseline

Aims and objectives






Technical work

Outcomes

What it is ...

- ✍ A three-year IST-funded **Thematic Network** (Working Group) establishing a wide, interdisciplinary and closely collaborating network of experts to provide the **European Health Telematics industry** with a comprehensive code of practice on how to appropriate the benefits of **universal design**.

Baseline concept

-  It is possible to design most manufactured items and building elements to be usable by a broader range of human beings, including:
 -  children,
 -  elderly people,
 -  people with disabilities, and
 -  people of different anthropometric measures.

The concept in practice

Early adopters

-  architects

-  interior designers

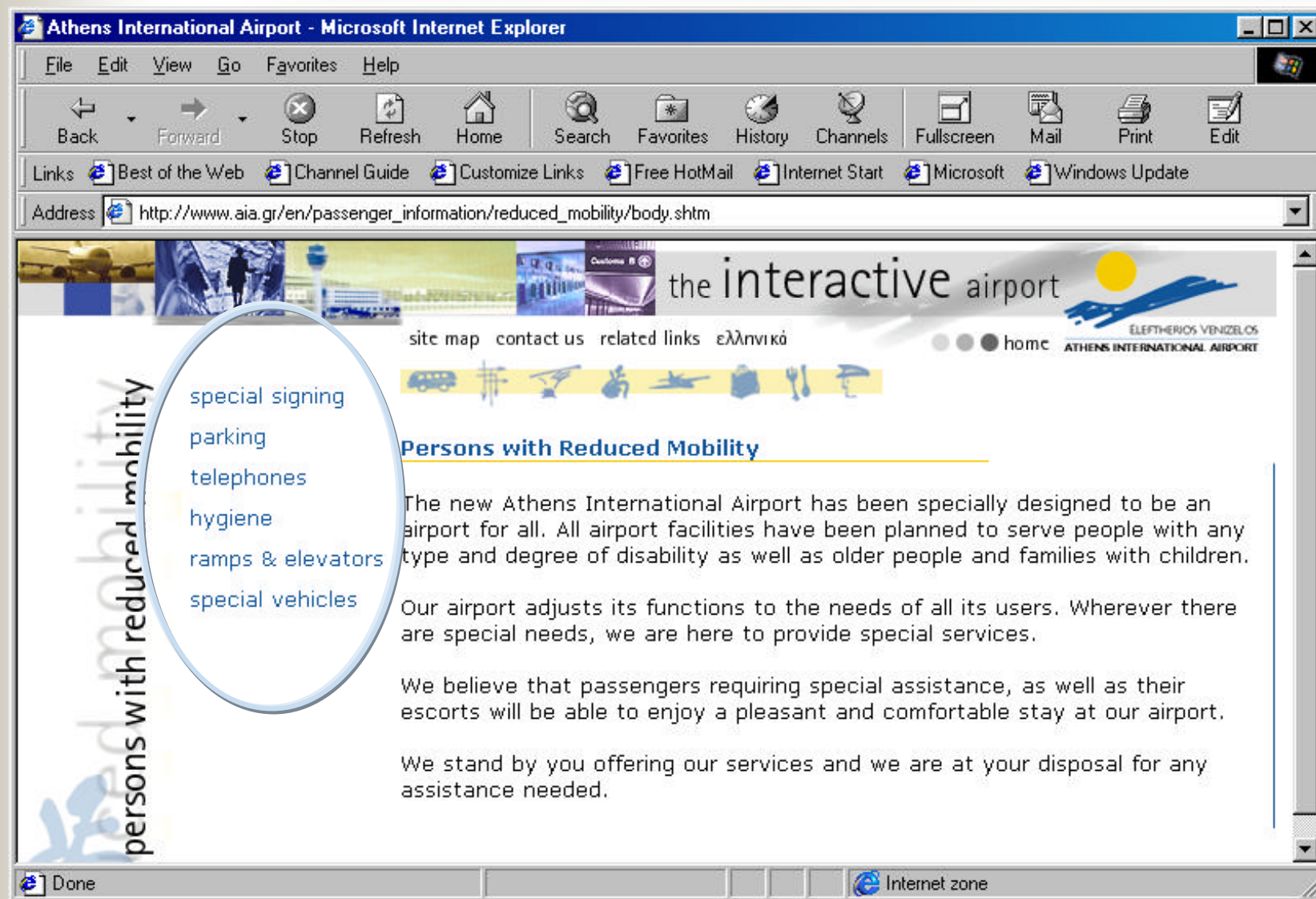
Application in landscape design

-  public buildings

-  workplaces

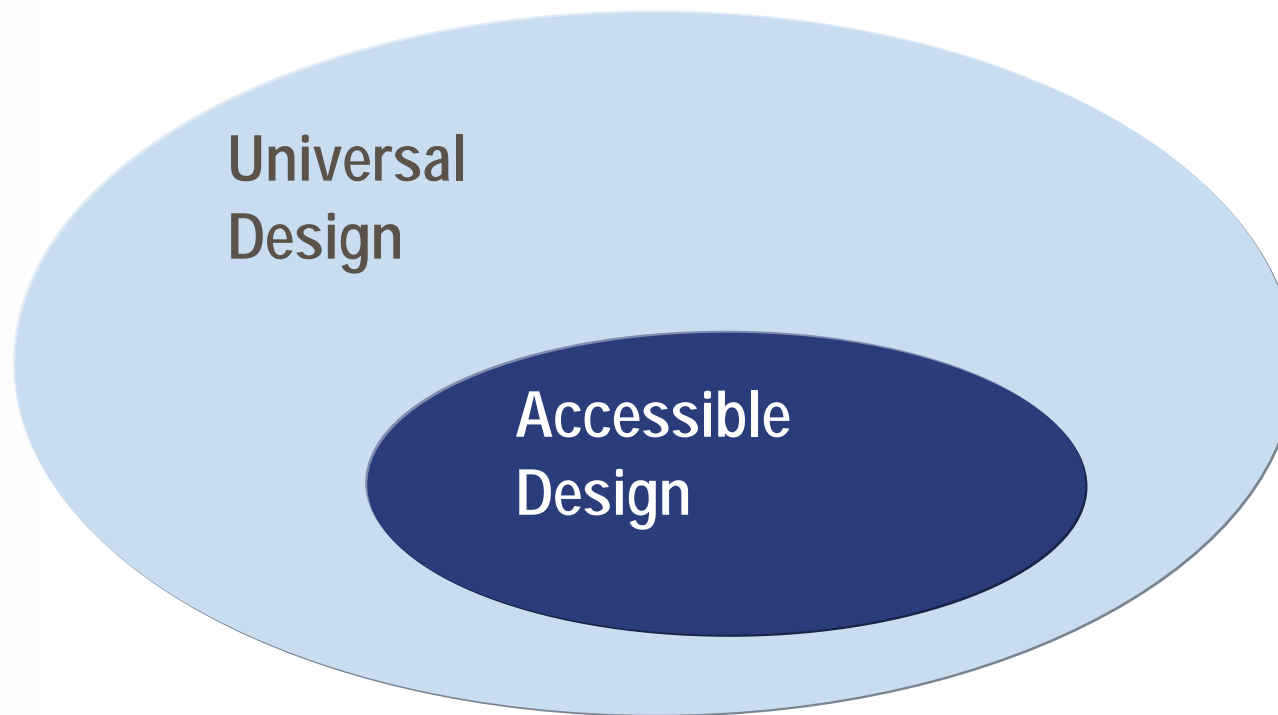
-  housing

The situation today



Accessible versus universal design

✍ Accessible design is **not** always universal design



An example - The amphitheatre

✗ The owners claim that it is fully accessible by disabled people




- ✗ Special signs
- ✗ Seating
- ✗ Information



This is not universal design !!!




