Consumer Evaluation Measurement for Objectified Industrial Use

CONEMO 47 EN/1 CORNET Project

Run-time:

January 2011 – March 2013

Dipl.-Wirtsch.-Ing. Markus Köhler

Monitoring Event Vienna, 23rd January 2013

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Chair of Metrology and Quality Management, Laboratory for Machine Tools and Production Engineering WZL, RWTH Aachen, Germany

Agenda

1 **Theoretical Background and Objectives of CONEMO**

2 **Technical Progress and Selected Results**

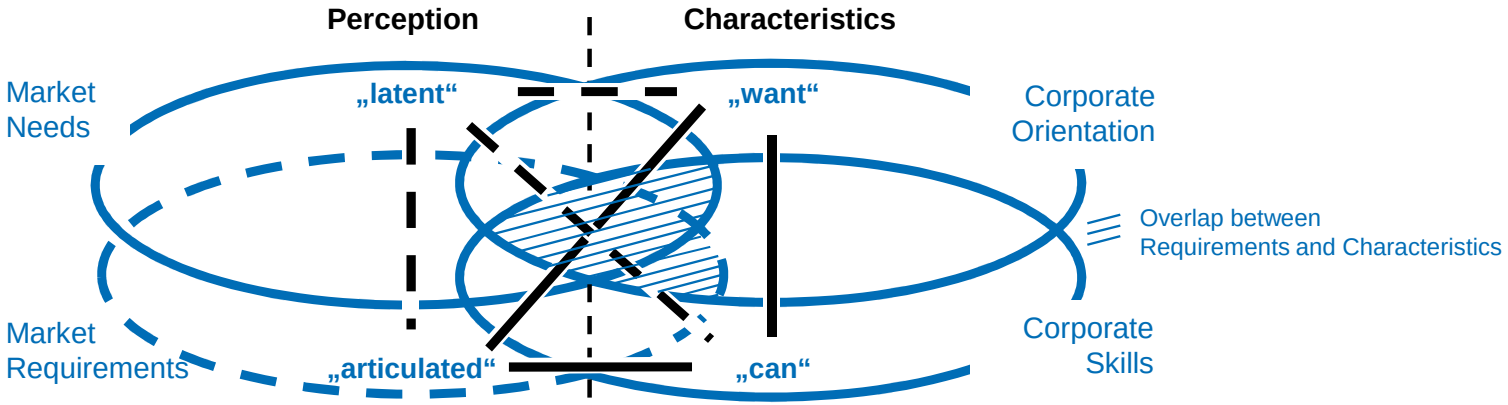
3 **Integration of SMEs and Dissemination**

Using Perceived Quality Data for Emotional Product Design

Customer's Subjective Perception of Product Quality is Central for Purchasing Decisions

Perceived Quality

- Cognitive and emotional comparison between product characteristics and customer requirements and needs,
- based on conscious and unconscious perception,
- related to experiences and expectation of the specific target group.



- A generic understanding of product quality is important to enhance Affective Design.
- Companies have to consider quality judgments by customers already in the early stages of PDP.
- There is a lack of approaches mastering this challenge for SMEs in a systematic and scientific way.

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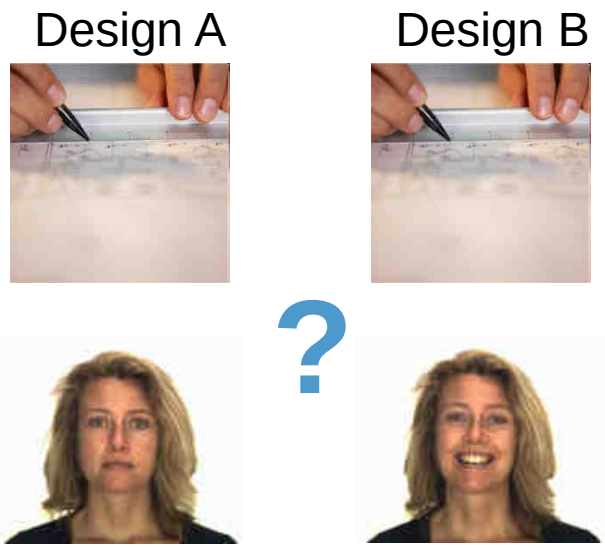
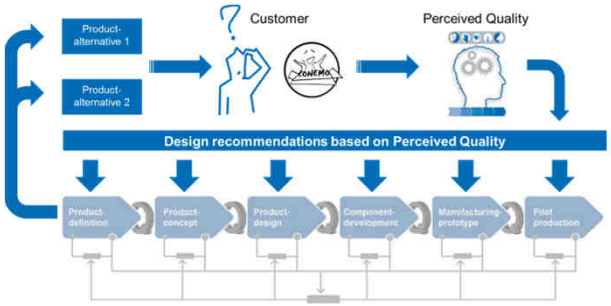
Objectives of CONEMO

