



Friendly Rest Room

Final conference

Vienna 17 March 2005



**Programme
&
Presentation Hand-outs**

Project QLK6-CT-2001-00458 within the EU FP5, Quality of Life, Key Action 6.

www.frr-consortium.org



Project QLK6-CT-2001-00458 within EU FP5.

FRR Final conference
Vienna, 17 March 2005

Table of contents

Foreword	4
Programme FRR Final conference Vienna, 17 March 2005	5
Hand-outs Presentations	7
Welcome and Opening	7
Overview on FRR Project	11
Results from User Needs Questionnaires	15
Case Studies from Milan	19
Purpose and Implementation of User Involvement.....	29
Ethics in FRR.....	32
Engineering and Manufacturing the Final FRR Prototype according to the User Needs	35
Research in and Design of Toilet Supports and Means for Perineal Cleansing	38
Design of Flexible User Interface Demonstrator, Control Software and Sensors..	41
Overview about iterative prototype generations at the 5 test sites in Vienna, Lund, Athens, Delft and Milan	46
Toilet Design for Visually Impaired Persons.....	49
Results from Athens - including report about sequence of testing and used material.....	55
The Final FRR Container final design	57
Real life test at a day care centre, Results of the validation phase	58
Voices of the users	64
The FRR Book – “Developing adaptable toilets of the future for disabled and elderly people”	68
Other scientific publications of the FRR	71
Contact info FRR consortium partners	73

Foreword

The shifts in age-group ratios in the population are confronting us with new challenges. At the moment Europe is at the top of the old age statistics with the highest life expectancy rate. The changes in the age structure of the population mean new socio-political responsibilities both today and in the future. It is quite obvious that appliances and technological equipment can help to maintain older persons' quality of life by enabling them to stay longer in their own homes, and/or to lead relatively more independent lives even if living in an older people's home or some other institution.

FRR ("Friendly Rest Room") was an EU project within the Quality of Life programme which set out to make toilet facilities better suited for older people and people with disabilities. Many elements of the FRR (seat, grab bars, etc.) are individually adjustable to meet the needs of persons with different functional limitations or disabilities, allowing them to gain greater autonomy, independence, self esteem, dignity, safety, improved self-care and, therefore, enable them to enjoy a better quality of life.

We are proud to present in this conference some of the main results from the FRR-project. In many of the scientific disciplines that collaborated in the project, these results form the first attempt to investigate in-depth the area of toileting, thus providing knowledge that did not exist prior to the FRR-project. Though we are fully aware that we did not arrive at a final point, we see a lot of possible solutions to problems so widely spread within the European population.

This conference is hosted by the care providing institution Caritas Socialis in Vienna whose clients and staff members already have contributed significantly to the evaluation of the different laboratory and field test prototypes of the FRR project. This offers an optimal base for our final conference which intends to put the focus on the user related results. Additionally and complementary to this final conference, the consortium is working on publishing a book containing more detailed scientific findings (to be available by mid of this year, publisher: IOS press).

Many of these findings would not have been possible without the continuous support of our Project Officer, Dr. Gesa Hansen, who guided us through difficult phases of the project and thereby encouraged us to carry on. We would like to thank her and our Project Technical Assistant, Mr. Ivor Ambrose, for this support.

Most important, however, was the collaboration of users and user organisations who voluntarily contributed to the project without being reimbursed fully for their large investment of time and effort. The project's success is owed to their willingness, and would not have been able without their contributions. We are very grateful for their support.

Prof. Johan Molenbroek

On behalf of the FRR project consortium

Programme FRR Final conference **Vienna, 17 March 2005**

Caritas Socialis Pflege und Sozialzentrum Rennweg
Oberzellergasse 1, A-1030 Vienna

FRR is a 3-years' research and development project with partners from various disciplines to develop and test prototypes of innovative toilets in order to assist older people or persons with disabilities and to make a contribution to improve their quality of life. The Conference will provide an overview of the project work and of the results.

10:00 Welcome and opening

- Chair person: Prof. Johan Molenbroek, FRR Coordinator, TU Delft.
- Ulla Herfort-Wörndle, Secretary General, EURAG.
- Prof. Wolfgang Zagler, FORTEC, TU Vienna.

10:25 Quality of Life / Key Action 6- The Aging Population and Disabilities
by Gesa Hansen, European Commission, DG Research.

10:40 Overview on FRR Project
by Prof. Johan Molenbroek, FRR Coordinator, TU Delft.

User-Driven Research: User Involvement & User Needs

10:50 Results from User Needs Questionnaires
by Christian Dayé, EURAG.

Case Studies from Milan
by Terezina Menezello, SIVA; Milan.

CBI – Computer Based Interviews as a tool
by Peter Gregor, University of Dundee.

User Involvement & Ethics

11:20 Purpose and implementation of User Involvement
by Marianne Egger de Campo / Christian Dayé, EURAG.

Ethics in FRR
by Prof. Ina Wagner / Marjo Rauhala, TU Vienna.

12:00 Lunch break (buffet)
(possibility to join a guided tour to toilet room used for FRR real life test)

User-Centred Design & Engineering

- 13:30 Engineering and Manufacturing of the final FRR prototype according to the user needs**
by Attila Rist, CSO, Debrecen.
- 13:45 Research in and design of toilet supports and means for perineal cleansing**
by Sonja Buzink & Dries Dekker, TU Delft.
- 14:00 Design of flexible user interface demonstrator, control software and sensors**
by Håkan Neveryd, CERTEC, Lund Univ. & Paul Panek, FORTEC, TU Vienna.
- 14:20 Overview about iterative prototype generations at the 5 test sites in Vienna, Lund, Athens, Delft and Milan**
by Paul Panek, FORTEC, TU Vienna.
- 14:50 Coffee break**
- 15:20 Toilet design for visually impaired persons**
by Håkan Neveryd, CERTEC, Sweden.
Results from Athens - including report about sequence of testing and used material
by Panayota Sourtzi, HAGG & University of Athens, Athens.
- 15:50 The Final FRR Container final design**
by Renate de Bruin, TU Delft.

FRR in the Real Life

- 16:10 Real life test at a day care centre**
Results of the validation phase
by Nadia Gentile, EURAG & Christian Dayé, EURAG.
- 16:30 Voices of the users**
by Robert Schlathau, MS Society Austria User Board (primary user), Ramona Rosenthal, Christine Pauli, Nurses from Caritas Socialis, Vienna (secondary users).
- 17:00 Discussion**
Moderated by Prof. Johan Molenbroek, TU Delft & Paul Panek, FORTEC.
- 17:30 End of the conference**

Hand-outs Presentations

All sheets of presentations (please add possible additional sheets to the presentation after the last slide) present at the BSCW (<http://frr.nurs.uoa.gr/bscw/bscw.cgi/0/40090>) on Monday March 14th 13h⁰⁰

Welcome and Opening

by Prof. Johan Molenbroek, FRR Coordinator, TU Delft.

FRR Introduction of Consortium Partners


Who is Who in FRR

The FRR Consortium
www.frr-consortium.org

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FRR Introduction of Consortium Partners


The FRR-consortium



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FRR Introduction of Consortium Partners

The Partners



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FRR Introduction of Consortium Partners


Why Delft had interest in coordinating the FRR-project

- 35 years experience with developing products for elderly and handicapped, with ergonomics, anthropometry and product safety
- Experience with intimate matters like toileting and sexual aids
- 90 fte per year (9 times FRR) are spend to develop new products with master students
- Availability of technical-, medical-, business and social-disciplines within the faculty
- IDE philosophy is User centred Research and Design; slogan: 'creating products for people'
- IDE-designers learn in a 5 years curriculum to translate the research output into innovative product characteristics

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FRR Introduction of Consortium Partners

Coordinator Delft University of Technology (TUD)



Johan Molenbroek
Renate de Bruin
Sonja Buzink
Dries Dekker
Erik Huijs
Diederik van der Pant

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FRR Introduction of Consortium Partners

fortec Research Group on Rehabilitation Technology



fortec develops innovative concepts and technical (mainly software and microprocessor based) aids to overcome existing barriers in the life of old people and persons with a disability

Staff: 7 assistive technology and universal design researchers plus support personnel

Fortec belongs to the Institute "integrated study" at Vienna University of Technology

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Other R&D Projects

SILC – (FP5/IST): development of a wrist worn alarm system with integrated biometric sensors and fall detection for senior citizens

RESORT – IP based remote service provision system for PC based Assistive Technology (TAP in FP4)

FASTY – Faster Typing for Disabled Persons (IST/FP5): word prediction for European languages

MOVEMENT – Development of an intelligent mobility concept for wheel chair users (IST/FP6)

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Fortec's team and main tasks in FRR project

Responsible for technical activities of test site in Vienna

Development of FRR System Software and Interface Software (together with Certec, Sweden)




Wolfgang Zagler Paul Panek Niki Stefanakis Georg Edelmayer Peter Mayer

Email: frr@fortec.tuwien.ac.at

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Introduction of Consortium Partners

Institute for Design & Assessment of Technology
Ethical reviewers (subcontractor)



Mario Rauhala Ina Wagner

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Introduction of Consortium Partners

SITUATED RESEARCH

- It is necessary to study real people with real objects in real situations in real time.
- Research on the dynamics in FRR is very complex and requires competence from different fields of knowledge.
- You cannot know until you have tried.



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Introduction of Consortium Partners

AND

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Introduction of Consortium Partners

Design for Everyday Life

- Certec has more than 15 years experience of participatory design for everyday life.
- The experiences from the design process in the FRR project will be utilized in other ongoing and coming projects for elderly and people with disabilities.
- The deep engagement and involvement of test persons and User-board in FRR has clearly demonstrated the importance of this project.
- The design of a friendly restroom for and together with fragile elderly persons calls for research methods that take into consideration their weaknesses. That put a demand on researchers flexibility and sensitivity.

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EURAG – European Federation of Older Persons

- non-profit and non-religious European organisation
- founded in 1962 with seat in Luxemburg
- independent of political parties
- since 1974 the EURAG General Secretariat is in Graz/Austria
- through its member organizations, EURAG represents millions of older people from 33 European countries
- its purpose is to promote elderly people's quality of life on societal, social and political levels



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EURAG's FRR-team



Marianne Egger de Campo, Sociologist



Nadia Gentile, Sociologist



Gerhard Teissl, Director & Project Manager



Christian Dayé, Sociologist

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EURAG's role within FRR-project:

User Involvement

„To establish, to monitor and, if necessary, to criticise the process of User Involvement within the project's development.“

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FRR Introduction of Consortium Partners

University of Athens (UoA)



John Mantas



Joseph Liaskos




Martha Charalabidou


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FRR Introduction of Consortium Partners


University of Dundee (UNIDUN)




Norman Alm




Nick Hine




Sian Joel



Katrina Hands



Kenny Morrison




Peter Gregor

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Landmark Design Holding (LM)



Theo Groothuisen



Marja Van Weeren

Theo and Marja are moved to Korea as from 15 february 2005

Theo is now Full Professor in Design at the Korean Institute for Science and Technology

Marja is lecturing Design

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Servizio Informazioni Valutazione Ausili (SIVA)




Renzo Andrich Terezinha Menezello

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Hellenic Association of Gerontology and Geriatrics (HAGG)






Panayota Sourtzi Fotini Tolka A. Mouyias P. Tsoli

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Clean Solution kft (CSO)



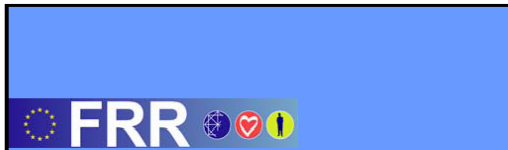
Atilla Rist

Clean Solution is a small company in Debrecen, Hungary and specialised in Sanitary Products. CSO is the production company within the FRR-consortium who was responsible for the making of all the different FRR-prototypes


Now QLK6-CT-2001-00458 Friendly First Room - Final Meeting - 17 March 2005, Vienna

Overview on FRR Project

by Prof. Johan Molenbroek, FRR Coordinator, TU Delft.



Overview
The development of a Friendly RestRoom
A user friendly restroom for elderly and persons with limited abilities

 Professor dr. Johan F. M. Molenbroek
Renate de Bruin MSc



Why a Friendly Restroom?

In Europe alone, 14.9% of the population is faced with problems as a result of getting older, in 2040, this will be 23%.

Research has shown that 54% of the target users have difficulties in using the rest room

injuries from falling
balance problems
support
(un)dressing
sitting down
getting up
hygiene
reaching

"Developing Friendly Rest Rooms for the elderly and the disabled people"
FRR Final Conference Vienna, 17th March 2005

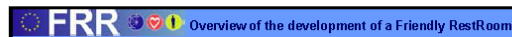


Past

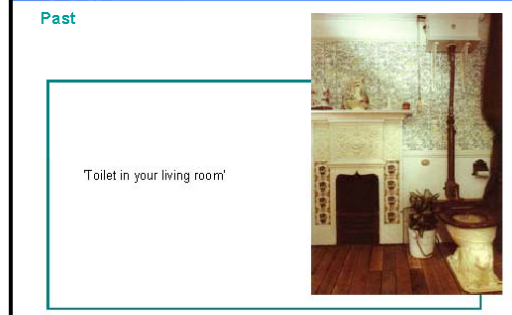


"Toilet in your living room"

"Developing Friendly Rest Rooms for the elderly and the disabled people"
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Past



"Toilet in your living room"

"Developing Friendly Rest Rooms for the elderly and the disabled people"
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Past



"Family toilet"

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Present



"Typical Dutch toilet"

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FRR  Overview of the development of a Friendly RestRoom

Future

"Toileting in public"




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Objectives of the FRR project

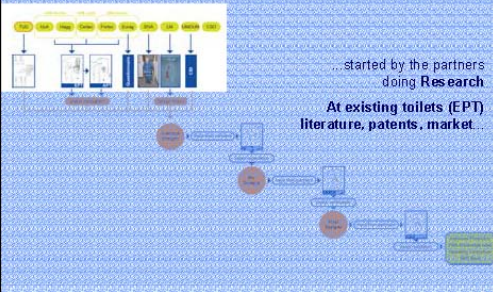
- Developing a user centered innovative smart toilet
- Development of a "FRR new knowledge base"
- Establishment of an independently operating consortium
- Publishing of project results in a book

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FRR  Overview of the development of a Friendly RestRoom

...started by the partners doing **Research**

At existing toilets (EPT) literature, patents, market...



