

## MAUSE : Towards the MAuration of Information Technology USability Evaluation

### About COST294-MAUSE

**COST294-MAUSE** is a usability research community run under the auspices of COST (<http://cost.cordis.lu/>). MAUSE is the acronym for "Towards the MAuration of Information Technology USability Evaluation". The ultimate goal of COST294-MAUSE is to bring more science to bear on Usability Evaluation Methods (UEMs) development, evaluation, and comparison. The results will be of benefit to industry and educators, thus leading to increased competitiveness of European industry and better products for the public.

The major rationale for our collaboration is that we share the vision to improve the research as well as practical work on usability. Existing problems in usability research, from basic to intricate, need to be resolved through extensive co-operation within a community of usability professionals and researchers with diversified backgrounds. In fact, usability research has been rather fragmented and scattered in a variety of industrial and academic institutions. We want to coordinate these distributed efforts to best utilize the resources available, and to mutually stimulate and enrich ongoing research activities. **COST294-MAUSE** is a community committed to address this challenge.

### Updates from Working Groups

Hereafter we present the latest activities accomplished by our WGs.

#### **WG1: Critical Review and Analysis of Individual UEMs** (Coordinator: Dominique Scapin, INRIA, France)

WG1 has extended the coverage of its initial method descriptions. Using its UM Generic Description template and its Case Study Description template, WG1 has been able to describe nineteen methods (including one methodology consisting of several methods), and three app "case studies" (applications of a method). The second interim report based on the above analyses is accessible via the MAUSE Digital Library (doc id 372). It has also been discussed during the MAUSE meeting in Oslo, October 15. Further WG1 work will concern:

- Enlarging the coverage of a variety of UMs, particularly for Collaborative Methods
- Extending coverage to more computer-based methods; coordination with WG4 is in progress
- Exploration of new peer-review mechanisms in order to disseminate the results
- A one day WG1 workshop is going to be organized in Athens, Greece on 5th March 2007. See Upcoming Events in this issue.

#### **WG2: Comparing UEMs: Strategies and Implementation** (Coordinator: Gilbert Cockton, University of Sunderland, UK)

UEMs are compared by coding problem sets from different methods. With problem sets coded across a set of dimensions, UEMs can be compared by calculating distributions across a dimension (e.g., appropriateness of UEM usage, allowing ease of accurate and/or effective use to be compared). Some coding methods are analytical, and can be carried out by researchers with a problem set based on an appropriate reporting format. Other coding methods are empirical, and require further evidence, e.g., thoroughness and validity require a master set of actual problems to code hits, misses and false positives. Dimensions for downstream utility always require empirical evidence beyond the problem set (e.g., persuasiveness requires feedback from project management and the development team).

At the Oslo meeting, we progressed WG2's Codelights multi-site experiment by agreeing on a format for coding dimensions. Each dimension has 6 attributes: *Name / Definition / Operationalisation / Evidence requirements / Sources of bias / Ease of coding*. Attendees of Oslo meeting volunteered to provide coding dimension definitions for UAF/Norman's Model, impact measures (frequency, severity, and persistence), explanatory power, effort per problem, and downstream utility. We have existing volunteers in place for appropriateness, distributed cognitive resources (DCRs)/ preparedness, DCR effectiveness. Some coding dimensions are applied to complete problem sets, such as skill requirements, evaluator satisfaction, and project management needs. Now we are gathering example problem sets for the multi-site experiment.

#### **WG3: Defect Classification Schemas** (Coordinator: Mark Springett, Middlesex University, UK)

• *Validation of the Classification of Usability Problems (CUP) Method*: CUP has undergone two completed validation studies so far. Work is currently being carried out on two further validations, based in Iceland and the UK.

• *Extensions to CUP*: Proposed extensions to aspects of the pre-CUP phase are being developed. One or more short-term scientific missions are proposed in the New Year for collaborative development and testing of these ideas.

• *Comparative studies of Defecting Classification Schemas (DCS)*: Work carried out on a selection of defect classification schemas may be merged with the UM Generic Description template and its Case Study Description template.

