2014 9th International Conference on the Quality of Information and Communications Technology

(QUATIC 2014)

Guimaraes, Portugal
23-26 September 2014
# Table of Contents

- Message from Conference Chairs.............................................................................................................xi
- Organizing Committee..............................................................................................................................................xiv
- Program Committee......................................................................................................................................................xv

## Invited Papers (Keynote Speakers)

- Software Defects: Stay Away from Them. Do Inspections! .................................................................1
  *Guilherme Horta Travassos*

## Main Session

- Overcoming Structural Resistance in SPI with Change Management .........................................................8
  *Henrique Narciso and I. Allison*

- Higher Education Business Process Improvement: Achieving BPMM Level 3 ........................................18
  *Duarte Duarte and Paula Ventura Martins*

- Results of 10 Years of Software Process Improvement in Brazil Based on the MPS-SW Model .................28
  *Marcos Kalinowski, Kival Weber, Nelson Franco, Elidiane Barroso, Virginia Duarte, David Zanetti, and Gleison Santos*

- Systems and Software Engineering Standards for Very Small Entities: Implementation and Initial Results ..........38
  *Claude Y. Laporte and Rory V. O'Connor*

- Estrangement between Classes: Test Coverage-Based Assessment of Coupling Strength between Pairs of Classes .........................................................48
  *George Kakarontzas, Vassilis C. Gerogiannnis, Stamatia Bibi, and Ioannis Stamelos*
Incident Management Optimization through the Reuse of Experiences and Natural Language Processing ..............................................................58
  
  Glauber Bezerra, Vladia Pinheiro, and Adriano Bessa

Pattern Based GUI Testing for Mobile Applications .........................................................66
  
  Pedro Costa, Ana C.R. Paiva, and Miguel Nabuco

  
  Antonia Bertolino, Said Daoudagh, Francesca Lonetti, and Eda Marchetti

A Bottom-Up Quality Model for QVTo ............................................................................85
  
  Christine M. Gerpheide, Ramon R.H. Schifferlers, and Alexander Serebrenik

Comparing Three Notations for Defining Scenario-Based Model Tests: A Controlled Experiment .......................................................................95
  
  Bernhard Hoisl, Stefan Sobernig, and Mark Strembeck

Web Application Model Generation through Reverse Engineering and UI Pattern Inferring .............................................................................105
  
  Clara Sacramento and Ana C.R. Paiva

**Thematic Track: Quality in ICT Requirements Engineering**

Foreword of the Thematic Track: Quality in ICT Requirements Engineering ..................116
  
  Maria Lencastre

An Experiment of Software Quality Evaluation in the Audio-Visual Media Preservation Context ...........................................................................118
  
  Isabella Biscoglio and Eda Marchetti

Towards a System Requirements Specification Template that Minimizes Combinatorial Effects ...........................................................................124
  
  Alberto Rodrigues da Silva, Jan Verelst, Herwig Mannaert, David Almeida Ferreira, and Philip Huysmans

A Study on the Viability of Formalizing Use Cases ..........................................................130
  
  Rui Couto, Antônio Nestor Ribeiro, and José Creissac Campos

Preliminary Experience Using JetBrains MPS to Implement a Requirements Specification Language .........................................................................134
  
  Alberto Rodrigues da Silva, Siniša Vlajić, Saša Lazarević, Ilija Antović, Vojislav Stanojević, and Miloš Milić

**Thematic Track: Quality in Agile Methods**

Foreword of the Thematic Track: Quality in Agile Methods ...............................................138
  
  Panagiotis Sfetsos
A Reference Model for Agile Quality Assurance: Combining Agile Methodologies and Maturity Models .................................................................139
  Fernando Selleri Silva, Felipe Santana Furtado Soares, Angela Lima Peres, Ivanildo Monteiro de Azevedo, Pietro Pereira Pinto, and Silvio Romero de Lemos Meira

A Comparative Study on the Effectiveness of Patterns in Software Libraries and Standalone Applications .................................................................145
  Panagiotis Sfetsos, Apostolos Ampatzoglou, Alexander Chatzigeorgiou, Ignatios Deligiannis, and Ioannis Stamelos

**Thematic Track: ICT Process Improvement and Assessment**

Foreword of the Thematic Track: ICT Process Improvement and Assessment .................................................................151
  Karol Frühauf

Improving the Software Factory Contracting Process in the Public Area: The Rio de Janeiro City Hall's Experience .................................................................152
  Marcia Fontes, Wesley Nascimento, Katia Carvalho, Edison Moreira, Monica Cardoso, and Mariano Montoni

Test Process Improvement with Documentation Driven Integration Testing .................................................................156
  Florian Häser, Michael Felderer, and Ruth Breu

QuASE: A Tool Supported Approach to Facilitating Quality-Related Communication in Software Development .................................................................162
  Vladimir A. Shekhovtsov, Heinrich C. Mayr, and Vladyslav Lubenskyi