Testing Service to Measure and Objectify Customer's Attention and Emotional Judgment

- Aligning customer and companies product understanding
- Identifying relevant product attributes
  - e.g. Eye tracking
- Measuring customer evaluation on products in the early PDP
  - Questionnaires and physiological signals: EMG, GSR
- Linking product strategy with perceived product components





Integration of Objectified Information into the PDP of SMEs

- Establishing a classification catalogue based on Quality Gates to assure emotional quality
- Design rules for development of new products
- Linking the results with established methods of Affective Design

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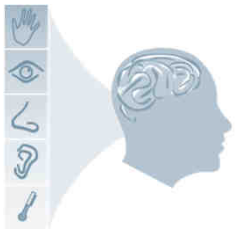
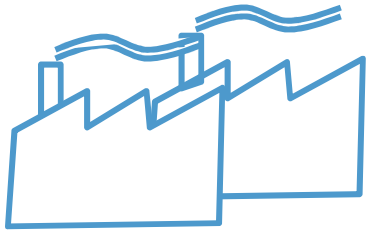
The Collaborative and Interdisciplinary Approach of CONEMO

Perceived Quality



Requirements of SMEs



Objectives

- Testing Service to Measure and Objectify Customer's Attention and Emotional Judgment
- Integration of Objectified Information into the Product Development Process of SMEs

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- Perceived Quality Management
- Product structure and Function Analysis
- Product Development and Quality Gate systematic

FQS DGQ-FORSCHUNG Forschungsgemeinschaft Qualität

- Project coordination Germany

IBV INSTITUTO DE BIOMECÁNICA DE VALENCIA

- Emotional Engineering
- Behaviour analisis
- Registration of physiological signals

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Agenda

1 Theoretical Background and Objectives of CONEMO

2 Technical Progress and Selected Results

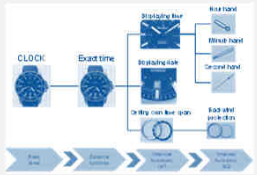
3 Integration of SMEs and Dissemination

Systematic Measurement of User Attention, Perception and Emotions for Objectified Use

