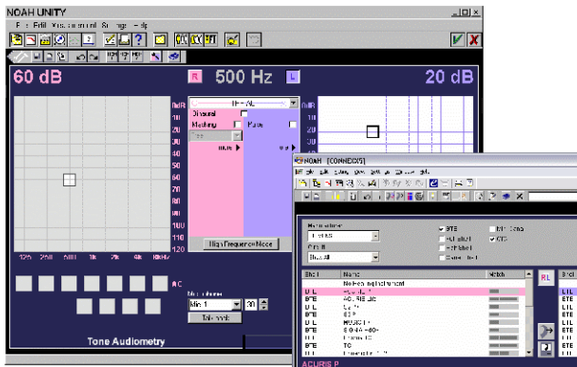
SIEMENS

User-centered Product Definition

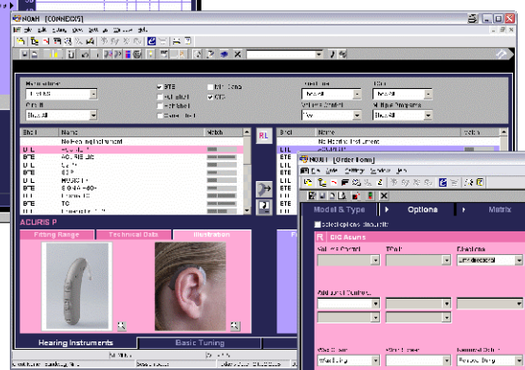
Siemens Audiological Engineering Group
Siemens Medical Solutions

