



Innovation Progress and Future Outlook

AIAA Workshop on Multiple Aspects of Innovation

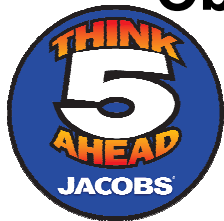
**David Whitlock, Director of Division Programs and Innovations Office
January 29, 2016**

Safety Moment



Think 5 Ahead Program

- **Encourages our people to take time to think 5 seconds to 5 minutes ahead before beginning a task**
 - Assess activity, environment, potential safety risk and consequences
 - Program encourages same thought process to be used outside of the workplace
- **Initiated to supplement the Jacobs BeyondZero® program and other existing safety controls like Safe Plans of Action (SPAs), Hazard Analyses (HAs), and Safety Observation Reports (SORs)**



Students using Think 5 at a FIRST Robotics contest



Employee's son taking Think 5 to the US Navy

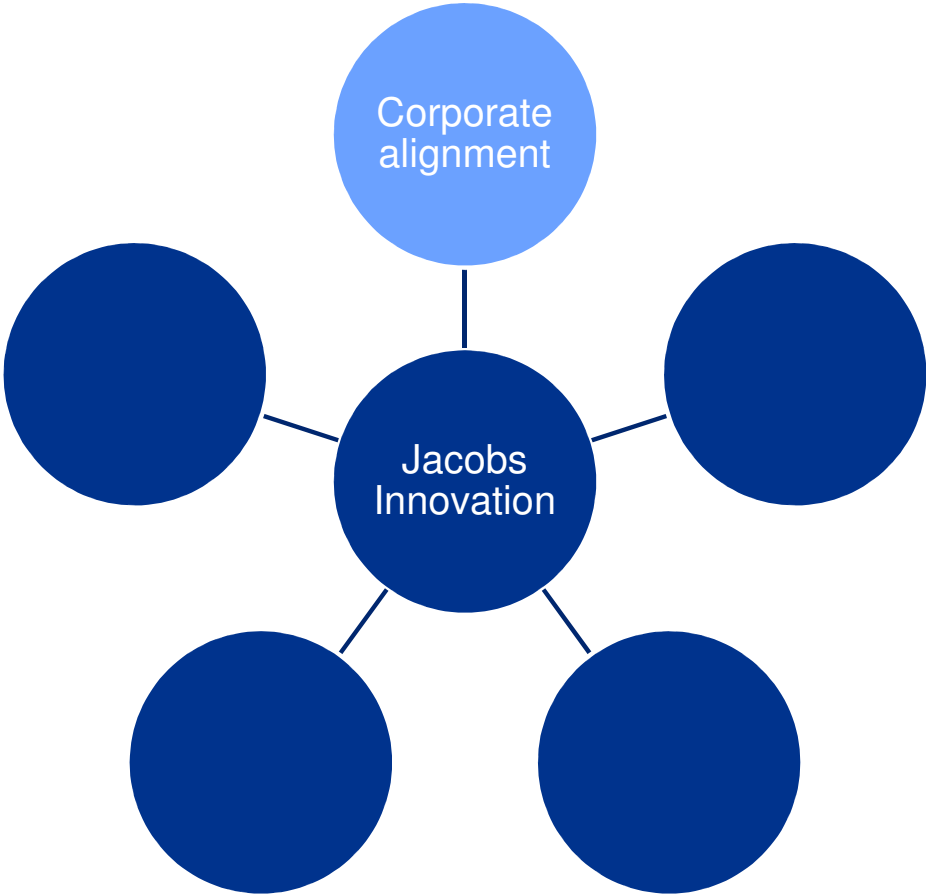
Jacobs – JSC Engineering, Technology, and Science Contract (JETS)

- JETS contract implemented May 1, 2013
 - 5-year contract; plus two, 2-year options
 - Follow on to the Engineering and Science Contract (2005 – 2013)
- Delivers products and services for the Engineering (EA) and Exploration Integration and Science Directorates (XA)
- Currently 820 employees (Jacobs and nine teammate companies)
- Space Act Agreement in place
- OSHA VPP Star Site