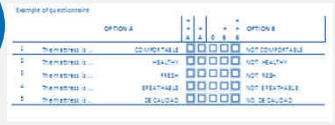
WP1 Project Management

WP2 Company and Product Strategy

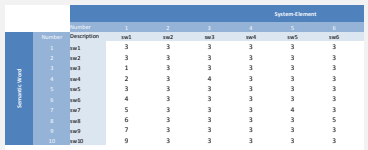
WP3 Product Structure



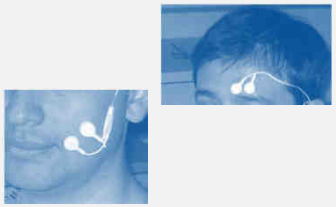
WP4 Semantic concepts



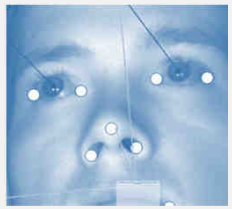
WP5 Strategy-Structure-Matrix



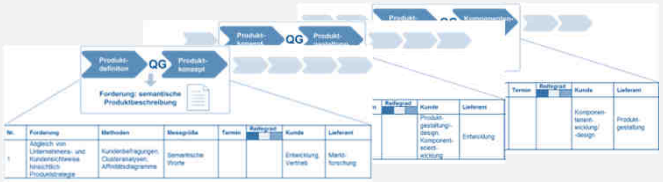
WP6 Laboratory set-up



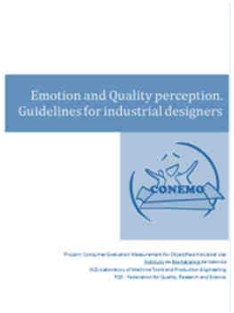
WP7 Emotional Evaluation



WP8 Emotional Quality Gates



WP9 Dissemination



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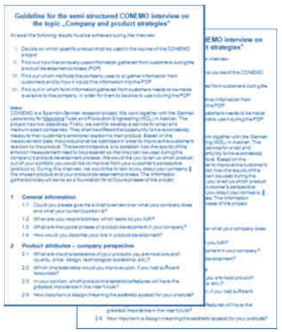
Results of the Project

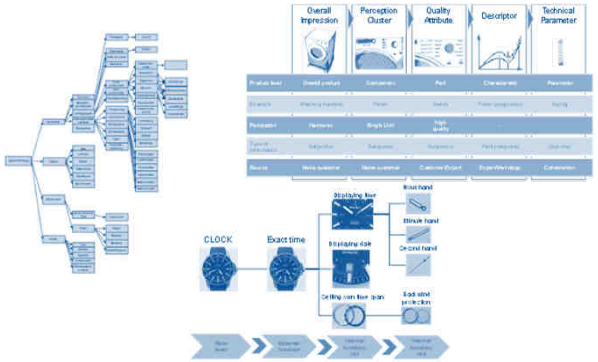
Product Strategy



Results:

- Guideline for semi structured interview
- Requirements of SMEs for user emotional design process
- Consistent product strategy requirements

Product Structure



Results:

- Approval of usage of System Analysis
- Approval of usage of structured approach towards quality perception

Semantic Concepts

OPTION A	+ + A	+ A	0	+ B	+ + B	OPTION B
COMFORTABLE	☐	☐	☐	☐	☐	NOT COMFORTABLE
HEALTHY	☐	☐	☐	☐	☐	NOT HEALTHY
FRESH	☐	☐	☐	☐	☐	NOT RESH
BREATHABLE	☐	☐	☐	☐	☐	NOT BREATHABLE
DE CALIDAD	☐	☐	☐	☐	☐	NO DE CALIDAD

Results:

- Verified study of semantic concepts
- Development of paper based and online questionnaires

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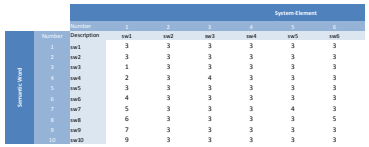
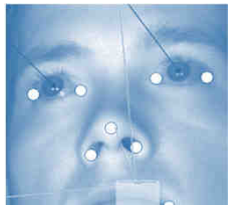
Results of the Project

Aligning Strategy & Relevant Perceived Components



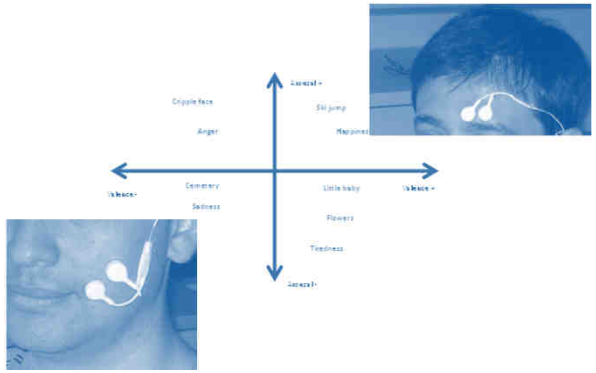
	Number	Description	sw1	sw2	sw3	sw4	sw5	sw6
Semantic Spread	1	sw1	3	3	3	3	3	3
	2	sw2	3	3	3	3	3	3
	3	sw3	1	3	3	3	3	3
	4	sw4	2	3	4	3	3	3
	5	sw5	3	3	3	3	3	3
	6	sw6	4	3	3	3	3	3
	7	sw7	5	3	3	3	4	3
	8	sw8	6	3	3	3	3	5
	9	sw9	7	3	3	3	3	3
	10	sw10	9	3	3	3	3	3



