

# Preface

*“As projects get more complicated, managers stop learning from their experience. It is important to understand how that happens and how to change it....Fallible estimates: In software development, initial estimates for a project shape the trajectory of decisions that a manager makes over its life. For example, estimates of the productivity of the team members influence decisions about the size of the team, which in turn affect the team’s actual output. The trouble is that initial estimates usually turn out to be wrong.” (Sengupta, 2008)*

*This book aims directly to increase the awareness among managers and practitioners that estimation is as important as the work to be done in software and systems development. You can manage what you can measure!*

*Readers will find in this book a collection of lessons learned from the worldwide “metrics community,” which we have documented and enhanced with our own experiences in the field of software measurement and estimating. Our goal is to support our readers to harvest the benefits of estimating and improve their software development processes. We present the 5 ISO/IEC-acknowledged Functional Sizing Methods with variants, experiences, counting rules, and case studies – and most importantly, illustrate through practical examples how to use functional size measurement to produce realistic estimates. The book is written in a practical manner, especially for the busy practitioner community. It is aimed to be used as a manual and an assistant for everyday work.*

*Estimation can be a win–lose job: it has to be done professionally to enable transparency, efficiency, and control of IT projects.*

Software project estimation is the first step to determine how successful projects, processes, and product goals will develop and also how they will be measured and how their goals will be reached.

The thesis presented in this book is that software project estimation can be done in a highly professional manner and that it can be done accurately. *The authors also point out that the process of estimation and the required time for it must be planned “a priori”!*

*The first step for the success of a software project is to ensure that it is started in a professional manner.* This requires a planning period supported by

a highly professional estimation process to ensure a solid foundation for project planning. Accurate estimates require quantitative measurements, ideally tool-based, to reduce measurement variations. *Furthermore, estimating does not gain the respect it deserves when it is done using only paper and pencil support – when the software engineers who provide the input data work professionally with the newest technologies.*

*The application of an estimation method as well as the use of estimation tools and benchmarking data are nowadays “sine qua non” conditions for best practices in software engineering. In the unanimous opinion of estimation experts, this is the worldwide “state of the art.”*

Software project managers must also monitor and actualize their estimates during the project. *Estimates and project measures provide key risk indicators and hence are excellent for the tracking of the progress of a software project and the monitoring of its success – that is, they can provide valuable early warning signals if set up properly!* Fire fighting can be exciting, but does not help in fire prevention nor in the avoidance of significant costs and delays. A proper estimation process presents an opportunity for people tired of fire fighting to correctly plan and manage their software projects.

*Estimation is an activity of the right brain:* (the right brain being known for emotions and imagination, and ideas about the future and the unknown). *Estimation can also be performed with the left brain* (where logic and experience, and ideas about the past and known reside).

## History of This Book

This book has a history as long as it took to implement a software measurement and metrics program in the IT department of an international insurance company in Germany. The initial text was published as the diploma thesis of Axel Fabry, when he was a student of Manfred Bundschuh, working in a practicum project to plan and initiate the estimation program for the IT department. Fabry's thesis reported lessons learned about the trip wires involved with the implementation of estimating and laid the foundation for the first edition of this book. Regrettably, Mr. Fabry could not support the second edition, and its actualizations were done by Manfred Bundschuh.

The translation of the second edition into English was triggered by the German publisher Springer, who asked for an English translation and update, which has become the version you now possess. This led to the involvement and beneficial improvement, enhancement and actualization of the book done by the American author Carol Dekkers.

*Why did Springer ask for an English translation and further updating of the successful German book on software estimation?*

*Initially*, the demand emanated from colleagues at the European metrics organizations in Spain and Italy, and later from others who heard about the benefits gained by introducing metrics in Germany over the past years.

*Secondly*, the ISBSG collection of figures published as *The Benchmark* and other products are featured prominently in this book. These form a treasure trove of data that are of interest in the whole of the English-speaking metrics community.

*Thirdly*, this book presents an orderly overview of software -estimation, -metrics, -measurement, -measurement standards, and -benchmarking, with all related facets, augmented by many practical experiences of both of the authors. The book is aimed for beginners as well as experienced colleagues working with software -estimation, -measurement, and -metrics.

