

Aerospace
Readiness: Market
Intelligence &
Positioning for
Success

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Africa



Introduction

Aerospace Readiness: Positioning Your Company to Seize Success

The Opportunity

- Unmanned
- Commercial
- Space

The Challenge

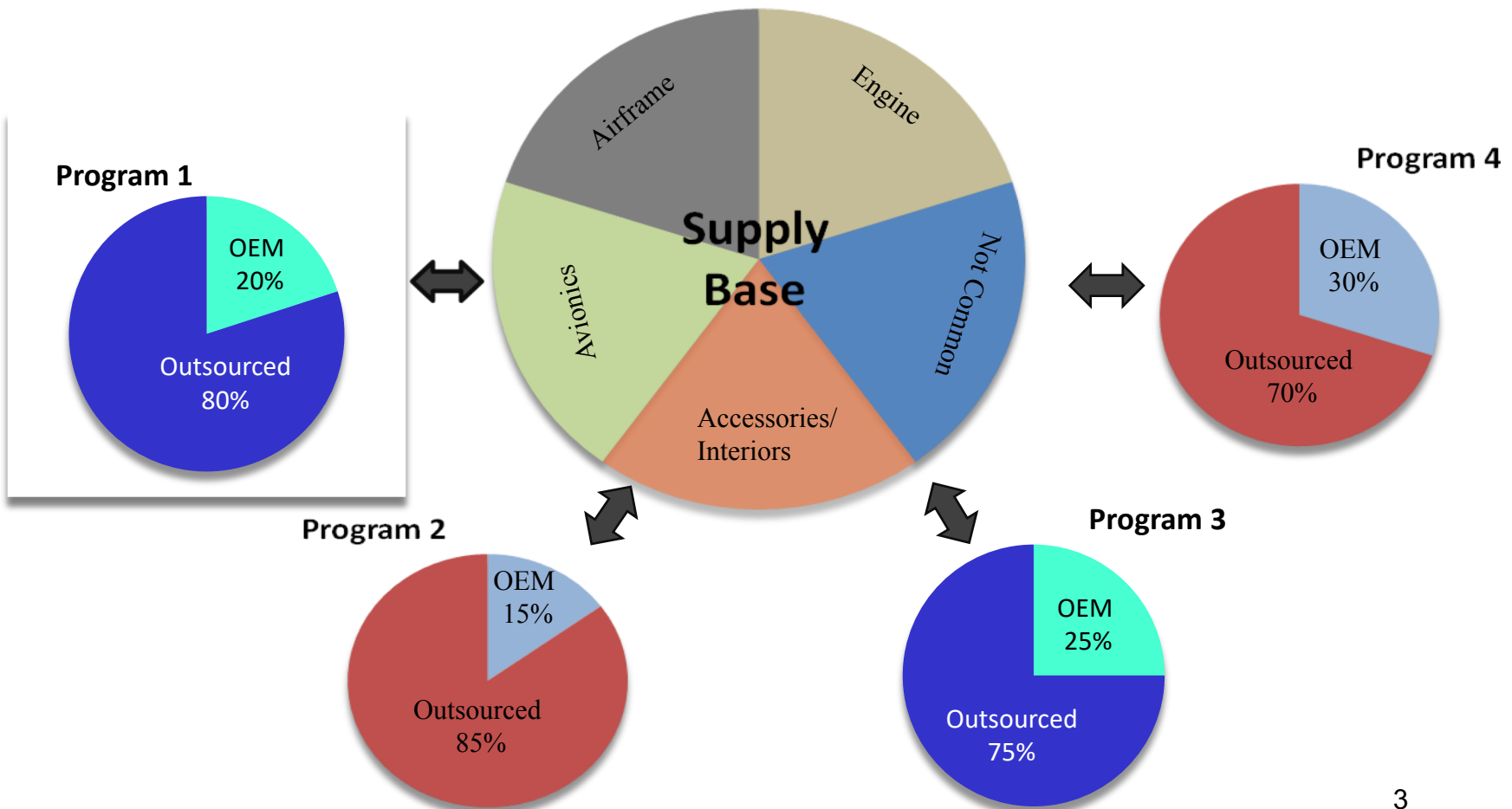
- Technology
- Workforce
- Vision/Innovation

The Response

- Strategy
- Knowledge
- Execution

The Supply Network/Chain is Critical to the Aerospace Enterprise!