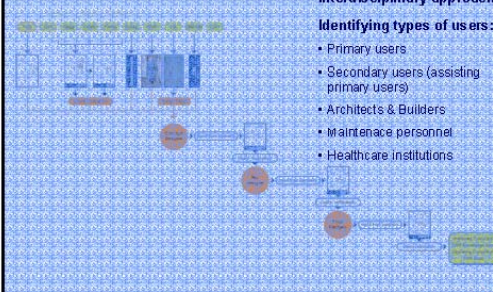
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FRR  Overview of the development of a Friendly RestRoom

Interdisciplinary approach

Identifying types of users:

- Primary users
- Secondary users (assisting primary users)
- Architects & Builders
- Maintenance personnel
- Healthcare institutions



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FRR  Overview of the development of a Friendly RestRoom

Behavioural studies in the Restroom

Even toestemming vragen aan SIVA voor plaatje rechts!



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FRR  Overview of the development of a Friendly RestRoom

Computer Based Interviews

Female Users - Interview regarding body posture and cleaning habits


6. What means of cleaning do you prefer to use after defecating?

☐ Towel or wet (toilet) paper ☐ Hand shower or bucket

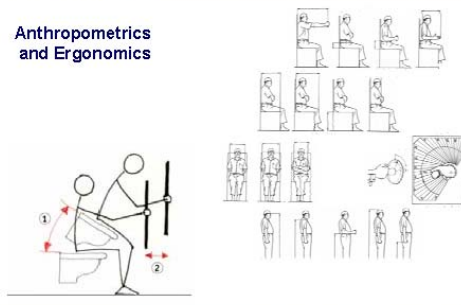
☒ Dry (toilet) paper ☐ Other

☐ Water from bottle or cup


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Anthropometrics and Ergonomics




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Problem analysis

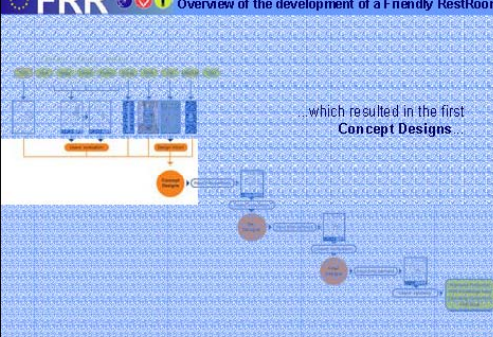


"Mathilde"




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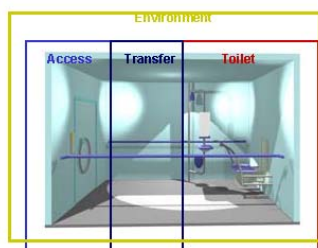


...which resulted in the first **Concept Designs**...


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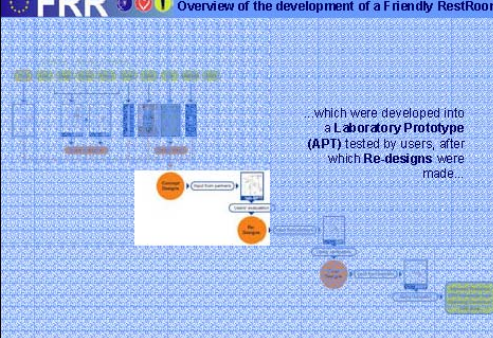
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Four areas of use




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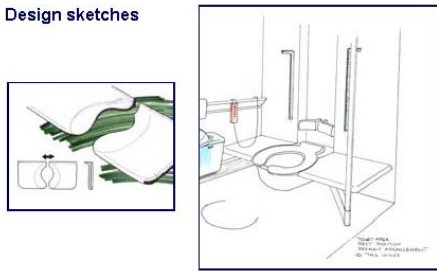


...which were developed into a **Laboratory Prototype (APT)** tested by users, after which **Re-designs** were made...

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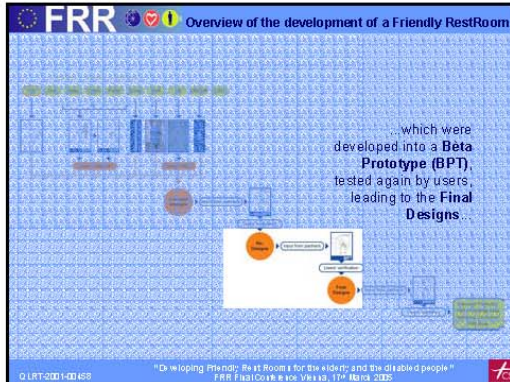
FRR  Overview of the development of a Friendly RestRoom

Design sketches



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FRR Overview of the development of a Friendly RestRoom



which were developed into a **Beta Prototype (BPT)**, tested again by users, leading to the **Final Designs**.

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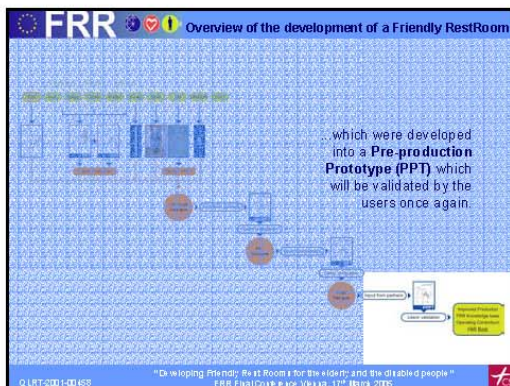
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Building Beta prototypes



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which were developed into a **Pre-production Prototype (PPT)** which will be validated by the users once again.

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The pre-production prototypes and FRR-container



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Results

- Knowledge base
- Pre-Production Prototype (first presented at RehaCare Fair Nov. 2004 Düsseldorf Germany) with 1 patent request and 3 model protection request
- The FRR book in 2005

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FRR Overview of the development of a Friendly RestRoom

Why a Friendly Restroom?

Because it will improve the Quality of Life for many elderly and disabled people in Europe.



Thank you!

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Results from User Needs Questionnaires

by Christian Dayé, EURAG.

**Ergebnisse des
User Needs
Fragebogens**

Results from User Needs
Questionnaire



Christian Dayé
EURAG – Bund der Älteren
Generation Europas

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**The FRR-
Questionnaire**

- Paper-pencil questionnaire
- Four pages, 61 items
- Five languages
- Distributed in five european countries by partner organizations

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EURAG

Das gemeinnützige, nicht gewinnorientierte Ziel der EURAG ist es, die Interessen der älteren Generation in Europa zu vertreten und zu fördern. Dies geschieht durch die Förderung von Projekten, die die Lebensqualität der älteren Generation verbessern und die soziale Integration fördern. Die EURAG ist eine europäische Organisation, die aus Mitgliedern aus verschiedenen Ländern besteht. Die EURAG ist eine europäische Organisation, die aus Mitgliedern aus verschiedenen Ländern besteht.

Frage	Antwort	Frage	Antwort
1. Wie oft besuchen Sie das WC?	1-2 mal	11. Wie oft besuchen Sie das WC?	1-2 mal
2. Wie oft besuchen Sie das WC?	3-4 mal	12. Wie oft besuchen Sie das WC?	3-4 mal
3. Wie oft besuchen Sie das WC?	5-6 mal	13. Wie oft besuchen Sie das WC?	5-6 mal
4. Wie oft besuchen Sie das WC?	7-8 mal	14. Wie oft besuchen Sie das WC?	7-8 mal
5. Wie oft besuchen Sie das WC?	9-10 mal	15. Wie oft besuchen Sie das WC?	9-10 mal
6. Wie oft besuchen Sie das WC?	11-12 mal	16. Wie oft besuchen Sie das WC?	11-12 mal
7. Wie oft besuchen Sie das WC?	13-14 mal	17. Wie oft besuchen Sie das WC?	13-14 mal
8. Wie oft besuchen Sie das WC?	15-16 mal	18. Wie oft besuchen Sie das WC?	15-16 mal
9. Wie oft besuchen Sie das WC?	17-18 mal	19. Wie oft besuchen Sie das WC?	17-18 mal
10. Wie oft besuchen Sie das WC?	19-20 mal	20. Wie oft besuchen Sie das WC?	19-20 mal

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**Why using a
questionnaire?**

Three purposes:

1. To explore the scope of the need for new technology in this area, thus indicating the importance of new solutions.
2. To identify and rank the difficulties when using standard toilet, thus providing starting points for development work.
3. To investigate the importance of non-technical factors that have to be taken into account (e.g. counter-arguments, cultural or gender differences).

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**Organizations &
Countries**

EURAG: German speaking area of Central Europe: Austria, Germany, Switzerland.

ÖMSG: Members of the Austrian Multiple Sklerosis Society (ÖMSG).

Project partners **HAGG** and **UoA:** Greece (Athens).

Project partner **SIVA** and cooperative partner **SSSUP:** Italy (Milano and Pisa).

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**Disseminated
among the target
group of FRR:**

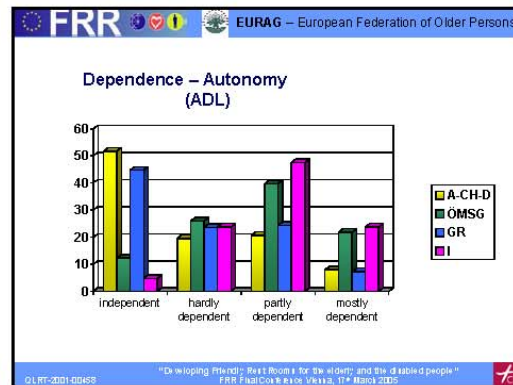
- Older persons and
- Persons with (physical) limitation.

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Age and Sex

Sample	Age			Sex	
	Minimum	Maximum	Median	Male	Female
Central-european Seniors (N=93)	38	91	73	27,5%	72,5%
Members of OMSG (N=77)	29	81	54	33,8%	66,2%
Greek Respondents (N=126)	21	96	73	34,1%	65,9%
Italian Respondents (N=27)	24	93	78	33,3%	66,7%

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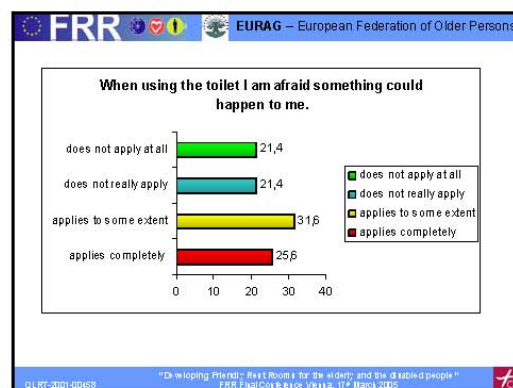
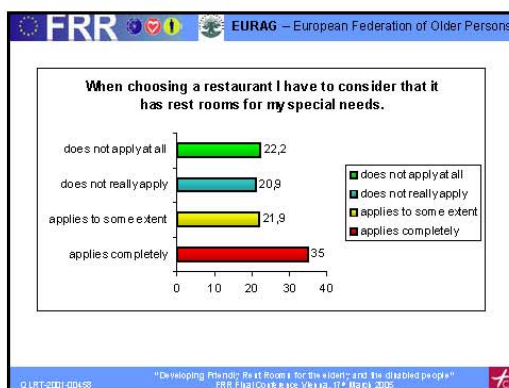


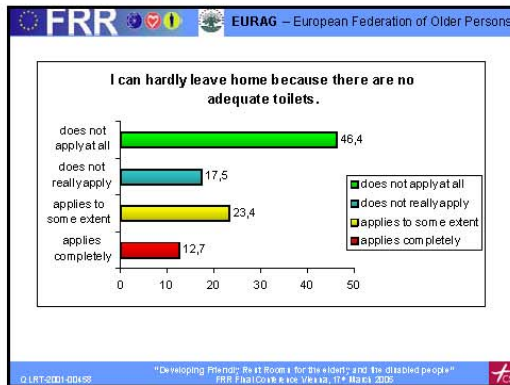
- Three purposes:**
- To explore the scope of the need for new technology in this area, thus indicating the importance of new solutions.
 - To identify and rank the difficulties when using standard toilet, thus providing starting points for development work.
 - To investigate the importance of non-technical factors that have to be taken into account (e.g. counter-arguments, cultural or gender differences).
- QLRT-2001-00458 "Developing Friendly Rest Rooms for the elderly and the disabled people" FRR Final Conference Vienna, 17th March 2005

Ad 1): Importance of new solutions

Question: How far does the lack of usable toilets affect the quality of life of older persons and persons with physical limitations?

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Ad 1): Importance of new solutions

Conclusion: effective and innovative technological solutions in the toilet area as well as their propagation and availability are urgently needed.

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Three purposes:

- ✓ To explore the scope of the need for new technology in this area, thus indicating the importance of new solutions.
- **To identify and rank the difficulties when using standard toilet, thus providing starting points for development work.**
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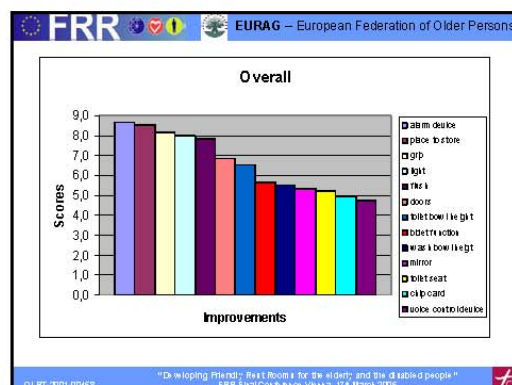
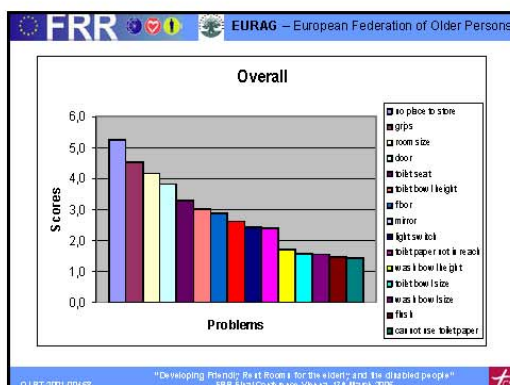
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Ad 2): Core difficulties

Question: Which aspects of using a standard toilet cause difficulties, and how do the users evaluate proposed solutions?

