# Progress and Breakthroughs in Autonomous Vehicles: A JPL Perspective

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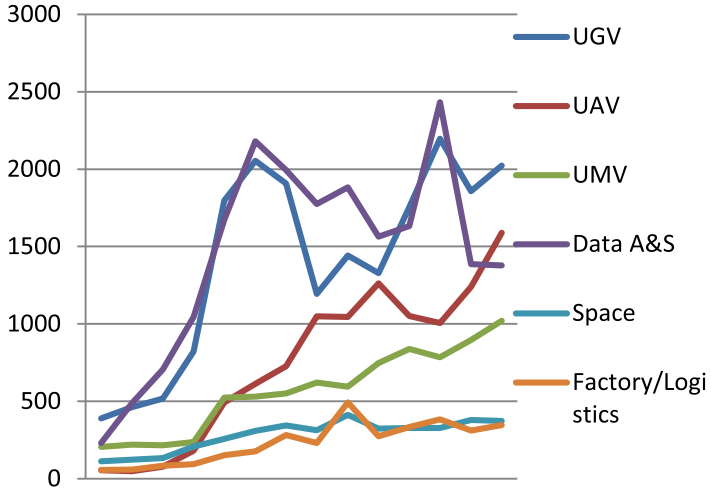
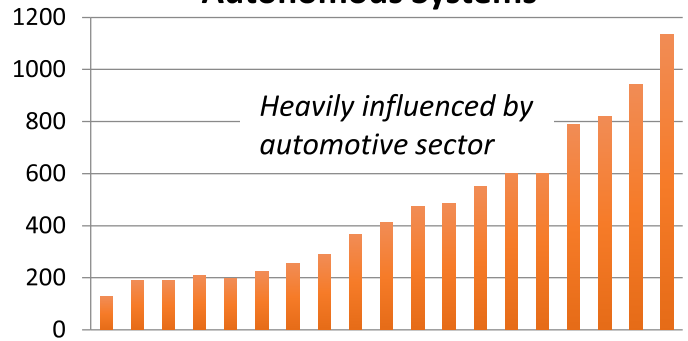
# Explosive Worldwide Growth of Autonomous Systems

*Autonomy Strategic Plan*

**Autonomy Publications: 2000-2013**




**World Patents: 1995-2013**
**Autonomous Systems**




**Technical Publications**

- > 20 journals
- > 25 conferences (10 new in last decade)
- > 10 challenges (couple of XPrize)

