Architecting Software Intensive Systems A Practitioners Guide

Managing the Development of Software-Intensive SystemsReliability of Software Intensive SystemsSoftware-Intensive Systems and New Computing ParadigmsDesigning Software-Intensive Systems: Methods and PrinciplesSummary of a Workshop on Software-Intensive Systems and Uncertainty at ScaleSoftware Quality AssuranceSummary of a Workshop on Software-Intensive Systems and Uncertainty at ScaleComplex, Intelligent, and Software Intensive SystemsProject Management of Large Software-Intensive SystemsComplex, Intelligent, and Software Intensive SystemsComplex, Intelligent and Software Intensive SystemsReliability of Software Intensive SystemsArchitecting Software Intensive SystemsEstimating Software-intensive SystemsComplex, Intelligent, and Software Intensive SystemsEnvironment Modeling-Based Requirements Engineering for Software Intensive SystemsComplex, Intelligent and Software Intensive SystemsReliability, Quality and Safety of Software-Intensive SystemsEngineering Theories of Software Intensive SystemsComplex, Intelligent and Software Intensive Systems James McDonald Phuong Y. Tran Martin Wirsing Tiako, Pierre F. National Research Council Ivan Mistrik National Research Council Leonard Barolli Marvin Gechman Leonard Barolli Leonard Barolli Michael A. Friedman Anthony J. Lattanze Richard D. Stutzke Leonard Barolli Zhi Jin Leonard Barolli Dimitris Gritzalis Manfred Broy Leonard Barolli Managing the Development of Software-Intensive Systems Reliability of Software Intensive Systems Software-Intensive Systems and New Computing Paradigms Designing Software-Intensive Systems: Methods and Principles Summary of a Workshop on Software-Intensive Systems and Uncertainty at Scale Software Quality Assurance Summary of a Workshop on Software-Intensive Systems and Uncertainty at Scale Complex, Intelligent, and Software Intensive Systems Project Management of Large Software-Intensive Systems Complex, Intelligent, and Software Intensive Systems Complex, Intelligent and Software Intensive Systems Reliability of Software Intensive Systems Architecting Software Intensive Systems Estimating Software-intensive Systems Complex, Intelligent, and Software Intensive Systems Environment Modeling-Based Requirements Engineering for Software Intensive Systems Complex, Intelligent and Software Intensive Systems Reliability, Quality and Safety of Software-Intensive Systems Engineering Theories of Software Intensive Systems Complex, Intelligent and Software Intensive Systems *James McDonald Phuong Y. Tran Martin Wirsing Tiako, Pierre F. National Research Council Ivan Mistrik National Research Council Leonard Barolli Marvin Gechman Leonard Barolli Leonard Barolli Michael A. Friedman Anthony J. Lattanze Richard D. Stutzke Leonard Barolli Zhi Jin Leonard Barolli Dimitris Gritzalis Manfred Broy Leonard Barolli*

managing the development of software intensive systems provides both an introduction to

project management for beginner software and hardware developers as well as unique advanced materials for experienced users this beneficial resource presents realistic case studies for planning and managing verification and validation for large software projects complex software and hardware systems as well as inspection results and testing metrics to monitor project status industrial practitioners and students will learn ways to improve how they manage and develop their project management applications and techniques to establish large software applications and systems

reliability of software intensive systems

this volume presents results of three workshops of the interlink working group setup by the eu to look at software intensive systems and novel computing paradigms it covers ensemble engineering theory and formal methods and novel computing paradigms

this book addresses the complex issues associated with software engineering environment capabilities for designing real time embedded software systems provided by publisher

the growing scale and complexity of software intensive systems are introducing fundamental new challenges of uncertainty and scale that are particularly demanding for defense systems to assist in meeting these challenges the department of defense asked the nrc to assess the nature of u s national investment in software research as part of this study a workshop was held to examine uncertainty at scale in current and future software intensive systems this report presents a summary of the workshop discussions that centered on process architecture and the grand scale dod software challenges for future systems agility at scale quality and assurance with scale and uncertainty and enterprise scale and beyond the report also offers a summary of key themes emerging from the workshop architectural challenges in large scale systems the need for software engineering capability and open questions and research opportunities

