

# 6<sup>th</sup> IS4ALL seminar

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15 November  
Dublin, Ireland

# Agenda

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👉 Welcome

👉 IS4ALL

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

👉 Discussion

# IS4ALL (IST-1999-14101)

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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



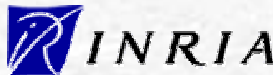
- EHTEL Association, Belgium



- 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
  - 1<sup>st</sup> Seminar in Rotterdam, NL (19 November 2001) focused on universal design practices
  - 2<sup>nd</sup> Seminar in Brussels, B (13 December 2001) focused on Health Telematics scenarios for universal access
  - 3<sup>rd</sup> Seminar in Budapest, H (25 August 2002) focused on code of practice
  - 4<sup>th</sup> Seminar in Paris, Fr (23 October 2003) followed by the 2<sup>nd</sup> IS4ALL Workshop
  - 5<sup>th</sup> Seminar in Heraklion, Crete, GR (26 June 2003) followed by the 3<sup>rd</sup> IS4ALL Workshop) in the context of HCII'2003
  - 6<sup>th</sup> Seminar in Dublin Ireland (15 November 2003)

# 6<sup>th</sup> 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

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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

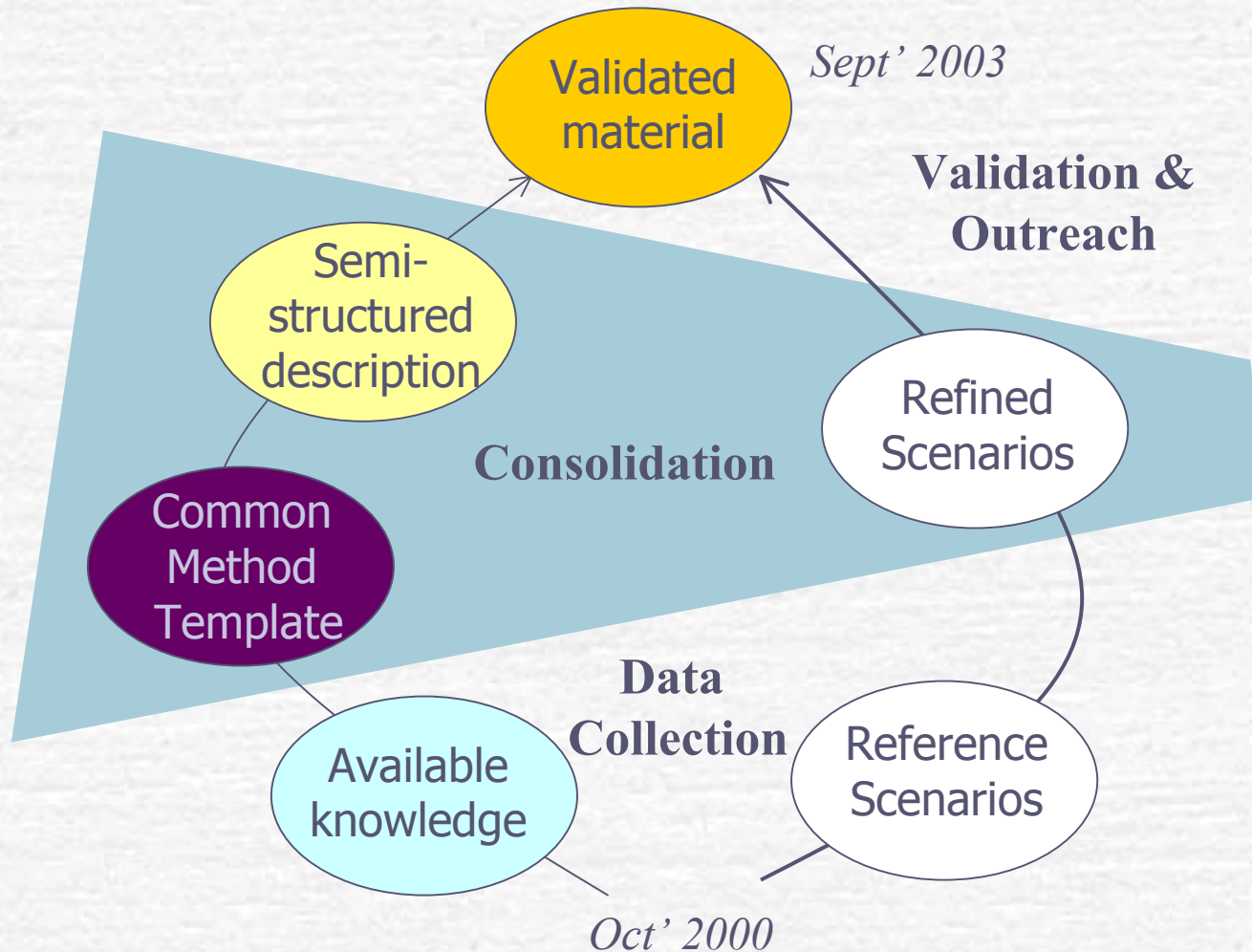
# Implications

- 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

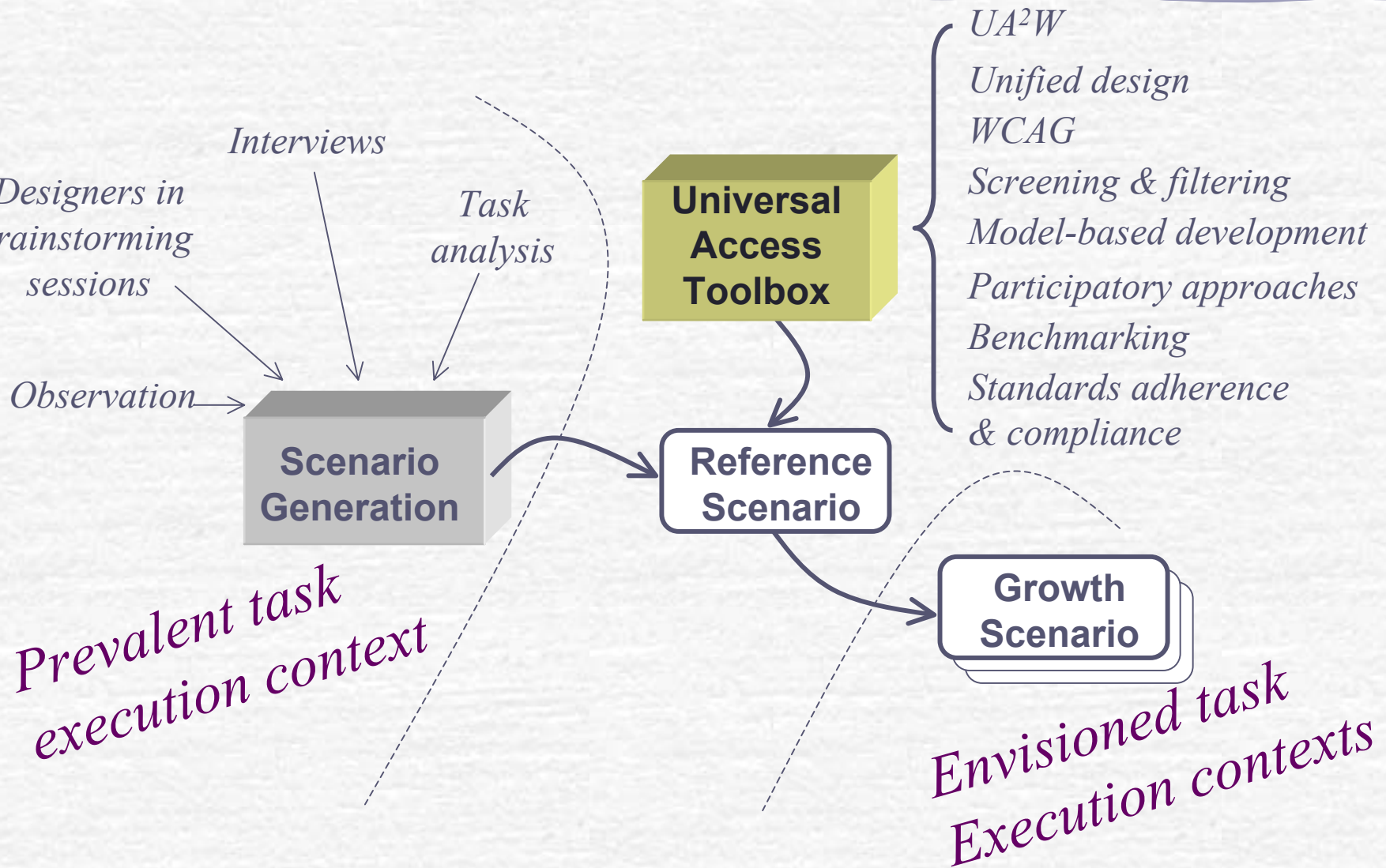


# The IS4ALL technical approach

- 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

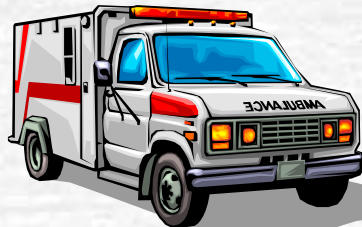
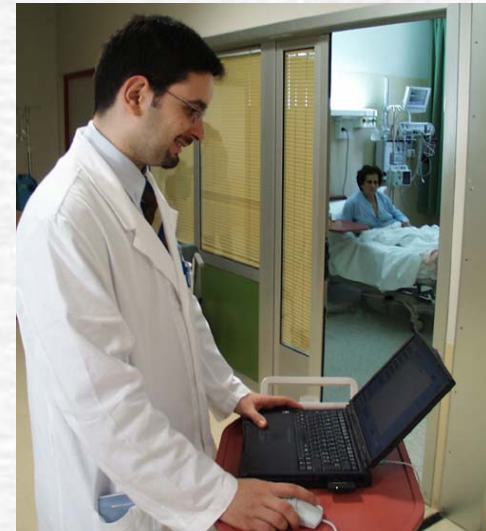


# Micro-methods

	Problem being addressed							0
	Un	Device (technique, tool or representation) used to address the challenge	HYGEIANet					
			MEDIBRIDG					
Access	Procedure for using the device							WARDINHAN
	SPERIGEST							
Model-based d	Participatory	Outcomes	UniLINZ		Austria			
			EMPIRICA		Germany			
	Underlying assumptions							ClinicCoach
Ben	AVANTI-PALIO							
	Practical example (i.e. an interface mock up or a process outline)							WARDINHAN
Usability	WARDINHAN							
	ISO, CEN/ISSS							ClinicCoach
	Guidelines	Pisa, UCL					SPERIGEST	

# 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

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- ☛ **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

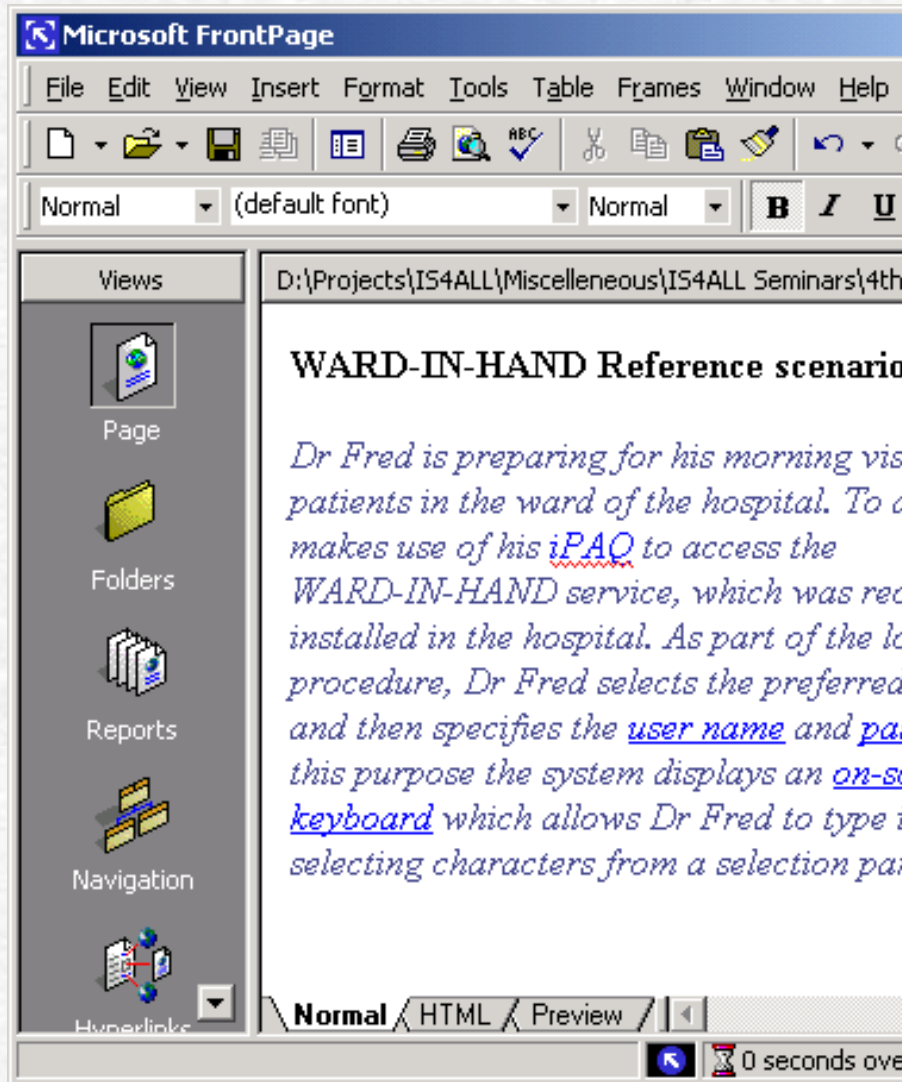
## National initiatives

- 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](http://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

