

Early Experience with Requirements Traceability in an Industrial Environment

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Abstract

Cisco Systems, a major provider of networking and network management solutions, traditionally builds products incrementally, so that the complexity of each development is low. Current projects are more complex, motivating more formal systems engineering. Company studies show that requirements issues, particularly missing requirements, cause delays and defects.

A pilot project of a tool-assisted requirements traceability process was conducted in one Business Unit using Rational Software's RequisitePro®. There was some concern that the project selected for this pilot was too far along in its development cycle for traceability to be of sufficient benefit; this concern was not warranted, as a number of problems were found, such as marketing requirements not incorporated into the engineering specification.

The pilot project demonstrated the value of the process, convincing management to extend it to other projects, and additional Business Units. The process required significant training and continuing direct process and tool support. Weaknesses were revealed in the requirements development process, including the lack of a consistent elicitation process. Process extensions and changes are planned to address these weaknesses.

About the Speakers

***Merlin Dorfman** is a Quality Systems Staff Engineer at Cisco Systems in San Jose, California. Merlin retired in 1997 from Lockheed Martin Corp., where he was a Technical Consultant in the System Engineering organization, Space Systems Product Center. Dr. Dorfman is a Fellow of the American Institute of Aeronautics and Astronautics (AIAA), winner of its Aerospace Software Engineering Award for 1999, a former member of its System Engineering Technical Committee, and past chairman of the Software Systems Technical Committee. He is an affiliate member of the IEEE Computer Society and a member of the American Society for Quality (ASQ) and its Software Division. He is co-editor of three IEEE Tutorial volumes, "Software Engineering," "Software Requirements Engineering," and "Standards, Guidelines, and Examples for System and Software Requirements Engineering," and co-editor of a volume, "Aerospace Software Engineering," in the AIAA "Progress in Aeronautics and Astronautics" Series. He was a member of the Steering Committee for the IEEE International Conferences on Requirements Engineering in 1994, 1996, 1998, and 2000. Dr. Dorfman has a BS and MS from MIT and a PhD from Stanford University, all in Aeronautics and Astronautics. He is a registered Professional Engineer in the states of California and Colorado.*

***Roy Chardon** is a Quality Systems Engineer at Cisco Systems in San Jose, California. Roy has over 30 years experience in systems engineering and project management. His experiences span research, engineering, verification and validation, fielding, application, operational support, product enhancements, and product end-of-life for software and hardware. These experiences contributed to his life-cycle perspective of Requirements Engineering. Roy is the lead engineer, responsible for institutionalizing within the pilot business unit the process described in this paper. Roy has a BS in Physics from the University of Washington. He has done graduate work in engineering, with emphasis on software engineering. Roy is a member of INCOSE.*