



# Economics-Driven Software Architecture

From Morgan Kaufmann

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## Economics-Driven Software Architecture From Morgan Kaufmann

*Economics-driven Software Architecture* presents a guide for engineers and architects who need to understand the economic impact of architecture design decisions: the long term and strategic viability, cost-effectiveness, and sustainability of applications and systems. Economics-driven software development can increase quality, productivity, and profitability, but comprehensive knowledge is needed to understand the architectural challenges involved in dealing with the development of large, architecturally challenging systems in an economic way.

This book covers how to apply economic considerations during the software architecting activities of a project. Architecture-centric approaches to development and systematic evolution, where managing complexity, cost reduction, risk mitigation, evolvability, strategic planning and long-term value creation are among the major drivers for adopting such approaches. It assists the objective assessment of the lifetime costs and benefits of evolving systems, and the identification of legacy situations, where architecture or a component is indispensable but can no longer be evolved to meet changing needs at economic cost. Such consideration will form the scientific foundation for reasoning about the economics of nonfunctional requirements in the context of architectures and architecting.

- Familiarizes readers with essential considerations in economic-informed and value-driven software design and analysis
- Introduces techniques for making value-based software architecting decisions
- Provides readers a better understanding of the methods of economics-driven architecting

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## **Economics-Driven Software Architecture From Morgan Kaufmann Bibliography**

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## Editorial Review

### Review

"This multi-faceted body of knowledge will be able to guide any practicing software architect or software engineer in making explicit economic and strategic considerations of architectural choices." - *Computing Reviews*

"The main goal of this book is to outline some of the current thinking on the processes and practices for economics- and value-oriented software architecting." - *HPCMagazine.com, August 2014*

### From the Back Cover

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### About the Author

Ivan Mistrik is a computer scientist who is interested in system and software engineering (SE/SWE) and in system and software architecture (SA/SWA), in particular: life cycle system/software engineering, requirements engineering, relating software requirements and architectures, knowledge management in software development, rationale-based software development, aligning enterprise/system/software architectures, and collaborative system/software engineering. He has more than forty years' experience in the field of computer systems engineering as an information systems developer, R&D leader, SE/SA research analyst, educator in computer sciences, and ICT management consultant.

In the past 40 years, he has been primarily working at various R&D institutions and has done consulting on a variety of large international projects sponsored by ESA, EU, NASA, NATO, and UN. He has also taught university-level computer sciences courses in software engineering, software architecture, distributed information systems, and human-computer interaction. He is the author or co-author of more than 80 articles and papers in international journals, conferences, books and workshops, most recently a chapter Capture of Software Requirements and Rationale through Collaborative Software Development, a paper Knowledge Management in the Global Software Engineering Environment, and a paper Architectural Knowledge

Management in Global Software Development.

He has written a number of editorials and prefaces, most recently for the book on Aligning Enterprise, System, and Software Architecture and the book on Agile Software Architecture. He has also written over 120 technical reports and presented over 70 scientific/technical talks. He has served in many program committees and panels of reputable international conferences and organized a number of scientific workshops, most recently two workshops on Knowledge Engineering in Global Software and Development at International Conference on Global Software Engineering 2009 and 2010 and IEEE International Workshop on the Future of Software Engineering for/in the Cloud (FoSEC) held in conjunction with IEEE Cloud 2011. He has been the guest-editor of IEE Proceedings Software: A special Issue on Relating Software Requirements and Architectures published by IEE in 2005 and the lead-editor of the book Rationale Management in Software Engineering published by Springer in 2006. He has been the co-author of the book Rationale-Based Software Engineering published by Springer in May 2008. He has been the lead-editor of the book Collaborative Software Engineering published by Springer in 2010, the book on Relating Software Requirements and Architectures published by Springer in 2011 and the lead-editor of the book on Aligning Enterprise, System, and Software Architectures published by IGI Global in 2012. He was the lead-editor of the Expert Systems Special Issue on Knowledge Engineering in Global Software Development and the co-editor of the JSS Special Issue on the Future of Software Engineering for/in the Cloud, both published in 2013. He was the co-editor for the book on Agile Software Architecture published in 2013. Currently, he is the lead-editor for the book on Economics-driven Software Architecture to be published in 2014.

Rami Bahsoon is a Senior lecturer in Software Engineering and founder of the Software Engineering for/in the Cloud interest groups at the School of Computer Science, University of Birmingham, UK. His group currently comprises nine PhD students working in areas related to cloud software engineering and architectures. The group's research aims at developing architecture and frameworks to support and reason about the development and evolution of dependable ultra-large complex and data-intensive software systems, where the investigations span cloud computing architectures and their economics. Bahsoon had founded and co-organized the International Software Engineering Workshop series on Software Architectures and Mobility held in conjunction with ICSE and the IEEE International Software Engineering IN/FOR the Cloud workshop in conjunction with IEEE Services. He was the lead editor of two journal special issues with the Journal of Systems and Software Elsevier- one on the Future of Software Engineering for/In the Cloud and another on Architecture and Mobility. Bahsoon has co-edited a book on Economics-driven Software Architecture, to be published by Elsevier in 2014 and co-edited another book on Aligning Enterprise, System, and Software Architectures, published by IGI Global in 2012. He is currently acting as the workshop chair for IEEE Services 2014, the Doctoral Symposium chair of IEEE/ACM Utility and Cloud Computing Conference (UCC 2014) and the track chair for Utility Computing of HPCC 2014. He holds a PhD in Software Engineering from University College London (UCL) for his research on evaluating software architecture stability using real options. He has also read for MBA-level certificates with London Business School.

Rick Kazman is a Professor at the University of Hawaii and a Principal Researcher at the Software Engineering Institute of Carnegie Mellon University. His primary research interests are software architecture, design and analysis tools, software visualization, and software engineering economics. He also has interests in human-computer interaction and information retrieval. Kazman has created several highly influential methods and tools for architecture analysis, including the SAAM (Software Architecture Analysis Method), the ATAM (Architecture Tradeoff Analysis Method), the CBAM (Cost-Benefit Analysis Method) and the Dali architecture reverse engineering tool.

Currently a post-doctoral researcher in the CREST centre, SSE group, UCL. She received her PhD in Software Engineering from Kings College London in 2010. She has been working on multi-objective requirements selection and optimization for release planning problem.

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