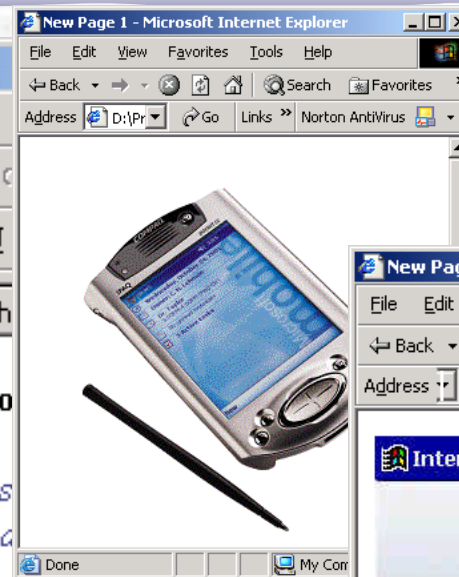


The screenshot shows the Microsoft FrontPage 2000 interface. The title bar reads "Microsoft FrontPage". The menu bar includes File, Edit, View, Insert, Format, Tools, Table, Frames, Window, and Help. The toolbar contains icons for new file, open, save, print, and other editing functions. The left sidebar shows "Views" with options like Page, Folders, Reports, Navigation, and Hyperlinks. The main editing area shows a file path: D:\Projects\IS4ALL\Miscellaneous\IS4ALL Seminars\4th. The page content includes the title "WARD-IN-HAND Reference scenario" and a paragraph of text in a cursive font.

**WARD-IN-HAND Reference scenario**

*Dr Fred is preparing for his morning visit to his patients in the ward of the hospital. To do this, Dr Fred makes use of his iPAQ to access the WARD-IN-HAND service, which was recently installed in the hospital. As part of the login procedure, Dr Fred selects the preferred language and then specifies the user name and password. For this purpose the system displays an on-screen keyboard which allows Dr Fred to type in text by selecting characters from a selection panel.*

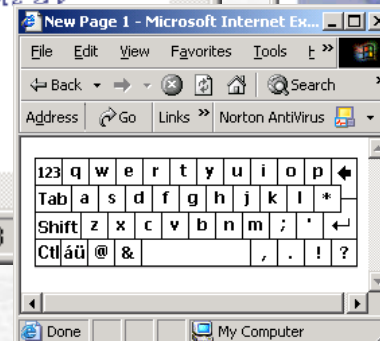
At the bottom, the status bar shows "Normal / HTML / Preview" and a timer "0 seconds over 28.8".



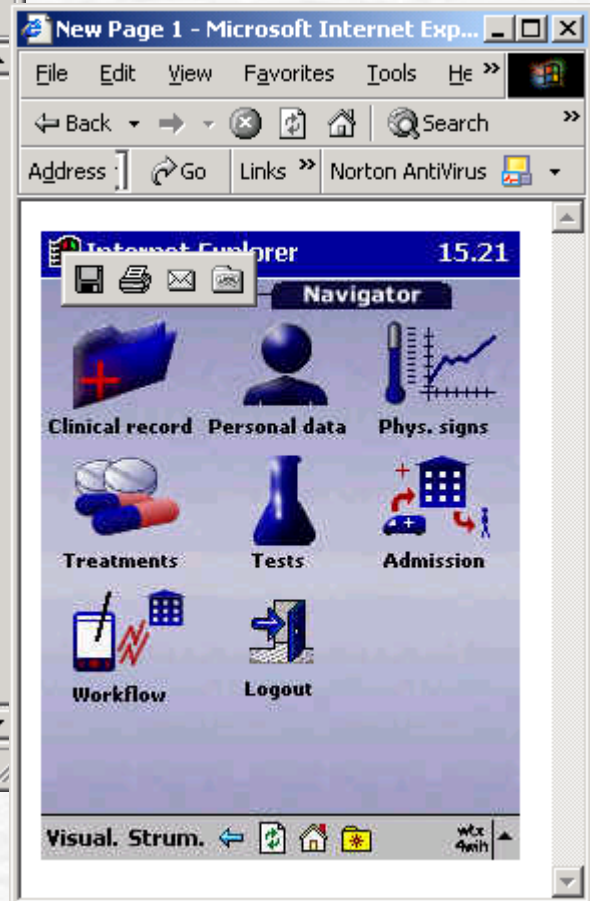
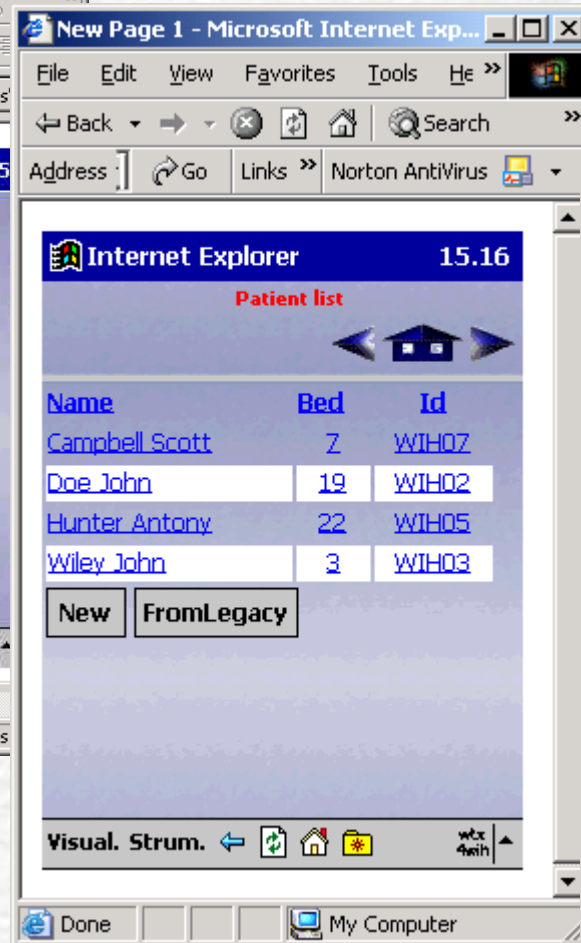
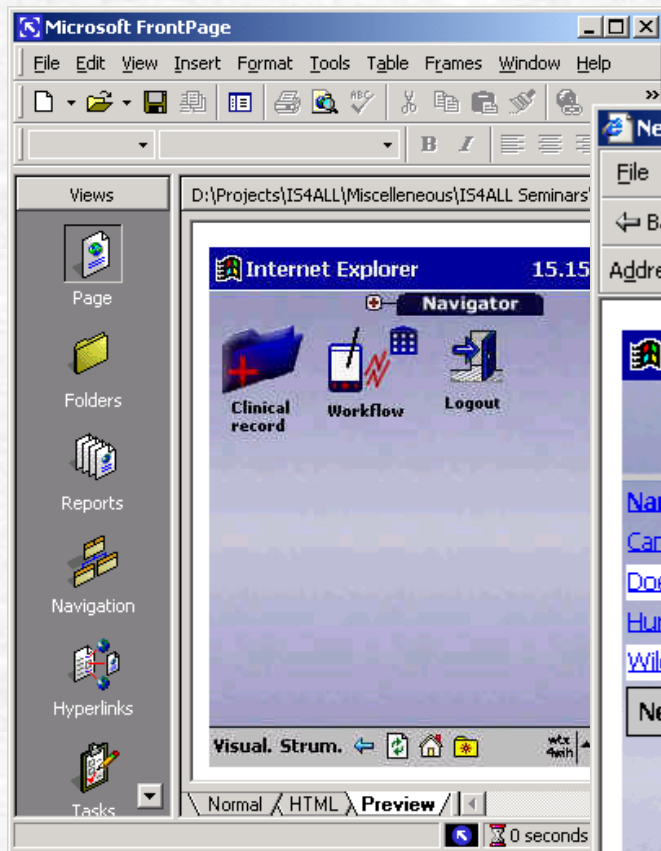
The screenshot shows a web browser window displaying a login page. The title bar reads "New Page 1 - Microsoft Internet Explorer". The address bar shows "D:\Pr...". The page content includes a login form with a blue header, a shield logo, and the following elements:

- Language selection: ☒ En, ☐ It, ☐ De, ☐ Es
- Username field:
- Password field:
- Login button:
- Reset button:

The status bar at the bottom shows "My Computer".



# WARD-IN-HAND (Cont.)



# Relevance of universal access

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- 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

Internet Explorer 15.21

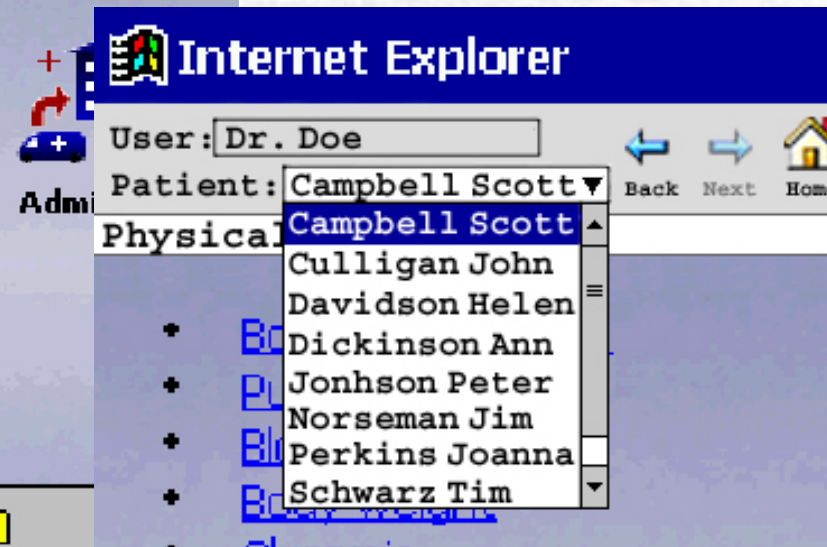
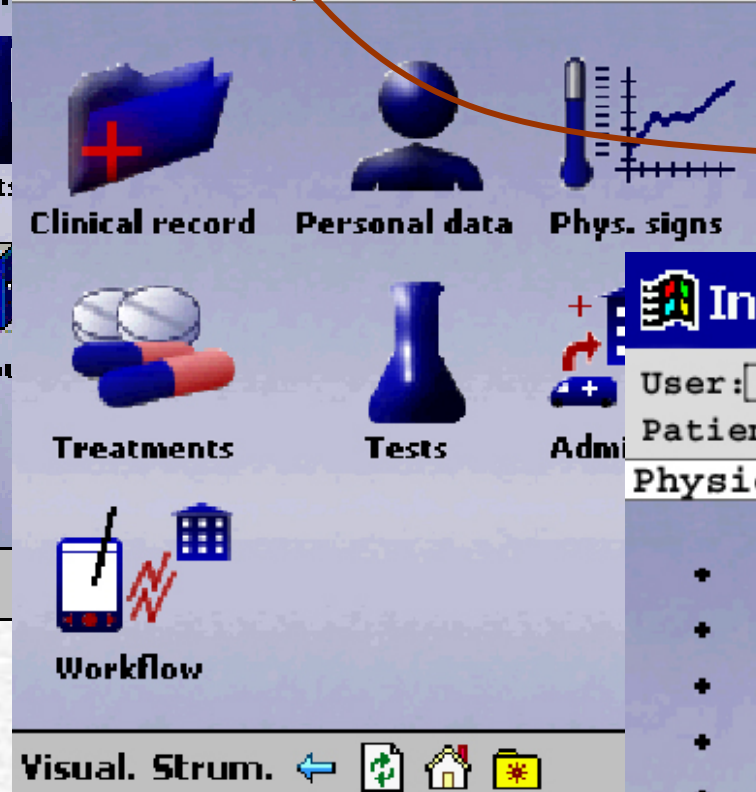


Revising the current user profile

Navigation

Retrieving another patient's EHR

Internet Explorer 9.29  
User: Dr. Doe  
Patient: Not Selected  
WARD - IN - HAND





# Improving the original style (Cont.)

Internet Explorer 9.29

User:  Back Next Home Logout


Patient:


WARD-IN-HAND\Admission\Discharge

Dismissal report:






Denounce:

Diagnosis:

Date:  



123 q w e r t y u i o p  
Tab a s d f g h j k l \*  
Shift z x c v b n m ; ' <  
Ctl á ü @ & , . ! ?

