

"1000 years from now, people need to come and understand what happened without forcing people to dig it out of the sand."

- Dan Hagedorn, Curator Emeritus, The Museum of Flight
in reference to the Boeing Centennial

History in the Making: Capturing the Dawn of the New Space Movement

Geoffrey Nunn, The Museum of Flight

The past decade has marked a significant inflection point in the United States' approach to space access. With NASA retiring the Shuttle and refocused on returning to deep space, the role of servicing Earth orbit and suborbital space has opened up to a host of new corporate players. Technological developments such as small satellite technology, reusable rockets, more efficient propulsion, and new business models like rocket rideshare, and commercial Earth imaging are making space more affordable and accessible to not just government and large corporate players, but startups, universities and even individuals.

This rapid growth and diversification of the space industry, sometimes referred to as "New Space", presents a challenge for historians and museums who are working to communicate this story as it emerges, and preserve it into the future. If the historical preservation community hopes to thoroughly understand and communicate this moment in space history, we cannot simply stick to the NASA story as we have traditionally told it. While NASA is still a major part of the ongoing story of space, and is directly involved with incentivizing the New Space boom, there is simply too much happening beyond the agency's direct control for us to ignore. (Yuhas) We must reach out directly to the companies who are now making space history both with NASA and under their own unique visions.

In 2011, The Museum of Flight in Seattle began a concerted effort to document and share the story of New Space. This was prompted in part by identifying a common public misunderstanding surrounding the Shuttle's retirement. As we began work on exhibitry for the Charles Simonyi Space Gallery, which would house the Shuttle Full Fuselage Trainer, our staff began to regularly encounter visitors expressing dismay that, to paraphrase, "Space was canceled". There seemed to be an equation among some in our visitor population that the Shuttle was all NASA did, and that NASA was the only U.S. entity going to space. We became determined to help educate the public that NASA was most certainly not shut down, and that the U.S. space effort was alive, well, and even growing. That meant telling not only the post-Shuttle NASA story, but also striving to capture the emerging world of New Space.

For a history museum, interpreting the present and even the near future is a strange and often uncomfortable situation. In doing so, we walk a fine line between chronicling the significant change that is occurring, and veering into prophecy. We have little doubt that the changes taking place are significant and will impact national and global access to space for the foreseeable future. The museum's president emeritus, Doug King who comes from a tech industry background, loves to compare the feeling of New Space with the vibe in Silicon Valley in the late 1970s. As with the dawn of the computer age, things are changing fast, and history is being made as we watch.

As The Museum of Flight began our outreach, our staff developed firsthand experience with the idiosyncrasies of the New Space movement and its implications for historians and cultural institutions. One of the first differences we noticed was just how many New Space companies are out there, and how quickly that population is growing. The Space Angels Network, a venture capital group focused on the aerospace industry, reports that the number of space companies receiving venture capital investment has grown rapidly from basically 0 in the early 1980s to around 50 in 2009 to 303 in 2017. (Kilian and Patel 3) For an aerospace museum used to relying on NASA and a small handful of its large contractors for artifacts and source material, keeping up with this ever growing web of new players is proving quite a challenge.

On the most basic level, it is a challenge to tease out which stories are worth preserving and telling. Many New Space companies end up falling by the wayside before ever producing a material contribution. Weeding out the companies who will have a significant impact on the history of space from the so-called “paper rocket” companies can be exceptionally difficult if not impossible. Even companies which appear to be thriving one day can quickly fall by the wayside. (Foust) It is also important to consider that even paper rocket companies can impact future endeavors. Indeed, many of the technologies being realized during the New Space boom had their genesis in the canceled space concepts of the past. (Howell) (Rhian) (Shubber) Parsing the sheer volume of information and activity happening right now can prove truly overwhelming.

The culture at many of these companies also presents a challenge for museums. The main point of contact is often the marketing or business development staff who are focused first and foremost on promoting their company’s business and image. When The Museum of Flight first engaged with these groups, many did not seem to know what to make of a museum approaching them about their work. We occasionally received the cold shoulder as though we were the press trying to dig up dirt on their company. When they began to warm up, we were often faced with a different challenge—getting business developers to share their story in a way that wasn’t trying to sell something. The typical museum visitor might be really interested in a description of cool New Space technology, but they don’t really care about how disruptive it will be, or the great investment opportunities for partners getting in at the ground level, or how much money it will save a client. Perhaps more importantly, as educational non-profits by definition, museums are legally prohibited from engaging in corporate promotion. We work hard to coax the descriptions of these New Space companies out of the clean room and the board room to help communicate the work being done in easily accessible lay terms.

The small, agile, entrepreneurial nature of many New Space companies also leaves few resources available for museum display. The Museum of Flight has leaned heavily on digital images, video and text content, but collecting the physical artifacts of this movement remains of paramount importance. Those artifacts communicate the reality

of what is happening to the public. New Space is more than simply thought exercises and concept drawings. These companies are really building new technology and reaching space.

Securing loans or donations of physical objects related to New Space currently faces several hurdles. First and foremost, many of these companies are small and use everything they have until it is destroyed. While a company's executives might be interested in saving their work for posterity, they may have to wrestle it out of the hands of their engineers who want to test it until it explodes. Engaging with business development staff can present an entirely different challenge to artifact acquisition. We had one company ask to recall the exhibit loan of an early full-scale engineering model because after several business pivots, their company was no longer pursuing that technology. From their forward-thinking business perspective, that model was old news and off message. To an historian, it encapsulated the company's first principles and therefore retained tremendous value. As the historical preservation community begins to engage on these matters, much of our conversation will involve shifting people's frame of mind from the business at hand to the broader impact they are and have already had on the business of space.

While New Space objects are relatively scarce at the moment, museums should also be prepared for a potential flood of available material as more and more companies shift from concept to test to operations. The advances in reusable launch systems may prove to be a boon to institutions with the room to care for and display them. The incorporation of 3D printing into space manufacturing may also reduce the burden on releasing a piece of hardware to museums vs. retaining it for test and production. Additive manufacturing, however, presents its own host of challenges for tracking provenance, not to mention a host of new materials which conservators must learn how to best care for.

The New Space industry seems conflicted about the role of public engagement and museums as potential partners in that effort. On the one hand, conferences like NewSpace 2016 have featured strong running themes of the industry's need to raise

public awareness. (Brancato, Dyson and Gerardi) (O'Brien) On the other, based on our experience, there remains a hesitance among many in the industry to engage in any communication that is not directly business or marketing related. The space entrepreneurs working in New Space know that they are making history, but they often struggle to preserve that history. Given the small, fast, and lean operating realities of many New Space companies, is it even fair to expect them to take on that responsibility? How can the historical preservation community best assist to ensure that the dawn of New Space is captured for generations to come? How do we translate our needs across the language barriers of business, technical and historical discourse? Most importantly, how do we do all this without imposing an undue burden on all those involved?

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