

TOFFLER  
ASSOCIATES



# FUTURE STATES

F O R U M

**FUTURE OF THE SPACE INDUSTRY**  
**Agile and Adaptive Organizations**

**August 8, 2013**  
**Dinner Discussion Highlights**

We discussed the **future of the space industry** and **what we must do today as leaders** to prepare and “pre-adapt” for it.

Increasingly, industry leaders recognize that their **environment is changing dramatically** and that they and their **organizations must change in equally dramatic ways**. For the space industry, budget constraints in traditional government customers, the emergence of new markets and new commercial players, and the ongoing globalization of the industry are only some of the factors that compel a reimagining of what it takes to compete and succeed. Many believe that services will lead the next big wave of innovation for the space industry. Many are focused on pursuit of new opportunities in adjacent markets that leverage their companies' capabilities and skills in new ways. **Driving that innovation and seizing those opportunities demands agile and adaptive organizations.**

Space industry companies are taking steps to become more agile and adaptive. Even as we compete, **there is much we can share with and learn from each other**. And there is much that we can learn from leaders in other industries who face many of the same challenges and are taking their own steps to make their organizations better able to adapt to the future environment.

The idea of *managing* change is no longer relevant in the environment the space industry is in today and will face in the future – agile and adaptive organizations must focus on *change leadership* to thrive.

On August 8, 2013, Toffler Associates and The Space Foundation jointly hosted a dinner with leaders from more than twenty organizations to discuss what change leadership can and must look like for the space industry, and how to make it happen. We posed several questions for discussion, and our dialogue touched on many others as well.

- What must we do to be leaders vs. managers, with the passion and vision needed to move our peers, employees and customers forward to truly new business models?
- How prepared are our organizations for change, and what must we do to better anticipate key changes on the horizon and pre-adapt our strategies, structures, and processes before those changes emerge?
- How can we find, recruit, and retain the talent we need – not just technical or “STEM” talents but the many other skills and attributes that the future demands?
- What lessons can space industry leaders take from other organizations that have adapted or attempted to adapt to new markets and industry transformations?

Over the course of the evening, some themes emerged:

- Making our industry and organizations more agile demands **a rich and far-ranging understanding of the future business and operating environment** and articulating and communicating **a clear, inspiring vision** of our purpose and the value we create in that environment. If we focus on anticipating what the future markets will demand and developing the vision of what value we will create for those markets, we can be more agile with respect to the strategies for *how* to create it as the pace of change in the environment continues to accelerate.
- More than many industries, the space industry faces challenges **shifting from a culture of risk aversion to one in which risk-taking is not only accepted but encouraged**. Several factors are at play, including the life-safety imperative in an inherently dangerous endeavor; regulations; the scale of the financial investments; and others. There is no one right strategy for striking the balance between risk-encouragement and risk-management, or for making the needed culture shift.
- **We need change leadership, not change management**, to make the shift we need in our organizations and industry to succeed in the future environment. Managers drive programs, systems, efficiencies – leaders drive *people*, impelling them to do think and behave in new ways. Change doesn't just happen organically even when people are inspired, it demands all the rigor and planning of a well-run program, but

more importantly in our space industry organizations it will require individuals with authority, power, and influence to visibly lead the change.

- **Attracting the next generation** of young, technically-talented and agile-thinking women and men to the space industry **will be both the signal and a key enabler of our success in effecting real change**. To do so we must create conditions in which they have the freedom to innovate in the ways that are the hallmark of their era (open architectures, collaboration). But attracting and retaining them will also demand **empowering them to truly be part of the leadership and decision-making** within our organizations

## The future environment and communicating a vision

Looking not only at the space industry but also across other industries, too often organizational change efforts are in reaction to environmental changes that have already happened or are far along in the process of happening. When we do that, we are moving our organizations away from something (today's challenging conditions), not *toward* a vision that can unite and inspire our workforce and customers and political leaders. As an industry we have to articulate what one guest described as a "global proposition," a case for the multi-dimensional benefit of space that can inspire and sustain the allegiance of a clear majority of Congress and the public at large. Just as importantly, it must attract the talented, visionary scientists and engineers and management leaders needed to bring it to fruition.

Is that vision about exploration – space as a destination – or about space as a platform for services and applications that enable audacious achievements in our lives on this planet? To suggest it is one or the other is a false choice. Exploration has always been pivotal to commerce and prosperity, and that will be true of space exploration as well; however, the industry has not made that connection in the minds of the public in a clear and compelling way. It may be because we abide this false choice, treating the exploration as somehow dissociated from the leveraging of space to affect life on earth. History is replete with examples of exploration followed by settlement, and we have spoken for decades of settlements on the Moon or other planets just as we followed exploration with settlement in Vasco da Gama's time or the American West. But in the case of space, perhaps it is best to remember that exploration was followed directly by exploitation of natural resources – economic value from the "new world" that had a game-changing impact on the "old world." Economies have changed over the past 500 years and we cannot take our lessons from the Age of Exploration without updating them to the 21st century knowledge age. We use the metaphor of "digital native" to describe the generation increasingly now coming into our workforce. Extend the metaphor and consider how they are accustomed to "settlement" in the sense of leveraging a *virtual* medium to enable things never before imaginable in the medium in which they *physically* live. We should be looking to find other ways (beyond launch and travel) to inspire industries with how they can leverage the medium of space. Just as we do not refer to the ocean or air as an "industry" but rather a domain leveraged by many different industries, so should we be thinking about space. At the same time,



we know from polls of the “Mars generation” and from the talented engineers working to create new ways of gaining access to space that they also are inspired by the audacious vision of settlement in the traditional sense, putting humans on other planets and enabling people to live in space in the future.