software quality assurance in large scale and complex software intensive systems presents novel and high quality research related approaches that relate the quality of software architecture to system requirements system architecture and enterprise architecture or software testing modern software has become complex and adaptable due to the emergence of globalization and new software technologies devices and networks these changes challenge both traditional software quality assurance techniques and software engineers to ensure software quality when building today and tomorrow s adaptive context sensitive and highly diverse applications this edited volume presents state of the art techniques methodologies tools best practices and guidelines for software quality assurance and offers guidance for future software engineering research and practice each contributed chapter considers the practical application of the topic through case studies experiments empirical validation or systematic comparisons with other approaches already in practice topics of interest include but are not limited to quality attributes of system software architectures aligning enterprise system and software architecture from the point of view of total quality design decisions and their influence on the quality of system software

architecture methods and processes for evaluating architecture quality quality assessment of legacy systems and third party applications lessons learned and empirical validation of theories and frameworks on architectural quality empirical validation and testing for assessing architecture quality focused on quality assurance at all levels of software design and development covers domain specific software quality assurance issues e g for cloud mobile security context sensitive mash up and autonomic systems explains likely trade offs from design decisions in the context of complex software system engineering and quality assurance includes practical case studies of software quality assurance for complex adaptive and context critical systems

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this book provides a platform of scientific interaction between the three challenging and closely linked areas of ict enabled application research and development software intensive systems complex systems and intelligent systems software intensive systems strongly interact with other systems sensors actuators devices other software systems and users more and more domains are using software intensive systems e g automotive and telecommunication systems embedded systems in general industrial automation systems and business applications moreover web services offer a new platform for enabling software intensive systems complex systems research is focused on the overall understanding of systems rather than their components complex systems are characterized by the changing environments in which they interact they evolve and adapt through internal and external dynamic interactions the development of intelligent systems and agents which are increasingly characterized by their use of ontologies and their logical foundations offer impulses for both software intensive systems and complex systems recent research in the field of intelligent systems robotics neuroscience artificial intelligence and cognitive sciences are vital for the future development and innovation of software intensive and complex systems

the book describes how to manage and successfully deliver large complex and expensive systems that can be composed of millions of line of software code being developed by numerous groups throughout the globe that interface with many hardware items being developed by geographically dispersed companies where the system also includes people policies constraints regulations and a myriad of other factors it focuses on how to seamlessly integrate systems

satisfy the customer s requirements and deliver within the budget and on time the guide is essentially a shopping list of all the activities that could be conducted with tailoring guidelines to meet the needs of each project

this book presents scientific interactions between the three interwoven and challenging areas of research and development of future ict enabled applications software complex systems and intelligent systems software intensive systems heavily interact with other systems sensors actuators and devices as well as other software systems and users more and more domains involve software intensive systems e g automotive telecommunication systems embedded systems in general industrial automation systems and business applications moreover web services offer a new platform for enabling software intensive systems complex systems research focuses on understanding overall systems rather than their components such systems are characterized by the changing environments in which they act and they evolve and adapt through internal and external dynamic interactions the development of intelligent systems and agents features the use of ontologies and their logical foundations provide a fruitful impulse for both software intensive systems and complex systems research in the field of intelligent systems robotics neuroscience artificial intelligence and cognitive sciences is a vital factor in the future development and innovation of software intensive and complex systems

this book explores three interwoven and challenging areas of research and development for future ict enabled applications software intensive systems complex systems and intelligent systems software intensive systems are systems that extensively interact with other systems sensors actuators devices and users more and more domains are now employing software intensive systems e g the automotive sector telecommunication systems embedded systems in general industrial automation systems and business applications moreover the outcome of web services offers a new platform for enabling software intensive systems complex systems research is focused on the overall understanding of systems rather than their components complex systems are very much characterized by the changing environments in which they operate through their multiple internal and external interactions they evolve and adapt through internal and external dynamic interactions the development of intelligent systems and agents which is increasingly characterized by the use of ontologies can be beneficial for software intensive systems and complex systems alike accordingly recent research in the areas of intelligent systems robotics neuroscience artificial intelligence and the cognitive sciences is essential to the future development of software intensive and complex systems

reliability of software intensive systems

architectural design is a crucial first step in developing complex software intensive systems early design decisions establish the structures necessary for achieving broad systemic properties however today s organizations lack synergy between software their development processes and technological methodologies providing a thorough treatment of

annotation this book outlines practical proven estimating techniques that are simple and easy to use for software practitioners

