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A FRAMEWORK FOR COLLABORATIVE DISTRIBUTED DESIGN IN THE SPACE INDUSTRY-  
LEVERAGING THE SMITHVENT EXPERIENCE

**Abstract**

As rapid technological changes continue during the digital era, a change in how businesses and organizations operate is apparent. At the beginning of the 21st Century, virtual teams were used to facilitate collaboration with global or regional experts who did not have the bandwidth to travel. Today, virtual teamwork has evolved to the point where virtual collaboration is the norm for many companies. These new collaboration technologies are reshaping economies and societies, and have only been amplified by the COVID-19 pandemic. Yet, students and professionals alike still experienced difficulties in adapting to this new environment, with colleagues and coworkers spread across the world. Therefore, identification of best practices to leverage in this new working environment is critical, especially given how rapidly the industry is developing and moving. One such framework of best practices was developed by the SmithVent team, a 30-person distributed team of Smith College alumni, faculty, staff, and friends who designed and fabricated a simplified and cost-effective ventilator over a three-month period, winning the CoVent-19 Challenge in July 2020. This paper introduces examples of recent space-based projects and discusses how various elements from the five main categories (motivation, culture, structure, process, and resources) of the SmithVent framework were applied successfully. Learnings from these space-based examples can provide students and professionals efficient methods for collaborating in a virtual environment across a wide range of technical projects.