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Contribution of Space Activities to Solving Global Societal Issues (2)

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THE SPACE TECHNOLOGY SCOREBOARD - A NEW METHODOLOGY FOR COMPARING NATIONAL SPACE TECHNOLOGY LEVELS

Abstract

While the number of countries participating in space activities has dramatically increased in recent years, currently there is no single framework to systematically assess and compare the space-related technological capabilities of nations. This paper introduces the Space Technology Scoreboard, a set of a comparative matrix and diagram, which visually presents national space technology capability in an internationally comparable manner. A framework called the Space Technology Matrix has been devised to describe and analyze different areas and varying levels of space technology demonstrated by each spacefaring nation. An initial version suggested in this paper categorizes space technology into ten different areas, such as earth observation, satellite communications, and space launch, and defines three major milestones and six levels of technology for each of the areas. The milestones and levels are unique for each technology area, but are consistent across compared countries. Thus they provide the basis for differentiating capability levels. Any given nation's space technology capability could be broadly assessed using this Matrix. The result of the assessment is then mapped on a specially devised chart called The National Space Technology Scoreboard, a circular chart similar to a dart board, whose subsections correspond to particular area and level of space technology defined by the Space Technology Matrix. The Scoreboard provides a visual mapping of the same amount of information contained in the Matrix in a single, simple diagram of a nation's space technology capability. In order to test this framework, scoreboard charts were produced for a number of spacefaring nations with varying degree of space technology capabilities, including South Korea, the United States, and Mexico. Although it has some limitations, the initial demonstration indicates that the framework is intuitive to understand and could be effectively used for comparative analysis of space technology for all spacefaring nations. In particular, it could be used as a tool of communication for those with relatively low expertise in space technology, such as politicians and the public, as it does not require detailed prior knowledge about space technology or space programs of each nation. The framework described in this paper also provides a method to establish the baseline of current national technology levels, as input to a road mapping activity.