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**SHAPING THE FUTURE OF AEROSPACE**

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Estimating the cost of space programs is in many ways similar to estimating costs of other military systems. The basic methodologies all require an understanding of the historical costs of similar programs. They involve some form of extrapolation from the historical data, adjusting for the programmatic and technical characteristics of the program being estimated. Estimates of software size or functionality must also be developed to estimate its cost. The uncertainty of the methodologies themselves, as well as in the technical and programmatic inputs, contributes to risk, which must be quantified. The survey was initiated in 2004, but the costing protocol was not distributed to the survey panels until January 2006. Some 30 notional mission concepts were costed by May 2006. <sup>11</sup> For details concerning the costing methodologies used in the first decadal survey on Earth science and applications from space, see NRC, *Earth Science and Applications from Space: National Imperatives for the Next Decade and Beyond*, 2007, pp. 43-58. Page 45 Share Cite. Although adding this extra step would take time, it would, in Bookbinder's opinion, result in a closer coupling between a survey's science goals and recommended set of future missions and allow for greater community innovation. The success rate was estimated by considering CubeSat missions as a Bernoulli experiment, so the success rate is considered as a parameter of a binomial distribution. It was considered a "success" if the CubeSat survived its early operational stages (deployed and commissioned) or, in other words, "it did not die as an infant." Launch failures were excluded. Figure 10. Moreover, the diminishing costs of CubeSat missions is becoming possible because of the fast technology advancements in microelectronics, coupled with the intense use of COTS components. A. Scholz, *CubeSat Standards Handbook, a Survey of International Space Standards with Application for CubeSat Missions*, The LibreCube Initiative, First Issue, 2017. Survey methodology is "the study of survey methods". As a field of applied statistics concentrating on human-research surveys, survey methodology studies the sampling of individual units from a population and associated techniques of survey data collection, such as questionnaire construction and methods for improving the number and accuracy of responses to surveys. Survey methodology targets instruments or procedures that ask one or more questions that may or may not be answered. Good cost estimation is essential for keeping a project under budget. Many costs can appear over the life cycle of a project, and an accurate estimation method can be the difference between a successful plan and a failed one. Estimation, however, is easier said than done. Projects bring risks, and risks bring unexpected costs. Cost estimation is the process that takes those factors into account, and calculates a budget that meets the financial commitment necessary for a successful project. Project cost estimation applies to everything from building a bridge to developing that new killer app. |