- The Supply Base Is The Focal Point for Manufacturing (and Many Times MRO, Too)



Next Generation Supply Chain Characteristics

- Real time responsiveness to demand (agile and flexible)
- Performance based (customer is co-mgr of outcomes)
- Resilient (risk management/networked response/diagnostics)
- Dynamically configurable; analytical frameworks and tools
- Technology enabled visibility (process/factory floor/MRO)
- Co-management/co-creation of performance/innovation & metrics
- Real time status for recognition of performance leading indicators
- Knowledge and skills are source of advantage (build sustainable talent pipeline)

“Outsource capacity-never capability”

The Opportunity

- Unmanned Market – The Next 5 to 10 Years
Market Value (Estimate) to 2025: \$50b+
- Commercial Market – The Next 20 Years
Market Value (Estimate) to 2037: \$6T+
- Space – The Next 50 Years? 100 Years?
Market Value (Estimate) to ??:

Unmanned Aerial System Uses

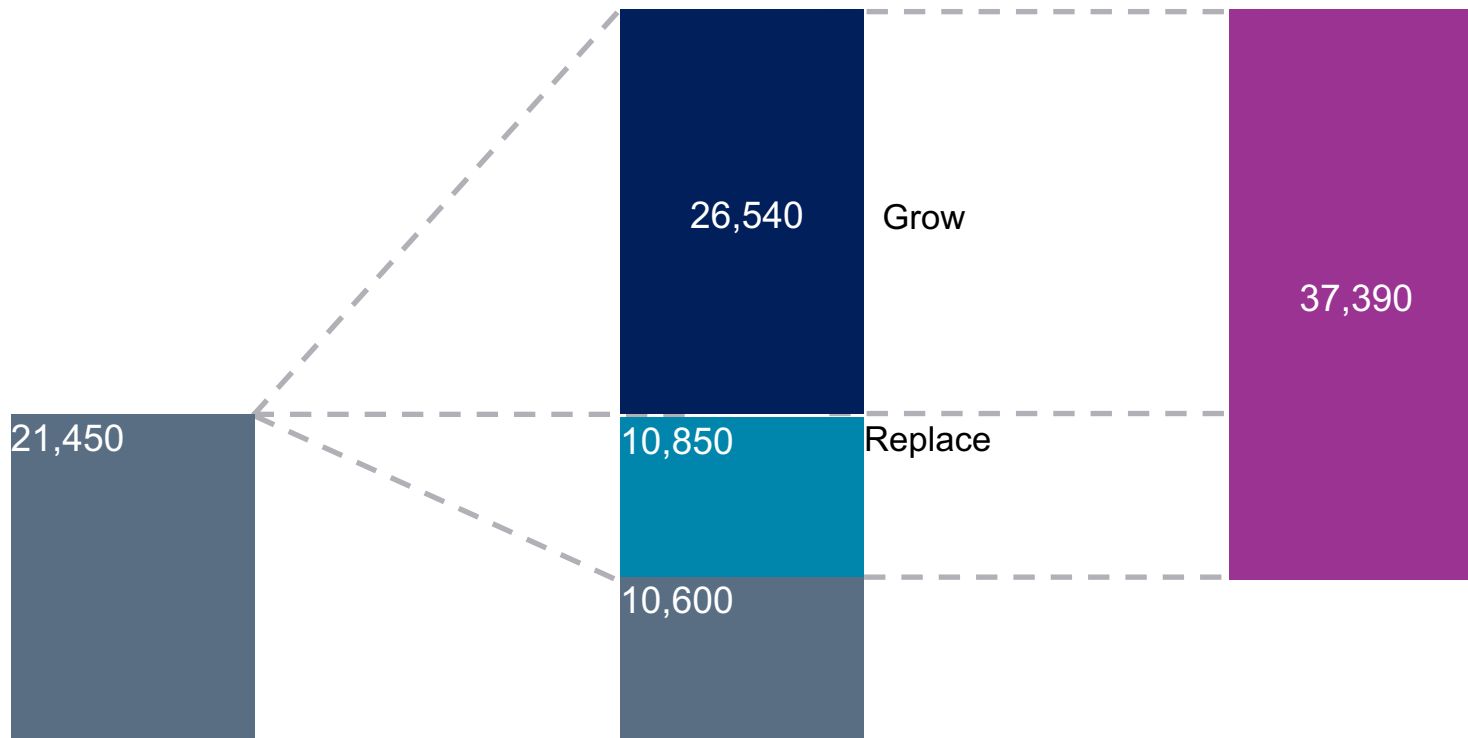
Military

- Targets and Decoys
- Intelligence, Surveillance and Reconnaissance
- Search and Rescue
- Security and Force Protection
- Air Refueling
- Communications
- Logistics Missions
- Munitions Delivery
- Counter UAS Operations

Commercial

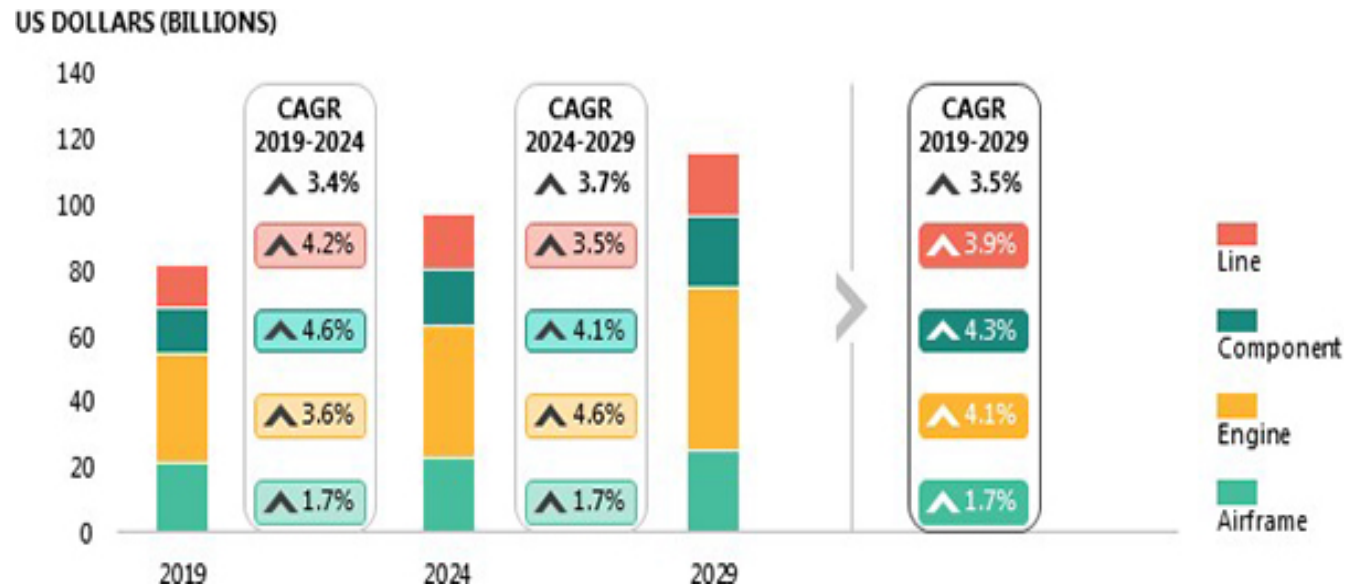
- Power, Pipeline, Road, Rail Monitoring
- Agriculture
- Search and Rescue
- Law Enforcement and Investigation
- Pollution/Environmental/Wildlife Monitoring
- Science and Research
- Mail/Freight
- Disaster Response/Relief
- Imagery and Mapping
- Maritime/Shipping Monitoring
- Communications

