6th IS4ALL seminar

15 November

Dublin, Ireland

Agenda

- Welcome
- IS4ALL
  - Overview
  - Methodology, goals & technical approach
  - IS4ALLmethods landscape (emphasis on examples and case studies)
- Discussion

IS4ALL (IST-1999-14101)

What it is…

- A 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 access
- Not an RTD project

Participants

- Main contractor
  - ICS-FORTH, Greece
- Members
  - MS-HUGe, Belgium
  - EHTEL Association, Belgium
  - CNR-IFAC, Italy
  - INRIA, France
  - FhG-IAO, Germany
  - FhG-FIT (formerly GMD), Germany

Objectives

- Four main objectives:
  - **Consolidate** existing knowledge on Universal Access in the context of IST into a comprehensive code of design practice.
  - **Translate** the consolidated wisdom to concrete recommendations for Health Telematics.
  - **Demonstrate** the validity and applicability of the recommendations (through implementation of concrete scenarios)
  - **Promote** the Universal Access principles and practice in Health Telematics

IS4ALL seminars

- Part of the project's outreach work plan
- In total the IS4ALL project has organized six seminars in different European countries
- Focus and content of seminars varies
  - 1st Seminar in Rotterdam, NL (19 November 2001) focused on universal design practices
  - 2nd Seminar in Brussels, B (13 December 2001) focused on Health Telematics scenarios for universal access
  - 3rd Seminar in Budapest, H (25 August 2002) focused on code of practice
  - 4th Seminar in Paris, Fr (23 October 2003) followed by the 2nd IS4ALL Workshop
  - 5th Seminar in Heraklion, Crete, GR (26 June 2003) followed by the 3rd IS4ALL Workshop) in the context of HCII'2003
  - 6th Seminar in Dublin Ireland (15 November 2003)

6th Seminar: Objectives

- Present highlights of the project
  - Motivation and rationale
  - Technical approach
  - (Some) methods (MedicSCORE)
- Retrospective analysis
  - What is the message to be conveyed
  - Willing recipients of the message and their experience (MediBRIDGE)
- Next steps!
  - Role of national / European institutions

Universal access in the context of IS4ALL

Project web site

http://is4all.ics.forth.gr

A definition

- A system is universally accessible if it can be accessed effectively, efficiently and with satisfaction by all authorized users, anytime and from anywhere, without applying other actions or means than those provided for this purpose for the software considered

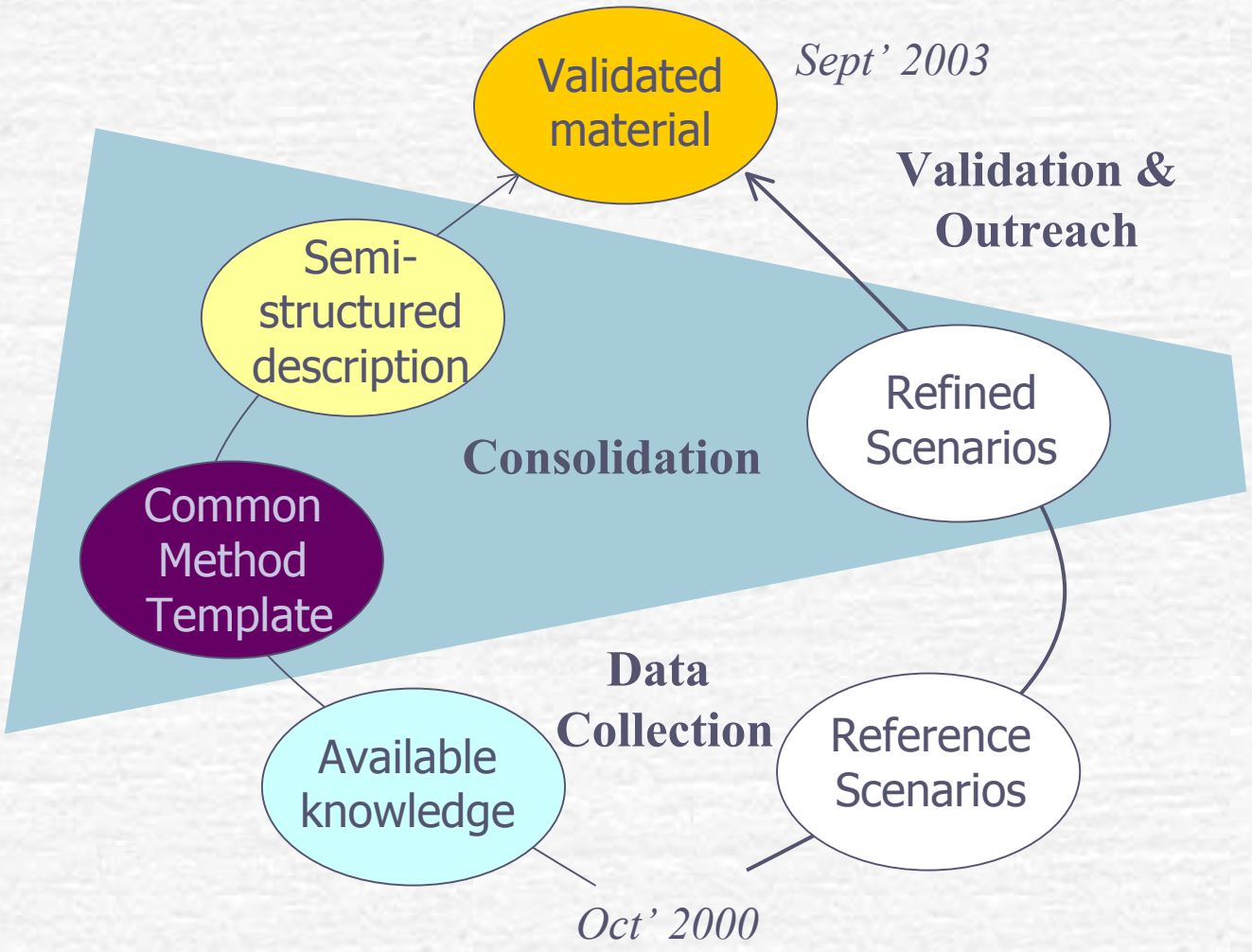
Implications

- The definition implies that
  - universal access is more than mere (low-cost) access
  - universal access assumes high *usability*
  - universal access means *adaptation* on behalf of the software
  - universal access entails *user perceived qualities* but also *features* related to the development process
  - universal access requires explicit accounts of the *global execution context* of tasks

Universal access: Some issues

- What exactly is universal access?
  - Is it a distinct feature of certain products?
  - How can we address it, if needed
  - Are conventional practices appropriate?
- Why is universal access different from accessible design?
  - How does it differ and what skills are required to practice universal access design?
- Finally,
  - Is universal access appropriate?
  - Is it feasible?
  - Is it economically effective and efficient?
- …

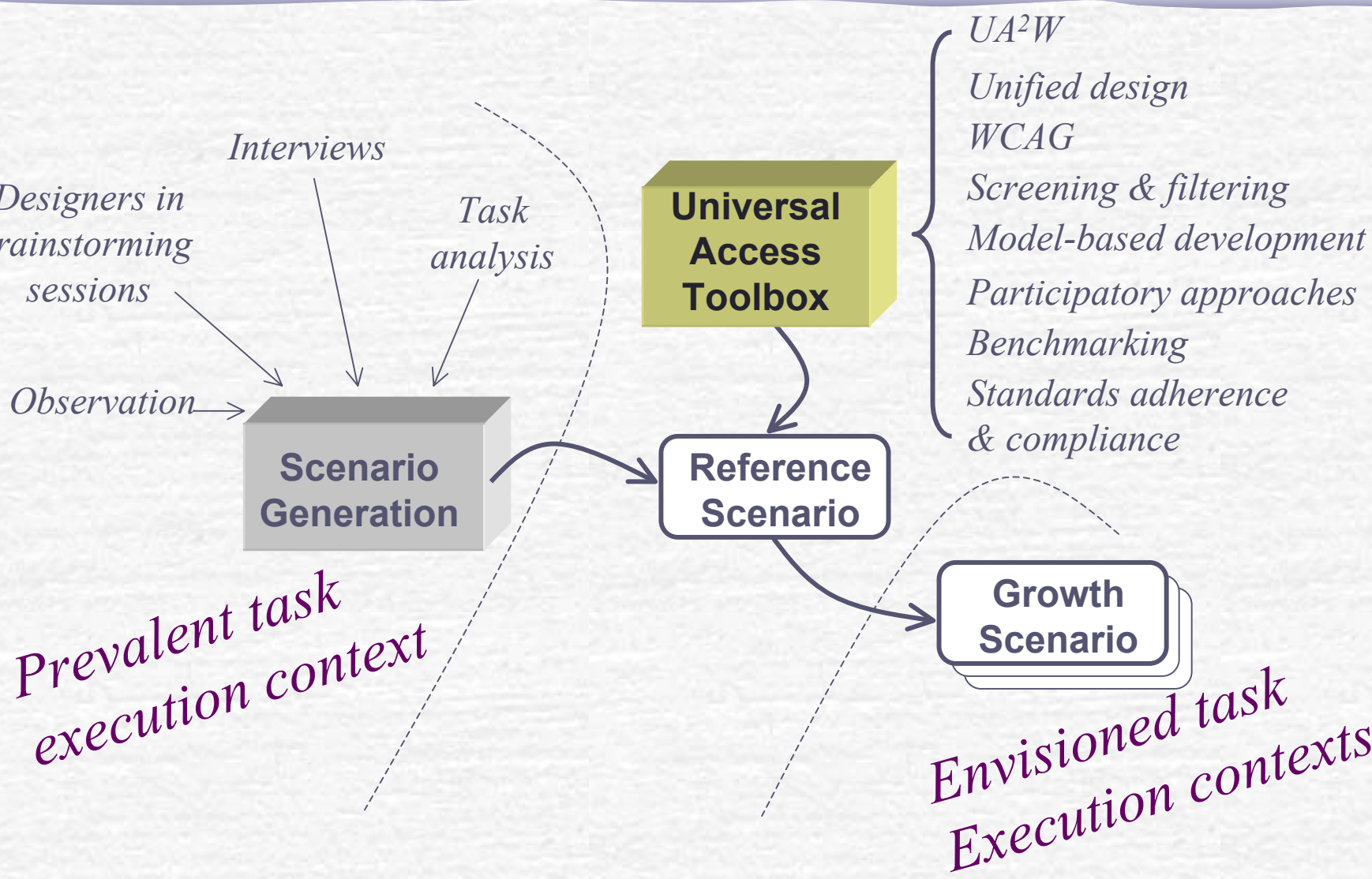
Methodology



The IS4ALL technical approach

- A scenario-based approach, featuring *proactive* and *analytical* insight to universal access
  - Cooperative requirements engineering with scenarios
  - Design space analysis
  - Claims analysis
- Scenarios emphasizing access to *Electronic Health Records* by different users in various contexts of use, making use of a range of access terminals

Illustration of methodology



Micro-methods

Un						
Access						
Model-based d						
Participatory						
Ber						
Usability						
					ISO, CEN/ISSS	
Guidelines	Pisa, UCL					SPERIGEST

Problem being addressed

Device (technique, tool or representation) used to address the challenge

Procedure for using the device

Outcomes

Underlying assumptions

Practical example (i.e. an interface mock up or a process outline)

HYGEIAnet

MEDIBRIDG

WARDINHAN

SPERIGEST

UniLINZ Austria

EMPIRICA Germany

ClinicCoach

AVANTI-PALI

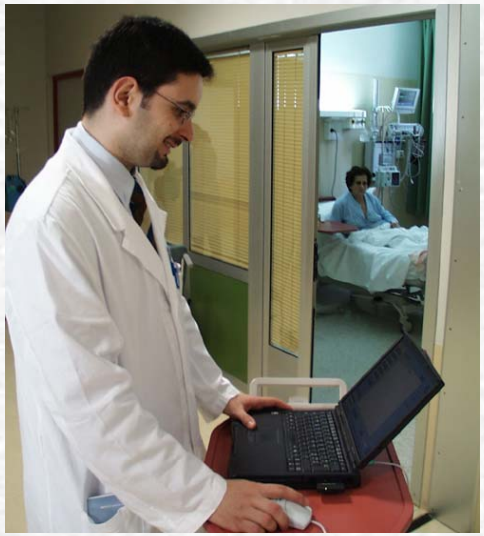
UniKENT WARDINHAN

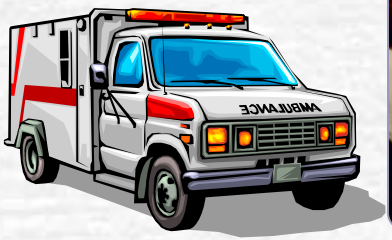
WARDINHAN

ClinicCoach

Scenarios

- A description of a possible set of events that might reasonably take place in a Health Telematics environment
- Stimulate thinking about
  - possible occurrences of artefacts
  - assumptions related to artefacts
  - possible opportunities and risks
  - courses of action





Phases in scenario generation

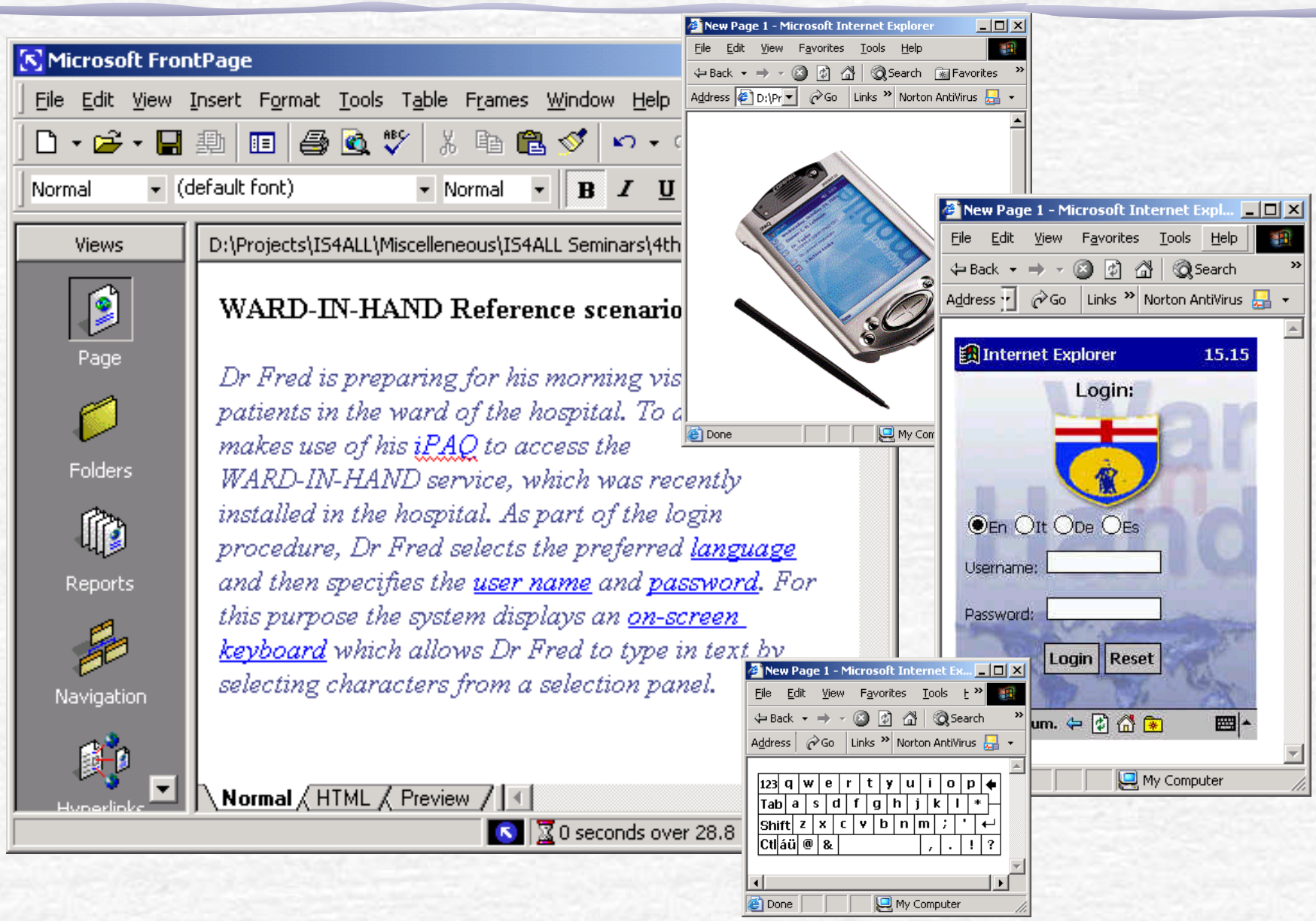
- Phase 1: Agreement with user community
  - Explanation of the type, nature and scope of the scenario-based inquiry
- Phase 2: Narrative description
  - Using mock-ups (paper- or computer-based prototypes), explain how the task is currently being accomplished using the existing system
- Phase 3: Revision & Confirmation
  - Narrative description revised and confirmed by real users

Scenarios being considered

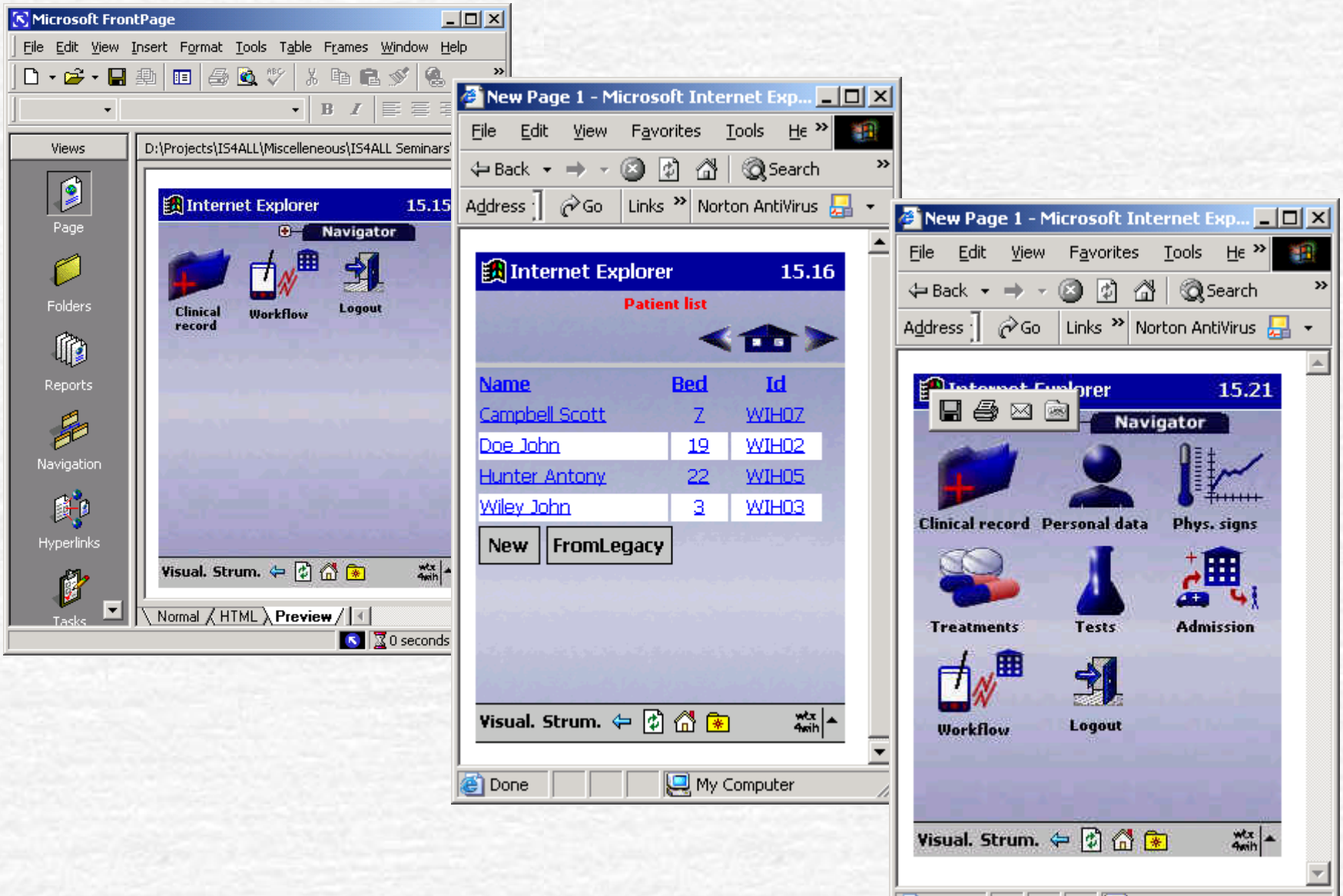
- EC-funded projects
  - WARD-IN-HAND (IST-1999-10479)
    - http://www.wardinhand.org
  - C-CARE (IST-1999-10217)
    - Frame of reference is MediBRIDGE in Belgium
- National initiatives
  - Medical information islands (SPERIGEST)
    - The IFC Information System
  - Austrian reference scenario (University of Linz)
  - German reference scenario (Empirica)
  - ClinicCoach (Commercial product by German firm)
    - www.ClinicCoach.de
  - HYGEIAnet
    - Regional Health Telematics Network of the Island of Crete
    - http://www.hygeianet.gr/

Examples & use cases

WARD-IN-HAND - An example



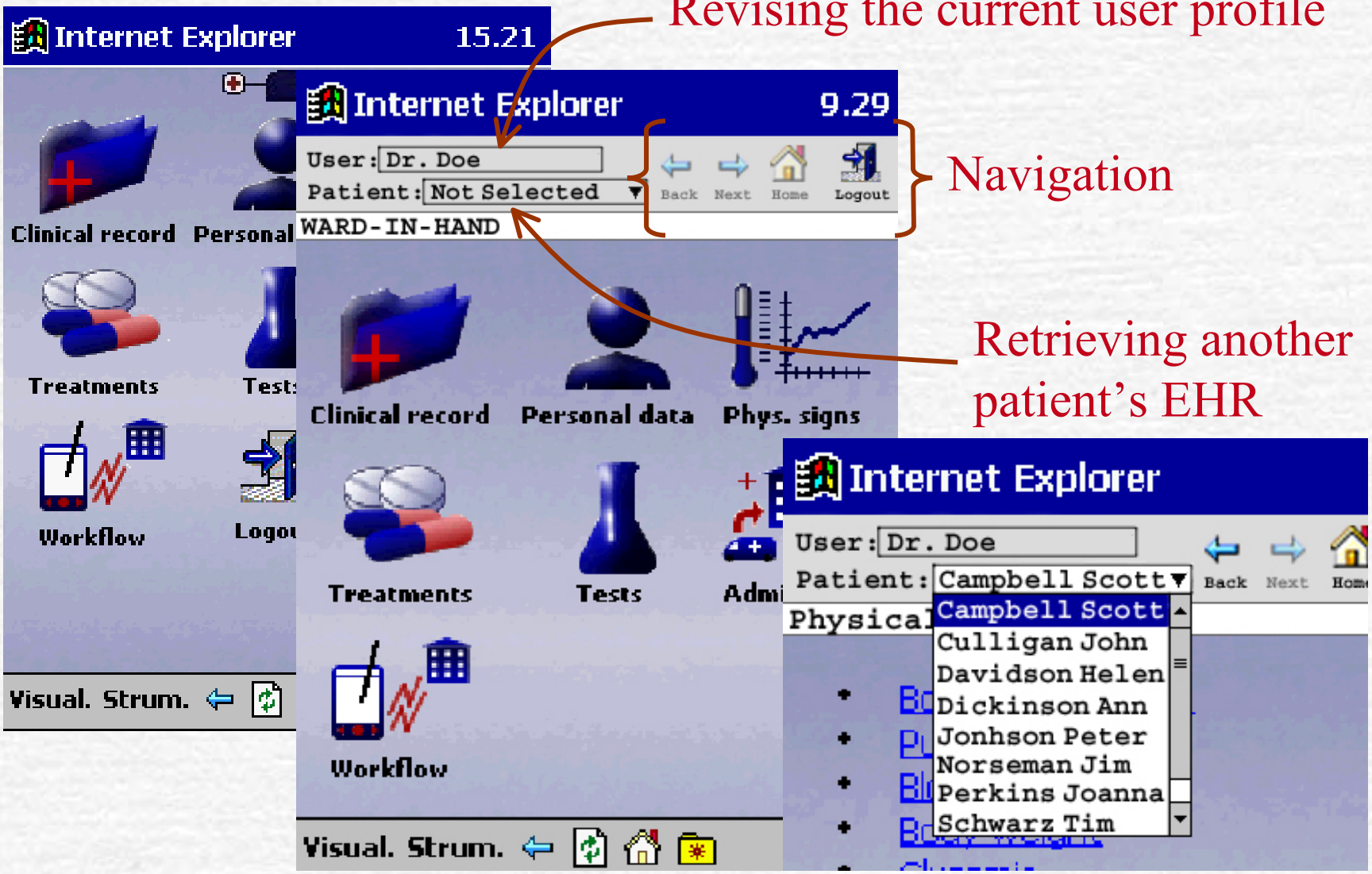
WARD-IN-HAND (Cont.)



