

The Business Ecosystem of Nanosatellites

*Peter Platzner and Veronica LaRegina
International Space University*

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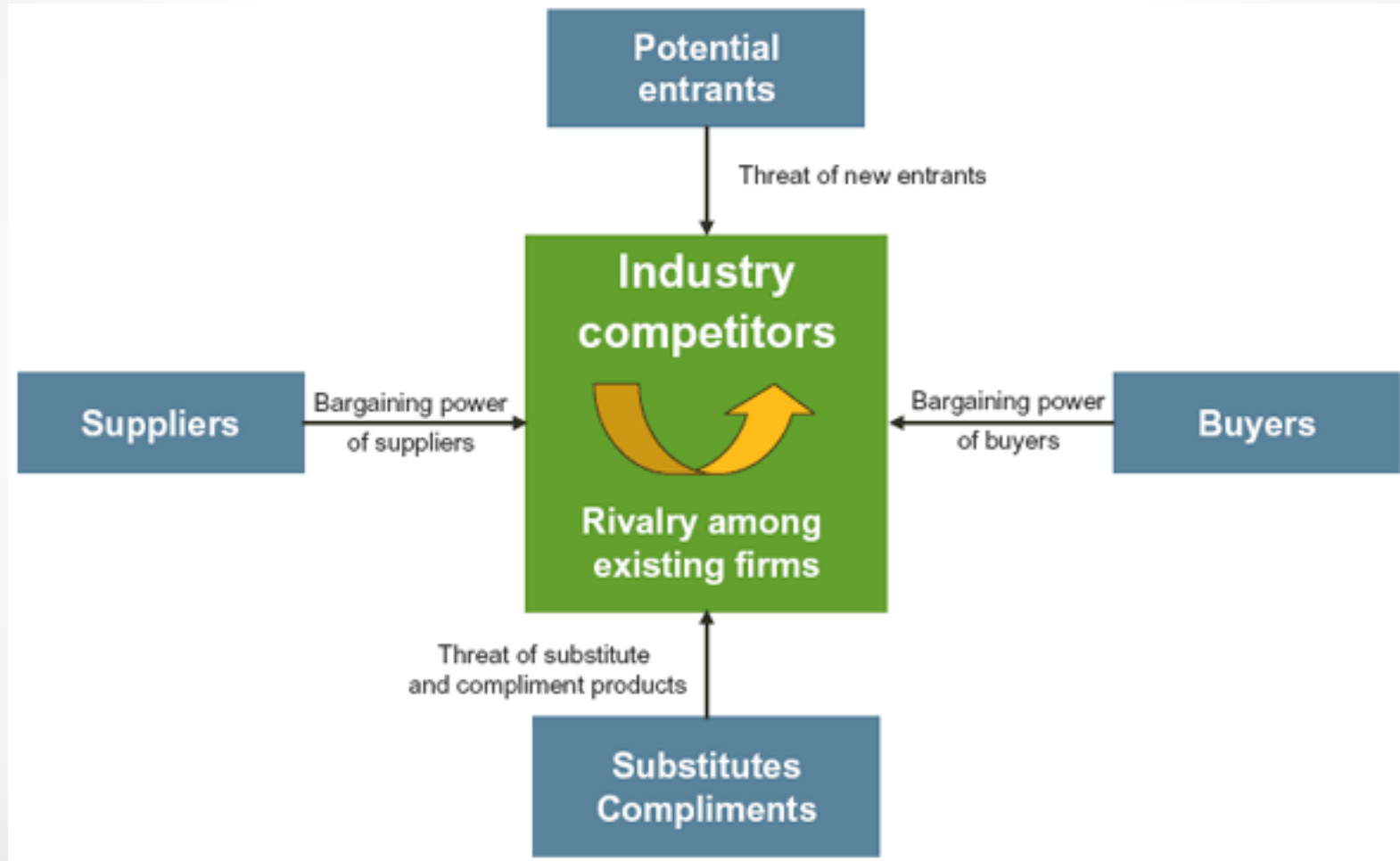
Executive Summary

1. Describing the business environment in a dynamic fashion modeled after biological ecosystems can create insights into business opportunities and strategies for business success
2. Examples for the Nanosatellites sector are
 - o Launchers and On-orbit-servicing/debris removal
 - o The Bandwidth-Problem and Opportunity
 - o The widening gap between general perception and technological reality
3. Constraints are essential for break-through innovation
4. Method of research study

Please note that these are preliminary findings as our study is not completed and we are still gathering data

The Standard View of Static Relationships

Porter's Five Forces of Competitive Position



The Dynamic Ecosystem View

“A business ecosystem is an economic community of interacting organizations and individuals — the organisms of the business world.