Number of Passenger Aircraft Will More Than Double in the Next 20 Years



Source: Airbus GMF 2018

MRO Global Spend 2019 – 2029 Raising to US\$116B



Source: Oliver Wyman

Space: Market Growth Near Limitless?

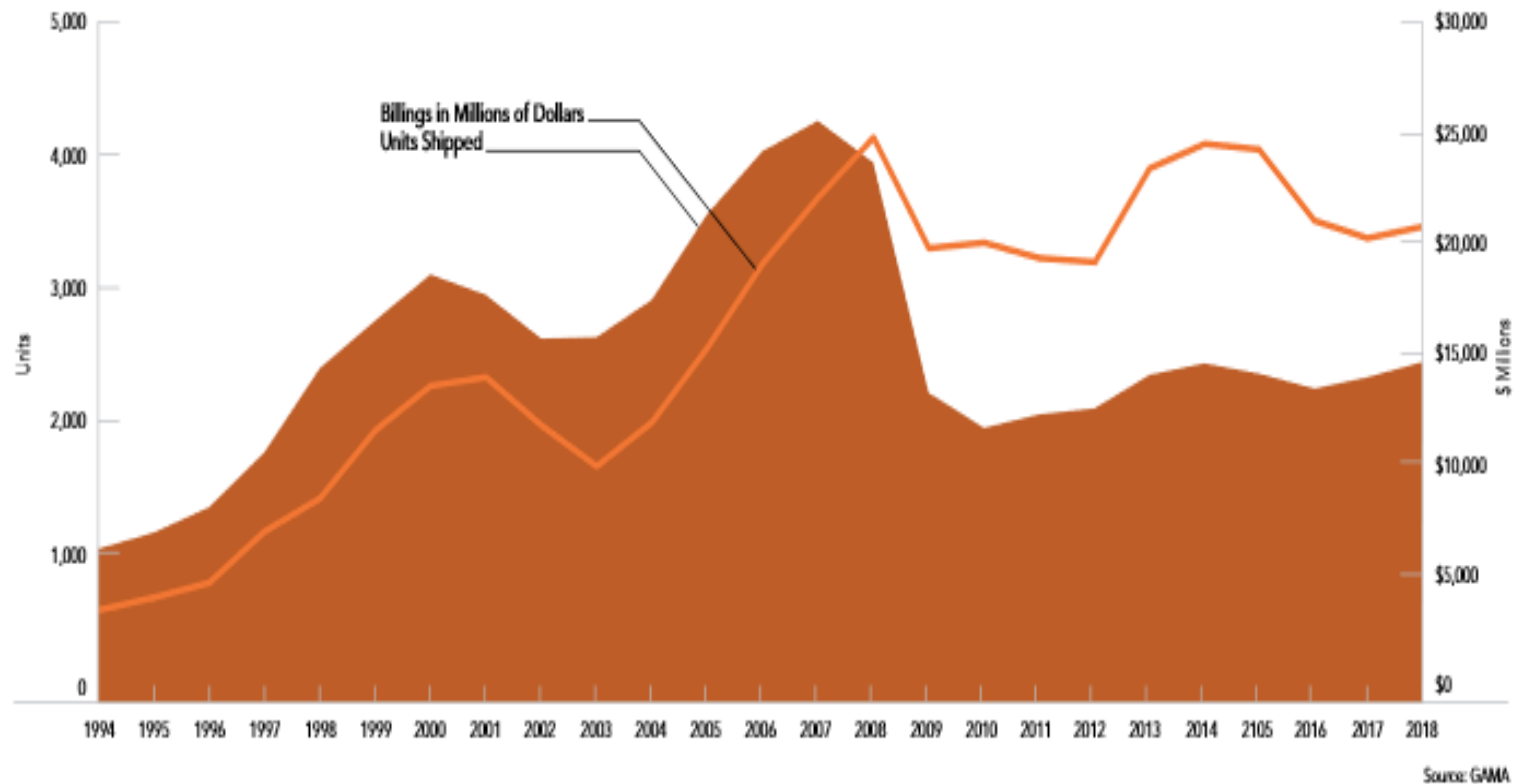
Exhibit 1: Space Age 2.0 in a nutshell



Source: BofAML Global Research based on various sources

A Quick Look at General Aviation

FIGURE 1.1 General Aviation Airplane Shipments and Billings Worldwide (1994–2018)



A Quick Look at General Aviation – Con't

1.3 Customer Delivery Region (in Percent of Total) for General Aviation Airplane Shipments by Type of Airplane Manufactured Worldwide (2007–2018)

Year	Piston					Turboprop					Business Jet				
	North America	Europe	Asia-Pacific	Latin America	Middle East & Africa	North America	Europe	Asia-Pacific	Latin America	Middle East & Africa	North America	Europe	Asia-Pacific	Latin America	Middle East & Africa
2007	66.5	16.3	9.2	5.4	2.7	57.2	16.3	8.6	14.4	3.4	58.3	24.9	4.2	7.5	5.2
2008	68.1	15.2	7.5	7.3	2.0	57.3	21.9	6.0	7.4	7.4	53.8	25.9	4.7	9.4	6.3
2009	59.4	21.2	9.5	6.8	2.8	57.8	17.5	8.7	8.1	7.8	49.4	26.3	8.6	9.2	6.4
2010	53.4	18.6	13.7	8.8	5.5	43.2	15.2	16.8	14.7	10.1	42.1	22.8	11.8	14.3	9.0