**Increased competition for talent; establish strategic partnerships to acquire technology**

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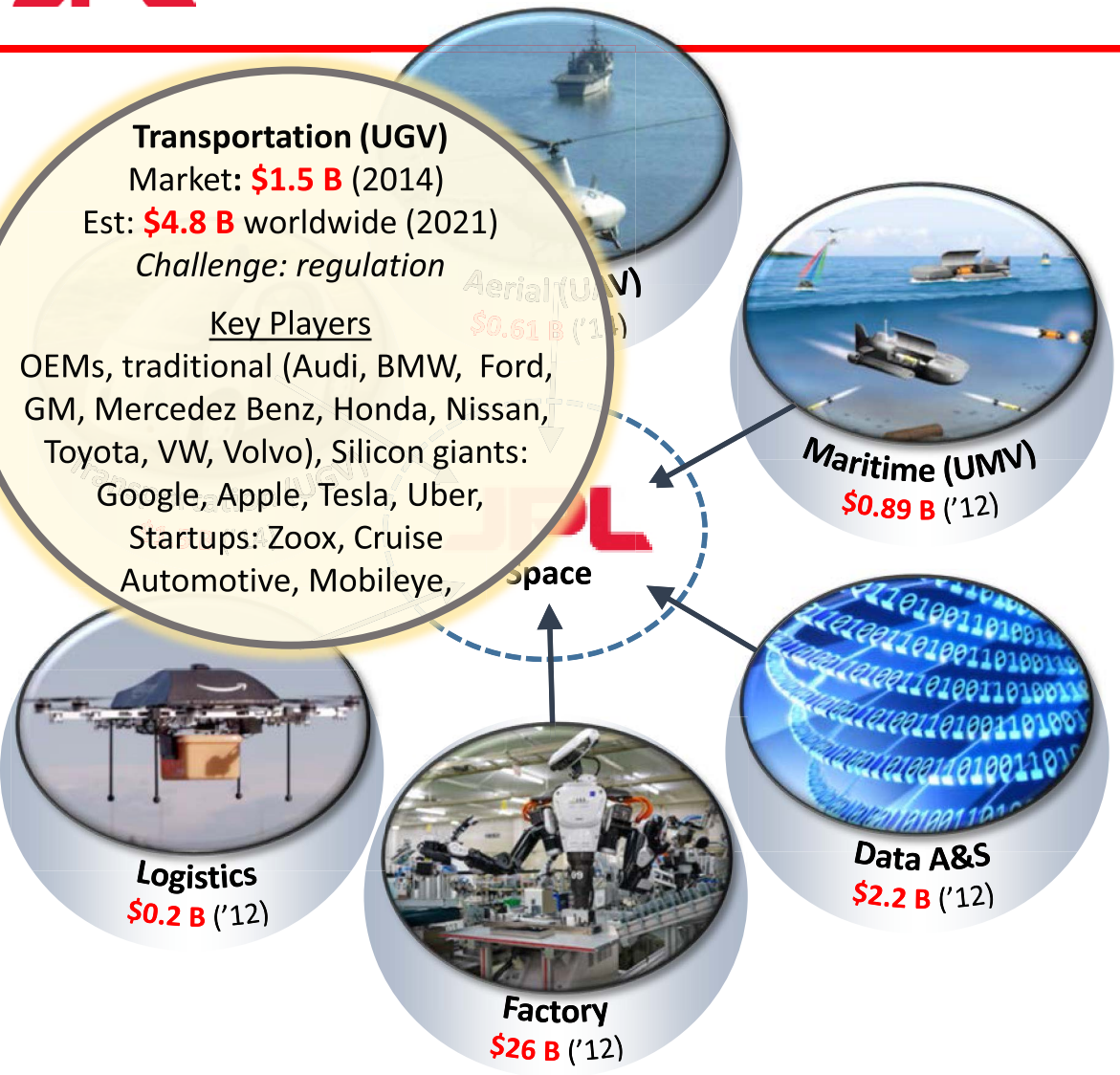
**Transportation (UGV)**
Market: **$1.5 B** (2014)
Est: **$4.8 B** worldwide (2021)
*Challenge: regulation*

Key Players
OEMs, traditional (Audi, BMW, Ford, GM, Mercedez Benz, Honda, Nissan, Toyota, VW, Volvo), Silicon giants: Google, Apple, Tesla, Uber, Startups: Zoox, Cruise Automotive, Mobileye,

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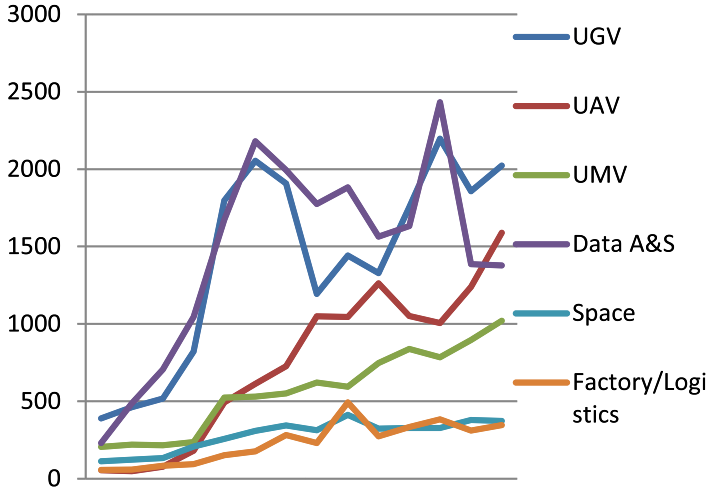