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Ad 2): Core difficulties

Conclusion: Based on a broad empirical foundation, we can indicate where the core difficulties appear, and to which extent the proposed technological solutions are accepted.

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Three purposes:

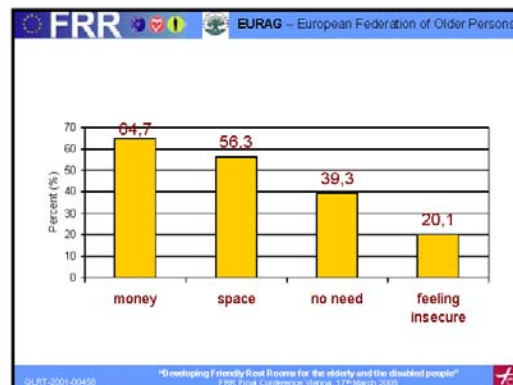
- ✓ To explore the scope of the need for new technology in this area, thus indicating the importance of new solutions.
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Ad 3): Counter arguments

Question: Which non-technological problems could make the deployment of such an innovative toilet difficult, or retard its propagation?

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Ad 3): Counter arguments

Conclusion: These statements must be taken into account when designing and developing a new technological aid, thus diminishing the risk of delivering technology of low (social and practical) acceptability.

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Thank you!



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Case Studies from Milan

by Terezinha Menezello, SIVA; Milan.

Partner SIVA
www.siva.it

Fondazione Don Carlo Gnocchi Onlus
Centro di Bioingegneria

An initiative of the Don Carlo Gnocchi Foundation Milan - Italy
Research, Information, and Education on Assistive Technologies
A nation-wide network of advice centres on assistive technologies

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Elderly and people with disabilities - Limitations in their everyday life

Three case studies

Terezinha Menezello

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Three case studies with elderly people and people with disabilities in different situations are presented as examples of adaptation of the bathroom area. Concrete solutions that have been found with respect to their limitations and the way they successfully solved their problems by means of home adaptations using either low-tech solutions or high tech devices are described.

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An old couple

The main purpose of this intervention is to find out facilitation in the rest room, so as to make it possible to carry out every day's activities without structural changes in bathroom

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Luigi and his wife

- The actors: Luigi (96 years old) and his wife (82 years old) live on their own in an apartment at the 4th floor, in a big city

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Luigi's bathroom



Luigi moves independently inside his home. He uses a walker to support shifting. When he arrives in front of the bathroom door, he leaves the walker outside and uses different support points (the door handle, the wash machine, the sink, the drawer handle), until he arrives in position to seat on the toilet bowl.

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How Luigi moves inside of his bathroom



- Luigi moves slowly and needs to lean against the sink, the support bars, and handles.
- The comoda chair has a hard surface causes pain to seat down

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FRR 

The toilet bowl




- The height of toilet seating is lower than a standard; it is only 42 cm. including the toilet seat. As the problems related to growing old, includes sitting down and getting up of the toilet increase, Luigi becomes dependent on his wife

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Toilet bowl with comoda chair



With increasing of difficulties, Luigi used a comoda chair to be independent but actually the hard surface generates pain and leads also to skin problems

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Raised toilet seat with fixed handles



Solution adopted:

1. Raised toilet seat with fixed handles – to allow for stability and safe seating down and getting up of the toilet bowl.
2. Characteristics:
 - Fixed support on toilet bowl
 - Metal structure in aluminium
 - Long handle

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FRR 

The way Luigi uses the sink




- The sink: By using a comoda chair placed near the sink, equipped with a cushion, because the hard surface generates pain and leads also to skin problems in the sciatic region just where there is the point of support when he is sitting Luigi seats down to execute the daily morning activities of personal hygiene; he washes his face, brushes his teeth, combs his hair and shaves without help.

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FRR 

The wash tub



- Luigi has slowness in movement, he tries hard to get up from seating, he feels back pain and has also edema in the legs.
- He was not able any more to go in and out of wash tub

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Swivel wash tub chair



- Luigi and his wife have a lucid mind and they are looking for assistive devices to support independent living for them.
- Solution adopted**
- Swivel washtub chair, suitable to overcome difficulties of positioning inside of washtub.

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Luigi and his wife going out of bathroom



- Luigi uses a stick and handles to move inside of his bathroom and leave it before go out
- Her wife helps him reach the walker

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Silvia's Bathroom

The choice for a more independent life in bathroom

Terezinha Menezes

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The actor: Silvia is 59 years old woman and in July 2002 she had a hemorrhagic aneurysm resulting into compression of the brain with consequent hemiplegia. Following discharge from a Rehabilitation Center, she lives at home with her family. **The bathroom is currently the environment that represents the main problem to be addressed in order to take control of her hygienemore independently as possible**

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The choice of Silvia

- The apartment has two bathrooms (a small one, with not accessible box shower, and a larger one, with the wash tub). After a thorough study Silvia and her family decided to change the main bathroom to create an accessible room for her needs.

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The main bathroom



- It is the spacious but the wash tub was not indicate to give Silvia's more autonomy

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The toilet bowl



- The height of toilet seating is lower than a standard; it is only 42 cm. including the toilet seat.
- It is placed against the wash tub and it is no place to transfer

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The wash tub




- The access in the wash tub is difficult. Silvia can arrive only by the front side.

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The small bathroom



- The box shower is not accessible (there is a degree high 13 cm.)
- The bidet hinders the pass

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The toilet bowl



- The toilet bowl: The bowl has a double function; as a WC and as a bidet. It is about 50 cm. high and it is provided with a front opening in order to allow the washing operations through the use of an external shower

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The box shower



- The box shower: A shower tray floor edge and a folding seat
- Silvia can use the shower chair from bedroom

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The shower chair




- Silvia transfer from wheelchair to shower chair and reach shower box push by an assistant

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The wash basin



- The washbasin: Baked clay washbasin is provide with rest for the elbows, splashboard borders and it has a particular hollow shape which allows an easier access

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The new bathroom



- The room is spacious to move inside by a wheelchair user and an assistant. Silvia now is able to use the new bathroom more safely and comfortably.


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Tina's Bathroom

After 3 years without using the bathroom, she decided that it was time to return to a more autonomous life

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New kind of life.

- She is a woman 46 years old and tries to become more independent at home.
- In 1985 she suffered a surgical complication following an operation to a severe scoliosis that led her to stay in bed for 10 years. In 1999 she became able to seat; she adopted a wheelchair and begun to seek more autonomy.

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The accesibility and to toilet bowl



- The access is impaired on the left side by the sink and on the right side by the shower box. There is no place to install support to the transfers and it is too high for the user. The height of WC should be the same as the wheelchair (it is too high).

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The toilet bowl



- The bowl has an opening at the front side, designed to help with cleaning, however, it creates instability. Tina has spastic legs and the transfer can produce contractions and she does not feels safe; she fears the empty space in front of her while attempting transfer.

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The shower box and upsetting chair



The user decided to eliminate the upsetting chair, alternatively, she's trying out a shower chair with the big wheels to be able to manoeuvre on her own.

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The shower chair with big wheels



By this way, the transfer will be done in the bedroom (bed to shower chair and shower chair to bed).

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The Sink:



The accessibility, the size, and height are considered by Tina adequate. The mixer tap is easy to handle and safe.

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The light point and electrical outlet:



- It is located too high (150 cm) and it is not accessible. To turn on the light she uses a walking stick but the electrical outlet is not usable.

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Lighting and mirror



Transfer the light point and electrical outlet at 100 cm high and at the left side of the sink because access is easier Tina is satisfied of illumination of her bathroom

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Thank you

Terezinha Menezello

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CBI – Computer Based Interviews as a tool by Peter Gregor, University of Dundee.



Computer Based Interviewing

Computer Based Interviewing for the FRR Project

Dundee University
Division of Applied Computing

Primary investigator : Dr. Norman Alm
Co-investigators : Dr. Peter Gregor, Dr. Nick Hine

Research assistants
Text questionnaire : Sian Joel
CBI with graphics : Katrina Hands
Standalone CBI and Virtual reality CBI : Kenny Morrison

 Department of Applied Computing

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Computer Based Interviewing

FRR Project – Dundee's Role

Provide computer based tools, as required, that could be used in the requirements and information gathering process

- Questions about health and mobility
- Explore the difficulties that might be experienced with various types of 'normal' toilets
- Ask opinions about new design features

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Computer Based Interviewing

Features of computer based interviewing

CBI has a 30 year history

Previously had been found to produce more complete and more honest answers when the subject matter is embarrassing

Collects information directly into a computer, for future analysis

Can be delivered using the internet

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Computer Based Interviewing

Computer Based Interviews (CBI's)


Web text-based questionnaire created

Web-based authoring and translation tool created - enabled partners to construct interviews and produce translations in their own language

Graphics produced by Landmark Designs were incorporated into a second web CBI (and standalone CBI)

The usefulness of CBI's for the FRR project purposes, and also the acceptability of using graphics to show toilet use were tested with two focus groups

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Computer Based Interviewing

User Questionnaire

Please try to imagine an ordinary toilet. What kind of difficulties do you experience when using an ordinary toilet? (If you have adapted the toilet in your private home please try to imagine a public toilet).

The toilet is too small?

1. Always
2. Often
3. Sometimes
4. Never
5. Don't know

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Computer Based Interviewing

Web-based Authoring Tool

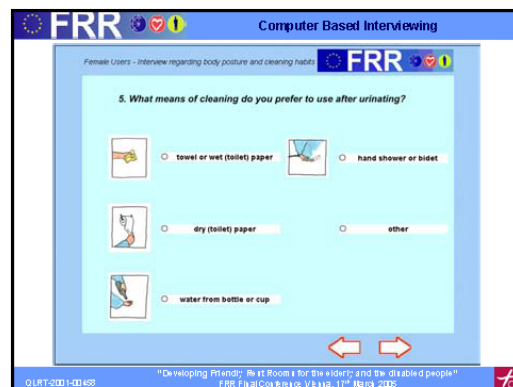
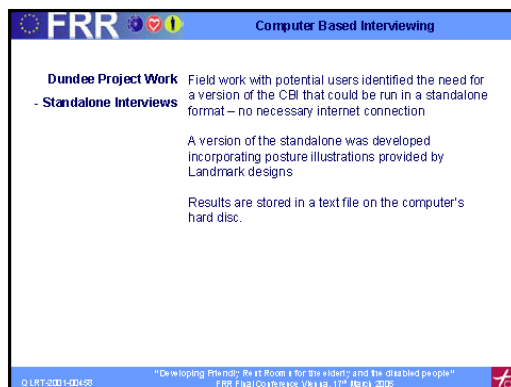
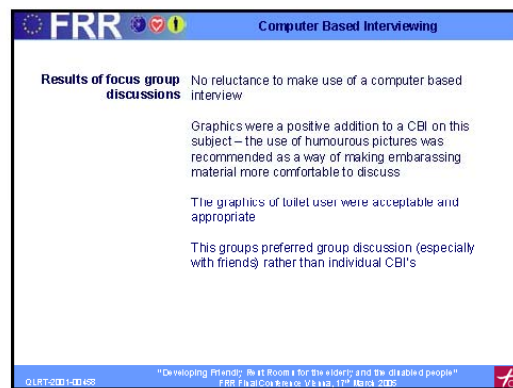
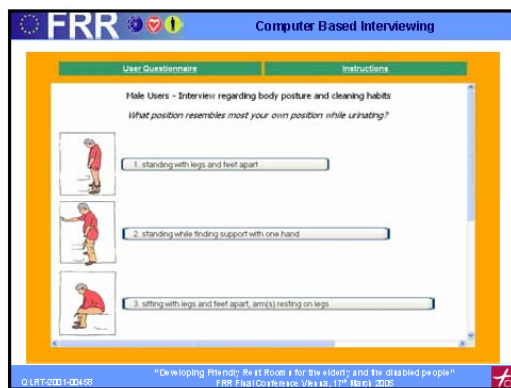
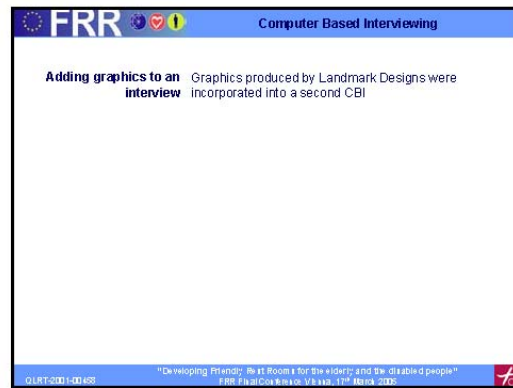
Home Master Translation Multimedia Join Format Generic User

