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ASCENDxTexas

INTERACTIVE SESSION DETAILED SUMMARY

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TABLE OF CONTENTS

Executive Summary **3**

Industry 4

Policy & Government 5

International 6

Capital 7

Workforce 8

Topic Area Details **9**

Industry 10

New Barriers & Solutions 10

Priorities 11

Policy & Government 12

New Barriers & Solutions 12

Priorities 13

International 14

New Barriers & Solutions 14

Priorities 15

Capital 16

New Barriers & Solutions 16

Priorities 17

Workforce 18

New Barriers & Solutions 18

Priorities 19

EXECUTIVE SUMMARY

The third iteration of ASCENDxTexas, held 14–15 February 2024, focused on the theme: Next Steps in the LEO-to-Lunar Voyage, and was a dynamic dive into projects and strategies that can revolutionize the off-world ecosystem. This day-and-a-half event served as a collaborative hub, fostering partnerships and overcoming barriers to build transformative outcomes and to catalyze a new era of the space economy. An interactive session was conducted to engage attendees in meaningful discussion around breaking barriers, priorities, and potential solutions to accelerate the space ecosystem. Small group leaders (or table captains) guided attendees through a 60-minute session to provide their perspectives on the barriers and pathways to success for our nation's exploration efforts. Each group discussed two of five topic areas: industry, policy/government, international, capital and workforce. The 18 separate table groups consisted of 200+ participants.

Building off of the 2023 ASCENDxTexas Interactive Session, table groups reviewed the challenges and barriers to success in the topic area, then discussed changes to the environment, new barriers, and what sustainability looks like in that area. Then participants moved on to suggest priorities and potential solutions to revolutionizing our off-world ecosystem. The table captains captured comments and discussion in an interactive document. This allowed session leaders to quickly distill key information for an outbrief later in the event. This report is a more detailed summary of the session.

The outcome of the interactive session was a set of prioritized areas of emphasis with solutions to be pursued during the coming year that benefit the national exploration goals of the next 5 to 20 years. A high-level summary of each of the five topic areas follows, including some comments and discussion points from attendees. This document does not represent the perspective of any one individual or organization, but rather is a compilation of many different viewpoints from participants who attended 2024 ASCENDxTexas.

INDUSTRY SUMMARY

Key takeaways in the industry topic area highlight the importance of balancing collaboration, competition, and profitability while addressing challenges related to human space mission requirements, intellectual property (IP) rights, knowledge sharing, and efficiency improvements.

Firstly, there is a recognized need to reduce competition among commercial participants in the space industry while delineating clear boundaries between collaboration and competition. Finding the right balance is crucial to fostering a healthy ecosystem that promotes innovation and growth while avoiding unnecessary conflicts that could hinder progress. Secondly, the challenge of navigating human space mission requirements emerges as a significant concern, particularly in terms of reconciling the interests of NASA primes with those of new space companies. Protecting strong IP rights and promoting data sharing emerge as top priorities to facilitate collaboration and innovation while safeguarding proprietary information.

Furthermore, there is a shift in the dynamics of space technology development, with NASA no longer being the sole driver of innovation. This underscores the need for a paradigm shift toward shared practices and knowledge initiatives that benefit the entire industry, encouraging collaboration and efficiency. In addition, there's an emphasis on NASA's role in setting specific goals and objectives to support sustainability, attract investors, and drive technological advancements. Improving data sharing, efficiency, and transparency within the industry are essential components of this effort, along with addressing supply chain challenges and streamlining processes like organization conflict of interest (OCI) evaluations.

Finally, reaching out to non-aerospace sectors for innovative solutions, fostering dialogue through generic trade conferences, and leveraging NASA's role as a repository for common parts in the supply chain are identified as potential strategies to overcome industry challenges and drive progress in the space ecosystem. These takeaways underscore the need for collaborative efforts, strategic partnerships, and efficient resource utilization to realize the full potential of space exploration and technology development.

