

Improving Search Tools for Mars Missions

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When planning actions for spacecraft on Mars, the list of tasks can be extensive and complex. As a result, Mars Exploration Rover (MER), Phoenix, and Mars Science Laboratory (MSL) rely on Ensemble to carefully and precisely arrange all of their spacecraft instructions, which we call activities, into a plan. Every new sol, mission operations prepare and deliver a new plan to the spacecraft. Because the plans are often complicated, it is essential that scientists using Ensemble have an efficient tool to search through the plans that they are creating. The initial search tool required that the user enter an XPath, a language for addressing parts of a structured document, to find the desired activities. XPath has the potential to be very powerful because of its speed and ability to find very specific items; however, its syntax can be intricate and confusing. The new search tool creates an abstraction between the users and the correct XPath. In addition, the search results are displayed in a tree format that adds context to the location of each activity found. By combining a clean, simple user interface with XPath functionality, the new search tool will aid scientists and engineers in creating, maintaining, and revising the plans for spacecraft on many different missions.