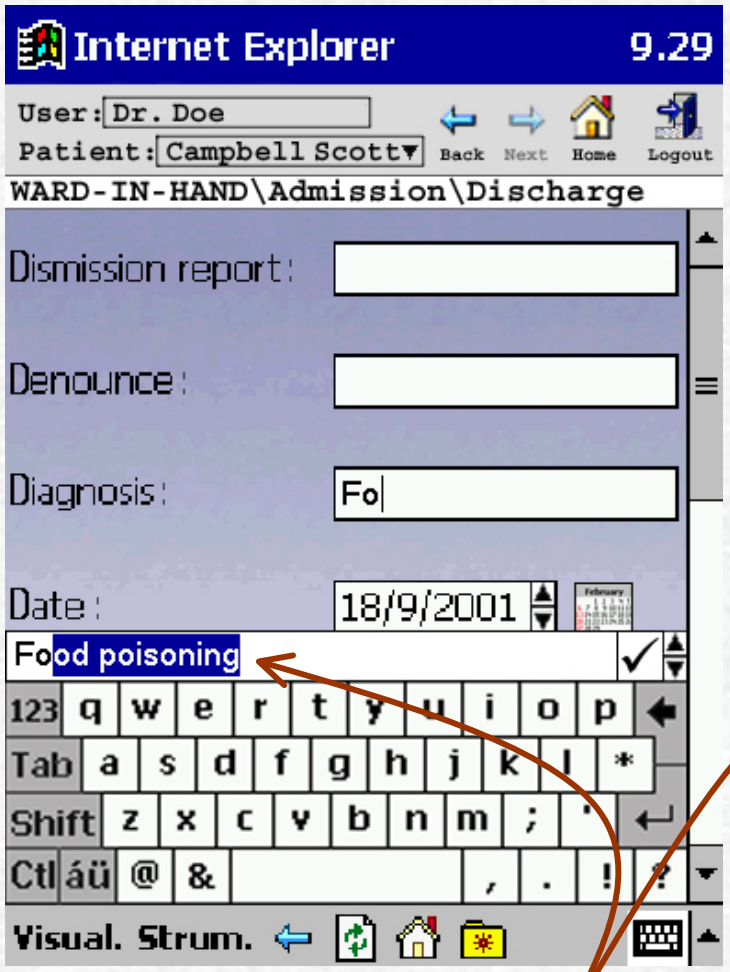
Relevance of universal access

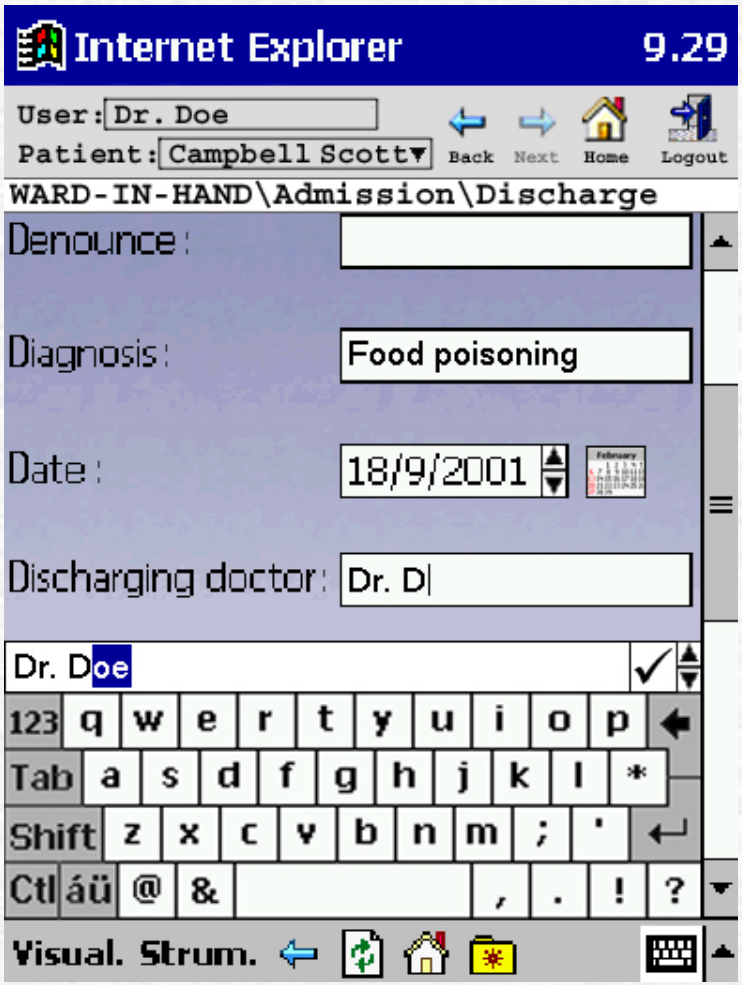
- Improving the initial design
  - Identifying usability problems and revising the design
- Designing an alternative style for another platform
  - Defining the scope for alternative access (e.g., a corresponding HTML style)
- Augmenting a style to facilitate user-adapted interaction
  - Defining and embedding accessibility features for different users

Improving the original style



Improving the original style (Cont.)

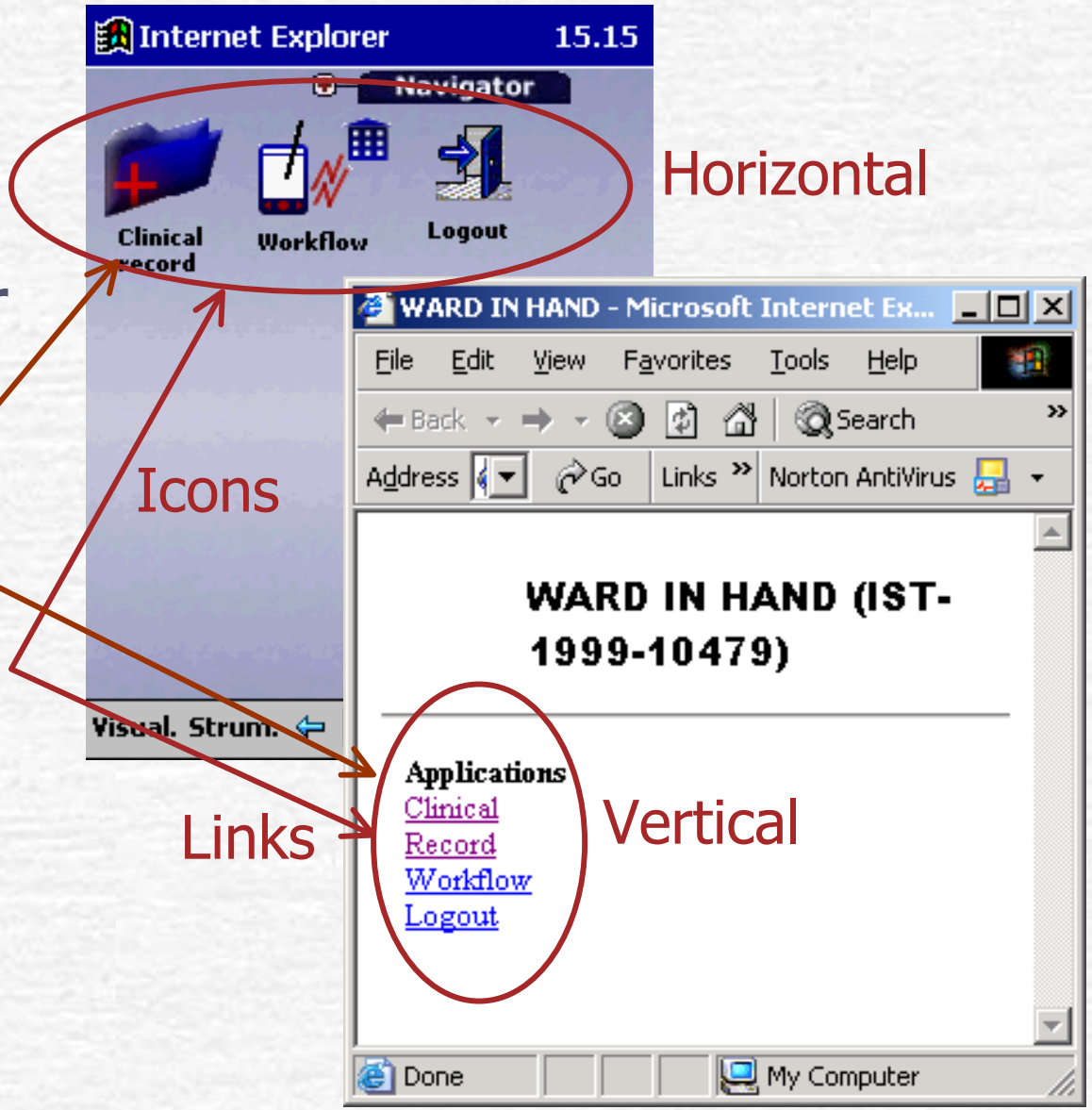




Context-sensitive editing

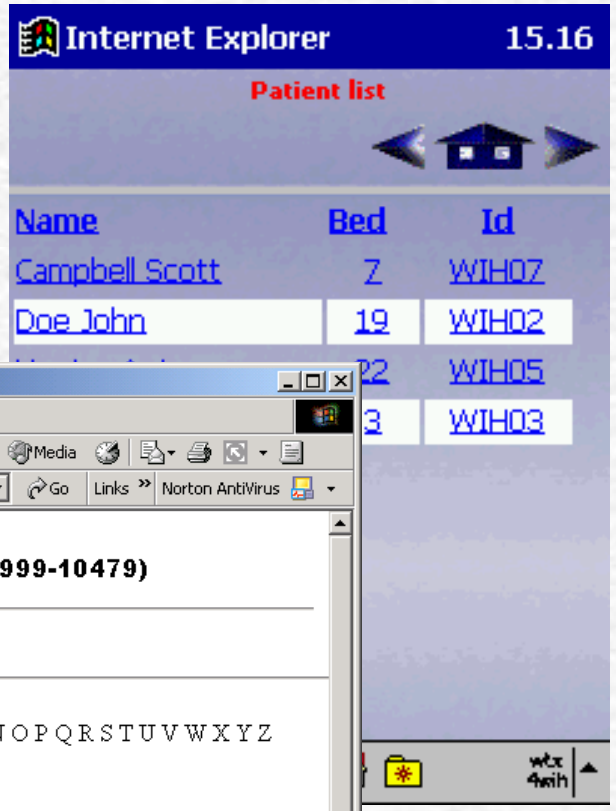
An alternative style

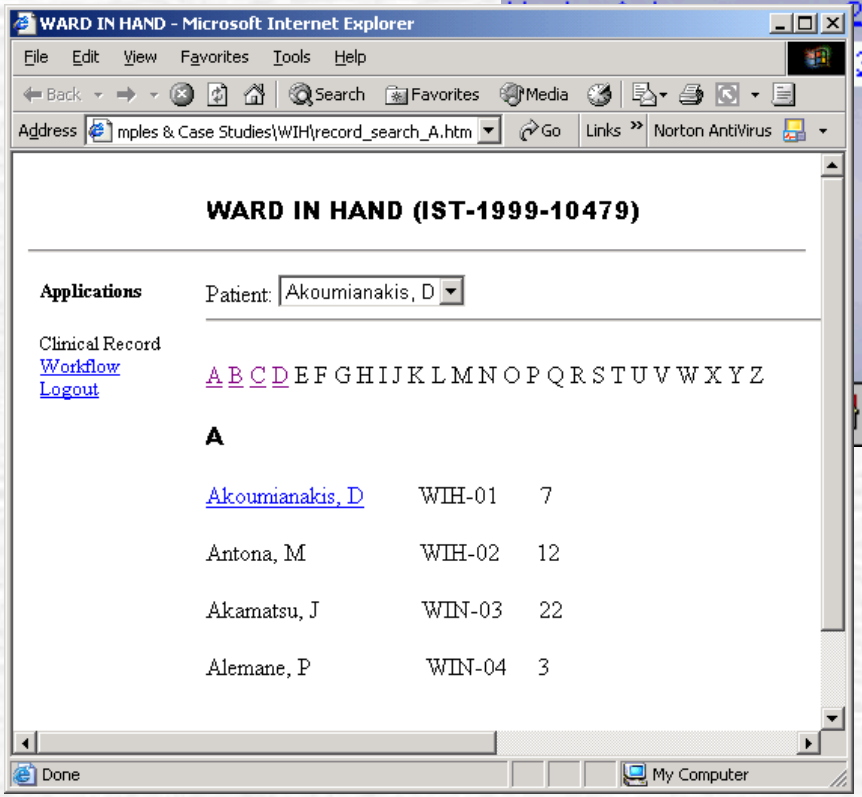
- Revisions in the layout of the container object
  - Topology
  - Presentation of selection set



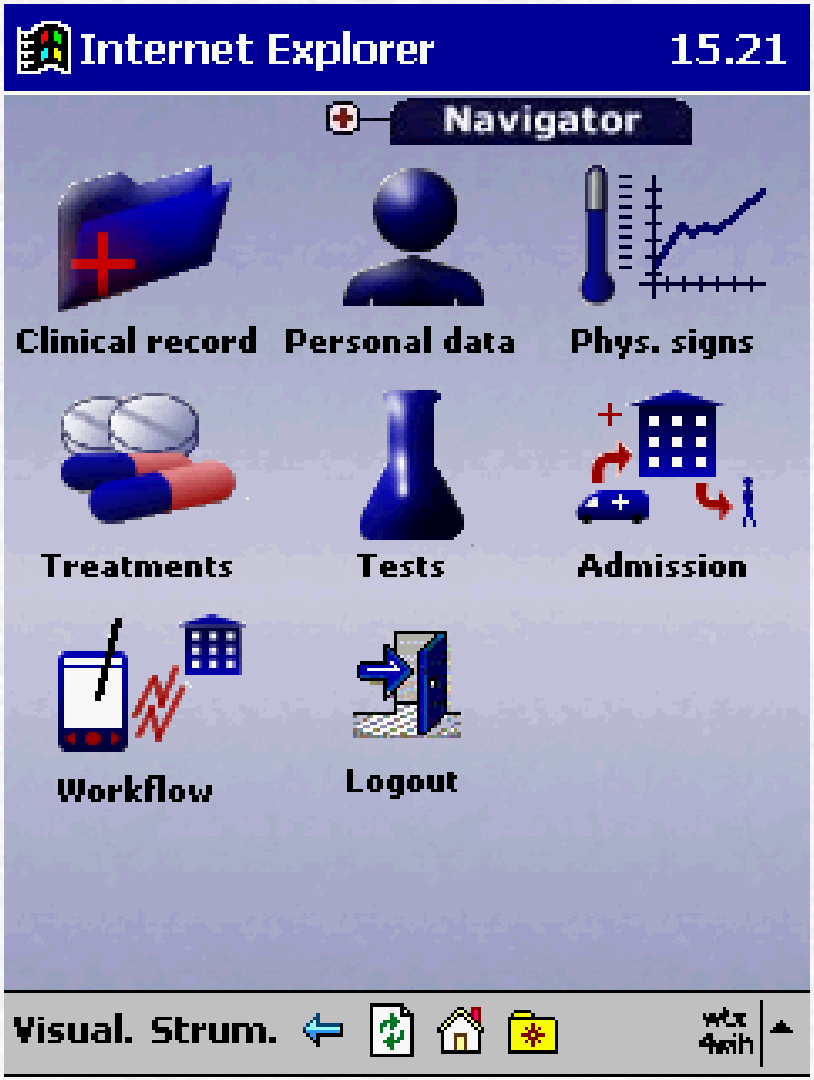
Searching & finding a record

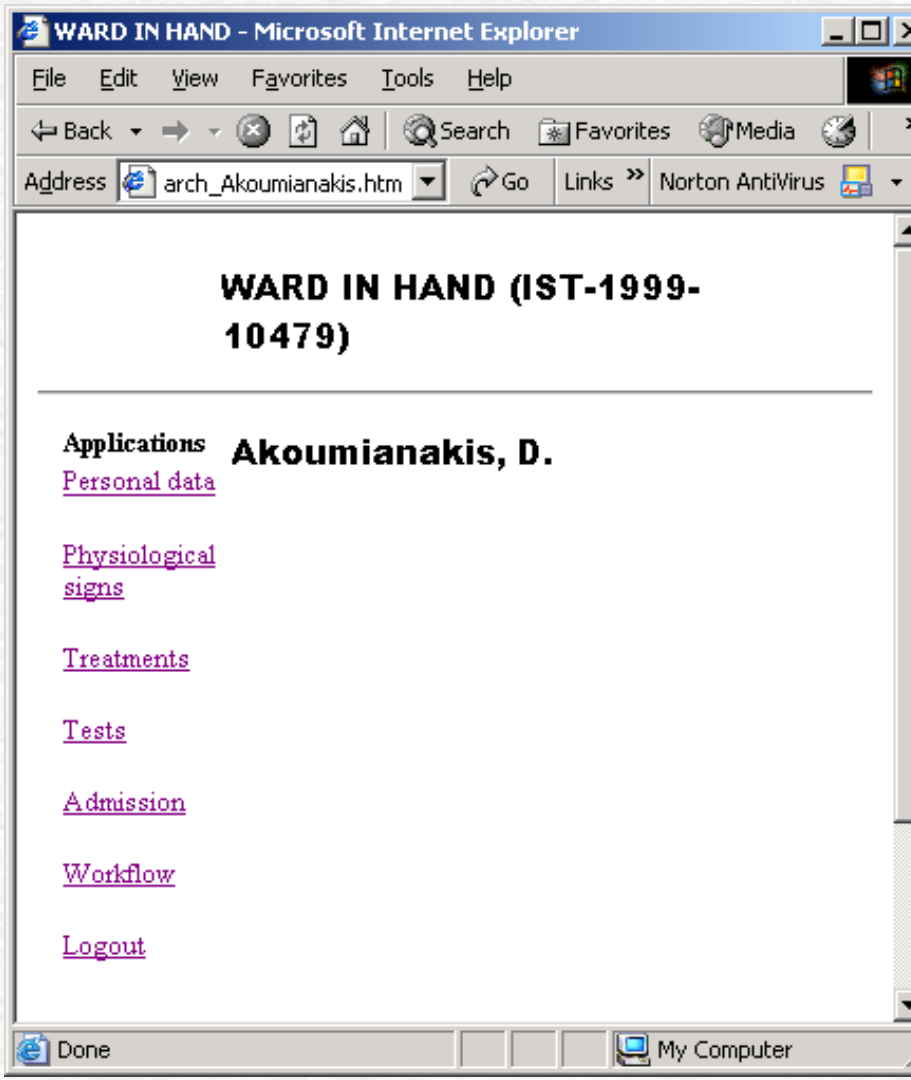
- Revisions in the syntax of the dialogue and the user's task sequence
  - Index
  - Selection set



