We are going to Mars! No need to rush.

The moment in human history when a boot of an astronaut softly touches surface of the Mars will be a phenomenal success of our space endeavors. 10- or 20-years horizon for Mars missions seems closer to reality than ever. By end of September 2016, Elon Musk from SpaceX unveiled company's daring plan to colonize Mars in coming decades with first manned mission around year 2024. Two weeks later, President Obama's op-ed argued for need to pursue the goal of successfully landing on Mars with something bigger, something more courageous than rovers in near future. Space community has been in recent years discussing that Moon or Mars may become the next targets of space policies. Possibly even in cooperative manner. These recent steps as if confirm such ideas. We are going to Mars! But.... there are several more buts that one should pay attention to.

Elon Musk is a unique personality in global space sector. Lots of stimuli brought up by activities of SpaceX in recent years advanced and promoted technological and economic development in U.S. space sector. Elon Musk's speech at the International Astronautical Congress in Guadalajara, Mexico in September 2016, where he outlined Mars Vision of SpaceX to an audience of several thousand people, offered some answers but at the same time opened at least several other questions when and how will humanity settle on the Red Planet.

I agree that declared interests and efforts to venture to Mars are a good reason to be enthusiastic but that does not relate to unfeasible ambitions. SpaceX's vision is teetering on the edge. It expects first manned mission to Mars in 2024, with "shuttle" transportation on Earth-Mars route after 2030, on a rocket Interplanetary Transport System with size and characteristics exceeding those of Saturn V... and with crew that will easily outweigh capacity of small commercial airplane. Furthermore, self-sustainable human colony on Mars in in SpaceX's view achievable in 40 - 100 years. Achieving such bold goals in current technological and financial challenges inherent to great space projects will be difficult and it is questionable whether we discuss ambitious vision or an illusion.

Meanwhile, NASA continues with R&D on its own vision Journey to Mars, will more flexible framework of manned mission to the surface after 2030. In procedural terms, usual way of subcontracting private sector is being employed, with companies such as Lockheed Martin, Boeing or Orbital ATK being some of the largest contractors. NASA is contracting also SpaceX to some activities in space program, mainly in ISS cargo missions, but not in Journey to Mars.

Two parallel efforts may in theory constitute healthy competitive environment, however, in a situation such as this one, a space project with numerous technological, logistical and financial difficulties, the duplicity is redundant. What is more, deeper and even more extensive international cooperation in Mars efforts is insufficient. International partnerships in global space sector are standard operating procedures for many actors in many different project areas, with European Space Agency being a fantastic example of benefits that international cooperation can bring to mainly smaller countries in the world. Mars efforts, either through

governmental resources or private sector investments, are carried today still predominantly by shoulders of the U.S.

It is important to continuously push on new cooperative efforts and ideas how to bring together more and more relevant players as well as small countries to a single table and find ways to intensify cooperation in order to reduce expenses and foster new innovative ideas. World politics, however, can and usually is playing out also in smaller subsectors of human activity, with space sector not being an example. Tense foreign relations of U.S.A with Russia or China do have consequences (maybe not as strong but still present) in space sector. Both of these countries represent relevant players in global space politics, in fact China might be the only country with functional orbital station in 10 years timespan. If one adds national security implications of space activities, these factor can together severely limit further and deeper international cooperation in Mars endeavors.

Financial and technological challenges related to journeying to Mars are as evidenced not the only ones. Even such "exotic" activity as space travel is subject to international law, regulatory mechanisms and national legislations. One of the principles of international space law is prohibition of harmful contamination of environment of other celestial bodies with terrestrial life forms. Even U.S. Mars rovers behave according to this principle. Manned missions to Mars will have to, besides other challenges, properly address several legal issues related to space exploration. What is more, human element of Mars missions opens up also psychological (long-term presence in space, crew cohabitation) and ethical questions (hypothetical contact and interaction with extra-terrestrial life form)

Does this all mean that humanity should abandon from manned Mars endeavors. Definitely no. Innovative visions that people such as Elon Musk bring to cosmonautics are incredibly stimulating and contribute to new developments. By successfully establishing itself on global launch market, SpaceX stimulated and enhanced natural competitiveness in global space sector. Without it, the sixth generation of European Ariane rockets or NASA-designed Space Launch Systems would not have progressed with such rapid development. The attractiveness of spaceflight should, however, not be accompanied by excessive ambitions, which may lead up to failures and in worst-case scenario to tragedies. Space Shuttle Challenger and Columbia crashes in 1986 and 2003 cause gaps in manned spaceflight lasting almost two years. Although no similar tragic event occurred since Columbia crash, and it may not even be case of ambitious SpaceX rockets, pushing too much on launch schedule in order to get to Mars as soon as possible may eventually turn out unfortunate.

Let's not be then surprised if year 2024 ends up unachievable. Throughout the history of spaceflight, quite often we estimated manned mission to Mars in 20 years from that specific moment of estimation. In the case of today, such horizon seems feasible more than never. Several technologies outlined in projections are being tested or are in late phases of development. However, getting it all done in 10 years will be difficult. I believe SpaceX is aware of this as well as of all the dangers associated with inadequate pushing on the launch schedule.

It is, on the other hand, successful marketing strategy, which puts the company back in the headlines of news all around the world. And in comparison with September launch failure on Florida, this time in positive light.

I do not doubt that humanity will eventually land on Mars. And it will be wonderful moment. Space exploration and manned missions deeper into the Solar System may not have as direct impact on daily life on Earth as usage of satellite infrastructure on Earth orbits, however, venturing deeper into space has fantastic psychological effect, impact on human imagination and potential to answer fundamental ontological question.

Mars mission, as the next great leap in manned spaceflight, thus deserve support and enthusiasm. This support, however, must be also adequately skeptical. Ambitions and amount of risk should be balanced by each other. Savvy visions bring with them also positive impulse, but we must avoid putting them in unachievable timeframes. We live in 21st century, in an era of great technological developments and innovations. Our efforts to explore and discover unknowns should build upon that. It is not necessary to take the risk and uncertainties as Portuguese, Spanish or British seafarers, explorers of the New World, had to, centuries ago. We do not neither live in Cold War space race that would pressure us to achieve space firsts. Mars is harsh mistress, but will wait for us.

Tomas Hrozensky