this book gathers the proceedings of the 11th international conference on complex intelligent and software intensive systems cisis 2017 held on june 28 june 30 2017 in torino italy software intensive systems are characterized by their intensive interaction with other systems sensors actuators devices and users further they are now being used in more and more domains e g the automotive sector telecommunication systems embedded systems in general industrial automation systems and business applications moreover the outcome of web services delivers a new platform for enabling software intensive systems complex systems research is focused on the understanding of a system as a whole rather than its components complex systems are very much shaped by the changing environments in which they operate and by their multiple internal and external interactions they evolve and adapt through internal and external dynamic interactions the development of intelligent systems and agents which invariably involves the use of ontologies and their logical foundations offers a fruitful impulse for both software intensive systems and complex systems recent research in the fields of intelligent systems robotics neuroscience artificial intelligence and cognitive sciences is essential to the future development of and innovations in software intensive and complex systems the aim of the volume complex intelligent and software intensive systems is to provide a platform of scientific interaction between the three interwoven and challenging areas of research and development of future information and communications technology ict enabled applications software intensive systems complex systems and intelligent systems

environment modeling based requirements engineering for software intensive systems provides a new and promising approach for engineering the requirements of software intensive systems presenting a systematic promising approach to identifying clarifying modeling deriving and validating the requirements of software intensive systems from well modeled environment simulations in addition the book presents a new view of software capability i e the effect based software capability in terms of environment modeling provides novel and systematic methodologies for engineering the requirements of software intensive systems describes ontologies and easily understandable notations for modeling software intensive systems analyzes the functional and non functional requirements based on the properties of the software surroundings provides an essential practical guide and formalization tools for the task of identifying the requirements of software intensive systems gives system analysts and requirements engineers insight into how to recognize and structure the problems of developing software intensive systems

software intensive systems are systems which heavily interact with other systems sensors actuators devices other software systems and users more and more domains are involved with software intensive systems e g automotive telecommunication systems embedded systems in general industrial automation systems and business applications moreover the outcome of web services delivers a new platform for enabling software intensive systems complex systems

research is focused on the overall understanding of systems rather than its components complex systems are very much characterized by the changing environments in which they act by their multiple internal and external interactions they evolve and adapt through internal and external dynamic interactions the development of intelligent systems and agents which is each time more characterized by the use of ontologies and their logical foundations builds a fruitful impulse for both software intensive systems and complex systems recent research in the field of intelligent systems robotics neuroscience artificial intelligence and cognitive sciences is a very important factor for the future development and innovation of software intensive and complex systems the aim of the book complex intelligent and software intensive systems is to deliver a platform of scientific interaction between the three interwoven challenging areas of research and development of future ict enabled applications software intensive systems complex systems and intelligent systems

it is indeed widely acceptable today that nowhere is it more important to focus on the improvement of software quality than in the case of systems with requirements in the areas of safety and reliability especially for distributed real time and embedded systems thus much research work is under progress in these fields since software process improvement impinges directly on achieved levels of quality and many application experiments aim to show quantitative results demonstrating the efficacy of particular approaches requirements for safety and reliability like other so called non functional requirements for computer based systems are often stated in imprecise and ambiguous terms or not at all specifications focus on functional and technical aspects with issues like safety covered only implicitly or not addressed directly because they are felt to be obvious unfortunately what is obvious to an end user or system user is progressively less so to others to the extend that a software developer may not even be aware that safety is an issue therefore there is a growing evidence for encouraging greater understanding of safety and reliability requirements issues right across the spectrum from end user to software developer not just in traditional safety critical areas e g nuclear aerospace but also acknowledging the need for such things as heart pacemakers and other medical and robotic systems to be highly dependable

software engineering has over the years been applied in many different fields ranging from telecommunications to embedded systems in car and aircraft industry as well as in production engineering and computer networks foundations in software technology lie in models allowing to capture application domains detailed requirements but also to understand the structure and working of software systems like software architectures and programs these models have to be expressed in techniques based on discrete mathematics algebra and logics however according to the very specific needs in applications of software technology formal methods have to serve the needs and the quality of advanced software engineering methods especially taking into account security aspects in information technology this book presents mathematical foundations of software engineering and state of the art engineering methods in their theoretical substance in the step towards practical applications to examine software engineering techniques and foundations used for industrial tasks the contributions in this volume emerged from lectures of the 25th international summer school on engineering theories of software intensive systems held

at marktoberdorf germany from august 3 to august 15 2004

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