Results:

- Measuring visually perceived product quality esp. In early phases of PDP
- Applying Eye-Tracking and questionnaires
- Verified study design and test protocols

Measurement Equipment



Results:

- Dimensional classification of emotions with physiological signals
- Set up of EMG – slide combining EMG and GSR and dimensional appraisal
- Main dimensions are valence (like-dislike) and arousal (intensity).

Measuring Emotions

Results:

- Using Eye Tracking, questionnaires and physiological signals in order to evaluate emotional product design
- Test protocols

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Agenda

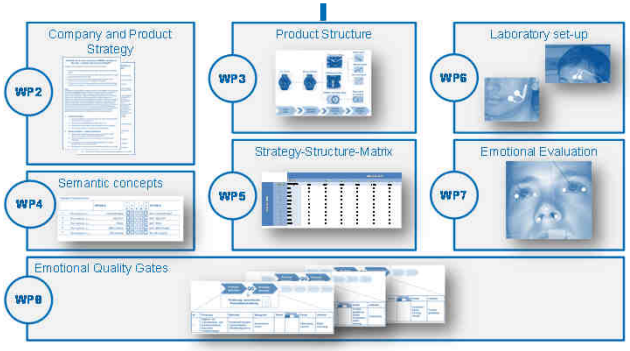
1 Theoretical Background and Objectives of CONEMO

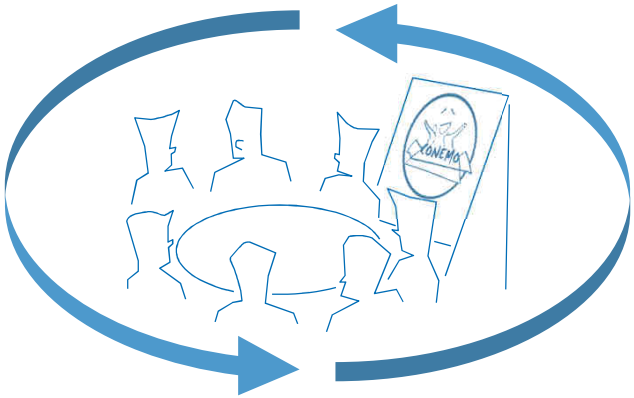
2 Technical Progress and Selected Results

3 Integration of SMEs and Dissemination

Harmonization and Synchronization of Research Activities and Industrial Requirements for Objectified Use

- Research Activities, e.g.
  - Continuous development of testing services for emotional product design
  - Steering Committee Meetings
  - Consultant work (semantic space, system analysis, defining PDP, Q-Gates, suggestions for design, etc.)
  - Guidelines

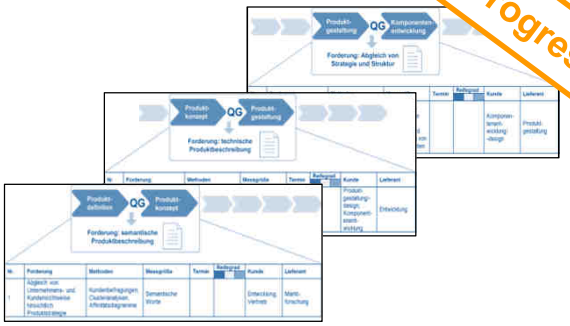




- Integration and Involvement of SMEs, e.g.
  - User Committee Meetings in Spain and German
  - Individual visitations of SMEs
  - Industrial requirements and questions
  - Definition of Business and Practical cases
  - Continuous validation of developed methodology

Emotional Quality Gates

In Progress



Expected Results:

