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ENABLING THE CAPTURE AND SHARING OF NASA TECHNICAL EXPERTISE THROUGH  
COMMUNITIES OF PRACTICE

**Abstract**

Historically, engineers at the National Aeronautics and Space Administration (NASA) had few opportunities or incentives to share their technical expertise across the Agency. Its center- and project-focused culture often meant that knowledge never left organizational and geographic boundaries. With increasingly complex missions, the closeout of the Shuttle Program, and a new generation entering the workforce, developing a knowledge sharing culture became critical. To address this need, the Office of the Chief Engineer established communities of practice on the NASA Engineering Network. These communities were strategically aligned with NASA's core competencies in such disciplines as avionics, flight mechanics, life support, propulsion, structures, loads and dynamics, human factors, and guidance, navigation, and control.

Since the NASA Engineering Network was implemented in 2006, 22 community sites have gone live. At first they were focused on collecting information such as specifications, contact lists, and training opportunities. This alone was a breakthrough for the Agency; to be able to find key resources in one location was a major step forward. As more people began to use the communities, they evolved into more interactive sites. Engineers suggested content, found peers to help with pressing problems, and benefited from knowledge sharing presentations.

Communities of practice also became a vehicle for engineers tackling new and cutting edge concepts to gather and share insights, enabling innovation in ways that might have been impossible without them. Two areas where this occurred were in the fields of fault management and autonomous rendezvous and docking.

This paper describes the process used to identify and develop communities, from establishing simple websites that compiled discipline-specific resources to fostering a knowledge sharing environment through collaborative and interactive technologies. It includes qualitative evidence of improved availability and transfer of knowledge. It focuses on pivotal capabilities that increased knowledge exchange such as a custom-made Ask An Expert system, community contact lists, publication of key resources, and submission forms that allowed any user to propose content for the sites. It discusses the peer relationships that developed through the communities and the leadership and infrastructure that made them possible.

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