

THE BUSINESS VALUE OF AGILE SOFTWARE METHODS

Maximizing ROI with Just-in-Time Processes and Documentation

By Dr. David F. Rico, Dr. Hasan H. Sayani, and Dr. Saya Sone

ABOUT THE BOOK

"This book challenges many of the fundamental theories underlying traditional and agile methods; it poses that agile methods are the evolution of 20th century management thought rather than its antithesis; it shows that agile methods are based on systematic values, principles, and discipline; and, more importantly, it demonstrates that agile methods are right-sized, just-enough, and just-in-time approaches for maximizing the business value of new product development."

—Dr. Jeffrey V. Sutherland

Today, there are over 250,000 information technology projects in the U.S., these projects are valued at over \$300 billion, and nearly 167,000 (67%) of these projects may be using agile methods to ensure their ultimate success rather than traditional methods. As a new model of project management, agile methods can be used to improve the success, business value, and return-on-investment of high-risk and highly-complex information technology projects in today's dynamic, turbulent, and highly-uncertain marketplace. In fact, Fortune 500 U.S. firms view agile methods as a powerful organizational transformation approach for jumpstarting the technological engines of their bureaucracies in today's sluggish economy, and to gain a foothold in the \$3 trillion U.S. electronic commerce industry that may grow to \$10 trillion in the next decade.

The Business Value of Agile Methods is a comprehensive methodology for quantifying the costs and benefits of using agile methods to create innovative software products. Using cost of quality, total cost of ownership, and total life cycle costs, the authors estimate return on investment and net present value. For the first time, the use of advanced measures, such as real options, is utterly simplified. This book disarms explosive issues related to the adoption of agile methods. It provides a broad survey of cost and benefit data from an analysis of hundreds of projects. It then introduces the industry's first top-down parametric models for estimating the costs and benefits of agile methods. And it contains numerous examples on how to estimate the costs and benefits of the major types of agile methods such as Scrum and Extreme Programming, among others.

KEY FEATURES

- Designed for practitioners, students, scholars, managers, change leaders, and executives who want to learn how to gain a competitive advantage from the business value of agile methods.
- Marks a major milestone in the history of agile methods by establishing a solid foundation for understanding how to achieve the maximum economic business value of agile methods.
- Opens with a comprehensive definition, introduction, and explanation of agile methods for those embarking upon a journey of scholarly research into the science of agile methods.
- Unravels and shatters key myths and misconceptions propagated by traditionalists surrounding the modern-day phenomenon of agile methods for creating innovative software products.
- Identifies the major types and kinds of agile methods, along with the major forms of best practices, as a pretext for mixing and matching them to create super-hybrid methodologies.

- Ponders a thought-provoking history of agile methods with respect to scientific management, organizational behavior, systems theory, new product development, and lean thinking.
- Serves as a roadmap for linking agile methods to major industry standards such as the project management, systems engineering, and software engineering body of knowledge.
- Disarms explosive issues by explaining the role of agile methods in software engineering and supporting processes such as documentation, quality assurance, and software maintenance.
- Introduces a complete family of metrics and models specially designed for agile methods, rather than saddling projects with traditional, industrial-age manufacturing-era measures.
- Provides one of the first and only comprehensive compilations of the costs and benefits of agile methods from an analysis of hundreds of studies of real-world software projects.
- Presents a comprehensive suite of top-down metrics, models, and measurements for estimating the costs, benefits, return on investment, and net present value of agile methods.
- Illustrates the first simple-to-use parametric models of real options for estimating the business value of agile methods since the inception of the Nobel-prize winning Black-Scholes formulas.
- Closes with numerous examples, data, figures, and references for estimating business value and identifies a set of critical success factors for succeeding with agile methods every time.

ABOUT THE AUTHORS

Dr. David F. Rico has been a technical leader in support of NASA, DARPA, DISA, SPAWAR, USAF, AFMC, NAVAIR, CECOM, and MICOM for over 25 years. He has led, managed, or participated in over 20 organization change initiatives using agile methods, Lean Six Sigma, ISO 9001, CMMI®, SW-CMM®, Enterprise Architecture, Baldrige, and DoD 5000. He specializes in IT investment analysis, IT project management, and IT-enabled change. He has been an international keynote speaker, published numerous articles, and written or contributed to six textbooks. He holds a BS in computer science, MS in software engineering, and a DM in information systems. He's also a certified PMP and CSM.