• *Study of Expert Interpretations of Quality attributes*: The first phase of this work is underway, using the Repertory Grid technique to elicit Usability/HCI design experts' interpretations and application of quality attribute terminology. Interviews are currently being conducted in the UK and Finland. A further expansion of this work in other partner countries will take place early in 2007.

#### **WG4: Review on Computational and Definitional Approaches in Usability Evaluation**

(Coordinator: Christian Stary, University of Linz, Austria)

Working Group 4 (WG4) is concerned with a systematic review on the computational and definitional approaches in usability evaluation. Of primary interest are the capabilities of formal representations and corresponding computational schemes. To facilitate the review process a layered scheme for the structured evaluation of existing computational usability evaluation methods (CUEMs) has been proposed.

WG 4 has finished the review process. Ten CUEMs have been analyzed. The CUEMs have been chosen by checking whether direct, or at least interpreted statements to the different categories of our review scheme can be found in the published literature. The review results indicate that a wide range of different methods are used within the different CUEMs. A meta-analysis, which is based on the ten individual CUEM reviews, has been performed and reported in a deliverable entitled «Meta-Review». This document will serve as the basis for developing a meta-scheme for defining the maturation of computational usability evaluation. In addition, to realize inter-WG collaboration and integration, individual CUEM reviews are being re-structured with respect to WG1 review templates (see above). These exercises will further strengthen the overall outcomes of the Action.

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## Overview of Partners from Spain

Partners from 21 countries have actively participated in the preparation of the Action or otherwise indicated their interest in the COST294 Action MAUSE. In this issue we highlight the research activity of our partners from Spain.

### The LoUISE group

The LoUISE group (Laboratory of User Interaction and Software Engineering) belongs to the Information Systems Department of the University of Castilla-La Mancha and the Computer Science Research Institute (<http://www.i3a.uclm.es>), which is located at Albacete Science and Technology Park.

The Group is composed of 7 Doctors, 7 PhD. students and several post-graduate students granted in different applied projects. The group was formed at the end of 2000 with the main objective of outlining new development proposals for improvement of the quality of interactive systems. A variety of approaches from Human-Computer Interaction, Software Engineering, Intelligent Systems, Computer Vision, etc., are considered and integrated. Our main and general goal is to "Improve the Quality in Human-Computer Interaction". To this end, our research interests concern the following areas: methodologies, models and tools for User Interface development; adaptive and collaborative environments; next generation User Interfaces; artificial vision techniques; and web-based systems. All this research takes into account usability and accessibility criteria and integrates them into the development process.

In our research group, we propose a usability quality model based on:

- International standards - ISO 9126 - because we want to help in the UI development process
- In our usability quality model we can find criteria such as understandability, learnability and operability. These criteria are decomposed into additional sub-criteria using ergonomic criteria (Bastien et al.),
- Ergonomic criteria are useful to organize experience and to evaluate artifacts. We have experience in the format of patterns according to the PLML (Borchers) specification.
- The integration of quality and experience is possible (Montero). It can be useful to evaluate user interfaces, from a usability point of view, in the first stage of the development process.

To support the development of run-time adaptable user interface, a multi-agent adaptation engine has been developed that decomposes the adaptation process into four steps: initiative, proposal, decision, and execution. For this purpose, the adaptation rules are explicitly encoded in a knowledge base, from which they can be retrieved and executed at any time. In particular, the execution of adaptation rules is ensured by examining the definition of each adaptation rule and by interpreting it at run-time, based on a graph transformation system. The solution proposed is able to decide which adaptation fits best the situation, taking into account ergonomic criteria (Bastien et al.) to preserve the overall system usability during the system adaptation.

The results of these research activities are being applied to different projects in collaboration with enterprise initiatives. Another objective of ours is the participation in multidisciplinary projects.