## **From risk aversion to encouraging risk**

The space industry arguably is at a unique disadvantage with respect to becoming an industry of agile and adaptive organizations, for several reasons that individually and collectively have created a deep-seated culture of risk aversion. We will have to work harder than other industries to overcome these industry-specific barriers to agility.

Our risk aversion stems in part from the intense focus on safety. Extraordinary steps to minimize the risk of loss of life from a catastrophic failure in launch or operations is the natural commitment and priority of responsible leaders in this dangerous endeavor. But that risk aversion has come to pervade much of what we do across all the *non*-operational dimensions of our businesses – how we approach the business environment, how and even *whether* we think about and go about changing our organizations. We can trace our risk aversion also to the fact that, traditionally, what we do is has required enormous investments of time and resources. It takes years or decades, and often billions of dollars, to design, build, launch, and operate space architectures and missions. We have become accustomed to lengthy time horizons to squeeze the risk out of these investments, but there is a growing mismatch between the rapid pace of change in so many dimensions of the operating environment and the long lag-time to operational success and payoff depending on the vertical within the industry. Agility is (in part) about speed and rapid response to such changing conditions – and the agility of the organization is what will enable the reduction of cycle time, cost, *and* risk through new technologies, new processes, and new business models.

A lengthy discussion of the challenges associated with revolutionizing space launch highlighted the tension we must resolve between adaptability and risk aversion. We will not be able to reduce the cost or risk of access to space without trying new things, but doing so requires us to overcome our aversion to the risk of trying new things. Relying much more on modeling and simulation (M&S) in place of traditional industry approaches of test and inspection is one example. Simulations numbering in the thousands can be conducted on much more rapid timelines and at much lower cost and potentially can result in higher degrees of confidence in new launch vehicles or other technologies. But shifting to an M&S-centric approach represents a risk-aversion barrier we have not yet overcome as an industry. Operating inside a structure of rigorous government regulations is a contributing factor that may be impeding such a shift (and impeding organizational agility in numerous other ways) but we cannot use these rules-of-the-road as an excuse. Participants agreed that it accepting risk is not the same as encouraging it, and we will not be able to push for regulators to accept new approaches to risk management until we encourage risk within our own organizations.

## Change leadership, not change management

Changing our space industry organizations to encourage risk-taking, to embrace new business models, to leverage the attributes of our increasingly "digital native" workforce and our networked, global, fast-paced business environment will not just happen. In each of our organizations we need a methodical and rigorous but *leader-driven* process for making the organization become agile and making it operate that way on a sustained basis. We need change leadership not change management.

It begins with understanding the risks and impact of changing the culture of a large, established company or agency and developing formal plans to manage those risks. In the space industry in particular, the risks of such a culture change could include losing or devaluing the experience and knowledge of current technical and management leaders as we try to marry the "Silicon Valley mindset" to the best practices and experience of the legacy industry. It also demands people with authority, power, and influence visibly lead the change – and these may not always be only the obvious ones by position or title within the organization. Some of the change leaders may reside outside the functional or other formal leadership structure or structures.

Changing our organizations must be approached like a program or campaign – something for which the space industry with its long history of rigorous program management ought to be particularly well suited, if we allow ourselves to adapt and apply that experience in a different context. Perhaps more important than anything else is leaders communicating the change vision (how the organization will be different and why that must be so) to employees, investors, customers, political leaders, and other stakeholders. We also must provide the knowledge, tools and training, supporting procedures, and infrastructure to help employees operate successfully in an agile and adaptive organization and to shed those status quo behaviors that impede agility. Measurement will be as vital as in any successful program – quantitative and qualitative metrics for what it will look like when we get there, and mileposts and maps for what we expect of the organization and the individuals every step along the way.

Participants converged on the importance of change leadership over more traditional change management for making our organizations more agile and adaptive. As one put it, for the space industry the three keys will be *leadership* that is imaginative and inspiring, creating a *culture* that allows the freedom to act on new ideas, and *science* applied against societal needs. Another stressed that entrepreneurialism won't thrive across the industry if we rely narrowly on our heritage achievements and improving on them incrementally. New space companies must value and build on that legacy, but all space companies must rely even more importantly on the industry's legacy of encouraging extraordinary creativity and creating conditions that let talent take risks.