Dr. Hasan H. Sayani has been in industry and academia for over 40 years. His interests are in information systems, information systems development, life cycle methods and tools, and semantic database management systems. He taught at the University of Maryland–College Park in the Information Systems Management program. He cofounded a firm that built systems for various commercial and governmental organizations. He has participated in various professional and standardization organizations (including IEEE, ACM, CASE, ANS, CODASYL, DoD, CALS). He holds a BS, MS, and PhD from the University of Michigan.

Dr. Saya Sone has worked for multiple Fortune 500 companies, such as CSC, BT, and AOL. She has led numerous data center design, software development, marketing, and customer support projects. She managed a corporate-wide rollout of agile methods and Scrum at a major U.S. electronic commerce firm. Her field of specialty is agile project management. She holds an MA in project management and a DBA in information systems. She is also a certified project management professional, as well as a certified Scrum practitioner.

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BOOK REVIEWS

Agile by the numbers. *For years I've gotten questions from people to show them the proof that agile works. Well, this book is definitely a step in the right direction towards answering that question. Based on information from hundreds of projects the book works through the costs and benefits of agile throughout the entire life cycle.*

Disciplined agile teams measure their effectiveness, or lack thereof I suppose, and then act on those measures to improve their approach. This book also provides insight into what to measure on agile project teams.

If you're thinking about agile or about improving your existing agile approach, this book should prove to be a valuable asset.

—Scott Ambler, Chief Methodologist/Agile Expert for IBM Rational

Agile methods are highly-disciplined. *This reference shows that agile methods are based on systematic values, principles, and discipline; and, more importantly, it demonstrates that agile*

methods are right-sized, just-enough, just-in-time approaches for maximizing the business value of new product development.

—**Dr. Jeffrey V. Sutherland, Co-Creator of Scrum, CEO, Scrum, Inc.**

Comprehensive and rigorous reference to agile. *If you've longed for a comprehensive and rigorous reference that supports agile methods -- here it is, at last! This is a work that stands out from the crop because if its comprehensive treatment of agile: management, engineering, documentation, with special references to the military and government domains. There's also a comparative study of agile methods along with surveys, metrics, and other financial analysis that will impress your inner actuary. Dr. Rico, Dr. Sayani, and Dr. Sone bring their considerable academic prowess to bear on some of the most persistent objections to agile. In particular, those looking to build a bullet proof case for agile methods based on solid data and comprehensive research and analysis will find this an invaluable work.*

—**Sanjiv Augustine, President, LitheSpeed, Author, Managing Agile Projects**

Strong motivation for agile Development. *Business has long desired a comprehensive review of the economics of software development and this work by David Rico goes a long way towards this goal. We in the community have been telling our business partners that lean and agile methods are superior for a variety of reasons but often have lacked the data to quantify our assertions. Dr. Rico's extensive research into the ROI of various software development practices finally allows us to quantify the impact that process has on business results. David Rico is at the forefront of bringing new levels of rigor and science to the problem of software economics. His data and his insights into that data are transforming how we think about software development processes.*

—**Roland Cuellar, Vice President, LitheSpeed, Certified Scrum Master, Lean Six Sigma Green Belt**

Sheds important light on the costs and benefits of agile methods. *David Rico brings together key data and useful business metrics to help shed light on the success of Agile methods on the software industry, instead of hearsay and evangelism without grounding. I find this invaluable in conversations with executive management to ground Agile approaches in reality. I highly recommend it.*

—**Gabrielle Benefield, Certified Scrum Trainer, Scrum Training Institute**

Agile methods for an agile world. *The world is changing. The increased use of technology in the form of social networking, text messaging, and wireless internet access is fundamentally altering information flows. In order to manage the frenetic pace of information exchange inherent in modern projects, agile methods are arguably the most effective methods a business can use. In *The Business Value of Agile Methods*, David Rico reveals the history of the evolution of agile methods from traditional management practices, and presents valuable information about the current state of the art of the practice of agile methods. The structure of the book is such that it is broken down into individual topics that are as quick and easy to read as an*

