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## PREDICTING TECHNOLOGY COMMERCIALIZATION SUCCESS: AN EXAMINATION OF KEY VARIABLES LEADING TO TYPE I AND TYPE II ERRORS IN FUNDING DECISIONS (INTERACTIVE PAPER)

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**INTERACTIVE PAPER SESSION**

**PREDICTING TECHNOLOGY COMMERCIALIZATION SUCCESS: AN  
EXAMINATION OF KEY VARIABLES LEADING TO TYPE I AND TYPE II ERRORS  
IN FUNDING DECISIONS**

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**Principal Topic**

Predicting the future successes of early to mid-stage technologies is one of the most fundamental of all technology management functions. Grant funding agencies, university technology transfer offices and venture capitalists all partake in this exercise. But while we know, at least in hindsight, some of the factors that appear to be related to successful technological commercialization we know far less about whether or not these factors can actually be predicted.

This study examined sixty-eight early to mid-stage homeland defense technologies which were funded by the Center for the Commercialization of Advanced Technology (CCAT), a DoD sponsored agency. In addition, a paired sample of unfunded proposals to CCAT was also examined. This allowed for examination of Type I errors (not funded but successful technologies) and Type II errors (funded but failed technologies) by matching funding decisions to the subsequent success or failure of technologies progressing towards commercialization.

**Method**

Commercialization success was measured by subsequent commercialization or licensing, the establishment of a cooperative research and development agreement (CRADA), or funding by private equity investors. Four classes of variables were used as predictor variables: a) technology characteristics, such as stage of development, b) organization characteristics, such as age and size, c) research team characteristics, such as education, and d) the evaluative scores on five dimensions provided by the grant application reviewers.

Three different methods were used to analyze the data: an artificial neural network model (ANN), a Bayesian Data Reduction Algorithm (BDRA), and a traditional linear methodology, multi-categorical discriminate analysis.

**Results and Implications**

Three major findings were suggested. First the less restrictive neural network and BDRA techniques provided better predictions of success than the linear models. Second, grant application reviewers had little ability to predict technology success. And third, a reasonably good predictive model of technology success could be constructed from the technology and organization variables. Given that grant application funding is based primarily upon expert reviewers' assessment, our study suggests that a more efficient structural model needs to complement expert assessments.

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