

A framework for the management of controlled experiments in Software Engineering

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Abstract

Quality is an elusive concept the absence of which is readily understood and recognised. Attempts to define it have lead to a multiplicity of descriptive terms some of which we dealt with in this paper. Quantitative assessment of quality is only possible through the use of surrogate factors and their associate metrics. Software quality measurement encompasses the development and use of methods, tools and techniques. Laboratory experiments permit the researcher to identify precise relationships between a small number of variables that are studied intensively via a designed laboratory situation using quantitative analytical techniques with a view to making generalisable statements applicable to real-life situations. This paper reports on insights gained in designing and executing controlled laboratory in Software Engineering over a period of 10 years. A framework for the design and execution of such experiments which includes feedback mechanisms for process improvement is proposed. An outline of results obtained using this framework and indications of further work complete the paper.