

The rise of the NewSpace: opportunities and challenges for the European space economy

Luca del Monte

Space Economy Manger

luca.del.monte@esa.int

IAF - GLIS 2016
Geneva 6th June 2016

The new space race



- Today, the new Space Race is the challenge of how to better capitalise on the social and economic advantages that flow from space science and technology.
- The Agency – as any other modern public administration – has a responsibility to ensure the **creation of value for society**, in an end-to-end perspective (i.e. from technology research to service development).
- Creation of value means ESA shaping and setting the conditions for the future technological and market opportunities to drive **sustainable growth**.
- Creation of value means also the Agency contributing to activities that turn space research into **industry competitiveness**, successful European innovation stories, encouraging entrepreneurship and providing a framework that drives **start-ups**, the take-up of new businesses and job creation.
- The economic value of space is significantly complemented by the services enabled by space infrastructures in sectors such as meteorology, energy, telecommunications, insurance, transport, maritime, aviation and urban development. **The space sector is not only a growth sector itself, but is the vital enabler of growth in other sectors.**

New markets are attracting new private capital in the form of non-aerospace investors, Venture Capitalists and crowdfunding

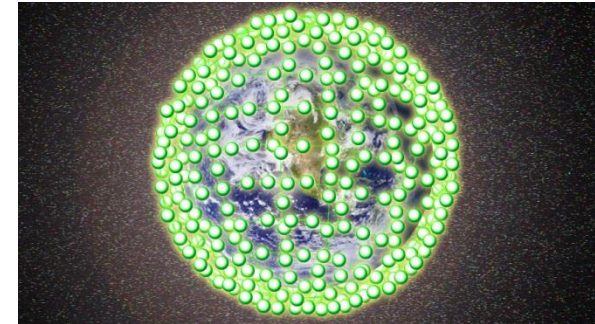


- The US remains the focus of **space entrepreneurship**
- the areas with the highest growth are represented by **small satellites and data analytics**
- The new entrants usually bring new approaches prioritising **cost** over performance and reliability.
- These new enterprises are **pitched as IT** or media companies where the investments are regarded as being in data products and services rather than in space (which is just another place where data is collected).
- These companies become often **takeover targets** of tech giants like Google and Facebook rather than of traditional aerospace firms.

Where does NewSpace come from?



1. NewSpace comes from the **convergence of space with other Verticals**. These other industrial sectors (e.g. ICT or automotive) bring to space new philosophy, new R&D and production paces, new funding schemes (e.g. VC, crowdfunding and Induced prizes), new business perspectives (PPP), new markets (e.g. tourism, real estate, burial service), new opportunities...and new challenges (e.g. space debris, cybersecurity).
2. NewSpace innovation is not just in the technological achievements (not even when the rocket booster re-entries to be reused!), but is in the **revolutionised industrial processes** (as is the case for the internet mega-constellations).



Is it just a “cultural difference”?



1. Early space embodied much of the Silicon Valley’s culture of today. Silicon Valley embodies a **triumvirate of factors for innovation** and disruption that were all at the heart of early space initiatives:
 - a. technical,
 - b. cultural and
 - c. financial.
2. The success of the Silicon Valley is mainly due to:
 - a. An emerging space market (where in many cases **Government is one of the key customers**), and
 - b. A **robust ecosystem** composed by academia (Stanford university), Institutions (NASA Ames), and space and non-space (GAFA) industries located in close proximity and conducive of innovation, rather than to specific industrial policies, targeted support to SME and/or injection of capitals at early stage.

The misplaced obsession with startup and SME



1. It is not startups or entrepreneurs in and of themselves, but the **innovation ecosystems** within which they operate and which they depend on which does matter: high growth innovative firms (*of any size*) within that system !
2. Innovation-led “smart” growth has occurred mainly in countries with a big group of medium to large companies, and a small group of SMEs that is spun out from some of those large companies or from universities. These firms have benefited immensely from **government funded research.**
3. Many firms in Silicon Valley have benefitted directly from early-stage funding by government, as well as the ability to build their products on top of government funded technologies. They apply remarkable in-house developed skills to these technologies, effectively surfing on a government-funded wave.

