BUILDING THE FOUNDATIONS FOR A LARGE SCALE, CROSS-SECTOR COLLABORATION FOR A PERMANENT AND SUSTAINABLE RETURN TO THE MOON SURFACE. Angeliki Kapoglou[1], [1] Moon Village Association.

Introduction: An increasing number of credible, governmental and private sector efforts are currently underway to bring a sustained human presence to the Moon. However, particularly in the private sector, these organizations are not well coordinated or actively collaborating to the detriment of all. The challenge for the lunar exploration community? How can we collectively prepare for novel, cost-efficient and agile programs for lunar settlement and allow for space agencies, commercial space, philanthropists and citizens to create an integrated, mutually reinforcing strategy? To explore together we also need to design new ways of working together.

This challenge arises from the broad mix of expertise common on cross-industry teams. Enabling a permanent and sustainable return to the Moon will require building trust and collaboration between leaders in the private and public sectors unused to working together. Participants will often live in different intellectual worlds and have distinct technical languages. Thus when cross-industry teams come together, they might suffer from culture clash. However, to make real progress we have to harness the best thinking and judgment of our best innovators, experts and decision makers out there— especially when they don't agree. In practice, this means creating value for the overall system but also actively surfacing and resolving tension within the system. Our stakeholders' many differences— of role, of mindset, of culture, and more— can be rich sources of insight. But these differences have to interact with one another in the right ways to create value. Orchestrating this kind of collective effort is possible but it requires a new scale of leadership: System Leadership. Too often collaboration is thought to be driven by alignment to formal project plans, investment memos, and impact metrics. What's also needed is the informal sense of shared values, common language, and trust in others' intentions to tackle the issues and problems that emerge "off-plan". Therefore, we advocate that there are two major and parallel design challenges for the lunar exploration community:

1. **The Design of the technical artifacts:** the infrastructure needed for a permanent and sustainable human return on the Moon and its key technical and scientific elements.

2. **The Design of the intervention that brings the vision to life:** the international partnership; the introduction and integration into the status quo and the acceptance by the stakeholders.

To date, much of the dialogue in the space sector has focused on engineering and science and less on the intervention that is needed to ensure an effective, large scale and cross industry collaboration on the Moon surface. However, one of the biggest differentiators between success and failure in implementing large scale system innovations is whether the emotional dynamics of what it takes for people to trust each other are factored into the strategy. In order to design effective interventions, we must pay attention not just to formal procedures, but also to culture. During this transition phase, we need to properly account for the fact that we are asking the people in the system to change—people with pride in what they do, knowledge of subtle details about how things work, and personal relationships with colleagues who help them solve problems.

A permanent and sustainable human presence to the Moon is ambitious, but we believe it is achievable in the coming decade if all the key actors in the ecosystem collaborate effectively. Therefore, this presentation will describe five key practices that we perceive as the most critical in building the foundations needed for large scale system design and cross-industry collaboration.