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María Lozano



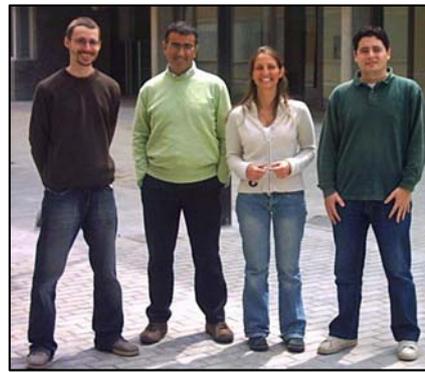
Pascual González



Víctor López Jaquero

### OO-Method, HCI + SE sub-group

The OO-Method is a research group of the Department of Information Systems and Computation, Technical University of Valencia, Spain (<http://oomethod.dsic.upv.es/>). The OO-Method



**OOH-Method group :** (left to right) Sergio Spaña, Oscar Pastor, Inês Pederiva, Ignacio Panach

defines a model-based approach to software development. In this framework, our main interest is the correct conceptualization of the user interaction, in order to produce the proper Interface Models that will later derive the final software Interface Layer. This involves the bridging of Human-Computer Interaction (HCI) and Software Engineering (SE) methods and techniques

The OO-Method underpins a challenging technology devoted to automatic software production, which is called OlivaNova Method Execution; this industrial approach is supported by a suite of powerful model-based tools. Some of the current research work is:

- OO-Method currently defines a sound Abstract Interface Model, which deals with the structure and composition of the interaction. This model allows the specification of the interface aspects that are independent of the final platform, operating system and programming language in which it will be later implemented. A Concrete Interface Model is being defined in order to deal with the design and refinement of the interface, with the intention of better fitting the user needs and preferences and specifying all those attributes of the interface elements, which are platform-specific but still language-independent
- The Abstract Interface Model itself is also being extended, by including well-known usability patterns, at an abstract level. These will have influence both in the architecture and the interface of the final application.
- The software production process is being re-engineered to incorporate better user interaction. This methodological concern tries to involve the user in the development process in many ways. For example, some sketching techniques are being reviewed and proposed in order to capture interaction requirements.

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### ISSI Group, Tech. Univ. of Valencia

The Information Systems and Software Engineering research group (ISSI group, <http://issi.dsic.upv.es>) is part of the Logic Programming and Software Engineering Research Group at the Technical University of Valencia. During its almost twenty years of existence, the ISSI group has focused its research efforts on the study and construction of modelling environments and tools for software engineering. Several prototypes of development environments (OO\_METHOD CASE, KAOS, LUNA, ARCA, AFTER, RETO, OCA and PRISMA) have been developed as a result of several projects funded by public and private funding. Our current research interests in the field of Usability Engineering include the integration of usability in Model-Driven Architecture (MDA) environments, the definition of a Usability Model for early usability evaluation and the definition of model transformations guided by usability criteria. A model transformation is the cornerstone of the MDA paradigm. It is a process of converting one model to another model until the software's delivery on a given platform. In our approach, a transformation is guided by usability attributes that act as the driving force to lead the transformations. This approach is being developed upon a platform for model management called MOMENT. Silvia is currently performing a post-doctoral research stay on these topics at the BCHI, Univ. Catholique de Louvain.

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Silvia Abrahão

# COST294-MAUSE Book Project

## Introduction

The **COST294-MAUSE** book project was stimulated by the event International COST294 Workshop on User Interface Quality Models, 12th -13th September 2005, Rome, Italy. Enthusiastic and enlightening discussions in the Workshop have led to the conceptualization of the overarching theme as well as the title of the book "**Maturing Usability: Quality in Software, Interaction and Value**", *Effie Lai-Chong Law, Ebba Thora Hvannberg & Gilbert Cockton* (Eds.), Springer.