- if a sound **downstream application ecosystem** in Europe does not develop quickly, data generated by European space infrastructure will be harvested and used just by US companies: focus on moving capacities downstream
- National, local and **regional governments** need to interface effectively with what is provided at the European (ESA and EU) level and to promote and encourage the use of space products and services most effectively.
- The downstream technologies, data processing and analysis systems should be able to take advantage of **permeable innovation ecosystems (spin out and spin in)**
- Mainstreaming space in a **civil context** could be a distinctly European approach. Europe cannot rely on approaches designed for other purposes by others.
- Need to develop a proper **innovation strategy** to create and capture value (incremental, disruptive, radical, architectural)

BACKUP SLIDES

The Valley's Venture Capitals are eyeing space, however...



1. VC considers that Space is where Internet was in 1990 i.e. *"We still need to figure out what it is useful for..."*.
2. Today there are no dedicated space VC firms – and hence no special consideration for Space.
3. VC seek companies with a "good chance" of generating a lot of return "very quickly": as a consequence VC is not for all startup.
4. Normally only 1/1000 startups get funded by a VC.
5. The basic framework that a startup needs to fit in order to be eligible for a VC interview is represented by the following set of questions:
 - a. Does anyone want it? > Product market fit
 - b. Are there a lot of those people? > Market size
 - c. Can you find them? > Unit economics/ Go-to-market strategy/
Sales effectiveness
 - d. Does it work? > technology
 - e. Is timing realistic?

The Valley's Venture Capitals eyeing space, however...



1. The typical VC investment is represented by strong upfront cash-consumptive period of building, followed by short period of harvesting high-margin product. VC looks for multiplier of 4x in 3-6 years maximum.
2. Non space industry and VC do not fully understand the value propositions of the space startup. They do not understand the difference in culture and pace in space industry wrt traditional industry. The Space User Case is not interesting....*"just some pictures and some phone call"* and, development time is too long – VC look for very short return time exit strategy. Biotech is far more risky and resource consuming, but the user case is solid
3. Cubesats are making the lead development time much shorter and comparable to VC window of opportunity.
4. Social safety net is a real problem for VC to invest in Europe at early stage.

1. Develop an **Innovation Policy**, as an element of the ESA Industrial Policy :
 - a. on-going study with Prof.Mazzuccato
 - b. Joint OECD-ESA Workshop in ECSAT
 - c. HLF
2. Develop a MISSION-driven "**innovation platform**" model bringing together industry and investors to work together on **selected challenges**.
3. developing and implementing alternative and complementary financing schemes (e.g. **Prizes** or crowd-funding) to support innovation in the downstream sector
4. Assessment of **innovative partnership** schemes
5. Develop (**ESA**) **Innovation and Creativity** Community
6. Assess the progress of the platforms against the achievement of the objective to create self-sustainable and competitive space **downstream market ecosystems**.



Some elements of an Innovation policy

- a. The European way to “anchor tenants”
- b. Strategic platforms (e.g. the UK Catapult approach)
- c. Policy about space-based applications use
- d. Synergies and complementarity between EC (e.g. ESIF) and ESA funding
- e. SME’s access to capitals
- f. consolidation in the downstream (e.g. R&D economy of scale, international cooperation strategies) – creation of European champions
- g. Creation of new professional skills/profiles
- h. Clustering approaches
- i. Alternative funding schemes (Prizes/Crowdfunding)

A number of motivations have emerged as rationale for inducement prizes as propellers of R&D and innovation



Stimulus factor

May be used to:

- Encourage basic research
- Spur initial development of a new industry
- Focus efforts on problems that are not actively considered by the scientific/technical community
- Open and enhance existing technical communities dealing with certain challenges

Assets and resources retrieval

May be used to:

- Promote development of intellectual property rights by researchers (not intended for ESA)
- Identify bright researchers and problem solvers
- Grant sponsors exclusive procurement rights on innovative technologies (not intended for ESA)

Efficiency

May be used to:

- Private commercial sponsorship replaces scarce public funding
- Increase the effectiveness of available research funds, thanks to a multiplier effect on the prize funds originating from competitors' own investments
- Reduce the risk of public investment (by paying only in case of success)
- Reduce administrative and bureaucratic burden

Outreach

- Raise the general public awareness on a given sector/issue
- Sponsorship may be used as promotional/marketing tool