POLICY & GOVERNMENT SUMMARY

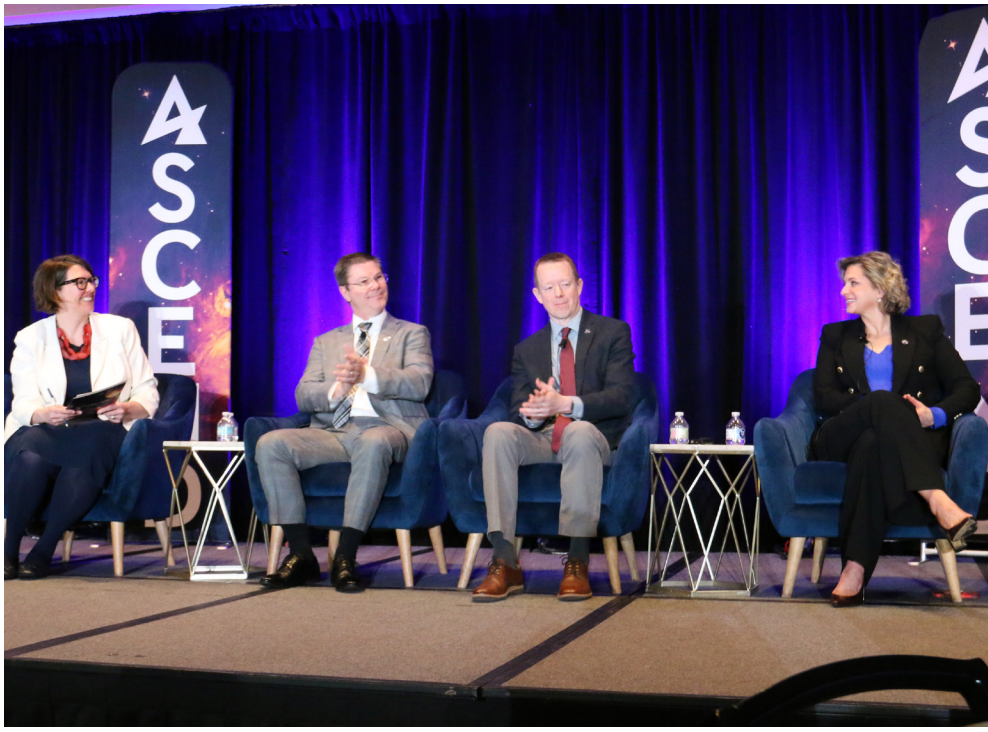
Key takeaways in the policy and government topic area emphasize the need to address challenges posed by the election cycle, which can disrupt funding stability and drive changes in course, necessitating strategies to enable multiyear funding to mitigate uncertainties. International and policy-related cybersecurity risks emerge as significant concerns, underscoring the importance of robust security measures and clear policy frameworks to safeguard sensitive information. Effective information sharing and the establishment of clear roles and capabilities by NASA are crucial for supporting industry growth and fostering collaboration. Industry stakeholders express considerable apprehension regarding funding levels and stability, particularly amid potential changes in administration, emphasizing the importance of proactive efforts to ensure continuity and support from government entities. Furthermore, NASA's initiatives to improve processes and engage with industry have been positively received, highlighting the importance of continued collaboration and dialogue to address shared challenges and drive innovation in the space sector.

INTERNATIONAL SUMMARY

In the international topic area, key takeaways revolve around the imperative of establishing clear property rights and protecting intellectual property, addressing funding challenges and international competition for U.S. contracts, and mitigating political instability through multilateral sharing agreements. Despite the potential for broader collaboration, the International Traffic in Arms Regulations (ITAR) remains a significant barrier to international cooperation. Additionally, there is widespread confusion surrounding the Artemis Accords, with many stakeholders unaware of its purpose or provisions. Clarifying the Accords and fostering greater awareness and participation are essential for advancing international collaboration in the space domain.

CAPITAL SUMMARY

In the capital topic area, a key takeaway from the discussion is the critical need to address funding challenges and establish a common customer base, potentially leveraging NASA's support to attract new, younger, and more agile companies. The speed of government processes and their impact on industry collaboration, particularly concerning intellectual property, emerges as another pivotal consideration. Additionally, the significant barriers posed by the cost of capital and inflation highlight the necessity for strategic partnerships, including international collaborations, to mitigate financial constraints and foster sustainable growth in the space ecosystem.