These organisms co-evolve their capabilities and roles and align themselves with the directions set by central companies (“keystones”).

This enables the community to align their investments and find mutually supportive roles.”

James F Moore, 1993

Evolutionary economics examines (1) the interactions of components of a business ecosystem, (2) how the ecosystem’s components tend to affect other parts of the ecosystem, and (3) how those interactions change the business ecosystem as a whole.

www.wisegeek.com

4 Examples of the Ecosystem Analogies

Biology

Business

Dynamic

Wolfe-pack

DVD Standard

Niche

Cleaner Fish

Bard's gluten-free Beer
Wordsation (Triplets clothing)

Network

Symbiotic relationships
Human Protein Interaction

Microsoft
Car Manufacturer

Disruption

Invasive species
(Nile Perch, Asian Carp)

Clayton Christenson
(mobile phones vs. landline)

Dynamic Military – Industry Relationship (I)

Military

Vs.

Launchers

Tension

The technical closeness of launchers and military technology is often a source of tension between the military and new local launch providers or emerging space nations' desire to reach launch capabilities

Cooperation

DARPA seeks “on-demand” satellite imagery which requires launch capabilities for micro or Nano-satellites

Opportunities for spin-in, e.g. DARPA's SeeMee program and street racing NOX or Generation Orbit

Dynamic Military – Industry Relationship (II)

Military

Vs.

On-Orbit servicing
Space Debris Removal

Cooperation

On-orbit servicing and space-debris removal is often seen as a potential business opportunity for nano and micro satellites. The key component is on-orbit propulsion capability which would also have benefits for other applications requiring pointing accuracy

Tension

Some argue that programs like DARPA's Phoenix only serve the purpose of developing anti-satellite capabilities without the problems and risks of traditional ASAT's

**Relationships can be dynamic,
core-incentives however rarely change**

NanoSat-Bandwidth – Barrier or Opportunity?

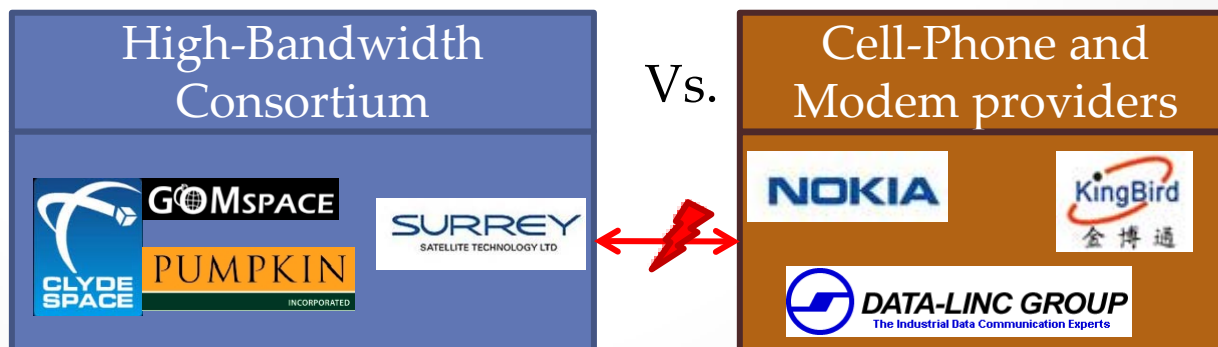
“Look, it’s simple physics. Optics and data-bandwidth seriously limit the usefulness of Nanosatellites and this wont change”