Last but not least, themes like productivity measurement, estimation tools, software reuse and redevelopment, and estimation in the maintenance process as well as in Object-Oriented-, Data Warehouse-, or Web- environments are dealt with in this book.

## The Books' Content

This book delivers a framework for novices who are getting started in software project estimation, and also offers to the practitioner practical information for transfer into the profession. The text is derived from years of experience by the authors in software development and project management, and supported by a national and international networking in European and worldwide metrics- and standards- organizations.

Chapter 1 provides an entrance portal into the theme and introduces the first concepts. Chapter 2 lays the fundamental concepts, and together with Chapter 3 presents an overview for the reader desiring quick access to the information. The remaining chapters present topics on estimation in more detail, progressing in several steps:

- Estimation prerequisites and implementation, together with methods of estimation
- Estimation of maintenance effort
- Software measurement and metrics fundamentals, and product and process metrics
- Measurement communities and resources for measurement and benchmarking
- The IFPUG Function Point Method and the other four ISO/IEC-acknowledged Functional Size Measurement Methods
- Function point related measurement variants, experiences, counting rules, and case studies

- Measurement and metrics in object-oriented environments and data warehouse environments, and in software reuse and redevelopment
- A chapter about tools and their methods
- An appendix with examples and checklists.

*Each chapter ends with a management summary* for the reader who wants a quick synopsis or a list of important internet addresses for further reading.

## Acknowledgements

An ambitious book translation and actualization project like this one (about 700 pages), which was performed as a hobby besides family, profession, lectureship of the German author at the University of Applied Sciences and his commitments in the German metrics organization DASMA over a 10-year time-frame and the commitments of the American author to her consulting business, international speaking engagements, and ongoing leadership endeavors, undoubtedly produces some loss by friction. The more important are the positive direct and indirect contributors each author would like to acknowledge and thank:

- Manfred's family in Germany (who had to live some time with his conscious absence and the partial occupation of the living room as author)
- Carol's two grown children, Corinne and Alex, who continue to be a source of inspiration and support in her international business
- *Good* managers who backed Manfred during the introduction of the metrics program at the international insurance corporation
- Ambitious colleagues at the same organization who were willing to widen their horizon and did not fear the additional effort to embrace estimation with Manfred during the management of their projects; colleagues who maintain an active network in professional and metrics organizations and who generously shared their own experiences. These include especially Luigi Buglione (GUFPI-ISMA), Ton Dekkers (NESMA), Peter Fagg (UKSMA), Peter Hill (ISBSG), Capers Jones, Roberto Meli (GUFPI-ISMA), Jolijn Onvlee (NESMA), Tony Rollo (UKSMA), Luca Santillo (GUFPI-ISMA), Charles Symons (UKSMA), Frank Vogelesang (NESMA), as well as Professors Alain Abran, Reiner Dumke, and Eberhard Rudolph. A special thanks also to Pekka Forselius, president of ISBSG and senior advisor to the Finnish Software Measurement Association (FiSMA), who provided essential contributions including the FiSMA Functional Size Measurement Method, experiences with ISBSG, and expertise about the practical implementation of estimating and software measurement
- Numerous students who committed their practical term and thesis to the introduction of a metrics program in their organizations. These students managed great effort and complex investigations of large amounts of data, some of them being rewarded with a DASMA students thesis award

- Note that the experiences herein are provided from the personal experiences of both authors. Our belief in the importance of professional estimating and benchmarking is passionate and results in opinions that are sometimes articulated in a very pronounced manner to foster an awareness that proven methods should be professionally used
- One final note: during the writing of this book we have used information and communications technology (ICT), information technology (IT), software intensive systems, and similar terms in an approachable and some-times interchangeable manner. For readers desiring a more formal treatise on the use of these and other industry terms, the reader is referred to the foreword and appendix of the American author's April 2008 book: Program Management Toolkit for software and systems development, co-authored with Pekka Forselius et al. by Talentum (ISBN: 978-952-14-1338-4).

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