- Criteria catalogue to implement emotional design into PDP of SME
- Guideline with important aspects of emotional design in PDP
- Easy to use tool for assessing the need for emotional design within the PDP of SME

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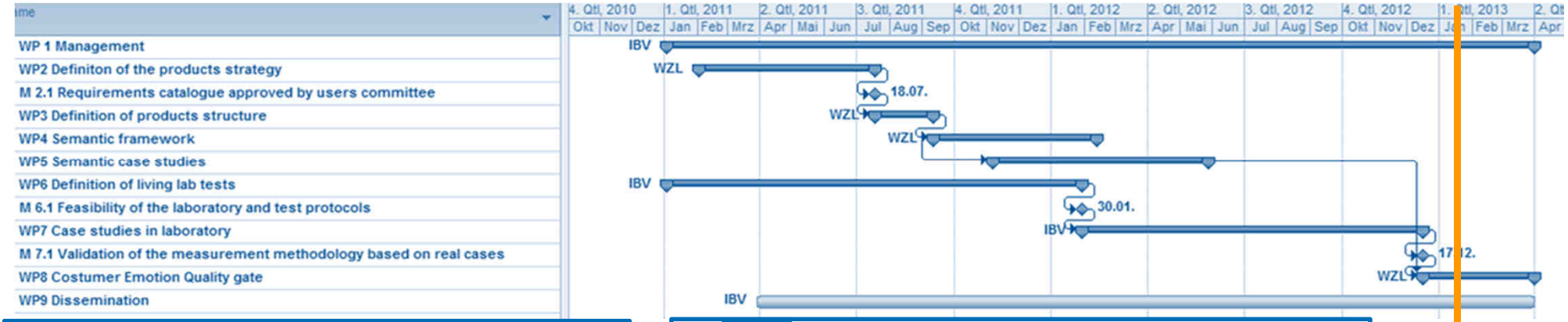
Project Plan – Continuous Involvement of Companies Producing Products Where Customer Perception is of Vital Importance

- Performing of research activities by WZL and IBV
- Project Coordination Germany by FQS

SC Meetings

- Q1/2011, Project-Kick-Off
- Q3/2011, Defining Product Structure
- Q4/2011, Reviewing Results Pre-Studies
- Q2/2012, Requirements Emotional Q-Gates
- Q1/2013, Review Results & Draft Guidelines



- Continuous, individual visitations of SMEs guaranteeing a multi-sector approach:

UC Meetings

Germany

- Kick-off, Industrial Requirements
- Review of results of pre-studies.
- Preparation of Emotional Q-Gates.

Spain

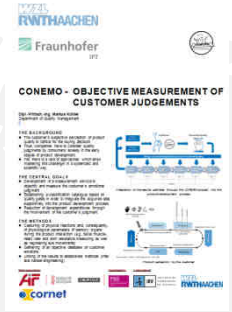
- Kick-off, Industrial Requirements
- Preparation of case studies.
- Review case studies.

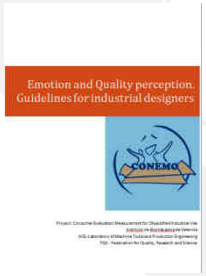
Dissemination of Results

Visibility and Accessibility of Project Results

Continuous Transfer of the Results, e.g.

- User Committee Meetings
- Individual visitation of the SMEs
- Project Homepage (conemo.ibv.org)
- Posters and Flyers (English, Spanish and German)





Scientific Dissemination, e.g.

- Conference on Affective and Pleasurable Design 2012
- Several planned publications on international level (e.g. ISMTII 2013, Metrology 2013)
- Publication in professional magazines on national level (e.g. IBV magazine)
- Guidelines for SMEs (in Progress)

Presentations and Introduction of the Planned Research Approach, e.g.

- 14th BAIKA Annual Congress “Zulieferer Innovativ 2012”
- 56th EOQ/DGQ/FQS Congress, 2012
- Presentation of the Eye Tracking methodology on Hannover Trade Fair, 2012
- 13th BAIKA Annual Congress “Zulieferer Innovativ 2011”

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Thank you for your attention!

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