Jacobs Innovation approach

- Understanding customer (and customer's customer) needs today, tomorrow, and beyond
- Leveraging decades of in-house expertise while realizing that new approaches and technology will be necessary for the future of human space exploration
- Finding sources beyond the JSC and NASA walls to bring that innovation to the table
- Removing barriers to forward thinking ideas

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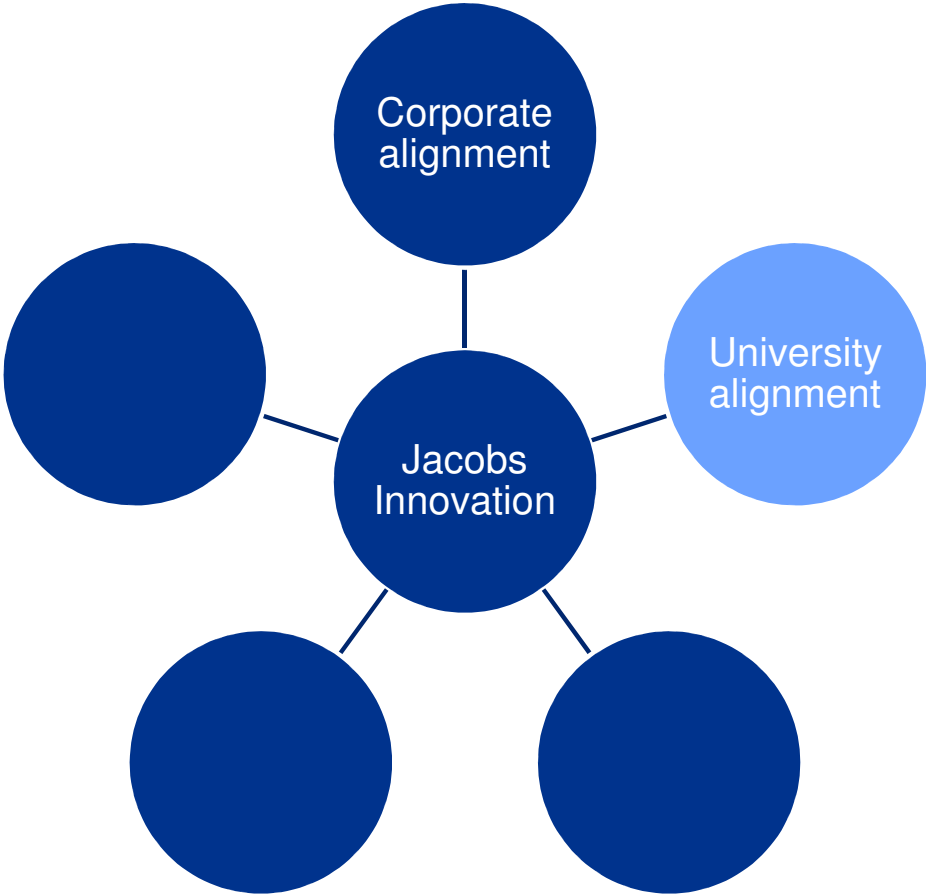
Corporate Alignment

- Jacobs partnered with established aerospace services companies on JETS to bring forward expertise as needed by our customers
 - Boeing
 - ATK (which became Orbital-ATK)
 - Oceaneering
 - United Technologies
- Ability to leverage Jacobs Engineering expertise and clients
- Established JETS teammate position on contract to facilitate reachback
- Allows NASA customer access to established technologies and expertise as evolving needs are realized and defined

Corporate Alignment

- Examples used on JETS
 - Orbital-ATK: Parachute Extraction/Separation Analysis Services
 - Oceaneering: Batteries, Robotics, Computational Fluid Dynamics, life support systems
 - Boeing: Satellite systems with respect to orbital debris
 - Jacobs: Test facility modification
- Ensure customer needs are mapped to teammate capabilities to identify and strategically close gaps via corporate partnerships
 - Developed and maintain a tool to clearly show where capability lies within JETS partnerships