Visual. Strum.     

Internet Explorer 9.29


User:  Back Next Home Logout

Patient:


WARD-IN-HAND\Admission\Discharge

Denounce:






Diagnosis:

Date:  

Discharging doctor:



123 q w e r t y u i o p  
Tab a s d f g h j k l \*  
Shift z x c v b n m ; ' <  
Ctl á ü @ & , . ! ?

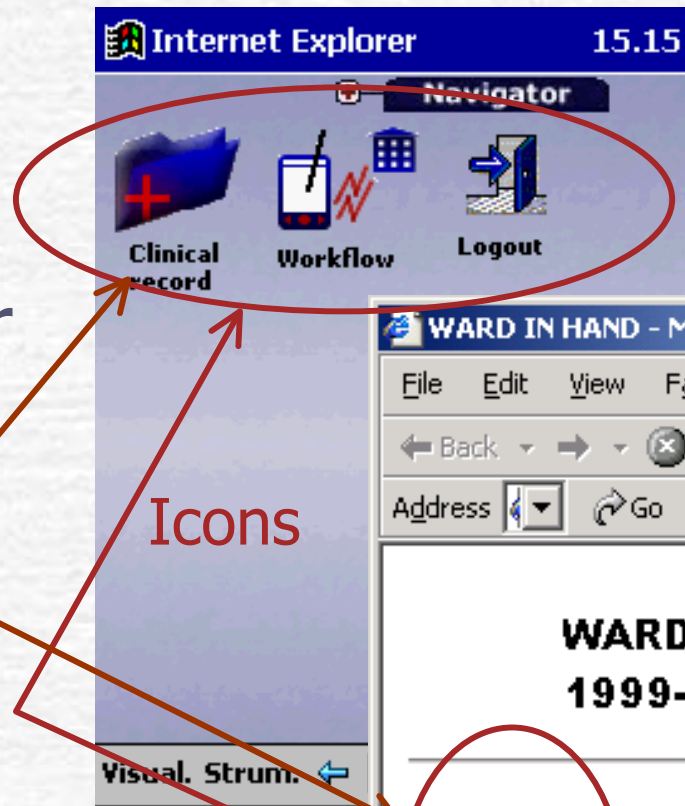
Visual. Strum.     

Context-sensitive editing

# An alternative style

Revisions in the layout of the container object

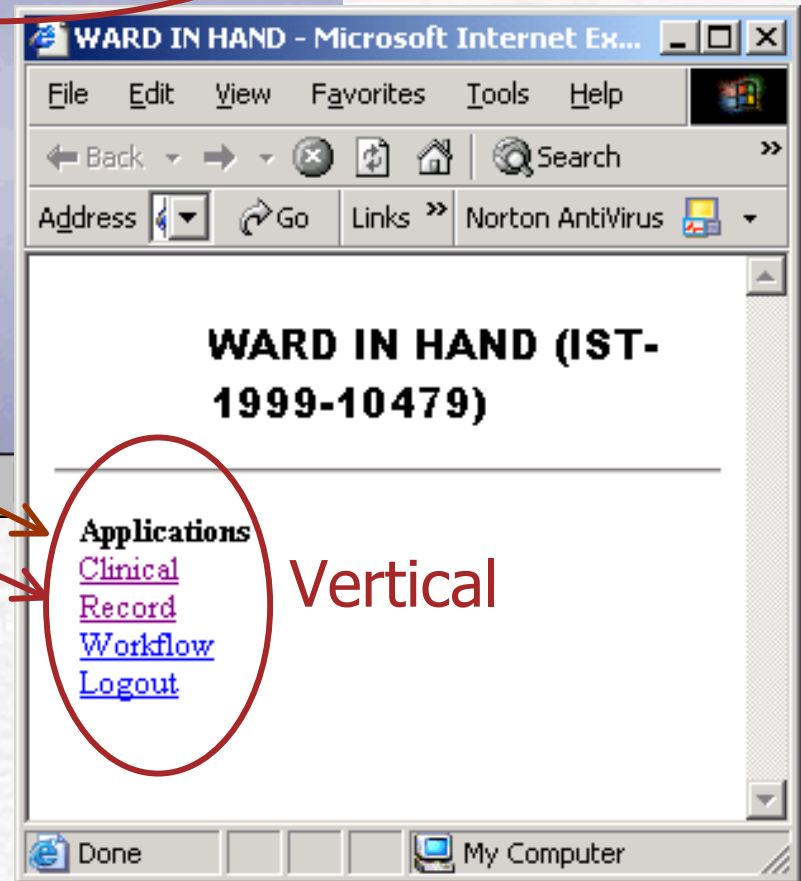
- Topology
- Presentation of selection set



Horizontal

Icons

Links

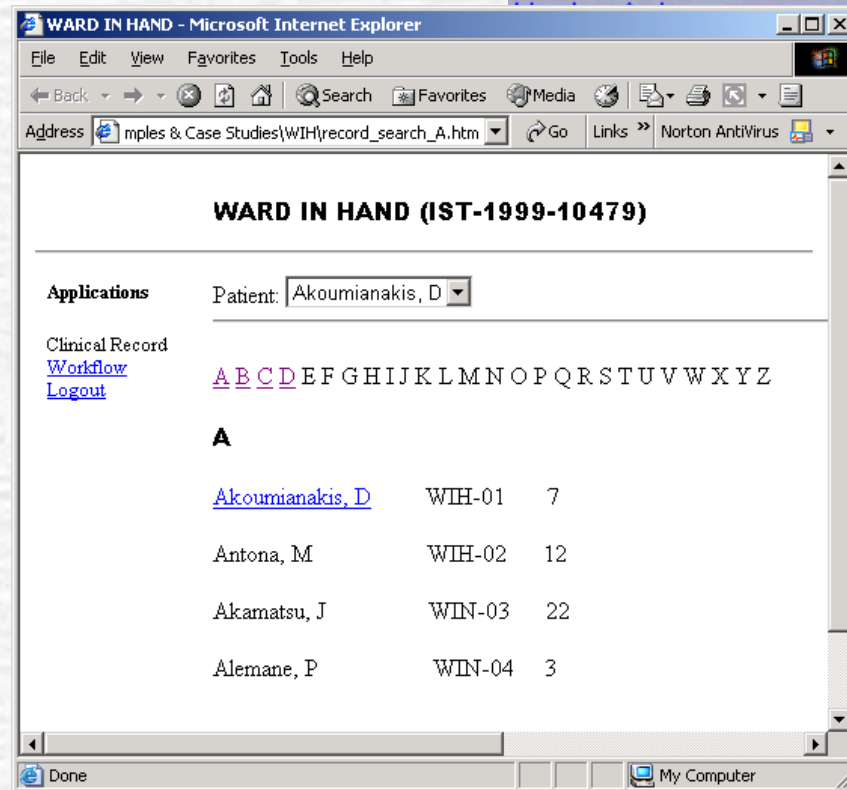
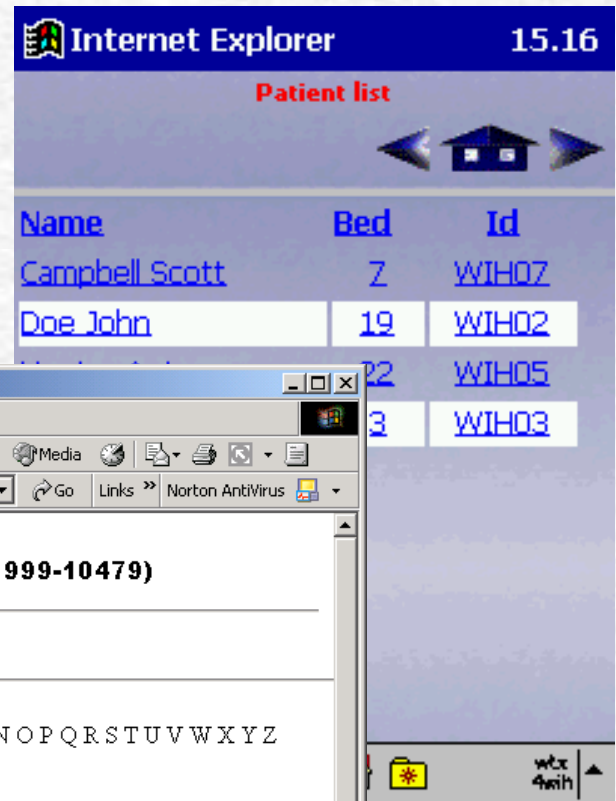


Vertical

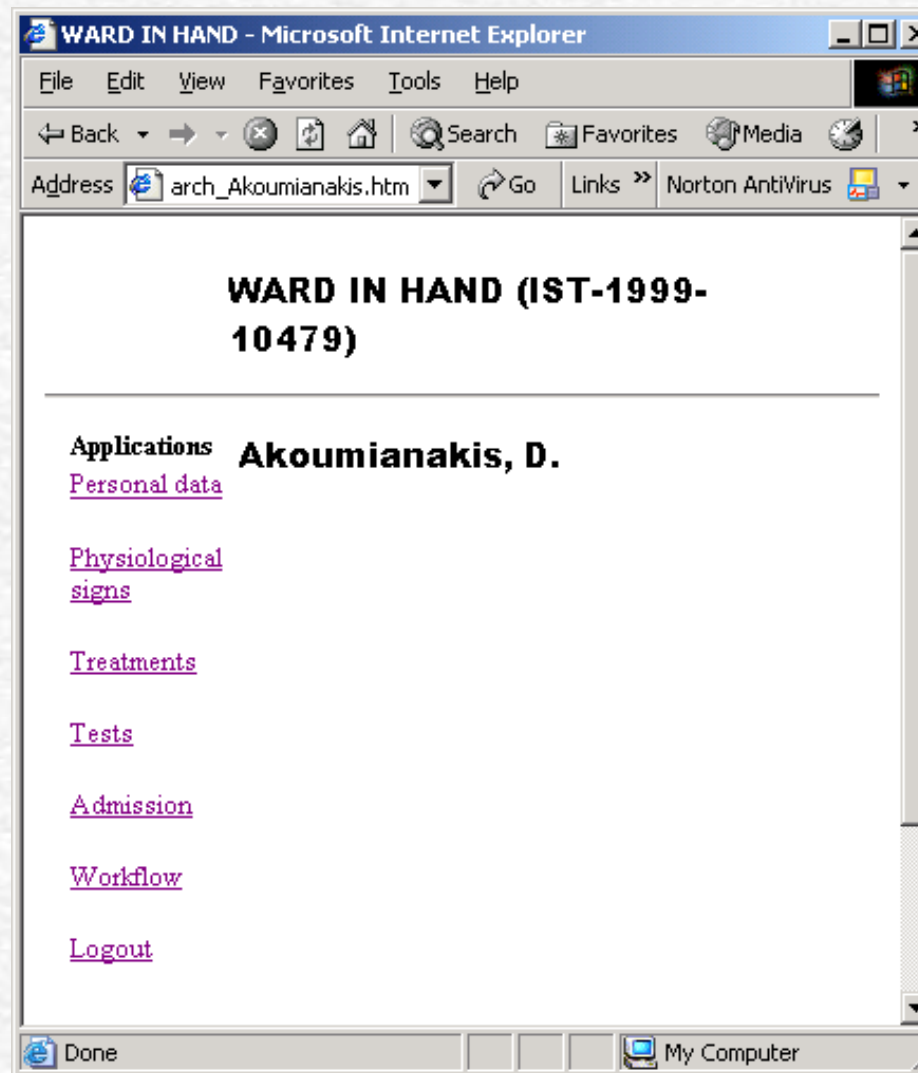
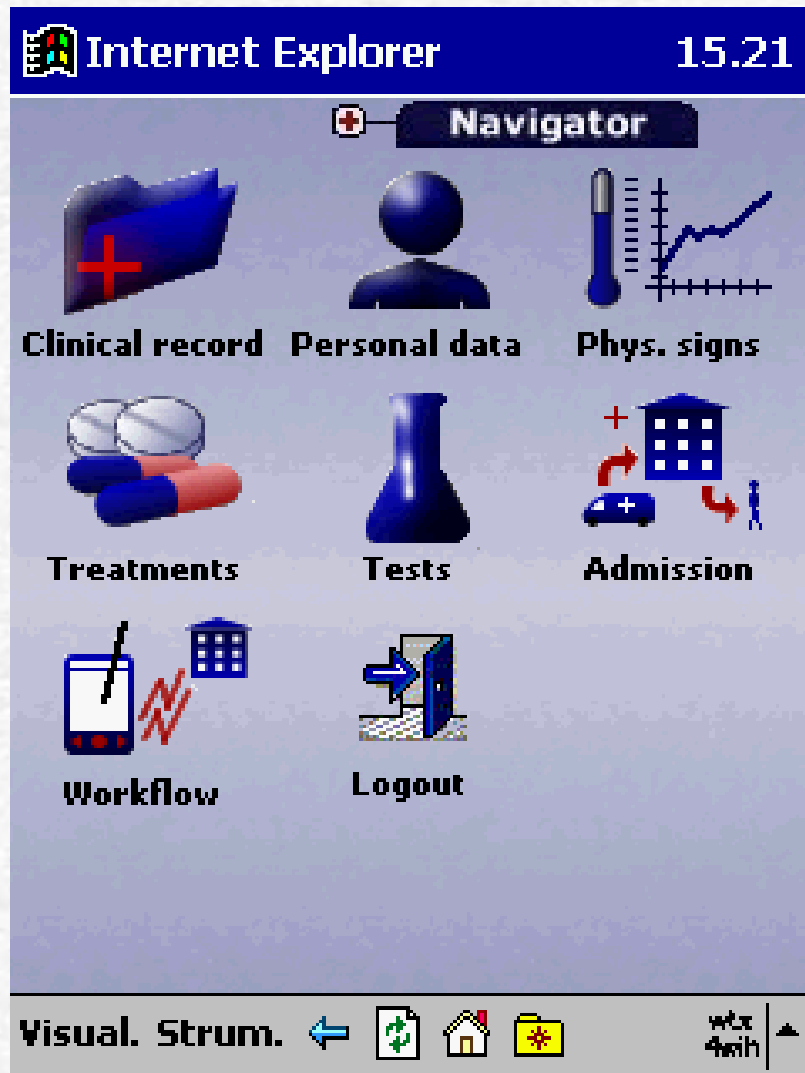
# Searching & finding a record