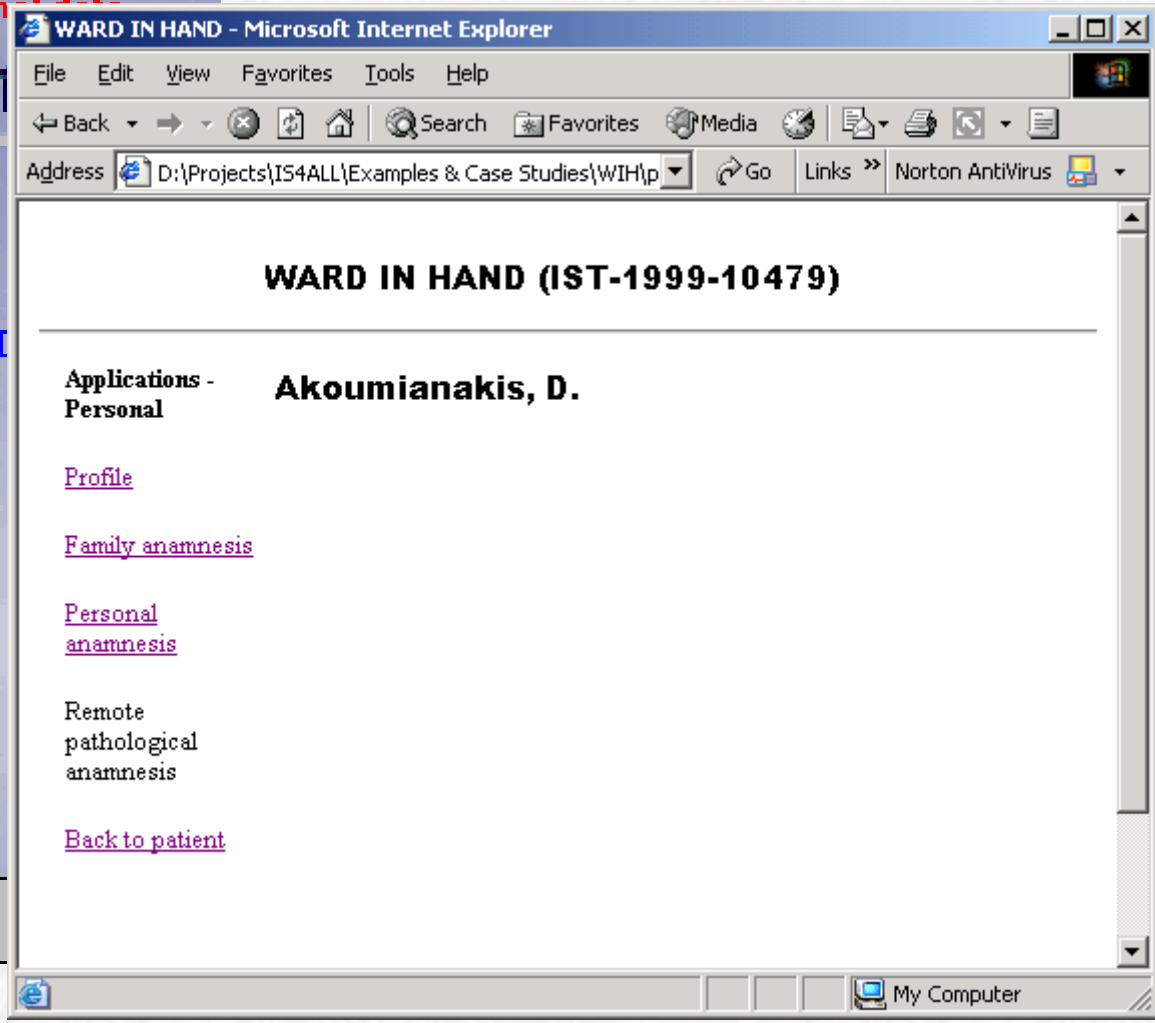


Preview of patient-services

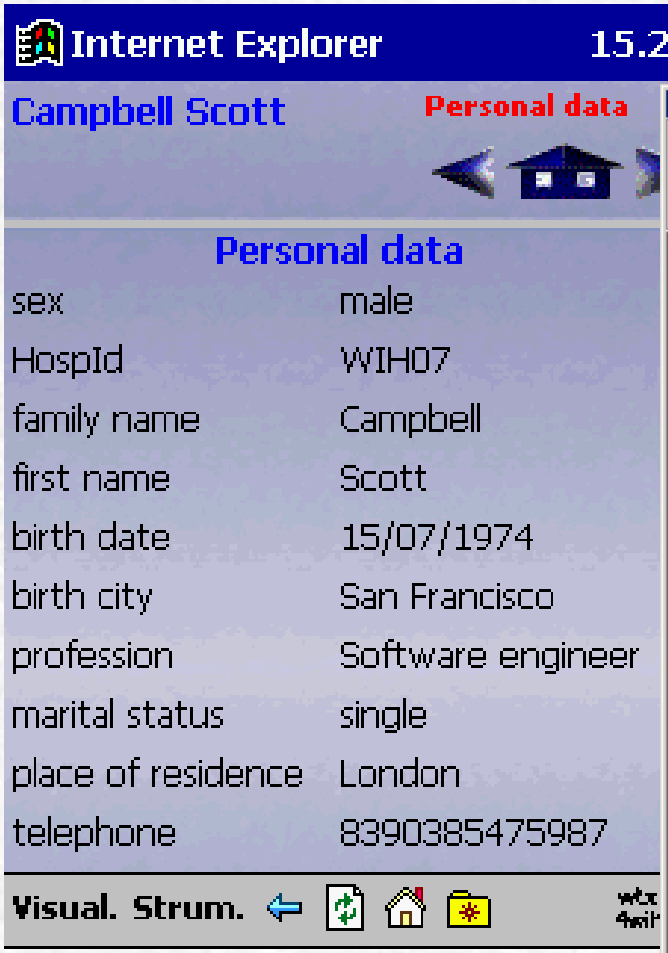


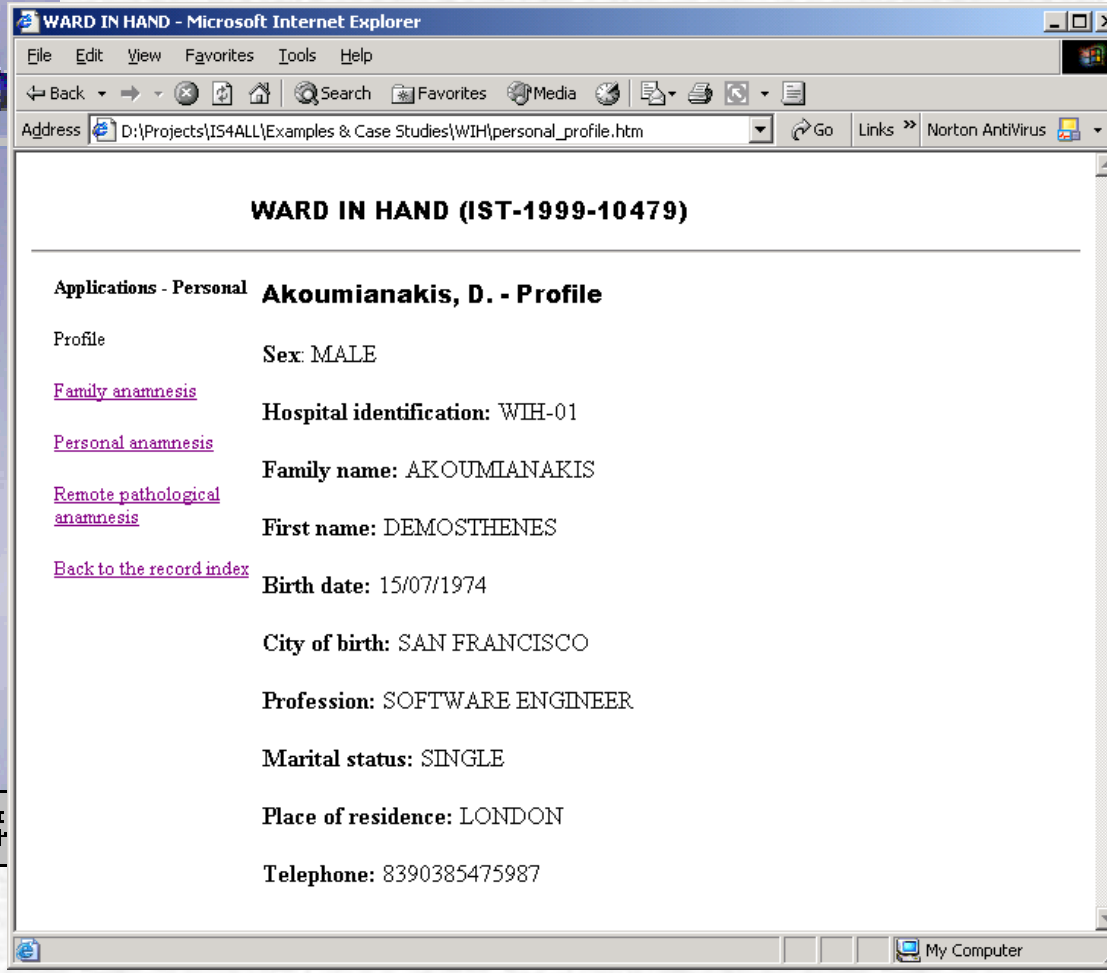


Preview of personal data

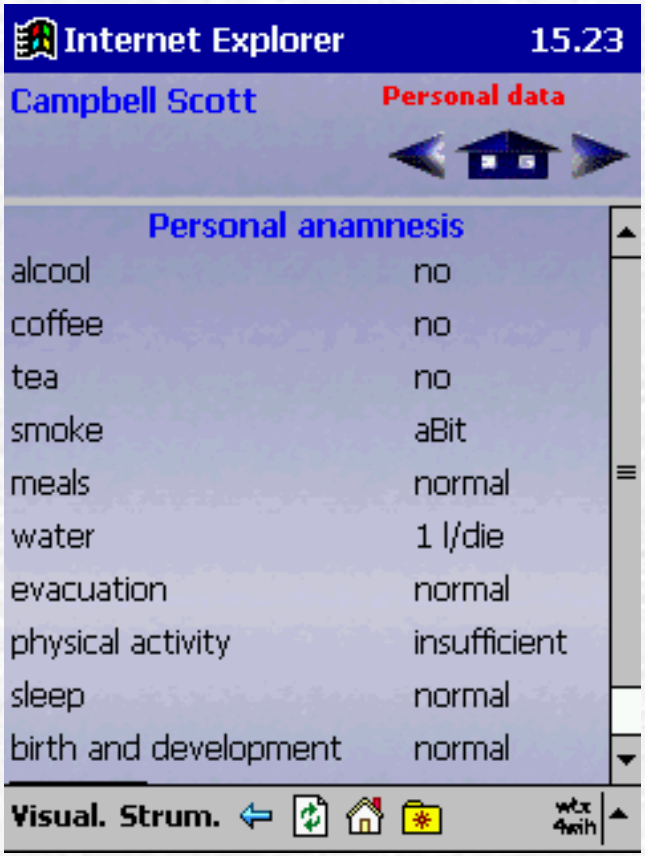


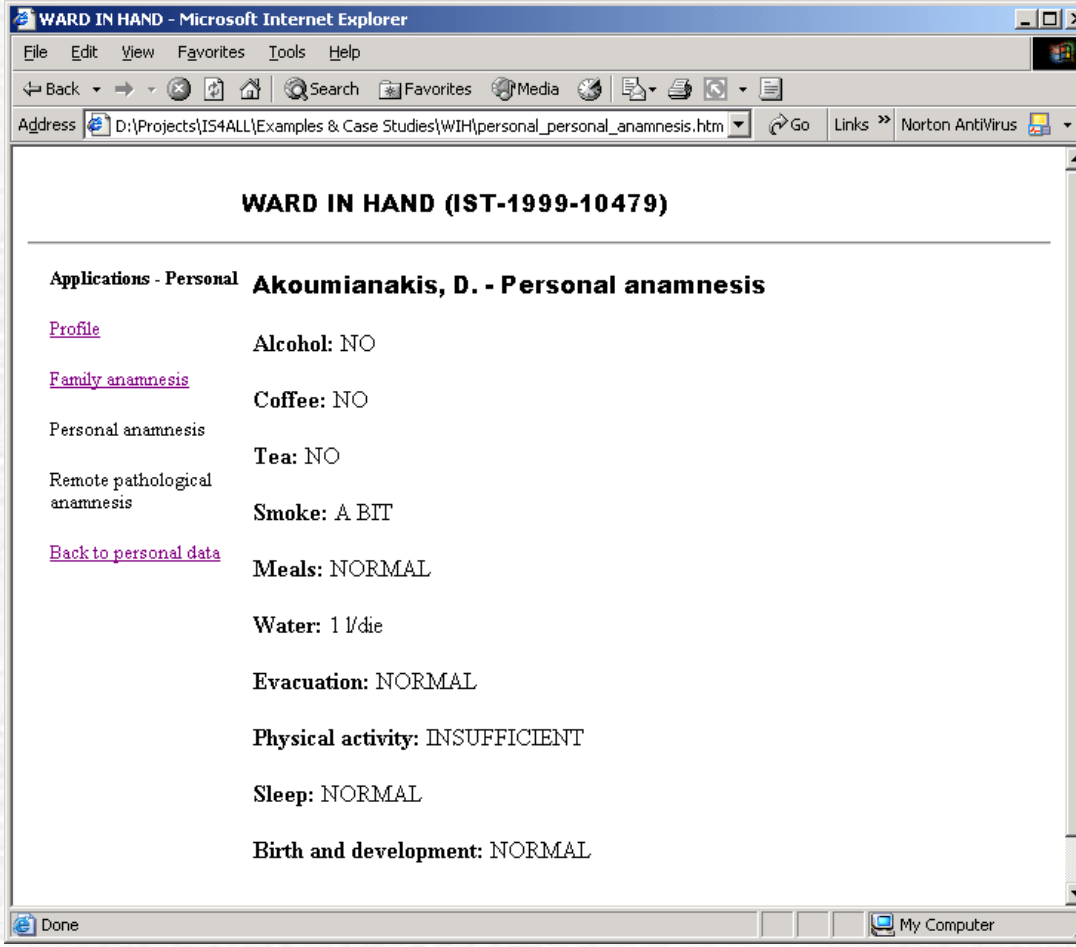
Preview of patient's profile



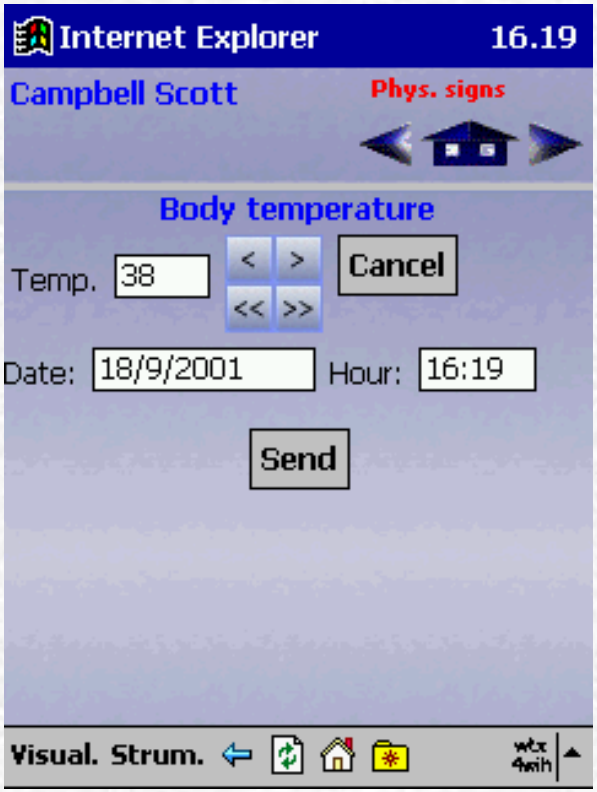


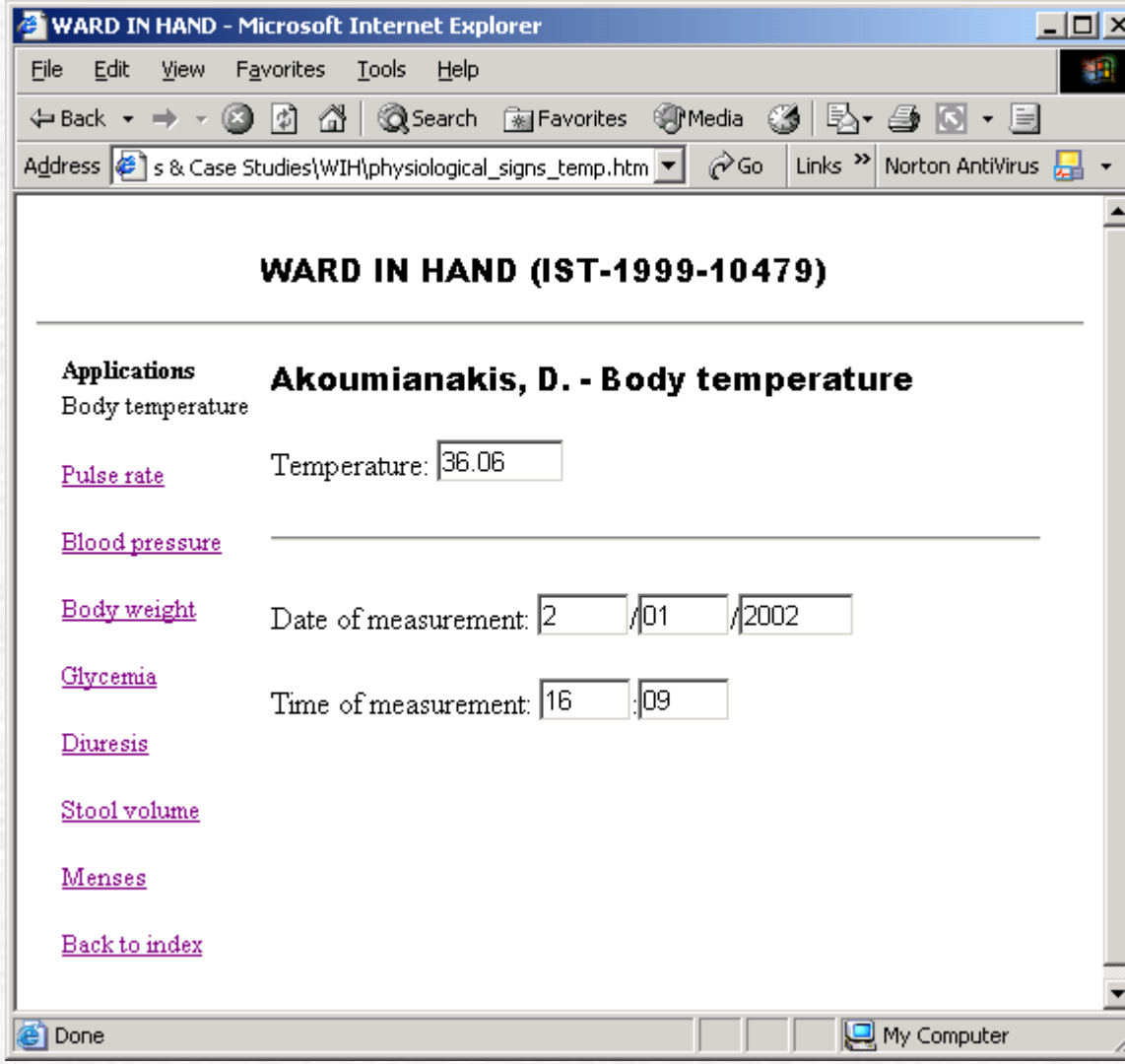
Preview of personal anamnesis



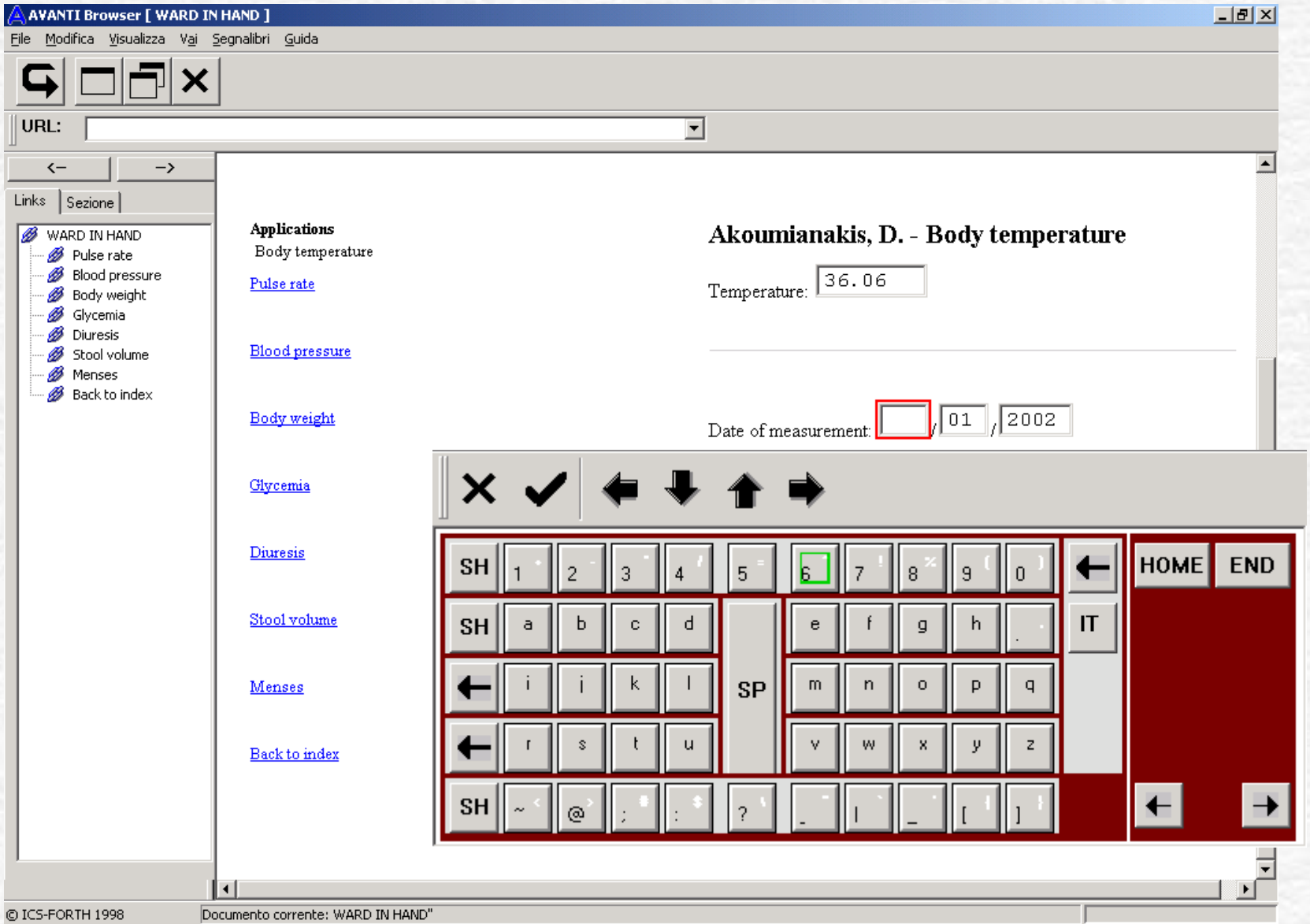


Recording the body temperature





Augmenting a style



Implications for original prototype

- Improvements
  - The original iPAQ version is now available over the WWW (*Platform independence*)
  - The Web-based version may respond to an increased number of requests (*Scalability*)
  - The Web-based version is available to user with motor impairments (*Personalization*)
  - Access can now be granted to users at remote sites e.g., the home, the office, public terminals (*Ubiquity*)

Improving accessibility

The SPERIGEST initiative

SPERIGEST

- An initiative supported by Italian Ministry of Health for the management of patients, mainly affected by cardiovascular diseases, dealing with clinical and administrative aspects.
- Focuses on three sections
  - Clinical aspects
  - Administration
  - Management

Information distribution

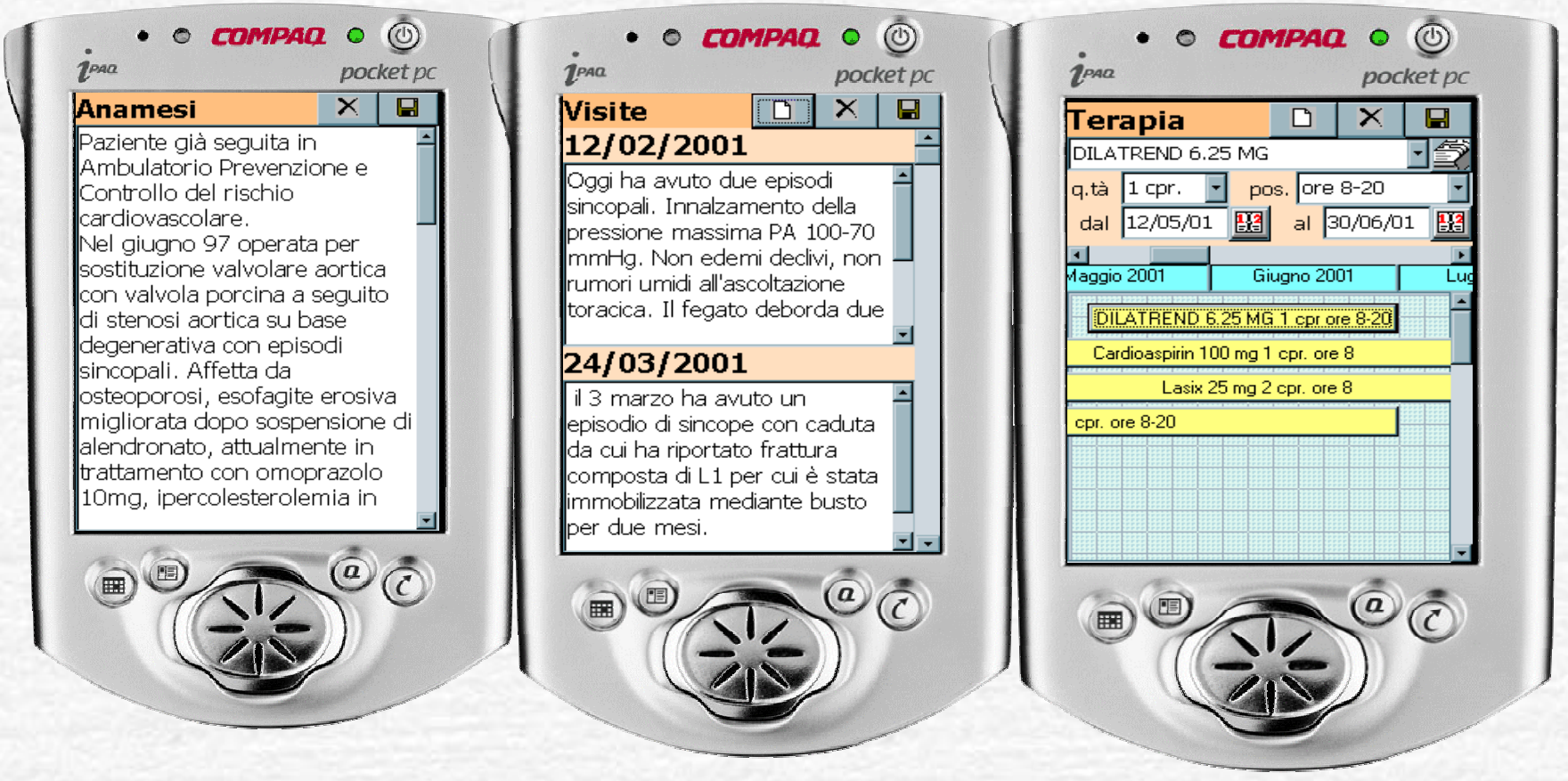
- Integration of the subsystems (e.g. radiology, EKG, ecography, nuclear medicine etc.) obtained through
  - a network backbone
  - a central database devoted to collect relevant clinical and administrative information
  - software interfaces, connecting each data source to the central database

The scenario

Mr X is a 62 year-old patient, suffering from chronic stable angina, treated with medical therapy (nitro-derivates and beta-blockers). After dinner he suffers from chest pain refractory to sublingual nitrates. She decides to call her General Practitioner

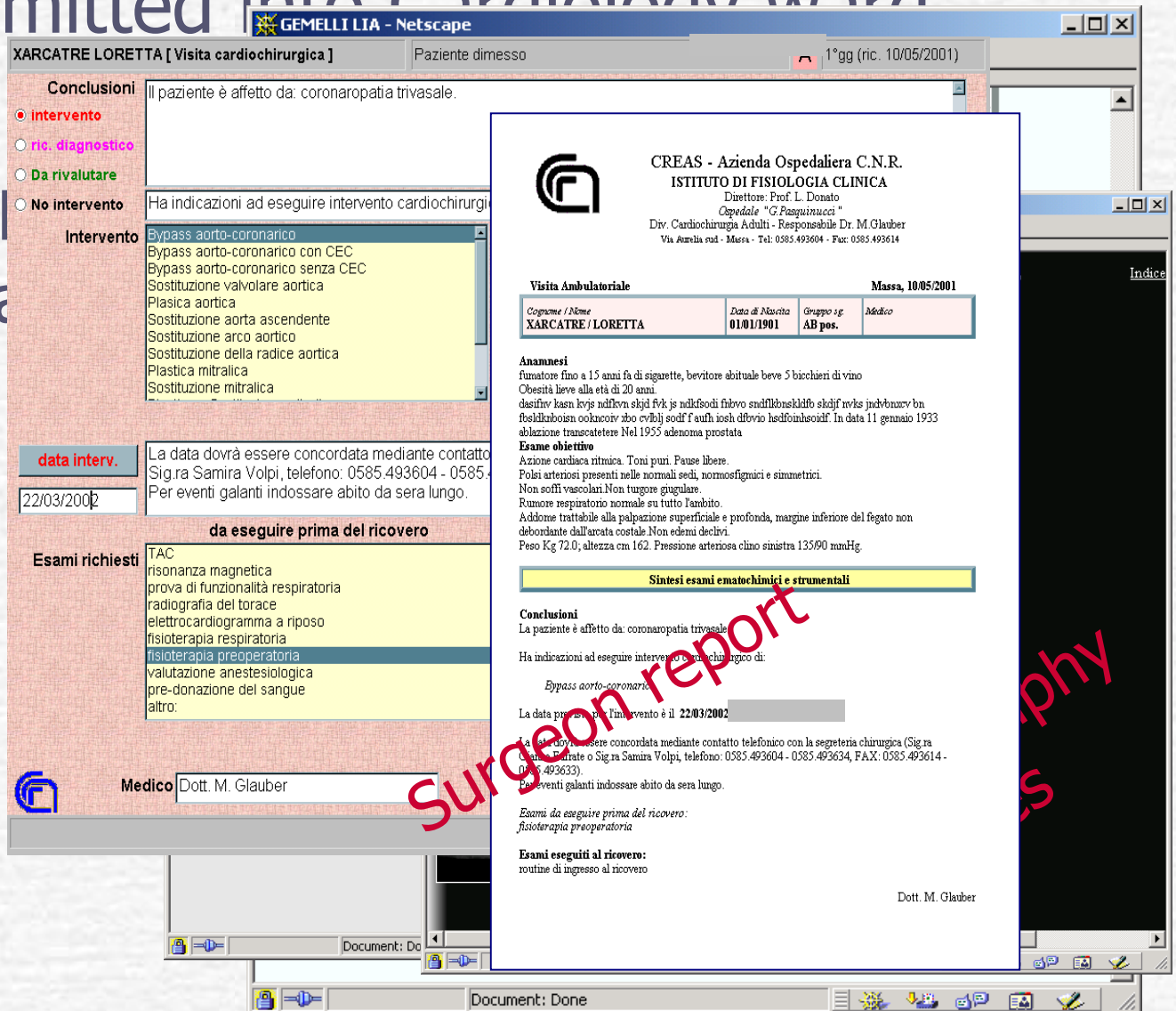
Visit at home

The doctor uses a Palm-PC to recall clinical data of the patient from SPERIGEST Network (using a GPRS interface).