*executive summary, yet highly informative. The large number of sections represents a body of knowledge that as a whole might be equivalent to a year of graduate management study. I can attest to the fact that he takes a great deal of thoughtfulness and care into the advice he offers his audience. That same level of care is found in every section of this book. If you are looking for an easy to read, informative, and compelling book on the complete toolbox of agile methods history and practice look no further than *The Business Value of Agile Methods*. Beyond the scope of this book itself, the further readings section at the end of each chapter is the best guide you can find to industry standards and other works on the subject matter. Such a comprehensive and concise guide to literature could only be assembled by an IT industry professional with over twenty years of professional and academic experience on a wide diversity of projects, such as Dr. Rico.*

—Anwar Al Mallah

Provides powerful evidence that agile methods can improve the bottom line. Agile methods have risen to the forefront of software development methodologies. Organizations large and small have begun to investigate the benefits of integrating Agile methodologies into the workplace. Now, a new book by Dr. David F. Rico, Dr. Hasan H. Sayani, and Dr. Saya Sone provides a thorough analysis of the business value of Agile methods.

The Business Value Of Agile Methods begins with an introduction that touches the history, practices, tools, and technologies of various Agile methods. From there it moves on to examine the costs and benefits of Agile methods. It concludes by showing the benefits of Agile methods in financial terms as measured by ROI, NPV, and ROA.

This is a great book for anyone who wants a broad introduction to Agile methods. It is even better for people who are looking to introduce Agile methods in their workplace. In a concise, readable fashion, the authors document the financial benefits of using Agile methods. By quantifying these benefits, the authors have made it easier to champion the cause of Agile methods.

This book is a must for anyone trying to introduce Agile methods to their organization. It provides powerful evidence that using Agile methods can positively affect the bottom line. By framing the argument in financial terms, the authors have provided the ammunition required to initiate lasting organizational change.

—Jim Nix

Excellent resource for measuring the ROI of agile methods. This book captures the essentials of agile methods in a very practical, easy to read form. Each chapter provides succinct information, demonstrating the significance of agile methods. The authors stress the importance of collaboration, teamwork, and adaptability as key to the discovery of business value. The book also unravels the practical side of project management processes by showing the similarities in language, terminology, and frameworks typically found in PMI's Project Management Body of Knowledge. It describes simple project management practices for agile software development projects, using built-in project management frameworks for planning and execution processes. If

you wonder how to measure progress, return on investment, or how to get started with agile methods, this book has your answers.

—Winston Gonzalez, President, Zeenie Enterprises LLC (ZeLLCo)

Compelling read for agile enthusiasts. *This book captures the essentials of agile methods in a very practical, easy to read form. Each chapter provides succinct information, demonstrating the significance of agile methods. The authors stress the importance of collaboration, teamwork, and adaptability as key to the discovery of business value. The book also unravels the practical side of project management processes by showing the similarities in language, terminology, and frameworks typically found in PMI's Project Management Body of Knowledge. It describes simple project management practices for agile software development projects, using built-in project management frameworks for planning and execution processes. If you wonder how to measure progress, return on investment, or how to get started with agile methods, this book has your answers.*

I just finished reading "The Business Value of Agile Software Methods" and I'm very impressed with the breadth-yet-detailed coverage on agile. As an agile coach and consultant, I found this book something I both wanted to hand my new agile customers and also dive into for the advanced coverage of topics like ROI, metrics and business value.

For the ROI of agile methods, the authors present clear techniques for calculating business value as well as agile's historical performance with respect to ROI, using case studies and surveys to support their research. Also included are the measures of agile methods and how these can be compared (favorably) to traditional methods. For completeness, the authors cover software engineering, tools and technologies, software engineering and project management.

Each area of agile is covered in a chapter, often 8 - 10 pages, and there are 24 chapters. As such, this book is able to offer the reader education and analysis of many areas of agile, but summarize it in less than 10 pages so as to make it a quick read. While I read it straight through and enjoyed it, I think I'll use it even more as a reference to look-up information going forward.