WORKFORCE SUMMARY

The most valuable takeaway from this round of discussions in the workforce topic area is the effectiveness of boomerang employees, highlighting the importance of selling the excitement of being part of historic endeavors and promoting a supportive work-life balance to attract and retain talent. Additionally, there is a clear opportunity to leverage AI for recruiting and staffing, alongside the need to harness social media to engage with the next generation of workforce. The challenges of an aging workforce and issues with knowledge transfer underscore the importance of understanding the full lifecycle of space projects and optimizing workforce capabilities accordingly. Furthermore, there are concerns about workforce supply not meeting demand and the need for NASA to re-examine education requirements in solicitations to enable industry agility and responsiveness. It's crucial to address challenges such as unrealistic expectations for contractors and ensure realistic timelines to prevent burnout and recognize all contributors in the project chain.

TOPIC AREA DETAILS

INDUSTRY

NEW BARRIERS & SOLUTIONS

The space industry faces a myriad of barriers that hinder innovation, sustainability, efficiency, and diversity of participation. One significant challenge lies in the inefficiencies of the Small Business Innovation Research (SBIR) Program, where funds are dispersed without a perceived clear strategic direction, leading to a lack of focus and impact. Moreover, the industry struggles with prolonged decision-making cycles, often resulting in obsolete products or shifting requirements by the time projects are completed.

Unlike terrestrial operations, piecemeal approaches aren't feasible in space endeavors, necessitating a comprehensive master plan for development. However, funding remains a major obstacle for smaller companies seeking to enter the space sector, despite their potential for innovation and agility. Additionally, the industry lacks a clear governing body to establish standards and guidelines, which could lead to inconsistency and resistance from commercial entities. Cultural barriers also impede progress, as seasoned professionals may have difficulty in collaboration and knowledge transfer to newer generations, hindering cross-pollination of ideas and methods. Furthermore, the dominance of prime contractors, coupled with stringent regulations and procurement processes, limits opportunities for smaller businesses and stifles diversity within the industry.

To address these challenges, potential solutions include streamlining the SBIR process, fostering collaboration between industry and government, easing regulatory burdens, and promoting diversity through equitable opportunities and support for smaller companies. Additionally, enhancing communication, knowledge sharing, and investment in STEM education can help bridge the gap between academia and industry, facilitating the integration of theoretical knowledge with practical applications. Ultimately, creating a more inclusive, agile, and resilient space ecosystem requires concerted efforts from all stakeholders to overcome existing barriers and unlock the full potential of space exploration and innovation.

PRIORITIES

The priorities for industry in the space ecosystem revolve around incentivizing innovation, fostering collaboration, establishing standards, and ensuring consistent funding and support from government agencies like NASA. One key focus is on incentivizing innovation through effective allocation of resources, such as those provided through programs like SBIR. However, there's a call for better execution of these programs, suggesting a more strategic distribution of funds to avoid dilution and to support a diverse range of players, including smaller businesses.

A major concern is the potential competition between government-funded research and private industry initiatives, particularly when NASA's research efforts overlap with those of private companies. This scenario can hinder collaboration and support for space exploration. Additionally, there's a perception that entering the space industry requires a significant portion of revenue from NASA contracts, which may not be true or sustainable for companies. The need for stability and predictability in funding and contracts is crucial for the industry's growth and sustainability. Collaboration and partnership are seen as essential for industry growth and innovation. Initiatives like mentorship programs and increased engagement with student organizations and academia can help foster talent development and knowledge sharing within the industry. Furthermore, there's a need for streamlined procurement processes, consistent funding commitments, and clear communication channels between government agencies and industry stakeholders to minimize barriers and optimize resource utilization in the space sector.

Integration and standards are emphasized as critical aspects of industry development. Standardization facilitates collaboration and interoperability across different players in the space ecosystem, ultimately driving innovation and efficiency. There's a push for NASA to establish common standards, particularly in emerging areas like lunar exploration, to avoid fragmentation and promote a more cohesive approach to space exploration.

