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ASSIMILATING THE REQUIREMENT SPECIFICATION FOR MARS MANNED MISSION: A NOVEL
APPROACH

Abstract

Aligned with the UAE Space Strategy 2117, which aims to establish the first inhabitable human on the Martian Surface by 2117, and with the current enthuse toward space tourism, we propose a novel Framework to assimilate the process of requirement specification for a Manned Mission to Mars surface. Deep Space Manned Missions are unique and characterized with a set of specific requirements that should be elicited from different sources and stakeholders to ensure the missions' success. In addition, these missions are highly dependent on the software components in the command and data handling system (CDHS) is used to control the spacecraft and interact with the astronauts. Our contribution consists of: (i) surveying current trends in space system requirement engineering from requirement illustration to requirement specification; and (ii) proposing a new set of requirements for control and data handling systems in space missions that are related to astronauts, particularly emotional requirements for deep space manned missions, which to the best of our knowledge have not been considered before. Moreover, our contribution introduces a modular requirement model to ensure the modularity and reusability of these requirements in several manned space missions. We do believe that this contribution will strengthen the position of UAE as one of the top countries in the world that invest in space sciences.