The main objective is to bring together, in one book, contributions on the topic of usability in connection to quality in software, interaction and value. A balance between theoretical and empirical work is to be thrived for. Foreword and sixteen chapters are authored by 30 contributors of diverse backgrounds coming from 14 countries in Europe and North America. The book will be of great value to usability researchers and practitioners and to the Human-Computer Interaction (HCI) community at large. The target audience is everyone who is interested in exploring issues in usability and HCI. They are graduate and postgraduate students, faculty members, industrial partners, and members of standardization bodies and other similar initiatives.

## Three major parts

The book consists of three major parts, each of which is underpinned by some specific ideas and concerns. For software to be of high quality, it needs to meet specified requirements or to show emerging qualities that satisfy different stakeholders with different backgrounds, needs and goals. Consequently, complex factors and measures are involved in evaluating qualities of software systems. Amongst others, three major perspectives are addressed in this book:

- **Quality in Software:** An entity, which is assumed to have intrinsic quality, can be evaluated without the involvement of users or user surrogates. Developers and project managers are expected to focus on this perspective, addressing the effectiveness of development as opposed to the revenue to be gained from the product.

- **Quality in Interaction:** An entity, whose quality is assumed to emerge when it is in use, can be evaluated with the involvement of users or user surrogates. User experiences are the focus of this perspective.

- **Quality in Value:** An entity, whose quality is assumed to have impact in the real world, can be evaluated over a span of time and space with users, operational data or content, other systems and the overall context. Social policy makers and marketing professionals are expected to focus on this perspective.

## Scientific Committee

A Scientific Committee has been established for providing expert consultations and opinions on the quality of individual chapters, thereby ensuring the topics being tackled in a scientific and professional manner. Each member has been responsible to review chapter proposals and full chapters. All 27 members of the Scientific Committee are leading HCI researchers, specializing in usability evaluation, software quality engineering and software design and contributing substantially to the advancement of the field of HCI.

**Release Plan:** The book project is at its final stage and the book is expected to be on shelf by the summer 2007.

## Take note: COST294-MAUSE Book

**Title:** Maturing Usability: Quality in Software, Interaction and Value

**Editors:** Effie Lai-Chong Law, Ebba Thora Hvannberg & Gilbert Cockton

**Publisher:** Springer Verlag

**Release:** Summer 2007

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*Dedication: In memory of David Carr*

**Foreword:** *Dennis Wixon & Robin Jeffries* (MGS User Research, USA; Sun Microsystems, USA)

### PART 1: QUALITY IN SOFTWARE

**Chapter 1:** Usability Evaluation of User Interfaces Generated with a Model-Driven Architecture Tool. *Silvia Abrahão<sup>1</sup>, Emilio Iborra<sup>2</sup> & Jean Vanderdonck<sup>3</sup>* (<sup>1</sup>Valencia University of Technology, Spain; <sup>2</sup>CARE Technologies, Spain; <sup>1,3</sup>Université catholique de Louvain, Belgium)

**Chapter 2:** Software Quality Engineering – the Leverage for Gaining Maturity. *Witold Suryń* (École de Technologie Supérieure, Canada)

**Chapter 3:** Connecting rigorous system analysis to experience-centred design. *Michael Harrison<sup>1</sup>, Gavin Doherty<sup>2</sup>, Jose C. Campos<sup>3</sup> & Sten Loer<sup>4</sup>* (<sup>1</sup>University of Newcastle, UK; <sup>2</sup>Trinity College Dublin, Ireland; <sup>3</sup>Universidade do Minho, Portugal; <sup>4</sup>Germanischer Lloyd AG, Germany)

**Chapter 4:** Usability in Agile Software Development.

*Scott Ambler* (Ambysoft, Canada)

**Chapter 5:** Supporting Evaluation of Multimodal Safety Critical Interactive Applications Using Dialogue and Interaction Models. *Regina Bernhaupt<sup>1</sup>, Philippe Palanque<sup>2</sup>, Marco Winckler<sup>2</sup> & David Navarre<sup>2</sup>* (<sup>1</sup>Universität Salzburg, Austria; <sup>2</sup>Université Paul Sabatier, France)