Overall, the priorities underscore the importance of fostering innovation, collaboration, and standardization while addressing challenges such as funding stability, regulatory consistency, and talent development to drive sustainable growth and advancement in the space industry.

POLICY & GOVERNMENT

NEW BARRIERS & SOLUTIONS

Barriers in policy and government within the space ecosystem present multifaceted challenges that hinder innovation, investment, and collaboration. One key issue is the uncertainty surrounding regulatory oversight of novel space activities, with questions arising about whether the FAA or the Office of Space Commerce should take the lead. This lack of clarity creates ambiguity and can stifle the development of new commercial ventures in space. Another significant concern is the inadequacy of the insurance market for space activities, which poses risks and uncertainties for investors and companies. Government intervention is seen as crucial to incentivizing states and other investors to support the commercial space industry, potentially through targeted policies or incentives that encourage investment and development in the sector.

The appropriation cycle and government shutdowns exacerbate funding uncertainties and delays, impacting companies' ability to plan and invest in long-term projects. Calls for multiyear funding and a flexible open architecture aim to mitigate these challenges and provide greater stability for the industry. Additionally, the restrictive nature of ITAR regulations and the lack of clarity surrounding NASA's roles and responsibilities further complicate matters, impeding the speed and efficiency of business operations.

Furthermore, the slow transition between overseeing programs and the lack of effective management changes hinders progress and innovation within the space sector. There's a pressing need for NASA to improve processes, share critical information, and establish guidelines for disclosing relevant data to industry partners. Additionally, barriers to entry for small businesses hamper the growth of the lunar economy, necessitating measures such as personnel exchanges with NASA and expedited technology transfer processes to foster industry development.

In summary, addressing these barriers requires coordinated efforts between policymakers, government agencies, and industry stakeholders to establish clear regulations, provide stable funding, streamline processes, and promote knowledge sharing and collaboration. By addressing these challenges, the space ecosystem can unlock its full potential and drive innovation and growth in the years to come to ensure our off-world future.

POLICY & GOVERNMENT

PRIORITIES

In the space ecosystem, priorities in policy and government revolve around establishing stable policies and funding mechanisms to reduce uncertainty and risk for industry players. The lack of consistent policy and funding hampers innovation and investment, necessitating efforts to create frameworks that provide stability and encourage long-term planning and development. Additionally, procurement policies and models need to be revisited to minimize risk for industry stakeholders, ensuring that the process is transparent and equitable while fostering collaboration and innovation.

Addressing cybersecurity concerns emerges as another critical priority, with data sharing becoming increasingly central to space activities. Efforts to mitigate cybersecurity risks and establish clear regulations for data sharing are essential to safeguard sensitive information and promote trust and collaboration among stakeholders. Human-centered design principles can offer solutions to some challenges, emphasizing the importance of user-centric approaches and adaptable frameworks that accommodate diverse needs and perspectives. Furthermore, optimizing government funding allocations, such as Texas's state-level appropriation, is vital to fostering a robust space ecosystem and achieving national goals, thereby fostering talent and sustaining momentum in revolutionizing space exploration.

INTERNATIONAL

NEW BARRIERS & SOLUTIONS

The international space ecosystem faces a multitude of barriers and complexities that hinder collaboration and progress. At the forefront are the Artemis Accords, an agreement outlining principles for lunar exploration endorsed by some countries and new companies, but not universally accepted. This lack of uniformity creates an uneven playing field where resources may be exploited by non-signatories, complicating cooperation and economic development. Moreover, the inclusion of countries like China remains uncertain, raising questions about the breadth and depth of international participation.

Political dynamics further complicate matters, as seen in strained relationships between the United States and countries like Russia, impacting collaborative efforts and necessitating diverse partnerships. However, the absence of a clear ownership structure for these issues exacerbates challenges in fostering inclusive and sustainable space activities. Geopolitical tensions and regulatory frameworks such as ITAR restrict collaboration, particularly with smaller nations, hindering talent acquisition and technology exchange.

Practical concerns also impede progress, including the lack of standardized operations, cultural differences, and the formidable expenses associated with mission control and infrastructure setup. Moreover, disparities in accessibility and economic viability across regions create additional hurdles, with individual regions emerging as attractive hubs for space-related ventures due to favorable regulatory environments.