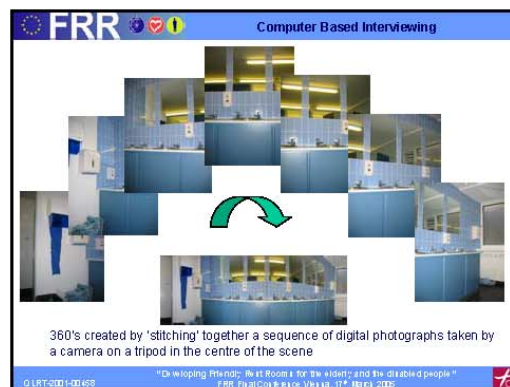
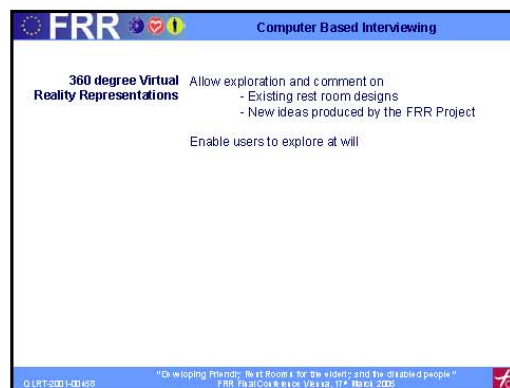
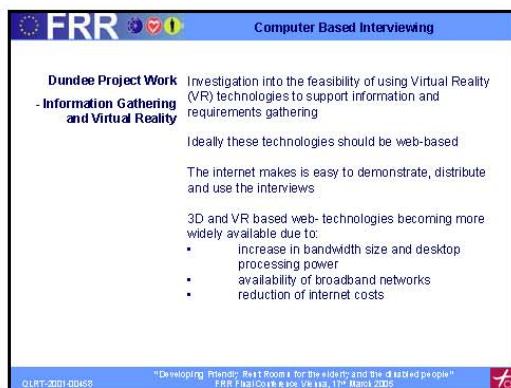
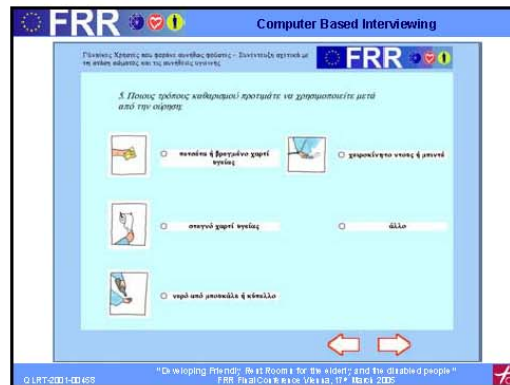
Please complete with your chosen questions

Question 1
Question 1 Possible Answer 1
Question 1 Possible Answer 2
Question 1 Possible Answer 3
Question 1 Possible Answer 4
Question 1 Possible Answer 5

Submit Master Questionnaire (Reset)

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Computer Based Interviewing

3D Virtual Reality Scenes VR technologies were investigated further as a means of information gathering

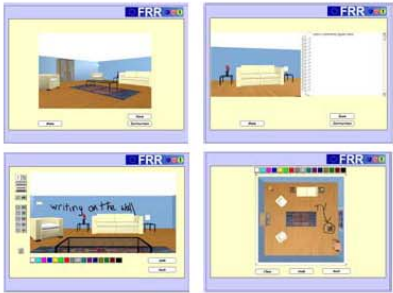
Include 3D environments where the user feels more immersed within the environment

Introduced a novel way of obtaining user-feedback

- the user first clicks with the mouse on the desired wall
- comments are then entered by keyboard typing or freehand writing using the mouse

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Computer Based Interviewing



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Computer Based Interviewing

Pilot Study Traditional paper-based interview was compared with the interactive environment

12 users were asked to select one item from the scene that they liked and one item that they didn't like from within the 'living-room' scene.

Users were instructed to record their selections and make some comments about why they liked/didn't like their selected items.

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Computer Based Interviewing

Conclusions Onscreen notepad was deemed to be the most usable and most helpful information gathering tool.

The enjoyment aspect of drawing on the walls of the scene was highlighted

It is not clear whether the ability to draw within the scene would actually benefit information gathering.

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Computer Based Interviewing

Summary Elderly people were generally unworried about talking about toilets and toilet-habits

CBI proved beneficial for gathering and storing data electronically

The feasibility of using web-based virtual reality tools to support information and requirements gathering was also explored throughout the project

- 360 degree panoramic views
- Virtual environments incorporating 3D models

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Computer Based Interviewing

Thank you....

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Purpose and Implementation of User Involvement

by Marianne Egger de Campo / Christian Dayé, EURAG

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Ziel und Praxis von User Involvement

Purpose and Implementation of User Involvement

 Marianne Egger de Campo
& Christian Dayé
European Federation of Older Persons

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Objective:

User Involvement

„To establish, to monitor and, if necessary, to criticise the process of User Involvement within the project's development.“

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What is a user ?

- **Primary-User:** Older persons or persons with (mostly physical) disabilities
- **Secondary-User:** family (carers), professional carers, doctors, therapists
- **(Tertiary-User:** Public/government offices, Insurance companies, hospitals, assistive technology enterprises etc.)


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Principle:

The development of the innovative toilet should be guided by **needs** and **wishes** of users and **not** by **business interests**.


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What is User Involvement?

- Close and direct cooperation with users (both primary and secondary users).
- Needs and Expectations of the user steer the development process.
- Development of a (technical) solution that assists users in their everyday life and improves their quality of life.

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Three main steps of User involvement

- First Step: Establishment of a cooperation structure
- Second Step: Planning of joint activities (Tests, Experts discussions etc.)
- Third Step: Probing and Evaluating the Project

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Conditions for Collaboration

- Safety
- Legally, but in particular ethically and morally safe (Informed consent procedure, confidentiality etc.)
- Cooperative Atmosphere
- As comprehensive as possible
- (For Users) efficient in time
- (For Researchers) effective in terms of meaningful coherent data

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Two Forms of Collaboration


Continuous Collaboration

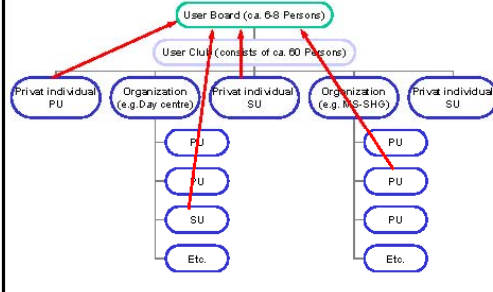
- Users accompany the Project
- Time consuming

Specific Collaboration

- Tests
- Regular Information about project's progress
- Continuity of test users

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Laboratory Tests



- Photograph from Laboratory of fortect, Vienna.


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Labortests
Information Kit

At least two weeks prior to the test each users gets:

- General Introduction
- Form for Informed Consent
- Explanation for Informed Consent
- Information about technical specifications of the prototype
- Declaration of Confidentiality


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Laboratory Tests

Script


- 1) Welcome (Room 1)
- 2) Optional: Introductory video (Room 1)
- 3) Declaration of Confidentiality (Room 1)
- 4) Demonstration (Room 2)
- 5) Instructions (Room 2)
- 6) Informed Consent (Room 2)
- 7) Test (Room 2)
- 8) Interview (Room 1)

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Methodological Principles

- **Data Triangulation** (*N. Denzin*): (multiple sources of data)
Sensordata, Interviews, video films about tests, Questionnaire, Case Studies etc.
- **Theoretical Sampling** (*Glaser/Strauss*): Conscious selection of test users according to their experience and knowledge.

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Three main steps of User involvement

- ✓ First Step: Establishment of a cooperation structure
- ✓ Second Step: Planning of joint activities (Tests, Experts discussions etc.)
- **Third Step: Probing and Evaluating the Project**

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Real Life Test





Photograph of Real life Installation at the premises of the MS-Day Centre of CS, Vienna.

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Thank you!



EURAG – European Federation of Older Persons

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Ethics in FRR

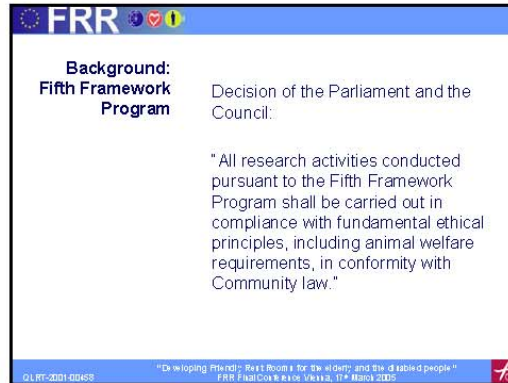
by Prof. Ina Wagner / Marjo Rauhala, TU Vienna:



Ethical Review in the FRR Project – A Continuous Process

Marjo Rauhala & Ina Wagner
Ethical Peer Review in FRR
Vienna University of Technology

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Background: Fifth Framework Program

Decision of the Parliament and the Council:

"All research activities conducted pursuant to the Fifth Framework Program shall be carried out in compliance with fundamental ethical principles, including animal welfare requirements, in conformity with Community law."

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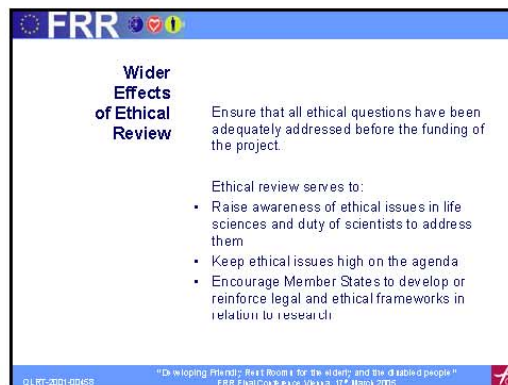


Ethical Review – Objectives

Ensure that proposers of research have:

- identified all ethical issues which the research may raise
- taken into account ethical issues in setting the experimental framework and protocols
- taken appropriate measures to fulfill all ethical and legal requirements at national level
- respected the ethical framework of the Quality of Life program

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Wider Effects of Ethical Review

Ensure that all ethical questions have been adequately addressed before the funding of the project.

Ethical review serves to:

- Raise awareness of ethical issues in life sciences and duty of scientists to address them
- Keep ethical issues high on the agenda
- Encourage Member States to develop or reinforce legal and ethical frameworks in relation to research

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The FRR Approach to Ethical Review

Empirical – Descriptive - Enlarged

- Less normative and evaluative
- Not relying solely on existing research and professional guidelines or principles of medical ethics
- Active participation, continuously addressing the ethical dimensions:
 - Special user group
 - Sensitive area of research, "taboo"
 - User-driven nature of FRR research
- Action research aspect: approach facilitates learning about ethical aspects of one's work

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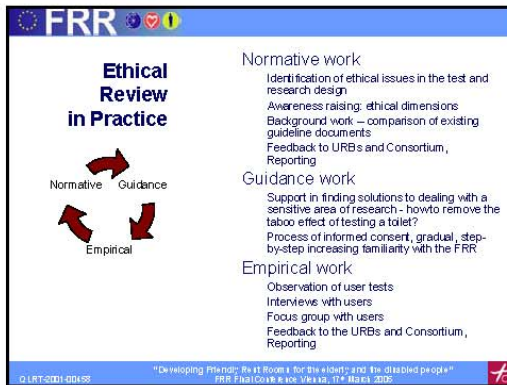
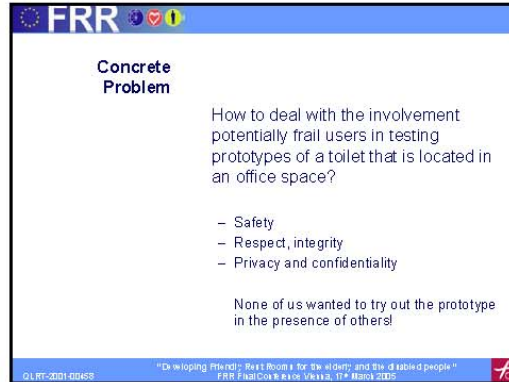


Methods

Ethnographic fieldwork

- Participation in meetings, observation of user tests
- Interviews with users and developers
- Analysis of project materials and reports

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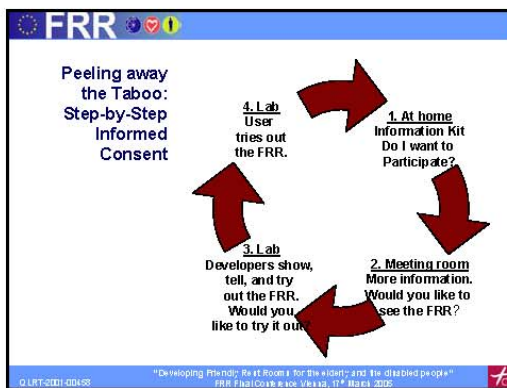
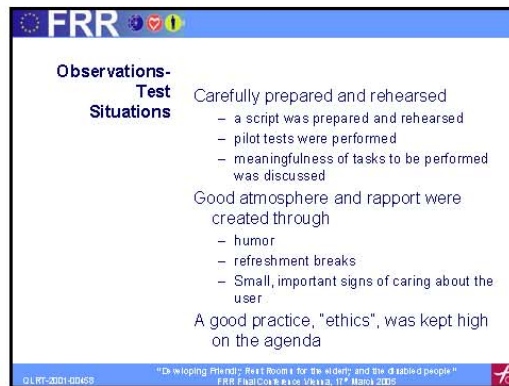
Concrete Problem

How to deal with the involvement potentially frail users in testing prototypes of a toilet that is located in an office space?

- Safety
- Respect, integrity
- Privacy and confidentiality

None of us wanted to try out the prototype in the presence of others!

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Observations-Test Situations

Carefully prepared and rehearsed

- a script was prepared and rehearsed
- pilot tests were performed
- meaningfulness of tasks to be performed was discussed

Good atmosphere and rapport were created through

- humor
- refreshment breaks
- Small, important signs of caring about the user

A good practice, "ethics", was kept high on the agenda

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Observations - Participants Displayed

Trust in the project, institutes and developers

- open, active, courageous participants
- "This could be embarrassing, but everything has always been handled delicately."
- "There are no secrets here."

Confidence

- Felt confident giving feedback: "If it is made for us it must be made properly."

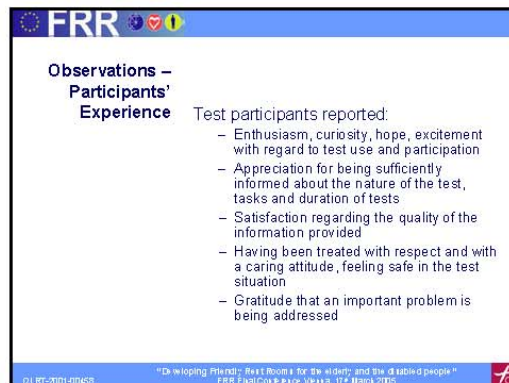
Well-being in the test situation:

- Spontaneous comment: "It is really great here with you."
- "This is fun."
- "I have felt safe and important here."