Cardiology ward admission

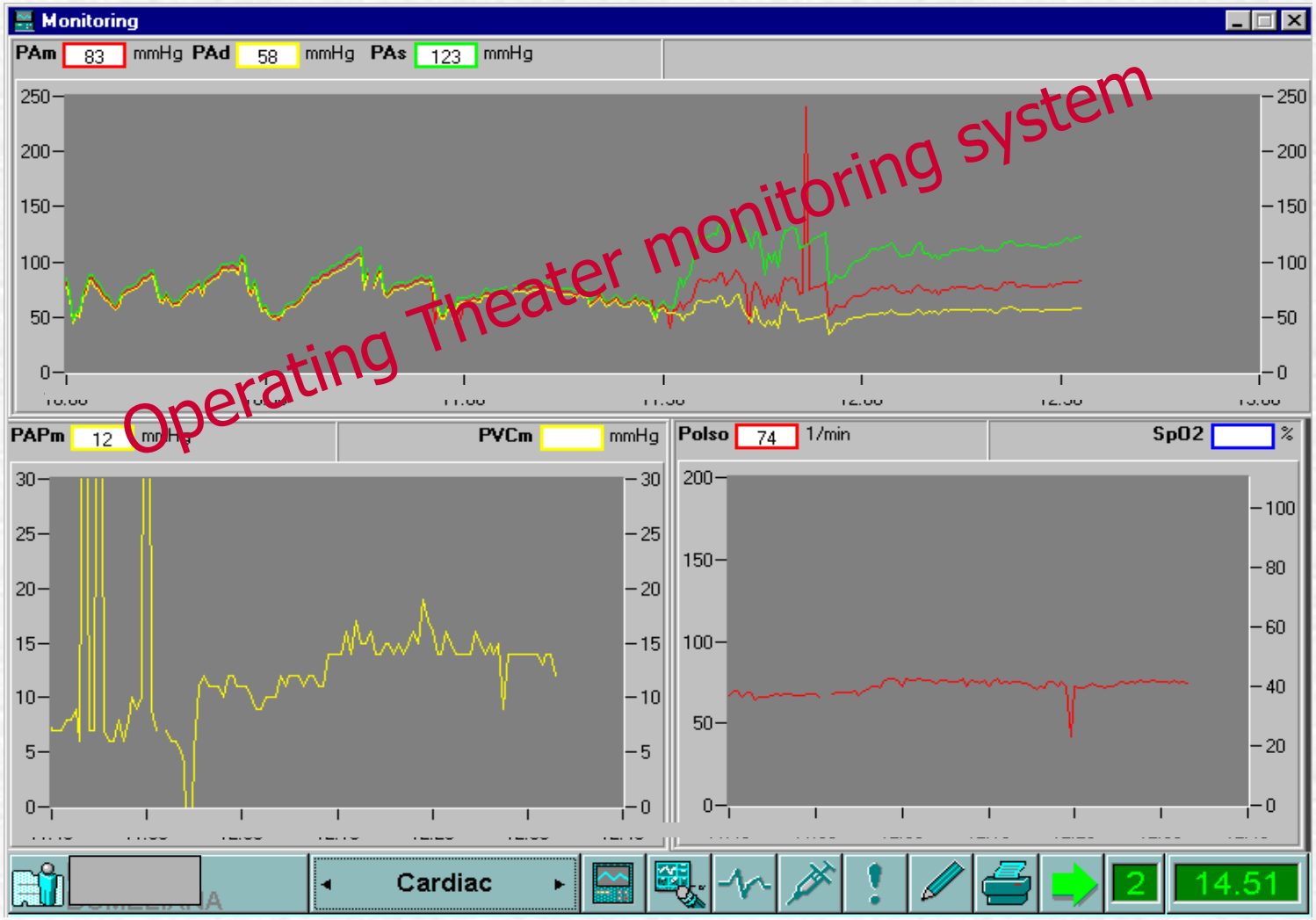
- Patient admitted into Cardiology ward
  - EKG
  - Angiograp
  - Blood ana



At Massa Hospital

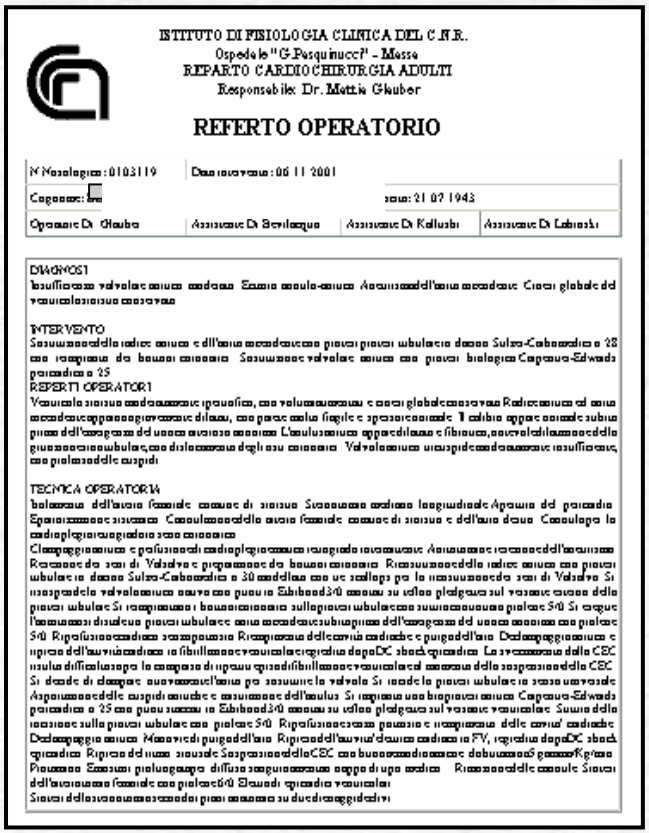
Massa Hospital nurses arrange everything for patient arrival at 9:30 morning. During patient's transfer to Massa with an ambulance transport (60 Km away), a ward clerk at Pisa Hospital completes the discharge letter and notifies the surgeons of the patient late events. At patient arrival Dr. Y, the on duty surgeon, admits the patient to Sub Intensive Cardio-surgical unit and a bar-code identification bracelet is attached to the patient's wrist. The surgical procedure is scheduled for the same afternoon.

At the operating theatre



ICU (Intensive Care Unit)

Text report (web app.)



ISTITUTO DI FISIOLOGIA CLINICA DEL C.N.R.
Ospedale "G.Pasquinucci" - Massa
REPARTO CARDIOCHIRURGIA ADULTI
Responsabile: Dr. Mattia Glauber

REFERTO OPERATORIO

N°Nosologico: 0103119 | Data ricovero: 06/11/2001

Cognome: [illegible] | nato: 21/07/1943

Operatore Dr. Glauber | Assistente Dr. Scrivanopo | Assistente Dr. Kallushi | Assistente Dr. Labinski

DIAGNOSI
Insufficienza valvolare aortica endocea. Stenosi aorto-aortica. Aneurisma dell'aorta ascendente. Circa globale del ventricolo sinistro conservato

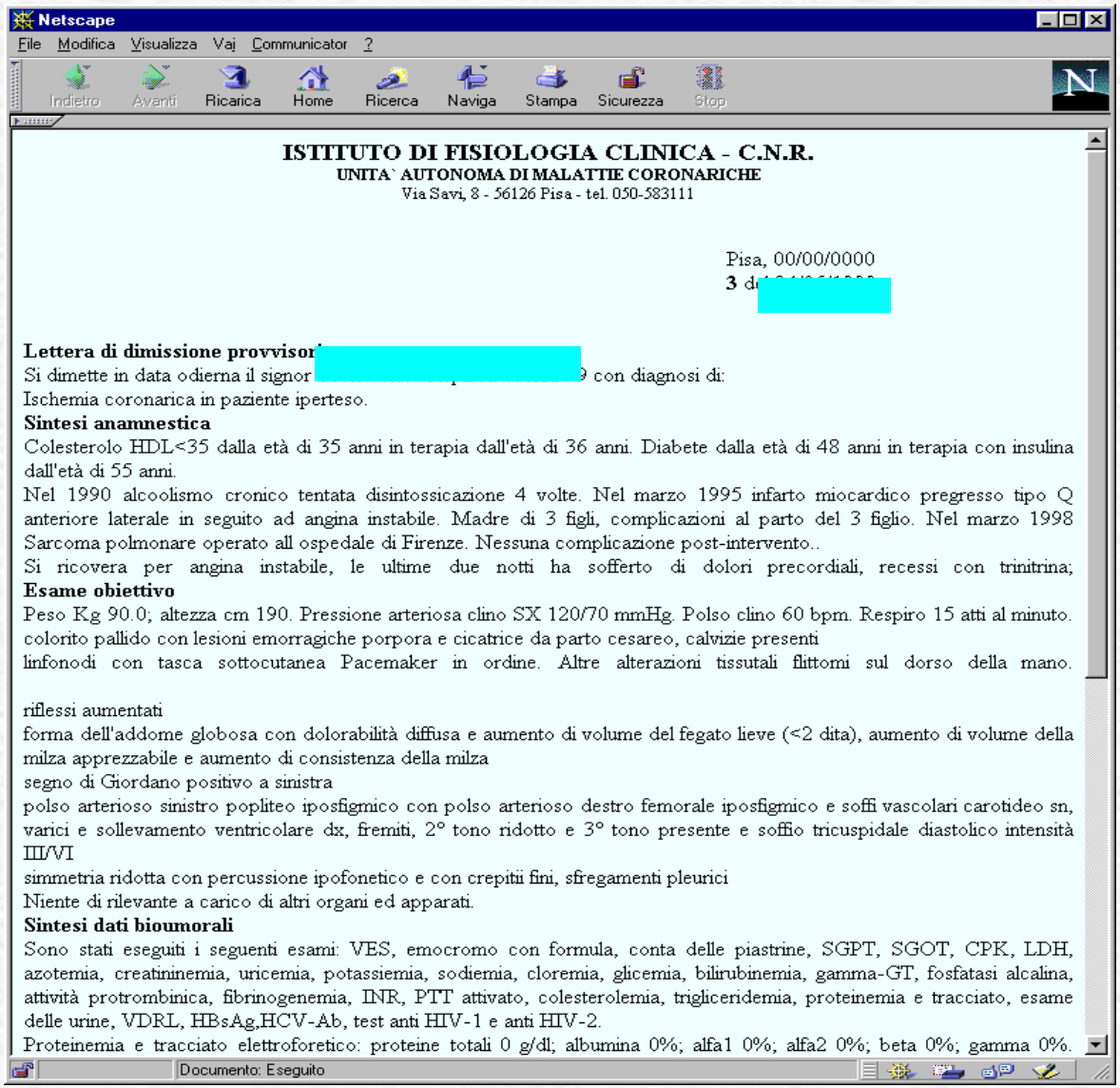
INTERVENTO
Sostituzione della radice aortica e dell'aorta ascendente con protesi protesi tubulare dacron Sulzer-Carbomedics a 28 con impianto dei bottoni coronarici. Sostituzione valvolare aortica con protesi biologica Carpentier-Edwards pericardica a 25

REPERTI OPERATORI
Ventricolo sinistro ipocontrattile, con valvola aortica e circa globale conservata. Radice aortica ed aorta ascendente aneurismatiche dilatate, con pareti molto fragili e ipercalcificate. Il calibro appare normale subito prima dell'emergenza del tronco arterioso anonimo. L'aorta toracica appare dilatata e fibrosa, ancora dilatazione ascendente giunzionale tubulare, con distensione degli assi coronarici. Valvola aortica tricuspidale con lembi ispessiti e calcificati, con prolasso delle cuspidi

TECNICA OPERATORIA
Dopo circa dell'aorta toracica discendente di sinistra. Successiva cardioplegia fredda ematica. Apertura del pericardio. Esplorazione cardiaca. Canulazione della aorta toracica discendente di sinistra e dell'aorta ascendente. Canulazione cardioplegica coronarica. Clampaggio aortico e perfusione cardioplegica ematica coronarica. Arresto cardiaco. Incisione dell'aorta ascendente. Resezione dei lembi valvolari e progressiva dei bottoni coronarici. Ricostruzione della radice aortica con protesi tubulare in dacron Sulzer-Carbomedics a 30 mediante cui vengono poi reimpiantati i bottoni coronarici dei lembi valvolari. Si reimpianta la valvola aortica con punti in Ethibond 3/0 annodati su teflon plegget sul versante esterno della protesi tubulare. Si reimpiantano i bottoni coronarici sulla protesi tubulare con punti in Prolene 5/0. Si esegue l'anastomosi distale con protesi tubulare aorta ascendente-subito prima dell'emergenza del tronco anonimo con punti in Prolene 5/0. Ripristino circolazione coronarica spontanea. Riempimento della cavità cardiache e progressivo dell'aorta ascendente. Defibrillazione ventricolare spontanea dopo DC shock spontanea. La ripresa della CEC risulta difficoltosa per la comparsa di ripetuti episodi fibrillatori ventricolari con necessità di ripetuti DC shock. Si decide di disporre nuovamente l'aorta per sostituire la valvola. Si reimpianta la protesi tubulare in sede aortica. Aspirazione cardiaca e asciugatura dell'aorta. Si reimpianta una bioprotesi aortica Carpentier-Edwards pericardica a 25 con punti singoli in Ethibond 3/0 annodati su teflon plegget sul versante ventricolare. Sutura della resezione sulla protesi tubulare con punti in Prolene 5/0. Ripristino circolazione spontanea e reimpianto delle cavità cardiache. Defibrillazione cardiaca. Massaggio cardiaco. Ripristino dell'attività cardiaca spontanea. Ripresa del ritmo sinusale. Sospensione della CEC con buona stabilità emodinamica. Emostasi. Posizionamento di drenaggio diffuso sopra-aortico e sopra di ogni sutura. Ricostruzione della cassa. Sintesi dell'avventizia frenica con punti in Prolene 5/0. Chiusura pericardio sopra-aortico. Sintesi della cassa toracica per piani anatomici su due drenaggi aspirativi

Clinical Registry (Java app.)

Patient discharge and follow-up



Netscape

File Modifica Visualizza Vai Communicator ?

Indietro Avanti Ricarica Home Ricerca Naviga Stampa Sicurezza Stop

ISTITUTO DI FISIOLOGIA CLINICA - C.N.R.
UNITA` AUTONOMA DI MALATTIE CORONARICHE
Via Savi, 8 - 56126 Pisa - tel. 050-583111

Pisa, 00/00/0000
3 d[redacted]

Lettera di dimissione provvisor[redacted]
Si dimette in data odierna il signor [redacted] con diagnosi di:
Ischemia coronarica in paziente iperteso.
Sintesi anamnestica
Colesterolo HDL<35 dalla età di 35 anni in terapia dall'età di 36 anni. Diabete dalla età di 48 anni in terapia con insulina dall'età di 55 anni.
Nel 1990 alcoolismo cronico tentata disintossicazione 4 volte. Nel marzo 1995 infarto miocardico pregresso tipo Q anteriore laterale in seguito ad angina instabile. Madre di 3 figli, complicazioni al parto del 3 figlio. Nel marzo 1998 Sarcoma polmonare operato all ospedale di Firenze. Nessuna complicazione post-intervento..
Si ricovera per angina instabile, le ultime due notti ha sofferto di dolori precordiali, recessi con trinitrina;
Esame obiettivo
Peso Kg 90.0; altezza cm 190. Pressione arteriosa clino SX 120/70 mmHg. Polso clino 60 bpm. Respiro 15 atti al minuto. colorito pallido con lesioni emorragiche porpora e cicatrice da parto cesareo, calvizie presenti
linfonodi con tasca sottocutanea Pacemaker in ordine. Altre alterazioni tissutali flittomi sul dorso della mano.

riflessi aumentati
forma dell'addome globosa con dolorabilità diffusa e aumento di volume del fegato lieve (<2 dita), aumento di volume della milza apprezzabile e aumento di consistenza della milza
segno di Giordano positivo a sinistra
polso arterioso sinistro popliteo iposfigmico con polso arterioso destro femorale iposfigmico e soffi vascolari carotideo sn, varici e sollevamento ventricolare dx, fremiti, 2° tono ridotto e 3° tono presente e soffio tricuspidale diastolico intensità III/VI
simmetria ridotta con percussione ipofonetico e con crepitii fini, sfregamenti pleurici
Niente di rilevante a carico di altri organi ed apparati.
Sintesi dati bioumorali
Sono stati eseguiti i seguenti esami: VES, emocromo con formula, conta delle piastrine, SGPT, SGOT, CPK, LDH, azotemia, creatininemia, uricemia, potassiemia, sodiemia, cloremia, glicemia, bilirubinemia, gamma-GT, fosfatasi alcalina, attività protrombinica, fibrinogenemia, INR, PTT attivato, colesterolemia, trigliceridemia, proteinemia e tracciato, esame delle urine, VDRL, HBsAg,HCV-Ab, test anti HIV-1 e anti HIV-2.
Proteinemia e tracciato elettroforetico: proteine totali 0 g/dl; albumina 0%; alfa1 0%; alfa2 0%; beta 0%; gamma 0%.

Documento: Eseguito

Universal access issues

- Several considerations
  - Interoperability of data
  - Accessibility of specialized applications
  - Portability across platforms (desktop, iPAQ)
  - etc
- Focus on an examination of compliance to W3C-WAI Content Accessibility Guidelines (WCAG)

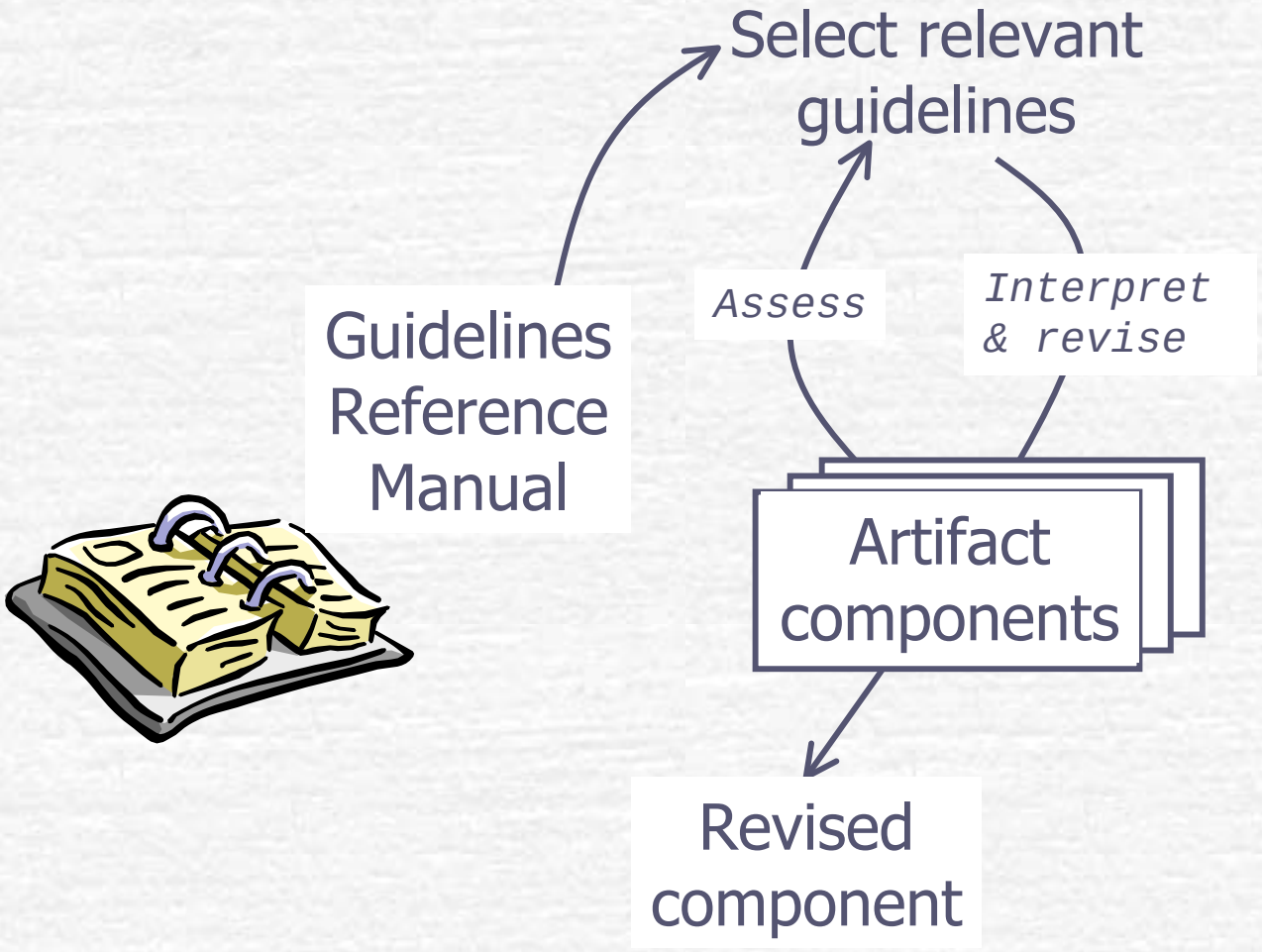
W3C-WAI Content Guidelines

- 14 guidelines
  - Provide equivalent alternatives to auditory and visual content
  - Don’t rely on colour alone
- 3 priority levels
  - Web content developer *must…*
    - *A level*
  - A Web content developer *should…*
    - *AA level*
  - A Web content developer *may*…
    - *AAA level*

Checkpoints

- 16 checkpoints at A level
  - Embedded information conveyed with colour also available without colour (for example from context or mark-up)
- 30 checkpoints at AA level
- 9 checkpoints at AAA level.

