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Author: Prof. Koichi Yonemoto  
Kyushu Institute of Technology, Japan, yonemoto.koichi873@mail.kyutech.jp

Ms. Misuzu Onuki  
Space Access Corporation, Japan, onuki@spaceaccess.jp

A NEW SPACEPLANE VENTURE COMPANY IN JAPAN - CHALLENGES IN THE LAST  
FRONTIER BOTH DEVELOPMENT AND BUSINESS

**Abstract**

Generally speaking, to invest space vehicle startups is the last thing to do. This is an old understanding from previous decades. In the last ten years space vehicle companies, especially smallsat launch rocket companies, have gotten funding and advanced their development activities including several in Japan. Three of them are small rockets and two of them are horizontal take-off and landing spaceplanes. Space Walker is the newest spaceplane startup, which will finally develop a horizontal take-off and landing fully reusable two-stage spaceplane. Space Walker has three unique advantages.

The most particular character on this enterprise is to use the Japanese reusable space transportation engineering heritage of winged suborbital rocket HIMES developed by ISAS of Ministry of Education and unmanned orbital space shuttle HOPE-X by NASDA of Japan, the former JAXA's. Japanese government has now a policy to release technologies of JAXA to access commercial opportunities and markets. Space Walker will develop its next-gen winged suborbital vehicle enhancing these legacies as far as applicable based on the experimental winged rocket development at Kyushu institute of Technology since 2005.

The second unique advantage is that Space Walker has former board members and experienced engineers of Japanese aerospace companies, who have contributed to the important space programs in Japan since the 1980's including rockets, satellite and reusable space transportation development. For space venture companies, it is one of the most important and precious elements of synergies between the so-called Old Space and New Space. Executives of New Space have been come from other industries such as finance, legal, marketing, creative director, IT and so on, for good influences between the existing space and non-space.

The third one is the business model. The spaceplane Space Walker is aiming at for the first stage of business is an unmanned suborbital vehicle, which will be used not only microgravity experiments, ignerosphere observation, astronomy, remote sensing and education, but also creative opportunities such as media, movie, branding, advertisement, and so on. Then a larger size of manned suborbital vehicle for both much higher altitude suborbital services, and also smallsat launch to the low earth or sun synchronous orbits. Evolved development will be a manned suborbital vehicle for space tourism and ultimately a manned orbital one after that. This paper introduces the unique advantages, opportunities, and challenges by the Japanese spaceplane startup Space Walker.