Software Metrics Related to Maintainability and a Longitudinal Study of the Linux Kernel

Abstract

The vast majority of any non-trivial program’s life cycle will be spent in the maintenance phase. The degree to which the software is readily maintainable has enormous impact on the cost of the maintenance, and can also impact the overall quality of the software.

In contrast to the “hard” engineering disciplines (Electrical, Chemical, Mechanical, Civil), Software Engineering is (pun intended) a “soft” engineering discipline. Just as with any other engineering project, our products must meet the original design constraints, and the project should come in on-time and on-budget. Unlike the “hard” engineering disciplines, however, we do not have reliable metrics that will predict success or failure prior to the implementation.

There is no direct measure of “maintainability”. We can, however, correlate measurements of other factors that have been shown to be related to maintainability. This indirect comparison can help point us towards (or indicate there is no sense in pursuing) various metrics to help predict software maintainability.

Biography

Dr. Thomas completed his bachelor’s degree at the University of Tennessee in 1984, after which he spent over twenty years in the corporate sector, engaged in all forms of IT management, including code development, manufacturing process automation, statistical process control, business integration, and project management. He has worked such wide-ranging fields as consumer products, healthcare products and services, automotive component manufacture, and has consulted as an expert witness in software-related court cases.

Dr. Thomas left the corporate world to pursue a new career in teaching Computer Science at the college level. He received his M.S. and Pd.D. degrees in Computer Science from Vanderbilt University in Nashville, Tennessee, in 2005 and 2008, respectively, and has been an Assistant Professor in the University of Toledo’s EECS department since January 2010, teaching in the University Partnership program at the Lorain County Community College in Elyria, OH.

Dr. Thomas’s research interests are in the areas of software metrics and sorting algorithms.