Addressing these barriers requires a concerted effort to streamline regulations, foster cross-border partnerships, and enhance accessibility to talent and resources. Initiatives like the Artemis Accords need clarification and broad participation, alongside efforts to modernize regulatory frameworks like ITAR. Embracing inclusivity, standardization, and collaborative frameworks will be crucial in realizing the full potential of the international space ecosystem while navigating geopolitical complexities and technological advancements.

INTERNATIONAL

PRIORITIES

In the international topic area, several key priorities emerge, each demanding attention and strategic solutions for effective collaboration and advancement. Foremost among these priorities is the establishment of property rights on celestial bodies such as the moon and asteroids, which are crucial for fostering investment and development. Determining legal frameworks and enforcement mechanisms for such rights poses a complex challenge requiring international consensus and cooperation. The Artemis Accords, intended to govern lunar exploration activities, require universal clarity and a shared understanding across international boundaries. Ambiguities within the Accords, particularly regarding ownership and operational standards, need to be addressed to foster cohesive collaboration and prevent disputes.

Moreover, the need for robust space law and effective enforcement mechanisms cannot be overstated, particularly in light of geopolitical tensions involving major space players like China and Russia. It's imperative to ensure that international collaboration benefits all parties involved, with clear guidelines and equitable distribution of monetary gains. Furthermore, the lack of international standards and uniformity within NASA itself poses obstacles to efficient collaboration and resource sharing. Clarity on leadership roles and the establishment of common language and protocols are essential for effective communication and coordination among international partners.

ITAR remains a significant hurdle, limiting collaboration and hindering the flow of talent and technology. Streamlining ITAR processes, fostering cross-border partnerships, and empowering technically literate individuals to make informed decisions regarding export control can help alleviate these challenges.

Success in addressing these priorities lies in the development of comprehensive policies, robust enforcement mechanisms, and transparent frameworks for collaboration. By fostering a culture of cooperation, embracing risk-taking, and streamlining regulatory processes, the international space community can navigate geopolitical complexities and technological advancements while unlocking the full potential of the space ecosystem.

CAPITAL

NEW BARRIERS & SOLUTIONS

In the capital topic area, several barriers impede industry growth and sustainability. One significant challenge is the uncertainty surrounding budgets, which fluctuate annually, leading to difficulty in long-term planning. Additionally, the absence of a ceiling for future costs creates unpredictability, necessitating government involvement to mitigate risks. Another obstacle is the slow procurement process, hindering timely project execution and funding allocation. Moreover, the high cost of capital and doing business, compounded by lengthy lead times for materials, pose challenges, particularly for small businesses.

In recent times, several changes have influenced the space industry landscape. Inflation, escalating costs of orbit access, and talent poaching from other sectors have impacted operations. However, advancements in technology have simultaneously lowered the cost of orbit, opening up new possibilities for exploration and commercial endeavors.

Sustainability in the space industry entails developing long-range plans with government support, fostering financial models that work for emerging entities such as Axiom and Intuitive Machines, and diversifying investment sources. To achieve sustainability, there's a need for education on space investment risks, flexibility in NASA's contracting mechanisms, and collaboration with non-aerospace companies to leverage resources and expertise. Furthermore, standardizing core infrastructure, reducing development costs, and leveraging historical knowledge and intellectual property can facilitate industry growth and competitiveness.

Addressing these barriers and embracing changes while fostering collaboration and innovation will be crucial for ensuring the sustainability and growth of the space industry. Efforts to streamline processes, secure stable funding, and foster partnerships will pave the way for a thriving space ecosystem that benefits both industry players and broader society.

PRIORITIES

Several priorities have emerged for industry players. One crucial focus is ensuring the availability of resources, both in terms of materials and subject matter expertise (SME). While Space Act Agreements provide access to government infrastructure and expertise, there's a need to address the transition of SMEs from government to industry. NASA's succession planning could play a role in retaining and sharing expertise within the community, potentially by encouraging contractors to take on more civil servant roles strategically to gain industry knowledge while also considering the delineation of inherently governmental roles and responsibilities.