Some guiding principles

 Universal design is NOT:

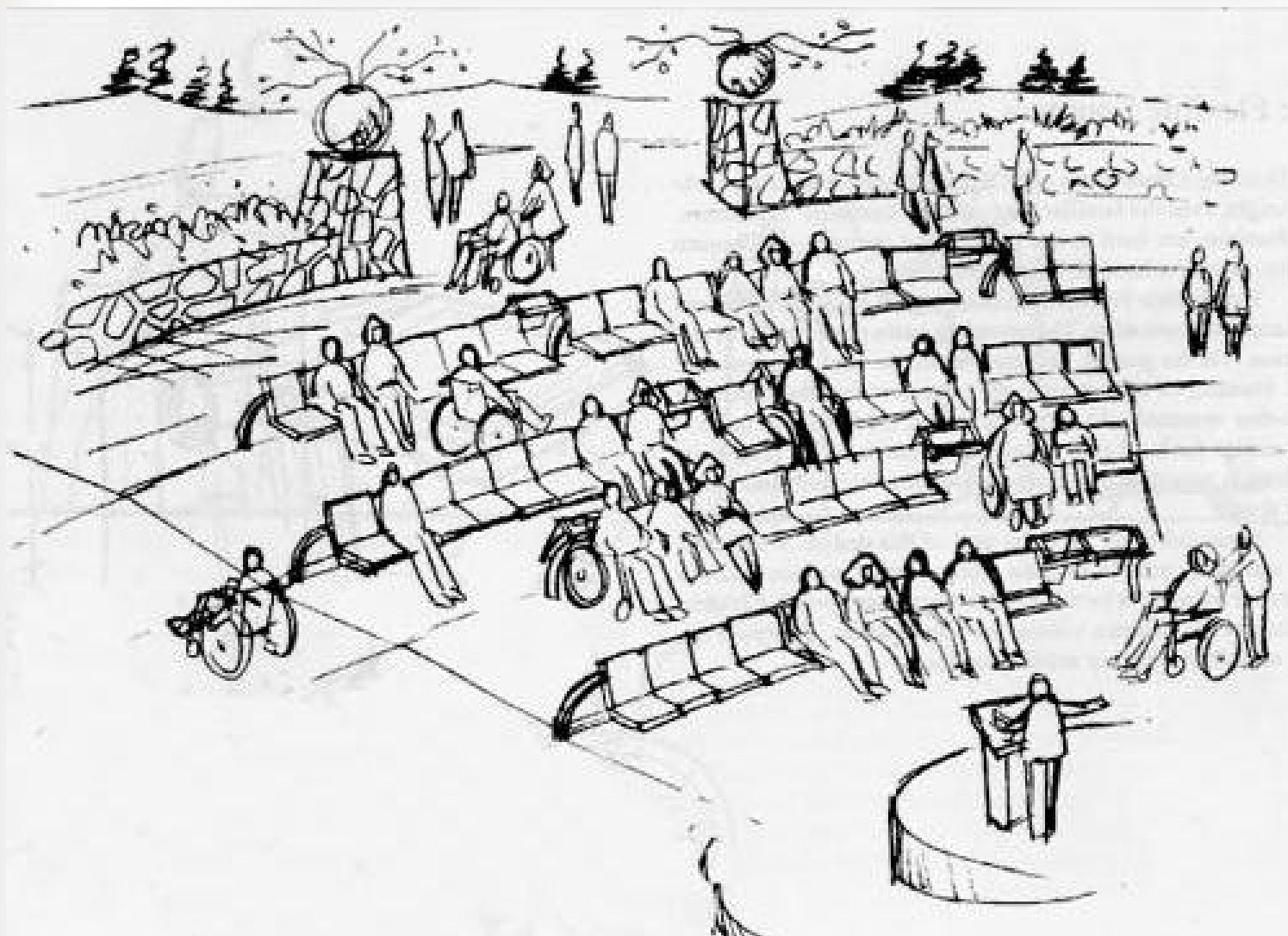
-  adding specialised equipment to accommodate special needs
-  adapting features of an environment to achieve what is possible with current facilities
-  retrofitting elements for disability access

Some guiding principles (Cont.)

 Instead, universal design entails:

-  paying attention to human access from the beginning
-  adopting an inclusive design process
-  committing to solutions which maximise usability








An amphitheatre for all



Lessons learnt

- ✍ Universal design requires a code of practice
 - ✍ structured process and phases
 - ✍ suitable techniques to attain specific targets
 - ✍ measurable yardsticks and assessment protocols for each phase
 - ✍ reference examples
- ✍ All the above are available to practitioners in mature engineering design disciplines

In the context of IST design

-  Is the baseline concept powerful enough?
-  What extensions are required, if any?
-  Can we build upon the experiences of other engineering design disciplines?
-  What code of design practice is needed?
 -  Process guidance
 -  Methods and techniques
 -  Examples

Universal Access





✍ Access by **any** (authorized) **user** to digital content and information from **anywhere** and at **anytime**

IS4ALL focus

- ✍ Universal access as a **quality attribute** with functional and non-functional implications
- ✍ IS4ALL focuses on **non-functional** aspects:
 - ✍ interaction design
 - ✍ the processes involved

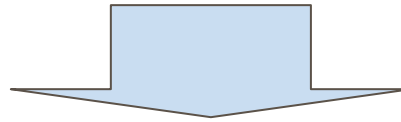
Aims and objectives

 Four main objectives:

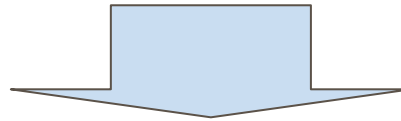
-  **Consolidating** existing knowledge on Universal Access in the context of IST into a comprehensive code of design practice.
-  **Translating** the consolidated wisdom to concrete recommendations for Healthcare Telematics.
-  **Demonstrating** the validity and applicability of the recommendations (concrete scenarios)
-  **Promoting** the Universal Access principles and practice in Healthcare Telematics

Project phases

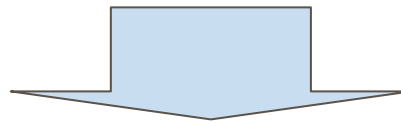
Develop Universal Access code of practice