Understanding the limits of benefit

- "I am doing this to benefit future pensioners, like you."

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Observations - Participants' Experience

Test participants reported:

- Enthusiasm, curiosity, hope, excitement with regard to test use and participation
- Appreciation for being sufficiently informed about the nature of the test, tasks and duration of tests
- Satisfaction regarding the quality of the information provided
- Having been treated with respect and with a caring attitude, feeling safe in the test situation
- Gratitude that an important problem is being addressed

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Feedback on Informed Consent Procedure

"I liked the information very much. It was serious and important."

"Information gives a good feeling and it needs to be provided for the users in advance."

"We were always very well informed."

"We were always asked if everything was ok."

"I found it good that I was told how long the test would take and that I was reminded that it is the prototype, not me, that is being tested"

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Despite all our efforts...

...to act responsibly toward the users and their needs, protect their integrity, privacy and wellbeing, good preparation of users and ourselves...

...the unexpected can happen, as the test situation can:

- trigger an emotional response - it can be a reminder of one's disability or of loss of autonomy
- be physically strenuous (many transfers)
- be interpreted by the test persons as a test of their capacities ("how many did I get right?")

Additional challenge:

There is limited control in presenting the project outside the consortium

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Prototypen-Test: „Toiletten mit Hirn“!

Der Gang aufs WC stellt für viele Menschen mit physischer Behinderung ein Problem dar. Damit das „unsterbliche Bedürfnis“ keine unumstößliche Anforderung mehr kostet, forscht die TU-Wien nun an einer „intelligenten“ Toilette. Das Berichtsjahr berichtet exklusiv vom ersten „Probierrenn“!

von Ina Wagner

dem Verfahren sorgt ein voll automatisches Reinigungssystem für optimale Hygiene, und die vielen mechanischen Hilfsysteme der intelligenten Toilette führen wieder in einen sauberen, entspannten Zustand zurück. Was die technologischen Herausforderungen betrifft, so konnten beherrschbare „Low- und High-Tech-Konzepte“ realisiert werden. Ein gemeinsames Element mit Sprachsteuerung, Bewegungserkennung, Sensorik und moderner Robotertechnik. Ob die Behinderung dieser Toilette auch verstanden wird, erforscht man

gunde mit umfangreichen Anwender-Tests. Beim ersten Probierrenn im Versuchslabor gab's lediglich mit der Fernbedienung (klunkende) Probleme. Der person Franz Beck sprach. Die Funktion der Behinderungsmomente an der WC-Einstellung ist auch nicht ganz eindeutig. – Sozusagen funktioniert's aber ganz gut: Die Person ergab: „Vor allem bei den Testpersonen sehr gut an.“ Und: Schon im Herbst wollen wir den endgültigen Prototypus in einem Caritas-Staatskloster installieren.

Das Forschungsprojekt wird von 11 Partnern aus 10 EU-Ländern durchgeführt. Mehr Informationen zur Sanifaccon Toilette: www.sanifaccon.at/alter

Erst Blick hinter das erste Labor-Prototypensystem der neuen intelligenten Toilette – speziell auf ihre und ihren

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Despite all our efforts...

...to create a good research practice within the project, a common approach to ethics, persons external to the project's culture do not necessarily share the practice or respect the common guidelines, or a commitment to protect participants' interests.

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Concluding Thoughts

Ethical peer review helped put ethical questions continuously on the agenda of the FRR project.

It appeared to raise project workers' awareness of ethical issues in their work. Was considered "useful".

Informed consent procedure a tangible and probably lasting input for future work with users.

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Thank you for your attention!

Marjo Rauhala & Ina Wagner

Ethical Peer Review in FRR

Vienna University of Technology

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Engineering and Manufacturing the Final FRR Prototype according to the User Needs

by Attila Rist, CSO, Debrecen

FRR  **Friendly Restroom**

Components:

- Door
- Body support bars
- Vertical bars
- Safety Handle
- Transfer surface
- Korm. Unit
- Kontainer
- LWC with all options



[End](#)

CLEAN SOLUTION KFT. Web: <http://www.cstechnologie.com>; Email: cs@cstechnologie.com
Tel.: +36 62 536 325; Fax: +36 62 536 326

FRR  **Friendly Restroom**

Door



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FRR  **Friendly Restroom**

Body support bars



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FRR  **Friendly Restroom**

Vertical bars



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FRR  **Friendly Restroom**

Safety handle



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FRR  **Friendly Restroom**

Transfer surface



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FRR

Friendly Restroom

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Tel: +36 62 636 326; Fax: +36 62 636 326

Rock





Forrest Restroom

LWC with all options



Transfer surface



Vertical bars



Certain Wellness functions

Back support



Bidet



Hygiene options

Cleano-LiftWC



Cleano



Technical Data:

CLEAN SOLUTION KFT.

Web: <http://www.csstechnologie.com>; Email: cs@csstechnologie.com

Tel: +36 52 536 325; Fax: +36 52 536 325

Back



FRR

Friendly Restroom

Technical Data

Maße: 1450/825 (HxB)

Kübelnverstellung: 400-770 mm

Schließabzug: 2° - 10°

Wasserschliff: DN 100

Wasserschliff Øber: G 1/2"

Bohrweite: 116/131/141

Sprünkschliff: 230/60 Hz, 16A

Antriebsstromversorgung: 24VDC



1. Neigung mechanisch
2. Neigung motor
3. Wasserschliffschlüssel
4. Antrieb motor
5. Elektrik 1-2
6. Stromanschluss
7. Kabel
8. Spülung
9. (unlabeled)

Foot

CLEAN SOLUTION KFT.

Web: <http://www.ostechnologie.com>, Email: cs@ostechnologie.com

Tel. +36 52 536 325, Fax: +36 52 536 326

FRR

Friendly Restroom

GM

- + transfer seat
- + Vertical bars

Rock

CLEAN SOLUTION KFT.

Web: <http://www.cstechnologie.com>, Email: cs@cstechnologie.com
 Tel: +36 63 676 378 Fax: +36 63 676 385







Friendly Restroom

Grund Modul + Bidet (für Pflege und weisses function)










Eck

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Research in and Design of Toilet Supports and Means for Perineal Cleansing


by Sonja Buzink & Dries Dekker, TU Delft

FRR  **TU Delft** - Faculty of Industrial Design Engineering

**Research in and Design of
Toilet Supports
&
Means for Perineal Cleansing**


by D. Dekker MSc & S.N. Buzink MSc

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FRR  **TU Delft** - Faculty of Industrial Design Engineering

This presentation Usability studies by URB Delft

- Comfort toilet seats
- Usage & preferences for supports
- Usage & preferences for perineal cleansing

Results of these studies
Implementation of results in FRR designs

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The test environment Do-It-Yourself store Delft



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The test environment Usability laboratory at TUD

Means for perineal cleansing:


- Several types of support
- Model washbasin concept



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Pre-test 5 Students
Old age simulation gear



Cataract Glasses
Knee Braces
Ankle braces
Elbow braces
Wrist weights
Wrist braces
Sport tape
Rubber gloves
Ankle weights

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Usage different types of supports Sitting down
Standing up



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Usage means for perineal cleansing

Toilet paper
Sprayer & Blower

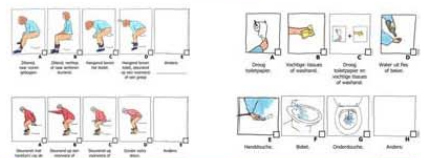


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Questionnaires

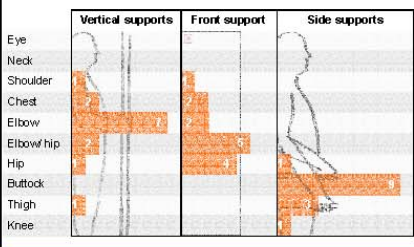
Common toilet postures
Means for perineal cleansing:

- Common used
- Experience
- Preference



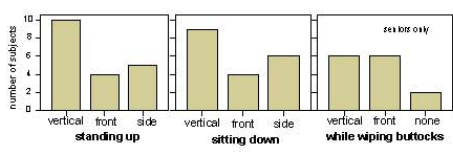
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Results Preferences positions per type of support



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Results Preferences for type of support per activity



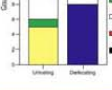
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Results Postures perineal cleansing

Observed postures



Declared common postures




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Implementation results research in design

Toilet seat
Transfer surfaces



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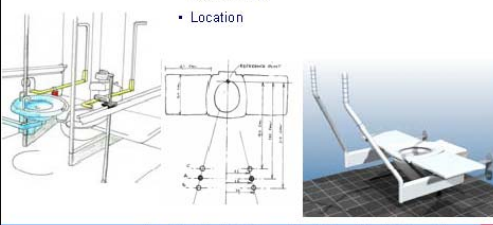


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Implementation results research in design

Supports

- Type
- Dimensions
- Location



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Implementation results research in design

Washbasin





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Implementation results research in design

Digital model FRR

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Conclusions

Usability research in multiple stages very valuable to provide guidance and remove uncertainties in design process
 Combination of observational research and questionnaires very valuable
 More research necessary to answer remaining and new design questions on influential factors on toilet behaviour and preferences of elderly users, both for toilet supports and perineal cleansing

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Design of Flexible User Interface Demonstrator, Control Software and Sensors

by Hakan Neveryd, CERTEC, Lund Univ. & Paul Panek, FORTEC, TU Vienna:

FRR User Interface, Sensors and Control Software

Design of a Flexible User Interface Demonstrator, Control Software and Sensors

Editors: Paul Panek¹⁾ & Håkan Neveryd²⁾

Contributors: Georg Edelmayer¹⁾, Håkan Efring²⁾, Gunilla Knall²⁾, Charlotte Magnusson²⁾, Peter Mayer¹⁾

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frr@certec.lth.se

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FRR User Interface, Sensors and Control Software

Overview

- Motivation & Purpose
- User Interface Demonstrator
- Sensors
- Control Software
- Findings and Conclusion

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FRR User Interface, Sensors and Control Software

Why UI, Sensors and Control Software?

The FRR concept aims at a toilet which automatically adjusts to the individual needs of elderly persons with functional limitations and/or persons with disabilities.

Adjustability of many elements requires an appropriate user interface

Automatic Adjustability requires

- means to recognise current status and current activities and intentions of the user
- an intelligent unit which can interpret different input signals and can steer the whole system

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FRR User Interface, Sensors and Control Software

Don't forget

It is **not** about finding out how much technology can be packed into a laboratory toilet system

It **is about** investigating which new approaches are useful and promising **from the users' point of view** in order to contribute to the main objective of the project: to allow the users to gain greater autonomy, independence, self-esteem, dignity, safety, improved self-care, to enjoy a better quality of life

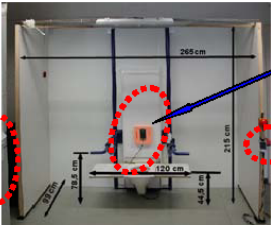
UI, Sensors and Control SW provide means to contribute to this

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FRR User Interface, Sensors and Control Software

Where is it located?

User Interface, Sensors, Control SW



Control Software running on a PC located in a control room very next to toilet room

Sensors

User Interface on hand held computer (PDA)

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FRR User Interface, Sensors and Control Software

Flexible User Interface Demonstrator


PDA (Personal Digital Assistant) was used as an input device, as it is the size of a conventional handheld device

Overview mode (providing an overview, but showing fairly small icons)

Large mode (showing only a few icons, but allowing for the use of big icons)

Scanning mode, acoustic feedback in Greek, Italian, Swedish, German, English

XML based control interface to FRR control unit



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FRR User Interface, Sensors and Control Software

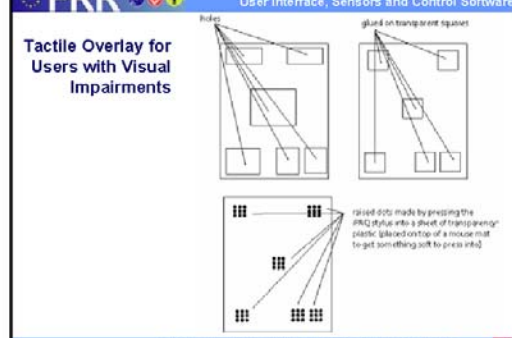
Screen Shots from user interface demonstrator. Left picture shows the conventional remote control



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FRR User Interface, Sensors and Control Software

Tactile Overlay for Users with Visual Impairments



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FRR User Interface, Sensors and Control Software

Sensors

What do we need sensors for?

- to find out the toilet's current position,
- to identify the user (and his/her preferences)
- to recognise his/her intentions (e.g. to sit down / to stand up)
- to recognise emergency situations

Examples of used sensors:

- 2 Position Sensor (height and tilt of bowl)
- Load cells, force sensitive resistors = pressure sensors, Force strain gauge sensors
- Ultra Sonic Distance Sensor
- Optical Fall Sensor
- Volume Level Sensor (Microphone) for triggering emergency call

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FRR User Interface, Sensors and Control Software

Sensors at toilet



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FRR User Interface, Sensors and Control Software

Sensors for User Identification

There are various technologies for user identification available. We are using contactless smart cards based on RFID (Radio Frequency Identification)

RFID technology allows to store and recall users' preferences in a contact less way (up to 70 cm)



The FRR smart cards currently do have credit card format, but also can be integrated in mobile phones, watches, keys, pieces of jewellery

The smart cards significantly contribute to the (self) adaptability feature of the FRR system

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FRR User Interface, Sensors and Control Software

Sensors for monitoring user's activities

Can we detect what the user is doing?

