

Programming, Theories and Science: A Retrospective Discussion

Martin Loomes¹

Abstract. In the early 1980s we were told we were in the midst of a “software crisis” that required urgent attention. One reaction to this was the formation of a number of factions offering “solutions” to our problems: the legacy of many of these still exist. In order to offer such solutions in ways that were both convincing and acceptable, they were usually proposed within paradigm, that is, they typically attempted to propose changes to current practices within the life-cycle paradigm. Moreover, objections to proposals also had to be made within-paradigm, or they were seldom taken seriously.

One particular division that occurred was the (frequently hostile) discussions between the formalists and the soft-systems communities, which may be caricatured as follows. The former asserted that only through the application of formal methods throughout the life cycle could things be put right. The latter asserted that important systems involved people, and the most crucial aspects of system were far too complex to be formalised. Ironically, both communities regularly appealed to the word “theories” in their arguments, either as the bedrock of science extolled by the formalists, or as mental artefacts developed by people.

This talk proposes that more fruitful discussions would have arisen had we stepped out of the life-cycle paradigm and explored the philosophy of science as providing potential conceptual frameworks. If we consider programming as theory-building (by no means a novel proposal) but do not feel constrained by the concepts, language and constraints of the lifecycle, we can start to see ways to reconcile the various viewpoints. Indeed, it might be argued that many of the discussions regarding the philosophy of science actually mirror those of software engineers, and a brief trip through some aspects of the philosophy of science post-Popper illustrates some interesting aspects of programming.

¹ Department of Computer Science, Middlesex University, England, email: M.Loomes@mdx.ac.uk