Articulate guidelines for how to use universal access in
Healthcare Telematics



Apply universal access principles in specific scenarios









Promote universal access principles into vendor
requirements

Workpackages



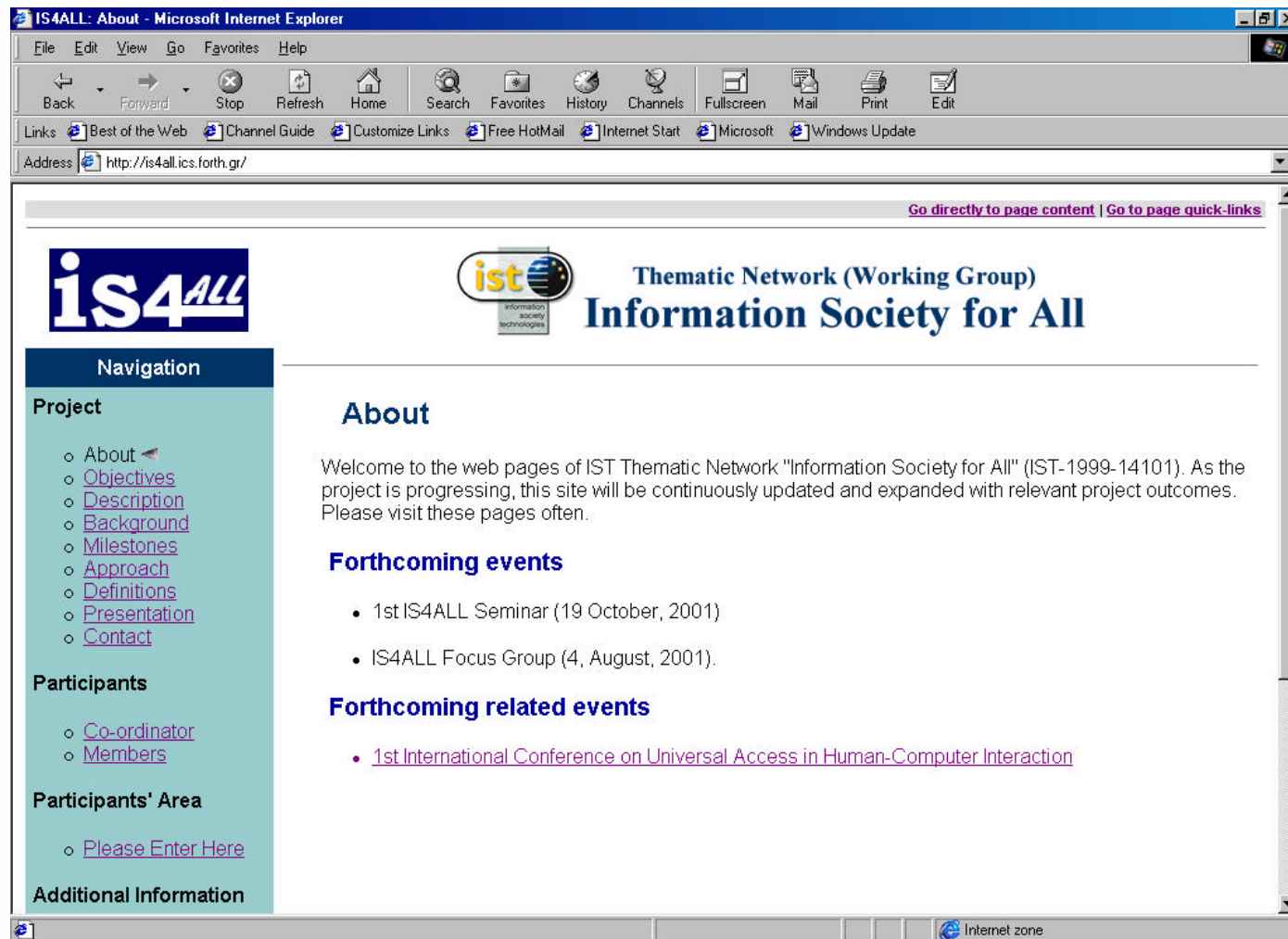
Technical work plan

Work packages

-  Work split into five workpackages
 -  Project Management
 -  Data collection
 -  Consolidation
 -  Outreach
 -  Evaluation and assessment

Project Web site





 <http://is4all.ics.forth.gr>



August 2001

Information Society for All - IS4ALL – IST-1999-14101

Data being collected

-  Two main clusters
 -  Universal design cluster
 -  Health Telematics cluster
-  Devise suitable instruments

Universal design cluster

 Methods, techniques and tools which are being used

 classification (empirical versus analytical)

 screening models

 principles and guidelines

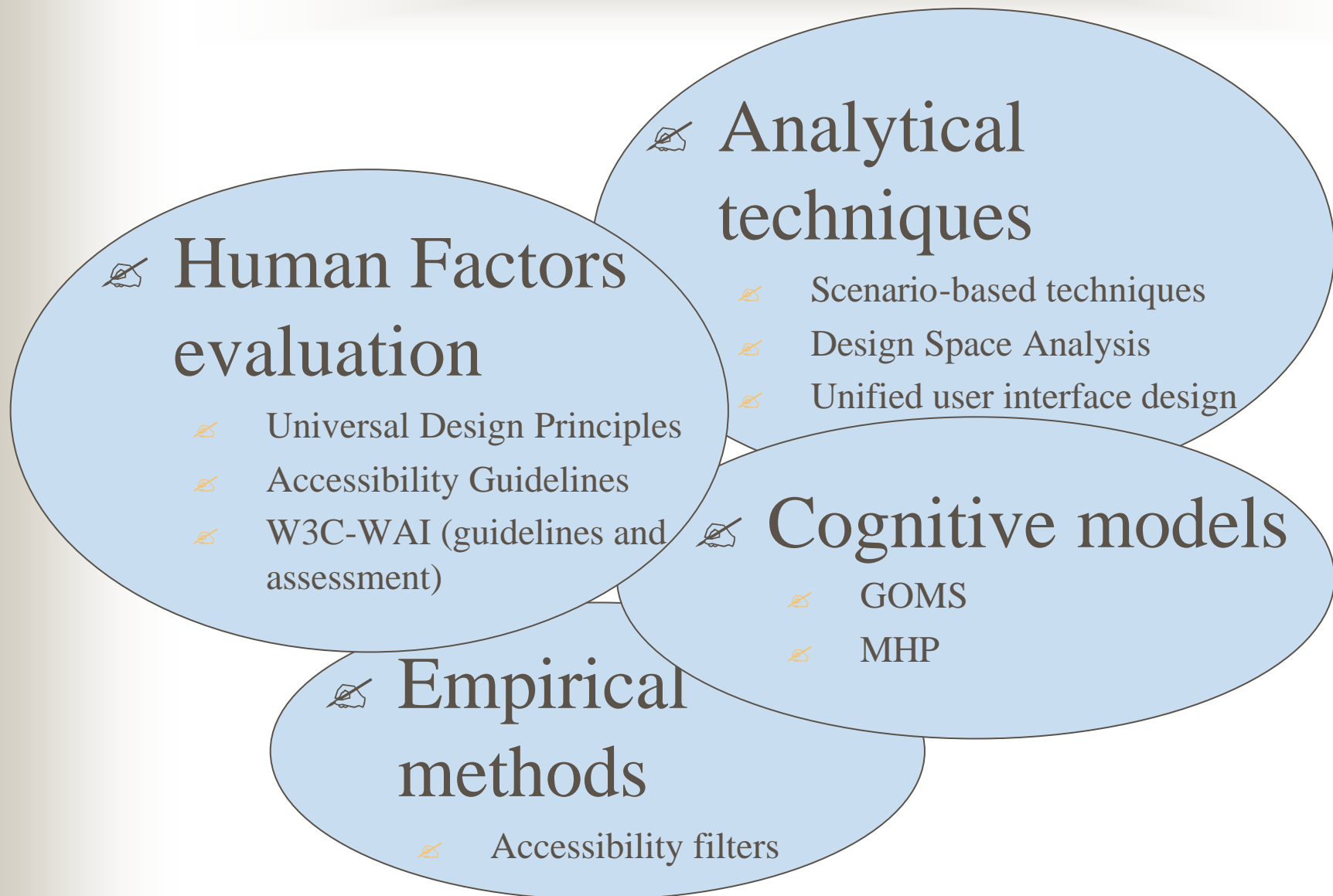
 analytical design

 instruments

 documentation template

 interview

Techniques to be investigated



Data collection plan




	<i>Case studies</i>	<i>Literature Review</i>	<i>Interview</i>	<i>Focused meetings</i>	<i>Short visits</i>	<i>Conference</i>	<i>Scenario</i>
<i>User-centred design</i>							
<i>Unified design</i>							
<i>Accessibility filters</i>							
<i>Universal design principles</i>							
<i>Assessment manuals</i>							
<i>Participatory approaches</i>							
<i>USERfit</i>							
<i>Cognitive models</i>							
<i>User modelling</i>							
<i>Usability evaluation</i>							
<i>Standards</i>							
<i>Guidelines</i>							

Health Telematics cluster

Requirements for universal access


-  user diversity
-  variety of platforms and terminals
-  contexts of use

State of the art


-  projects addressing universal access issues
-  which issue?
-  how it is being addressed?

