Space Race 2.0 – Who will win the race for the future of industry?

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Space Race 2.0: Driving technology and economy forward – Implications for various industries and opportunities for Germany.

Overview

- Private enterprises are spearheading innovations, and Germany has the opportunity to strategically position itself within the global space market.
- Artificial intelligence, robotics, software-defined systems, and sustainable space utilization will significantly influence economic and technological developments.
- Companies must integrate these technologies into their strategies to avoid falling behind.

Europe faces an increasing risk of becoming dependent on American companies in the burgeoning space market. Today, firms such as SpaceX and Starlink dominate the landscape with thousands of satellites and hundreds of rocket launches. But why is this significant?

A retrospective glance reveals that the USSR initially achieved considerable success in space exploration; however, the United States clinched the first space race with the moon landing. Despite subsequent international collaborations, such as on the International Space Station (ISS), public interest decreased, and budgets for space programs shrank.

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satellites are in orbit. Among them, 7,229 belong to Starlink or Starshield. (As of 02/25)

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rocket launches have been carried out worldwide since 2021 – with 346 of them coming from SpaceX alone.

Today, we are witnessing Space Race 2.0 – this time powered by private companies revolutionizing access to space. It is no longer merely about prestige projects; it is about economic and technological supremacy: from satellite constellations to new space stations and space tourism. The race is still open, but its outcome will be pivotal – for innovation, sovereignty, and the future of the global industry.

Moon Landing 2.0 – Germany's window of opportunity is closing rapidly

The first space race was decided with the moon landing: The USSR was the long-term-lead, but the USA secured victory with the first human on the moon. Today, we find ourselves in Space Race 2.0 — and this time, the outcome remains uncertain. Germany has a unique opportunity to strategically position itself in the global space sector.

The Federal Republic stands at a crucial position: With a robust aerospace industry, excellent research institutions, and the construction of its own spaceport, it possesses the potential to assume a leading role in the space market.

- Economic strength: Germany is the second-largest spacefaring nation in Europe. Companies such as Airbus Defence and Space, OHB, Rocket Factory Augsburg, Isar Aerospace, and HyImpulse are driving innovations forward.
- Skilled workforce and research: Of the 53,000 space experts in Europe, 10,200 are employed in Germany (as of 2021). Universities in Munich, Aachen, and Karlsruhe rank among the top 15 in aerospace engineering.
- Launch capacities: The construction of a German spaceport in the North Sea, along with access to European launch sites, opens new avenues for independent missions.
- Technological relevance: Space technologies are essential for numerous applications on Earth – from TV signals and GPS to satellite internet, imaging, and remote sensing.

Moreover, new research fields such as manufacturing in microgravity, high-precision optical fibers, and in-situ resource utilization present entirely new economic potentials.

The five key factors that will determine Space Race 2.0

Space technologies are no longer niche innovations; they influence numerous industries and everyday applications. However, the separation between the space and non-space industries has so far hindered the full realization of their potential. Space Race 2.0 will be determined by technological convergence and a cooperative ecosystem. To strengthen Germany's position and avoid falling behind, five central key factors for transformation are crucial:

Products, services, and industry become software-defined

The increasing software definition of products, services, and industry is also transforming the space sector. Software-defined architectures enhance interoperability, user-friendliness, and efficiency. Concurrently, technologies such as digital twins, synthetic data, and the metaverse enable scalable solutions that range from devices to the cloud. Companies like AWS are driving innovations with Ground Control as a Service, while satellite-based intelligence facilitates new applications in areas such as infrastructure, security, and energy supply.

Other industries are also facing a paradigm shift. Software-defined processes are transforming sectors such as automotive (Software-Defined Vehicles), defense (Software-Defined Defense), and manufacturing (Software-Defined Manufacturing). Companies must adapt their strategies to remain competitive in the long term.

New market opportunities and partnerships present significant potential: start-ups and companies from unrelated sectors are entering the market, putting pressure on established players. Hyperconvergence, which integrates IT, storage, and networks into a single architecture, further enhances production efficiency and enables companies to respond more swiftly to new demands.

AI fundamentally changes life as we have known it

Artificial Intelligence (AI) serves as the backbone of space exploration and automation. It enables autonomous spacecraft, robotics, and mission-critical processes, thereby minimizing the need for human intervention. Future missions will increasingly rely on AI-driven decision-making to enhance efficiency and precision.

