DECODING THE NEXT

STRATEGIC INTELLIGENCE
& FORESIGHT PRIMER

Today's challenges call for strategic innovation

The world is changing faster than ever. Staying competitive requires increasing pace and flexibility.

Many companies struggle to keep up: Rapid technological progress can outrun today's skills and mindsets. Geopolitical and macro-economic uncertainty reduce planning horizons and increase risk. Climate change and changing customer needs add additional complexity, threatening traditional business models and opening countless opportunities for growth.

We help Lufthansa Group and the travel industry move at the pace of the change.

TECHNOLOGICAL PROGRESS

INNOVATION GAP
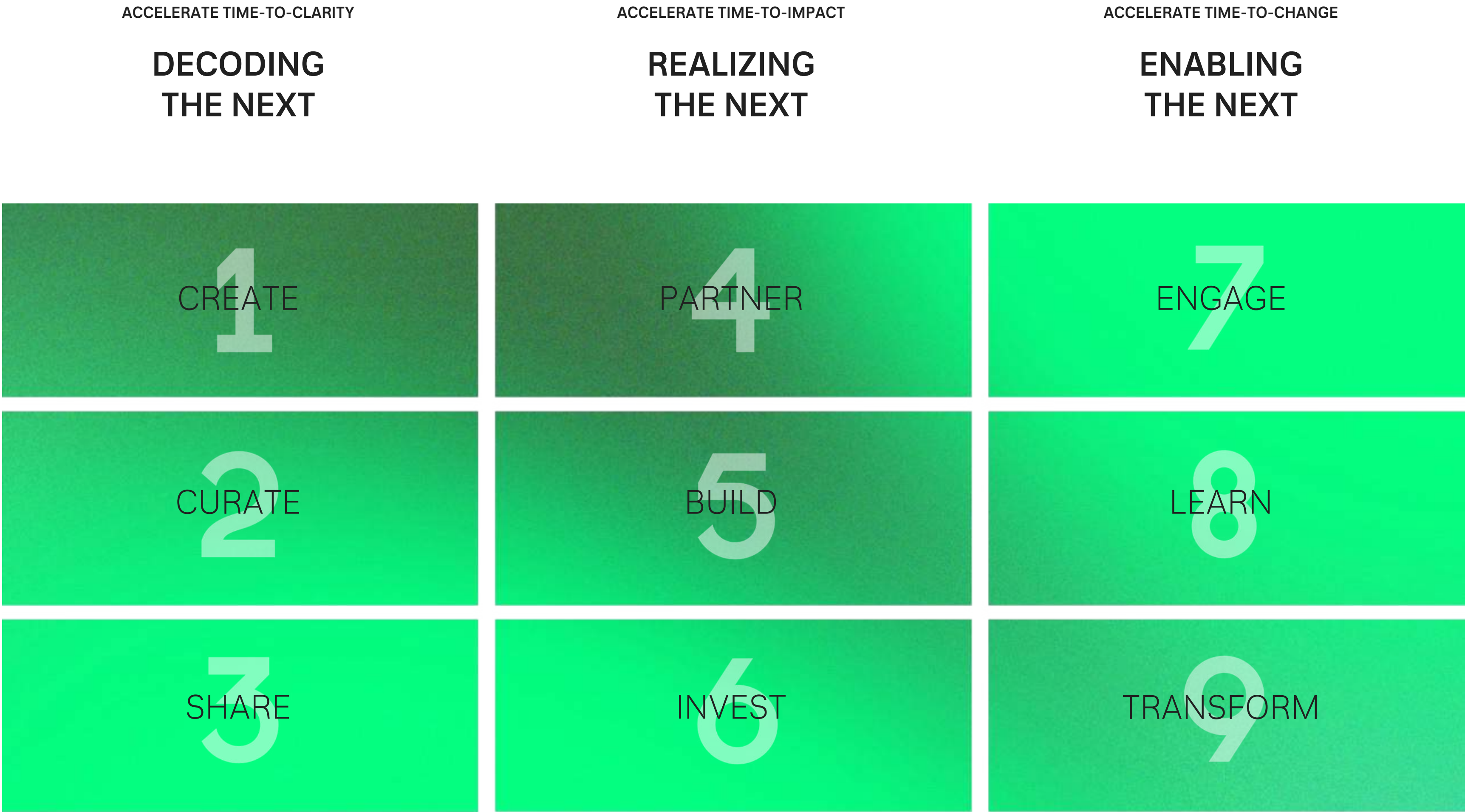
ORGANIZATIONAL ADOPTION

ACCELERATE THE NEXT IN TRAVEL