### PART 2: QUALITY IN INTERACTION

**Chapter 6:** Systems Usability – Promoting the Developing Usage. *Paula Savioja & Leena Norros* (Technical Research Centre of Finland)

**Chapter 7:** Towards Maturing Usability Practice in Website Design: Grounding how Practitioners Work to Inform Research Requirements. *Dominic Furniss<sup>1</sup>, Ann Blandford<sup>1</sup> & Paul Curzon<sup>2</sup>* (<sup>1</sup>University College London Interaction Centre, UK; <sup>2</sup>Queen Mary University London, UK)

**Chapter 8:** A Reference Model of the User-Centred Design Life Cycle. *Timo Jokela* (University of Oulu, Finland)

**Chapter 9:** Remote Usability Evaluation Using Multimodal Information on User Sessions. *Fabio Paterno & Carmen Santoro* (ISTI, C.N.R. Pisa, Italy)

**Chapter 10:** Utility and Experience in the Evolution of Usability. *Gitte Lindgaard & Parush, A.* (Carleton University, Canada)

### PART 3: QUALITY IN VALUE

**Chapter 11:** Quality in Software and Users' Health Issues. *Åsa Cajander, Inger Boivie & Jan Gulliksen.* (Uppsala University, Sweden)

**Chapter 12:** Usability Evaluation as Idea Generation. *Kasper Hornbaek* (University of Copenhagen, Denmark)

**Chapter 13:** Putting Value into E-valuation. *Gilbert Cockton* (University of Sunderland, UK)

**Chapter 14:** HCI and the Economics of User Experience. *Marcin Sikorski* (Gdansk University of Technology, Poland)

**Chapter 15:** The Future of Usability Evaluation: Increasing Impact on Value. *Stephanie Rosenbaum & Maggie Reilly* (Tec-Ed, USA)

### CONCLUSION

**Chapter 16:** A Green Paper for Usability Maturation. *Effie Lai-Chong Law<sup>1</sup>, Ebba Thora Hvannberg<sup>2</sup> & Gilbert Cockton<sup>3</sup>* (<sup>1</sup>ETH Zürich, Switzerland; <sup>2</sup>University of Iceland; <sup>3</sup>University of Sunderland, UK)

## Short Term Scientific Mission

### Florence Pontico

LIHS-IRIT, University Paul Sabatier  
Toulouse, France



#### *Usability patterns for eGovernment applications*

This one month long STMS held in October 2006 at SmalS-MvM (Brussels, Belgium) was proposed as part of Florence Pontico's PhD thesis whose main purpose is to investigate methods, tools and techniques enabling the development of usable, accessible and reliable eGovernment applications to a large public of citizens. As government agencies, such as SmalS-MvM, increasingly move towards providing web access to their administrative procedures, the need arises to provide universal access to this kind of software. This need is sharpened by the fact that eGovernment software is usually mandated to follow very strict requirements in terms of confidentiality protection, accessibility and general usability.

Quite often, the development of eGovernment application requires the participation of several categories of domain experts, software engineering and designers who must collaborate to produce efficient end-user applications. The dynamics created by the interaction of people with so diverse background and expertise motivates the development of methods and techniques to communicate results of usability evaluations and find jointly solutions to usability problems. This STMS supported an empirical investigation on the field attempting to provide a deeper understanding of the development process of eGovernment applications and usability evaluation methods employed to assess usability and accessibility in the industry.

During this STSM, we employed ethnographical methods to observe the current practice of design of eGovernment projects at SmalS-MvM. More specifically, the following activities have been conducted:

- carry out field observations of current practice of development of eGovernment applications
- analyze user interfaces of eGovernment applications and identify suitable user interface patterns

Thanks to this STSM, cooperation is now established between SmalS-MvM (<http://www.smals-mvm.be/>) and LIHS team (<http://lihs.irit.fr/>). Scientific contributions are actually done from this work in terms of methodology for organizing ergonomic guidelines for supporting the assessment of eGovernment applications. This work is motivated by the ethnographical observations performed at SmalS-MvM. Last but not least of the benefits of this STSM was the warmest welcome from Quentin Limbourg and the whole SmalS-MvM research department! Thanks a lot to them for this quite enlightening and pleasant stay in Brussels!