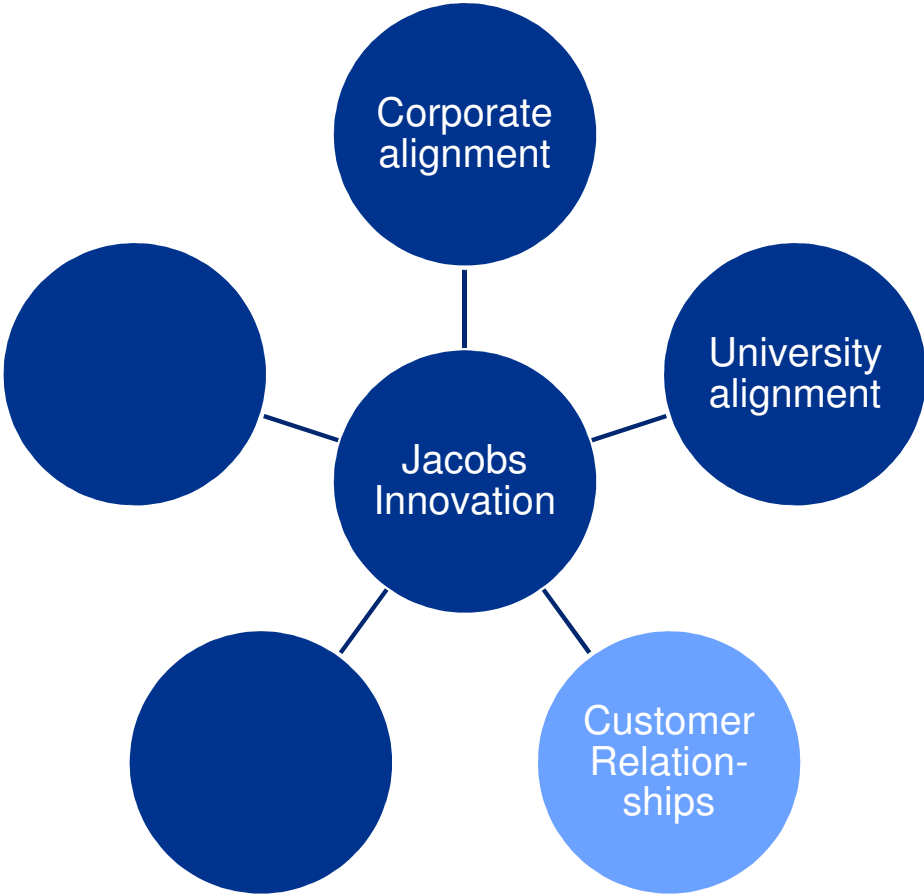
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University Alignment

- Established subcontracts with local and national universities to allow access to research technologies and partner on grant pursuits
- Examples used on JETS:
 - Texas State: Nanotechnology (including full time employee on JETS)
 - Texas State: Battery technology
 - University of Texas, Rio Grande Valley: Categorization of on-orbit photography
 - Arizona State: Geology and Space Exploration
- Allows universities access to NASA tasking
- Allows NASA access (via JETS) to university research technology
- Alignment for pursuit of non-NASA funding (frequently requiring corporate and academic partners)
- Enables NASA/Jacobs access to academic laboratories and facilities