Another priority lies in NASA's role as a foundational entity for many companies, particularly in sectors like medical devices and applications. There's a call for increased financial support from NASA, potentially positioning the agency as a baseline customer for these companies, especially in the near term to boost profitability and attract broader funding. Additionally, mitigating material costs, which are emerging as significant factors driving capital risk, is crucial to sustaining the momentum of NASA and commercial successes. More visible profitability is needed to attract external funding and showcase the viability of space ventures to a broader audience.

To address these priorities, potential solutions include enhancing NASA's role in facilitating partnerships by making connections across industries more accessible and promoting knowledge sharing without relying solely on the "brain drain" model. Embracing globalization and seeking out global markets interested in sustaining the space industry can diversify funding sources and expand opportunities for collaboration. Moreover, improving industry engagement through better advertising and sharing lessons learned can attract new participants and foster a more agile and innovative ecosystem. Success in these endeavors would be marked by increased collaboration, profitability, and sustainability within the space industry, ultimately driving continued growth and exploration.

WORKFORCE

NEW BARRIERS & SOLUTIONS

The workforce in the space ecosystem faces several barriers, exacerbated by the recent pandemic and shifting perceptions of space exploration. One significant challenge is the thinning out of SMEs, with experienced professionals leaving for more lucrative opportunities in the commercial sector, leading to a "starved" workforce environment. Effective compensation remains a critical barrier, especially with tech companies offering higher profits and attracting talent from government contracts. Additionally, the academic system's focus on theory rather than practical application and communication skills poses challenges in preparing the next generation of professionals. The vetting process for certain jobs is also seen as broken, and there's a lack of mentors to guide the incoming workforce.

Specific challenges include the need for a blended operations approach between countries and addressing ITAR and Export Control policies to retain international students. Solutions to these barriers include streamlining blended operations, sharing SME skills across NASA centers, and fostering a culture of collaboration to prevent poaching and enable a sustainable workforce. Moreover, there's a call for flexibility in job requirements, upskilling programs, and enabling remote work where feasible. Success in addressing these barriers entails maintaining continuity in the workforce, making work in the space ecosystem attractive, and ensuring skills retention after training. It also involves cultural shifts within individual players to embrace collaboration and adapt to changing workforce dynamics, ultimately securing a sustainable and skilled workforce for the future of space exploration.

WORKFORCE

PRIORITIES

In the workforce topic area, several priorities emerged, reflecting the need to adapt to evolving trends and address longstanding challenges. One key priority is the development of a sustainable pipeline of talent, with initiatives aimed at retaining mid-career professionals and fostering collaboration between industry and academia to meet workforce needs. This includes recognizing the changing motivations of the workforce, such as the desire for meaningful work and work-life balance, and leveraging these factors to attract and retain skilled individuals. Additionally, there is a growing emphasis on promoting the space ecosystem and the broader aerospace industry to upcoming and recent graduates, as well as increasing diversity and inclusivity within the workforce through targeted recruitment and outreach efforts.

Another priority is the effective transfer of knowledge and expertise within the workforce, particularly as the aging workforce retires and younger employees enter the industry. Solutions include implementing mentorship programs, enhancing informal project documentation, and encouraging participation in conferences and events to facilitate knowledge sharing and retention. Furthermore, there is a need to address barriers to entry into the industry, such as streamlining hiring processes and improving education and training programs to better align with industry needs. Additionally, there is a growing recognition of the potential of artificial intelligence (AI) to streamline recruitment and staffing processes, as well as improve data analysis and decision making within the workforce.

Success in addressing these priorities will involve a concerted effort from industry stakeholders, including government agencies, contractors, and educational institutions, to collaborate and innovate in workforce development and management. This may entail fostering a culture of continuous learning and flexibility, promoting work-life balance and diversity, and investing in AI and other technologies to enhance recruitment and training processes. Ultimately, success will be measured by the ability of the industry to attract, retain, and develop a skilled workforce capable of driving innovation and sustaining growth in the dynamic and rapidly evolving space ecosystem as we move off-world.

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