

# Human-Centered Intelligent Flight Surgeon Console

Jiajie Zhang, University of Texas at Houston  
 Jane Malin, Johnson Space Center  
 Kathy Johnson-Throop, Johnson Space Center

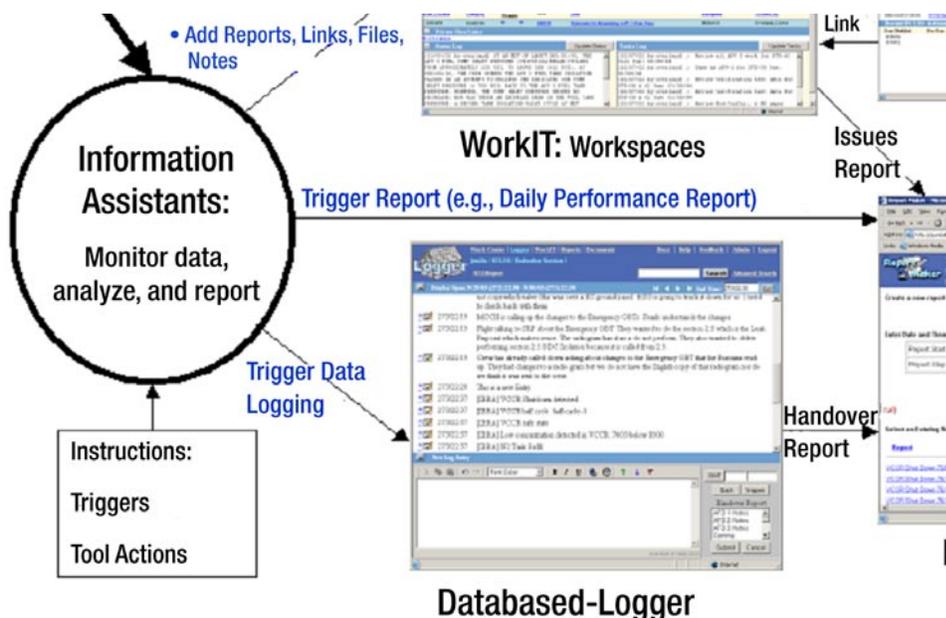
Jack W. Smith, University of Texas Health  
 Science Center at Houston &  
 Johnson Space Center

This project is to develop a flight surgeon console called Space Medical Agents Resource Technology (SMART) for Space Station medical operations. SMART will be intelligent decision support system for the acquisition, processing, and presentation of information. SMART is designed as a human-centered system that takes full consideration of the characteristics, capacities, and limitations of people and the unique requirements and task environment of space missions. SMART will provide task-specific, event-related, and context-sensitive data, procedures, functions, and tools to help users (1) get quick, accurate, and secure access pertinent crew health-related data and information at the point of care throughout an expedition, (2) process information quickly and accurately with minimum human

cognitive effort, and (3) make decisions correctly and rapidly to provide high-quality health and medical care to the crew. This type of capability will address the current problem of task-relevant access to large amounts of data from diverse sources in a variety of formats.

The Team Work Center is a suite of Web-based information management tools, and is a component of the next-generation flight surgeon console. It includes the information management tools Portal, WorkIT, E-Logger, and Report Maker, which are designed for use by both flight controllers (or crew) and software agents. Portal provides a high-level view of group activity by providing links to most recently changed data in the tools. The Electronic Console Logger is used to create a

database of log entries, to support search and review of large log files, to automate logging, and to generate handover reports and custom logs. WorkIT is a Web-based workspace manager where team members can author, contribute, and share items related to an issue, an anomaly, or a work topic in one accessible workspace, with capability to handle files, links, actions, and status and task logs. This is a natural source of information on the status of ongoing issues, and can be manipulated by an agent to produce automatic and on-demand reports. Report Maker is used to create report



formats for collecting information from multiple databases and embedding them in editable reports. The Team Work Center prototypes are being used and evaluated by NASA Extreme Environment Mission Operations group and in Space Station medical operations.

Human-Centered Distributed Information Design is a methodology developed to provide systematic principles, guidelines, and procedures for designing iterative and spiral product lifecycles for efficient human-centered computing systems. It was used to guide the data collection and analysis and subsequent design and evaluation of a prototype of a next-generation flight surgeon console.

