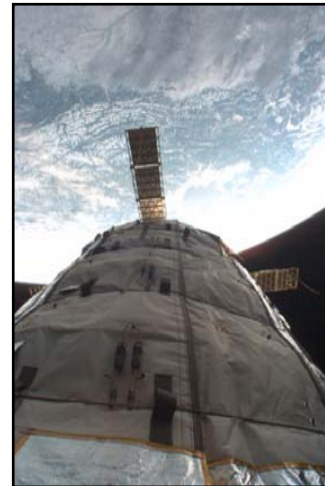


Commercial Space Market Segments Overview



**Amaresh Kollipara, Managing Partner
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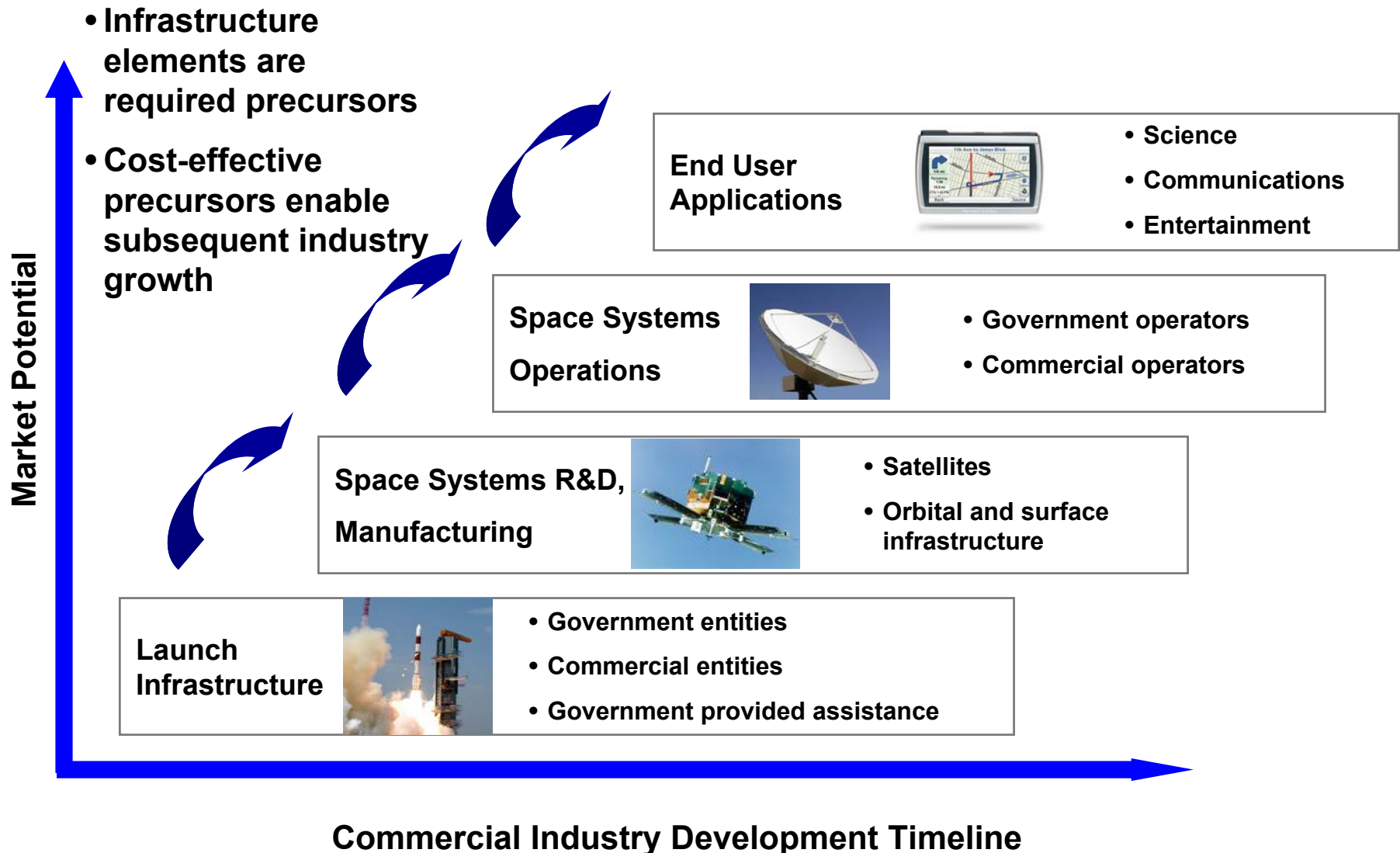
Themes



Themes

- Space is not a destination
- Space is an enabler for a variety of business verticals
- Space accelerates and expands business verticals by providing new, disruptive ways of doing business
 - Faster
 - Cheaper
 - Better
- Space-related commercial viability might exist in business areas that we have not thought of
- Infrastructure is a precursor to space-related applications

Different segments of the commercial space industry are closely related to each other.



