

ADVANCING CONNECTIVITY: THE ROLE OF VERTICAL INTEGRATION IN SHAPING THE FUTURE OF 5G IN SPACE

The Strategic Advantage of Vertical Integration

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rocketlabcorp.com



CONTENTS

What is 5G and what does Space have to do with it?

What is vertical integration for 5G NTN systems?

How much integration is needed for 5G NTN?

Who is ready for the 5G+ revolution?

Meet Lisa Kuo



With a portfolio spanning startups, corporations, non-profits, and government agencies, Lisa been at the forefront of transforming satellite communication ideas into reality. As the Director of Business Development at Rocket Lab, she leads the Radio Frequency and Communication product line, driving innovation and growth in satellite-based telecommunication programs.

Her aerospace journey has included pivotal roles at Ramon Space, Panasonic Avionics, The Aerospace Corporation, and The Boeing Company, consistently delivering pushing the boundary and fostering innovations.

Rocket Lab is an end-to-end space company, with portfolios spanning from space components, satellite systems, to launch.

INTRODUCTION OF 5G NTN

- 5G is the fifth generation of mobile network technology, promising faster speeds, lower latency, and greater connectivity
 - Key features include enhanced mobile broadband (eMBB), ultra-reliable low latency communication (URLLC), and massive machine-type communication (mMTC)
- Key elements of 5G network cannot be fulfilled without NTN (Non-Terrestrial Network) infrastructure
 - Global coverage for harmonization
 - Edge resilience and redundancy
 - Mobility support



5G + Space Infrastructure

5G NTN's transformative potential for the world and how we live our lives



5G IS HEADED FOR SPACE

- Ubiquitous coverage
- Edge resiliency
- Economical remote, IOT, M2M
- Foundation for 6G



SPACE IS READY FOR 5G

- Deployment of large constellations
- Advanced antenna + edge compute
- High cadence access to space
- Ground infrastructure



THE WORLD IS WAITING

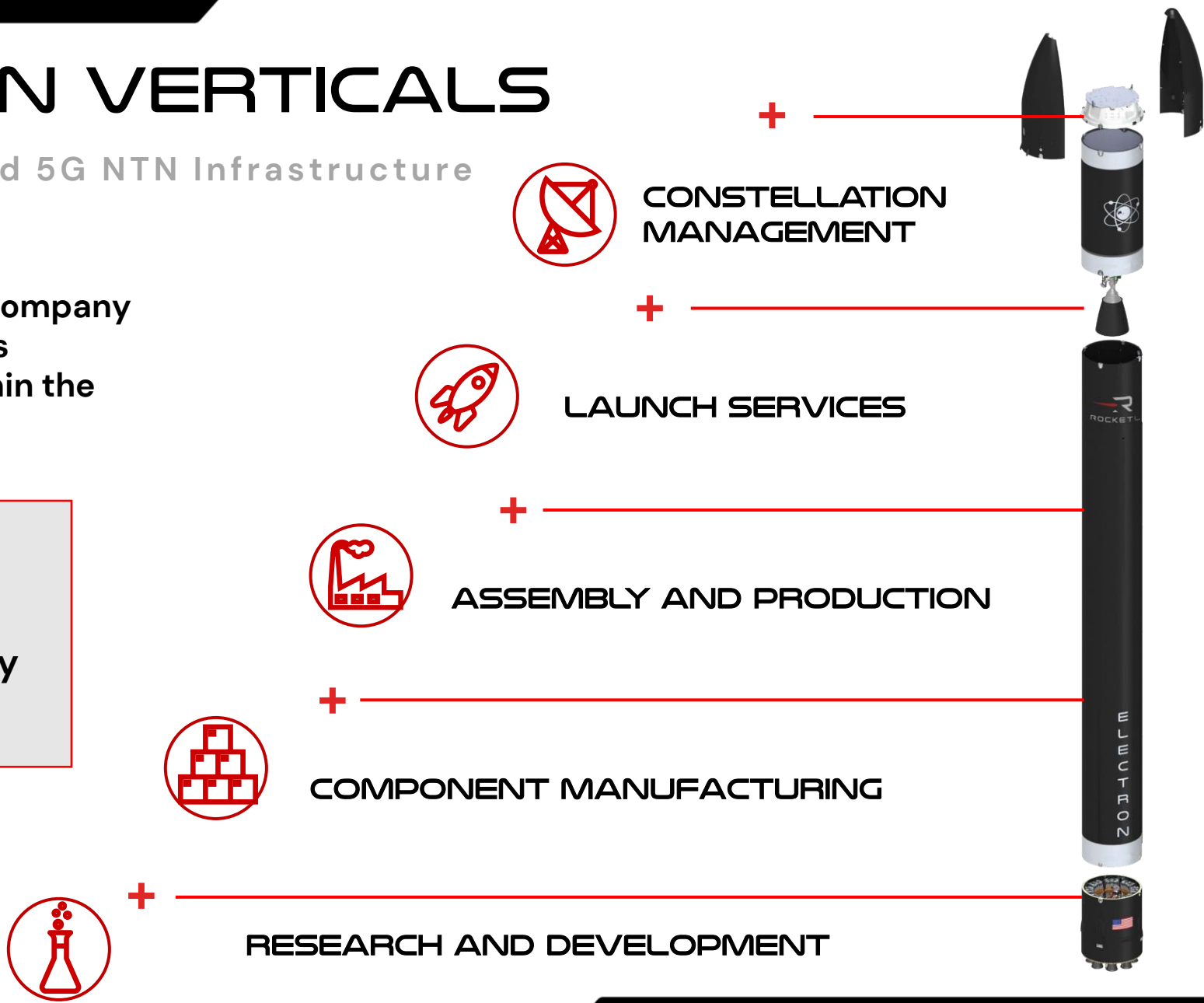
- Strategic partnerships
- Rich investment, public and private
- New use cases and markets
- Integration between segments