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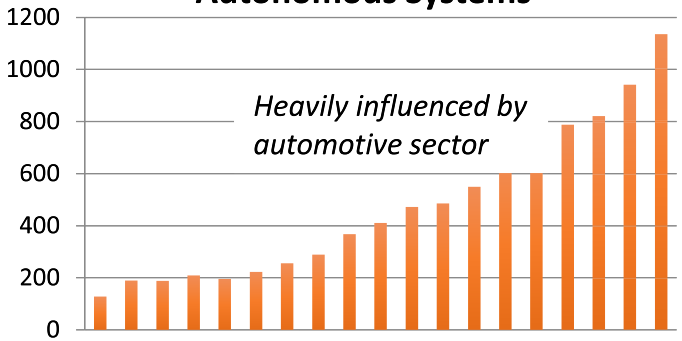


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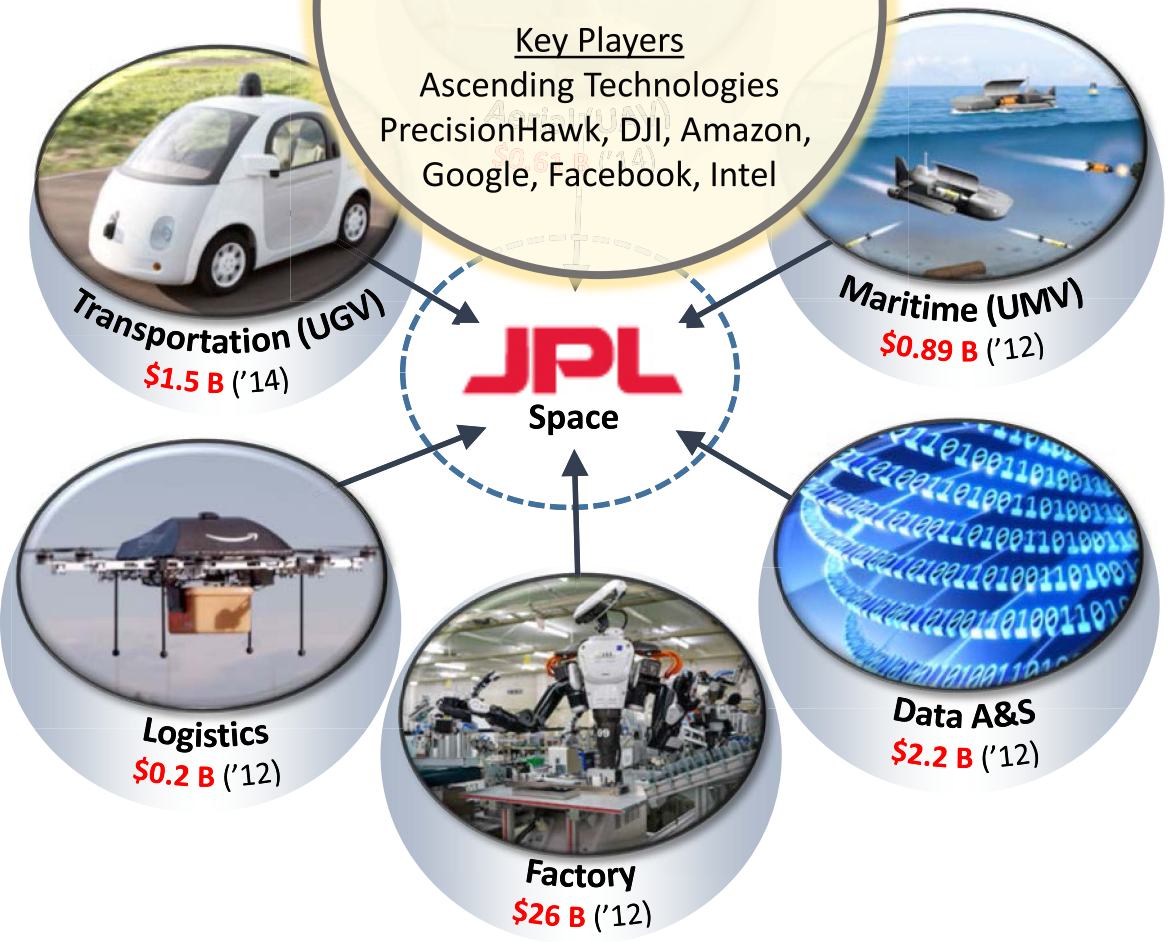
**Aerial (UAV)**
Market: **$0.61 B** (2014)
Est: **$4.8 B** worldwide (2021)
*Challenge: defense cuts, regulation*