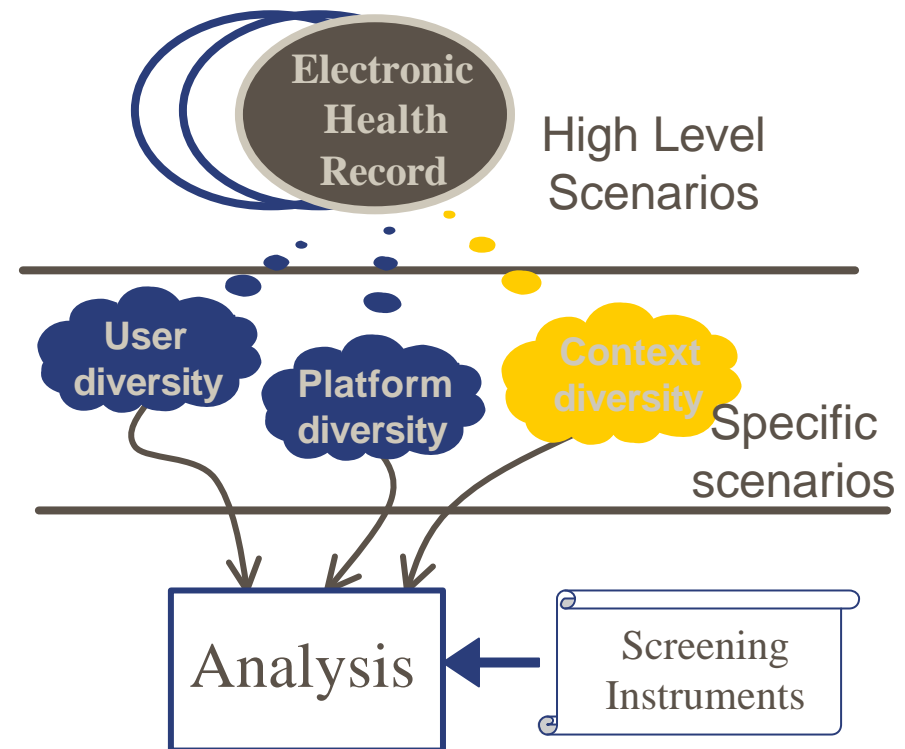
Plan for the HT cluster

Scenarios as instruments for data collection







 elaborate the designated scenarios so that they become more specific and concrete

 this may lead to a number of more detailed scenarios

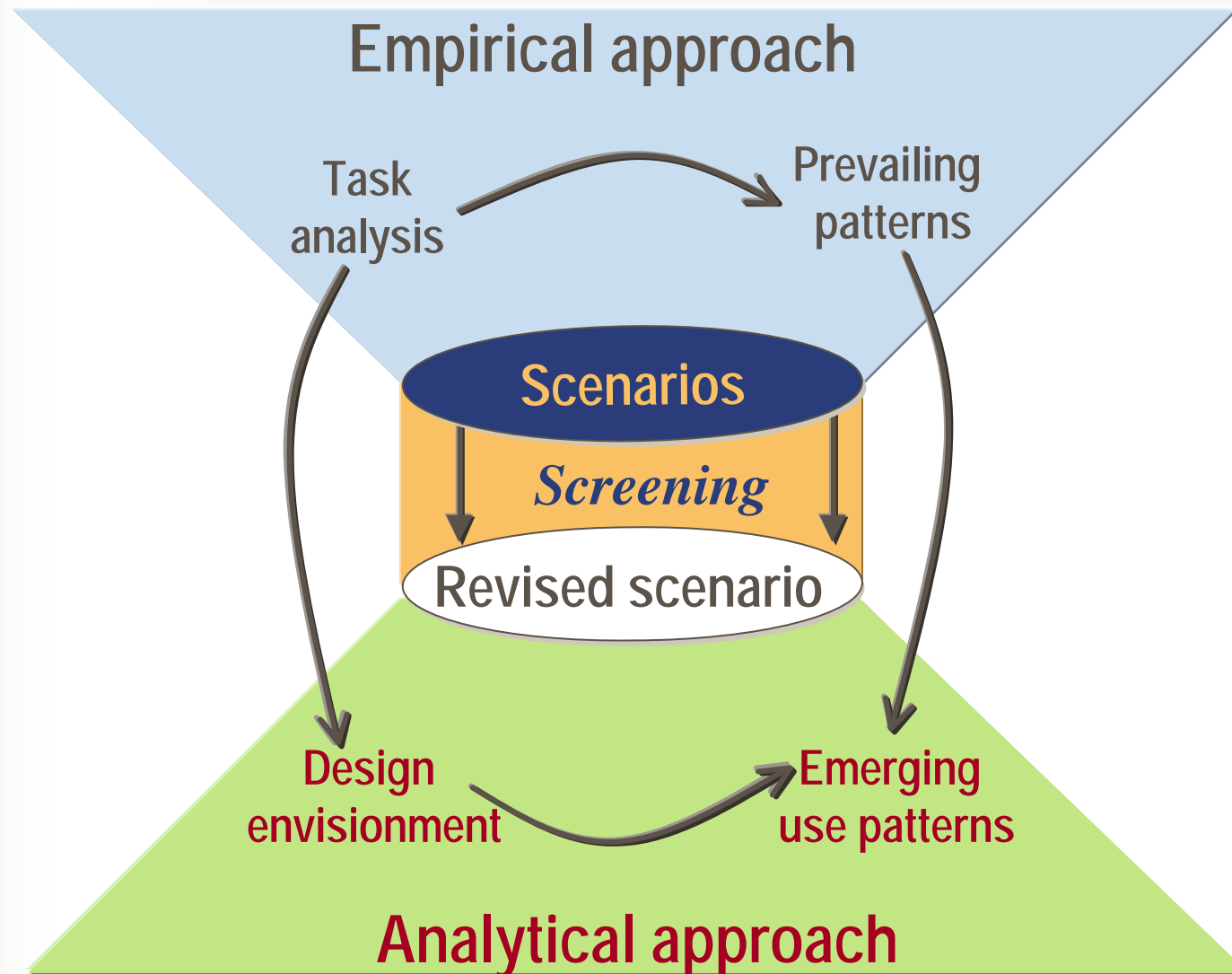
 agreement on scenario elicitation process