SPACE 5G NTN VERTICALS

Elements of Space-based 5G NTN Infrastructure

Vertical Integration involves a company controlling multiple stages of its production or supply chain within the same industry

5G NTN is like a Rocket-
Success soars when every stage is built together



5G NTN: EVERY BIT COUNTS!

Vertical Integration to squeeze every bit



HARMONIZATION

Across regulatory compliances



ECONOMY OF SCALE

Small mistake, big amplification



SPEED

Coverage takes time and volume



QUALITY

Consistency across constellation



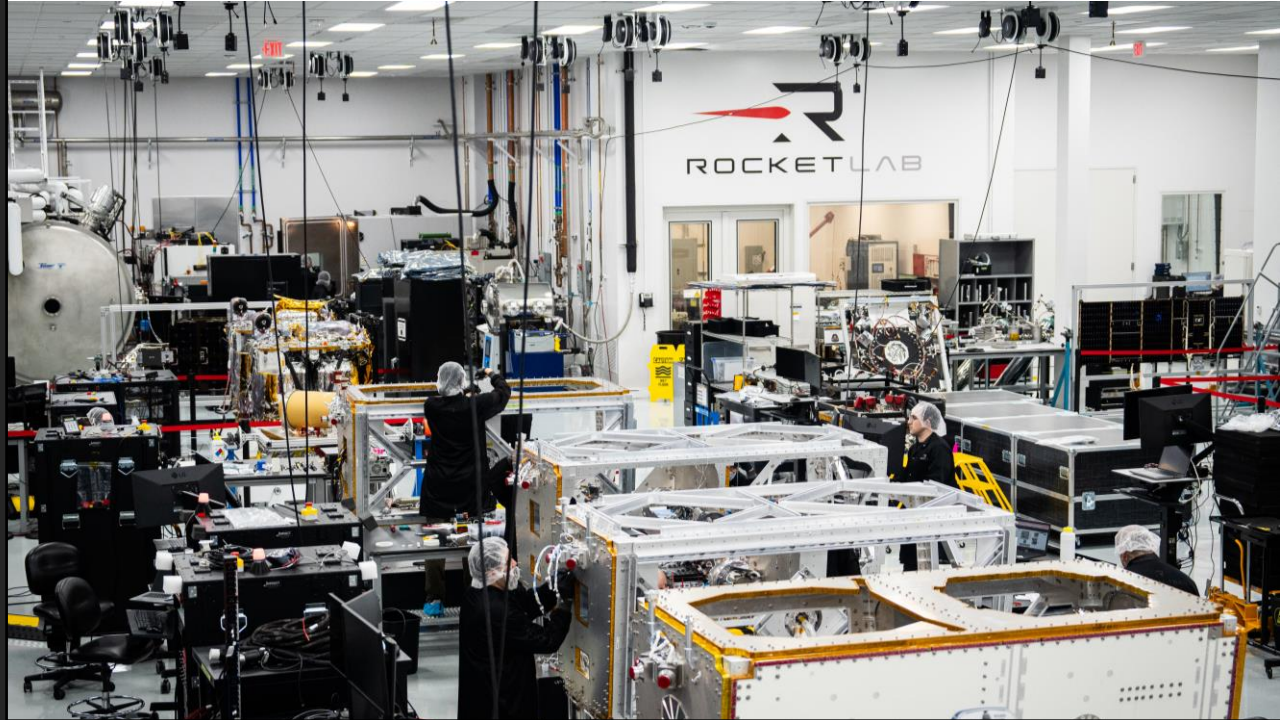
PERFORMANCE

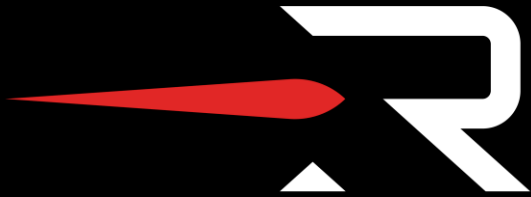
Many interfaces, many security gaps



OPERATIONS

Reducing dependency





ROCKETLAB

THE END-TO-END SPACE COMPANY

More than just a launch provider, Rocket Lab is uniquely positioned to be a leading end-to-end space company.