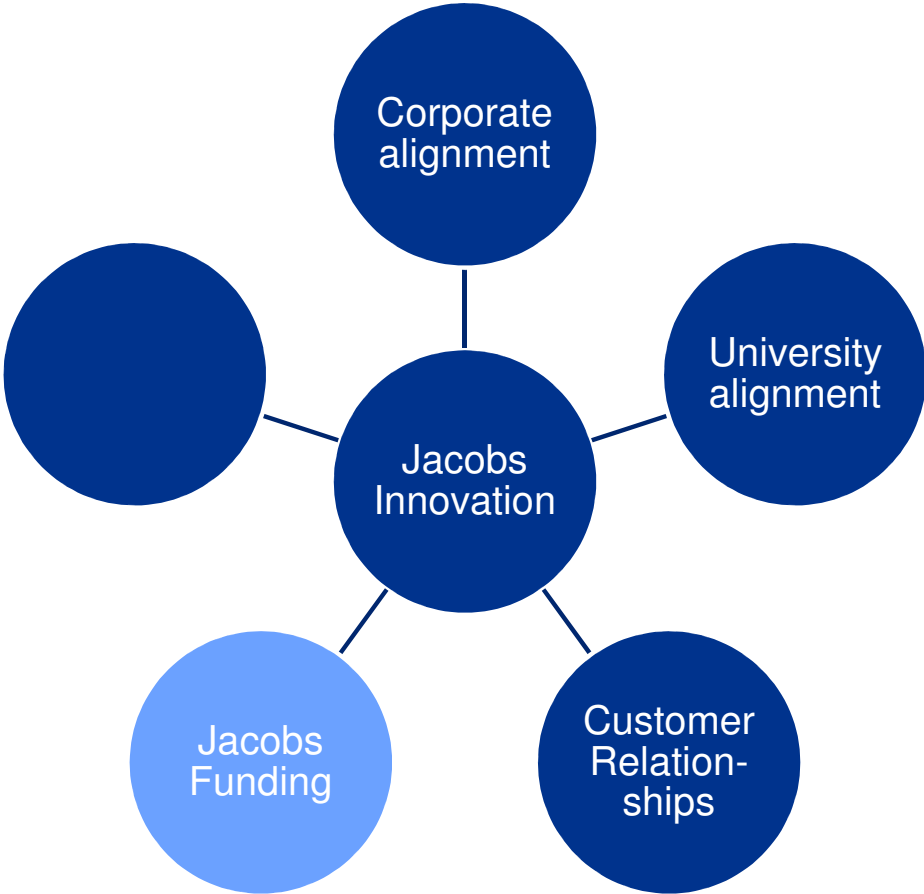
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Customer Relationships

- Jacobs strategic organizational alignment enabling one-to-one contact with NASA functional organizations
- Jacobs partnership approach ensures involvement in strategic planning at all levels
- Regularly updated familiarity with customer needs to enable Jacobs to proactively seek solutions
- Ensuring pursuit of external (including corporate) funding sources aligns with long term innovation and technology objectives of NASA customers
- Ability to act as liaison between non-aerospace technology sources (i.e. GE, Honda, Shell) and NASA to utilize facilities and resources

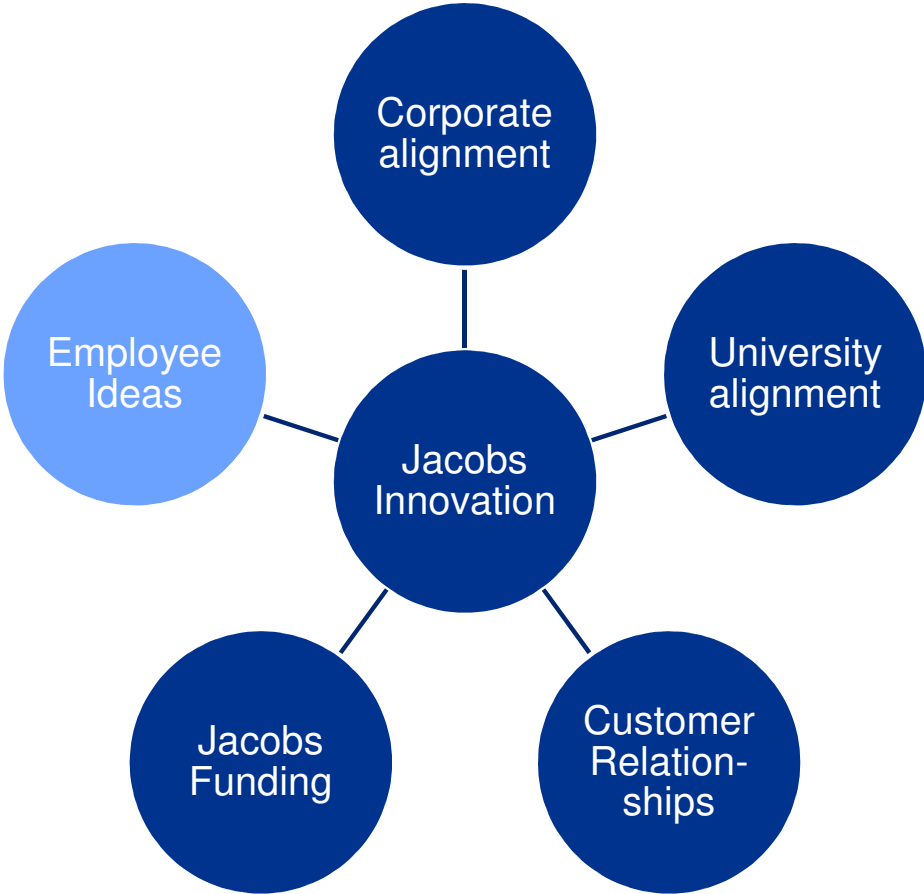
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Jacobs Funding

