

New Business Models for Space Exploration (14)

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## A HYBRID BUSINESS MODEL FOR THE DEVELOPMENT OF LARGE-SCALE SPACE PROJECTS

### Abstract

With the recent ending of the Space Shuttle program and the planned retirement of the International Space Station (ISS), many have jumped to the conclusion that space exploration is too expensive and probably is not even worth the money spent. The fact is that the numbers are staggering: NASA's Space Shuttle program has cost a total of 210 billion dollars over its 41 year life span, and the ISS has cost to date over 160 billion dollars (figures in 2011 US dollars). All this, along with the current scenario of global crisis, has led governments worldwide to rethink their leadership role in space exploration.

Furthermore, the history of space exploration has proven that it is barely impossible to justify large-scale space projects for conventional economic reasons. Capitalization is a critical factor because the total capital investment required is huge and the investment takes a very long time before producing any positive economic returns. Normally, these types of large investments are unattractive to most private investors and lenders. Governments worldwide have been the only ones able to make such risky and expensive investments with the aim of increasing national pride, technology leadership and military power. However, these assumptions may be challenged in the next future since such space efforts could be directed towards the creation of a space-based economy. Large-scale space projects such as a lunar outpost or a space solar power plant could be understood as consortiums of enterprises that strategically join their skills and resources to open new markets and business opportunities (e.g. space mining or space energy). Undoubtedly, going after new markets in space is a long-term play, and new business models are certainly required.

This paper presents a hybrid business model of open innovation, venture capital, technology transfer and philanthropy for creating and developing cost-effective large-scale space projects. The proposed business model approach is based on the synergies created when these concepts are applied to investing in space with the aim of building constellations of companies to support the development of such projects, both financially and technologically. The use of this business model could be ideal to harness the knowledge of a wide range of disciplines and stakeholders, and also could serve as an excellent way to build an ecosystem of companies capable to sustain the development of large-scale projects over the long term. This new hybrid business model will be discussed and analyzed in this paper.