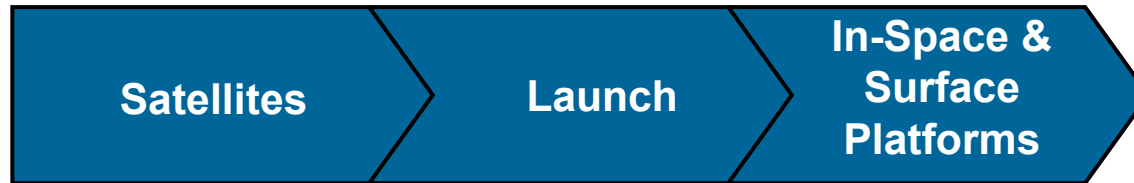
General Legal and Regulatory Considerations

- **ITAR - International Traffic in Arms Regulation** – a set of U.S. government regulations that control the export and import of defense-related articles and services on the United States Munitions List.
- **Informed Consent** – The requirement that risk takers, in space tourism and any other area where risks to life, health or property are high, are fully apprised of these risks and knowingly waive liability of the service provider.
- **IP/privacy – Who owns what Intellectual Property;** This pops up in delivery of data, including original programming, GPS systems, spy satellites, Google Earth, Google Street View, among others.
- **Choice of law – Whose law applies when incidents happen in space?** US? Russian? Japanese? What state will be legally friendliest to the U.S. launch and flight industry?

-Commercial Space Market Segments-

Space is an enabler: it enhances existing market verticals.

Infrastructure \$60B in 2007 Revenues*



Applications \$190B in 2007 Revenues*

Healthcare	Materials	Science Research
Media and Entertainment	Communications	Governance
Energy and Mining	Defense	Transport Operations

*Source: Space Report 2008, SIS Team analysis

Commercial Space Market Segments

Timeframe Estimates

Infrastructure



Applications



Short-term



Mid-Term

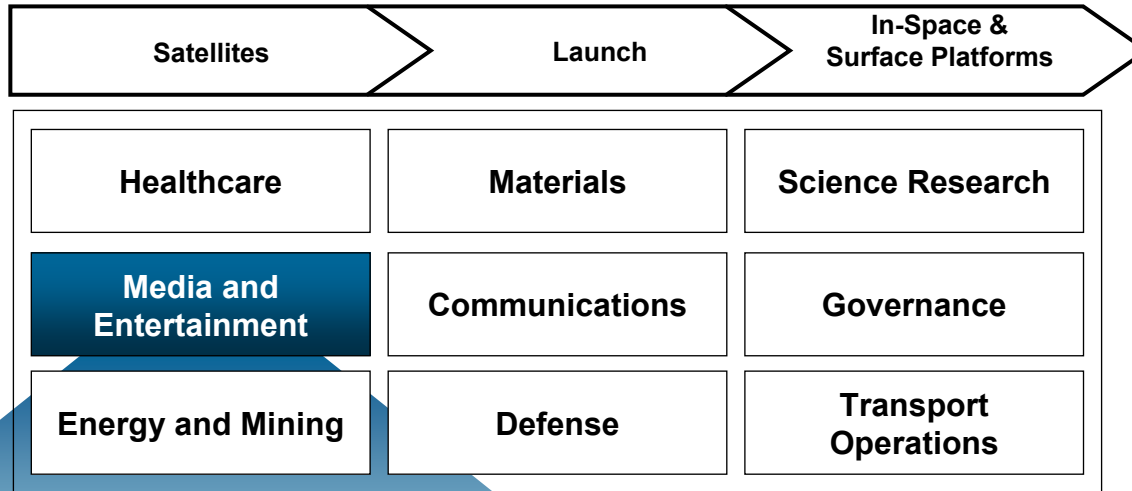


Long-Term



High Entry Costs

Media and Entertainment - Short Term Example

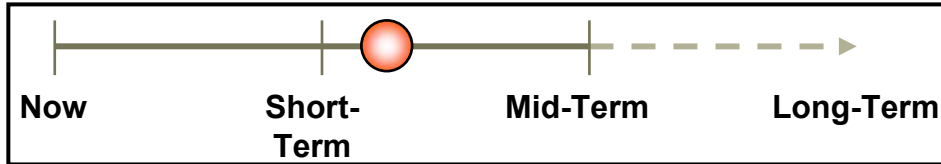


- Space tourism
- Commercial astronaut training
- Satellite based media distribution