Key Players
Ascending Technologies
PrecisionHawk, DJI, Amazon, Google, Facebook, Intel

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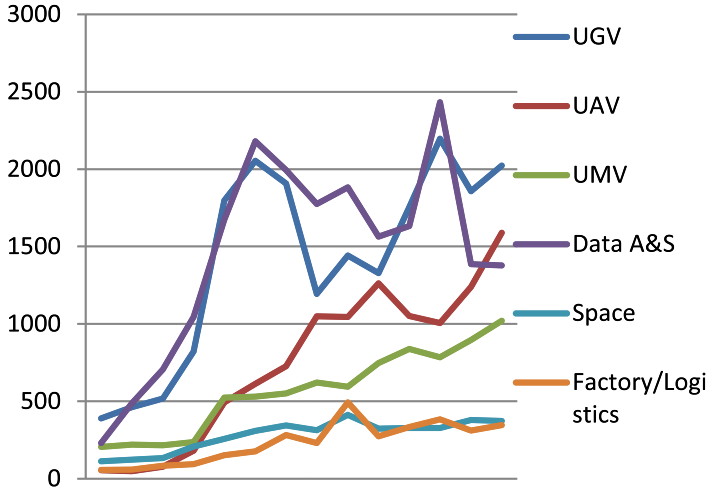


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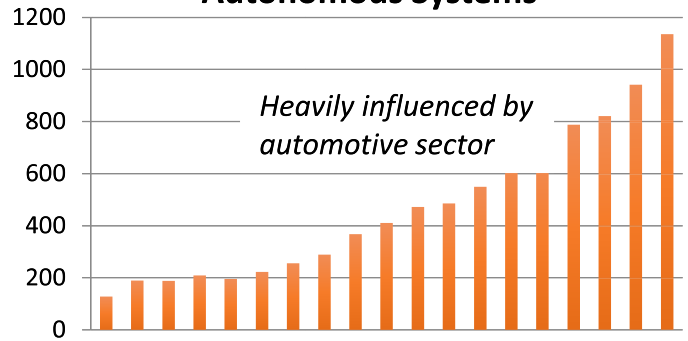


