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ASSESSMENT OF EVALUATION METHODS FOR SPACE TECHNOLOGY CONCEPTS

Abstract

The proposed paper identifies, analyzes and appraises a range of technology evaluation methods for their applicability in evaluating space technologies concepts. Evaluation methods are mostly used to support and enhance decisions regarding technology investments. Examples of evaluation methods include: Delphi, S-Curve extrapolation, decision trees, analogy- and patent analysis and many others. This paper will identify methods with the highest potential for evaluating space technologies in order to improve investment decisions in the space sector. Investments in space technologies can be categorized according to a mission-focused ("pull") and transformational ("push") influenced decision. Especially, the push investments require a great deal of strategic planning as their time horizon is longer than that of pull investments. Because of the presence of breakthrough innovations (also named Game Changing Technologies or Disruptive Space Technologies) the need for more accurate evaluation methods or guidelines is very urgent.

In literature many evaluation methods exist, however these methods are just partially applicable to the space sector because of different innovation dynamics. This difference causes the factors influencing the diffusion of innovations (e.g. buyer-seller interactions, push-pull factors) to be different from the non-space sector. This is partially caused by the monopolistic-oligopolistic market structure of the space sector, which is dominated by governmental acquisition. The market structure entails that a monopsonistic buyer (in most cases a governmental institution) faces a small amount of possible sellers (prime contractors). For example, because of a relative low frequency of space technology usage, the method of technology evaluation to extrapolate trends is hard to apply to the space sector. The proposed paper identifies which factors influence the effectiveness of evaluation methods within this market structure. Additionally, it assesses which methods show the highest potential to be an accurate tool for technology investment decisions. Research in this area will lead to more informed investment decisions and in this matter improve the technological capabilities of the space sector as a whole.