Nina Sandweg
User Interface Design
Product Management
SAT APM

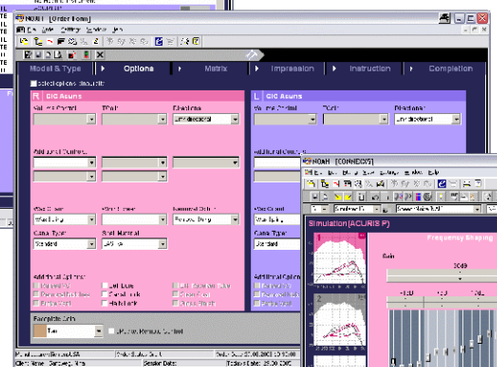
Siemens Audiological Engineering Group



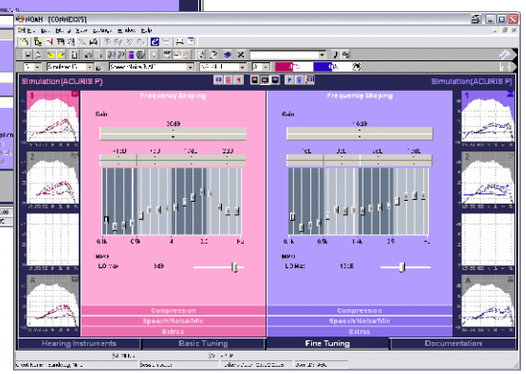
Diagnosis



Counseling

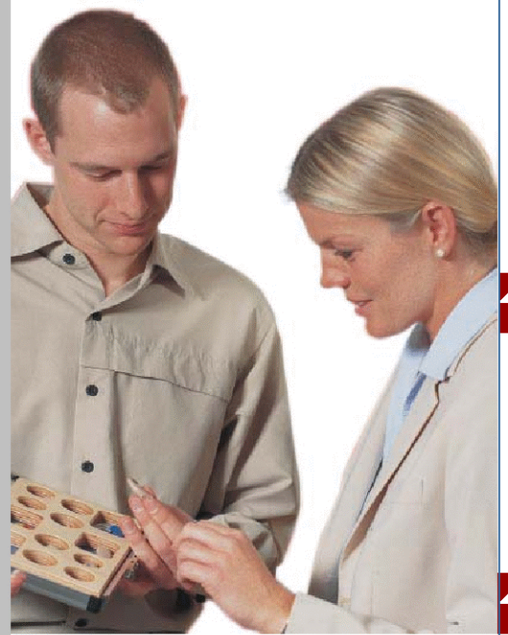


Ordering



Fitting

Hearing Impairment 2005



500 million **hearing impaired individuals worldwide**

15 million **in Germany**