2011	57.7	12.0	15.6	10.0	4.6	52.6	14.1	14.4	13.6	5.3	50.0	20.2	12.9	10.1	6.8
2012	50.4	19.6	16.3	9.7	4.1	48.6	12.6	17.4	14.5	6.9	49.7	20.8	11.8	11.6	6.1
2013	52.8	17.2	15.1	10.0	5.0	57.1	10.5	14.0	13.2	5.3	52.4	15.6	11.9	11.1	9.0
2014	55.1	19.7	12.1	8.9	4.3	51.3	7.7	19.4	15.3	6.3	52.2	19.5	10.9	9.4	7.9
2015	66.7	11.4	13.5	6.3	2.2	56.2	6.6	16.3	14.5	6.3	60.8	18.0	9.2	7.1	4.9
2016	69.6	10.1	10.2	5.8	4.3	57.8	10.6	13.2	9.9	8.4	62.0	18.8	7.7	6.2	5.3
2017	65.6	9.5	13.4	5.9	5.6	54.2	12.8	14.1	15.5	3.4	63.8	17.0	9.9	5.3	4.0
2018	61.5	10.8	18.5	5.0	4.1	49.8	12.9	15.1	14.9	7.2	65.1	15.4	10.0	5.8	3.7

Source: GAMA

A Quick Look at General Aviation – Con't

5.2b South Africa—Number of Registered by Type and Certification (2013–2018)

Year	Aircraft Type						Type Certified	Non Type Certified	Total Aircraft
	Piston-Engine Powered	Turboprop	Turbojet	Rotorcraft	Recreational	UAS			
2013	3,727	517	485	1,187	5,874	n/a	5,914	5,889	11,803
2014	3,779	516	492	1,207	5,992	n/a	5,994	5,992	11,986
2015	3,796	529	501	1,227	6,106	n/a	6,053	6,106	12,159
2016	3,805	532	511	1,268	6,198	252	6,126	6,203	12,589
2017	3,804	534	522	1,318	6,287	517	6,165	6,293	12,936
2018	3,823	552	521	1,357	6,332	796	6,253	7,128	13,381

The data is updated on March 31 of the year listed.