## Attracting and empowering the next generation

More than any other theme, our guests returned throughout the evening to the importance of attracting the interest of the next generation of young entrepreneurs and technical talents to the space industry and giving them the freedom to innovate and collaborate. Part of doing so will be providing conditions that allow them to work in

the ways that are the hallmark of their generation and of our 21st century knowledge environment and economy. We must allow our organizations to avail themselves of the power of “social networking,” not in the Facebook or Twitter sense but in the sense of vigorous, open collaboration among our engineers and other staff, within our companies but also across company and even industry lines. Open source architecture and development is another dimension of this. Not only can such approaches move the industry away over time from hierarchical requirements definition that contributes to high cost and long development cycles. Perhaps more importantly, they can help make the industry feel a more exciting and agile one to come to for the generation we want to attract that naturally thinks and works this way.

As the current generation of technical and management leaders retires, the space industry faces both an opportunity and a risk. We have to embrace the opportunity and let the new generation move into positions of true leadership (which may or may not be in the form of formal title or position, and increasingly it may *not* be). What does the room look like for a large aerospace company’s senior leadership meeting today, and what will it look like in five years? How are the youthful ideas being leveraged in the decision-making that drives everything from program and system design to the direction and strategy of the company? Empowering the *future* leaders *today* is vital for space industry companies to become agile, adaptive organizations. At the same time we must take deliberate steps to ensure we do not lose or devalue the experience and expertise that has made the industry able to accomplish all its great achievements. In the near term, as one guest put it, leadership’s job is removing the frictions that impede our people – of all generations – from accomplishing the great things they want to like “making launch irrelevant” and “making Moore’s law operate in space.”

## Conclusion

The time has never been as important as now to exchange ideas about how to prepare and position our organizations for the future, and take action on those ideas through change leadership.

We conclude this latest dialogue of leaders about the future of the space industry with considerable optimism. Becoming more agile and adaptive in our organizations is a great challenge, but one that can be met with an understanding and vision of the future environment, a shift from managing risk to encouraging and harnessing it, a shift from change *management* to change *leadership*, and the talent of the next generation of scientists and entrepreneurs. We must embrace and adapt for our own industry the successful practices of numerous organizations from other industries that have transformed themselves to new market conditions and other realities. We need to align our hiring with the attributes required for the future market and our incentives with the behaviors required for success. We need new models of partnership across government and industry lines, between “new space” and “old space” companies,



between the public and the industry. And we are seeing all of these already today. The challenge is to accelerate the change that is underway. Closing our discussion one of our guests invoked Michelangelo, who “visualized the angel in the marble and carved until he set it free.” We know what the agile, adaptive organizations of the future space industry look like – we need to think and work in new ways to set them free.



---

## TOFFLER ASSOCIATES

---

Toffler Associates is a strategy and organizational change consultancy, helping leaders build the extraordinary organizations of tomorrow. We serve as a catalyst for change for clients with tough problems to solve, creating impact through knowledge of the forces of change that will shape the future.

To accomplish this, we employ a collaborative approach to guide clients in the development of Knowledge Age business strategies. Our **Future Proof<sup>SM</sup>** business consulting service provides clarity by identifying the risks and opportunities that may lie ahead, enabling leaders to implement the changes necessary to create value, to sustain growth and to succeed in future operating environments.

We work with public-sector clients, such as federal agencies, the intelligence community, associations and educational institutions, to develop and implement ways to use resources more effectively and to build lasting public trust. We work with private-sector clients, like those in the transportation, aerospace, chemical, advanced materials, information technology and defense markets, to create and execute strategies that drive top-line growth.

We find daily inspiration in working with commercial enterprises and government agencies that are creating something that really matters to people, clients who are trying to make a difference in all of our lives. Our purpose is to help them achieve that. It is the passion that unites our firm as one community.

---

## THE SPACE FOUNDATION

---

The foremost advocate for all sectors of the space industry and an expert in all aspects of space, the Space Foundation is a global, nonprofit leader in space awareness activities, educational programs that bring space into the classroom and major industry events, including the Space Symposium, all in support of its mission "to advance space-related endeavors to inspire, enable and propel humanity."

The Space Foundation publishes *The Space Report: The Authoritative Guide to Global Space Activity* and provides three indexes that track daily U.S. stock market performance of the space industry. Through its Space Certification<sup>TM</sup> and Space Technology Hall of Fame<sup>®</sup> programs, the Space Foundation recognizes space-based technologies and innovations that have been adapted to improve life on Earth.

The Space Foundation was founded in 1983 and is based in Colorado Springs, Colo. Its world headquarters features a public Discovery Center with two main areas – the El Pomar Space Gallery and the Northrop Grumman Science Center featuring Science



On a Sphere®. The Space Foundation also conducts research and analysis and government affairs activities from its Washington, D.C., office and has a field office in Houston, Texas.

For more information, visit [www.SpaceFoundation.org](http://www.SpaceFoundation.org). Follow us on Facebook, LinkedIn and Twitter, and read about the latest Space Foundation activities in Space Watch.

For more information, please contact:

**Steven Kenney**  
[skenny@toffler.com](mailto:skenny@toffler.com)  
**202.489.6131**

**Beau Oliver**  
[boliver@toffler.com](mailto:boliver@toffler.com)  
**202.507.0646**