CROSSTALK would like to thank 309 SMXG for sponsoring this issue.

Since the beginning of early civilization, humanity has established goals and succeeded in completing remarkable engineering accomplishments that pushed the boundaries of what was considered possible. One needs to look no further than the Great Pyramid of Giza (2584–2561 BC), Lighthouse of Alexandria, the Parthenon (447-438 BC) or Chichen Itza (c900 AD), for notable ancient examples. In recent times, we have gone from creating the monuments of ancient times to engineering complex architectures, structures, electronic systems and artificial intelligence, such as multinational undersea tunnels, artificial archipelagos, the International Space Station, and IBM's "Watson" - the new Jeopardy champion.

Major projects are not new, but the way in which we now manage projects has evolved.

The field of project management has continually transformed to address new challenges, primarily an ever-increasing growth in complexity and scope. Innovation has led to new ways of managing interrelationships between specialists performing a vast number of different tasks. Hardware and software are now coordinated in concert within a system design. Systems of systems deal with our increasing need for instantaneous information. Compartmentalization of core best practices for project management activities include integrated planning, organizing, resourcing, directing, monitoring, and issues resolution allow for greater reach and control over simultaneous and multifunctional tasks.

Software system development has brought its own unique challenges to the table, such as its intangible nature, clear requirements, feature creep, interoperability, defect detection, backwards compatibility, and the constant evolution of technology. Despite these challenges, the body of knowledge for managing these projects has grown substantially over the last few decades with new innovations in our engineering models, methods, techniques, activities, and especially the automation of tools.

In this issue, we have taken not only a historical perspective of past practices but also highlight new innovations that continue the advancement of project management as a discipline in its own right. We begin this issue with a collaborate work based upon a study conducted at The MITRE Corporation. This article highlights the benefits of including explicit software quality requirements at the proposal stage of government contract bids, which in turn would allow for contractor selection to be influenced by the use of best practices in software development. We continue our focus on quality with a fascinating analysis by Paul Croll in *Quality Attributes: Architecting Systems to Meet Customer Expectations*. This article emphasizes the importance of defining and using a set of quantifiable quality attributes tied to customer expectations when evaluating candidate system architectures. With a greater understanding of the relationship between quality attributes and architecture, we can better predict how candidate architectures will meet customer expectations.

Another pressing issue in software project management is the increasing complexity of projects and the inherent difficulties in managing emergent behavior in software systems. In *The Whole Is More Than the Sum of Its Parts: Understanding and Managing Emergent Behavior in Complex Systems*, the authors provide an overview of the increasing importance of applying systems theory to software as well as explore some speculative new methodologies for managing undesirable emergent behavior in complex systems. To illustrate some of the complexities we now face in software development, we now turn to *Developing a Model for Simplified Higher Level Sensor Fusion*. In this article, the authors systematically study the current difficulties faced by multisensory data fusion programs and ultimately provide an adaptation of models that can be used to provide an improved assessment while simplifying the process needed to get there.

In past issues, we have featured many articles that provide practical guidance to improve the quality of Earned Value Management (EVM) information and highlighted the value of such data in managing a project. In *Basing Earned Value on Technical Performance*, Paul Solomon readdresses the topic and proposes new solutions to further enhance the value of EVM. Continuing down the path of accurate and reliable information, we need to look no further than William Roetzheim's work in *Core Estimating Concepts*. This article reveals that beneath the myriad of domain-specific estimation tools available lies a set of core estimation concepts that can provide a framework for building new models for your specific needs. We conclude our set of articles by stressing the importance of peer reviews in *Statistical Tune-Up of the Peer Review Engine to Reduce Escapes*. In this article, Tom Lienhard identifies defects passing undetected through peer reviews as a major source of rework as a major problem and proposes innovative improvements to the peer review process. As always, be sure not to miss David Cook's humorous, yet insightful, look back at hard-learned lessons to writing good software.

As we begin the new year, we are also beginning the 25th year of CROSSTALK publication as well. I would like to take a moment to express my sincere thanks to everyone for making such an accomplishment possible. To our co-sponsors, we thank you for your generous support and active involvement in providing an information and educational resource to the software industry. To the authors, we truly appreciate all of your time and effort in sharing such valuable information to the software community. To our readers, thank you for your continued support and hope that we continue to exceed expectations by publishing the highest quality articles.

From all of us at CROSSTALK, we wish you the best for the new year!

Justin T. Hill
Publisher, CROSSTALK