

IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
New Worlds - Non-Traditional Space Education and Outreach (7)

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OPEN INNOVATION FOR NASA ARCHITECTURE LIBRARY

Abstract

NASA's Center of Excellence for Collaborative Innovation (CoECI) uses open innovation, or "crowdsourcing", to access the global public to find ideas, concepts, designs, or solutions that meet a previously unmet need possibly resulting in significant advances in performance. The Center of Excellence for Collaborative Innovation was launched at the request of the White House Office of Science and Technology Policy. This is both a non-traditional method of innovation and a non-traditional method of outreach to the public to involve them in space technologies and programs. It has been used often for software development and new hardware technology. In this case we applied it to innovate with systems engineering tools for creating space architectures. The challenge was sponsored by NASA Engineering and Safety Center Systems Engineering Technical Fellow as part of a program for NASA's adoption of MBSE. It was a trial to see if there would be as much participation or quality submissions with this more specialized topic and skill. The challenge sought space architecture representations and decompositions to create a library of modeled parts in a system modeling language (SysML). Mission architects mostly start from scratch to build model elements representing the functional and physical architecture of a system in SysML. There are a few beginning libraries, but these are also local to a program or group. A common library will save system engineers a large amount of time, will allow project stakeholders to recognize common graphics and quickly understand the architecture options. The challenge was promoted internationally, especially through professional organizations and universities with a systems engineering focus. It was open for 4 months, purposefully over the winter holiday break time to allow participants extra time outside of work or school. The challenge was designed so that expertise in space hardware was not necessary but getting to play with models of space architecture could provide motivation to participate. We did not receive as many entries as other broader outreach challenges, but the ones we received were extremely thorough and high quality. Solutions came from individuals and teams, students and professional consultants from the United States and Europe. We learned a few lessons about how to engage with the public and what characteristics of a problem result in good crowdsourcing results. The outreach challenge produced several useful ideas and modeled space elements, and the group will be engaging the winners to learn more about their new approaches.