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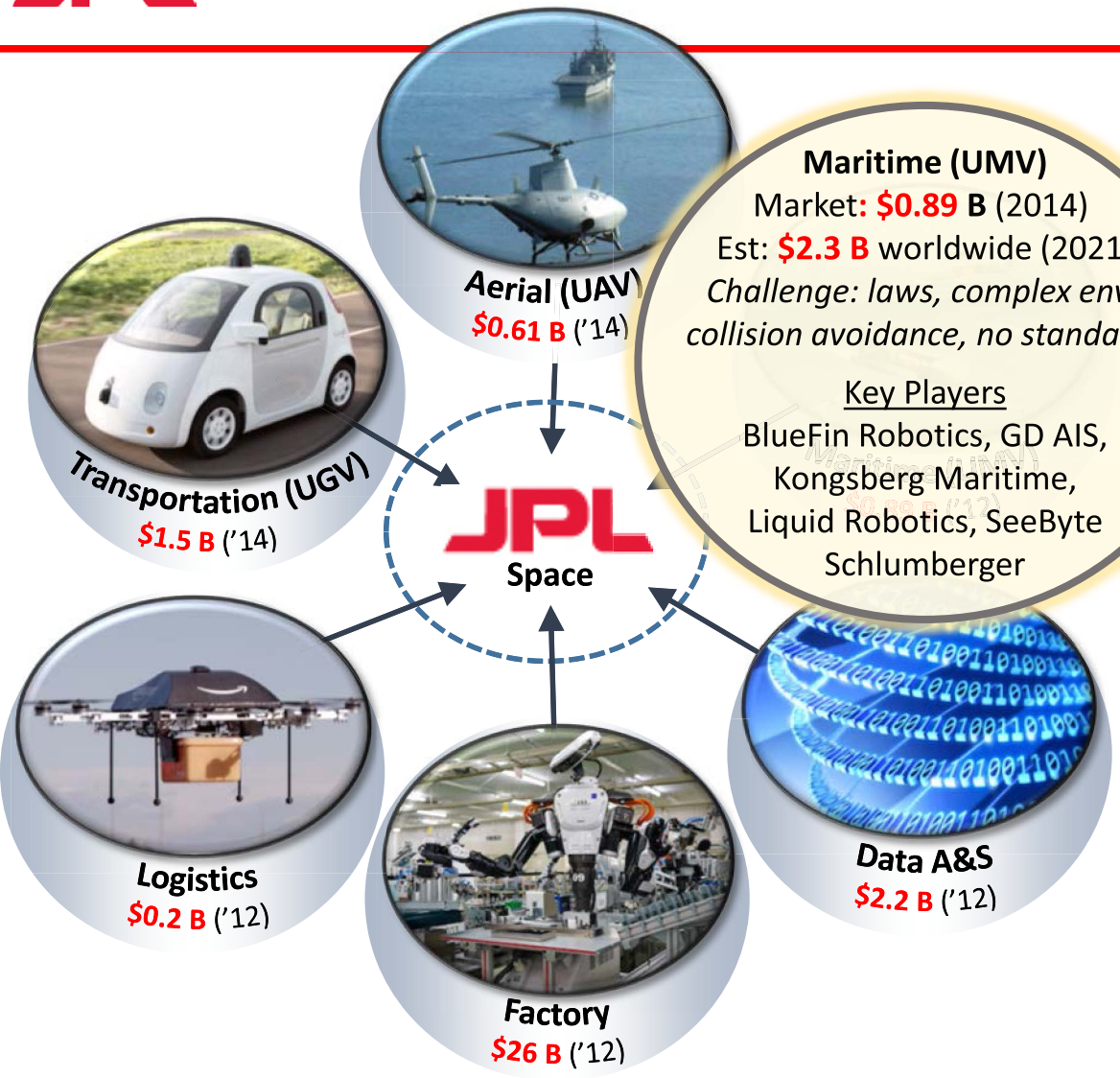


**Maritime (UMV)**
Market: **$0.89 B** (2014)
Est: **$2.3 B** worldwide (2021)
*Challenge: laws, complex env, collision avoidance, no standards*

Key Players
BlueFin Robotics, GD AIS, Kongsberg Maritime, Liquid Robotics, SeeByte Schlumberger

