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AUTOMATION OF THE APPLICATIONS DEVELOPMENT LIFE CYCLE: MEASURING THE VALUE ADDED

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ABSTRACT

This research explores the relationship between the use of systems development technology (i.e., CASE) and the process and performance of teams engaged in the design and delivery of business information systems. Using information gathered from one hundred development projects in twenty-five organizations, this project addresses the following research questions.

1. What are the characteristics of high-performing software development teams?
2. What are the effects of automation of the system life cycle on software development quality and productivity?
3. How can we measure the value of investing in CASE technology?

We use two major theoretical perspectives: group process theory and control theory. The basic premise of group process theories is that high performance is the result of the interactions and dynamics of the members of the team. This perspective offers valuable insights into the study of CASE usage, since researchers can examine how the interdependent activities of team members are facilitated by the coordination and communications functions of the CASE tools. Control theory proposes that the relationship between the project manager and team members is critical to effective performance. CASE tools which facilitate improved managerial processes by providing functions such as on-line performance metric systems and tracking of project goals and progress may impact control behaviors relating to team performance.

The methodological perspective for this study is longitudinal. In essence, we investigate the impact of CASE usage by following a set of application development teams over the course of their development projects. We administer questionnaires to participants at four points in their projects: at completion of requirements determination, at completion of physical design (during coding), at implementation, and six months after systems delivery. Additionally, we are attempting to gather a rich set of qualitative data by interviewing key organizational stakeholders, project managers, and team members. Finally, we are collecting objectives and perceptual measures of project performance.

We have already found a number of interesting preliminary results in the study. These results suggest that CASE can be successfully conceptualized and measured with a relatively small set of dimensions. In examining factors that affect CASE usage, we found availability, power, and ease-of-use to be particularly significant. Surprisingly, our results indicate that the use of structured methods is not a predicator of increased CASE usage, but is a predicator of effective usage. Similarly, for teams with relatively high levels of CASE experience, CASE usage relates to higher quality outputs. Teams with low experience use CASE much less effectively. Finally, we have found that both control and group processes impact CASE effectiveness.