- Space movie/documentary production
- GPS games
- Earth based simulations

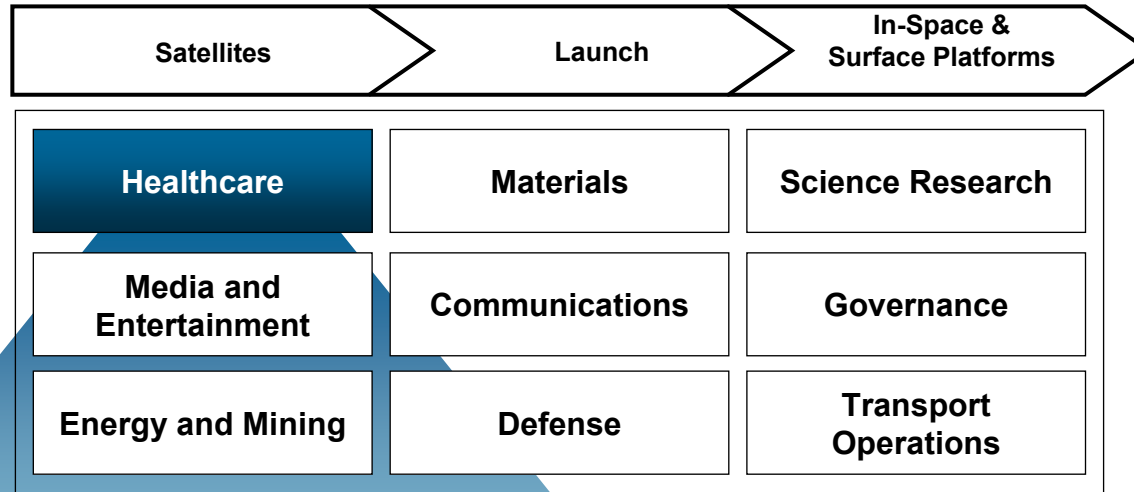
- Lunar rover related entertainment
- Live video feeds from orbit
- Real-time Earth imagery

Suborbital Space Tourism



- **Description**: Adventure/Entertainment flight in a small reusable vehicle to approximately 62 miles above the Earth's surface. Views, weightlessness, curvature of the Earth
- **Opportunity**: Lucrative high end passenger market
- **Competing Products and Services**: Terrestrial adventure travel experiences
- **Potential Complications**: Capital costs, regulations, health of passengers, accidents, unknown market size
- **Example Companies**: Virgin Galactic, Scaled Composites, XCOR, Armadillo Aerospace, Blue Origin, Space Adventures

Healthcare - Mid Term Example



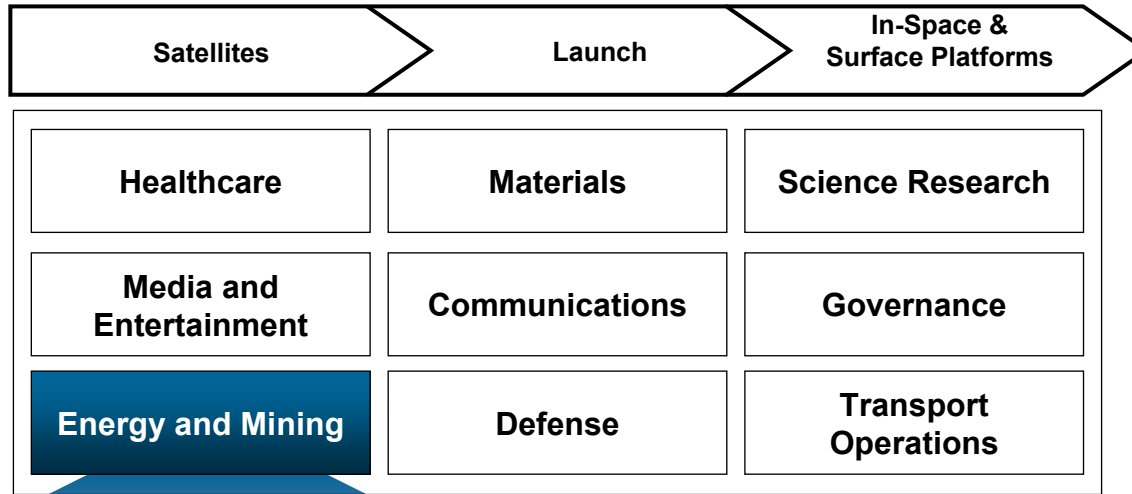
- “On-Orbit Research and Manufacturing”
- Telemedicine
- Ubiquitous Medical Records
- Disease Monitor

Healthcare



- **Description**: Use of space resources to aid in health care on Earth, including “On-Orbit Manufacturing,” telemedicine, ubiquitous medical records, interactive remote medical services, disease monitor
- **Opportunity**: Multibillion \$\$\$ microgravity bio research, crystal, bacteria growth, telemedicine savings and revenues
- **Competing Products and Services**: None in areas where microgravity is required, local medical services, traditional data collection and transfer
- **Potential Complications**: Cost of getting to orbit, minimal space/competitive, failed launches, market size unknown
- **Example Companies**: SPACEHAB

