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An Empirical Analysis of the Effect of Criticality, Complexity and Organisational Influence on Software Reliability

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Abstract

This paper is motivated by a desire to improve software reliability, in particular, the reliability of software that impacts the operational and financial viability of organisations. We examine the effects of Criticality, Complexity, and Organisational Influence on information systems reliability. Questionnaires were used to gather quantitative data for statistical analysis. Post-hoc in-depth interviews were used to help explain results of the statistical analysis. Surprisingly, no associations were observed between Reliability and Criticality or between Reliability and Complexity. A positive relationship was found, however, between system Reliability and Organisational Influence. The interviews indicated that organisations mitigated the potential negative effects of Complexity through additional planning, and achieved more reliable software by assigning more competent project managers. They managed Criticality by assigning more competent project managers to more critical systems. The significant relationship between system Reliability and Organisational Influence indicates that IS managers respond to internal political pressures. This result implies that senior management should take steps to ensure that excessive Organisational Influence does not cause IS managers to misallocate resources. For example, for each major project, the IS steering committee can determine the desired level of reliability, appoint project managers with the appropriate skill set, and periodically communicate with these project managers about the activities used to achieve each system's desired level of reliability.


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