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ECONOMIC CHALLENGES IN NEW SPACE EXPLORATION: A PERSPECTIVE ON MACHINE
ECONOMY AND DISTRIBUTED LEDGER TECHNOLOGIES**Abstract**

The transition from traditional to New Space marks a monumental shift, igniting unparalleled economic dynamism and spurring a wave of entrepreneurial ventures and technological breakthroughs. However, this transition also presents daunting economic hurdles, particularly in devising innovative business models to accommodate the unique production, distribution, and utilization of resources in extraterrestrial realms. This scholarly investigation delves deeply into these challenges from an economic-commercial perspective, drawing upon the conceptual frameworks of machine economy and Distributed Ledger technologies to navigate this multifaceted terrain.

The metamorphosis from antiquated space exploration methodologies to the modern ethos of New Space goes beyond mere scientific inquiry or geopolitical intrigue; it embodies a renaissance propelled by private enterprises enticed by the lucrative economic opportunities of outer space. This metamorphosis has cultivated a fertile landscape teeming with emerging startups and technology firms that, in their pursuit of pioneering advancements, have expanded the frontiers of conventional space endeavors. Nevertheless, the economic environment confronting these ventures is distinct, demanding the conception and implementation of groundbreaking business models tailored to the challenges of space exploration in the New Space era.

Amidst this crucible of economic innovation and experimentation, traditional economic doctrines, though venerable, prove insufficient in tackling the intricate tapestry of space economics, especially in reconciling efficiency with equitable resource allocation. Moreover, the looming specter of transactional costs looms large, necessitating concerted research endeavors aimed at devising transactional frameworks suited to the rigors of extraterrestrial habitats. Despite the tantalizing potential of Distributed Ledger Technologies (DLTs) in enhancing economic efficiencies in the cosmic domain, the uncharted territory of technical challenges remains a formidable frontier.

In contemplating the design of prospective business paradigms conducive to the burgeoning machine economies of space, insights drawn from the collaborative ethos and digital platforms characteristic of the sharing economy offer compelling parallels. These insights call for a recalibration of traditional economic paradigms to accommodate the demands of space, charting a trajectory towards the realization of sustainable and resilient economic frameworks.

In summary, the journey of space exploration in the New Space era necessitates a departure from conventional economic norms, ushering in an era of innovation and adaptation. Through the integration of machine economy and Distributed Ledger technologies, stakeholders are poised to surmount the economic challenges of space exploration and lay the groundwork for a prosperous and equitable future beyond the confines of Earth's orbit.

Keywords: New Space, Economic Challenges, Machine Economy, Distributed Ledger Technologie