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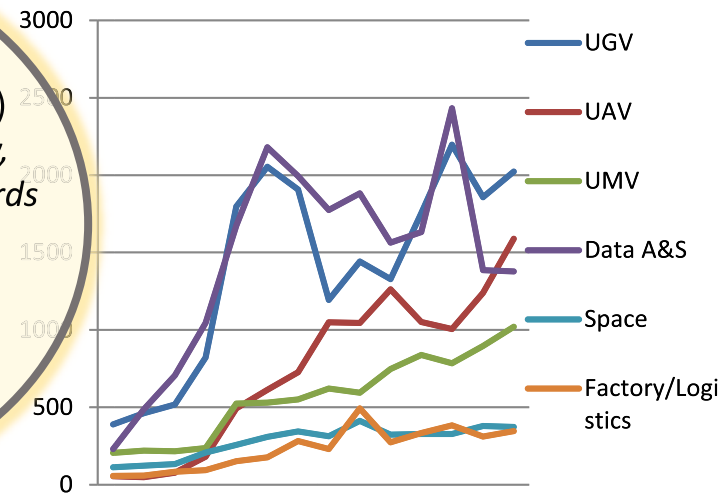


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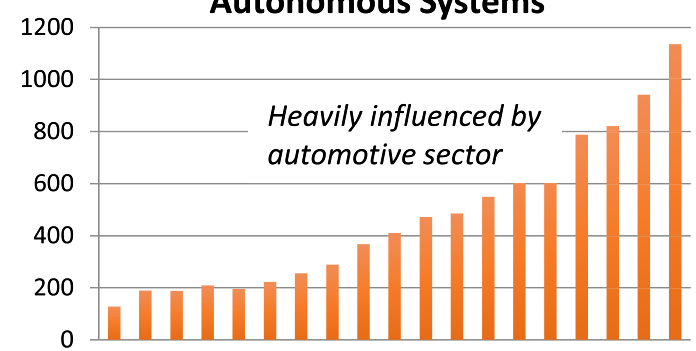


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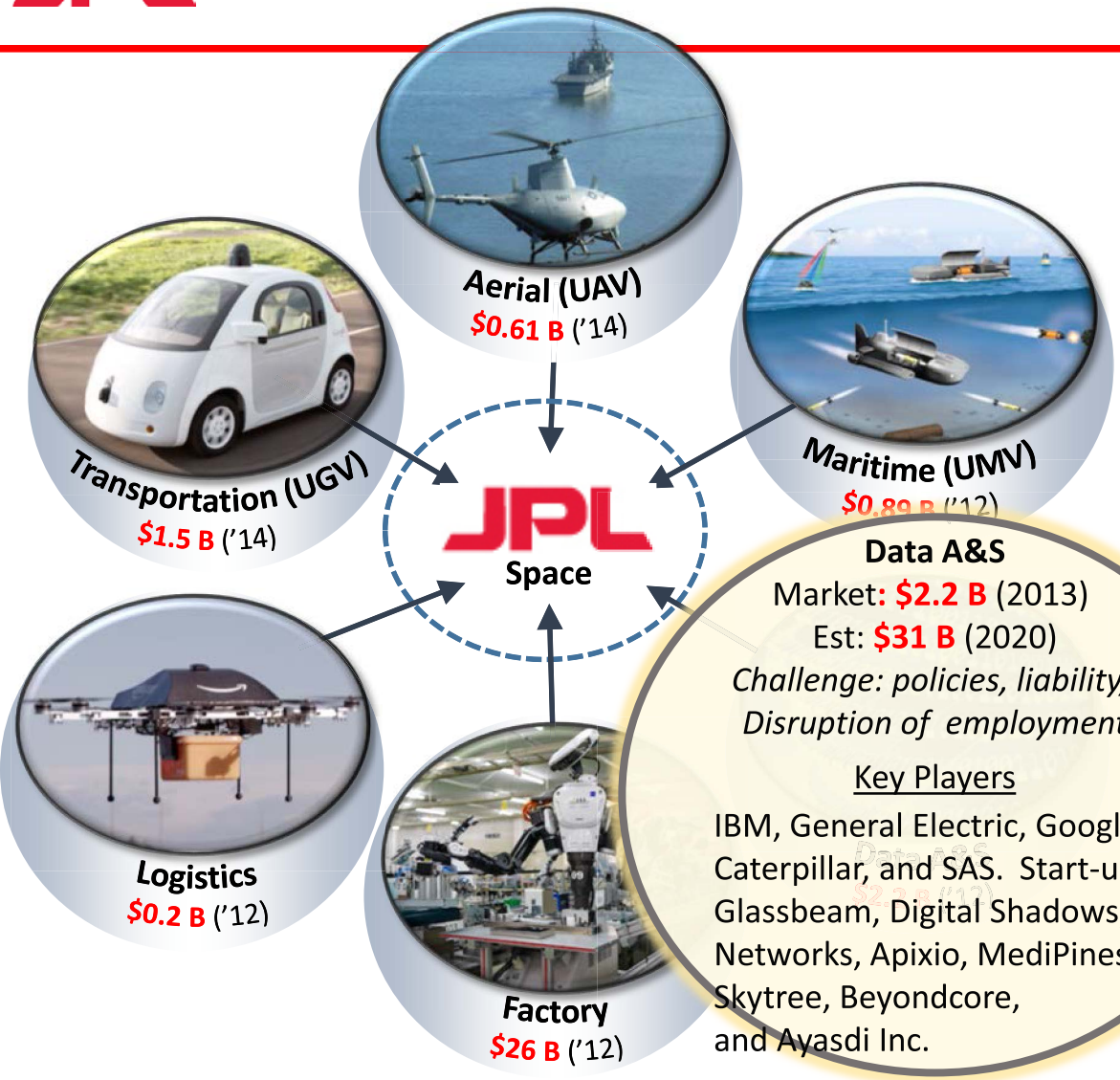