Source: South African Civil Aviation Authority, www.caa.co.za

The South African Civil Aviation Administration (CAA) changed how it publishes aircraft registration statistics. Table 5.1a shows the old data structure. Table 5.2b shows the new data structure. Non-Type Certified Aircraft (NTCA) are regarded as experimental aircraft. Not all NTCA are experimental aircraft. Experimental refers to construction being mainly amateur-built. There are also production built NTCA that are built to a standard.

The Challenge

- Technology
Automation, Materials, Environmental, Manufacturing
- Workforce
Skills, numbers, STEM
- Vision/Innovation
Sense and Respond

Continued Technological Advancement

- Artificial Intelligence
- Augmented Reality
- Wider use of composites & “Smart” materials
- Robotics
- Sensors: Smart Machines and On-board Prognostics
- Additive Manufacturing (3d Printing)
- Data-Driven Manufacturing – security and sharing
- Process Transformation

Smart Workers for Smart Machines and Products

Skills Across Multiple Domains – Appropriate STEM+

- Scientific literacy: general knowledge and understanding of scientific concepts and processes
- Technological literacy: understanding about technology and how it can be used to achieve a specific purpose or goal.
- Engineering literacy: ability to use the systematic and creative application of scientific and mathematic principles to practical ends.
- Mathematical Methods: understanding basic mathematics (up to algebra) and how and when to use.
- Information literacy: ability to find, access, and use information as well as the ability to evaluate the credibility of the information.
- Teaming and collaboration: work in a structured environment, and exhibit trust and respect towards one another through cooperative interaction.
- Adaptability and Managing Complexity: ability to recognize and understand that change is a constant, and to deal with change positively.

Innovation or Invention?

- Innovation*, *making processes and things better*:
 - Has replaced price as basis of competition globally
 - Is best managed and routinized as a process
 - Is encouraged by economic incentives
 - Requires enforceable contracts and immunity from arbitrary expropriation
 - Benefits expanded by opportunities for profitable dissemination and rental (e.g. licensing)
- Invention, *creating brand new things*
- Innovation is also the ability to create and produce economic value from invention

* Adapted from: The Free-Market Innovation Machine, by William J. Baumol, 2002

The Response

- Strategic Planning
- Market Knowledge/Intelligence
- Execution Basics

Strategic Planning

- Strategic planning is an organization's process of defining its strategy, or direction, and making decisions on allocating its resources to pursue this strategy, including its capital and people – Wikipedia
- Strategic planning is the continuous process of making present entrepreneurial (risk taking) decisions systematically and with the greatest knowledge of their futurity; organizing systematically the effort needed to carry out these decisions; and measuring the results of these decisions against expectation through organized, systematic feedback – Peter Drucker, *Management Tasks and Responsibilities*
- The science of making good decisions about the future – The Science of Strategy Institute

“You have to be fast on you feet and adaptive or else a strategy is useless” – Charles de Gaulle

Vision, Mission & Value Proposition: Building Blocks to Good Strategy

- **Vision:** a guiding statement for the organization - internally focused that will “energize and excite” employees toward achievement of the desired end state.
 - vision statements that are best are short and easily remembered.
- **Mission:** is usually directed to how the vision will be accomplished and should be more directed to the customer/market base of the organization.
 - makes it clear what the organization is offering
 - excites the customer/market base about engaging the organization - clear and compelling
- **Value Proposition:** explains why a customer will benefit from dealing with the organization.
 - helps “sell” a customer on an engagement.
 - provide an understanding of how the vision and mission will make it successful in customers’ eyes

Market Intelligence: Sun Tzu May Have Said



“If you know the competition, and know your industry and business, you need not fear the result of globalization. If you know your industry and your business but not the competition, for every victory gained in the market place you will also suffer a defeat. If you know neither the competition nor your industry and business, you will succumb and cease to thrive.”