Procedure for using the technique



Application in the IFC scenario

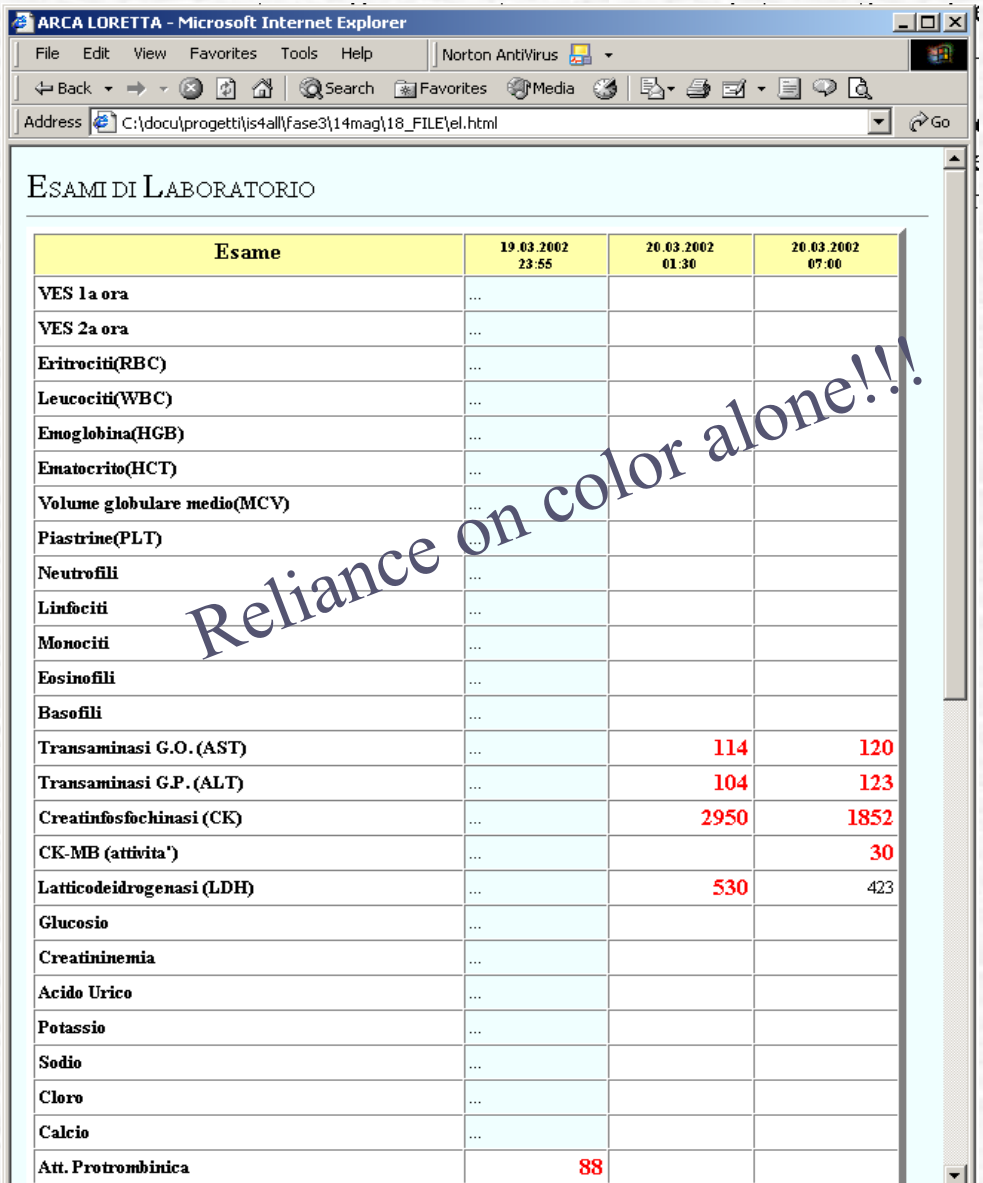
- Identify relevant components from the IFC scenario
  - Table
  - Image
  - Text
- Inspect each component's compliance to relevant guidelines and checkpoints
  - Interpretation needed to assess relevance of guidelines
- Document problems and potential solutions

The `text` component

Do not rely on colour alone (Guideline 2)

- ✓ Two check points
  - 2.1 Priority 1: Ensure that all information conveyed with colour is also available without colour
  - 2.2 Priority 3 for `text`: Ensure that foreground and background colour combinations provide sufficient contrast when viewed by someone having colour deficits or when viewed on a black and white screen

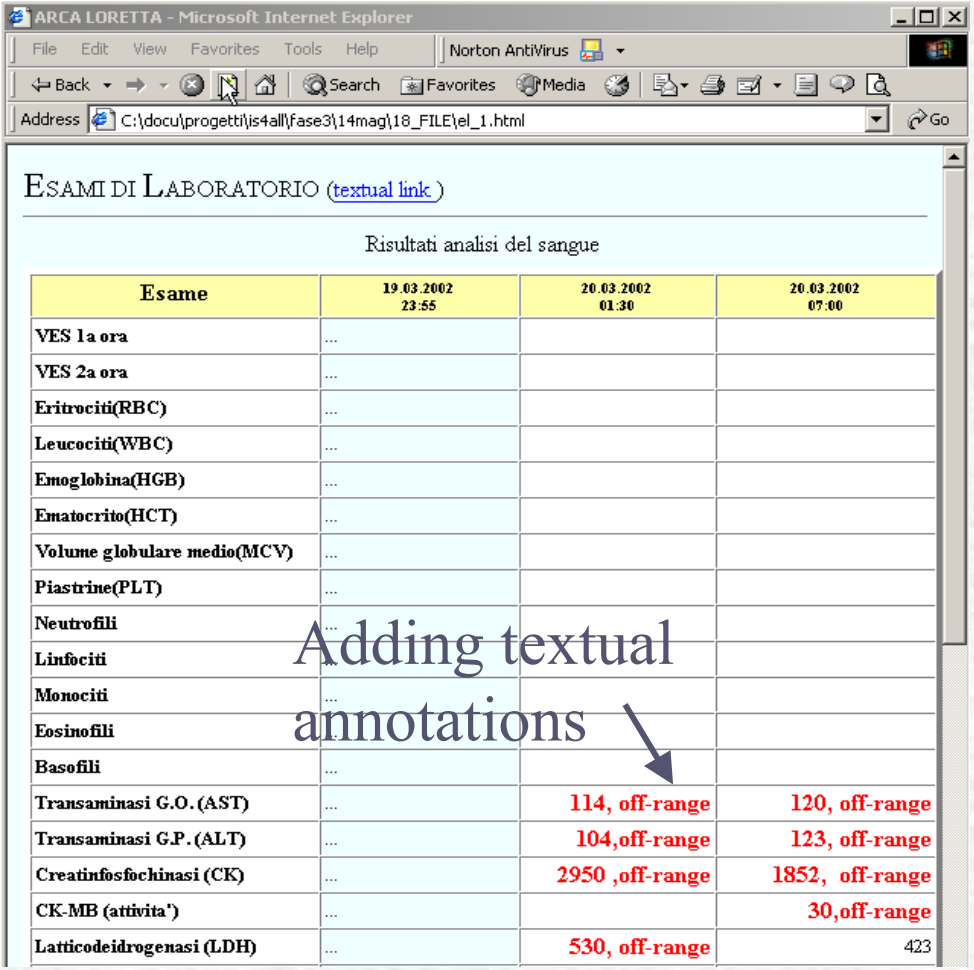
Improving accessibility - WCAG



Esame	19.03.2002 23:55	20.03.2002 01:30	20.03.2002 07:00
VES 1a ora	...		
VES 2a ora	...		
Eritrociti(RBC)	...		
Leucociti(WBC)	...		
Emoglobina(HGB)	...		
Ematocrito(HCT)	...		
Volume globulare medio(MCV)	...		
Piastrine(PLT)	...		
Neutrofili	...		
Linfociti	...		
Monociti	...		
Eosinofili	...		
Basofili	...		
Transaminasi G.O. (AST)	...	114	120
Transaminasi G.P. (ALT)	...	104	123
Creatinfosfochinasi (CK)	...	2950	1852
CK-MB (attivita')	...		30
Latticodeidrogenasi (LDH)	...	530	423
Glucosio	...		
Creatininemia	...		
Acido Urico	...		
Potassio	...		
Sodio	...		
Cloro	...		
Calcio	...		
Att. Protrombinica	88		

Improvements (1/2)

- Adding textual annotations



Esame	19.03.2002 23:55	20.03.2002 01:30	20.03.2002 07:00
VES 1a ora	...		
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Ematocrito(HCT)	...		
Volume globulare medio(MCV)	...		
Piastrine(PLT)	...		
Neutrofili	...		
Linfociti	...		
Monociti	...		
Eosinofili	...		
Basofili	...		
Transaminasi G.O. (AST)	...	114, off-range	120, off-range
Transaminasi G.P. (ALT)	...	104,off-range	123, off-range
Creatinfosfochinasi (CK)	...	2950 ,off-range	1852, off-range
CK-MB (attivita')	...		30,off-range
Latticodeidrogenasi (LDH)	...	530, off-range	423

Alternative

- Providing a footnote

fT4	11.4		
Proteina C Reattiva	0.10		
Osmolalita'	...		
Amilasi	...		
CK-MB (conc.)	20.9*	19.2*	8 *
Ferro	...		
Fosfatasi Alcalina (ALP)	...		
INR	1.04		
Lipoproteina (a)	9.6		
Mioglobina	633*	279*	60
Proteine Totali	...		
Protidogramma	...		
Troponina I	2.65 *	1.39*	0.57*
Urea	...		

* off-range values

ARCA LORETTA

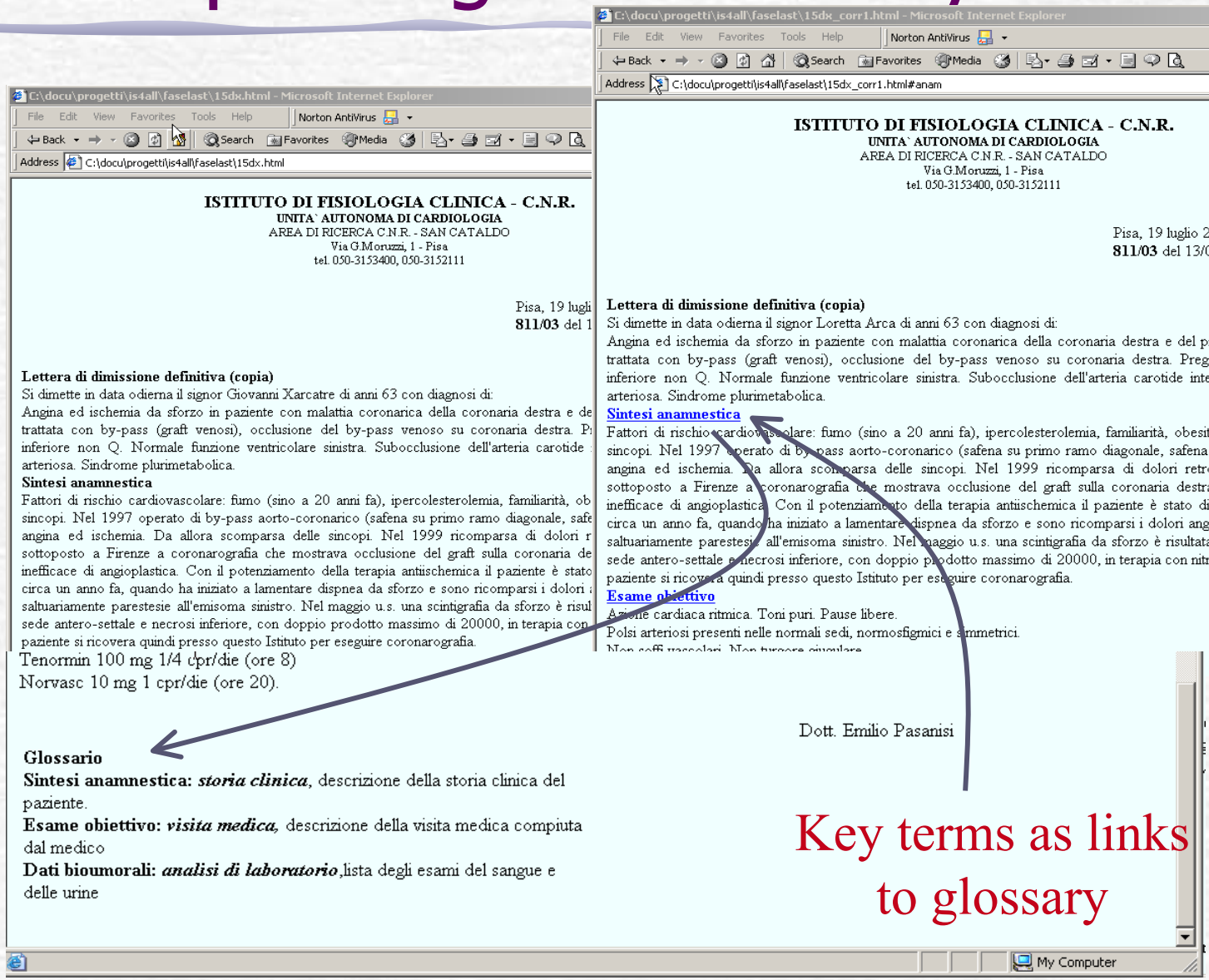
Local intranet

The `text` component

Ensure that documents are clear and simple (Guideline 14)

- 14.1 Priority 1: Use the clearest and simplest language appropriate for a site's content
- 14.2 Priority 3: Supplement text with graphic or auditory presentations where they will facilitate comprehension of the page
- 14.3 Priority 3: Create a style of presentation that is consistent across pages

Improving accessibility - WCAG



Key terms as links to glossary

Concluding remark

- W3C-WAI guidelines are a valuable reference resource for Web-based Health Telematics applications
- They are inspired by early work on accessible design
  - If interpreted proactively they serve both improved *usability* and *universal access*
- Guidelines are stable but not final
- Need for interpretation !!!

Role-adapted interaction

Overview

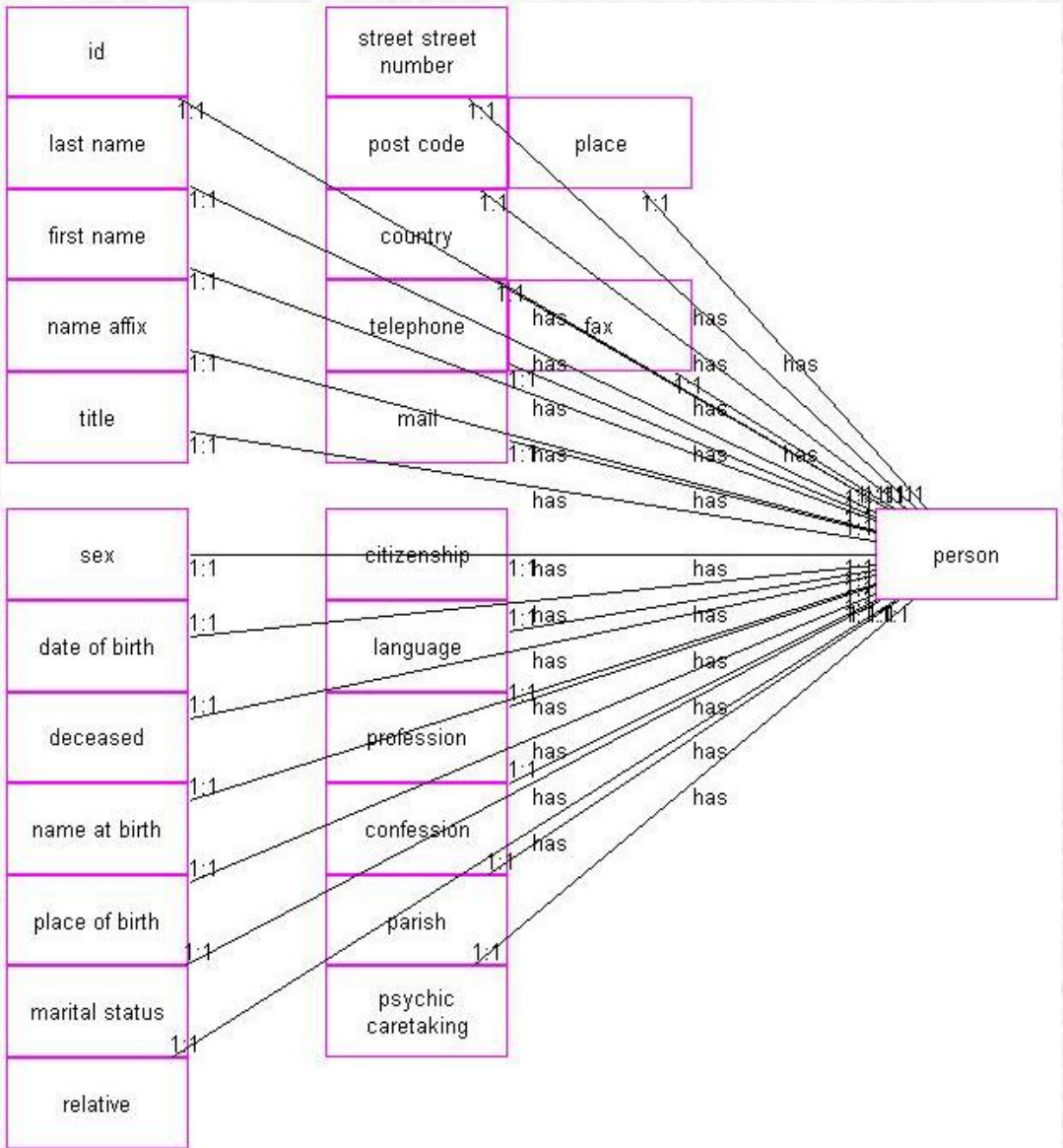
Description of technique

Example on the WWW

Overview

- Demonstration of how a model-based approach can be used to develop role-adapted user interfaces
  - Examples of domain-oriented analysis
  - Structure of TADEUS models
- TADEUS models
  - Object Relationship Diagrams
  - Object Behavior Diagrams
  - Object Interaction Diagrams

Example of an ORD



Scenarios

- Once the basic understanding of the business was completed, three scenarios were developed, all involving searching and presenting patient data:
  - File management by the administration assistant
  - Finalization of a patient's operation by operation ward
  - Retrieval of patient data and commenting by doctor

The scenarios in brief

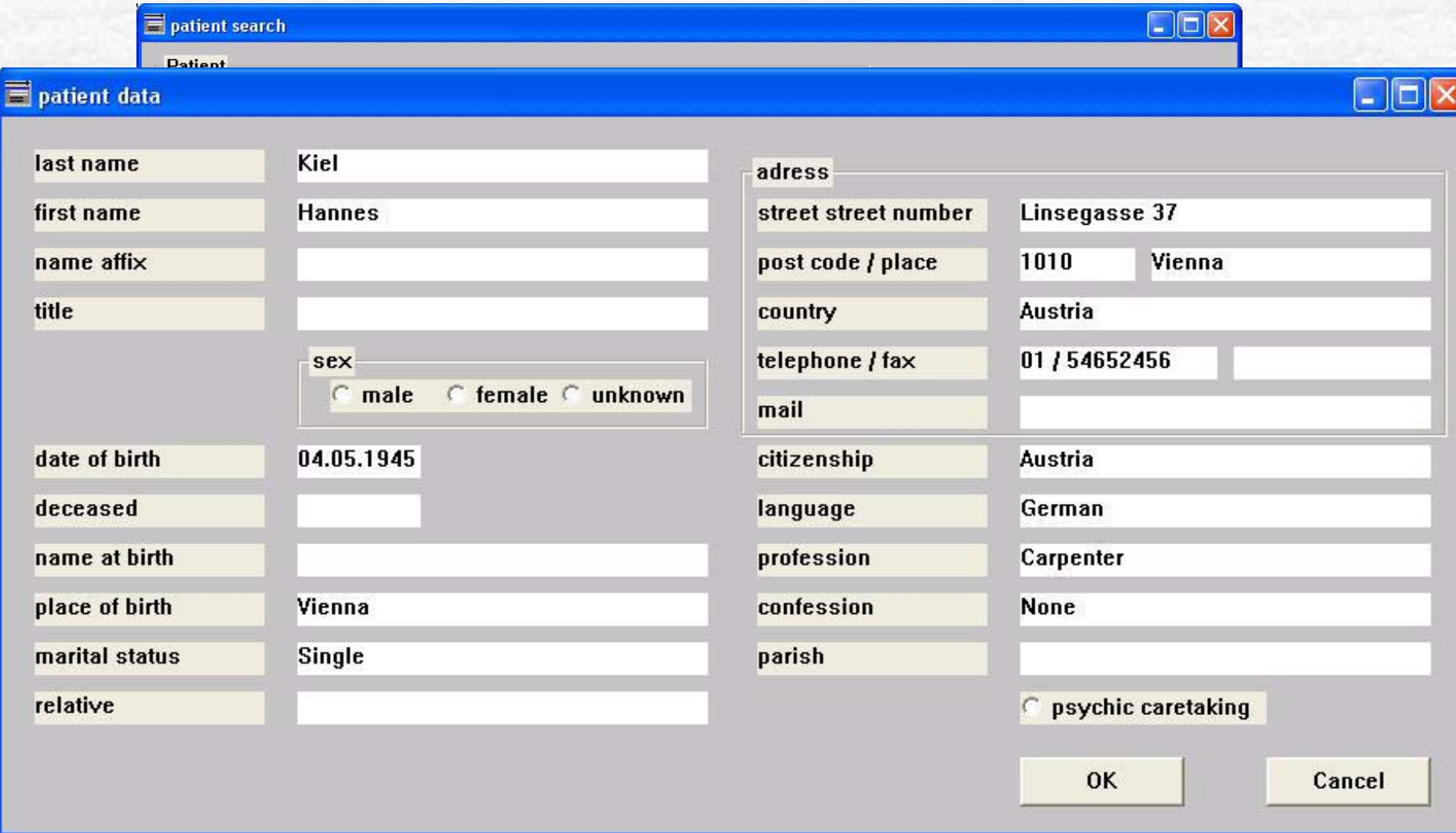
Scenario 1	Scenario 2	Scenario 3
Role Administration Assistant	***Role:*** Operation ward	***Role:*** Doctor
Location Application center	***Location:*** Ward	***Location:*** Office
Responsibility Acquire & type in personal patient data	***Responsibility:*** Assign operation data to a patient	***Responsibility:*** Access data, adds only text, but can't manipulate data
Tasks: Search for patient If patient data are available, they are displayed and can be edited Else, an empty form appears and data can be typed in	***Tasks:*** Search for patient If patient data are available, they are displayed and new data (location, time, date, doctor) are added Else error message	***Tasks:*** Search for patient If data are available three navigation paths are offered and comments can be added Else error message

Example

- Different options for different roles (adaptability)

