Ken Davidian is Director of Research at the FAA Office of Commercial Space (AST), Office of the Chief Engineer. The questions in the interview are prepared by the IJSTMI Editorial Board.

**IJSTMI:** FAA promotes global competitiveness of the US commercial space transportation industry and has an R&D plan for 2012, what are the major points of the R&D plan?

**Ken Davidian:** The Federal Aviation Administration (FAA) Office of Commercial Space Transportation (AST) is focusing on four main research areas regarding commercial space transportation: the first area is Space Traffic Management and Operations, the second area is Space Transportation Operations, Technologies and Payloads, the third area is Human Spaceflight and the fourth area is Space Transportation Industry Viability. AST has two main missions. The first mission is to judiciously regulate the commercial space transportation industry to ensure the safety of the public. The second mission is to encourage, facilitate and promote (EFP) a safe and successful commercial space transportation industry. The first three research areas primarily support the safety of missions and the Space Transportation Industry Viability research area primarily supports the EFP mission.

**IJSTMI:** Can you actually “manage” an emerging market at all? Is this not a purely self-evolving process?

**Ken Davidian:** It may be very hard to “manage” an emerging market, but what we are trying to
do is to understand the emerging market so that we can find out what are the biggest hurdles. Emerging markets have occurred in business for a long time and stereotypically you could say that an “emerging market” has typical characteristics and features. We are looking at what problem areas there might be and the emerging market should avoid, and this is something that I think we can do in smart way. One of the activities we are doing in association with our Industry Viability research area is to study the commercial space market through the perspective of Michael Porter’s Industrial Structural Analysis framework. FAA conducts economic impact studies, using economic multipliers to look at the influence of government to identify the direct, indirect and induced impacts on the economy as a whole. The economic impact report is very much based on data and there are certain economic models that calculate what the impact is. We do these kinds of analyses on a periodic basis. Another type of analyses we are doing is to look at the markets as different economists have been able to characterize them. If we are trying to understand emerging markets and what is the impact of providing, as for example if NASA does an acquisition of a certain type of spacecraft or service, we can use the models to assess the possible impact on the industry as a whole. So we are using different theories, such as the disruption innovation theory, to perform an analysis and we are writing papers using these theories. We are also using the Michael Porter industry structural analysis to take an initial look at the markets and try to identify the strength and source of the five forces (threat of new market entrants, competition among existing firms, bargaining power of buyers, bargaining power of suppliers, and the threat of substitutes) to try to identify where the roadblocks may be, where the land mines may be that need to be avoided. This year we are analysing the industry structure of the launch vehicles and on-orbit spacecraft markets. In the past we have looked at suborbital and nano-satellite markets. This year before the SEDS SpaceVision conference (27-30 October in Boulder, Colorado) we are going to run a two day Industry Structural Analysis workshop and the participants who come can decide what kind of markets they want to analyse near term or far term markets. There are so many engineers and scientists in this industry who have never heard of Michael Porter’s work. A lot of engineers think “If I have a great technical idea and I go to market with it, of course people will buy it because it is such a great idea.” What I like about Michael Porter is that it can be applied in a cook book approach. He has written a book called the “Competitive Strategy” in which he defines the industry structural analysis in Chapter 1 and it is very well laid out and very well explained. I have been building on that.

IJTSMI: Apart from the obvious financial incentives, what other elements (ones you consider critical) should be put in place to encourage the growth of the suborbital market?

Ken Davidian: Obviously we need to develop the supply of vehicles and their capabilities and NASA is doing that through its CRuSR Program. CRuSR stands for Commercial Re-usable Suborbital Research program. So they are helping to develop the vehicles capabilities, by paying for flights. But we also need to work on the customer base and trying to get more customers into the market place, at least in the early stages of market development. Especially if you subscribe to the disruption innovation theory by Dr. Clayton Christensen’s you are going to have vehicles that are not very high performing, but they are going to be inexpensive with respect to the traditional industry and they might offer some different services that customers may haven’t had before. So by identifying these non-consumers, part of the issue is to try to get some consumers to try something new they have never had before. This is similar to the Space Station problem that you were talking about. So the approach is to look at the research that has been done by Everett Rogers in his Diffusion of Innovation text book where he looks at how new ideas are adopted and diffused through society. Basically that is the research that identifies the
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