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Knowledge management in the digital transformation (2)

Author: Mr. Sawyer Rempel

University of Manitoba, Canada, sawyer.rempel@umsats.ca

Mr. Jaime Campos

University of Manitoba, Canada, camposj1@myumanitoba.ca

Dr. Philip Ferguson

University of Manitoba, Canada, Philip.Ferguson@umanitoba.ca

Mr. Luke Thiessen

University of Manitoba, Canada, luke.thiessen@umsats.ca

UNIVERSITY OF MANITOBA CUBESAT DESIGN PROJECT CASE STUDY: KNOWLEDGE  
RETENTION AND NEW MEMBER TRAINING TECHNIQUES FOR PROJECTS WITH HIGH TEAM  
MEMBER TURNOVER**Abstract**

Student design teams typically face challenges related to retaining design knowledge due to high member turnover. As a result this highlights the importance of new member onboarding and training to ensure consistent productivity. In addition the COVID-19 pandemic has resulted in unprecedented challenges with collaboration in a remote environment. Fortunately through the utilization of reporting tools and management methods teams would be able to record and distribute knowledge effectively.

Two teams have experimented with offsite project management tools to improve team communication and documentation. The University of Manitoba has a longstanding history of nanosatellite design, with two CubeSat programs currently in development. The university's space applications and technologies society (UMSATS) is a nanosatellite design team that designs and builds 3U CubeSats to compete in the Canadian Satellite Design Challenge (CSDC). The CSDC is an engineering design competition that runs on a two-year design cycle and tasks undergraduate and graduate students with developing satellite architectures to fulfill a target mission. In the current competition, students are required to include an earth observation payload that will be used as an education outreach tool. UMSATS has been part of every CSDC spanning the past decade, culminating in the current CubeSat iteration, TSAT-5. Additionally, the university's space technology and advanced research (STAR) lab is a newer pursuit, participating in the Canadian space agency's Canadian CubeSat project (CSA CCP). Their goal is to provide hands on training to post-secondary students with guidance from experts in industry. The STARLab is developing the Iris, a CubeSat that will expose at minimum 10 geological samples to observe the effects of space weathering. That results will be used to support researchers in analyzing data from the OSIRIS-REx mission.

To overcome these hurdles required the teams to undergo substantial programmatic shifts, as well as introduce new project management mechanisms focused toward optimizing the member onboarding and offboarding procedures. Both teams adopted agile kanban boards supplemented by messaging and remote meeting platforms to fulfill the presided need as well as adapt to the new format of remote working imposed by the pandemic. Additionally new member training has undergone design iterations to find methods that the team responds to successfully. This paper outlines the specific challenges encountered throughout the teams' development process and reflects on the key lessons learned.