**Data A&S**

Market: **$2.2 B** (2013)

Est: **$31 B** (2020)

*Challenge: policies, liability, Disruption of employment*

Key Players

IBM, General Electric, Google, Intel, Caterpillar, and SAS. Start-ups: Neura, Glassbeam, Digital Shadows, Preferred Networks, Apixio, MediPines, Skytree, Beyondcore, and Ayasdi Inc.

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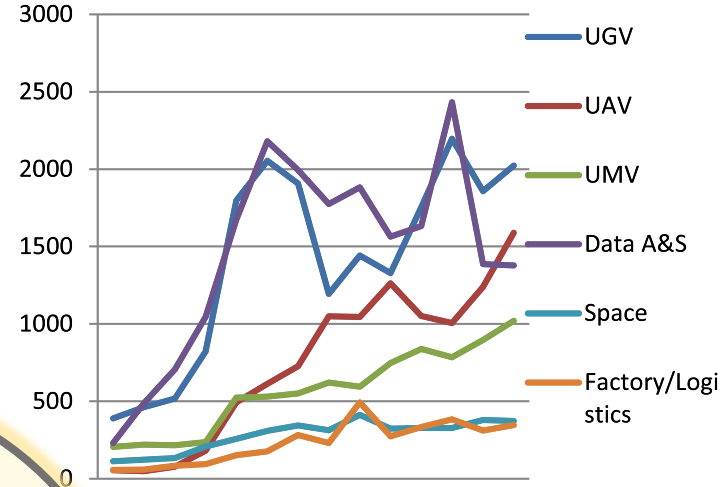


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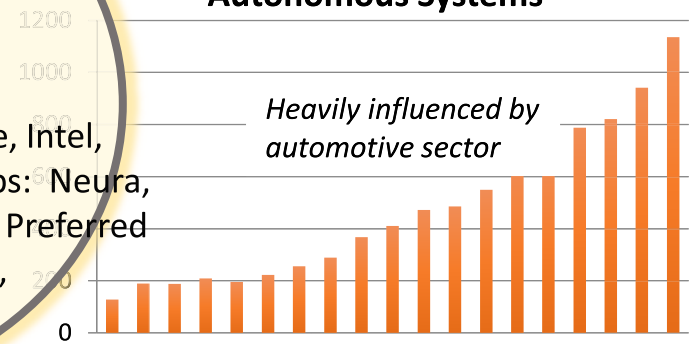


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