Revisions in the syntax of the dialogue and the user's task sequence

- Index
- Selection set



# Preview of patient-services





# Preview of personal data

Internet Explorer 15.21

Campbell Scott

Personal data

- [Personal data](#)
- [Family anamnesis](#)
- [Personal anamnesis](#)
- [Remote pathological anamnesis](#)

Visual. Strum.

WARD IN HAND - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print Links Norton AntiVirus

Address D:\Projects\IS4ALL\Examples & Case Studies\WIH\p Go

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**WARD IN HAND (IST-1999-10479)**

---

Applications - **Akoumianakis, D.**  
Personal

[Profile](#)

[Family anamnesis](#)

[Personal anamnesis](#)

Remote pathological anamnesis

[Back to patient](#)

My Computer




# Preview of patient's profile

**Internet Explorer** 15.21

**Campbell Scott** **Personal data**

**Personal data**


sex	male
HospId	WIH07
family name	Campbell
first name	Scott
birth date	15/07/1974
birth city	San Francisco
profession	Software engineer
marital status	single
place of residence	London
telephone	8390385475987

Visual. Strum.     

**WARD IN HAND - Microsoft Internet Explorer**

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print Copy Paste

Address  D:\Projects\IS4ALL\Examples & Case Studies\WIH\personal\_profile.htm Go Links Norton AntiVirus

---

**WARD IN HAND (IST-1999-10479)**

---

**Applications - Personal Akoumianakis, D. - Profile**

Profile

[Family anamnesis](#)

[Personal anamnesis](#)

[Remote pathological anamnesis](#)

[Back to the record index](#)

**Sex:** MALE

**Hospital identification:** WIH-01

**Family name:** AKOUMIANAKIS

**First name:** DEMOSTHENES

**Birth date:** 15/07/1974


**City of birth:** SAN FRANCISCO

**Profession:** SOFTWARE ENGINEER

**Marital status:** SINGLE

**Place of residence:** LONDON

**Telephone:** 8390385475987

 My Computer

# Preview of personal anamnesis

Internet Explorer 15.23

Campbell Scott Personal data

Personal anamnesis

alcohol	no
coffee	no
tea	no
smoke	aBit
meals	normal
water	1 l/die
evacuation	normal
physical activity	insufficient
sleep	normal
birth and development	normal

Visual. Strum. wtx 4min

WARD IN HAND - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Reload Home Search Favorites Media Print Copy Paste

Address D:\Projects\IS4ALL\Examples & Case Studies\WIH\personal\_personal\_anamnesis.htm Go Links Norton AntiVirus

---

**WARD IN HAND (IST-1999-10479)**

---

Applications - Personal **Akoumianakis, D. - Personal anamnesis**

[Profile](#) Alcohol: NO

[Family anamnesis](#) Coffee: NO

Personal anamnesis Tea: NO

Remote pathological anamnesis Smoke: A BIT

[Back to personal data](#) Meals: NORMAL

Water: 1 l/die

Evacuation: NORMAL

Physical activity: INSUFFICIENT

Sleep: NORMAL

Birth and development: NORMAL

Done My Computer

# Recording the body temperature

Internet Explorer 16.19

Campbell Scott Phys. signs

Body temperature

Temp.

Date:  Hour:

Visual. Strum. wx 4wih

WARD IN HAND - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print Links Go

Address s & Case Studies\WIH\physiological\_signs\_temp.htm Norton AntiVirus

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**WARD IN HAND (IST-1999-10479)**

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**Applications** **Akoumianakis, D. - Body temperature**

Body temperature

Pulse rate Temperature:

---

Blood pressure

---

Body weight Date of measurement: //2002

Glycemia Time of measurement: :

Diuresis

Stool volume

Menses

Back to index

Done My Computer



# Augmenting a style

AVANTI Browser [ WARD IN HAND ]

File Modifica Visualizza Vai Segnalibri Guida

URL:

Links Sezione

- WARD IN HAND
  - Pulse rate
  - Blood pressure
  - Body weight
  - Glycemia
  - Diuresis
  - Stool volume
  - Menses
  - Back to index

**Applications**

Body temperature

[Pulse rate](#)

[Blood pressure](#)

[Body weight](#)

[Glycemia](#)

[Diuresis](#)

[Stool volume](#)

[Menses](#)

[Back to index](#)

**Akounianakis, D. - Body temperature**

Temperature:

Date of measurement:  /  /

Navigation icons: X, ✓, ←, ↓, ↑, →

Virtual keyboard:

SH	1	2	3	4	5	6	7	8	9	0	←	HOME	END
SH	a	b	c	d		e	f	g	h	.	IT		
←	i	j	k	l	SP	m	n	o	p	q			
←	r	s	t	u		v	w	x	y	z			
SH	~<	@>	;	:	?	_		-	[	]		←	→

© ICS-FORTH 1998 Documento corrente: WARD IN HAND"

# 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

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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
- Angiography
- Blood analysis

**GEMELLI LIA - Netscape**

**XARCATRE LORETTA [ Visita cardiocirurgica ]** Paziente dimesso 1°gg (ric. 10/05/2001)

**Conclusioni**

☒ **Intervento**

☐ ric. diagnostico

☐ Da rivalutare

☐ No intervento

**Intervento**

Bypass aorto-coronarico

Bypass aorto-coronarico con CEC

Bypass aorto-coronarico senza CEC

Sostituzione valvolare aortica

Plastica aortica

Sostituzione aorta ascendente

Sostituzione arco aortico

Sostituzione della radice aortica

Plastica mitralica

Sostituzione mitralica

**data interv.**

22/03/2002

**da eseguire prima del ricovero**

**Esami richiesti**

TAC

risonanza magnetica

prova di funzionalità respiratoria

radiografia del torace

elettrocardiogramma a riposo

fisioterapia respiratoria

fisioterapia preoperatoria

valutazione anestesiológica

pre-donazione del sangue

altro:

**Medico** Dott. M. Glauber

**CREAS - Azienda Ospedaliera C.N.R.**  
**ISTITUTO DI FISILOGIA CLINICA**  
Direttore: Prof. L. Donato  
Capedale "G. Pasquiniucci"  
Div. Cardiocirurgia Adulti - Responsabile Dr. M. Glauber  
Via Aurelia sud - Massa - Tel. 0585 493604 - Fax: 0585 493614

**Visita Ambulatoriale** Massa, 10/05/2001

Cognome / Nome	Data di Nascita	Gruppo s.g.	Medico
XARCATRE / LORETTA	01/01/1901	AB pos.	

**Anamnesi**

funatore fino a 15 anni fa di sigarette, bevitore abituale beve 5 bicchieri di vino

Obesità lieve alla età di 20 anni.

distefiv kasn lvyv nldfiv skjd fvk ja nldfiodi fivov sudfllbnskldfo skdjf rvks jndvbnzv bn fudklbnsoen oolacnoiv xbo cvbllj sodf f auh. iosh dlvio ludfionheoidf. In data 11 gennaio 1933 obolazione traseatefere Nel 1955 adenoma prostata

**Esame obiettivo**

Azione cardiaca ritmica. Toni puri. Polse libere.

Polci arteriosi presenti nelle normali sedi, normosfigmici e simmetrici.

Non soffi vascolari. Non turgore jugulare.

Rumore respiratorio normale su tutto l'ambito.

Addome trattabile alla palpazione superficiale e profonda, margine inferiore del fegato non debordante dall'arcata costale. Non edemi declivi.

Peso Kg 72.0, altezza cm 162. Pressione arteriosa clino sinistra 135/90 mmHg.

**Sintesi esami ematochimici e strumentali**

**Conclusioni**

La paziente è affetto da: coronaropatia trivasale.

Ha indicazioni ad eseguire intervento cardiocirurgico di:

Bypass aorto-coronarico

La data prevista per l'intervento è il **22/03/2002**

La data dovrà essere concordata mediante contatto telefonico con la segreteria chirurgica (Sig.ra Samira Volpi, telefono: 0585 493604 - 0585 493634, FAX: 0585 493614 - 0585 493633).

Per eventi galanti indossare abito da sera lungo.

**Esami da eseguire prima del ricovero:**

fisioterapia preoperatoria

**Esami eseguiti al ricovero:**

routine di ingresso al ricovero

Dott. M. Glauber



# At Massa Hospital

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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



Text report (web app.)

Clima - Clinical Matrix

File Edit Moduli Statistiche Help Admin

The Matrix

Stampa Sezione dati 50 - Approcci chirurgici Chiudi

Strategia: solo chirurgia : ☒ Si ☐ No

Strategia: chirurgia+proc. percutanea : ☐ Si ☒ No

Accesso Sternotomia : Completa

Parasternotomia : No

Toracotomia : No

Conversione in Incisione Standard : ☐ Si ☒ No

Causa Conversione :

Uso di Shunt Intracoronarici : ☐ Si ☒ No

Tecnica Sutura Anastomosi Coronarica : Continua

Stabilizzazione del vaso : Suction Device

Tecnica preparazione dell'AMI : Visione Diretta

Flussimetria Graft Impiantato : No

Registra Registra + Succ. Precedente Successivo Default

Clinical Registry (Java app.)

