

The Cognitive Dynamics of Computer Science: Cost Effective Large Scale Software Development

Szabolcs Michael de Gyurky
(John Wiley & Sons, 2006)

Review by Ross Gagliano

Mike de Gyurky, a former JPL program manager, is a man after my own heart, mind, and spirit. Retired from the US Army, he served as a demolition expert in Germany and with the Special Forces in Viet Nam. He is also an admirer of Kant plus the Greek philosophers, as well as JPL's cofounder, Theodore von Karman. With the latter, Mike has speculated on a modern use of his lighter-than-air vessels, and from the former he has advanced an essence of an ontology for both software engineering specifically, and computer science generally. This book represents a culmination of Mike's highly successful 30-year career in managing the development of large-scale software systems.

The book's three main objectives have some far-reaching aspects. Besides proposing a software ontology and stressing development methodology, it offers an alternative view for the evolution of truly autonomous systems. What is commendable is that it never strays from the effectiveness commitment of such projects; i.e., completion on-time and within budget.

de Gyurky gains considerable credibility with his involvement in four real world projects that are presented as case studies: the Joint Theater Level Simulation (JTLS); the Global Decision Support System (GDSS); the Topex Telemetry, Command and Communications Subsystem (TCCS); and the Jason Satellite TCCS (or JTCCS). After extolling the virtues of war-gaming and the value of simulation, he emphasizes the importance of the American software industry, not only to the survivability of its architects, engineers, and managers, but also to the vital nature of their enterprise in the global marketplace and the critical role of its defense systems.

The book discusses the usual topics such as modular architecture, layered design, and the use of object-oriented code that directly contribute to product budget, quality, and schedule. But, in a real sense, deGyurky is on to something larger as he continually refers to the notion of autonomous systems, or simply the increasingly evident general intelligent systems and agents.

What makes this guide particularly useful and practical is his explanation of costs, especially for the software profession, in terms of dollars per (delivered and documented) line of code. Mike's obvious pride is reflected in the fact that his team consistently achieved high quality software at astonishingly low values (\$ 10/LOC) compared with industry-wide standards of ten to hundreds of times higher.

This book is a 'must have' for all computer scientists and software professionals.

Ross Gagliano is a retired professor, having helped found the computer science department at Georgia State University. He previously was a senior researcher at the Georgia Tech Research Institute.

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