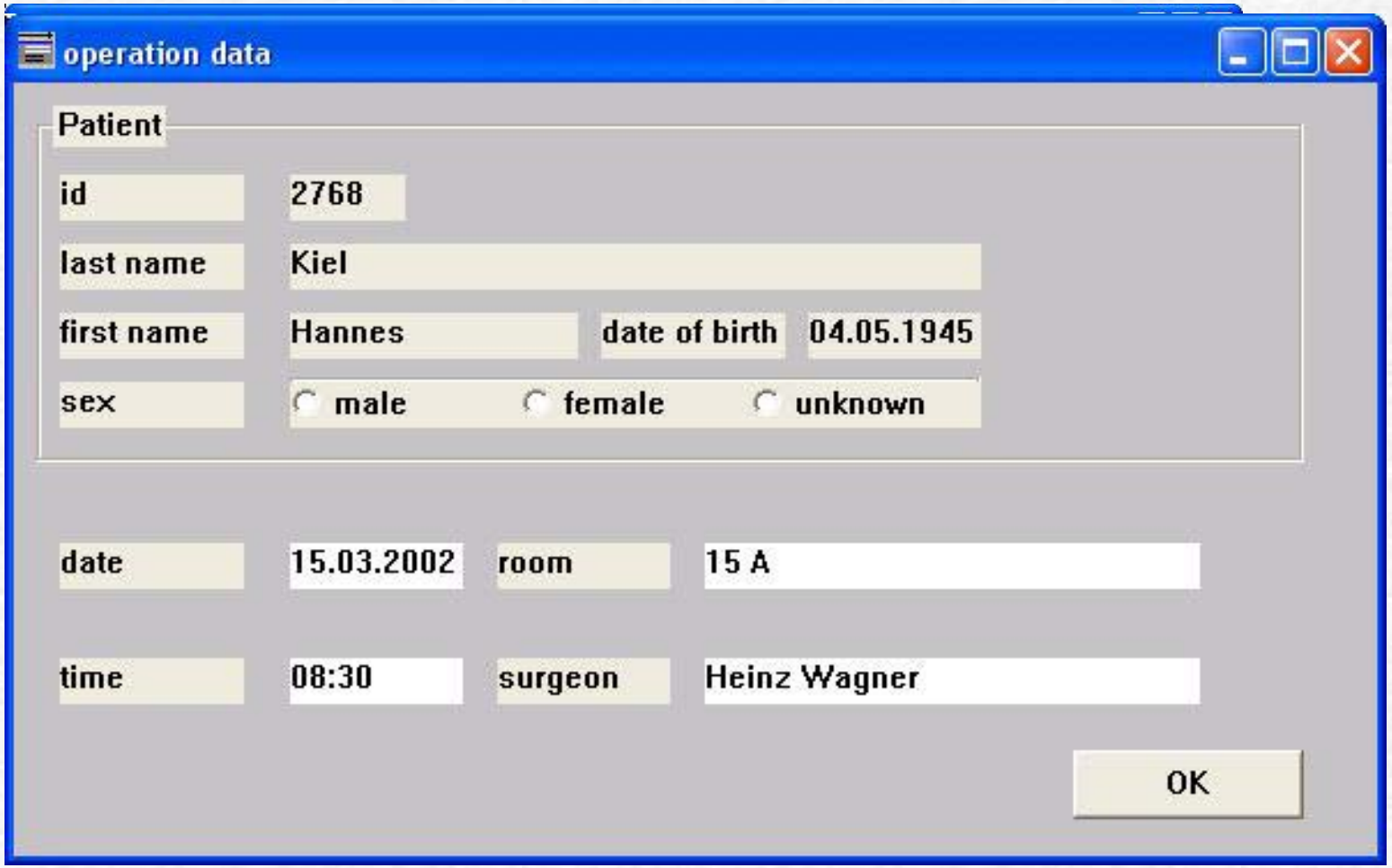
Admission assistant

- Admission assistant's search for a patient



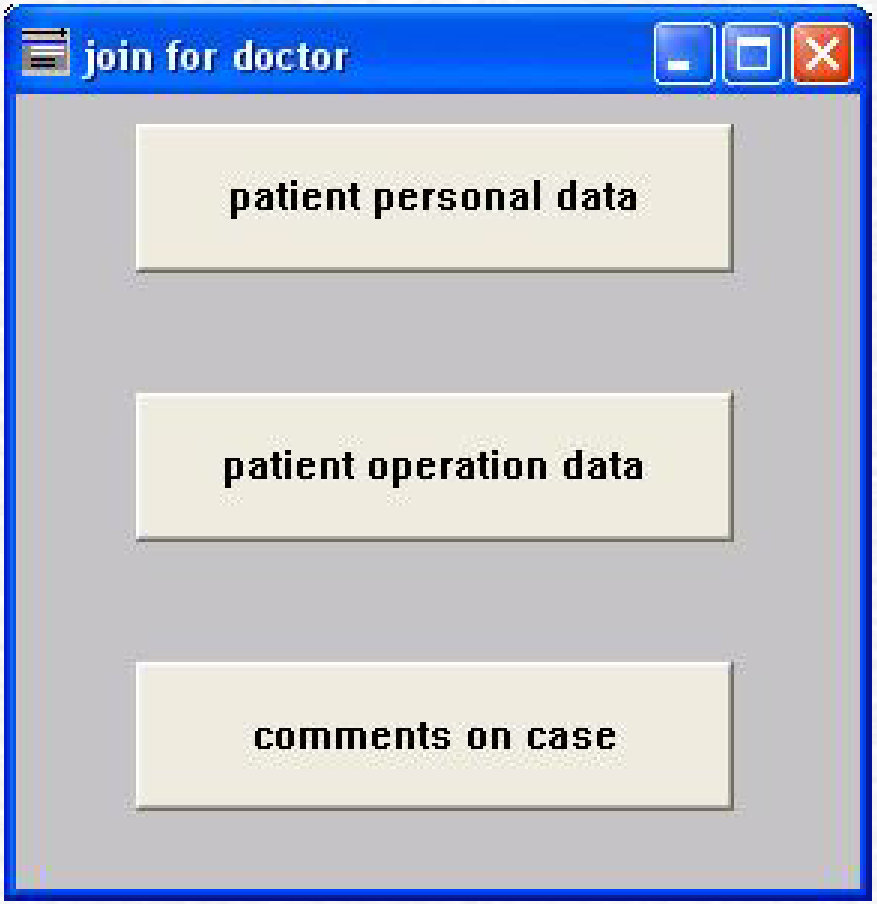
Operation assistant

- Operation assistant's view of the patient's record
- Task-specific view allowing updates



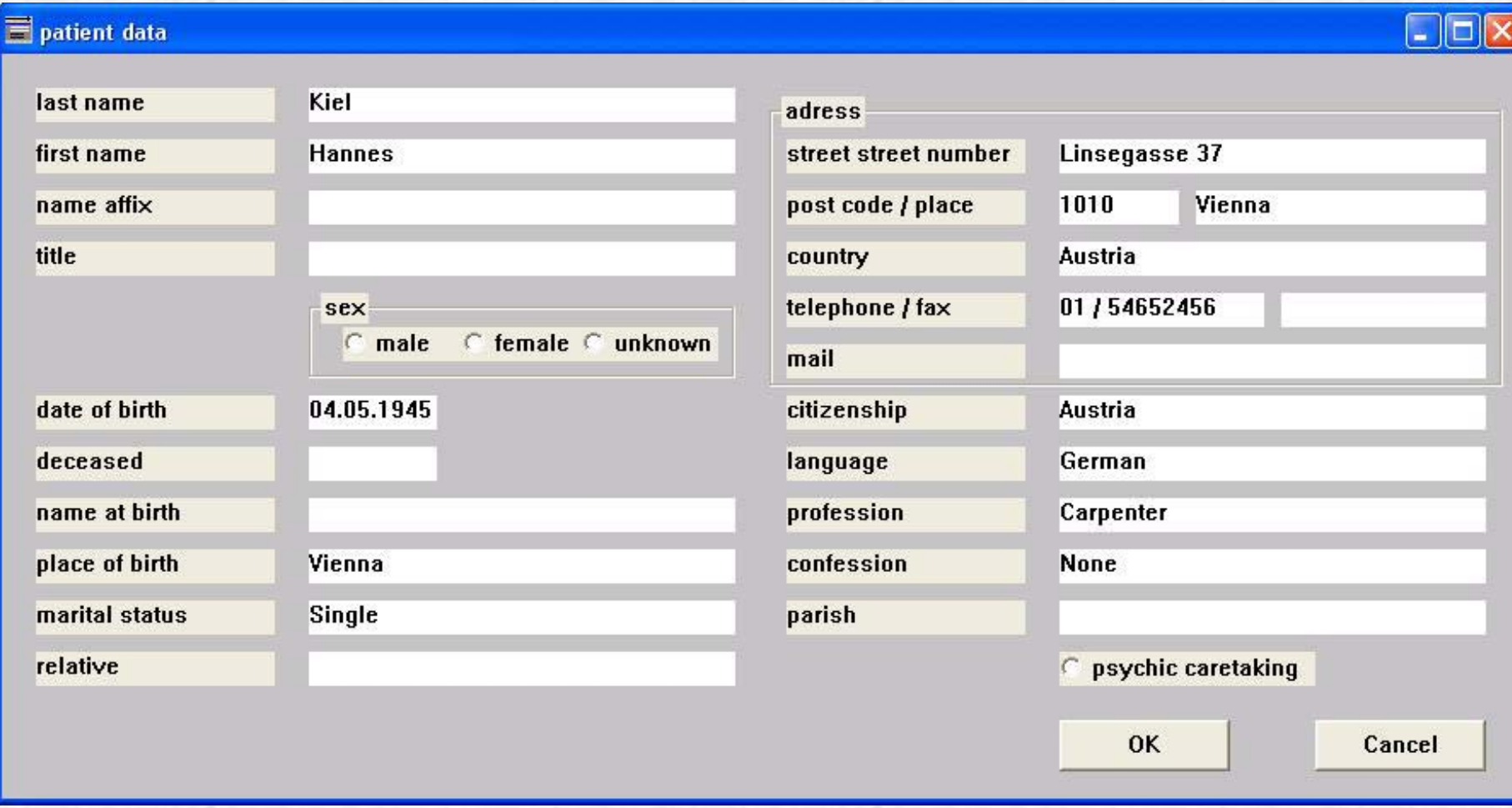
The Doctor (1/4)

- Access to various parts of the patient's record



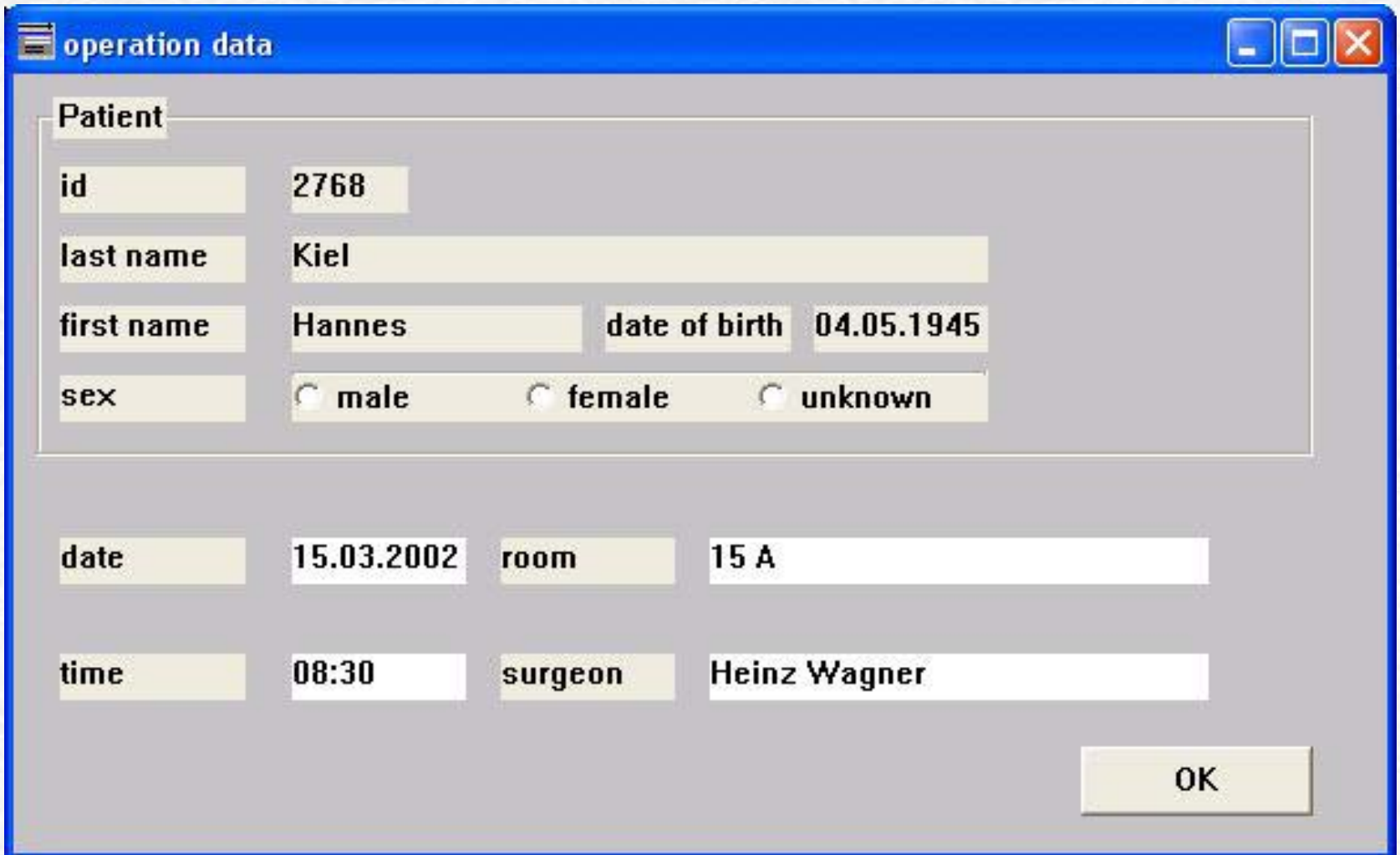
The Doctor (2/4)

- Presenting patient personal data



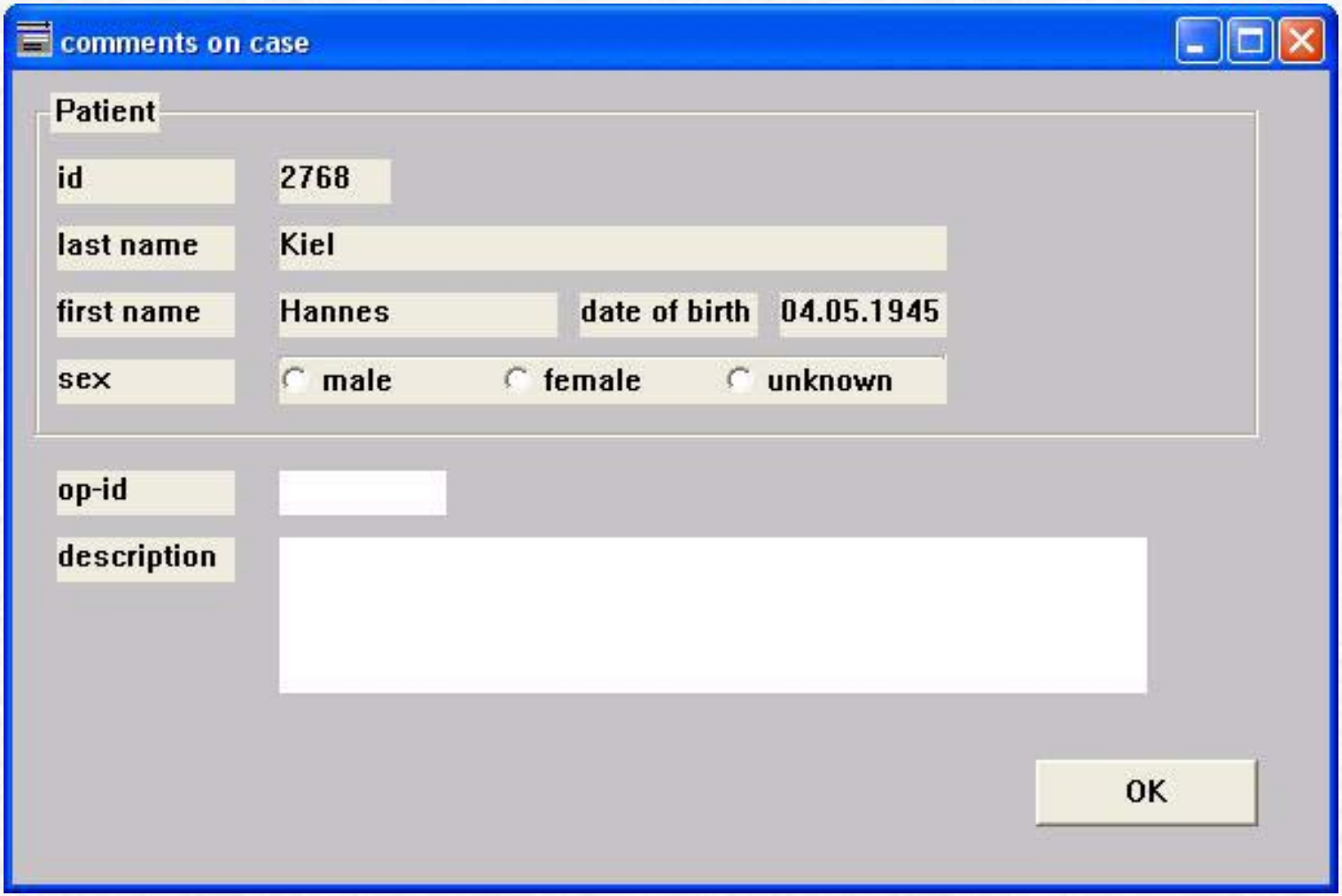
The Doctor (3/4)

- Present patient's operation data



The Doctor – (4/4)

- Add comments on case



Concluding remarks

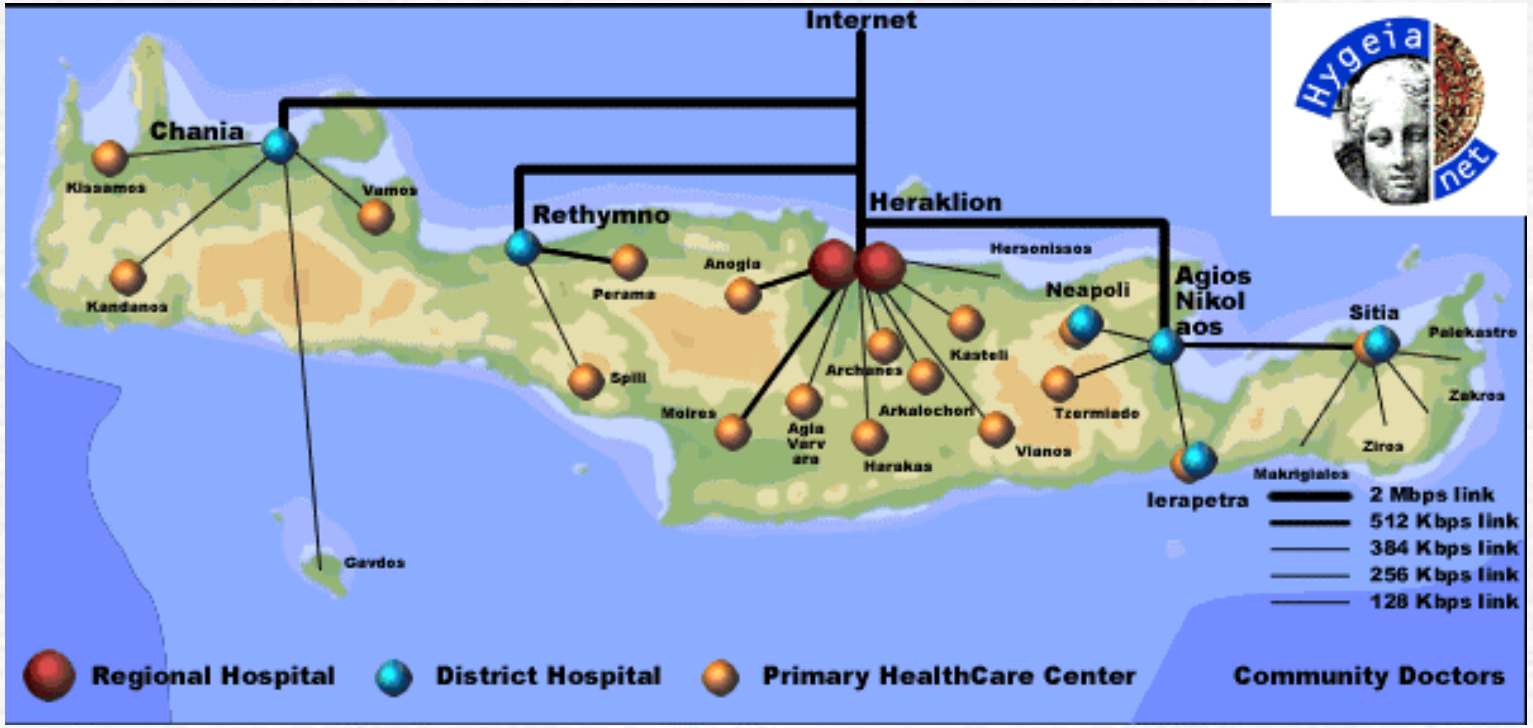
- The user interfaces presented are automatically generated from the TADEUS models
- The examples presented fall under role-adapted interaction where roles are determined by *functional* attributes rather than *personal preferences*