- Implementation of Engineering Development Facility
 - 3-D prototype printing capability
 - Engineering and design tools
 - Dedicated project space
 - Innovation collaboration center
- Strategically utilizing limited corporate funding to maximize innovation for NASA customer
 - Attendance and conferences and symposia
 - Provide proven proposal preparation, authorship, guidelines, and approaches
 - Advancement of Technology Readiness Level for unproven, but promising technology
 - Pursuit of NASA Innovation funding calls and projects
 - Technology Validation and Verification

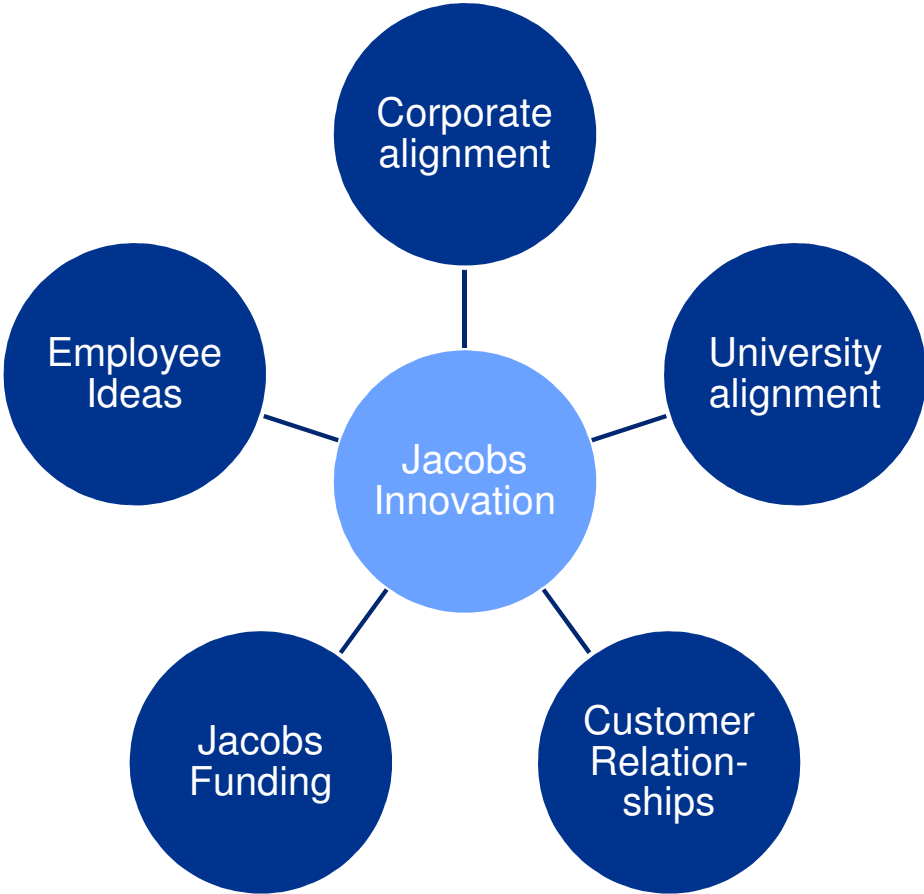
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Employee Ideas

- Incentivize employees to bring forward technology, process, or industry pursuit ideas
 - Provide employees funding for potential investigation
- Established lean, customized idea review process
 - Some may be “just do it”, others may involve Jacobs or NASA investment that must be evaluated by management for merit
- No boundaries on submissions
 - Technology
 - Process
 - Safety
 - Cost Savings / Lessons Learned

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January 29, 2016 – 17

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- A deliberate, strategic approach to maximize NASA access to technology in industry, academia, and the Jacobs workforce to further all technologies and improve processes and safety for the advancement of human space exploration

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