XARCATRE LORETTA 15:58 DALMIANI

# Patient discharge and follow-up

**Netscape**  
File Modifica Visualizza Vaj Comunicator 2

Indietro Avanti Ricarica Home Ricerca Naviga Stampa Sicurezza Stop

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

Pisa, 00/00/0000  
3 di [REDACTED]

**Lettera di dimissione provvisoria**  
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 fluttuanti 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 tricuspideale diastolico intensità III/VI  
simmetria ridotta con percussione ipofonetica e con crepiti 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

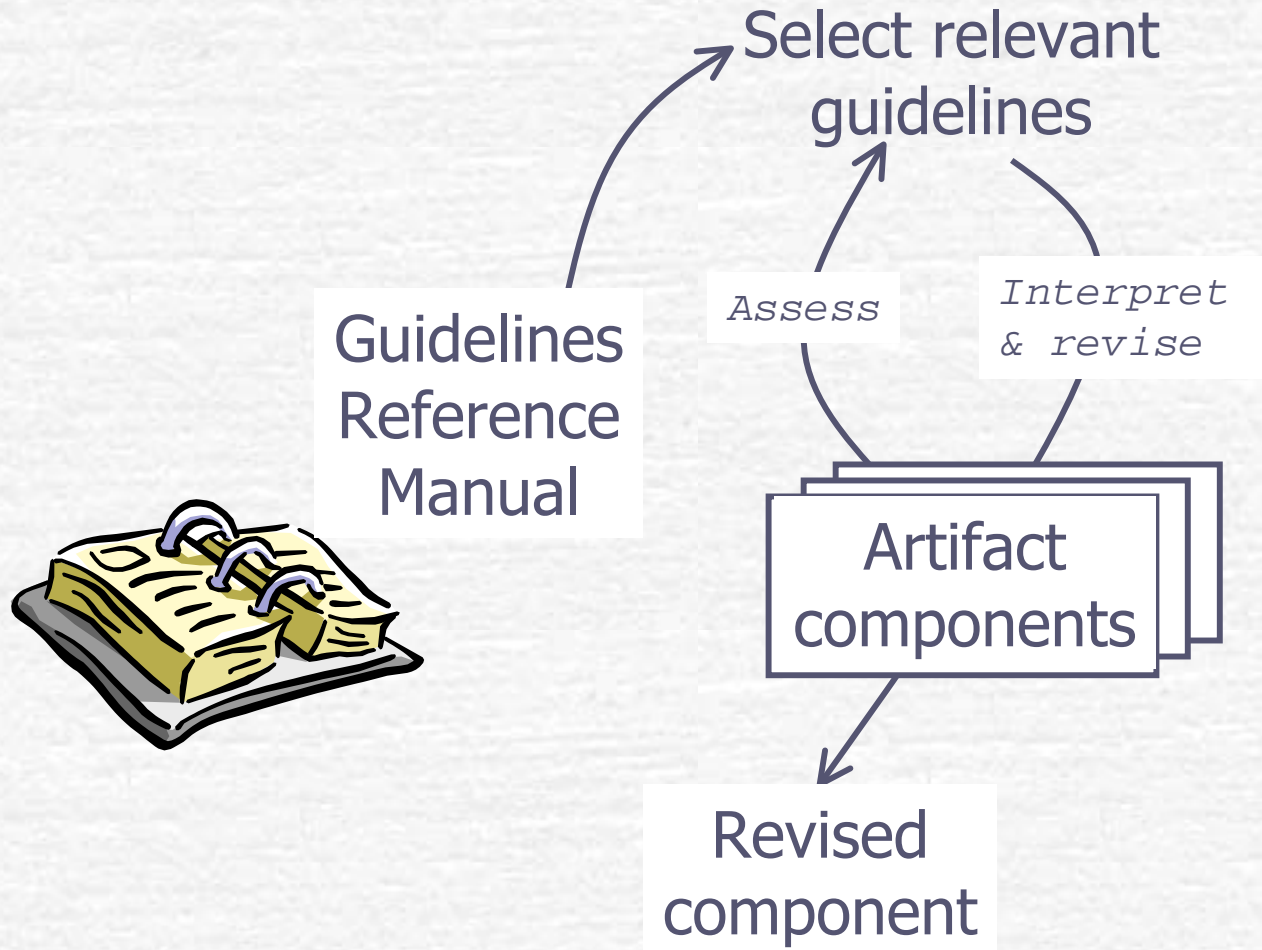
## 3 priority levels

- 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**<sub>Priority 1</sub>: Ensure that all information conveyed with colour is also available without colour
- **2.2**<sub>Priority 3 for text</sub>: 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

ARCA LORETTA - Microsoft Internet Explorer

File Edit View Favorites Tools Help Norton AntiVirus

Back Forward Stop Reload Home Search Favorites Media

Address C:\docu\progetti\is4all\fase3\14mag\18\_FILE\el.html Go

## ESAMI DI LABORATORIO

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 (attivit�)	...		30
Latticodeidrogenasi (LDH)	...	530	423
Glucosio	...		
Creatininemia	...		
Acido Urico	...		
Potassio	...		
Sodio	...		
Cloro	...		
Calcio	...		
Att. Protrombinica	88		

Reliance on color alone!!!

# Improvements (1/2)

## Adding textual annotations

ARCA LORETTA - Microsoft Internet Explorer

File Edit View Favorites Tools Help Norton AntiVirus

Back Forward Stop Home Search Favorites Media

Address C:\docu\progetti\is4all\fase3\14mag\18\_FILE\el\_1.html Go

ESAMI DI LABORATORIO ([textual link](#))

Risultati analisi del sangue

Esame	19.03.2002 23:55	20.03.2002 01:30	20.03.2002 07:00
YES 1a ora	...		
YES 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, 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 (attivit�)	...		30,off-range
Latticodeidrogenasi (LDH)	...	530, off-range	423

Adding textual annotations

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

# Improving accessibility - WCAG

**ISTITUTO DI FISILOGIA CLINICA - C.N.R.**  
UNITA' AUTONOMA DI CARDIOLOGIA  
AREA DI RICERCA C.N.R. - SAN CATALDO  
Via G. Moruzzi, 1 - Pisa  
tel. 050-3153400, 050-3152111

Pisa, 19 luglio  
811/03 del 1

**Lettera di dimissione definitiva (copia)**  
Si dimette in data odierna il signor Giovanni Xarcatre di anni 63 con diagnosi di:  
Angina ed ischemia da sforzo in paziente con malattia coronarica della coronaria destra e del primo ramo diagonale, già trattata con by-pass (graft venosi), occlusione del by-pass venoso su coronaria destra. Pi  
inferiore non Q. Normale funzione ventricolare sinistra. Subocclusione dell'arteria carotide  
arteriosa. Sindrome plurimetabolica.

**Sintesi anamnestica**  
Fattori di rischio cardiovascolare: fumo (sino a 20 anni fa), ipercolesterolemia, familiarità, ob  
sincopi. Nel 1997 operato di by-pass aorto-coronarico (safena su primo ramo diagonale, safe  
angina ed ischemia. Da allora scomparsa delle sincopi. Nel 1999 ricomparsa di dolori r  
sottoposto a Firenze a coronarografia che mostrava occlusione del graft sulla coronaria de  
inefficace di angioplastica. Con il potenziamento della terapia antischemica il paziente è stato  
circa un anno fa, quando ha iniziato a lamentare dispnea da sforzo e sono ricomparsi i dolori  
saltuariamente parestesie all'emisoma sinistro. Nel maggio u.s. una scintigrafia da sforzo è risul  
sede antero-settale e necrosi inferiore, con doppio prodotto massimo di 20000, in terapia con  
paziente si ricovera quindi presso questo Istituto per eseguire coronarografia.  
Tenormin 100 mg 1/4 cpr/die (ore 8)  
Norvasc 10 mg 1 cpr/die (ore 20).

**Glossario**  
**Sintesi anamnestica:** *storia clinica*, descrizione della storia clinica del  
paziente.  
**Esame obiettivo:** *visita medica*, descrizione della visita medica compiuta  
dal medico  
**Dati bioumorali:** *analisi di laboratorio*, lista degli esami del sangue e  
delle urine

**ISTITUTO DI FISILOGIA CLINICA - C.N.R.**  
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AREA DI RICERCA C.N.R. - SAN CATALDO  
Via G. Moruzzi, 1 - Pisa  
tel. 050-3153400, 050-3152111

Pisa, 19 luglio 2003  
811/03 del 13/07/2003

**Lettera di dimissione definitiva (copia)**  
Si dimette in data odierna il signor Loretta Arca di anni 63 con diagnosi di:  
Angina ed ischemia da sforzo in paziente con malattia coronarica della coronaria destra e del primo ramo diagonale, già  
trattata con by-pass (graft venosi), occlusione del by-pass venoso su coronaria destra. Pregresso infarto miocardico  
inferiore non Q. Normale funzione ventricolare sinistra. Subocclusione dell'arteria carotide interna destra. Iperensione  
arteriosa. Sindrome plurimetabolica.

**Sintesi anamnestica**  
Fattori di rischio cardiovascolare: fumo (sino a 20 anni fa), ipercolesterolemia, familiarità, obesità. Paziente con storia di  
sincopi. Nel 1997 operato di by-pass aorto-coronarico (safena su primo ramo diagonale, safena su coronaria destra) per  
angina ed ischemia. Da allora scomparsa delle sincopi. Nel 1999 ricomparsa di dolori retrosternali, per cui veniva  
sottoposto a Firenze a coronarografia che mostrava occlusione del graft sulla coronaria destra, sottoposta a tentativo  
inefficace di angioplastica. Con il potenziamento della terapia antischemica il paziente è stato discretamente bene sino a  
circa un anno fa, quando ha iniziato a lamentare dispnea da sforzo e sono ricomparsi i dolori anginosi da sforzo. Riferisce  
saltuariamente parestesie all'emisoma sinistro. Nel maggio u.s. una scintigrafia da sforzo è risultata positiva per ischemia in  
sede antero-settale e necrosi inferiore, con doppio prodotto massimo di 20000, in terapia con nitrati e calcio-antagonisti. Il  
paziente si ricovera quindi presso questo Istituto per eseguire coronarografia.

**Esame obiettivo**  
Azione cardiaca ritmica. Toni puri. Pause libere.  
Polsi arteriosi presenti nelle normali sedi, normosfigmici e simmetrici.  
Non soffocatori. Non tirare circolari.

Dott. Emilio Pasanisi

**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

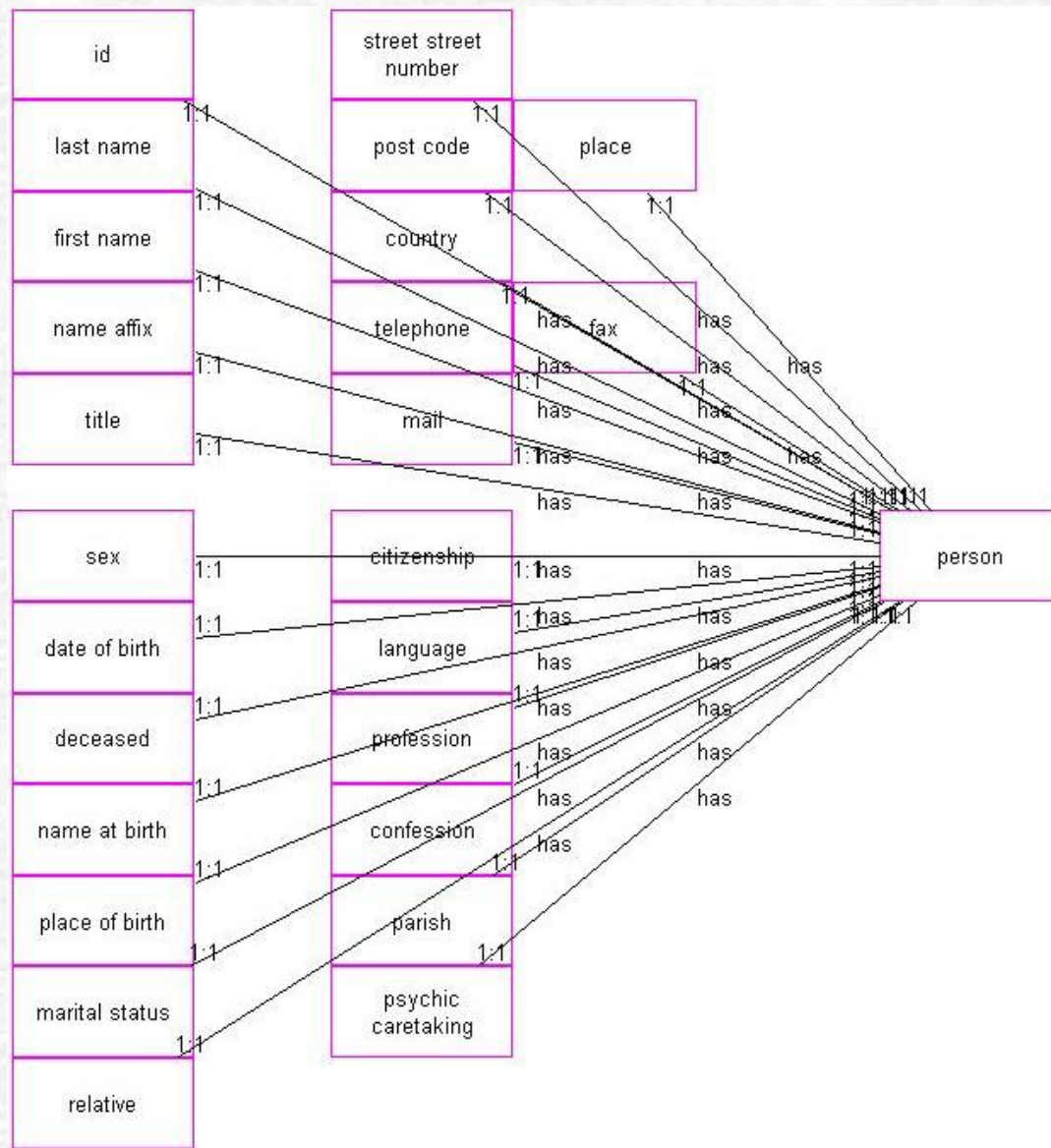
➤ Demonstration of how a model-based approach can be used to develop role-adapted user interfaces