3.5 million **Germans are wearing hearing instruments**

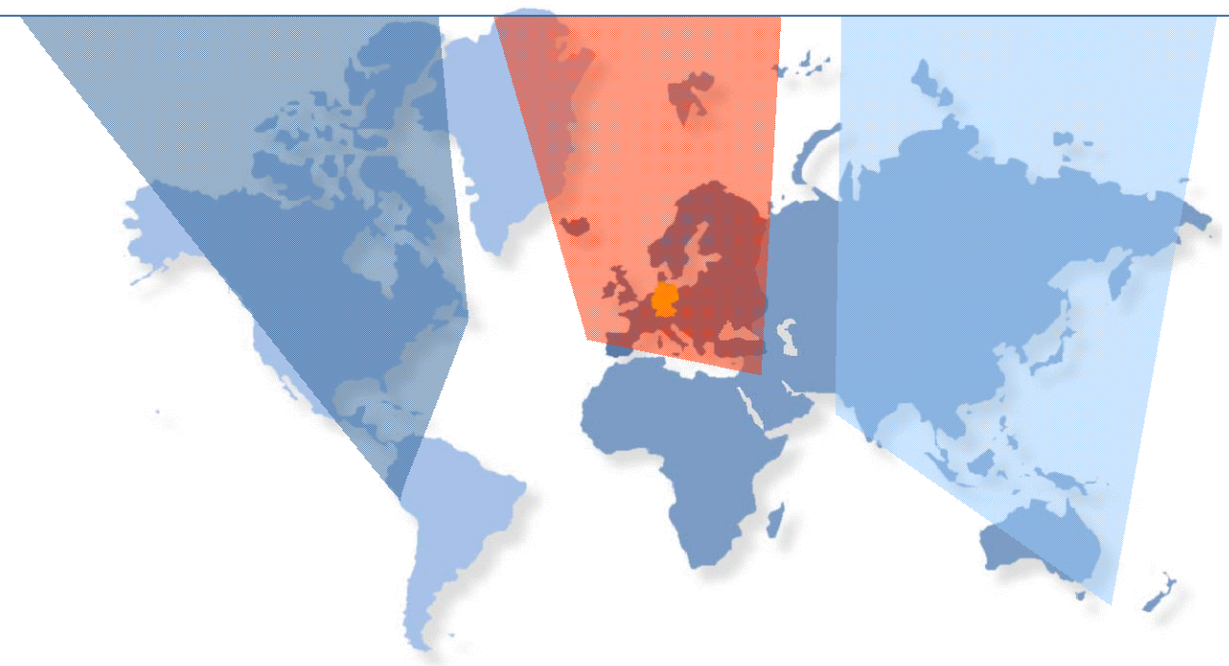
January 26th, 2006
Nina Sandweg

Siemens Hearing Solutions

Hearing Instruments World Market 2005

About **6.5** mio. Pieces

America **2.2** Europe **2.3** Asia Pacific **1.0** Rest **1.0**



Global Player

Worldwide Presence and Strategic Alliances

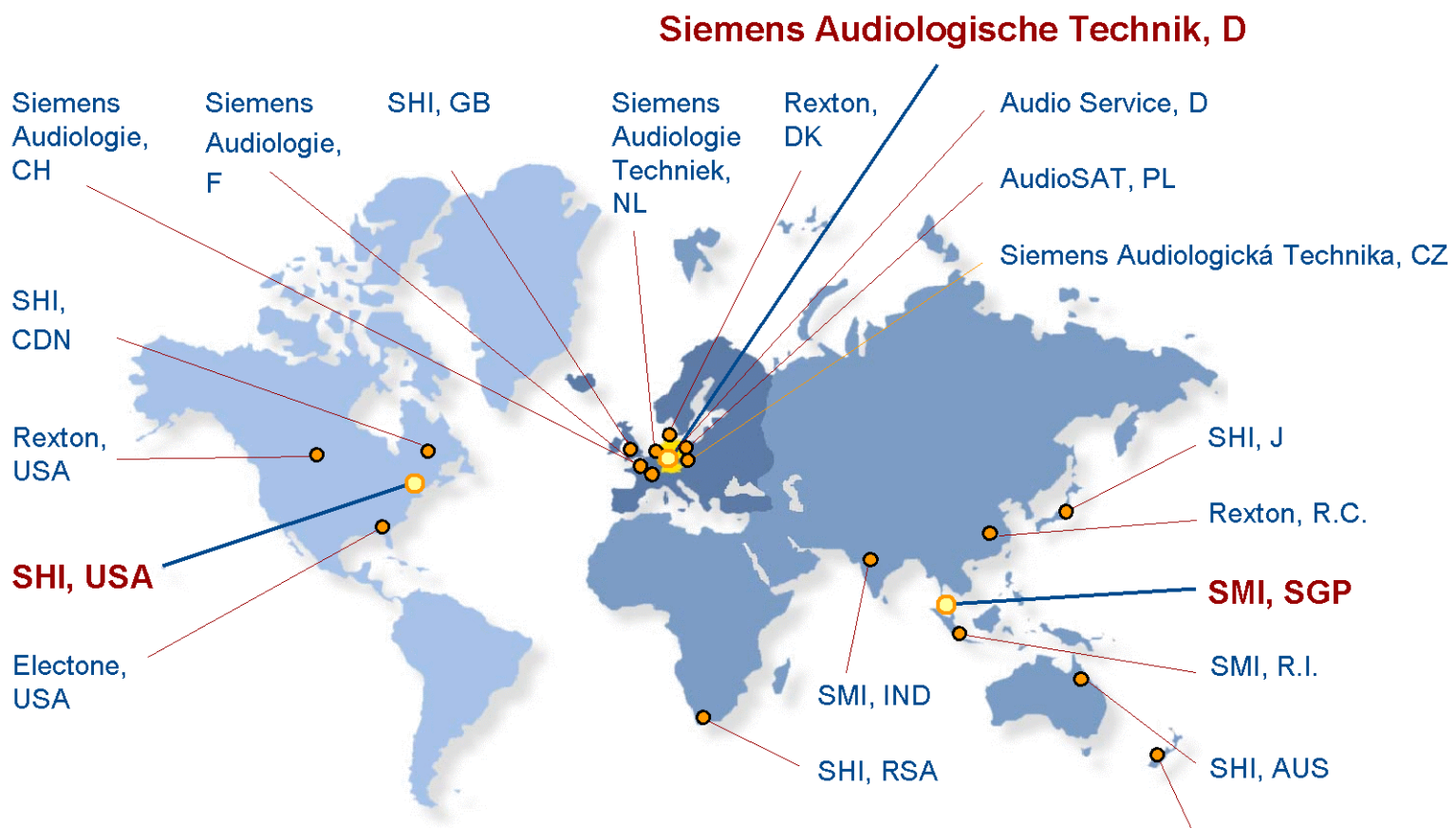
Siemens Audiologische Technik
Headquarter