LAUNCH

THE RIDE
TO SPACE

60+

Launches completed.

3

Rockets spanning small, medium, and hypersonic test launches.

2nd

Most frequently launched U.S. rocket annually.



SPACECRAFT

THE MACHINES
IN SPACE

40+

Rocket Lab spacecraft in production.

16

Spacecraft in orbit, scheduled for launch, or expected to have completed missions by end of Q3 2025.

10+

Satellite component product lines.



OPERATIONS

THE ACTIONS
IN SPACE

200+

Cumulative years in space operations

80+

Successful mission operations

2+1

Moon operations twice, Mars operations coming soon



UNIQUE POSITION

E2E

From satellite
design to launch,
ensuring end to end
delivery

EFFICIENT

Optimize cost, reduce
3rd party bottleneck
and margins

INNOVATE

Internal R&D to
address market
trends and needs

AGILE

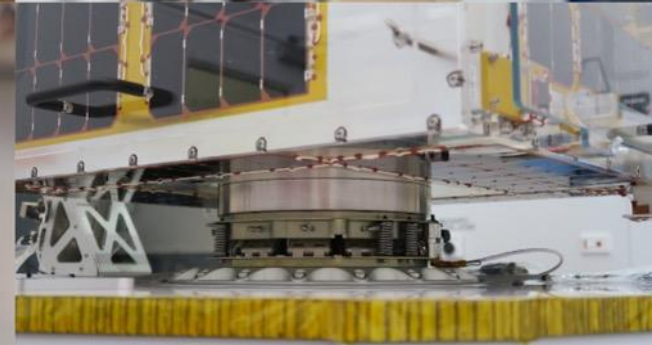
Insert new
technology at the
right time, every
time

CONTROL

Maintain consistent
performance,
ensuring
constellation
harmony

SPEED

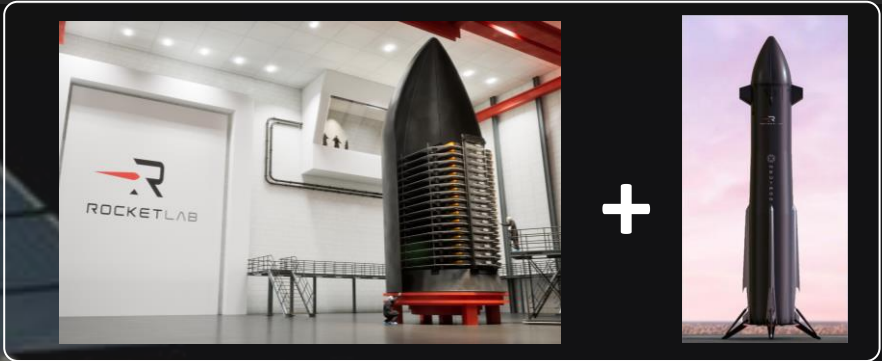
Build, launch,
service ahead of
competitors



CASE STUDY – Rocket Lab's Flatellite + Neutron

Introduction

A case study of Rocket Lab, with its Vertically Integrated satellite and rocket factories, is used as an example to illustrate vertical integration vs 5G NTN constellation success elements



Metrics

+ 50% - 100%

Efficiency optimization

Optimized faring volume for # of satellites with maximal payload efficiency

× 2 – 3X

Constellation rollout speed

Minimal 3rd party dependence, integrated program operations

– \$\$\$\$\$

Overall cost savings

Production line operation from beginning to the end, reusability everywhere

Conclusion



Global Coverage

Rapid deployment of satellites will attribute to success of global coverage



Cost Efficiency

Reuse of rockets, maximize launches, reduce cost on 3rd parties, harnessing economy of scale in house



Market Penetration

Expedited time to market due to integrated operations and deployments

WHO HAS THE KEYS TO SPACE

Early investment in vertical integration is key to win the 5G NTN race, and pave the way for 6G domination

5G is coming to space: to provide global high speed low latency connectivity, space is crucial for ubiquitous coverage and harmonious service offering

Vertical integration enables key aspects of rolling out 5G constellation such as cost efficiency and rapid deployment with seamless integration

Organizations will trade expenditure profile with cost, quality and speed, but everything in a constellation amplifies – failure and success

As we move towards 6G, companies that invest in vertical integration now will be better positioned to lead in the next generation of global communication



THANK-YOU

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