- 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

### **Role:**

Administration Assistant

### **Location:**

Application center

### **Responsibility:**

Acquire & type in  
personal patient 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

## Scenario 2

### **Role:**

Operation ward

### **Location:**

Ward

### **Responsibility:**

Assign operation data to a  
patient

### **Tasks:**

Search for patient

If patient data are available,  
they are displayed and  
new data (location,  
time, date, doctor) are  
added

Else error message

## Scenario 3

### **Role:**

Doctor

### **Location:**

Office

### **Responsibility:**

Access data, adds only text,  
but can't manipulate  
data

### **Tasks:**

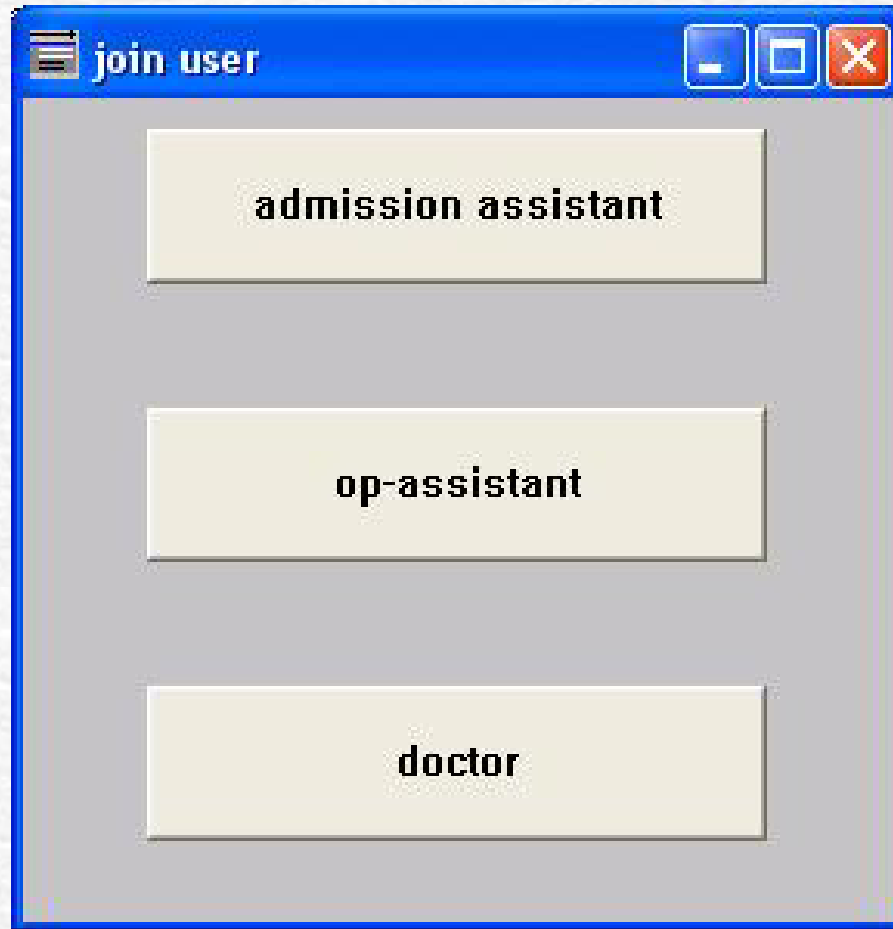
Search for patient

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

The screenshot shows a software window titled "patient data" with a blue title bar. Inside, there are two main sections: "patient search" (partially visible at the top) and "patient data" (the main form). The "patient data" section contains various input fields for patient information, organized into two columns. The "sex" field is a radio button group with options "male", "female", and "unknown". The "address" section is a separate box containing fields for street, post code, place, country, telephone, and mail. At the bottom right, there are "OK" and "Cancel" buttons.

patient search	
Patient	

patient data	
last name	Kiel
first name	Hannes
name affix	
title	
sex	<input type="radio"/> male <input type="radio"/> female <input type="radio"/> unknown
date of birth	04.05.1945
deceased	
name at birth	
place of birth	Vienna
marital status	Single
relative	
<b>address</b>	
street street number	Linsegasse 37
post code / place	1010 Vienna
country	Austria
telephone / fax	01 / 54652456
mail	
citizenship	Austria
language	German
profession	Carpenter
confession	None
parish	
	<input type="radio"/> psychic caretaking
OK Cancel	

# Operation assistant

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

The screenshot shows a software window titled "operation data" with a blue title bar and standard Windows window controls. The window contains a form for entering patient and operation data. The form is divided into two main sections: "Patient" and "Operation".

**Patient Section:**

- id:** 2768
- last name:** Kiel
- first name:** Hannes
- date of birth:** 04.05.1945
- sex:** ☒ male ☐ female ☐ unknown

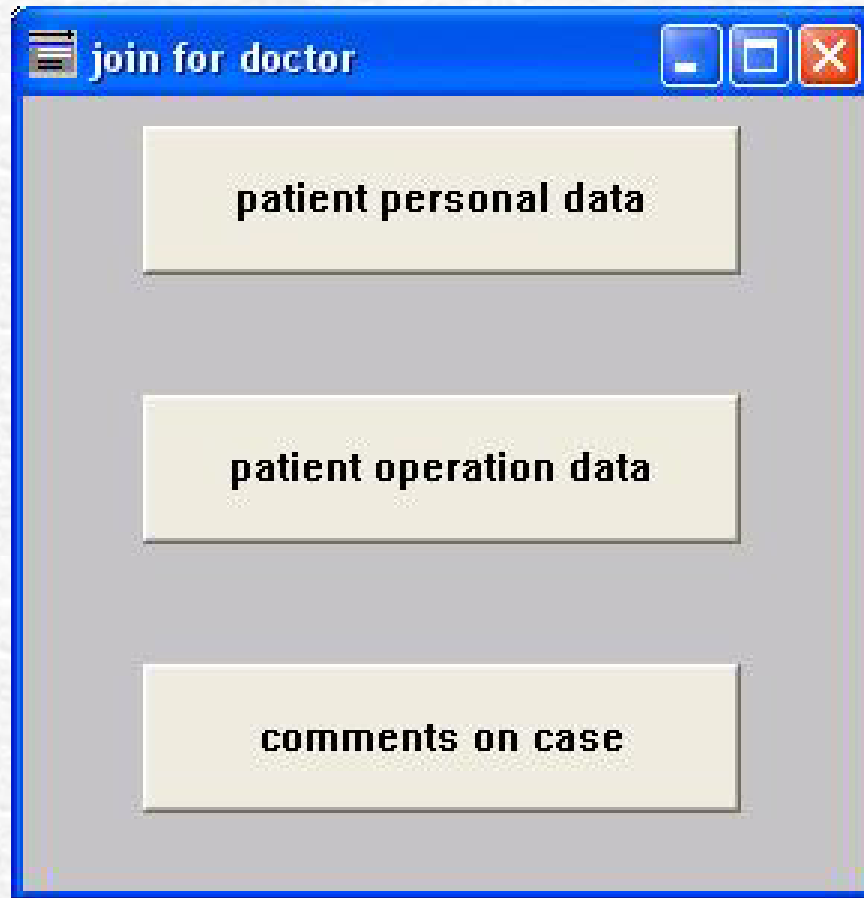
**Operation Section:**

- date:** 15.03.2002
- room:** 15 A
- time:** 08:30
- surgeon:** Heinz Wagner

An "OK" button is located at the bottom right of the window.

# The Doctor (1/4)

- Access to various parts of the patient's record





# The Doctor (2/4)

## Presenting patient personal data

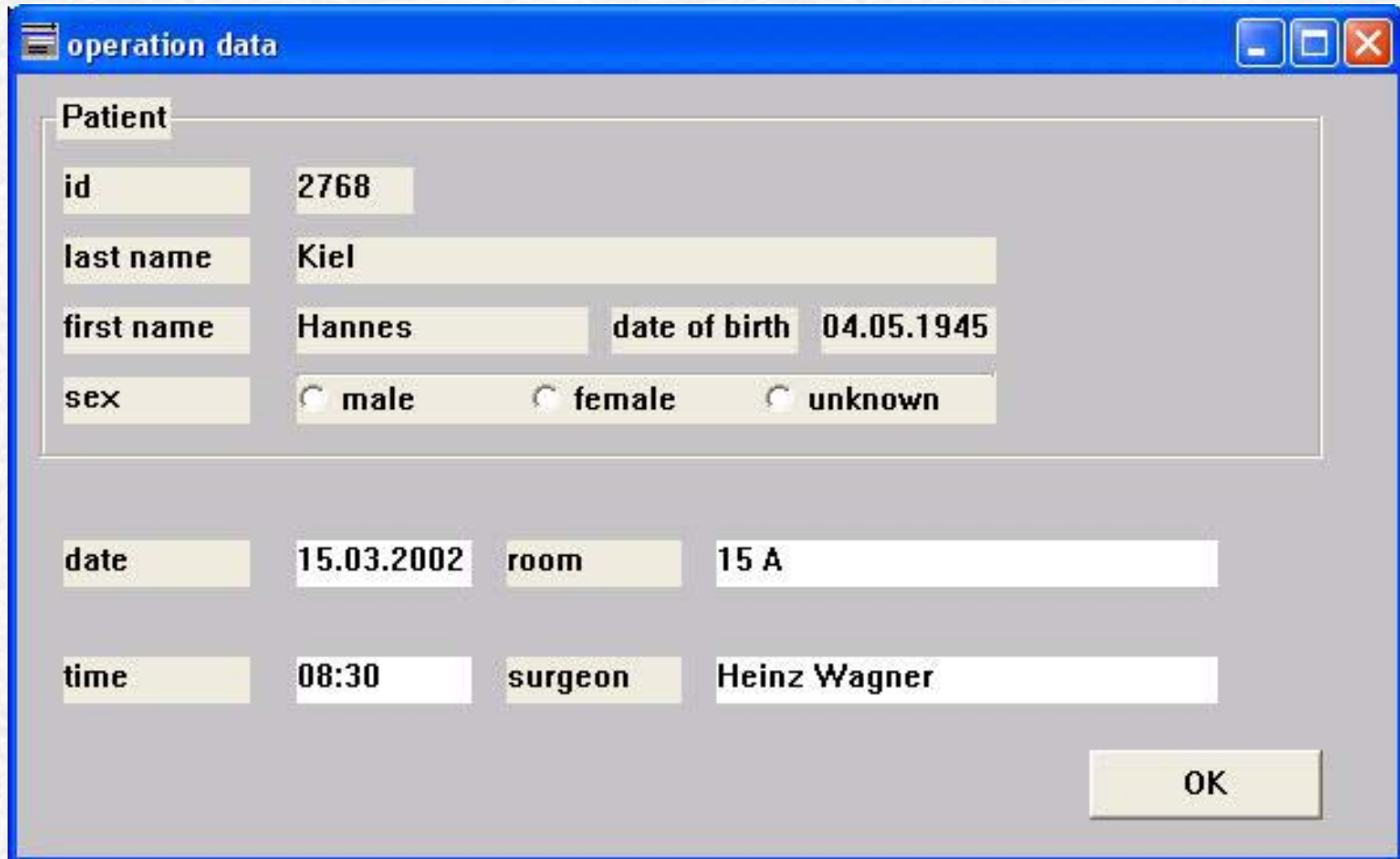
patient data

last name	Kiel	address	
first name	Hannes	street street number	Linsegasse 37
name affix		post code / place	1010 Vienna
title		country	Austria
	sex	telephone / fax	01 / 54652456
	<input type="radio"/> male <input type="radio"/> female <input type="radio"/> unknown	mail	
date of birth	04.05.1945	citizenship	Austria
deceased		language	German
name at birth		profession	Carpenter
place of birth	Vienna	confession	None
marital status	Single	parish	
relative			<input type="radio"/> psychic caretaking

OK Cancel

# The Doctor (3/4)

- Present patient's operation data



The screenshot shows a software window titled "operation data" with a blue title bar and standard Windows window controls (minimize, maximize, close). The window contains a form for entering patient and operation data. The form is organized into sections. The "Patient" section is enclosed in a box and includes fields for id (2768), last name (Kiel), first name (Hannes), date of birth (04.05.1945), and sex (radio buttons for male, female, and unknown, with "male" selected). Below this, there are fields for date (15.03.2002), room (15 A), time (08:30), and surgeon (Heinz Wagner). An "OK" button is located at the bottom right of the window.