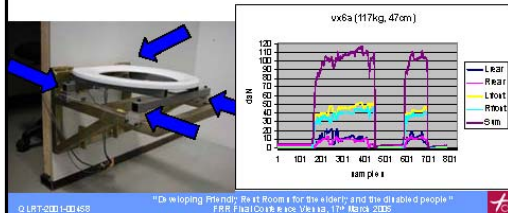
E.g. sitting down / Standing up

We can – e.g. by using side effects: if a user sits down – the tilt of bowl will increase

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Sensors for sitting position

In a lab test 4 sensors (Force Sensitive Resistors) were measuring the distribution of weight. In future it might be possible to detect if a user sits on a seat which is too high or too low.



vx6s (117kg, 47cm)

GSM

min

1 101 201 301 401 501 601 701 801

— Lear — Rear — Lfoot — Rfoot — Stim

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Fall Sensor

Laboratory Sensor System to recognise falls in the toilet room and to trigger an emergency call

Features

- Optical sensor with motion detection
- Binary output: fall has happened / has not happened
- Needs information if somebody is in the room or not
- Self adapting to the equipment mounted in the toilet

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Control Software

Currently running on a PC with WindowsXP located near the toilet, later to be implemented as embedded system


Gets data from other FRR modules (user interface module, sensors, smart cards, voice input module)

Interprets data and

Steers the toilet via link to embedded microprocessor board in toilet

Stores and recalls the users' preferred settings

Continuous logging functionality including synchronisation with the optional video recording



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Control Software: Voice Output

Gives acoustic information to inform the users about current situation and future activities of the toilet.

Can also be used for prompting, for guiding the user

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Control Software: Voice Control

Voice control (height, tilt, flush, light, alarm,...)

Speaker independent

command space

Reliability

Requirements to be fulfilled: loudness of user's voice, background noise, length of command words, cognitive load to remember words

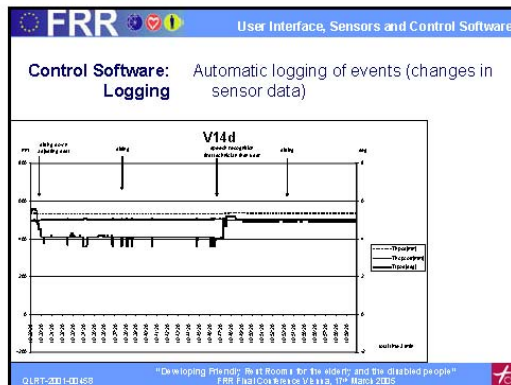
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Control Software: Remote Access

Allows the maintaining agency to access the FRR control unit from remote via the internet

Was successfully used during the FRR real life test at Caritas Socialis (based on a protocol from a previous EU funded project FP4/TAP DE4208 RESORT)

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FRR User Interface, Sensors and Control Software

Use Case: FRR contact-less smart card

User finds the toilet already well adjusted to be his/her preferred toilet
Individually preferred height, tilt
Preferred language for voice control & voice output
Activation / deactivation of all settings, e.g.: fall sensor, alarm call, voice control, voice output, weight sensors etc



FRR Smart Cards used during laboratory tests


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FRR User Interface, Sensors and Control Software

Use Case: FRR Voice Control

The toilet provides the missing "third hand" to the secondary user.

Typical: e.g. when using both hands for assisting during a transfer.



Microphone for Voice Control

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FRR User Interface, Sensors and Control Software

Use Case: Voice Output

FRR Voice Output

The toilet provides a cognitive orthosis

Could enhance autonomy of persons with mild dementia

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FRR User Interface, Sensors and Control Software

Findings & Discussion: Voice Control

- Works better than expected
- Is better accepted by old users than expected
- Technology not mature but promising
- Only laboratory tests
- Knock out criteria: volume of voice, background noise, high learnability
- Safety considerations

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FRR User Interface, Sensors and Control Software

Findings & Discussion: Touch Screen User Interface Demonstrator


- Works well
- Audio feedback of great value
- Scalability (including language settings)
- Only demonstrator for laboratory (hygiene)
- Larger Touch sensitive area requested

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FRR User Interface, Sensors and Control Software

Findings & Discussion: Contactless Smart Cards

- Powerful tool for personalisation
- Absolutely easy to be used
- Authentication (like Euro key)
- But could be forgotten
- Limited Range of detection



FRR Smart Cards used during real life test at Caritas Socialis day care centre

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FRR User Interface, Sensors and Control Software

Findings & Discussion: Sensors

- Fall sensor is very promising and needed
- Some user activities (sitting down / standing up) can be derived from tilt position sensor
- Low cost sensors (approx 1 Euro / unit) are promising and easy to be mounted
- Sensors should be seen as an option

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FRR User Interface, Sensors and Control Software

Conclusion

- Several new approaches have been implemented and evaluated by users
- Feasibility has been demonstrated and in most cases the usefulness was evaluated positively, especially regarding
 - adjustability of height and tilt of toilet,
 - flexible user interface,
 - voice control,
 - self adaptability of FRR system based on Smart Cards.
- Still "some" work is left for future projects, e.g. regarding Reliability, Safety and Hygiene

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FRR User Interface, Sensors and Control Software

Thank you

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Overview about iterative prototype generations at the 5 test sites in Vienna, Lund, Athens, Delft and Milan

by Paul Panek, FORTEC, TU Vienna:

Overview about Iterative Prototype Generations at the 5 test sites in Athens, Delft, Lund, Milan and Vienna

Editor: Paul Panek, fortec (TU Vienna, Austria)
fr@fortec.tuwien.ac.at

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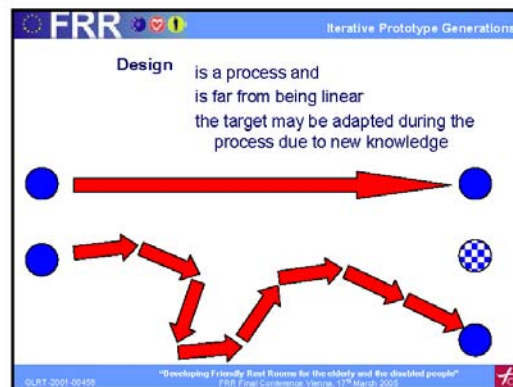
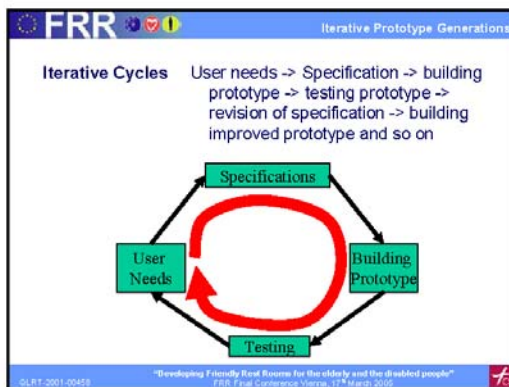
Overview

Why Iterative Prototypes? User Centred Iterative Design and Development

Examples of iterative design activities in FRR project


The 5 different test sites and their individual focus and prototypes

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New Type of Seat

a first vague idea was presented during kick of meeting (03/2002): "sitting board" from the Middle Ages might be good for improving stability



Usage for transfer (Hultling and Levi, 1995)




1st demonstrations

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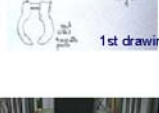
New Type of Seat

"Transfer"

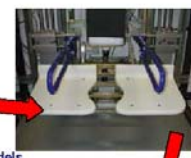
1st design drawings




1st drawings



1st wooden models



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FRR  Iterative Prototype Generations

New Type of Seat - Implementations

User tests - Space for personal belongings

Rethinking width of seat

Production of improved seats for lab prototypes

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FRR  Iterative Prototype Generations

New Type of Seat

Discussion with experts in Austria - Idea: smaller version of seat

Design of smaller seat

Combining seat with another FRR module: the vertical bars

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FRR  Iterative Prototype Generations

Summary

Several prototypes of the new seat were designed and fabricated and each step was tested by users

Doing this several new ideas have come up and were added

This enabled the consortium to come up with flexible solutions which also take into account different user needs and existing external limitations (lack of space in toilet room) in this way increasing the exploitability of the project's outcome


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FRR  Iterative Prototype Generations

Examples where we had to try again

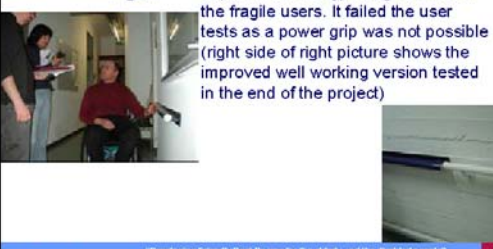


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FRR  Iterative Prototype Generations

Examples where we had to try again

A new type of a „wall mounted body support bar“ was developed intending to provide some type of guidance for the fragile users. It failed the user tests as a power grip was not possible (right side of right picture shows the improved well working version tested in the end of the project)



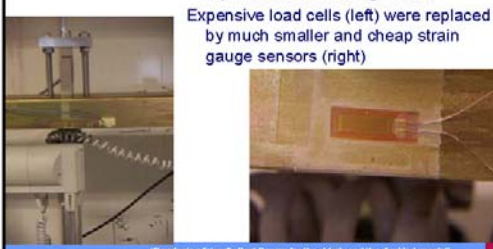
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FRR  Iterative Prototype Generations

Examples where we had to try again

Some types of sensors for measuring user's activities needed to be replaced due to too high costs


Expensive load cells (left) were replaced by much smaller and cheap strain gauge sensors (right)



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Test Sites of FRR Project

Athens, GR
Delft, NL
Lund, SE
Milan, IT
Vienna, AT



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Test Sites and FRR Components

According to the expertise, resources and available local user groups Each FRR test site has focussed on specific topics. Not all FRR components were tested at all sites. An overall coordination ensured that the outcomes fit together

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Different Test Environments and Settings

Different Environments (Examples):
With water // without water
booth in lab // Container // Complete toilet room // Field test in Real Life
Horizontal versus vertical prototypes

Different focus in User Groups (Examples):
Elderly
MS Patients
Wheelchair Users
Visually Impaired

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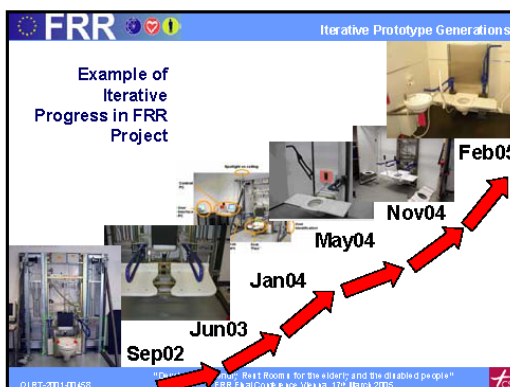
PersonTests per Prototype Generation

Prototype Generation	AT	SE	GR	IT	NL	
1st (EPT)	12	12	8	-	-	32
2nd (APT)	19	14	9	-	-	42
3rd (labBPT)	5	7	-	-	-	12
4th (BPT)	12	11	10	8	15	56
5th (PPT & Field test)	41 (#)	10	33	10	19	113
PersonTests	89	54	60	18	34	255

#) During field test in Vienna the 29 primary users carried out 316 toilet sessions

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Example of Iterative Progress in FRR Project



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Thank you

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Toilet Design for Visually Impaired Persons



by Hakan Neveryd, CERTEC, Lund Univ.:

 **FRR** 

Toilet design for visually impaired elderly persons

Håkan Neveryd
Lund University, Sweden

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Visual impairment

- Macula degeneration
- Glaucoma
- Cataract
- Diabetes
-



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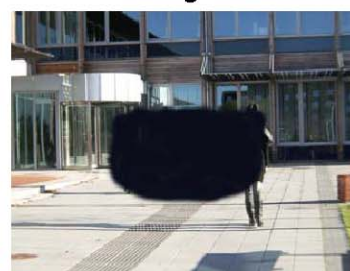
Normal Vision





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Macula degeneration



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Glaucoma



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Cataract



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Diabetes



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Orientation

1. Know where you are
2. Find the way to the goal
3. Understand when you have reached the goal

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Requirement for orientation

- General view of the environment
- Landmarks (beacons) in the environment
- No confusing parts in the environment
- Reduced the number of risks

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Statement (1)

Many visually impaired have difficulties to observe the differences on

colours

OR

some colours

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Statement (2)

- No recommendations of colour or colour combinations.
- The most important things are the combination between black and white in the environment

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How to facilitate the orientation

- Using contrasting colours
- Most important for visually impaired is using lightness contrast
- Using a "sufficiently" level of illumination

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Two simple and important tools

- NCS scale
- Luxmeter

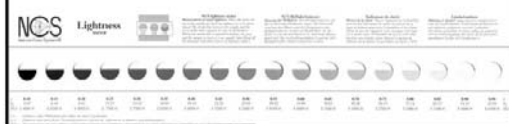
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NCS scale

Using the differences in the grey scale

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NCS scale



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Using NCS scale

1. Put the lightness meter on the test surface you wish to measure
2. Determine which of the lightness meters grey samples corresponds best with the test surface. Peer with your eyes.
3. Read the v factor
4. Repeat 1, 2 and 3 for the other test surface
5. A difference in 0,40 or more is acceptable for visually impaired

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Luxmeter

- Measuring the illuminance in Lux
- Recommended level 300 lux in rest rooms for the elderly

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Luxmeter



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The way to the rest room

- Orientation assistance in the floor
- Remark the red doors in the end of the corridor



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Stairs



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Recommendations (1)

- Choose material with high lightness on walls with windows and the window frame to decrease the risk for dazzling from the windows.
- No big mirrors but

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Entrée



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Recommendations (2)

- Use different lightness contrast on

door - door handle

wall - door frame



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Recommendations (3)

- Darker floor than walls
- Floor/wall and wall/ceiling "can" be delimited by a strip in a divergent lightness




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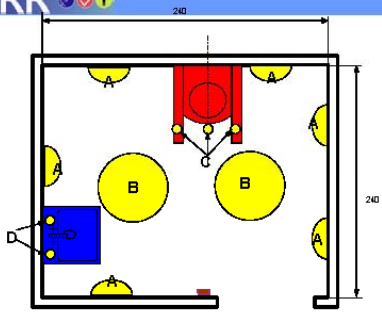
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Recommendations (4)


- Indirect light
- Frosted glass on the globe/lamp chimney
- Individual level of the illumination



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Positions in the rest room were a high level of illuminance are recommended

- Entrance
- Toilet
- Sink

For both sitting and standing people

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A last recommendation

At least 2 lamps
Why?
If one is not working!!!!
Advice: 2 different circuits!!!!