SHI USA
Competence Center
In-the-Ear
Hearing Instruments

SMI Singapore
Competence Center
Behind-the-Ear
Hearing Instruments

Global Player

Worldwide Presence and Strategic Alliances



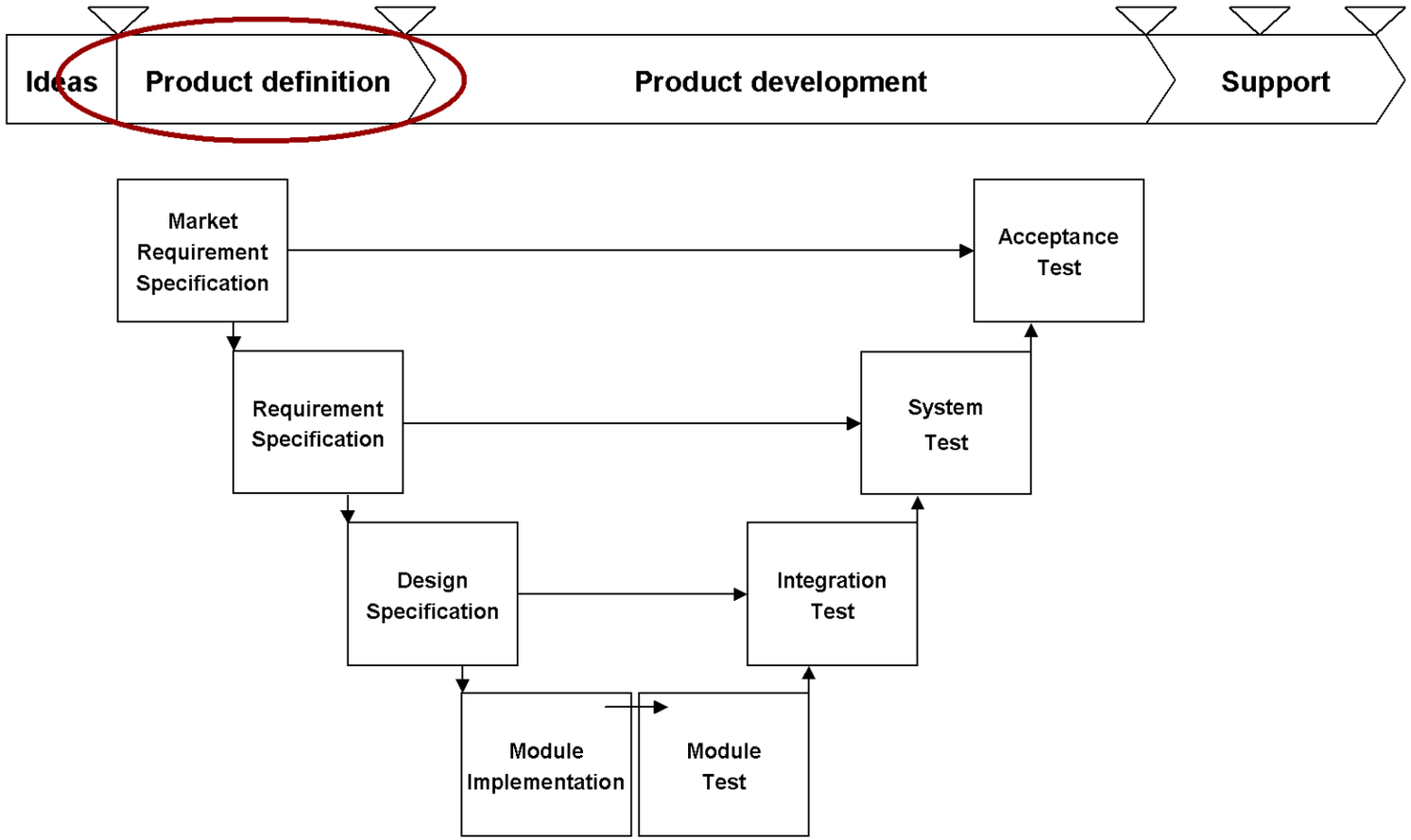
SHI = Siemens Hearing Instruments

SMI = Siemens Medical Instruments

Understanding Our Users

How do we find out what our users want?

Product Development Process at Siemens MED



Understanding our users

User requirements describe the users' perspective / expectations on the product:

- features and attributes a product should have and
- how the product should perform.

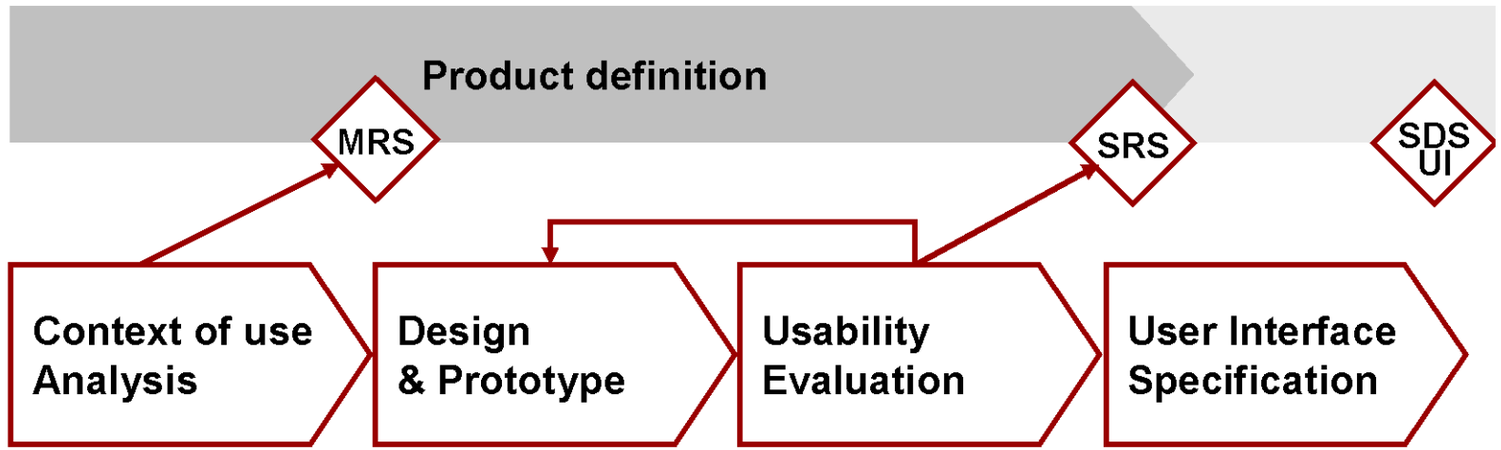
- How can user requirements be gathered and analyzed?
- How can user requirements be validated?

User Requirements Analysis

“Our users don’t know what they want!”

- User requirements analysis is **not about asking users** what system they want
- User requirements analysis is about **understanding users' current practices and problems** they encounter