### Special Interest Group on User Experience (SIG-UX)

The Special Interest Group on User eXperience (**SIG-UX**) was created as one of the outcomes of the exciting Workshop on UX held in Oslo on the 14<sup>th</sup> of October 2006 during the Nordichi2006 (<http://www.cost294.org/ux-workshop-nordichi2006/>).

The overall goal of the **SIG-UX** is to provide a global platform to develop a synergy between UX and related areas, especially usability, and to develop joint activities and strategies to advance this community of interest and practice.

This SIG aims to explore research and practical issues pertaining to UX from interdisciplinary perspectives and to promote as well as sustains members' efforts and interests in finding effective solutions. It also aims to identify trends and a unified vision for UX with the joint creation of a manifesto on UX, thereby guiding and driving this emerging field towards maturity. The SIG-UX serves as a portal for the presentation and dissemination of results and innovations.

The **SIG-UX** is open to all interested individuals and organizations engaged in UX and related areas. You can join this group at the COST294 web site: <http://cost294.org/sig-ux/>

For further enquires, contact Effie Law ([law@tik.ee.ethz.ch](mailto:law@tik.ee.ethz.ch)).

### Upcoming COST294-MAUSE Events

**3rd Open Workshop: Review, Report and Refine Usability Evaluation Methods (R<sup>3</sup> UEMs)** The aim of this workshop is to build a knowledge-pool around the WG1 to systematize the selection of appropriate Usability Evaluation Methods according to contextual requirements and constraints.

Location: Athens, Greece

Organizer: Dominique Scapin & Effie Law

Contact: [Dominique.Scapin@inria.fr](mailto:Dominique.Scapin@inria.fr)

Date: 5 March 2007

#### **5th Management Committee +WG meeting**

Location: Athens, Greece

Organizer: Simos Retalis

Contact: [retal@unipi.gr](mailto:retal@unipi.gr)

Date: 6-7 March 2007

**4th Open Workshop: Usability Evaluation of Social Software - Challenges and Solutions.** The concept of usability concept and practice is evolving and shifting the focus from individual, performance-based cognition to group, perception-based emotion and experience. The aim of this workshop is to review the extensibility of existing usability evaluation methods and metrics, to collect case studies and to identify alternative methods/ measures for evaluating social software.

Location: Moscow, Russia

Organizer: Effie Law & Svetlana Taneva

Contact: [Svetlana.Taneva@tik.ee.ethz.ch](mailto:Svetlana.Taneva@tik.ee.ethz.ch)

Date: 24th May 2007

#### **6th Management Committee +WG meeting**

Location: Salzburg, Austria

Organizer: Regina Bernhaupt

Contact: [regina.bernhaupt@sbg.ac.at](mailto:regina.bernhaupt@sbg.ac.at)

Date: 7-8 June 2007

### Related Events

#### **EIS 2007**

Location: Salamanca, Spain

Date: 22-24 March 2007

Web: <http://www.se-hci.org/ehci-hcse-dsvis07/index.html>

#### **CHI'07 workshop: Increasing the impact of usability work in software development**

Location: San Jose, USA

Date: 29th April 2007: Workshop

Web: <http://www.diku.dk/infosys/chiworkshop/>

#### **COST 298: The Good, the Bad, and the Unexpected.**

"The user and the future of information and communication technologies."

Location: Moscow, Russia

Date: 23-25 May 2007

Web: <http://conference.cost298.org/>

#### **INTERACT 2007**

Location: Rio de Janeiro, Brazil

Date: 10-14 September 2007

Web: <http://www.interact2007.org/>

#### **TAMODIA2007**

Location: Toulouse, France

Date: 8-9 November 2007

Web: <http://lihs.irit.fr/tamodia2007/>

### COST294-MAUSE Management Committee

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### COST294-MAUSE Dissemination Activity

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