NEXTGEN ONE PORTAL USABILITY EVALUATION

[1]E. V. Cross II, [2]J. S. Perera, [2]A.M. Hanson, [3]K. English, [4]L. Vu, [5]W. Amonette,
[1] Leidos, Houston, TX, [2]NASA Johnson Space Center, Houston, TX, [3]JES Tech, Houston, TX, [4]Geologics, Houston, TX [5]University of Houston Clear Lake, Houston, TX.

Abstract

Each exercise device on the International Space Station (ISS) has a unique, customized software system interface with unique layouts / hierarchy, and operational principles that require significant crew training. Furthermore, the software programs are not adaptable and provide no real-time feedback or motivation to enhance the exercise experience and/or prevent injuries. Additionally, the graphical user interfaces (GUI) of these systems present information through multiple layers resulting in difficulty navigating to the desired screens and functions. These limitations of current exercise device GUIs lead to increased crew time spent on initiating, loading, performing exercises, logging data and exiting the system. To address these limitations a Next Generation One Portal (NextGen One Portal) Crew Countermeasure System (CMS) was developed, which utilizes the latest industry guidelines in GUI designs to provide an intuitive ease of use approach (i.e., 80% of the functionality gained within 5-10 minutes of initial use without/limited formal training required). This is accomplished by providing a consistent interface using common software to reduce crew training, increase efficiency & user satisfaction while also reducing development & maintenance costs.

Results from the usability evaluations showed the NextGen One Portal UI having greater efficiency, learnability, memorability, usability and overall user experience than the current Advanced Resistive Exercise Device (ARED) UI used by astronauts on ISS. Specifically, the design of the One-Portal UI as an app interface similar to those found on the Apple and Google's App Store, assisted many of the participants in grasping the concepts of the interface with minimum training. Although the NextGen One-Portal UI was shown to be an overall better interface, observations by the test facilitators noted specific exercise tasks appeared to have a significant impact on the NextGen One-Portal UI efficiency. Future updates to the NextGen One Portal UI will address these inefficiencies.