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THE LUNAR OPEN ARCHITECTURE – A ROADMAP FOR A NEW ERA OF LUNAR EXPLORATION

Abstract

More groups across both public and private sectors are participating in and planning lunar missions than ever before. As the diversity of the space industry rapidly increases, collaboration in further lunar exploration and information sharing becomes all the more important if humans are to have a sustained and cooperative presence on the lunar surface. Collaboration and information sharing have been limited by the dominant utilized mechanisms, static roadmaps developed by singular organizations or committees. The wealth of rich information contained in these roadmaps suffers problems of limited accessibility by virtue of existing in large text documents that are difficult to navigate without extensive, dedicated study. These roadmaps are also fragile across even short timeframes, as their foundations and structures are determined at the time of creation and cannot accept addition of emergent ideas or developments. Additionally, these roadmaps are fundamentally limited in the low complexity of dependencies that can be presented/hierarchical information architecture.

We look to other examples of global, distributed innovation and collaboration, incorporating opportunities and lessons learned in the creation of a novel roadmapping tool: The Lunar Open Architecture. To address the limitations inherent in static roadmaps, we are creating a dynamic, web-based roadmap portraying potential paths to exploration and development on the lunar surface with a modular information hierarchy, capable of reflecting numerous dependencies, varied pathways and dynamic developments. This paper discusses the technology considerations for such a tool, including the mediation of participation through technology, new modalities of sharing and privacy enabled by digital formats, ongoing maintenance, and growth of the roadmap. We present our findings on data structures which enable users and moderators to adjust the meta-architecture over time as our collective understanding evolves, with a lower cost-of-change than existing paradigms. In addition, we present our findings on user interface design patterns that are adaptive to a user's role and technical ability, are effective in identifying the highest points of leverage within the context of decision making, and actively encourage group curation of this data commons.