UCD in Product Definition



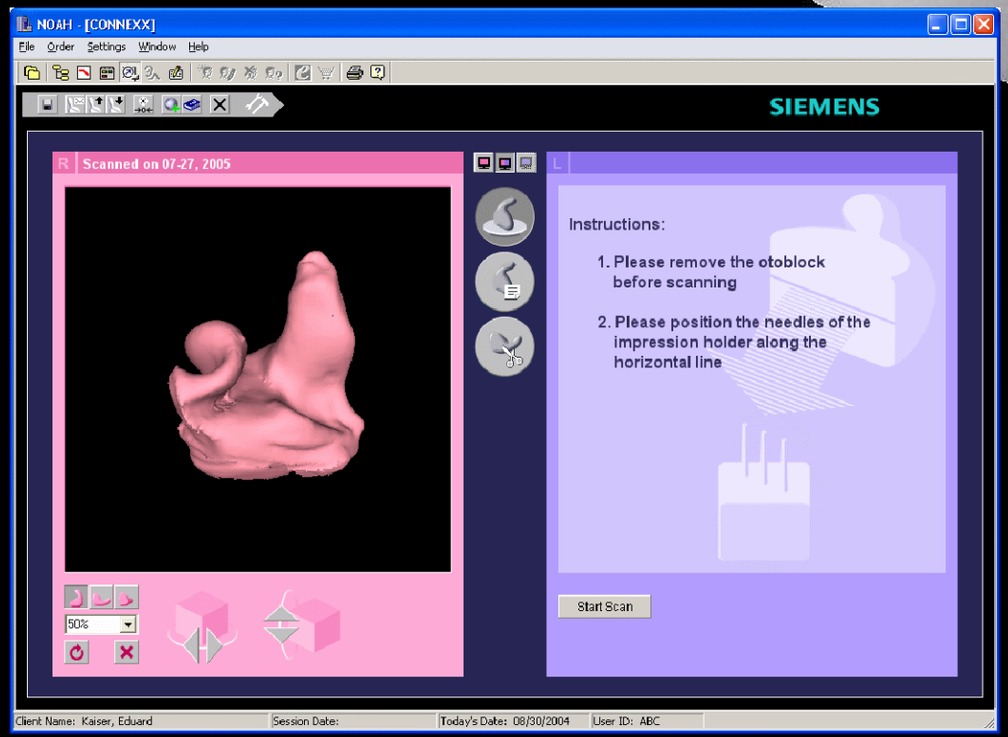
MRS	Market Requirement Specification
SRS	Software Requirement Specification
SDS UI	Software Design Specification User Interface

Project example: iScan

- 3D Scanner for digitizing ear impressions
- Transferring 1st production step from the manufacturer to the hearing care professional
- Enabling electronic ordering of In-the-Ear Instruments

iScan

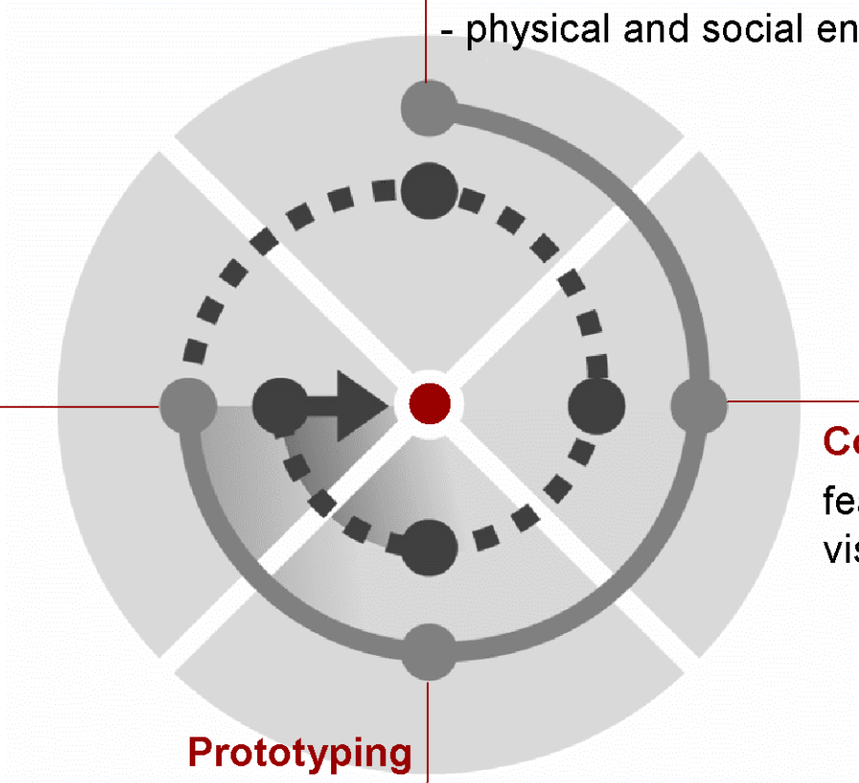

SIEMENS
iScan


NOAH - [CONNEXX]
File Order Settings Window Help
SIEMENS
R
Scanned on 07-27, 2005
50%
L
Instructions:
1. Please remove the otoblock before scanning
2. Please position the needles of the impression holder along the horizontal line
Start Scan
Client Name: Kaiser, Eduard
Session Date:
Today's Date: 08/30/2004
User ID: ABC