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Thank you!!!!!!

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Results from Athens - including report about sequence of testing and used material

by Panayota Sourtzi, HAGG & University of Athens:

FRR Partner European Institute for Rest Room Aid

Testing the FRR prototype system in URB Athens – including report about sequence of testing and used material

P. Sourtzi
Hellenic Association of Gerontology and Geriatrics
&
Faculty of Nursing,
University of Athens

ΕΘΝΙΚΟΝ & ΚΑΠΟΔΙΣΤΡΙΑΚΟΝ ΠΑΝΕΠΙΣΤΗΜΙΟΝ ΑΘΗΝΩΝ
NATIONAL & KAPODISTRIAN UNIVERSITY OF ATHENS

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FRR prototype Tests

EPT (Engineering ProtoType) tests (February 2003)

APT: Alpha ProtoType tests (September 2003)

BPT: Beta ProtoType tests (June 2004)

PPPT: PreProduction ProtoType tests (December 2004-February 2005)

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EPT in URB Athens

EPT components:

- Common toilet seat
- 2 horizontal grip bars
- moving toilet bowl
- moving washbasin
- full functioning toilet
- in a smaller than required room

Number of users: 8

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APT in URB Athens

APT components:

- Basic Lift – W/C
- Mounting grid for toilet seat designs
- 3 different toilet seats "Basic", "Flexible" and "Transfer"
- horizontal grab bars
- movement cont

Number of users: 9

"Flexible" seat

"Basic" seat

"Transfer" seat

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BPT components

The BPT components we have tested in URB Athens are the following:

- 1) Toilet seat and transfer seat
- 2) Horizontal grip bars
- 3) Wall mounted body support bar
- 4) Waste container(s)
- 5) Accessibility sign
- 6) The user interface

Number of users: 10

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PPPT components

The PPPT components we have tested in URB Athens are the following:

- 1) Toilet seat and transfer seat
- 2) Vertical grip bars
- 3) Wall mounted body support bar
- 4) Accessibility sign
- 5) Toilet room
- 6) Storage place

Number of users:
22 primary
11 secondary

PPPT

Accessibility sign

Wall mounted body support bar

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Tests persons recruitment

-Primary users:

Elderly people from KAPi (Centres for old or people) or from the researchers' corresponding milieu

Disabled people with movement difficulties

-Secondary users:

Nurses
Occupational therapists
Physiotherapists

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Experiences of testing: Older People

The testing procedure was very interesting to most of the users.

The prototype seemed to be:

Interesting, with many features and very helpful
Very innovative and up-to-date

but also,

Probably expensive
Complicated to some users due to some difficulty in use
"Too good to be true"

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Experiences of testing: People with disabilities

The testing procedure was very interesting to most of the users

The prototype seemed to be:

New and innovative, very interesting, and useful to their needs

But

They need more features to be provided when they use the prototype

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Experiences of testing: Secondary users

The testing procedure was more demanding to most of the secondary users

The prototype seemed to be:

New and innovative, very interesting, and useful to the needs of people who care for

But

They felt that it would be difficult for such device to be widely available

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Experiences of the research team

- *Working with people with different abilities*
- *Gaining knowledge about what test persons need, think and feel about their difficulties in daily life*
- *Managing difficulties during interaction with test persons and prototypes*
- *Working in a multidisciplinary group*
- *Collaborating successfully with other URBs from different scientific and cultures*

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The Final FRR Container final design

by Renate de Bruin, TU Delft:

Real life test at a day care centre, Results of the validation phase

by Nadia Gentile & Christian Dayé, EURAG:

FRR  **EURAG – Bund der Älteren Generation Europas**

FRR-Feldtest
Erprobung in der Praxis eines Tageszentrums

Real life test at a day care centre

Nadia Gentile & Christian Dayé
EURAG – Bund der Älteren Generation Europas

Contribution from
Georg Edlmayer, Peter Mayer, Paul Pankel
Fotoc (TU Wien)



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Warum ein Feldtest?

Ziele

- Detaillierte Daten über die konkrete Verwendung der neuen Toilette in der Praxis des MS Tageszentrums erheben
- Grad der Zufriedenheit der Anwender mit dem FRR Prototypen erheben
- Hinweise für zukünftige Entwicklungsrichtungen erhalten




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Hauptziele
Wunschergebnisse

- FRR Toilette ist sicher (Problem- und Unfallvermeidung)
- FRR fördert die Selbstständigkeit der Benutzer
- FRR unterstützt/entlastet Pflegepersonal (SU)
- Benutzer (PU) sind mit dem FRR zufrieden
- Nutzen des Feldtestes ist für alle Beteiligten erkennbar

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Zeit/Dauer

Idee
Feb 04

Klärung, Planung, Finanzierung, ...

Detaillplanung
Okt 04

Umbau, Einschulung, Start
Dez 04

Feldtest
Feb 05

1 Jahr

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Methoden/ Data Triangulation

- Teilnehmende Beobachtung und Fieldnotes (12 Tage, Nov04-Jan05)
- Interviews mit TG und Personal
- Beobachtungsblätter für Mitarbeiter
- ADL-Skala für TG
- ID Karten und LOG FILES
- Fragebogen zur Zufriedenheit



Heute: Blitzlichter aus 1. Datenauswertung
Vertiefung/weitere Vergleiche möglich.

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Teilnehmer

- ID-Karten für alle SU und 29 PU/Tagesgäste
- 22 W, 7 M
- zw. 39 und 79 J. (Schnitt 57 J.)

23 davon wurden vom PC „detektiert“, d.h. es gibt PC-Aufzeichnungen über Einstellungen bei der Benutzung.

- ADL= durchschnittlich 4,5
- 14 benutzen Rollstuhl, 3 Krücken, 6 Rollator, 2 Rollmobil, 4 keine Hilfsmittel, 7 Transfer mit Hilfe von 1-2 SU.




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FRR  **EURAG – Bund der Älteren Generation Europas**

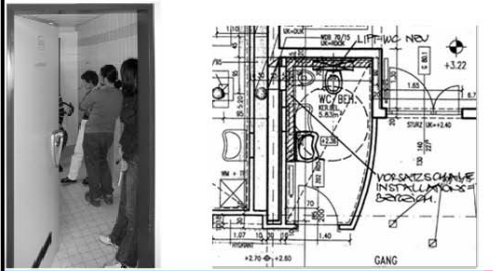
Installation



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Toilette - Raum



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Komponenten



- Einstellbare Toilette: Neigung (0 bis 6,5 Grad nach vorne) und Höhe der Toilette (43 to 75 cm). Zwei horizontale Grifftützen die hochgeklappt werden können
- Handfernsteuerung (6 Tasten für: Höhe hinauf/hinunter, Neigung nach vorne /zurück, Spülung, Alarm)
- Modul zur Benutzeridentifikation; 60 FRR „smart cards“
- Neuer Türgriff außen (designed by Landmark)
- Sensoren zum Messen von aktueller Höhe und Neigung, Status der Taster an der Fernsteuerung, Status der Tür und des Alarmsystems
- PC mit Software für Datenaufnahme und Speicherung, Fernwartung und Abfrage der Daten über LAN/Internet

(Anmerkung: Nur passives Aufnehmen der Daten, keine aktive Beeinflussung der Toilette)

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Erste Ergebnisse aus den aufgenommenen Daten

- Dauer: 22. Dez. 2004 bis 18. Feb. 2005
- 39 Tage (netto) numerisch ausgewertet
- 30 FRR Karten für Benutzer
- 24 FRR Karten für „Primary“ Benutzer
- 6 FRR Karten für „Secondary“ Benutzer
- 316 Benutzungen der Toilette
- 149 (47%) davon einer FRR Karte (und damit einem spezifischen Benutzer) zugeordnet.
- Toilettenbenutzungen pro Tag
 - 8,10 Durchschnitt
 - 2 Minimum
 - 14 Maximum

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Bereich der Verstellbarkeit von Höhe und Neigung

Wird der Bereich der möglichen Verstellbarkeit im täglichen Gebrauch tatsächlich genutzt?

Höhe der Toilettmuschel:



- Mögliche Verstellbarkeit: 43,8 bis 75,8 cm
- Minimale verwendete Höhe: 43,8 cm
- Maximale verwendete Höhe: 67,9 cm

QLRT-2001-00458 "Developing Friendly Rest Rooms for the elderly and the disabled people" FRR Final Conference Vienna, 17th March 2005

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Bereich der Verstellbarkeit von Höhe und Neigung

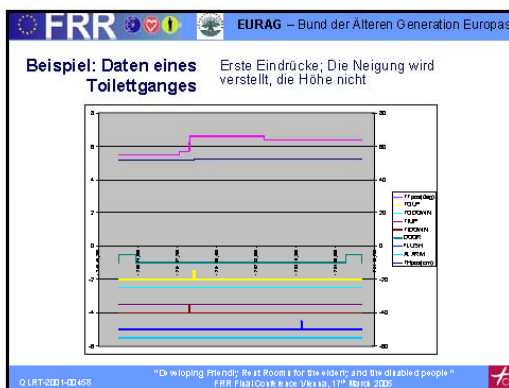
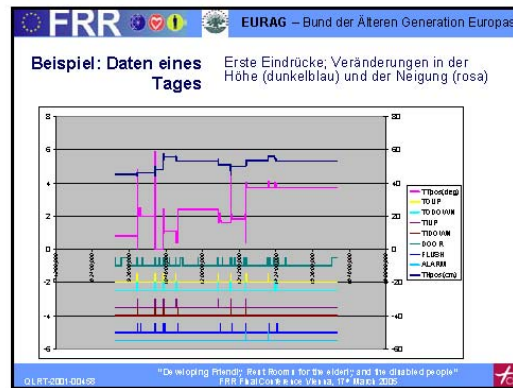
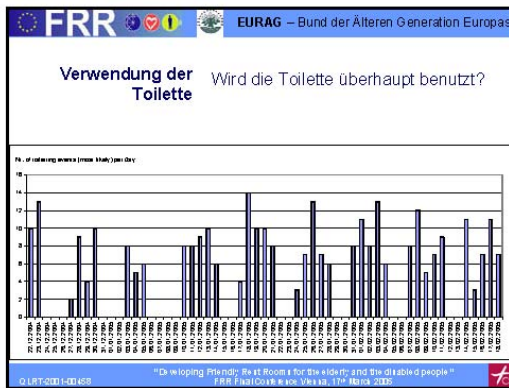
Wird der Bereich der möglichen Verstellbarkeit im täglichen Gebrauch tatsächlich genutzt?

Neigung der Toilettmuschel:



- Mögliche Verstellbarkeit: 0 bis 6,5 Grad
- Minimale verwendete Neigung: 0 Grad
- Maximale verwendete Neigung: 6,5 Grad

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FRR



EURAG – Bund der Älteren Generation Europas

**Infomappen,
Einverständniserklärung
& Sicherheit**

- Informed consent
procedure**
für PU und SU
- Safety of system




OLIT2001-00459

"Developing Friendly Rest Rooms for the elderly and the disabled people"
 FRB Final Conference, 1999, 17th March 2000



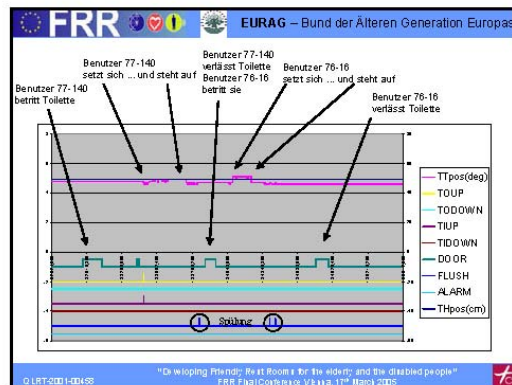



Information Tagesgäste

Einverständnis



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„Ich würde das Klo am liebsten mit nach Hause nehmen ...“

Transfer mit FRR: **hohe Kosten – hoher Nutzen (3)**

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Transfer mit FRR: **hohe Kosten – hoher Nutzen (4)**

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Waschbecken: zu groß



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Transfer mit FRR (2 Beispiel): **zu hohe Kosten**



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Höhenverstellbarkeit/ Neigung




- User haben Bodenkontakt = **GUT, gibt Sicherheit, unterstützt Handlungen**
- Transfer **leichter**, zB höher stellen für Transfer, danach tiefer, damit die Beine den Boden berühren können.
- **allg. nützlich**

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Fernbedienung



- Kommt allg. „gut“ an, „der rote Knopf“...
- mehr Selbstständigkeit (zB auch Schwesternruf selbst betätigen)
- um etwas vom Boden aufzuheben

Verbesserung

- Größe, Handlichkeit, Befestigung/Stabilität



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Horizontale Griffe



zu weit auseinander, zu eng ideal zu kurz, zu lang....

Ideal: verstellbar und fixierbar

"Developing Friendly Rest Rooms for the elderly and the disabled people"
FRR Final Conference Vienna, 17th March 2005

FRR  **EURAG – Bund der Älteren Generation Europas**

Halterung für Toilettenpapier



- Instabil
- steht im Weg
- nicht leicht zu erreichen

"Developing Friendly Rest Rooms for the elderly and the disabled people"
FRR Final Conference Vienna, 17th March 2005

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Sitz



Allg. wenig Statements ok.


Doch...

Öffnung verstellbar?

Größe: zu klein, zu groß, passend

Entwicklung: Verstellbar, einfach, sicher, und als "normale" Toilette erkennbar.


"Developing Friendly Rest Rooms for the elderly and the disabled people"
FRR Final Conference Vienna, 17th March 2005

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Fazit:

Vergleich mit Hauptzielen/Wunschergebnissen

- ✓ FRR Toilette ist sicher (Problem- und Unfallvermeidung)
- ✓ FRR fördert die Selbstständigkeit der Benutzer
- ✓ FRR unterstützt/entlastet Pflegepersonal (SU)
- ✓ Benutzer (PU) sind mit dem FRR zufrieden
- ✓ Nutzen des Feldtestes ist für alle Beteiligten erkennbar



"Developing Friendly Rest Rooms for the elderly and the disabled people"
FRR Final Conference Vienna, 17th March 2005

FRR  **EURAG – Bund der Älteren Generation Europas**



UND... DANKE an alle TZ-MitarbeiterInnen und Tagesgäste
für die tolle Zusammenarbeit, das Vertrauen, die Geduld ...
für Neugier, Mut und Herzlichkeit ...