HYGEIAnet

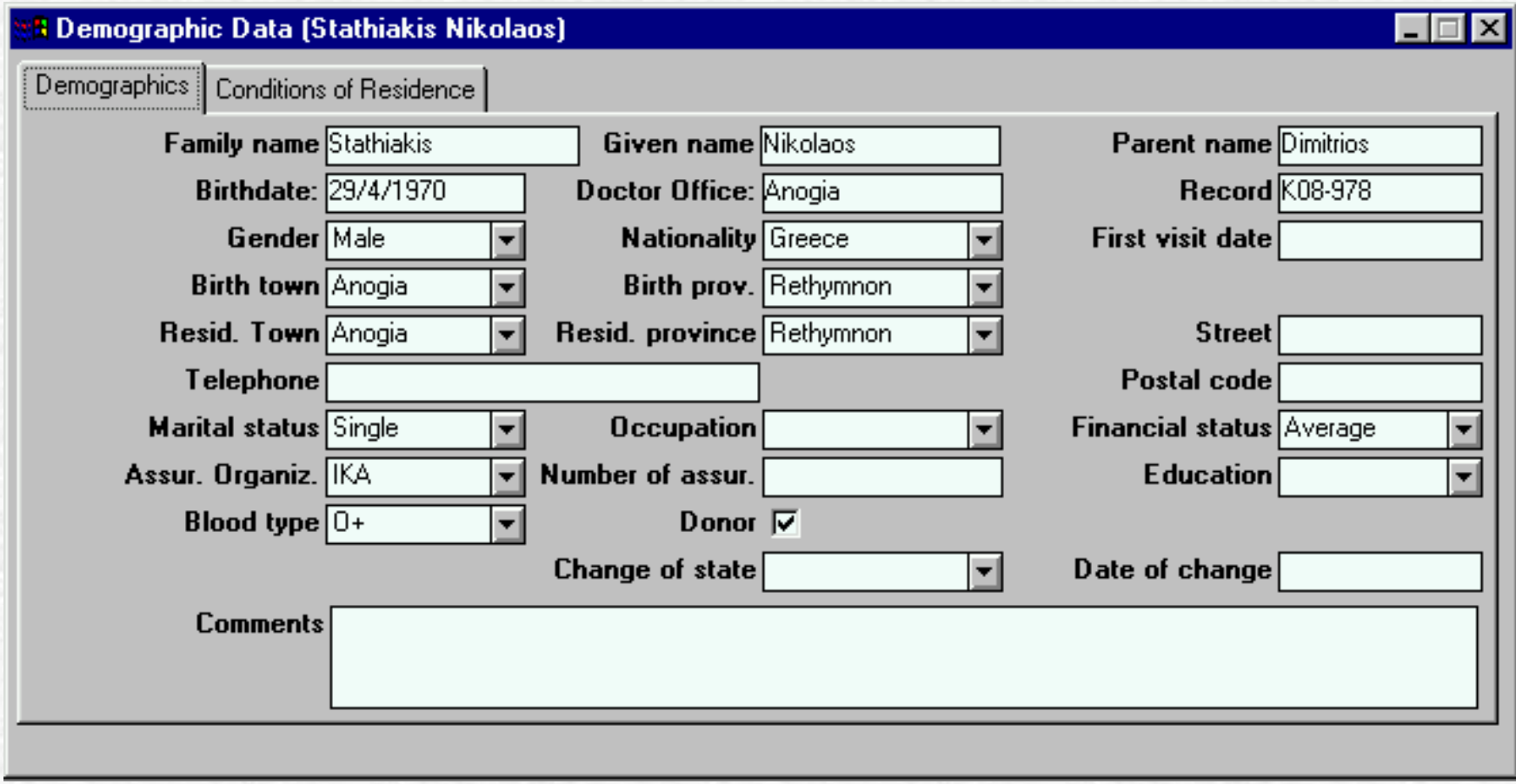
Regional Health Telematics Network

HYGEIAnet scenario

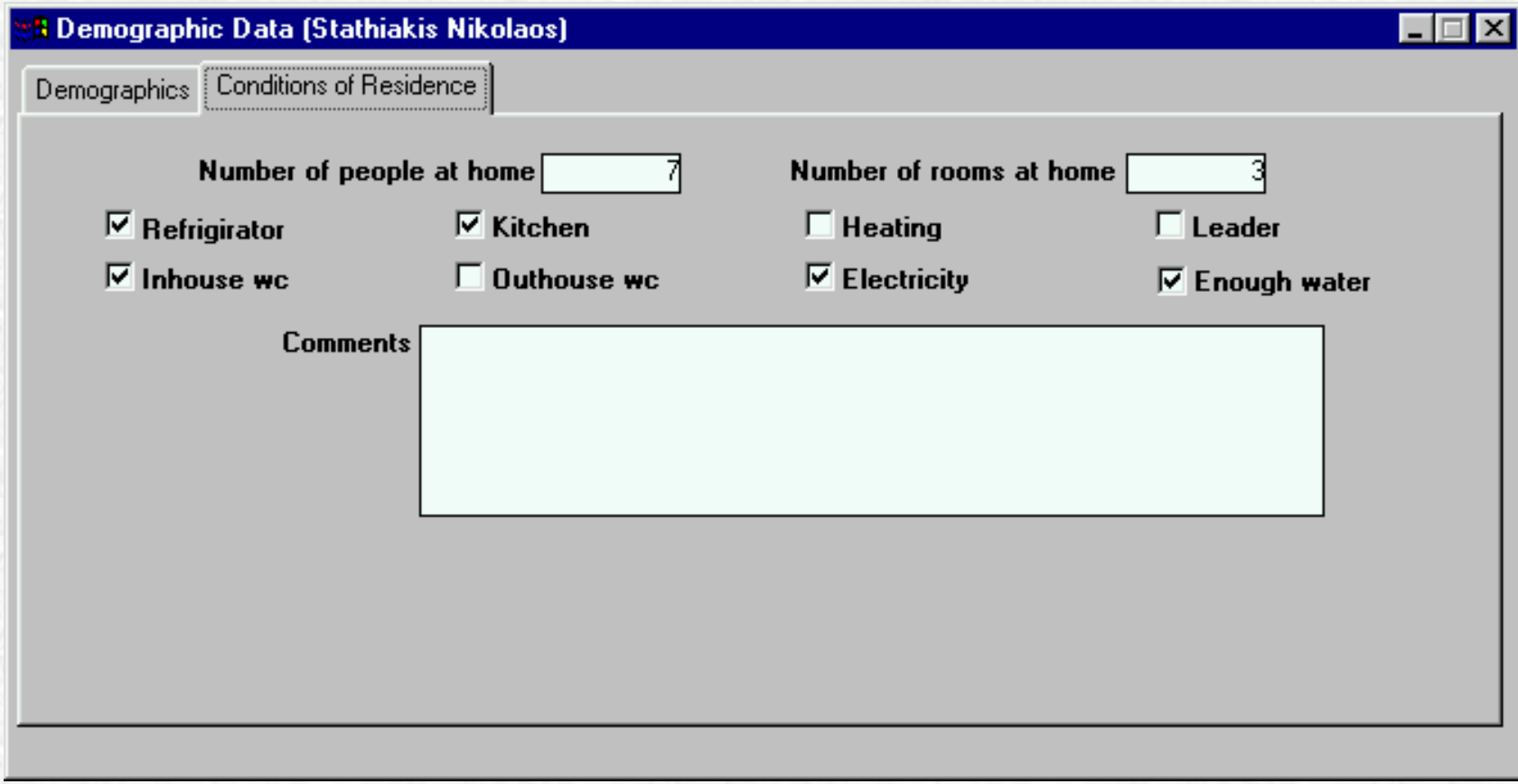
- Regional Health Telematics Network of Crete
- Support by EC-funded projects and national authorities



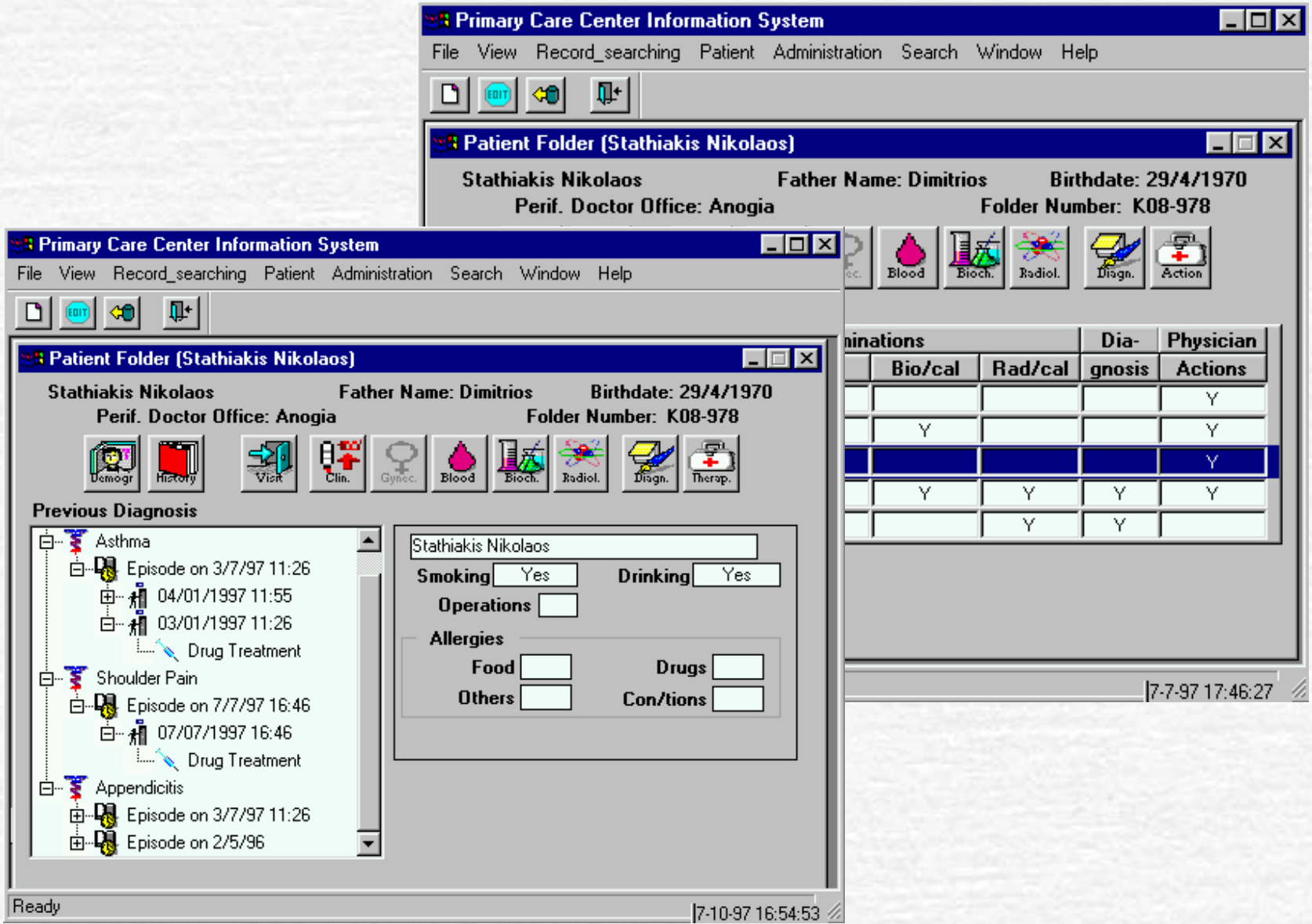
Demographics



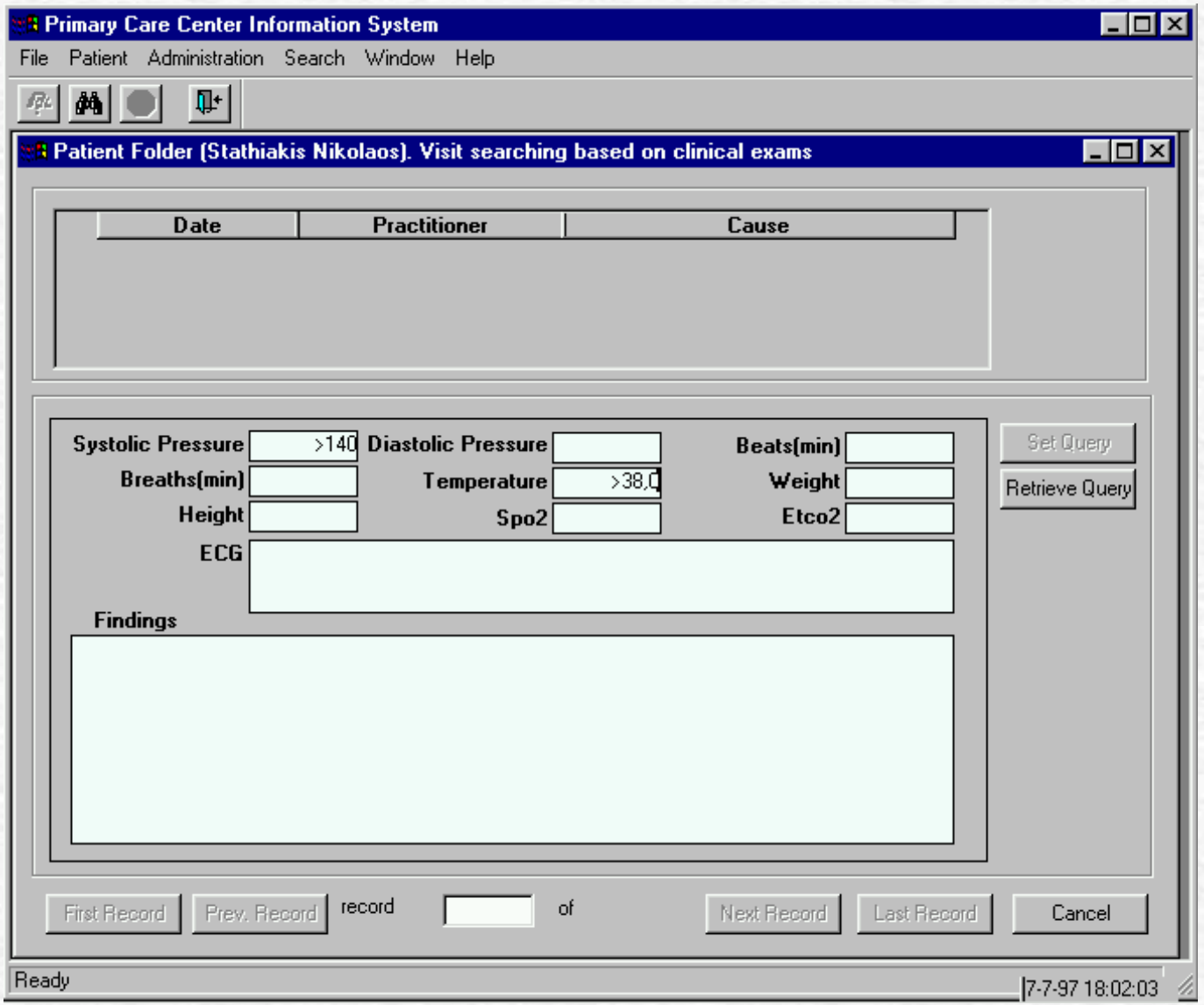
Condition of residence



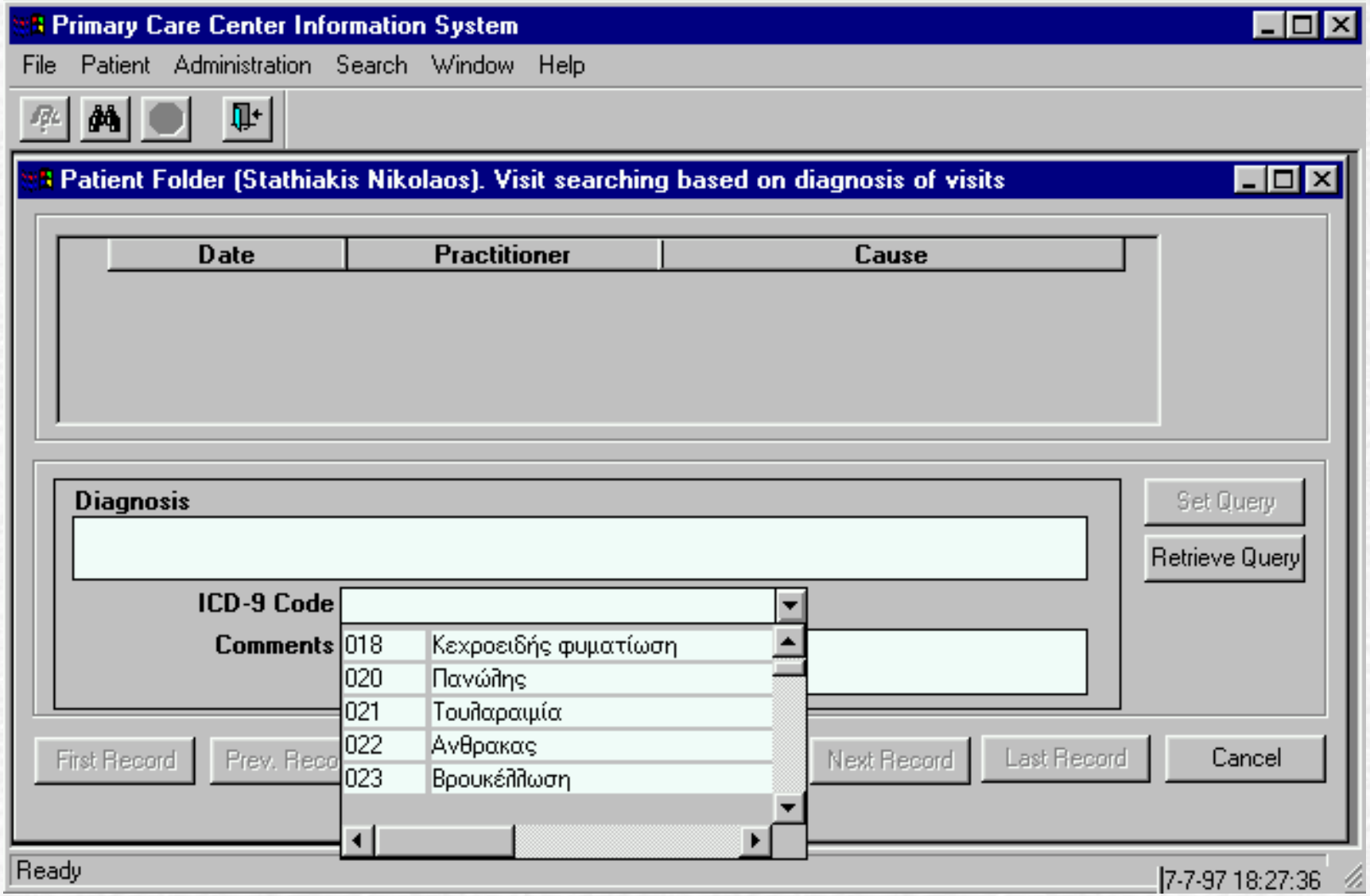
Integrated Patient History



Querying the medical record



Querying based on diagnosis



Universal access issues

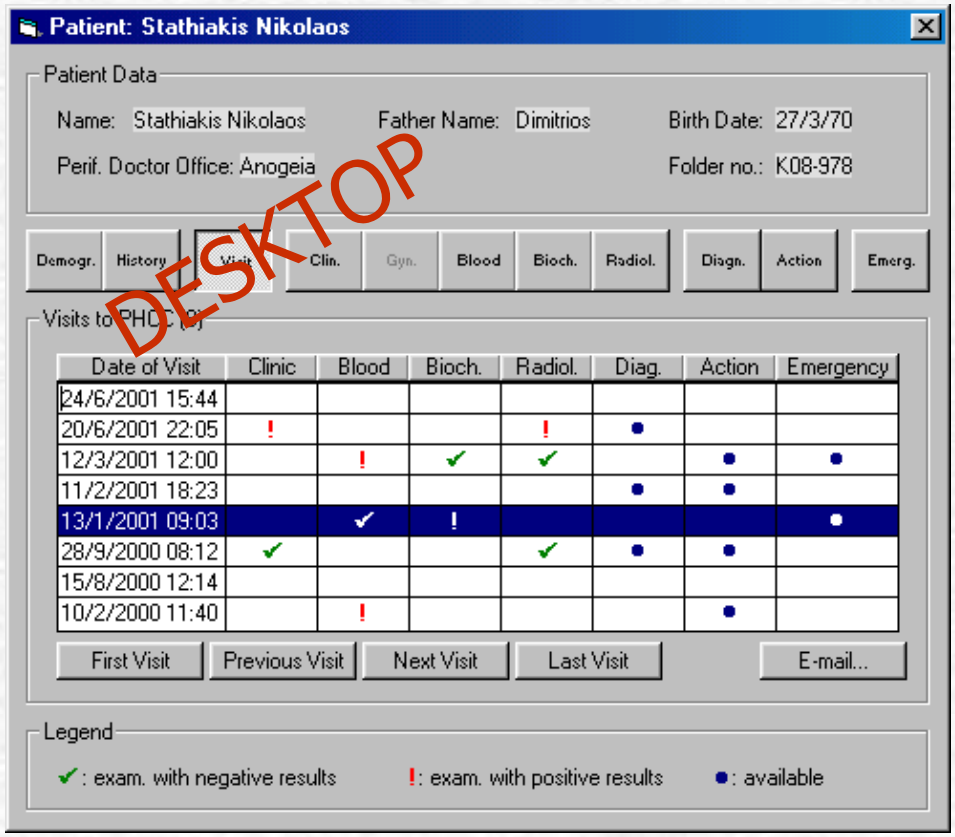
- Improving the Desktop style (not reported here)
- Developing new styles
  - HTML (example presented earlier)
  - ✓ iPAQ
  - ✓ WAP

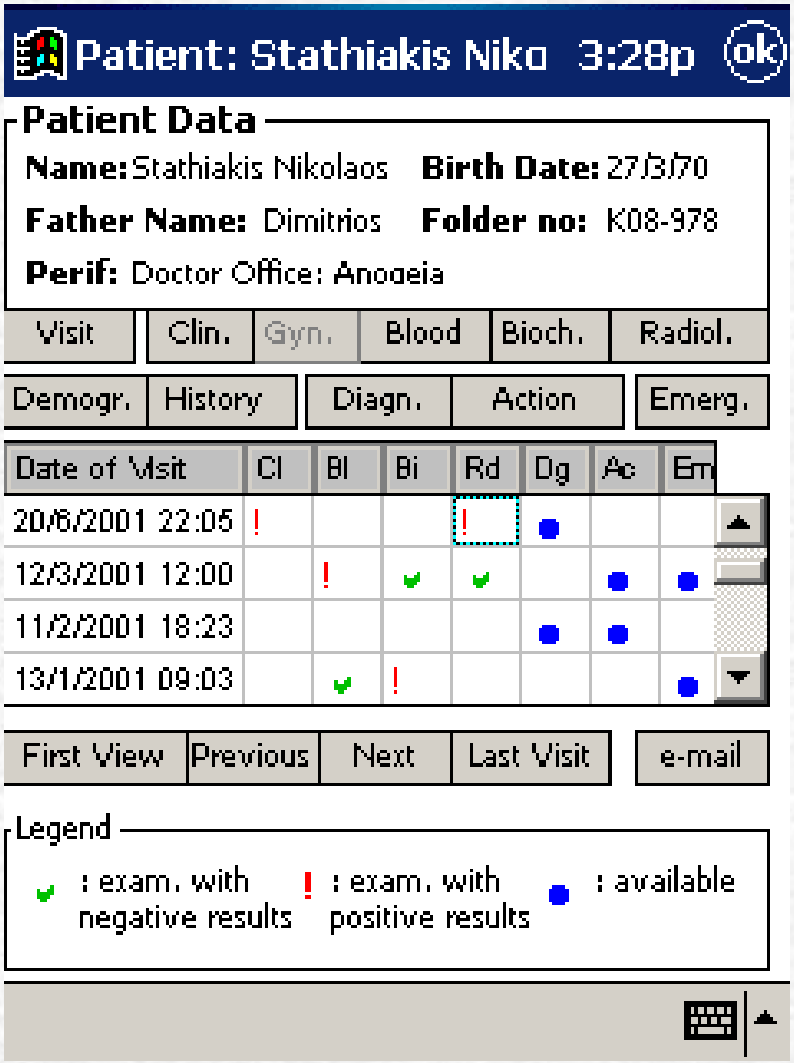
HYGEIAnet on the iPAQ

Highlights

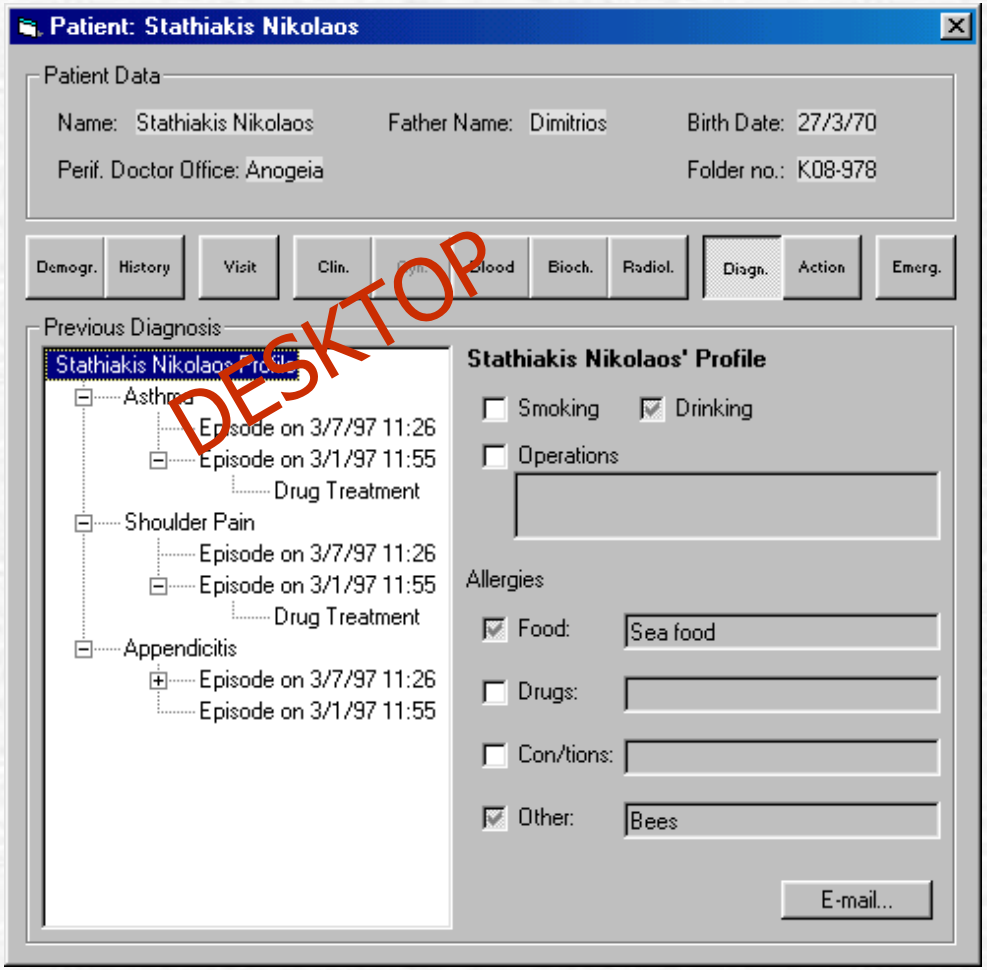
- Prototype of new styles for the iPAQ
  - Pointing as prime interaction technique
  - Visual keyboard for text editing
- Functionality remains the same