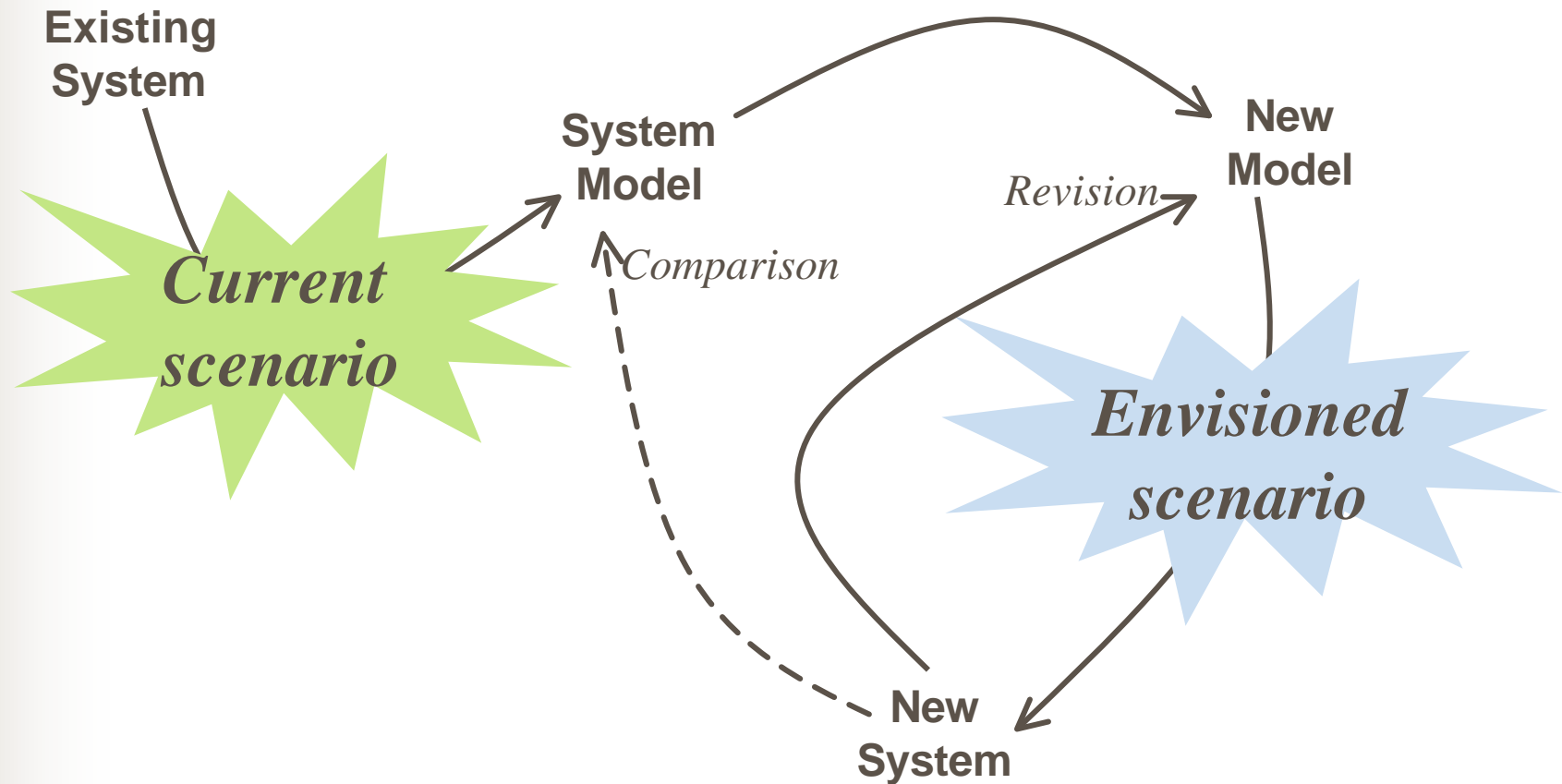
Scenarios

-  A description of a possible set of events that might reasonably take place
-  Stimulate thinking about
 -  possible occurrences,
 -  assumptions relating these occurrences,
 -  possible opportunities and risks,
 -  courses of action.

Alternatively






An engineering use of scenarios






Scenario types / classification

Different classifications

-  System Internal scenarios (**SI-type**)
-  System 2 System scenarios(**S2S-type**)
-  User Interaction scenarios (**UI-type**)

Content described

-  Goals, intentions, objectives
-  Work activities and proceses
-  Experience and use cases

Scenarios in IS4ALL

- ✍ Links with **requirements engineering with scenarios**
- ✍ A complete scenario should:
 - ✍ aim at a purpose (e.g. universal access)
 - ✍ be expressed in a form (narrative, (semi) formal)
 - ✍ it should provide content to describe
 - ✍ the **context of use** of an activity and where / how it is carried out
 - ✍ the **platforms** in place (or the artifact)
 - ✍ the target **users**

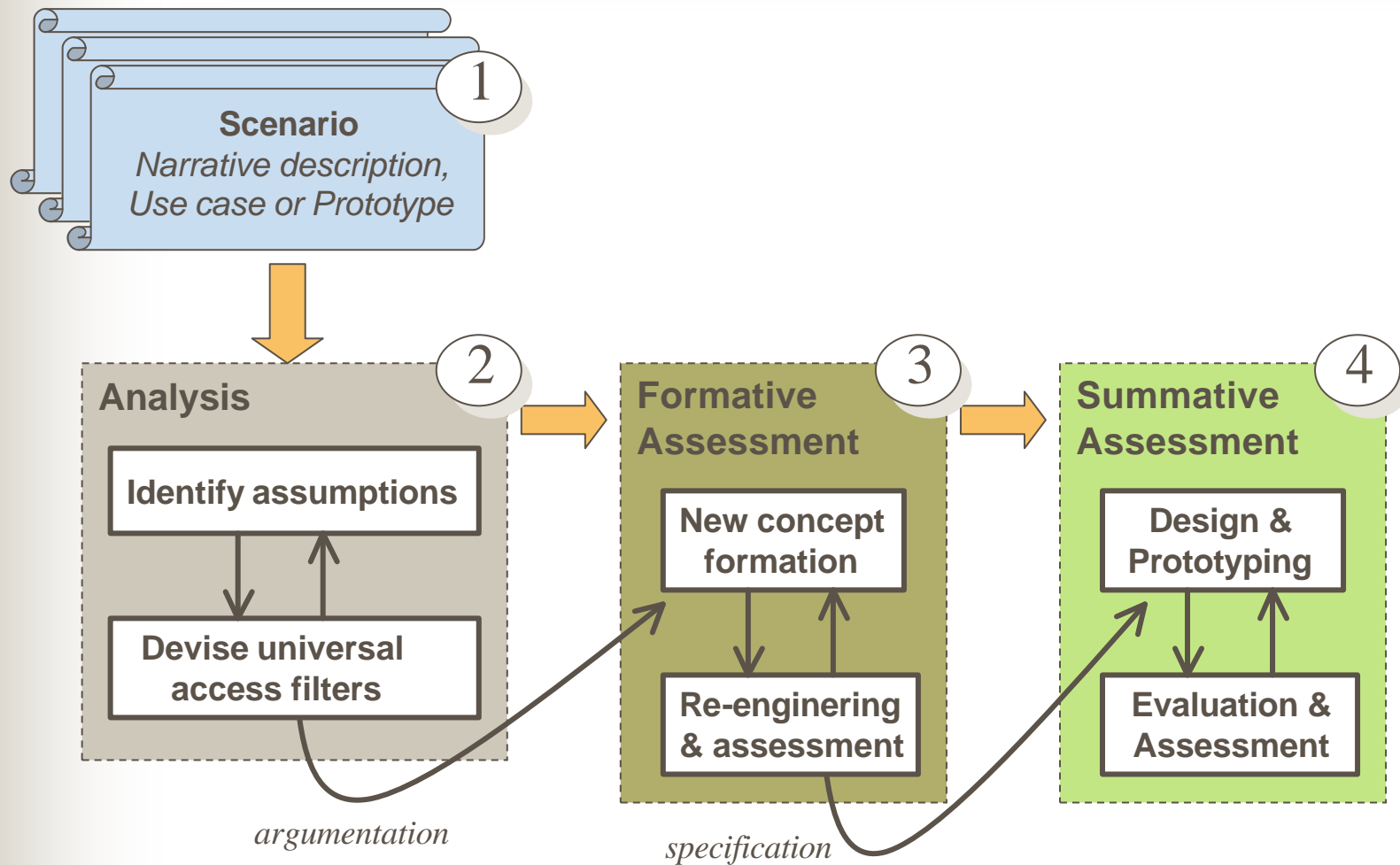
Scenario Elicitation Matrix

Quality Scenario	User diversity	Platform diversity	Usage context diversity
Scenario ₁			
Scenario ₂			
Scenario _?			

Scenario Elicitation Matrix

Context ?				
Home				
In-vehicle				
Context				
User	Platform	PC	PalmOS	WinCE
Category ₁				
Category ₂				
Category ?				









Process description



An example scenario




A user has just completed an order for several pharmaceuticals items. The on-line pharmacy store requests the user to specify payment details to process the transaction.

