

Creating Markets for Businesses

Jon Michael Smith (NASA SES Retired)

Abstract: At the start of the Shuttle program there were few users of the unique capabilities of the Shuttle. The Shuttle was the first reusable space transportation system that could carry 60,000 lbs of cargo to orbit in a large payload bay. To develop a market for the Shuttles use, NASA employed a technique that worked well and led to the development of new and innovative customers. This paper describes the technique and how it was implemented. It seems that this method may have broad application businesses that have advanced and cutting edge products and services like NASA has with the Space Shuttle Program.



The Space Shuttle program had a few users at the start of the Shuttle program. The customers were single use customers that launched single use, expendable satellites. The Shuttle had many capabilities which were new; among them were space based satellite repair, reuse, deployment and retrieval. Prior to the Shuttle, there were no deployable, retrievable, reusable satellites to capitalize on the Shuttles capabilities.

To develop a market to fully utilize the Shuttles capabilities, NASA developed a unique pricing policy which included incentives to foster the growth of new payloads that would benefit from the new space launch capability. The optimum shape to fully utilize the shuttle payload bay is a stubby 15 foot in diameter tuna can shape whose linear density is approximately 60,000 lbs divided by 60 feet; 10,000 pounds per foot.

At that time most of the satellites were slender payloads that could be launched on an expendable launch vehicle. Their linear density was approximately 30,000 pounds strung out over a 30 foot launch frame 10 feet in diameter. Such payloads have a linear density of about 10,000 pounds per foot: Right density but wrong shape. The price of a shuttle launch could be reduced by repackaging the satellite into a short, stubby configuration that snuggles into the payload bay as a stack of tuna-cans. This configuration was such that many different satellites could be launched together and deployed once the Shuttle was on orbit. The load factor and balance of a flight could be improved by sandwiching small such payloads in-between

the larger satellites. It was recognized that once a satellite was designed for the Shuttle, there was no expendable launch vehicle at the time that could carry the tuna-can shaped satellites: It was a one way street.

Step 1. Prepare a pricing policy where the launch cost was based on the weight and the length of the satellite. The formula we used was the ratio of satellite length to shuttle payload bay length and the ratio of satellite weight to full shuttle payload launch weight, whichever was the greater. The price was scaled upward based on the assumption of a 75% of the full capability of the shuttle would be used on any flight. This load factor is typical for pricing transportation systems which can fly many customers on a single flight.

Special incentives were included for “first-time unique use of the Shuttle” was included in the shuttle use policy. Also, special penalties for misuse of the shuttle, such as missing a shared payload flight, when NASA and the other customers were depending on the customer to occupy its place in the cargo hold.

Step2. To work with those interested in benefiting from the new shuttle capabilities by providing special pricing incentives for those that would develop small payloads that would fit neatly in between larger satellites. Doing so provided the customer may opportunities for a launch provided his smaller satellite could be compatible for sharing payload bay space with others.

Step3. To develop new satellites by encouraging customers to collaborate and find new satellites that would use the Shuttle. These lead existing customers to develop new and innovative use satellites. In this way the firms who were already familiar with the cost and shuttle use and incentive policies. Now this is where the techniques used by NASA will also apply to businesses in particular.

Among the examples of the development of the market for the Shuttle was the Spas 01 passive, self contained payload as developed by Messerschmitt-

Bölkow-Blohm.

SSP Early Market Development Matrix

		Space Lab	Com-Sat	SPAS-01	DoD	S/C ?...
		Customer A	Customer B	Customer C	Customer D	Customer ...
Space Lab	Customer A	■	SL+CS = Nothing			
Com-Sat	Customer B		■			
SPAS-01	Customer C		SPAS-01 + CS Power = Eureka	■		
DoD	Customer D			DoD +SPAS-01	■	
S/C ?...	Customer ...					■

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Once developed and proven operationally, NASA and MBB sought to find new uses of this payload while at the 1980 Paris Airshow.

The Marketing Concept was to seek new opportunities in the “**off-diagonal**” combinations of the experience customer matrix. The approach was to visit the MBB Spas 01 display, then visit the communications satellites firm displays, and investigate ways that both firms could benefit by collaboration. For example, the concept we studied was to attach the solar power wings used on comsats to the Spas 01 payload giving the Spas 01 a longer life capability on orbit.

The result emerged two years later as the Eureka satellite, also developed jointly by MBB, and the German DFVLR. Eureka was two Spas 01 satellites joined together with Comsat solar power wings adapted to the Eureka needs for on-orbit power, for use in reusable, repeatable, free-flying materials processing experiments.

A similar approach was used to encourage the DoD to use the SPAS-01. MBB took the lead in working with the DoD flew later as an experiments platform for the DoD.

The combinations to suggest to SSP customers were obvious once the matrix was developed. Looking back on this technique, it's clear that this method applies to operators of space transportation systems, whether Government or Commercial. We also used this matrix to find firms willing to collaborate with NASA and each other for other projects. In the authors mind, this matrix was the start of Space Commercialization later captured in Section 102-C of the NASA Charter as contributed by Bud Evans and the author (Aviation Week Laurels Award 1984).

This technique of finding combinations of innovative applications among ongoing customers already familiar with ones services seems to be an innovated way to develop markets for firms with unique capabilities, services and products. The customers already know how to do business with the firm. The customers already know the pricing and use policies. The customers already have relationships with the firm's sales and marketing staffs and most customers are looking for collaborative ventures at the edge of business innovations. *What was true for the Space Shuttle program is likely to be true for developing markets for other cutting edge products and services organizations in modern times. Simple techniques that really work have enduring value.*