Patient			
id	2768		
last name	Kiel		
first name	Hannes	date of birth	04.05.1945
sex	<input checked="" type="radio"/> male <input type="radio"/> female <input type="radio"/> unknown		

date	15.03.2002	room	15 A
time	08:30	surgeon	Heinz Wagner

OK

# The Doctor – (4/4)

➤ Add comments on case

**comments on case**

**Patient**

id	2768		
last name	Kiel		
first name	Hannes	date of birth	04.05.1945
sex	<input type="radio"/> male <input type="radio"/> female <input type="radio"/> unknown		

op-id

description

OK

# 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**

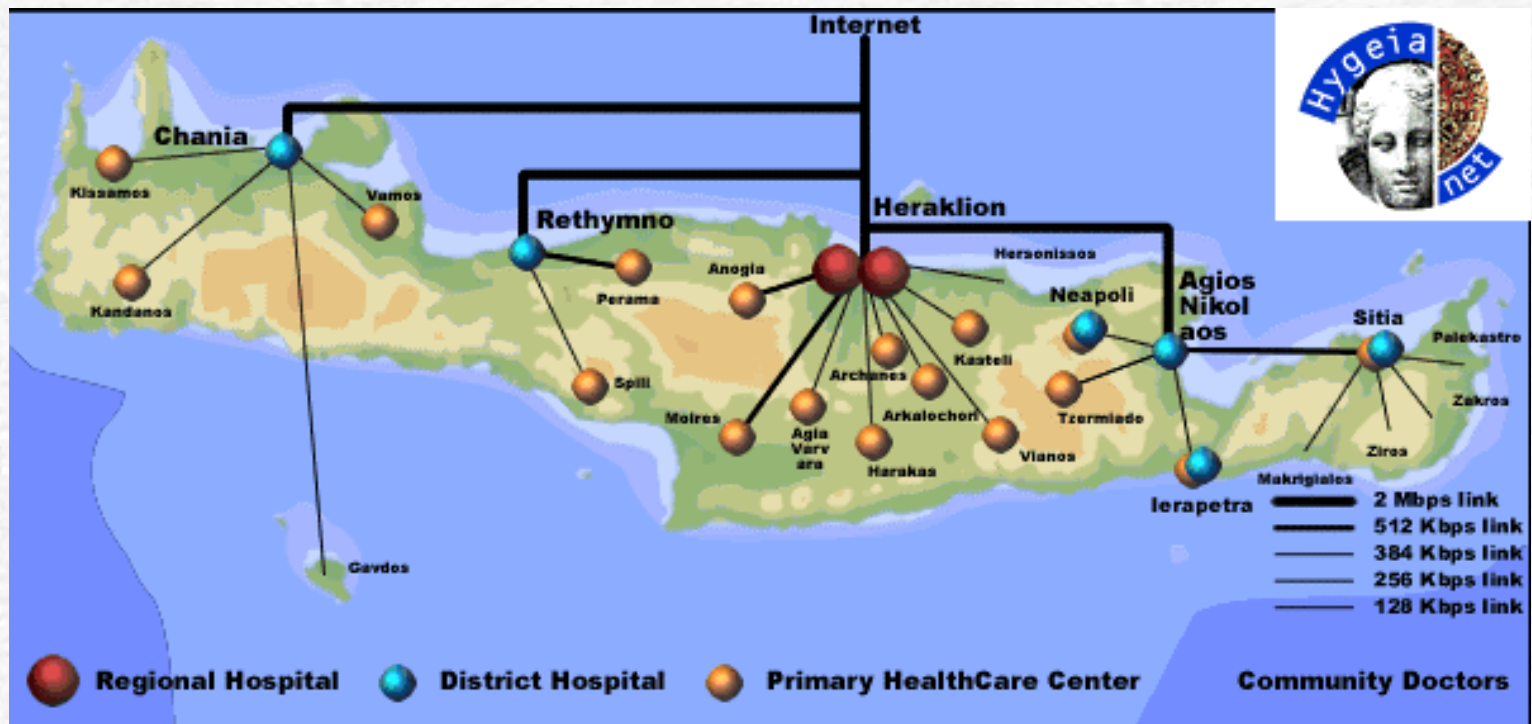


**Regional Health Telematics  
Network**



# HYGEIAnet scenario

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



# Demographics

**Demographic Data [Stathiakis Nikolaos]**

Demographics | Conditions of Residence

<b>Family name</b>	Stathiakis	<b>Given name</b>	Nikolaos	<b>Parent name</b>	Dimitrios
<b>Birthdate:</b>	29/4/1970	<b>Doctor Office:</b>	Anogia	<b>Record</b>	K08-978
<b>Gender</b>	Male	<b>Nationality</b>	Greece	<b>First visit date</b>	
<b>Birth town</b>	Anogia	<b>Birth prov.</b>	Rethymnon	<b>Street</b>	
<b>Resid. Town</b>	Anogia	<b>Resid. province</b>	Rethymnon	<b>Postal code</b>	
<b>Telephone</b>					
<b>Marital status</b>	Single	<b>Occupation</b>		<b>Financial status</b>	Average
<b>Assur. Organiz.</b>	IKA	<b>Number of assur.</b>		<b>Education</b>	
<b>Blood type</b>	O+	<b>Donor</b>	<input checked="" type="checkbox"/>	<b>Date of change</b>	
	<b>Change of state</b>				
<b>Comments</b>					

# Condition of residence

**Demographic Data (Stathiakis Nikolaos)**

Demographics | **Conditions of Residence**

Number of people at home

Number of rooms at home

<input checked="" type="checkbox"/> Refrigerator	<input checked="" type="checkbox"/> Kitchen	<input type="checkbox"/> Heating	<input type="checkbox"/> Leader
<input checked="" type="checkbox"/> Inhouse wc	<input type="checkbox"/> Outhouse wc	<input checked="" type="checkbox"/> Electricity	<input checked="" type="checkbox"/> Enough water

Comments

# Integrated Patient History

**Primary Care Center Information System**

File View Record\_searching Patient Administration Search Window Help

**Patient Folder (Stathiakis Nikolaos)**

Stathiakis Nikolaos Father Name: Dimitrios Birthdate: 29/4/1970  
Perif. Doctor Office: Anogia Folder Number: K08-978

**Primary Care Center Information System**

File View Record\_searching Patient Administration Search Window Help

**Patient Folder (Stathiakis Nikolaos)**

Stathiakis Nikolaos Father Name: Dimitrios Birthdate: 29/4/1970  
Perif. Doctor Office: Anogia Folder Number: K08-978

Demogr. History Visit Clin. Gynec. Blood Bioch. Radiol. Diagn. Therap.

**Previous Diagnosis**

- Asthma
  - Episode on 3/7/97 11:26
    - 04/01/1997 11:55
    - 03/01/1997 11:26
      - Drug Treatment
- Shoulder Pain
  - Episode on 7/7/97 16:46
    - 07/07/1997 16:46
      - Drug Treatment
- Appendicitis
  - Episode on 3/7/97 11:26
  - Episode on 2/5/96

Smoking ☐ Yes Drinking ☐ Yes

Operations ☐

Allergies

Food ☐ Drugs ☐

Others ☐ Con/tions ☐

Ready

7-10-97 16:54:53

ec. Blood Bioch. Radiol. Diagn. Action

vaccinations		Dia-	Physician
Bio/cal	Rad/cal	gnosis	Actions
			Y
Y			Y
			Y
Y	Y	Y	Y
	Y	Y	

7-7-97 17:46:27

# Querying the medical record

**Primary Care Center Information System** [min] [max] [close]

File Patient Administration Search Window Help

[icon] [icon] [icon] [icon]

**Patient Folder (Stathiakis Nikolaos). Visit searching based on clinical exams** [min] [max] [close]

Date	Practitioner	Cause
------	--------------	-------

Systolic Pressure  Diastolic Pressure  Beats(min)   
Breaths(min)  Temperature  Weight   
Height  Spo2  Etco2   
ECG   
Findings

record  of

Ready [7-7-97 18:02:03]



# Querying based on diagnosis

**Primary Care Center Information System**

File Patient Administration Search Window Help

**Patient Folder [Stathiakis Nikolaos]. Visit searching based on diagnosis of visits**

Date	Practitioner	Cause
------	--------------	-------

**Diagnosis**

**ICD-9 Code**

**Comments**

018	Κεχροειδής φυματίωση
020	Πανώλης
021	Τουλαραμία
022	Ανθρακας
023	Βρουκέλλωση

Ready

7-7-97 18:27:36

# 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

**Patient: Stathiakis Nikolaos**

**Patient Data**

Name: Stathiakis Nikolaos    Father Name: Dimitrios    Birth Date: 27/3/70  
 Perif. Doctor Office: Anoageia    Folder no.: K08-978

Demogr.   History   **Visit**   Clin.   Gyn.   Blood   Bioch.   Radiol.   Diagn.   Action   Emerg.


Visits to PHOC (9)

Date of Visit	Clinic	Blood	Bioch.	Radiol.	Diag.	Action	Emergency
24/6/2001 15:44							
20/6/2001 22:05	!			!	•		
12/3/2001 12:00		!	✓	✓		•	•
11/2/2001 18:23					•	•	
13/1/2001 09:03		✓	!				•
28/9/2000 08:12	✓			✓	•	•	
15/8/2000 12:14						•	
10/2/2000 11:40		!				•	

First Visit   Previous Visit   Next Visit   Last Visit   E-mail...

**Legend**

✓ : exam. with negative results    ! : exam. with positive results    • : available

**Patient: Stathiakis Niko 3:28p** 

**Patient Data**

**Name:** Stathiakis Nikolaos    **Birth Date:** 27/3/70  
**Father Name:** Dimitrios    **Folder no:** K08-978  
**Perif:** Doctor Office: Anoageia

Visit   Clin.   Gyn.   Blood   Bioch.   Radiol.

Demogr.   History   **Diagn.**   Action   Emerg.

Date of Visit	Cl	Bl	Bi	Rd	Dg	Ac	Em
20/6/2001 22:05	!			!	•		
12/3/2001 12:00		!	✓	✓		•	•
11/2/2001 18:23					•	•	
13/1/2001 09:03		✓	!				•

First View   Previous   Next   Last Visit   e-mail

**Legend**

✓ : exam. with negative results    ! : exam. with positive results    • : available



# The patient history on the iPAQ

**Patient: Stathiakis Nikolaos**

**Patient Data**

Name: Stathiakis Nikolaos    Father Name: Dimitrios    Birth Date: 27/3/70  
Perif. Doctor Office: Anogeia    Folder no.: K08-978

Demogr.   History   Visit   Clin.   Gyn.   Blood   Bioch.   Radiol.   **Diagn.**   Action   Emerg.

**Previous Diagnosis**

Stathiakis Nikolaos' Profile

- ☐ Asthma
  - Episode on 3/7/97 11:26
  - Episode on 3/1/97 11:55
  - Drug Treatment
- ☐ Shoulder Pain
  - Episode on 3/7/97 11:26
  - Episode on 3/1/97 11:55
  - Drug Treatment
- ☐ Appendicitis
  - Episode on 3/7/97 11:26
  - Episode on 3/1/97 11:55

**Stathiakis Nikolaos' Profile**

☐ Smoking    ☒ Drinking  
☐ Operations

**Allergies**

☒ Food: Sea food  
☐ Drugs:  
☐ Con/tions:  
☒ Other: Bees

E-mail...

**Patient: Stathiakis Nikolaos 3:31p**

**Patient Data**

**Name:** Stathiakis Nikolaos    **Birth Date:** 27/3/70  
**Father Name:** Dimitrios    **Folder no:** K08-978  
**Perif:** Doctor Office: Anogeia

Visit   Clin.   **Gyn.**   Blood   Bioch.   Radiol.

Demogr.   History   **Diagn.**   Action   Emerg.