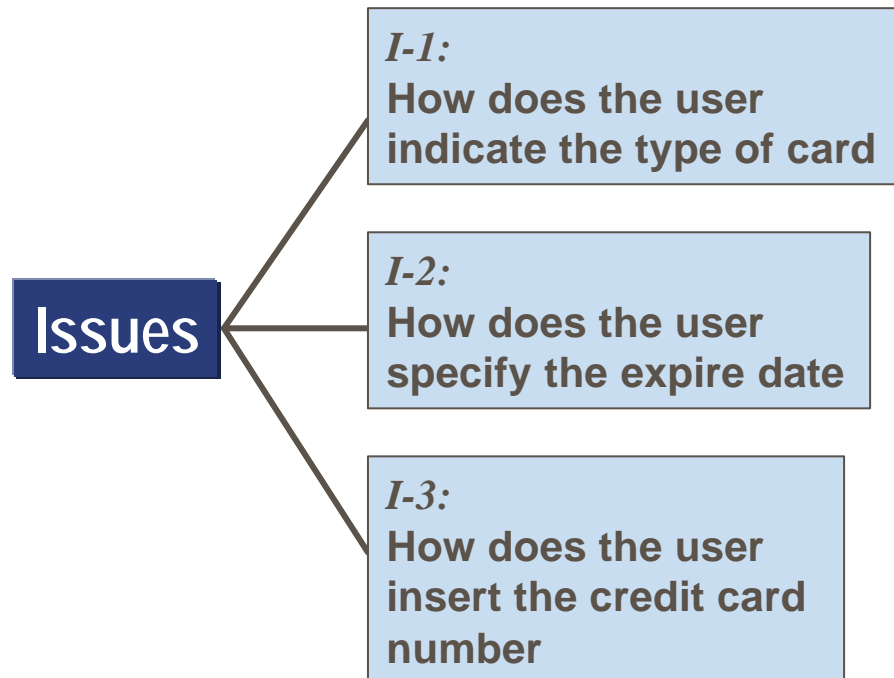
The design task

-  Design the dialogue through which a user can enter information about his/her credit card
-  Information to be entered includes:
 -  Type of card
 -  Card number
 -  Expire data
 -  User's name as printed on the card
 -  Billing address information
 -  etc

Identifying the issues

Issues raised:

-  How does the user indicate the type of card?
-  How does the user specify the expire data?
-  How does the user insert his/her credit card number?



Enumerating the options

Issues

I-1:
How does the user indicate the type of card

I-2:
How does the user specify the expire date

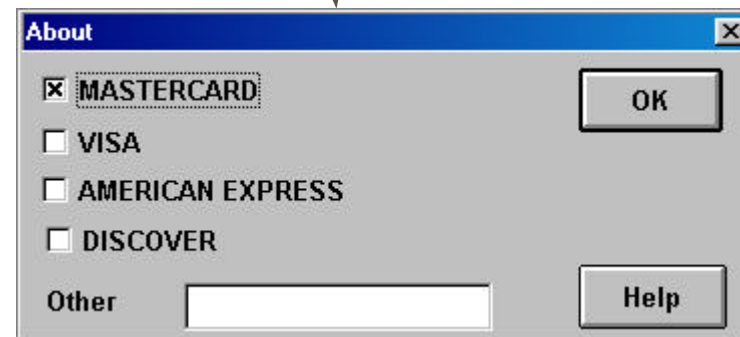
I-3:
How does the user insert the credit card number

O-1-1:
Choice from listbox

O-1-2:
Choice from checkbox

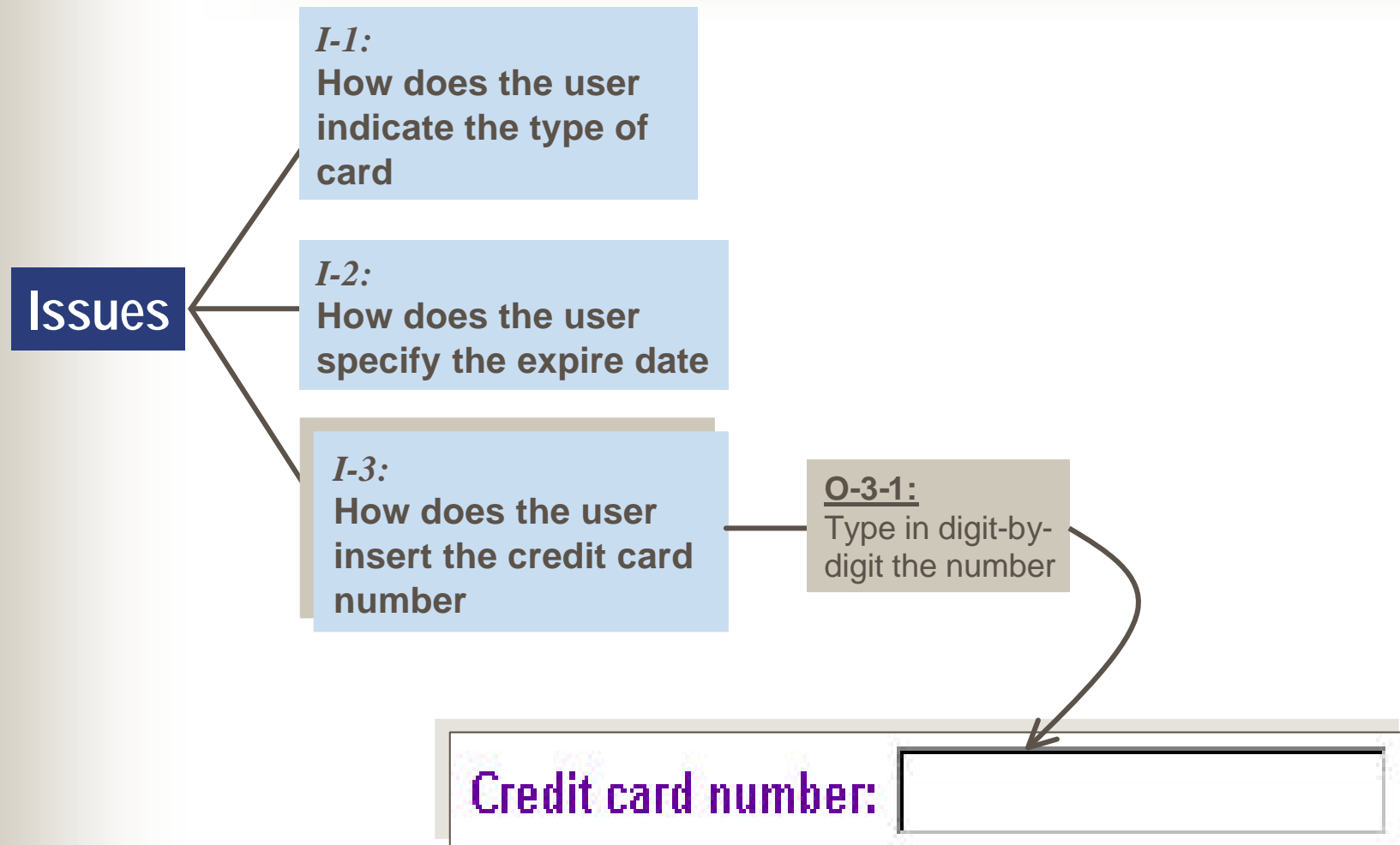


A screenshot of a Windows-style listbox. The top item is "MasterCard" and is highlighted. Below it are "MasterCard", "Visa", "American Express", and "Discover". A small downward arrow is visible on the right side of the listbox.



A screenshot of an "About" dialog box. It has a title bar with "About" and a close button. Inside, there are four checkboxes: ☒ MASTERCARD, ☐ VISA, ☐ AMERICAN EXPRESS, and ☐ DISCOVER. Below these is an "Other" label followed by a text input field. On the right side, there are two buttons: "OK" and "Help".

Enumerating the options (Cont.)



Example of the artefact

Payment method:	<input type="text" value="MasterCard"/>
Credit card number:	<input type="text"/>
Expiration date:	<input type="text" value="01 (January)"/> <input type="text" value="2001"/>
Cardholder's name: (as it appears on the card)	<input type="text"/>
<input type="button" value="continue"/>	

Example of the artefact (Cont.)

Billing Address Information:

Name:

Address line 1:

Address line 2:
(optional)

City:







State: ▼

ZIP code:

Phone:

[continue](#)

Tentative design



For convenient ordering, enter your full credit card information. (This is completely safe--[here's why](#).) If you would rather call us with your credit card number, enter only the last five digits in the form below. After you place your order, call us at 1-800-drugstore (1-800-378-4786).