Energy and Mining - Long Term Example



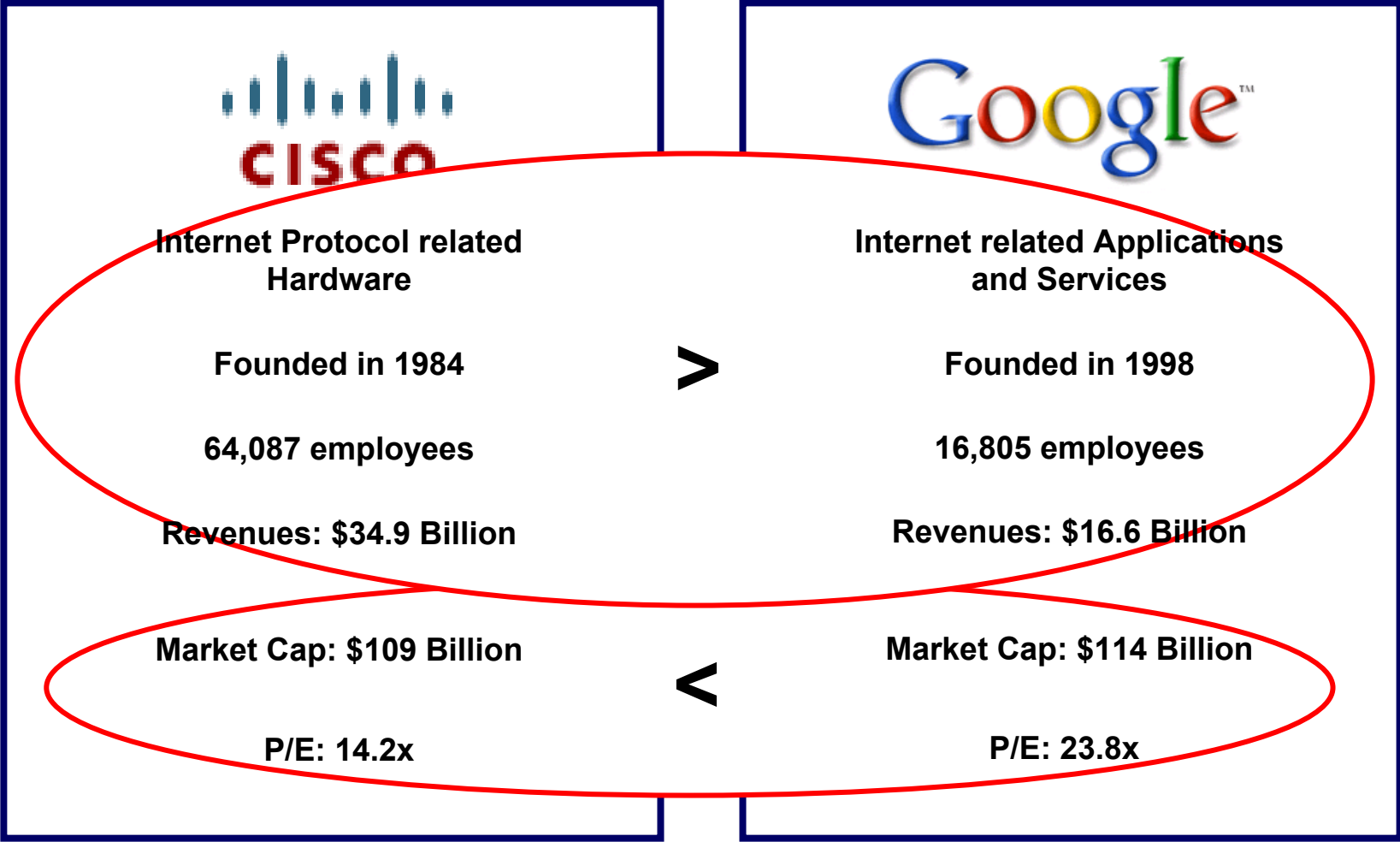
- **Lunar and Asteroid Mining**
- **Space Based Solar Power**

Space Based Solar Power



- **Description**: The generation and transmission of clean, usable electricity from solar arrays placed in GEO
- **Opportunity**: Multitrillion dollar electricity market and strong viability in the clean, renewable energy sub-segment
- **Competing Products and Services**: Traditional and renewable electricity production
- **Potential Complications**: Cost of getting to orbit, large capital cost for construction and assembly, social stigma, potential lack of economic viability
- **Example Companies**: None

Application and services companies may have higher “value” in the long term.



As of market close on 10/14/08.

Contact

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