

Foreword

What is the way design decisions are made in Software design and implementation? What is the relationship between a software artifact and customer requirements? What are the reasons, what is the rationale for a specific technical solution? How should design decisions be documented? These are only some of the questions which Bernhard Turban tackles in his dissertation on *Tool-Based Requirements Traceability*.

One of the major merits of this book is the successful bridging from design theories to practical tool design for embedded real-time software: Bernhard Turban actually puts design theory to work, in a way from which software designers and engineers may directly benefit. At the same time, this effort is firmly rooted in current software engineering standards like SPICE (Software Process Improvement and Capability Determination, ISO/IEC 15 504).

Tackling the documentation needs for software design decisions by implementing a tool using a specific algorithm or forwarding these decisions shows the authors inventiveness: For a problem many software engineers are constantly confronted with, this solution provides an innovative solution. At the same time, this approach generates traceability-relevant information.

In addition, the author does not only present a plausible and functional algorithm for documenting design decisions across different levels of the development process, he also realizes a complex interactive interface tool which seamlessly adds to the functionality of modeling tools. Based on this work, a commercial software development tool was created.

This work was developed not in an academic context, but in an industrial setting within a group of software engineers working in the domain of automotive embedded real-time systems. Thus, the author can draw all examples for his work from immediate observations in the development projects he was working on. This adds to the credibility of the work presented here, and I am sure that both academia as well as industrial software design can learn a good deal lot from Bernhard Turban's work.

With the complexity of software projects still rising, the demand for better documentation and traceability will grow beyond typical fields like the engineering of embedded systems. Therefore, it is to be hoped for that many software projects will benefit from Bernhard Turban's theoretical approach towards design decisions as well as from the tool solutions he has created.

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Tool-Based Requirement Traceability between
Requirement and Design Artifacts

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2013, XXVII, 439 p. 60 illus., Softcover

ISBN: 978-3-8348-2473-8