Space Agency Industry Veteran, 2012

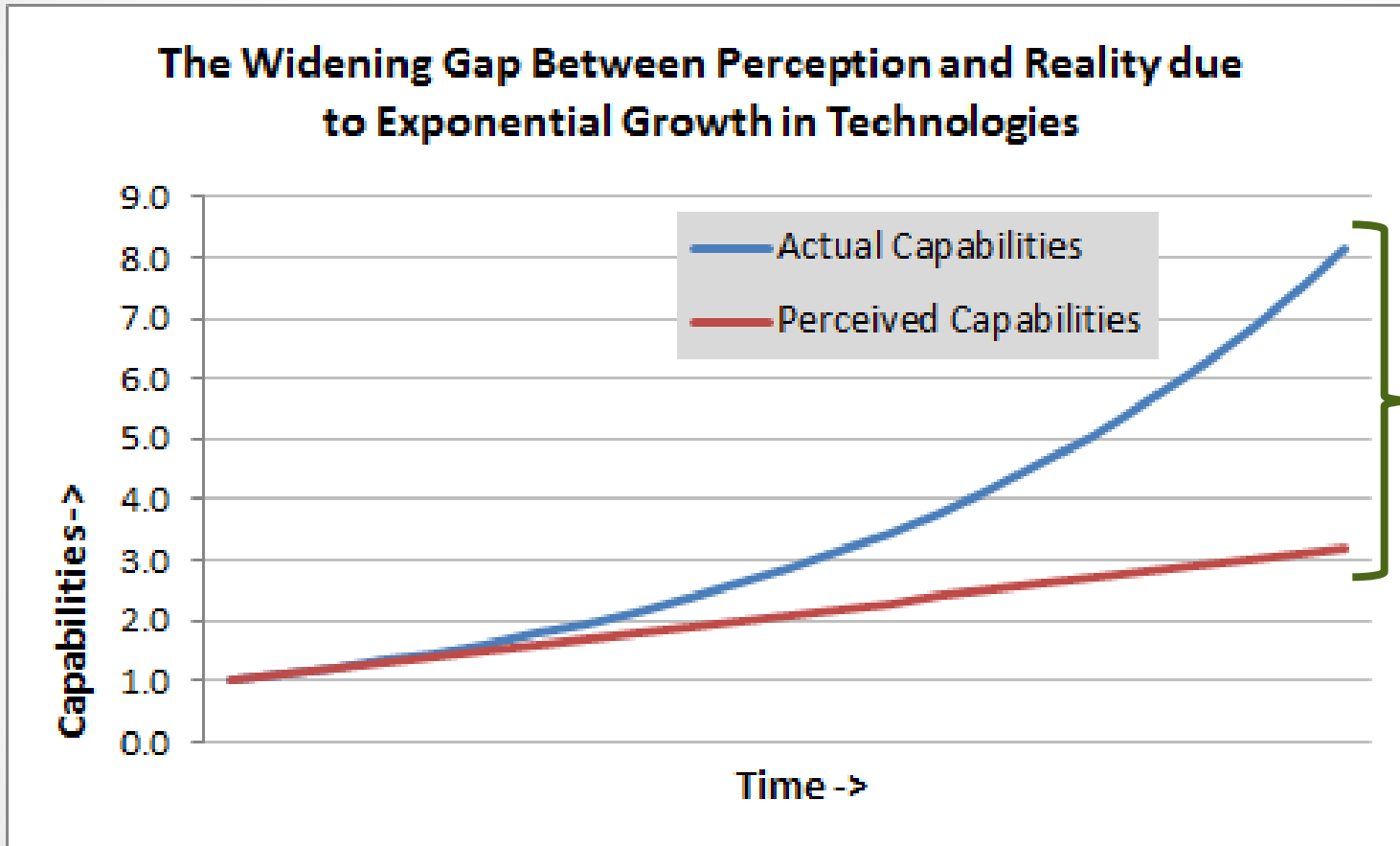
Static Industry View



Dynamic Industry View



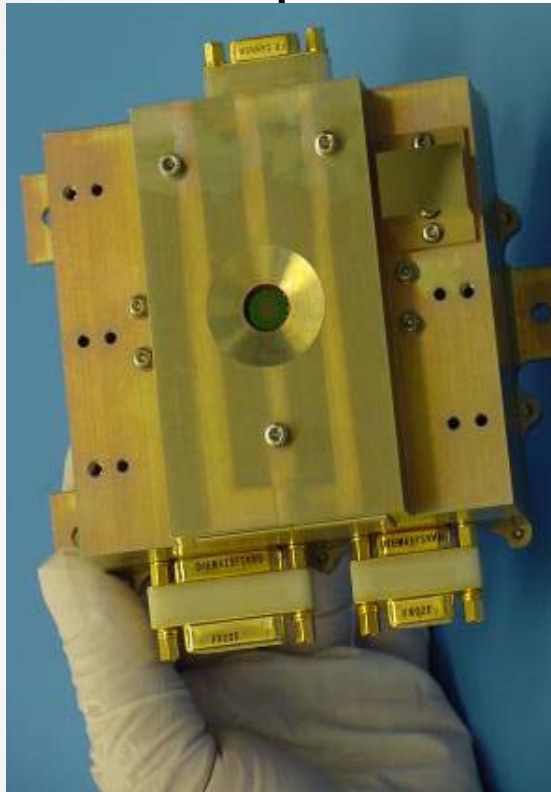
Perception – Great Barrier, Great Opportunity