Execution is Critical

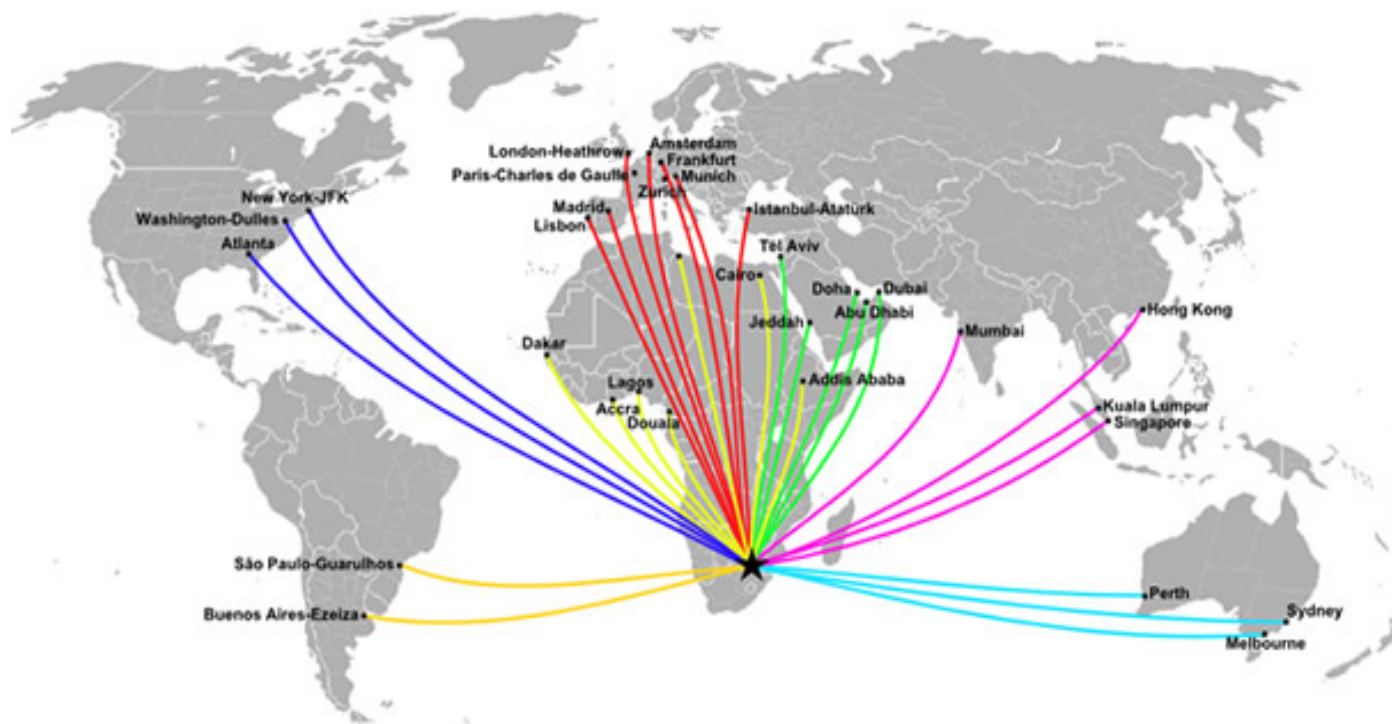
Align organization and structures to strategy.

Focus on and be clear about what matters most. Don't get diverted by every good idea.

Focusing on leading outcomes/behaviors not solely on overall results.

Holding people accountable; for not only their own performance but that of the team. Shared accountability is powerful.

Geolocation Considerations



“I haven’t tried it yet,” the knight said, gravely; “so I can’t tell for certain – but I’m afraid it will be a little hard”

*Lewis Carroll:
Alice’s Adventures in Wonderland*



“If where easy; why are we doing it?”

Thank you
for your time!

Questions?

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