At the same time, AI in space necessitates stringent ethical and regulatory oversight. Organizations such as the DLR (German Aerospace Center) and ESA (European Space Agency) are defining standards, while European stakeholders must comply with the EU AI Act (2024). Transparency and explainability are essential for building trust—particularly through rigorous training, safety-oriented AI coding, and human override capabilities.

Other industries also benefit from AI as a central driver of efficiency and automation. Companies that invest in AI expertise and governance secure competitive advantages and mitigate risks. Responsible regulation and societal acceptance are crucial for fostering innovation and economic stability. AI will not only optimize production processes but also advance sustainability and revolutionize human-machine interaction.

We are rapidly approaching the singularity of human and machine

AI and physical augmentation are transforming space travel. Machine-assisted intelligence enhances the effectiveness of astronauts, exemplified by CIMON, an assistance system aboard the ISS. AI-powered exoskeletons and robotic limbs improve mobility and strength, aiding in microgravity and facilitating the control of complex systems. At the same time, autonomous AI systems present challenges, as communication delays – approximately 13 to 24 minutes to Mars – complicate rapid human interventions.

In other industries, AI is also reshaping the workplace. Hybrid roles demand interdisciplinary skills and the application of automation. Exoskeletons enhance efficiency and safety in industry by alleviating heavy physical labor. The balance between AI and human autonomy remains crucial.

Ethical standards and governance models ensure responsible usage, as demonstrated by Waymo, whose autonomous systems adhere to stringent safety regulations.

Autonomous and humanoid robots become household technology

Autonomous robots are essential for space exploration, as they undertake installation, maintenance, and exploration in extreme environments. In the long term, they are expected to operate autonomously on the Moon and Mars, supporting settlements. Alongside functional robots, humanoid companions are gaining significance: NASA's Robonaut 2 (R2) was deployed on the ISS in 2011 to reduce workload and alleviate social isolation. The space industry recognizes robots as indispensable partners in technological advancement.

Other industries are also benefiting: Humanoid robots are being integrated into value chains, and companies – including major German DAX corporations – are advancing their deployment. However, this transformation requires deliberate change management, as many sectors still have limited experience with robotics. It is crucial to foster acceptance and clearly communicate opportunities to ensure a successful transition.

If we do not utilize space sustainably, we risk humanity's survival

Earth observation is driving the New Space sector forward by providing precise data solutions for economy and sustainability. At the same time, space exploration is evolving towards multi-use operations to utilize high costs and limited payload capacity more efficiently. SpaceX has revolutionized the industry with reusable rockets, increasing pressure on competitors.

Sustainability in space is becoming increasingly important. Space debris in low Earth orbit (LEO) poses a threat to satellites and research, prompting efforts to integrate sustainability goals into the UN agenda (UNOOSA).

The industry can learn from this: Earth observation data aids in monitoring natural disasters, managing emissions, and optimizing transportation.

Furthermore, space exploration demonstrates that economic pressure accelerates innovation – sustainability enhances profitability through better resource utilization and new revenue streams.

Successful companies focus on collaboration, technological innovation, and new market standards. Leadership emerges when organizations address existing industry challenges and redefine the market through bold changes.

Space as an opportunity: Act now to shape the future

The technological transformation in space has far-reaching implications for numerous industries. Companies that prepare early and integrate advancements in space technology into their business strategies will shape the future. Now is the right time to act, while the window of opportunity remains open. A tailored strategy that creates genuine value is crucial for long-term success.

Organizations should assess their readiness concerning the five central drivers and develop targeted strategies to adapt to the changes. The impacts of these drivers are profound – no company can afford to ignore them. Those who do not respond risk being displaced from the market. In this context, the human element remains the most critical success factor. A successful transformation requires that employees are actively involved in and supported throughout the change process.

What EY can do for you

EY offers a value-based end-to-end approach to support companies in their transformation. This includes market and competitive analyses, strategic ecosystems, new business models, development, prototyping, change management, research and development, technology roadmaps, as well as regulatory and ethical consulting. Through a holistic transformation of IT infrastructure, EY assists organizations in successfully seizing the opportunities of the space age.

Conclusion

Space Race 2.0 is fundamentally transforming the economic and technological landscape. Germany and its companies have the opportunity to assume a leading role in the space economy – but the window of opportunity is closing rapidly.

Five central drivers, including AI and sustainable space utilization, will shape the future. Companies that adapt early and integrate innovative technologies into their business strategies will secure crucial competitive advantages.

Those who ignore the transformation risk falling behind. At this very moment, it is time to take action, seize new market opportunities, and set the course for a future-ready economy.

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