Great Barrier
And
Great Opportunity

Perception vs. Technological Reality

2004



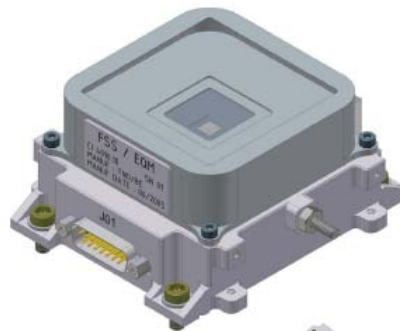
Model: TNO DSS

Weight: 475g

Price (1FM) n/a

Size: 900.9

2006



TNO FSS

365g

est. € 15,000

560.9 cm³

2012



CubeSat

5 g

€ 2,500

2.2 cm³

Constraints Foster Innovation (I)

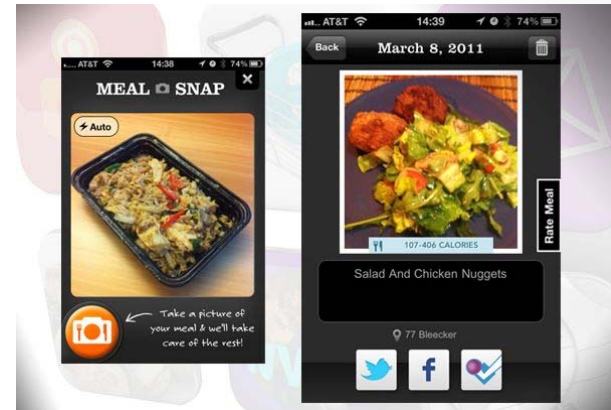


Constraints Foster Innovation (II)

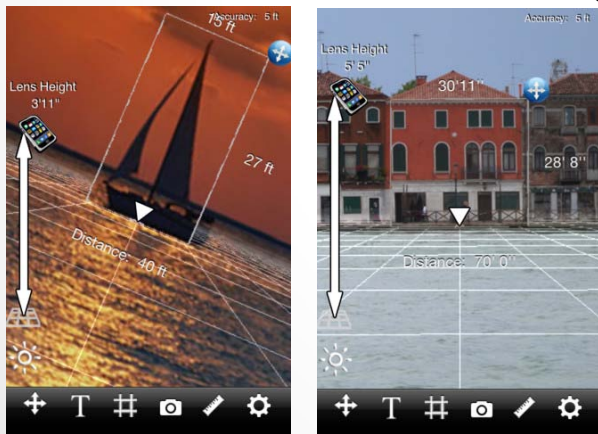
Maps, Translation, Chat



Snap Picture, get Calories



Calculate Distances and Height



Wind speed via microphone



Constraints Foster Innovation (III)

- On Harvard Business Review Blog, Uri Neren comments that after analyzing 162 methodologies around innovation, the most common thread is *Scarcity*
- Ethan Zuckerman talks about Innovation from Constraint in Africa and how everyday people innovative because of their constraints in hard to anticipate ways
- Google's Marissa Mayer, postulates that too much creative freedom results in unfocused work and she uses constraints in her team
 - Constraints in file size, pixels or speed
 - Prototype only for 1 day or 1 hour
- Other examples of self-imposed constraints are
 - Haiku and iambic pentameter in poetry
 - Miles Davis' "*Kind of Blue*" album in D and E dorian mode only
 - 160 character SMS launching Twitter and microblogging

The Constraints of Nanosatellites are
a source of business opportunities

Description of Survey

Note: Interviews performed from 2/15-3/15 2012

<i>73 Interviews</i>	Europa	Americas	Asia/ME	Global	Totals
Agency	4	2			6
Company	10	6	1		17
University	5	3	4		12
Students	7	8	6	14	35
Regulator				3	3
Totals	26	19	11	17	73

We continue to look for interviews with agencies, companies and universities, especially in Asia, Africa and Latin America

Conclusion

- A Dynamic view of the relationship of the market-participants in the Nanosatellite business ecosystem can potentially identify business opportunities
- These business opportunities present themselves sometimes only if a wider point of view outside the immediate Nanosatellite sector is taken
- Improvements in technology are ahead of general perception. This gap is creating a substantial source of business opportunities
- The constraints of Nanosatellites should be seen as a source of competitive advantage as they foster/force innovation above and beyond that in other satellite sectors

It's not what you look at that matters, it's what you see.

Henry Davis Thoreau

Questions

Contact: Peter.platzer@isunet.edu

If you interested in collaboration on education and business opportunities, we'd love to hear from you!