"Developing Friendly Rest Rooms for the elderly and the disabled people"
FRR Final Conference Vienna, 17th March 2005

Voices of the users

by Robert Schlathau, MS Society Austria User Board – primary user and Ramona Rosenthal, Christine Pauli, Nurses from Caritas Socialis, Vienna (secondary users):

FRR  

Voices of Users:

Vorteile



Fr. Fink

- ... Rücktransfer ist leichter, weil das Aufstehen unterstützt wird (hoch und nach vor gekippt)
- ... Selbstständiges Spülen ist möglich; (Glücksgefühl)
- ... Beidseitige Armstützen sind nützlich für Transfer

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FRR  

Voices of Users:



Vorteile



Fr. Fink


- ... Nützliche Einstellmöglichkeiten zur Aktivierung der Bauchmuskulatur beim Stuhlgang durch Bodenkontakt mit den Füßen
- ... Nützliche Einstellmöglichkeiten für Hin- und Rücktransfer in den Rollstuhl

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FRR  

Voices of Users:

Veränderungen/Wünsche



Fr. Fink

- ... Tolle Sache aber, das WC muss sich vorher auf meine Bedürfnisse einstellen können
- ... Türverriegelung über Handsteuerung wäre vorteilhaft
- ... Armstützen sollten höhen- und breitenverstellbar sein

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FRR  

Voices of Users:

Veränderungen/Wünsche



Fr. Fink

- ... Aus meiner Sicht ist eine zentimetergenaue Einstellung nicht notwendig, möglicherweise reicht eine skalierte Einstellung (1-5) für höhertiefer und Neigung vor/zurück
- ... Durchgehender Haltegriff über die ganze Breite der Tür zum Schließen (ÖNORM) und auch zum Öffnen

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FRR  

Voices of Users:

Veränderungen/Wünsche



Fr. Fink

- ... Genügend Platz um Toilette von beiden Seiten benutzen zu können

!!! ERKENNTNIS !!!

Es hätte sich durch eine solche Toilette meine Einschränkung der Selbständigkeit verzögert!

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FRR  

Voices of Users:

Vorteile



Fr. Adolf

- ... Selbständigkeit im Drücken des Schwesternnotrufs – macht mich glücklich !!!
- ... Füße berühren den Boden = Sicherheit !!!

QLK6-CT-2001-00458 "Developing Friendly Rest Rooms for the elderly and the disabled people" FRR Final Conference Vienna, 17th March 2005

FRR  

Voices of Users:

Veränderungen/Wünsche



Fr. Adolf

- ... Fernbedienung → große - eckige - konkave Tasten
- ... Armstützen in der Breite verstellbar
- ... für rumpfinstabile Menschen wären Seitenelotten oder eine Sitzführung von Vorteil = Sicherheit !!!
- ... Sprachsteuerung

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FRR  

Voices of Users:

Veränderungen/Wünsche



Fr. Adolf

- ... Hilfspersonen tun sich leichter beim Transfer → einerseits Sicherheit andererseits Entlastung der Hilfsperson

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FRR  

Voices of Users:

Vorteile



Fr. Freist

- ... Tolle Sache wegen der Haltegriffe für selbstständigen Transfer (geht schneller und ist sicherer) – Stressreduzierung macht glücklich !!!
- ... Anpassungsmöglichkeiten der Toilette
- ... Bodenkontakt !!!

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FRR  

Voices of Users:

Veränderungen/Wünsche



Fr. Freist

- ... Voreinstellung auf persönliche Bedürfnisse wäre super weil es dadurch schneller ginge !!!
- ... Musik
- ... Automatische Tür und Licht (lang genug)

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FRR  

Voices of Users:

Vorteile



Hr. Schlathau

- ... Endlich ein Versuch langjährige tägliche Probleme Betroffener ansatzweise zu lösen
- ... Einbeziehung Betroffener / Hilfspersonen
- ... Vielzahl an Einstellmöglichkeiten
- ... Multifunktionale Eingabe – Handbedienung, Sprache
- ... Speicherung Benutzerrelevanter Daten auf Speichermedium um Toilettgang zu verkürzen

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FRR  

Voices of Users:

Veränderungen/Wünsche



Hr. Schlathau

- ... Sprachsteuerung – Sprachen, Kommandos ?
- ... Eingabemöglichkeiten – Tasten, Touchscreen - Hygiene ?
- ... Alarmierung über Gegensprechanlage
- ... Alarmierung mit Selbstquittierung
- ... Türverriegelung – bei Alarmierung ?
- ... Technikausfall – inwieweit noch benutzbar ?

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FRR 

Voices of Users:

Veränderungen/Wünsche


Hr. Schlathau

- ... Toilette sollte von drei Seiten befahrbar, benutzbar sein (Rollstuhlfahrer)
- ... FRR muss Platz für Benutzer mit E-Rollstuhl und Hilfsperson gewährleisten (öffentlicher Bereich)
- ... Aspekte der Hygiene für FRR und Benutzer – Lösungen ?
- ... Transferunterstützung – Lösungen ?
- ... Toilettenselbstreinigung ? – öffentlicher Bereich

QLRT-2001-00458 "Developing Friendly Rest Rooms for the elderly and the disabled people" FRR Final Conference Vienna, 17th March 2005

FRR 


Voices of Users:

Veränderungen/Wünsche


Hr. Schlathau


- ... Umsetzung der Ergebnisse ist Basis zur Weiterentwicklung
- ... Verbindliche Umsetzung des FRR auf lokaler, nationaler und europäischer Ebene

QLRT-2001-00458 "Developing Friendly Rest Rooms for the elderly and the disabled people" FRR Final Conference Vienna, 17th March 2005

FRR 

Voices of Users:

Veränderungen/Wünsche



Hr. Schlathau

!!! ERKENNTNIS !!!

- ... Verwirklichung des FRR ergibt "Win – Win" Effekt für Benutzer (längere Selbstständigkeit) und Hilfspersonen (gesundheitliche Entlastung – z.B. Rücken)


= volkswirtschaftlicher Nutzen !!!

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FRR 

Voices of Users:

Vorteile


Fr. Pauli, Fr. Rosenthal u. Pflege team

- ... Endlich werden auch die gefragt, die tagtäglich mit solchen Situationen und Problemen konfrontiert sind
- ... Entlastung des Pflegepersonal durch die Höhenverstellbarkeit
- ... Wegklappen der Griffstützen ist als Vorteil zu sehen, weil mehr Platz ist

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FRR 

Voices of Users:

Vorteile


Fr. Pauli, Fr. Rosenthal u. Pflege team

- ... Türschnalle ist auch mit dem Ellbogen bedienbar
- ... Sicherheit für Benutzer durch Seitenstützen
- ... Zusätzliches Alarmsystem für Sturzsituationen

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FRR 

Voices of Users:

Veränderungen/Wünsche


Fr. Pauli, Fr. Rosenthal u. Pflege team

- ... Halterung für die Fernbedienung ist derzeit nur bei heruntergeklappten Griffen brauchbar
- ... Halterung für Klopapierrollenhalter ist derzeit nur bei heruntergeklappten Griffen brauchbar
- ... Waschbecken ist zu tief – nimmt viel Raum weg und man gelangt fast nicht zu den Wasserhähnen

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FRR 

Voices of Users:

Veränderungen/Wünsche

Fr. Pauli, Fr. Rosenthal u. Pflage team

- ... Handbrause für Waschbecken zur Intimpflege
- ... Armaturen mit Sensoren
- ... Generell muss ausreichend Platz um das WC sein (von 3 Seiten zugängbar und genügend Platz für Hilfsmittel wie Lifter und Aufstieghilfen)
- ... Sprachsteuerung

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FRR 

Voices of Users:

Veränderungen/Wünsche

Fr. Pauli, Fr. Rosenthal u. Pflage team

- ... Ablageflächen wären wünschenswert. (z.B.Katheterismus, Inkontinenzmaterial..)
- ... Verbale Anleitung
- ... Alarmer sollten auf der Handsteuerung wieder abstellbar sein - Fehlalarm
- ... Wenn WC sich nicht in einer Institution befindet muss eine automatische Reinigung und Desinfektion des WC's vorhanden sein

QLK6-CT-2001-00458 "Developing Friendly Rest Rooms for the elderly and the disabled people" FRR Final Conference Vienna, 17th March 2005

FRR 

Voices of Users:

Veränderungen/Wünsche

Fr. Pauli, Fr. Rosenthal u. Pflage team

!!! ERKENNTNIS !!!

- ... FRR ermöglicht jemanden, der aus meiner Sicht vollkommen auf Hilfe angewiesen ist, eine Ressource zu entdecken, die für ihn Selbstständigkeit bedeutet
- ... aber bietet auch die Möglichkeit Ressourcen und Selbstständigkeit länger zu erhalten (Rehabilitation).

QLK6-CT-2001-00458 "Developing Friendly Rest Rooms for the elderly and the disabled people" FRR Final Conference Vienna, 17th March 2005

The FRR Book

“Developing adaptable toilets of the future for disabled and elderly people”

The editors of the FRR Book are Prof. John Mantas and Prof. Johan Molenbroek. The book will be published in the summer of 2005 by IOS Press.

Table of Contents

Preface

Editors

Foreword

Ivor Ambrose (Project Technical Assistant of the FRR project)

Acknowledgements

Editors

Introduction

Gertraud Dayé (EURAG, Austria)

Section I: General Issues

Elderly and people with disabilities: Limitations in their everyday life

Panayota Sourtzi (HAGG, Greece), Terezinha Menezello (SIVA, Italy)

Smart homes – An example from the Netherlands

Ad van Berlo (Smart Homes, The Netherlands)

Design for All: a designers' mentality, not a tool

Prof. Theo Groothuizen, Marja van Weeren (Landmark Design Holding bv, The Netherlands)

Section II: Friendly Rest Rooms

Phase I: Initial Planning

Overview of the FRR project

Prof. Johan Molenbroek (TU Delft, The Netherlands)

The FRR-Questionnaire – Assessing who needs what and where

Christian Dayé (EURAG, Austria)

Ethical Aspects and Ethical Peer Review in a EU funded project coping with a sensitive area of personal hygiene

Marjo Rauhala, Prof. Ina Wagner (TU Vienna, Austria)

Fall prevention in the toilet environment

Sonja Buzink, (TU Delft, The Netherlands)

The influence of posture on defecation with implications for the height of the toilet

Prof. Chris Snijders (TU Delft, The Netherlands)

Phase II: Conceptual Definition: Methodology for user assessment and user involvement

Involvement of users and practitioners in anticipating future usage with design models

Theo Rooden (TU Delft, The Netherlands)

Older people's experience of their bathrooms

Stella Boess (TU Delft, The Netherlands)

User Driven Research – A Practical Example to Integrate Users' Needs and Expectations in a Research Project

Christian Dayé, Marianne Egger de Campo (EURAG, Austria)

User preferences regarding body support and personal hygiene in the toilet environment

Dries Dekker, Sonja Buzink, (TU Delft, The Netherlands)

Quantitative data from laboratory tests with old people and persons with disabilities using a computer controlled height and tilt adjustable toilet system with integrated sensors to enhance autonomy and safety

Paul Panek, Georg Edelmayer, Peter Mayer, Prof. Wolfgang Zagler (Fortec, Austria)

Computer-based interviews for eliciting sensitive information

Norman Alm, Peter Gregor, Nick Hine, Kenny Morrison, Sian Joel, Katrina Hands (Univ. of Dundee, UK)

Experience of testing with elderly users

Gunilla Knall, Panayota Sourtzi, Joseph Liaskos (Univ of Athens, Greece)

Phase III: Implementation

Final FRR components

Prof. Theo Groothuizen, Marja van Weeren (Landmark Design Holding bv, The Netherlands), Atilla Rist (CSO, Hungary)

Anthropometrics in the toilet environment

Prof. Johan Molenbroek (TU Delft, The Netherlands), Prof. Theo Groothuizen (Landmark Design Holding bv, The Netherlands)

Design of lighting in rest rooms for elderly persons

Håkan Neveryd (Certec, Sweden)

Rapid Prototyping of interface and control software for an intelligent toilet

Charlotte Magnuson (Certec, Sweden), Georg Edelmayer, Peter Mayer, Paul Panek (Fortec, Austria), Norman Alm (Univ. of Dundee, UK)

Phase IV: Evaluation of the final FRR

Concept, setting up and first Results from a real life installation of an improved toilet system at a care institution in Austria

Nadia Gentile, Christian Dayé, Marianne Egger de Campo (EURAG, Austria), Robert Schlathau (MS Society Austria User Board, Austria), Paul Panek (Fortec, Austria)

A Visual Sociology Field Study of Users' interaction with an FRR

Nadia Gentile (EURAG, Austria)

QUEST: Validation of the final FRR

Roelof Wessels (IrV, The Netherlands)

Exploitation of the final FRR

Prof. Theo Groothuizen, Marja van Weeren (Landmark Design Holding bv, The Netherlands), Lieuwe Boersma (TU Delft, The Netherlands)

Section III: Data Management issues

Health Data Security Issues

Prof. John Mantas, Joseph Liaskos (Univ. of Athens, Greece)

Knowledge Management

Prof. John Mantas, Joseph Liaskos (Univ. of Athens, Greece)

Conclusions and Future Developments

Editors

Appendix: Glossary

Editors

Subject Index

Editors

Author Index

Editors

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(in alphabetic order of the authors' names)

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- Buzink, S.N., D. Dekker, J.F.M. Molenbroek, R. de Bruin. **The toilet washbasin; a redesign for elderly people**, submitted.
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You can find more information about the frr consortium and project on:

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