**Previous Diagnosis**

Stathiakis Nikolaos' Profile

- ☐ Asthma
  - Episode on
  - Episode on**
- ☐ Shoulder Pain
  - Episode on
  - Episode on**
- ☐ Appendicitis
  - Episode on**

**Patient Profile**

☐ Smoking    ☒ Drinking  
☐ Operations

**Allergies**

☐ Food: Sea Food  
☐ Drugs:  
☐ Con/tions:  
☒ Other: Bees

# 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

Demographic Data [Stathiakis Nikolaos]

Demographics | Conditions of Residence

Family name	Stathiakis	Given name	Nikolaos	Parent name	Dimitrios
Birthdate	29/4/1970	Doctor Office	Anogia	Record	K08-978
Gender	Male	Nationality	Greece	First visit date	
Birth town	Anogia	Birth prov.	Rethymno	Street	
Resid. Town	Anogia	Resid. province	Rethymno	Postal code	
Telephone					
Marital status	Single	Occupation		Financial status	Average
Assur. Organiz.	IKA	Number of assur.		Education	
Blood type	O+	Donor	<input checked="" type="checkbox"/>	Date of change	
	Change of state				
Comments					



# Patient's demographics on WAP

Demographic Data [Stathiakis Nikolaos]

Demographics Conditions of Residence

Number of people at home  Number of rooms at home

☒ Refrigerator ☒ Kitchen ☐ Heating ☐ Leader

☒ Inhouse wc ☐ Outhouse wc ☒ Electricity ☒ Enough water

Comments

DESKTOP





# 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	<i>Quality attributes</i> <i>User interface requirements</i>	<b>NFR Analysis</b> <b>UA<sup>2</sup>W</b>
Concept formation & design	<i>Designing artifacts</i> <i>Building design representations</i> <i>Capturing design rationale</i> <i>Low-fidelity prototypes</i>	<b>Unified design</b> <b>TADEUS models</b> <b>WCAG conformance</b> <b>Screening</b>
Prototyping & development	<i>Supporting adaptation</i> <i>Accessibility</i> <i>Architectures for universal access</i>	<b>Style re-engineering</b> <b>Model-based development</b>
Evaluation	<i>Standards conformance</i> <i>Usability</i> <i>Benchmarking</i>	<b>MedicSCORE</b> <b>WCAG audit</b> <b>Benchmarking</b>

# 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

**Level A:**  
Quality attributes

**NFRs**

**Level B:**  
HCI design

Process  
Guidelines

*Adaptability*

*Scalability*  
*Individualization*  
*Platform independence*



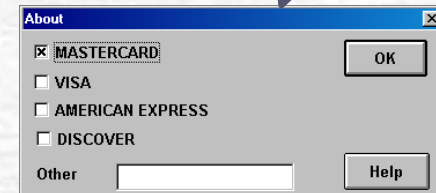
*Explicit choice (Selection panel)*

## 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 (List-box)*



*Explicit choice (Checkbox)*

# When to use methods (2/5)

## When

- there is no system but a design concept

## Then, UA<sup>2</sup>Ws can

- help define shortcomings
- envision new contexts of use
- define new design concepts by consensus

Artefact:	Mock-up listing all the tests ordered for the patient		
Functional Unit:	Ward of the clinic		
Style: Currently the system runs on an iPAQ The style is depicted in the mock up shown in the following figure			
Objectives: We would like to make the service accessible over the Web for authorised users.			
Functional Description Overview: No change			
Universal Access Issues:			
Issue Id.	Issue Description	Priority (H/M/L)	Constraint
1	Adaptability to different user groups	H	Blind, motor impaired and able-bodied users
2	Scalability to different platforms	H	Desktop, PDAs and Kiosks
3	Context-sensitive	H	Ubiquitous
Claims:			
Growth scenario 1	How can the task be performed over the Web		
Growth scenario 2	How can the task be performed using an alternative scanning, suitable for		

Payment method

Card number

Expire date

Card holder's name

Payment method:

Credit card number:

Expiration date:

Cardholder's name:

(as it appears on the card)

set-date-2

Payment method  
☐ VISA ☐ MASTERCARD ☐ AMERICAN EXPRESS ☐ DISCOVER

Expire date  
Month

Year

Card number

123 q w e r t y u i o p  
Tab a s d f g h j k l \*  
Shift z x c v b n m ; ' <  
Ctl @ & , . ! ?



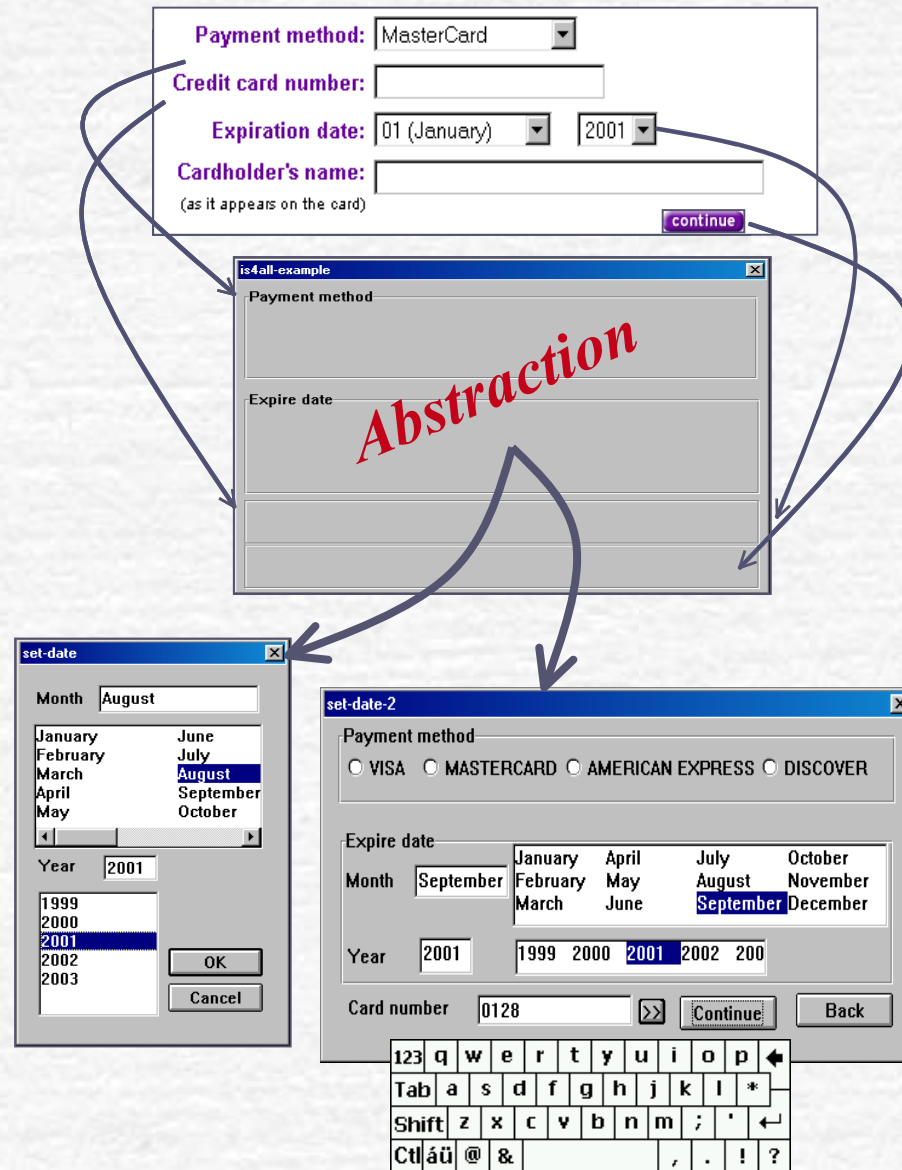
# When to use methods (4/5)

## When

- Requirements are specified and detailed design work is being undertaken

## Then, U<sup>2</sup>ID 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

**Patient: Stathiakis Nikolaos**

Patient Data

Name: Stathiakis Nikolaos      Father Name: Dimitrios      Birth Date: 27/3/70  
Perif. Doctor Office: Anoaea      Folder no.: K08-978

Demogr.   History   Visit   Clin.   Gyn.   Blood   Bioch.   Radiol.   Diagn.   Action   Emerg.

Previous Diagnosis

Stathiakis Nikolaos Profile

- Asthma
  - Episode on 3/7/97
  - Episode on 3/1/97
    - Drug Treatment
- Shoulder Pain
  - Episode on 3/7/97
  - Episode on 3/1/97
    - Drug Treatment
- Appendicitis
  - Episode on 3/7/97
  - Episode on 3/1/97

**Patient: Stathiakis Nikolaos 2:38p**

Patient Data

**Name:** Stathiakis Nikolaos      **Birth Date:** 27/3/70  
**Father Name:** Dimitrios      **Folder no:** K08-978  
**Perif:** Doctor Office: Anoaea

Visit   Clin.   Gyn.   Blood   Bioch.   Radiol.

Demogr.   History   Diagn.   Action   Emerg.

Previous Diagnosis

Drug Treatment

- Shoulder Pain
  - Episode on 3/7/97
  - Episode on 3/1/97
    - Drug Treatment
- Appendicitis
  - Episode on 3/7/97
  - Episode on 3/1/97

Patient Profile

☐ Smoking   ☒ Drinking  
☐ Operations

Allergies

☐ Food: Sea Food  
☐ Drugs:  
☐ Con/ctions:  
☒ Other: Bees

# When to use methods (5/5)

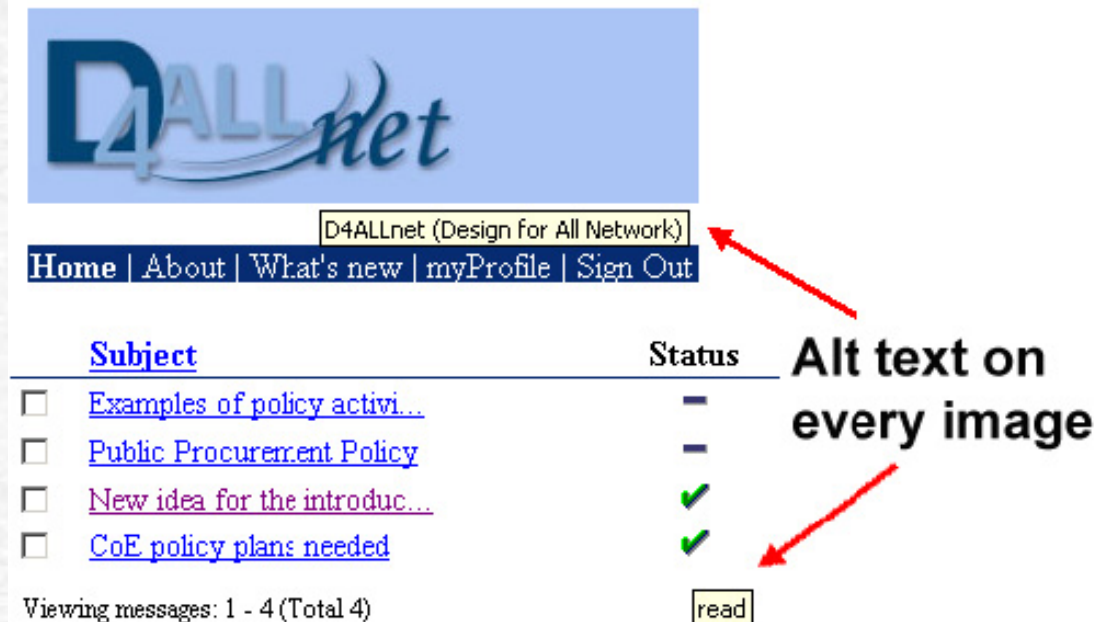
## When

- There is an requirement for accessibility

## Then WCAG can

- Provide useful guidance on what is to be done during design
- Shortcomings to be corrected

1.1 Provide a text equivalent for every non-text element (e.g., via "alt", "longdesc", or in element content).



The screenshot shows a web page with a blue header containing the 'D4ALLnet' logo. Below the logo is a navigation bar with links: Home, About, What's new, myProfile, and Sign Out. A red arrow points from the text 'Alt text on every image' to the logo. Below the navigation bar is a table with two columns: 'Subject' and 'Status'. The table contains four rows of data. A red arrow points from the text 'Alt text on every image' to the 'Status' column. At the bottom of the page, there is a 'Viewing messages: 1 - 4 (Total 4)' and a 'read' button.

Subject	Status
<input type="checkbox"/> <a href="#">Examples of policy activi...</a>	-
<input type="checkbox"/> <a href="#">Public Procurement Policy</a>	-
<input type="checkbox"/> <a href="#">New idea for the introduc...</a>	✓
<input type="checkbox"/> <a href="#">CoE policy plans needed</a>	✓

Viewing messages: 1 - 4 (Total 4)

read

# 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

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- 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)