User Centered Design

Analysis

Context of use:
- users
- tasks
- physical and social environment



Evaluation

gather user feedback

Concept

features, interaction, visual appearance

Prototyping

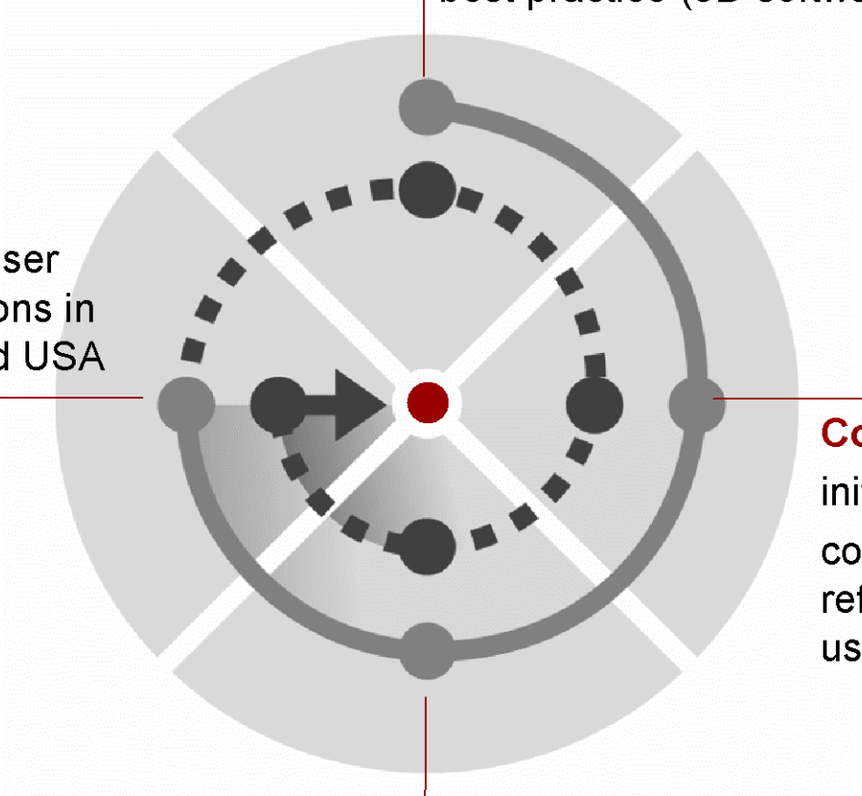
product mock-ups to make concept visible and tangible

Applied Approach

International Analysis

interviews, focus groups in key markets (Germany, USA)

best practice (3D software)



Evaluation

2 rounds of user testing sessions in Germany and USA

Concept

initial concept

continuous concept refinement based on user feedback

Prototyping

highly interactive prototype

The use concept

Method

- Focus groups and face-to-face interviews in Germany and the United States

Users

- Hearing Care Professionals
- Craftsman's skills for cutting the ear impression
  -> influence on shell quality
- No experience concerning electronic manipulation of 3D data

Task analysis

- part of ordering process
- Marking und **annotating** the ear impression
- Sometimes manipulating of impression e.g. cutting of canal