Payment method:

Credit card number:

Expiration date:

Cardholder's name:
(as it appears on the card)

Billing Address Information:

Name:

Address line 1:

Address line 2:
(optional)

City:

State:

ZIP code:

Phone:

Developing argumentation

- ✍ Ability to initiate movement on demand
- ✍ Ability to pull target
- ✍ Fine spatial control
- ✍ Eye-hand coordination

- ✍ Availability of fingertips as reliable contact site
- ✍ Competence in using keyboard

Size of VDU

The screenshot shows a credit card payment form with various fields and logos. Annotations include:

- A box containing four usability criteria: 'Ability to initiate movement on demand', 'Ability to pull target', 'Fine spatial control', and 'Eye-hand coordination'. Lines from this box point to the 'Payment method' dropdown menu and the 'Cardholder's name' field.
- A box containing two usability criteria: 'Availability of fingertips as reliable contact site' and 'Competence in using keyboard'. A line from this box points to the 'Billing Address Information' section.
- A box labeled 'Size of VDU' with a line pointing to the overall form area.
- A circle around the 'Payment method' dropdown menu, which is open, showing options: MasterCard, Visa, American Express, Discover (highlighted), and Diners Club.
- A circle around the 'State' dropdown menu, which is set to 'Alabama'.

Logos at the top: VISA, MasterCard, Fraud Protection Guaranteed, AMERICAN EXPRESS, DISCOVER, and Diners Club International.







Text: For convenient ordering, enter your full credit card information. (This is completely safe--[here's why](#).) If you would rather call us with your credit card number, enter only the last five digits in the form below. After you place your order, call us at 1-800-drugstore (1-800-378-4786).

Fields and labels:

- Payment method: (dropdown menu)
- Credit card number: (input field)
- Expiration date: (input field)
- Cardholder's name: (input field, with subtext '(as it appears on the card)')
- Billing Address Information:
 - Name: (input field)
 - Address line 1: (input field)
 - Address line 2: (input field, with subtext '(optional)')
 - City: (input field)
 - State: (dropdown menu, set to Alabama)
 - ZIP code: (input field)
 - Phone: (input field)

Buttons: continue

Developing argumentation - *Setting filters*

-  Reformulate implicit claims into suitable filters
 -  How can the task be carried out with an alternative pointing device (e.g. a stylus of a palmtop computer) ?
 -  How can the task be performed in a public kiosk?
 -  How can the task be performed by a user with gross-temporal control familiar with switch-based interaction ?
-  Revise original scenario
 -  scenario screening using the designated accessibility filters

Alternative for a palmtop device

- ✍ Four logical groups
- ✍ Smaller display requirements

...

is4all-example

Payment method

Expire date

Card number

Command

VISA MasterCard Fraud Protection Guaranteed AMERICAN EXPRESS DISCOVER NOVUS

set-date

Month August

January	June
February	July
March	August
April	September
May	October

Year 2001

1999
2000
2001
2002
2003

OK

Cancel

Option 1

 Selection by pointing

set-date-2 X

Payment method

☐ VISA ☒ **MASTERCARD** ☐ AMERICAN EXPRESS ☐ DISCOVER

Expire date

Month	September	January	April	July	October
		February	May	August	November
		March	June	September	December

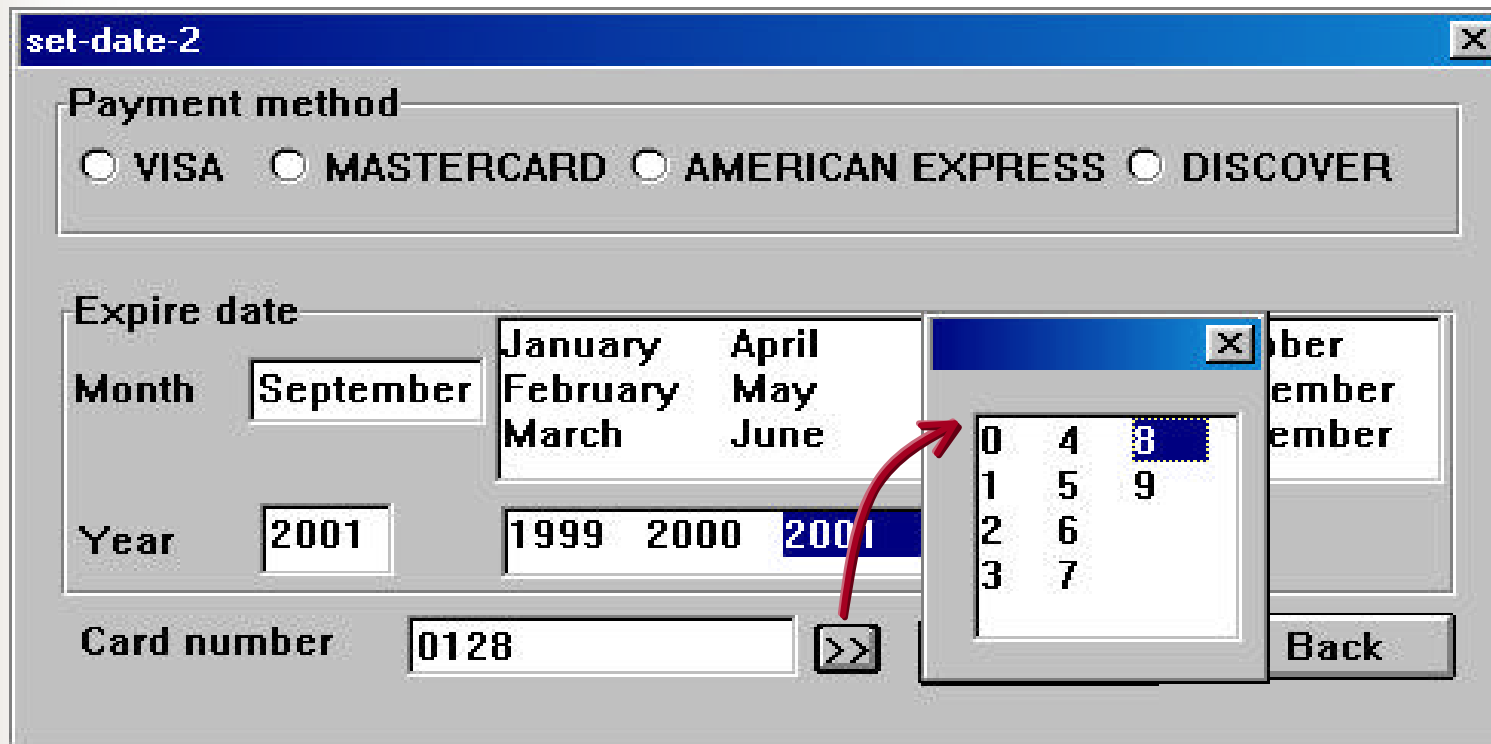
Year

2001	1999	2000	2001	2002	200
------	------	------	-------------	------	-----

Card number >>

Option 1 (Cont.)