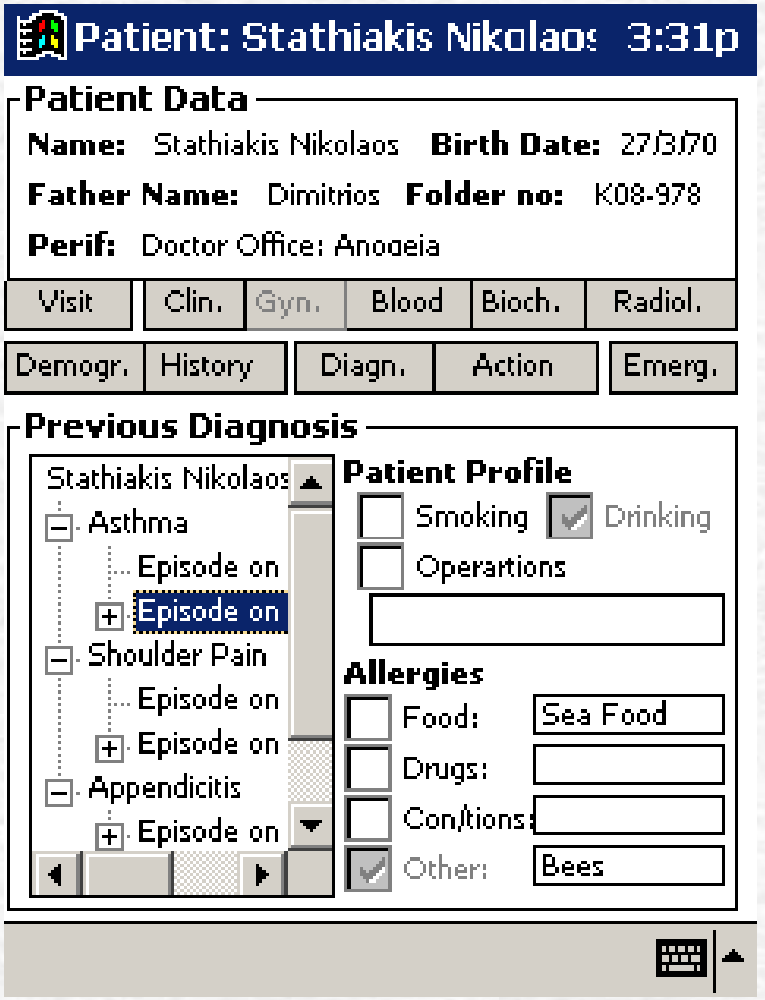
The patient history on the iPAQ





The patient history on the iPAQ





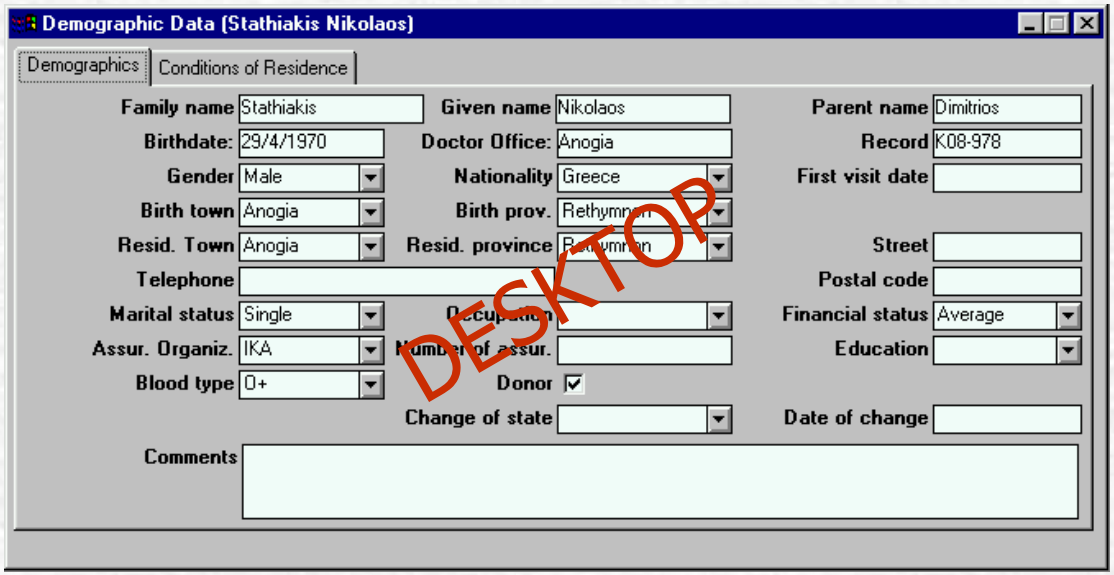
HYGEIAnet on a WAP phone

Alternative style for WAP phone

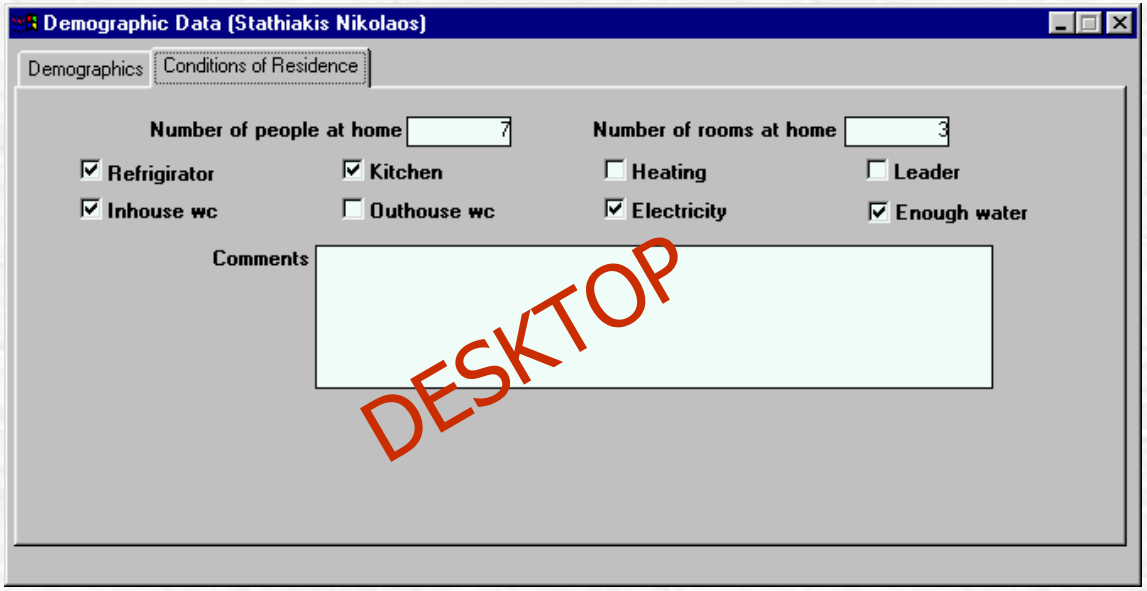
Highlights

- Prototype of new style for WAP phone
  - Multiple WAP pages
  - Alternate interaction technique
  - Page navigation

Patient's demographics on WAP



Patient's demographics on WAP



Summary & Conclusions

Summary of results

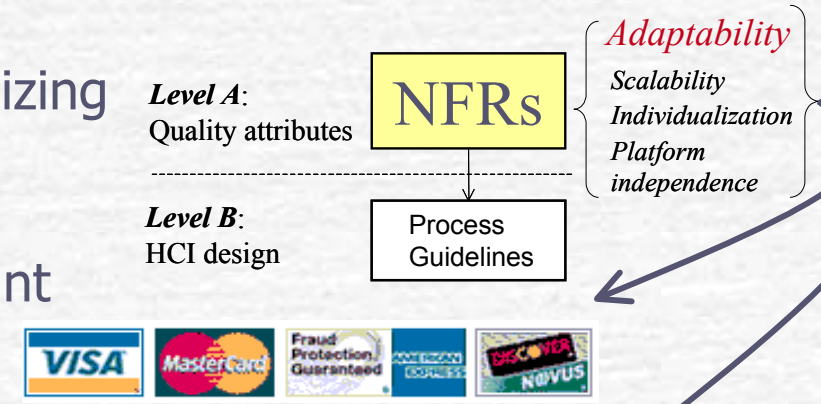
- A code of universal access practice
  - ***Seven*** representative scenarios
  - A structured-scenario based ***macro-level*** method as a reference frame for universal access
  - ***Eleven*** generic methods to address specific (micro-level) aspects of universal access
  - ***Sixteen*** validation case studies
- Documented in a comprehensive volume

Scope of methods

Phase	Micro-design target	
Requirements engineering	*Quality attributes* *User interface requirements*	**NFR Analysis** **UA²W**
Concept formation & design	*Designing artifacts* *Building design representations* *Capturing design rationale* *Low-fidelity prototypes*	**Unified design** **TADEUS models** **WCAG conformance** **Screening**
Prototyping & development	*Supporting adaptation* *Accessibility* *Architectures for universal access*	**Style re-engineering** **Model-based developmen**
Evaluation	*Standards conformance* *Usability* *Benchmarking*	**MedicSCORE** **WCAG audit** **Benchmarking**

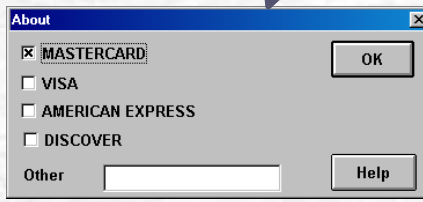
When to use methods (1/5)

- When
  - Starting a new project recognizing that adaptability, scalability, platform independence, ubiquitous access are important qualities to be addressed
- Then, NFRs analysis can
  - provide an explicit focus on these quality attributes highlighting how they are intertwined
  - help identify user, software and accessibility requirements
  - facilitate informed choice of critical system parameters (e.g. architecture)



Explicit choice (Selection panel)

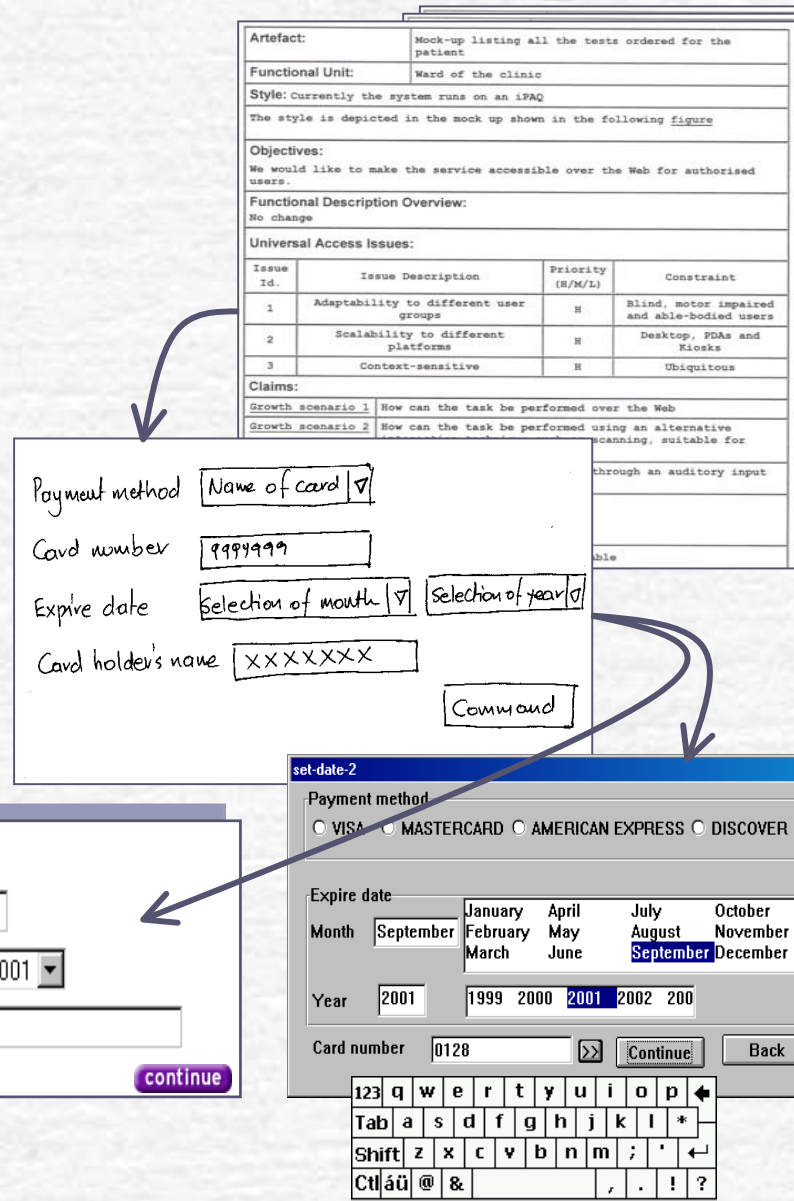
Explicit choice (List-box)



Explicit choice (Checkbox)

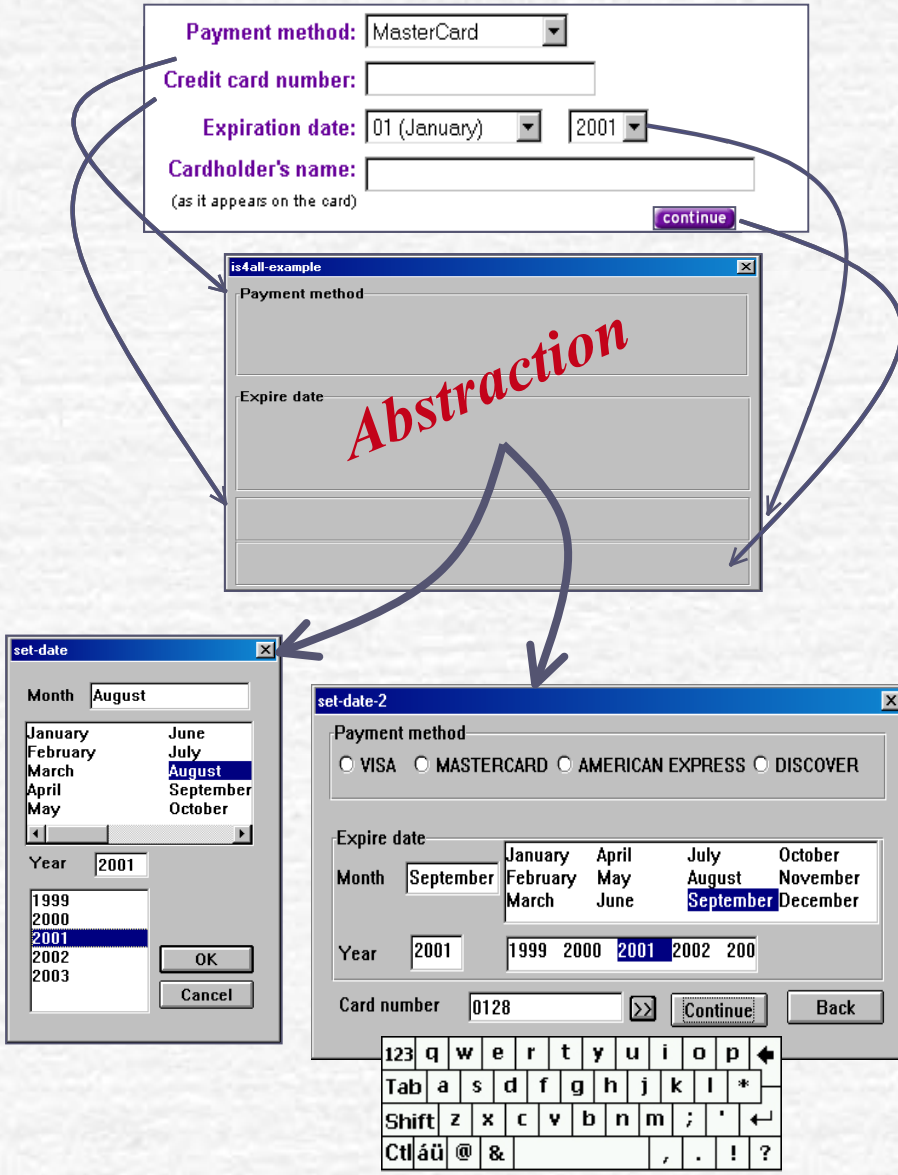
When to use methods (2/5)

- When
  - there is no system but a design concept
- Then, UA²Ws can
  - help define shortcomings envision new contexts of use
  - define new design concepts by consensus



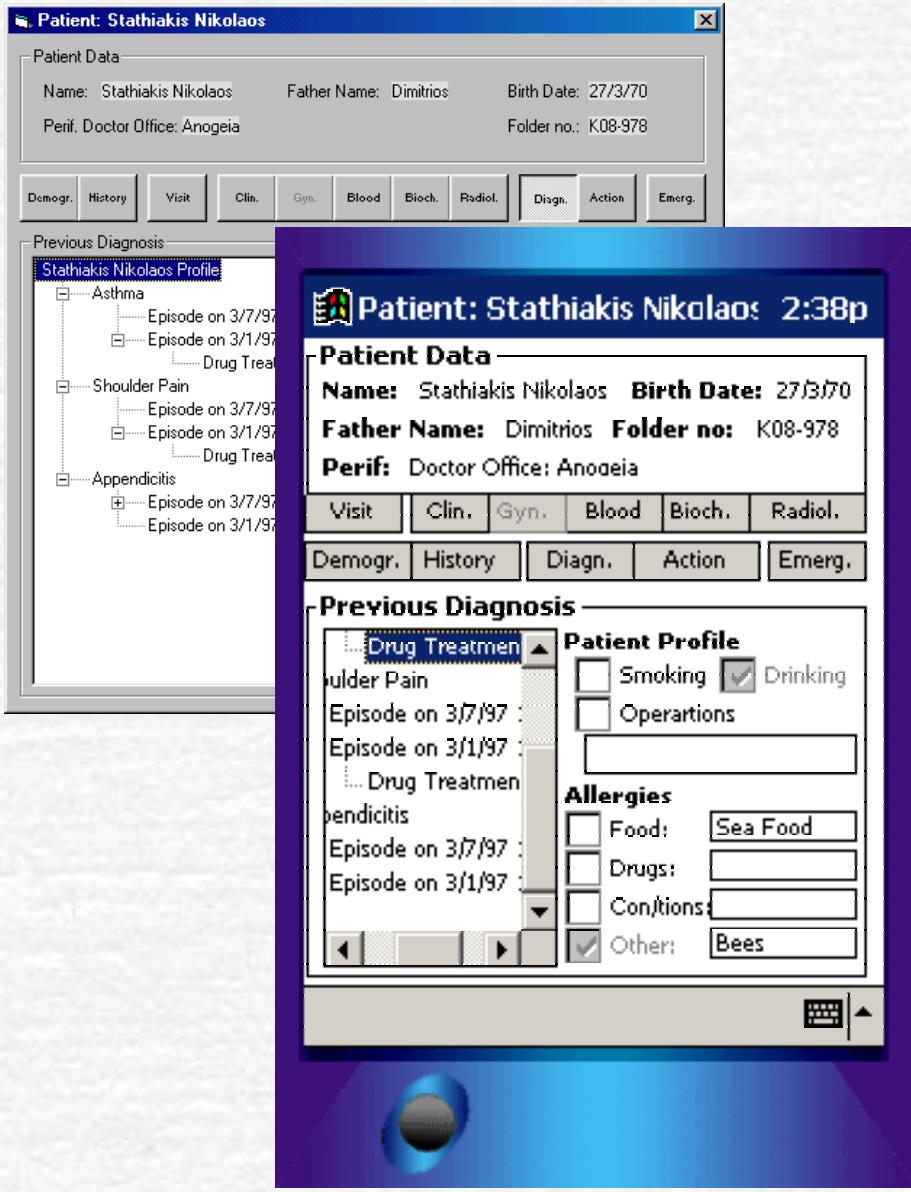
When to use methods (4/5)

- When
  - Requirements are specified and detailed design work is being undertaken
- Then, U²ID can
  - Help develop design representations
  - Map representations to artifacts
  - Develop design rationale
  - Incremental design



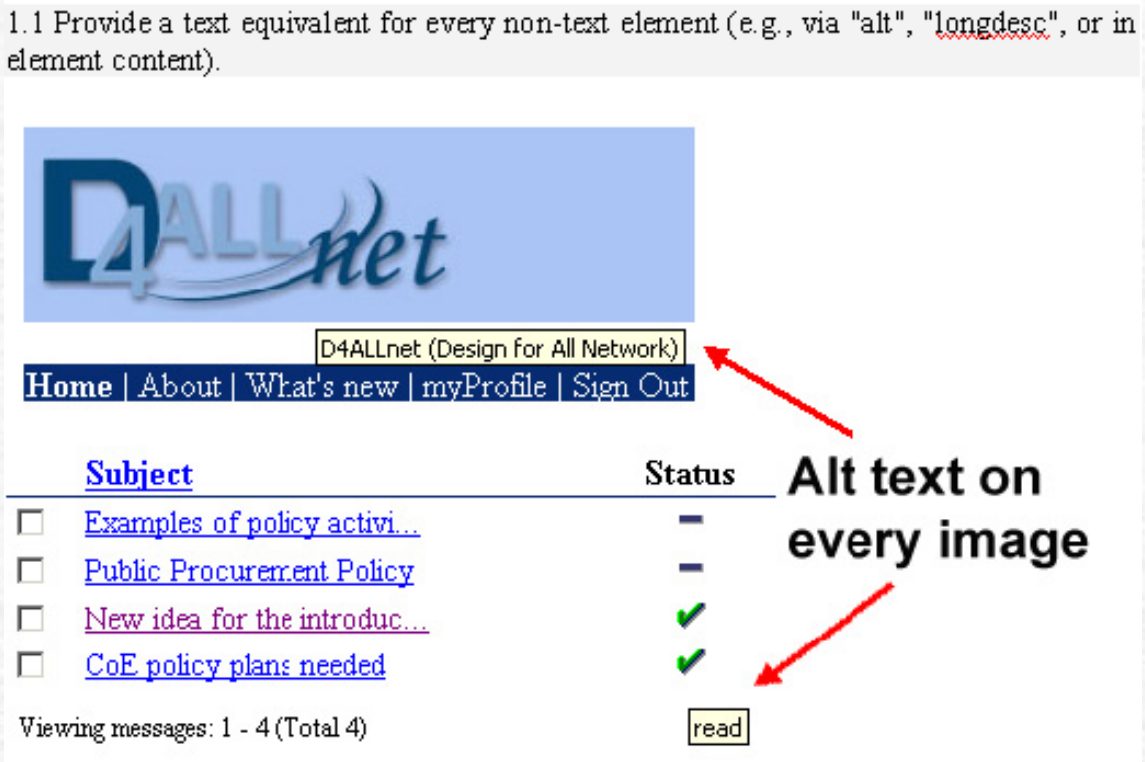
When to use methods (3/5)

- When
  - There is a system to be improved
- Then model-based development can
  - help build quick mock-ups
  - test mock-ups with end users
  - identify usability problems



When to use methods (5/5)

- When
  - There is an requirement for accessibility
- Then WCAG can
  - Provide useful guidance on what is to be done during design
  - Shortcomings to be corrected



On-going activities

- Compile the results in an edited book
- Deliver the content electronically as a training course
  - Training of professionals in Health Telematics organizations
  - Undergraduate . Postgraduate university courses on universal access
- Reach additional audience in Health Telematics
- Update and maintenance of the project's web site

Concluding remarks

- IS4ALL gained international visibility and recognition
  - Wide interest from various projects, organizations, etc.
- The project's tangible impact is beginning to show
- Clear need for continued commitment in this area
- IS4ALL results as input to on-going activities at national / European level (e.g. EUROREC)