

Preface

Why Did We Write This Book?

Over the past several years, we have fielded an increasing number of questions about how to apply Six Sigma in software and, more specifically, how to apply it in the context of the SEI Capability Maturity Model Integration (CMMI). Often, the questions revolve around perceived competition between the two initiatives. Other frequently asked questions have related to case studies, examples of statistical tools in use, tailored training, and measurement infrastructure. Questions have come from organizations already implementing CMMI or Six Sigma as well as those implementing both and also those not yet implementing either. They have come from the defense industry, government agencies, commercial industry, consultants, and academia.

Until now, our primary approach for widespread sharing of information has been conference presentations, tutorials, and panels. The original intent of this book is to be a companion guide to such speaking engagements—primarily Jeannine’s and Lynn’s—to capture the commentary that is never evident from viewing slides downloaded from the Internet and to further explain the underlying research and practice.

Our text focuses on the synergistic, rather than competitive, implementation of CMMI and Six Sigma, with “synergy” translating to “better, faster, cheaper” achievement of mission success. Topics range from value proposition to tactics. We point out how *not* taking advantage of what both initiatives have to offer runs the risk of an organization sinking time and energy into inventing something that already exists. Along the way, we try to debunk a few myths about Six Sigma applications in software.

While this book concentrates on the interoperability of Six Sigma and CMMI, we recognize that organizations rarely implement only these two initiatives. Accordingly, we have included a discussion of the more general case of multimodel process improvement—an area of emerging research. We offer an overall process for multimodel process improvement, noting strategies and

practices that transcend the models, and enable organizations to make informed decisions about how to effectively knit them together into a unified, single internal process standard. With the increasing pervasiveness of software in our society, we believe that the pressure from senior management to optimize the software portion of the business is going to escalate and that the interest in “better, faster, cheaper” and obsessively mission-focused software process improvement will grow considerably in coming years. The strategies and tactics we offer for an integrated approach to process improvement serve this purpose and mitigate the risks of “programs of the month,” competing initiatives, resource conflicts, funding conflicts, and other issues that plague process improvement groups.

All this having been said, there is no such thing as a “silver bullet” answer. What we offer in this book is a framework for reasoning about the task at hand and information to help readers formulate their own strategies and tactical plans.

Who Is the Audience for This Book?

We wrote this book primarily for people in process improvement roles, as well as the managers and technical staff with whom they frequently interact.

For process improvement personnel—including engineering process improvement group leads and members; measurement working group members; Six Sigma Black Belts, Master Black Belts, and Champions—the book supports strategic and tactical decision making about initiative adoption and joint, synergistic implementation. It also provides information, in the form of both facts and ideas, that can be used to gain sponsorship and buy-in for joint initiative implementation.

For technical management—including program, project, engineering, and line managers—the book also serves decision making. For this group, however, the value is more strategic. The book provides an independent view about joint initiative implementation strategies that can be used as a reference when internal proposals are put forward. It can enable technical management to more confidently sponsor and support such proposals because there is data to support how the achievement of mission and performance improves with these proposals. For senior technical personnel, who are charged with completing projects and delivering, this book provides insight into how joint initiative implementation can help them accomplish the mission. Additionally, it provides insight into the rationale behind the several

different joint implementation approaches—which may enable these personnel to better partner with improvement groups to select the most effective and efficient joint implementation design for their particular organizational culture.

How to Navigate This Book

The book is structured as follows.

- Chapters 1 through 3 present the foundational set of problem statements that have motivated most of our work. These chapters also provide a high-level explanation of CMMI and Six Sigma. Our presumption is that the majority of our readers have awareness of these technologies. We present enough explanation to allow you to understand the rest of the book even if you have no prior knowledge of CMMI and Six Sigma; however, this book will not make you an expert, and we strongly advise that you seek other references and training courses prior to any implementation. If you have an intimate knowledge of these technologies, Chapters 2 and 3 will scope and clarify their use in the remainder of this book.
- Chapters 4 and 5 describe the motivation for further considering the synergistic and mutually enabling aspects of Six Sigma and software improvement technologies. To do so, these chapters summarize the results of research as well as case studies.
- Chapters 6 through 8 discuss the strategic and tactical aspects of jointly implementing CMMI and Six Sigma, with a primary focus on the establishment of process infrastructure. This portion of the book closes with current thinking and emerging research regarding integrated approaches to multimodel process improvement.
- Chapter 9 illustrates several projects that may be part of a managed improvement project portfolio (a change from the majority of chapters in the book, which discuss leveraging CMMI and Six Sigma for the implementation of process infrastructure). The examples focus on project and product performance and also connect to issues of process infrastructure. They cover the gamut of Six Sigma framework usage—from Define, Measure, Analyze, Improve, Control (DMAIC) to Lean to Design for Six Sigma (DFSS).
- Chapter 10 summarizes key points from the whole book (for those who like to read the ending first!).

- The appendices contain additional details behind the main chapters of the book. The appendices also offer supplementary information on measurement practices, transition practices, and organizational change management. While not the main focus of this book, measurement, transition, and change management are critical to success, and we include in the appendices the principles and practices that we most often use.
- Following the appendices are the lists of references, additional resources, and acronyms.

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