 Editing by selecting from a panel



set-date-2 [X]

Payment method

☐ VISA ☐ MASTERCARD ☐ AMERICAN EXPRESS ☐ DISCOVER

Expire date

Month **September** **January** **April**
February **May**
March **June**

Year **2001** **1999** **2000** **2001**

Card number **0128** **>>**

Back

0 4 8
1 5 9
2 6
3 7

Alternative for motor-impaired

- ✍ Scanning is an option
- ✍ Group elements can be selected via manual or auto scanning

set-date-2

Payment method

☐ VISA ☐ MASTERCARD ☐ AMERICAN EXPRESS ☐ DISCOVER

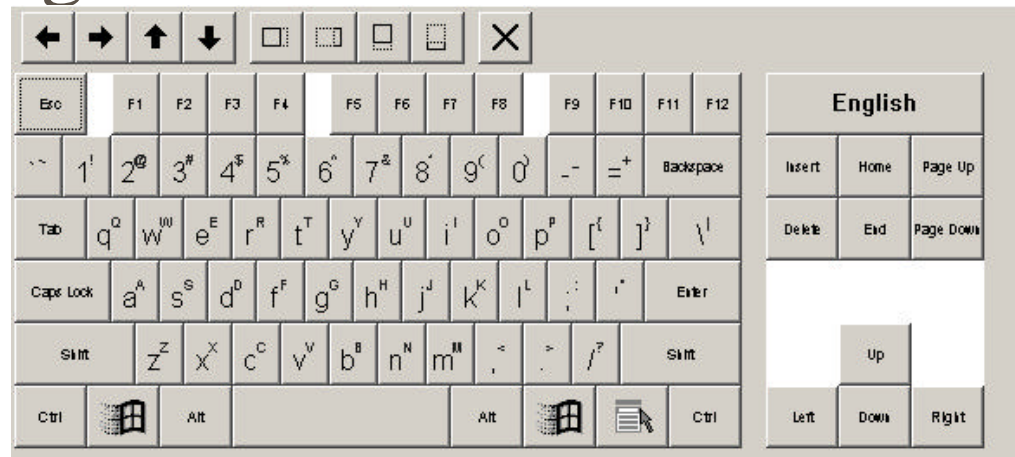
Expire date

Month: September

Year: 2001

Card number: 0128

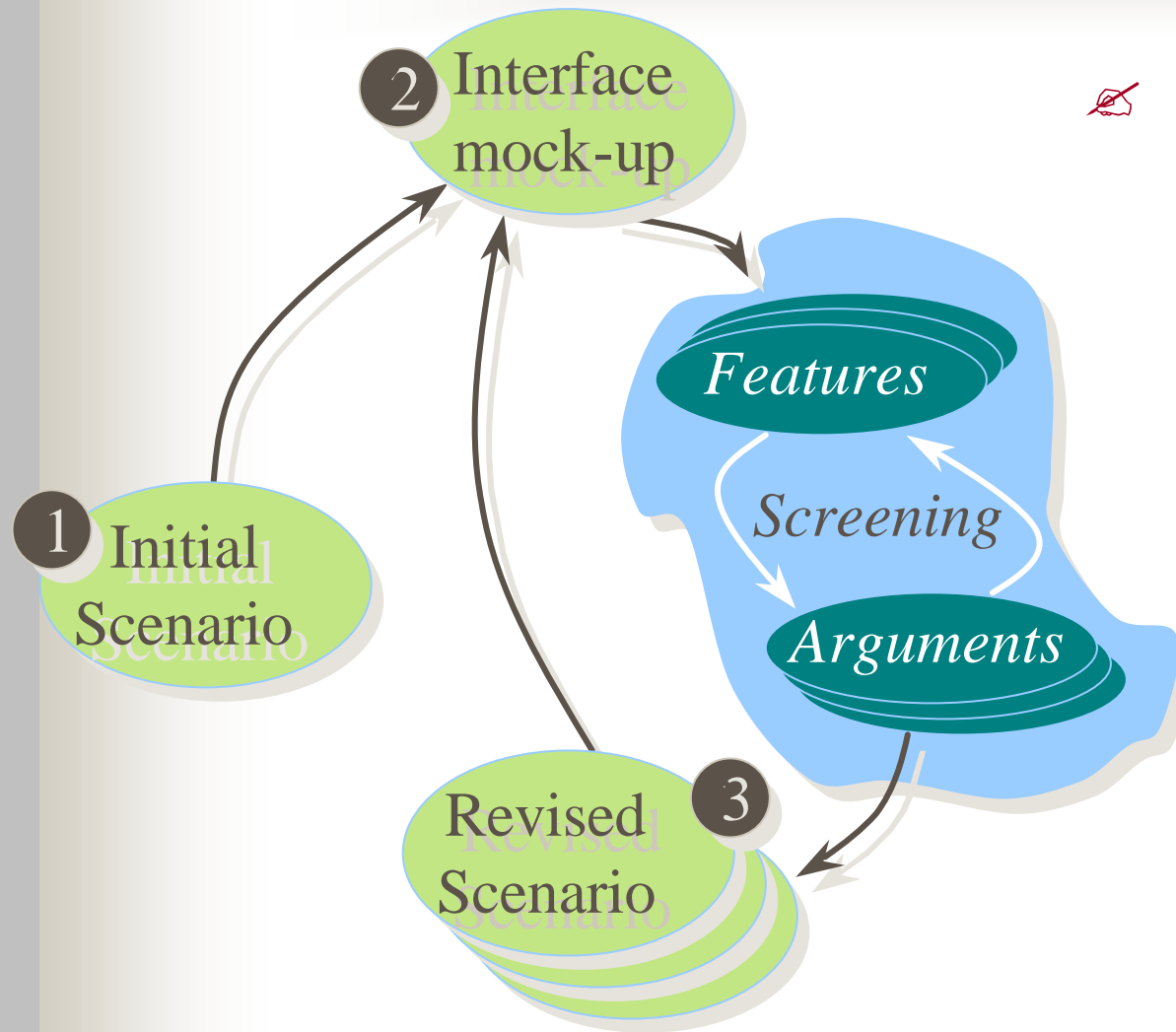
Continue Back





Implications

- ✍ Styles should be implemented and made available to the run-time system
- ✍ For each style develop suitable argumentation
 - ✍ Why does it exist ?
 - ✍ What issue does it support ?
 - ✍ When should it be initiated ?
 - ✍ Where is it implemented ?
 - ✍ How does it compare against competing styles ?
- ✍ The above will determine
 - ✍ the conditions for initiating a style
 - ✍ the relationship between styles

Towards a general process model



Open questions

-  How do we derive suitable filters?
-  How many filters does one use?
-  How does the designer assess progress?
-  What types of filters do we need for healthcare?
-  Can they be clustered?
-  Can they be validated?

Project milestones & results










Project milestones

- ✍ Definition of appropriate set of instruments for data collection
- ✍ Best practice code for Universal Access
- ✍ Scenarios to demonstrate the validity and applicability of such a code of practice
- ✍ Code for Healthcare practice
- ✍ Development of validation strategy
- ✍ Outreach
 - ✍ Web site, seminars, workshops, conferences and input to standardisation activities

Results of general value

- ✍ State of the art on universal access methods and supporting technologies
 - ✍ screening models
 - ✍ high level principles and guidelines
- ✍ A comprehensive code of practice on universal access
 - ✍ Guidance on universal access (macromethods)
 - ✍ Universal access techniques (micromethods)
 - ✍ Examples of good practice and case studies

Universal access code of practice

-  Process guidance (micromethods)
 -  High level principles which extend ISO 13407
-  Techniques (macromethods)
 -  Unified design method (for interaction design)
 -  Questionnaire (for evaluating tentative designs)
 -  Universal access filters (for argumentative requirements engineering)
-  Examples & case studies

Healthcare-specific results

- ✍ A process model detailing how universal access can be accounted for in Healthcare Telematics
- ✍ Prototypical implementations of Healthcare-specific artefacts (electronic healthcare records) & recommendations
- ✍ Universal access filters in Healthcare Telematics
- ✍ Design rationale and examples

Project phases

- ✍ Develop Universal Access code of practice and training course
- ✍ Develop guidelines for how to use universal access in Healthcare Telematics
- ✍ Select two products / scenarios to which we can begin applying universal access principles.
- ✍ Identify working filters that can be used during product screening
- ✍ Begin incorporating universal access principles into vendor requirements

Concluding remarks - Results

- ✍ A **process model** detailing how universal access can be accounted for in Healthcare Telematics
- ✍ **Prototypical implementations** of Healthcare-specific artifacts (electronic healthcare records) & recommendations
- ✍ **Universal access filters** in Healthcare Telematics
- ✍ **Design rationale** and examples