I think this book is ideal for a novice who wants a short-and-sweet overview of what agile is, where it came from and its core values. The middle to latter sections might be a bit much for a novice as more advanced topics are covered, but not necessarily depending on their background. Readers with a business background including project management will appreciate the author's efforts to show agile methods in light of traditional "waterfall" practices and measurements.

This book will also be ideal for the agile change agents who have been wanting to show that agile really does outperform traditional methods. The authors have gathered data from numerous agile surveys and projects to present a compelling case that agile projects have higher benefits, lower costs and risks than traditional methods.

Overall I think this book will be a compelling read for agile enthusiasts of all stripes.

—Ryan Shriver, Managing Consultant, Dominion Digital

Very interesting research. *The authors have provided interesting research on the business value of agile methods, and I enjoy seeing serious financial analyses being done on Agile. I had a chance to see David Rico present some of this research, and the differences between Agile and traditional methods were even greater than I expected, despite my support of Agile methods. I think books like this can go a long ways to convince traditional software development shops to consider more Agile methods.*

—Arin Sime, Senior Developer, OpenSource Connections

Like Business Service Management to IT Folks. *The Business Value of Agile Software Methods will affect very many conversations in which a champion socializes Agile with his/her executives. It is an excellent fit for the champion promoting Agile for the following reasons.*

1. It is about the business, not about the fine points of software methods. Like Business Service Management to IT folks, this book gives the heart of the matter to the software development executive.
2. The book captures, analyzes, and synthesizes the results of hundreds of systemic research studies.
3. It provides data on the various Agile methods without favoring one over another. Furthermore, the authors are quite explicit in stating that it not the method itself but the fit of a method to a company/culture/environment that counts.
4. It places equal weight on costs and benefits of Agile, thereby giving the reader a good grasp on trade-offs. This grasp can be enhanced through free downloads of cost and benefit spreadsheets from the corresponding Download Resource Center.
5. A very impressive aspect of this new book is the broad spectrum of the metrics it provides. Just about any business metric your CIO/CFO/CXO might use as the basis for his/her decision-making process, including Real Options Analysis (ROA), is provided. Moreover, the book encourages the use of multiple metrics, clearly indicating the pro and cons of individual metrics. For example: "The business value of Agile methods may be as much as 90% higher than NPV using ROA under extreme market conditions, including high inflation, risk change, and amount of time."

An often used Agile quip is "Don't take you boss to lunch; take him/her to the daily stand-up meeting." I would suggest you give The Business Value of Agile Software Methods to your boss at the end of his/her first stand-up meeting. This recommendation is nicely seconded by the following excerpt from colleague Sanjiv Augustine's review of the book:

... those looking to build a bullet proof case for agile methods based on solid data and comprehensive research and analysis will find this an invaluable work ...

— Israel Gat, Founder and CEO at The Agile Executive

Agile project management optimizes time and performance. *We were knocking our heads trying to find the right language to explain the value our leadership and organization development services bring to our business clients, but more, how to be more efficient in our design and delivery. Then came along Drs. David Rico, Hasan Sayani and Saya Sone's explosive book entitled "Business Value of Agile Software Methods" with a specific emphasis on "Business Value Metrics" that made complete sense. This approach not only speaks from hard data-rich examples, but also presents new thinking about how to measure and assess the level of teamwork, scalable development, and flexibility that accompanies the transformation process in any culture change effort. This is really a breath of fresh air in project development and management. Agile methods respond to organizational systems that have to maximize learning, while viewing the measurement process as essential to optimizing knowledge about their customers' preferences and the value they always expect. This work shows how to value time and by so doing, how to reduce waste and optimize return on investment.*

—**Dr. Omowale T. Elson, Managing Partner, Elson Consulting Group**

Much needed quantification. *This is an important book that has arrived at an important time. It does a great job, in a very concise way, of presenting the various aspects of Agile Software Development and its various incarnations. Most importantly, it also provides a comprehensive quantification of the benefits, from a business perspective, that provide the necessary economic backup that has long been missing for decision makers who are looking to adopt these methods. I enjoyed the fact that the book is right to the point, not unnecessarily long-winded, and easy to read. This is another aspect that is important as the decision makers who are on the fence with regard to the business value of software are frequently impatient about getting the data behind this. This book provides that information quickly.*

—**Bruce Trask, Chief Executive Officer, MDE Systems**