



DEPARTMENT OF THE AIR FORCE
Software Technology Support Center

Guidelines for Successful Acquisition and Management of Software-Intensive Systems:

**Weapon Systems
Command and Control Systems
Management Information Systems**

Version 3.0

May 2000

Preface and Acknowledgements

We are excited to provide version 3.0 of these *Guidelines for Successful Acquisition and Management of Software Intensive Systems*. We are pleased that prior editions have been so well received and that many individuals and programs have worked to implement the principles contained herein. Since this project began, the software community has experienced rapid changes. During the last few years in particular, software acquisition reform has introduced several changes and alterations of many long-held approaches. In the first few chapters we have tried to address these changes and accompanying issues. Likewise, we have updated information related to systems and software. We have left intact discussions dealing with software engineering principles since these tried-and-true principles do not change much—often, its putting them into consistent practice that is forgotten.

The turnover in the Department of Defense (DoD) acquisition and management workforce has suggested additional reasons for these *Guidelines*. The entire workforce has not been fully acclimated to the new approaches embodied in the acquisition reform policies. Also, we have witnessed many situations where individuals have repeated inappropriate or unsuccessful practices. Our hope is that the lessons learned by the past generation of acquisition managers and systems developers will put the new kids on the block on a success-oriented path. Hence, we have included information and emphasized concepts that may seem old-hat to those of you with experience but are completely new for others.

As we put these *Guidelines* together from our experiences with software acquisition and software development assessments and consulting, there are usually a handful of key principles that when not followed cause projects to suffer. Although these principles seem so basic, and possibly counter to our environment, we have noticed that their implementation is still not always forthcoming:

- We must focus on the true customer.
- We must spend more energy talking about and dealing with this customer and the actual product of our program and minimize, as much as possible, the time spent talking about the encompassing politics.
- We must understand the importance of the full lifecycle of our program and the accompanying product or service.
- We must baseline our requirements and project scope as early as possible.
- We should break up our program into smaller phases or multiple projects, if necessary, to gain the advantage of incremental successes.
- We must introduce measurements into our programs and appropriately use them for better predictability of costs, schedule, and quality and management of the program as it progresses. These measurements being used to also stimulate increased accountability into our cultures.
- We must not be afraid to talk about the risks associated with our programs and projects, and focusing on, tracking, and managing the key risks.
- We must capture relevant data, lessons learned, and other historical information from our programs with a mantra of organizational learning, regardless of the potential and actual staff and management turnover.
- We must work towards and emphasize sponsorship in our improvement efforts, where leaders and managers understand these principles and “walk the talk.”

These *Guidelines* represent the most comprehensive single source document on how to realize these principles and achieve similar goals. They continue to represent a substantive compilation of lessons-learned and best practices gathered from recognized industry and government software practitioners and

procurement experts. The major defense universities use them as course materials, Industry uses them to prepare for competitive software procurements, and software engineers refer to them to provide fundamental viewpoints not typically considered.

The Internet has caused us to reflect on how best to provide these *Guidelines*. Information, policies, and procedures will likely change faster than we can provide updates. Although still a large compilation of lessons-learned and best practices, these *Guidelines* should function as a starting point for the substantial body of knowledge available freely on the Internet. We refer you to Appendix A to assist with potential sites to search further for broader understanding of topics important to your needs.

A central theme of each edition of these *Guidelines* is how to turn an adverse situation into a success—how to turn a challenge into a victory. The most important ingredients in achieving these goals, the most crucial resources required to produce a quality product, are the people selected to do the job. The skills, experience, creative abilities of the team are key determinants of success or failure in the software world.

Representing many years of effort, these *Guidelines* were written with limited resources, a limited staff, lots of hard work, and lots of talent. Several people have had a hand in these *Guidelines*. Early coordination and oversight came from Joseph J. Stanko, research and writing from Susan Tinch Johnson, and vision and sponsorship from Lloyd K. Mosemann, II. Support and sponsorship for this version came from Col (Ret.) Joe Jarzombek and the Computer Resources Support Improvement Program (CRSIP). We would also like to convey a very special thanks to Tim Perkins, Leon Oldham, and Roald E. Peterson, Jr., for not only their skills in research and writing but their keen insights in the fields of software engineering, acquisition, and management. We are also indebted to Karen Rasmussen for her ability to make sense of the whole effort, by doing editing, design, and layout and putting these Guidelines into a readable format.



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