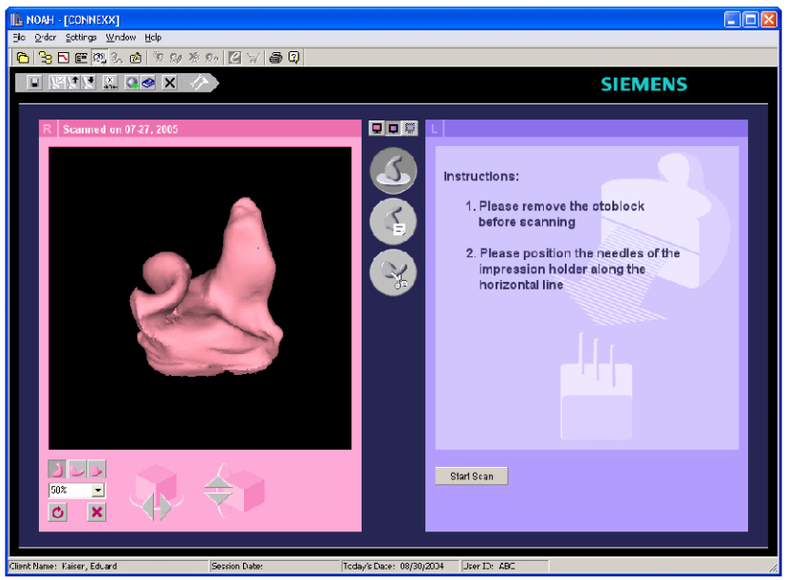
UI Concept & Interactive Prototype

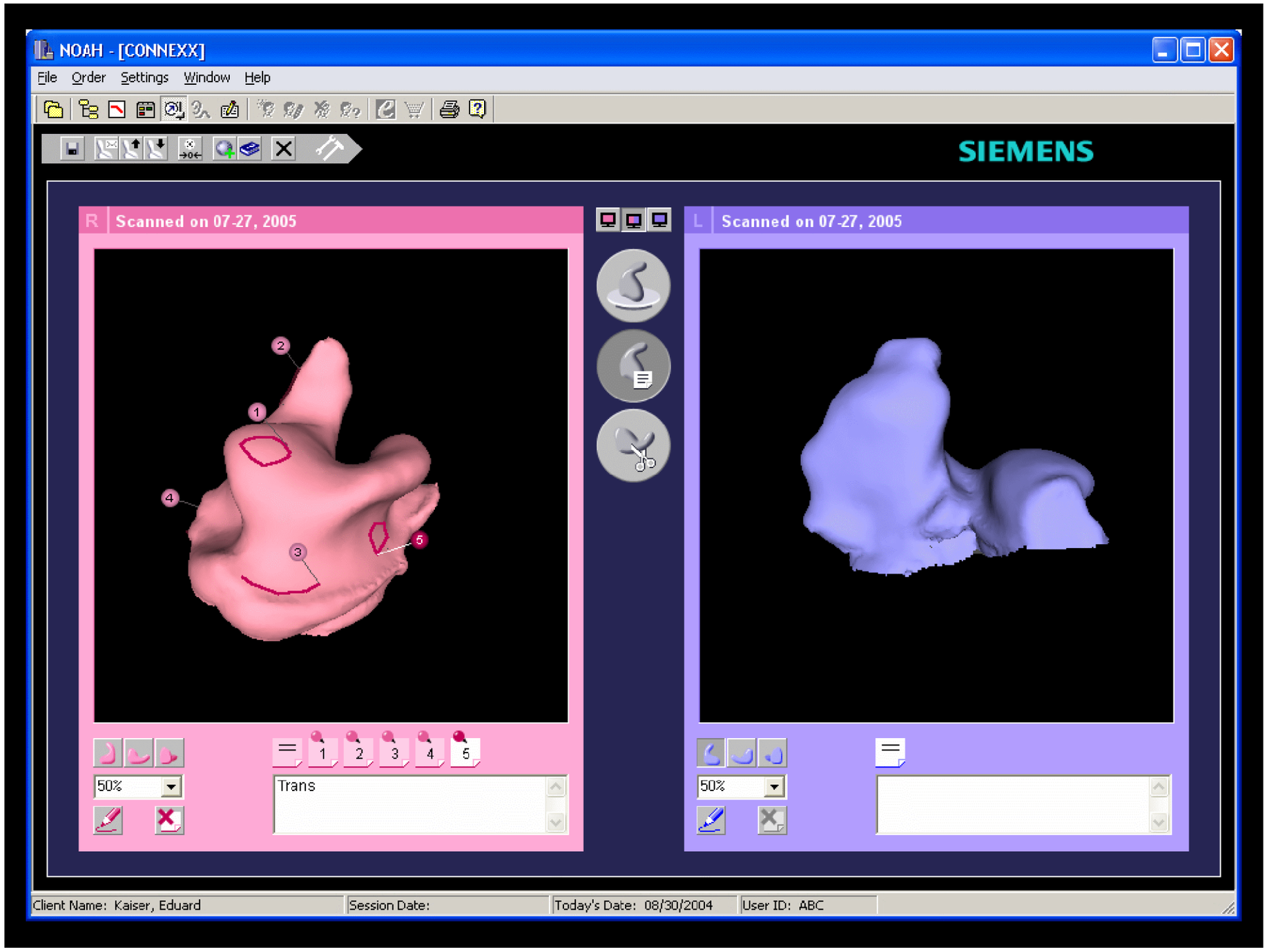
UI Concept & Design

- Visual Style defined by existing software applications at SAT (Hearing instrument fitting software, electronic ordering module)
- Intuitive interaction with 3D data, no special input devices
- Original scan data reproducible at all times

UI Prototype

- high-level, interactive




NOAH - [CONNEXX]
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Client Name: Kaiser, Eduard
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User ID: ABC

AttrakDiff™: Pragmatic and hedonic attributes

Pragmatic product attributes

fulfillment of individuals' behavioral goals

e.g. "supporting", "useful", and "controllable"

A product may be perceived as pragmatic because it provides effective and efficient means to manipulate the environment.

