Space Life Sciences Directorate Innovation and Collaboration Success Stories

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During 2010, the Space Life Sciences Directorate (SLSD) at Johnson Space Center embarked on a series of pilot activities that would test the utility of open innovation service provider (OISP) with respect to their ability to acquire solutions to human health and performance challenges associated with space flight. SLSD engaged the services of two OISPs—InnoCentive and yet2.com—to test this novel approach to problem solving and its feasibility for solving NASA's space flight challenges. The OISPs were chosen based on multiple factors including: network size and knowledge area span; established process; methodology; experience base; and cost.

InnoCentive and yet2.com each met the desired criteria; however, each company's approach to open innovation services is distinctly different. InnoCentive focuses on posting individual challenges to an established Web-based network of approximately 225,000 solvers; viable solutions are sought and granted a financial award, if found. Based on a specific technological need, yet2.com acts as a "technology scout," providing a broad external network of experts as potential collaborators for NASA. A relationship can be established with these contacts to develop technologies and/or maintained as an established network of future collaborators.

The challenges posted with the InnoCentive pilot have yielded 11 awarded solutions out of the seven challenges posted. A total of two proposals were granted a full award and nine proposals were granted a partial award. The six technical needs posted for the yet2.com pilot have yielded a substantial number of leads (235), some of which were not previously known to NASA. A total of 24 leads continue to be of great interest as potential collaborators for solving SLSD technology needs. The OISP methodology allows NASA to publicly issue challenges to seek innovative solutions and build awareness and collaboration with a global public. OISPs also represent a cost-effective and efficient way to seek solutions to NASA's challenges.

In addition to the success of the external open innovation efforts, SLSD made great strides in 2011 with establishing an internal NASA crowdsourcing pilot program entitled NASA@work. NASA@work was supported by the InnoCentive@work software platform. The objective of the NASA@work pilot was to connect the collective knowledge of individuals from all areas within the NASA organization via an internal Web-based platform. The platform provided a venue for NASA challenge owners (those looking for solutions or new ideas) to pose challenges to internal solvers (those, within NASA, who have the skill and desire to create solutions). The pilot was launched in 57 days—a record for InnoCentive and NASA—and ran for 3 months, with a total of 20 challenges posted agency wide. The NASA@work pilot attracted more than 6,000 participants throughout NASA with a total of 183 contributing solvers for the 20 challenges posted. At the time of the pilot's closure, solvers provided viable solutions and ideas for 17 of the 20 posted challenges. The solver community provided feedback on the pilot, describing it as a barrier-breaking activity, conveying that there was a satisfaction associated with helping co-workers, that it was "fun" to think about problems outside normal work boundaries, and that it was nice to learn what challenges others were facing across the agency.

The results of the external open innovation pilot efforts have promoted public involvement and awareness of the U.S. space program, and created an environment where one person can make a substantial difference. Similarly, the results of NASA@work—the internal collaboration platform—have demonstrated the power of leveraging internal expertise and personnel across a large and distributed agency, such as NASA.

Challenges and Lessons Learned

External Crowdsourcing Platform (InnoCentive Pilot)

1. Clear solver agreements and communication regarding NASA contractor or related civil servant participation is required.
2. Additional evaluation process training and support was required for challenge owners.

3. Scheduling difficulty between the challenge owner and InnoCentive's client services to coordinate the initial scope of challenge. The timing and schedules for challenge owners and InnoCentive's client services proved difficult at times during tight deadlines and schedules.
4. Process standards for approval to notify solvers of NASA challenge awards. The NASA Pilot Program team established an effective review panel as a process gate for the challenge owners to receive final approval of their award and rejection decisions.
5. Similar challenges posted concurrently can compete for solvers. Additionally, disparate award amounts can cause lower solver submissions. It is important to de-conflict competition between challenges to ensure success.

External Consortium Platform (yet2.com Pilot)

1. Preparing for the open innovation activity is an important step that contributes to the success of the approach. It is important to identify search areas that can benefit the most from technically developed solutions:
   - "Solvability" of the technology need
   - Urgency of the technology need
   - Internal capacity to finalize the development of a solution
   - Potential for solutions outside the main area of technical needs
   - New technologies vs. optimizing technologies
2. Much of the success in technical need selection can be attributed to the training conducted at the NASA locations.
3. Project teams that own technical needs within NASA are key stakeholders in the process of searching, selecting, and implementing solutions to the technical needs. Based on the results from the pilot search, one recommendation is to invite technical evaluators of the solution to be part of the project team.
4. The implementation of external solutions identified under this pilot would require broad organizational support across NASA centers.
5. It is important to conduct intellectual property due diligence of all external solutions.

Internal Crowdsourcing Platform (NASA@work Pilot)

1. The NASA community was receptive to the NASA@work platform and found it to be a worthwhile tool. The platform included the capability to do the following key tasks:
   - Promote and encourage collaboration
   - Assist challenge owners in the development of problem statements into challenges
   - Allow the organization to openly collaborate and evolve solutions
   - Permit owners to recognize contributions from solvers in a variety of ways
   - Provide feedback to the solver community and share success stories
2. It was found that certain challenges were more successful in attracting solvers and potential solutions than others.
   - Technical challenges generated 25% of the discussion posts of the theoretical challenges
3. It was found that the solver solutions could be placed into three categories:
   - Random Solutions—the group of solutions provided by solvers without background in the challenge area who were posting low value solutions
   - Repeat Solutions—the old and tired solutions that have been seen and tried before, but this provided a spark conversation in the group
   - Revealing Solutions—collaborative sparks where the dialogue was valuable in advancing the challenge
4. The rewards and recognition program requires refinement. Approximately 75% of the challenge owners and center champions felt that the awards offered were not sufficient for the problems posted.
5. A new innovation model often requires employees to do things in a new way, and that can be uncomfortable and adjustments need to be made to fit the culture of the NASA community.