A Cynefin Based Approach to Process Model Tailoring and Goal Alignment .................................................................166
  Marion Lepmets, Rory V. O’Connor, Aileen Cater-Steel, Antoni Lluís Mesquida, and Tom McBride

The Most Often Seen Misconceptions in Process Improvement .................................................................170
  Karol Frühauf

CERTICS Assessment Methodology for Software Technological Development and Innovation .................................................................174
  Angela M. Alves, Clenio F. Salviano, Giancarlo N. Stefanuto, Sônia T. Maintinguer, Carolina V. Mattos, Camila Zeitoum, Marcia Martinez, and Giancarlo Reuss

**Thematic Track: Quality in Model Driven Engineering**

Foreword of the Thematic Track: Quality in Model Driven Engineering .................................................................178
  Marjan Mernik

Comparing Three Notations for Defining Scenario-based Model Tests: A Controlled Experiment .................................................................180
  Bernhard Hoisl, Stefan Sobernig, and Mark Strembeck
On the Appropriateness of Domain-Specific Languages Derived from Different Metamodels .................................................................190
Igor Rožanc and Boštjan Slivnik

Refactoring Meets Model-Driven Spreadsheet Evolution ..................................................................................................................196
Jácome Cunha, João Paulo Fernandes, Pedro Martins, Rui Pereira, and João Saraiva

On the Impact of Automation and Trace-Enabling over the Quality of Model Transformations ........................................................................202
Verónica A. Bollati, Juan M. Vara, Álvaro Jiménez, and Esperanza Marcos

Thematic Track: ICT Verification and Validation

Foreword of the Thematic Track: ICT Verification and Validation ........................................................................................................208
Eda Marchetti

Combinatorial Testing in an Industrial Environment—Analyzing the Applicability of a Tool ........................................................................210
Nelly Condori-Fernández, Peter M. Kruse, Tanja E. J. Vos, Etienne Brosse, and Alessandra Bagnato

Automatic Test Set Generation for Function Block Based Systems Using Model Checking ..........................................................................216
Jussi Lahtinen

Validation of Interlocking Systems by Testing their Models ....................................................................................................................226
Andrea Bonacchi and Alessandro Fantechi

On Testing against Partial Non-observable Specifications .........................................................................................................................230
Natalia Kushik, Nina Yevtushenko, and Ana Cavalli

Thematic Track: Evidence-Based Software Quality Engineering

Foreword of the Thematic Track: Evidence-Based Software Quality Engineering ........................................................................................................234
Guilherme Horta Travassos and Fernando Brito e Abreu

Project Management Suported by Business Process Management ........................................................................................................236
Welkey Costa do Carmo and Adriano Bessa Albuquerque

Improvement Methods for Software Requirement Specifications: A Mapping Study .......................................................................................242
Viktor Pekar, Michael Felderer, and Ruth Breu
Thematic Track: Quality in IT Service Management

Foreword of the Thematic Track: Quality in IT Service Management ........................................246

Marion Lepmets

Incident Management Optimization through the Reuse of Experiences and Natural Language Processing ..........................................................................................................................247

Gláuber de Tarso Vieira Bezerra, Vládia Célia Monteiro Pinheiro, and Adriano Bessa Albuquerque

Toward a Gamification Model to Improve IT Service Management Quality on Service Desk ........................................................................................................................................255

Fabio Silva da Conceição, Alan Pedro da Silva, Ananias Queiroga de Oliveira Filho, and Reinaldo Cabral Silva Filho

Thematic Track: Quality in Web Engineering

Foreword of the Thematic Track: Quality in Web Engineering ............................................................261

Maristella Matera

Fuzzy Mashup Quality Requirements Specification for Web Users ..........................................................262

Andreas Rüempel, Carsten Radeck, Juri Tichomirow, and Klaus Meißner

A Novel Framework for Creating User Interface Level Tests Resistant to Refactoring of Web Applications ........................................................................................................................................268

Heidar Pirzadeh, Sara Shanian, and Farzin Davari

Thematic Track: SEDES’2014 Workshop

Foreword of the 5th Portuguese Software Engineering Doctoral Symposium (SEDES’2014) .................................................................274

Rui Abreu and João Pascoal Faria

Derivation of Data-Driven Software Models from Business Process Representations ..........................................................................................................................276

Estrela Ferreira Cruz, Ricardo J. Machado, and Maribel Y. Santos

Availability Evaluation of Software Architectures through Formal Methods ........................................282

João Miguel Franco, Raul Barbosa, and Mário Zenha-Rela

An OMG-based Meta-Framework for Alignment of IS/IT Architecture with Business Models ..........................................................................................................................288

Carlos E. Salgado, Ricardo J. Machado, and Rita Suzana Pitangueira Maciel

Automated Pattern-Based Testing of Mobile Applications ........................................................................294

Inês Coimbra Morgado, Ana C.R. Paiva, and João Pascoal Faria

On the Evaluation of Software Maintainability Using Automatic Test Case Generation .................................................................300

Ana Filipa Nogueira, José Carlos Bregieiro Ribeiro, and Mário Zenha-Rela