Hedonic product attributes

individuals' psychological well-being

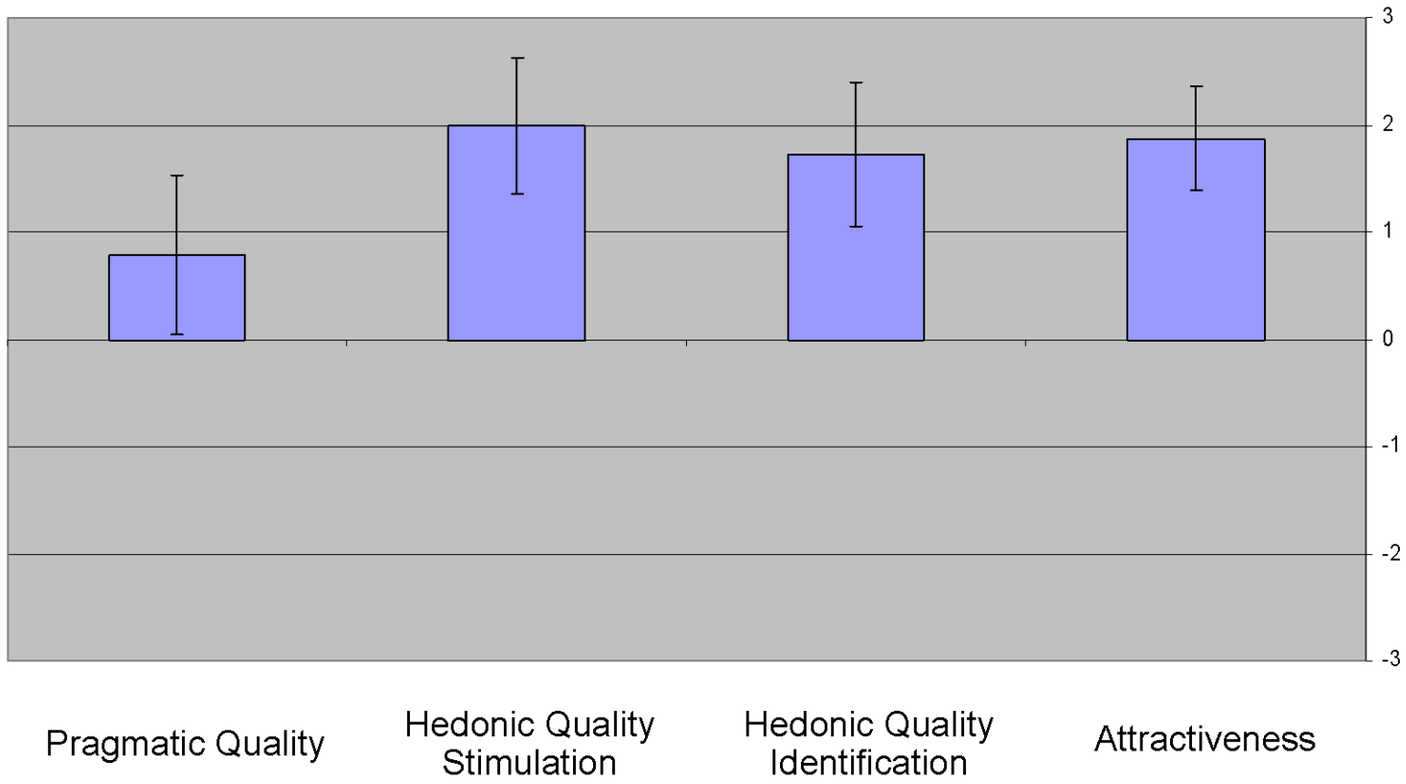
e.g. "outstanding", "impressive", "exciting", and "interesting"

A product may be perceived as hedonic because it provides stimulation, identification or provokes memories.

	1	2	3	4	5	6	7		
human	☐	☐	☐	☐	☐	☐	☐	technical	R PQ_1
isolating	☐	☐	☐	☐	☐	☐	☐	connective	HQI_1
pleasant	☐	☐	☐	☐	☐	☐	☐	unpleasant	R ATT_1
inventive	☐	☐	☐	☐	☐	☐	☐	conventional	R HQS_1
simple	☐	☐	☐	☐	☐	☐	☐	complicated	R PQ_2
professional	☐	☐	☐	☐	☐	☐	☐	unprofessional	R HQI_2
ugly	☐	☐	☐	☐	☐	☐	☐	attractive	ATT_2
practical	☐	☐	☐	☐	☐	☐	☐	impractical	R PQ_3

AttrakDiff™ Evaluation

iScan is perceived as **practical**, **innovative**, **presentable** and good.



Success factors

- User Centered Design activities are **integrated in product definition phase** of the product development process
- Strong **cooperation of product management and software development** leads to mutual understanding and improvement of results.
- **Prototypes** are not only valuable for feedback sessions with users. They also simplify communications among all project participants
- Very detailed requirements gathering phase; resulting in an **actual benefit for the customer**
- User centered design methods sometime prolong definition phase; but actual **development phase is usually shortened**.

Problems we face…

- Cost-justifying design efforts for software that is not sold
  -> no direct impact on hearing instruments sales
- Very short software release cycles lead to little or no time for “fit and finish” the user interface