THE NEXT IN TRAVEL IS YET TO BE BUILT

Accelerating innovation requires more than just moving fast. True acceleration comes from aligning momentum, achieving escape velocity, and maintaining pace across all dimensions of change.
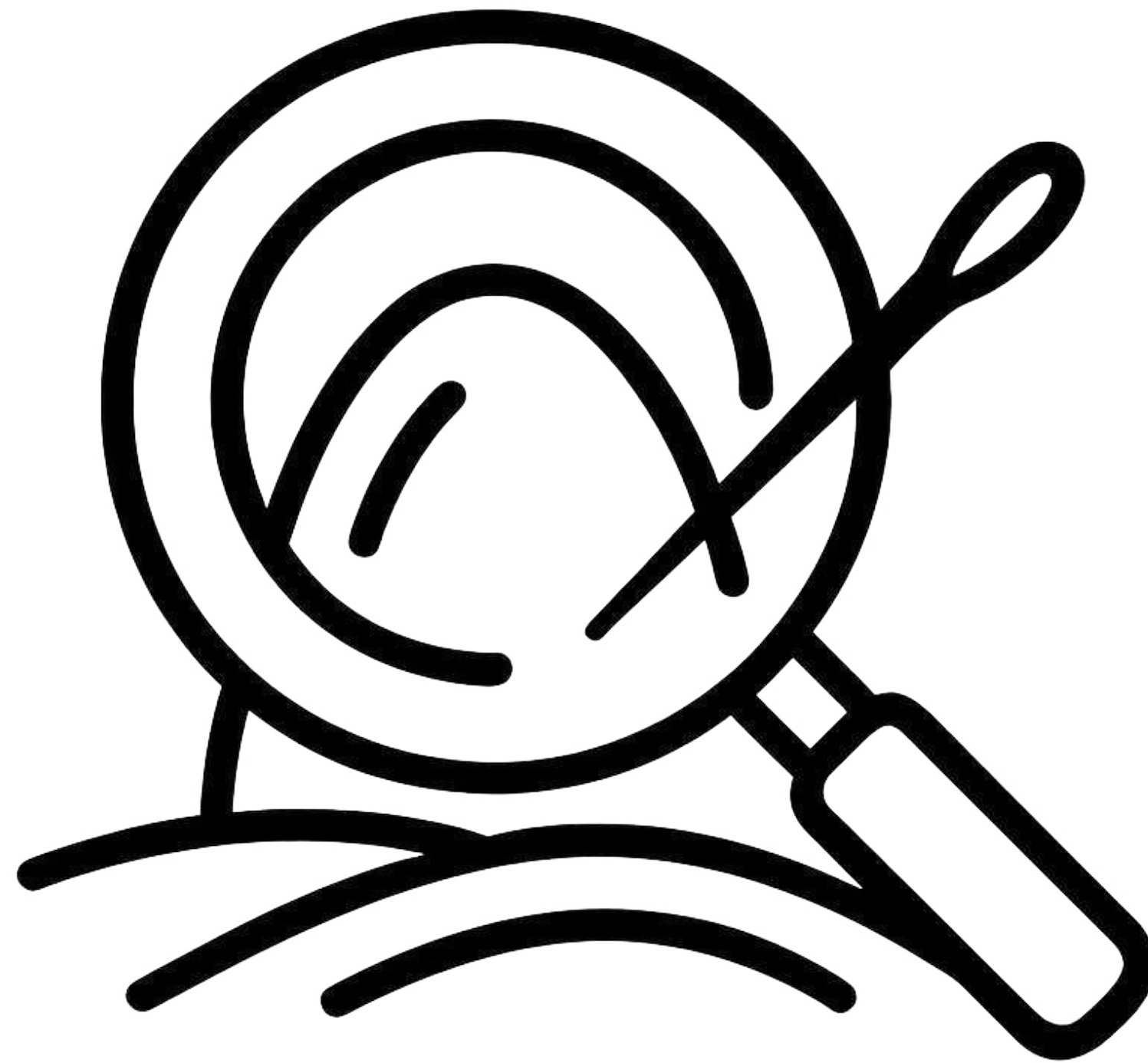
We have defined nine key components. While each component is already powerful on its own, together, they bring the NEXT to life.

This is not just a sprint; it's about building the long-term capacity to lead in a rapidly evolving industry.

ACCELERATE TIME-TO-CLARITY	ACCELERATE TIME-TO-IMPACT	ACCELERATE TIME-TO-CHANGE
DECODING THE NEXT	**REALIZING THE NEXT**	**ENABLING THE NEXT**
CREATE 1	PARTNER 4	ENGAGE 7
CURATE 2	BUILD 5	LEARN 8
SHARE 3	INVEST 6	TRANSFORM 9

WHY
THE CORPORATE NEED FOR SPEED

HOW

STRATEGIC INTELLIGENCE
AT THE SPEED OF CHANGE

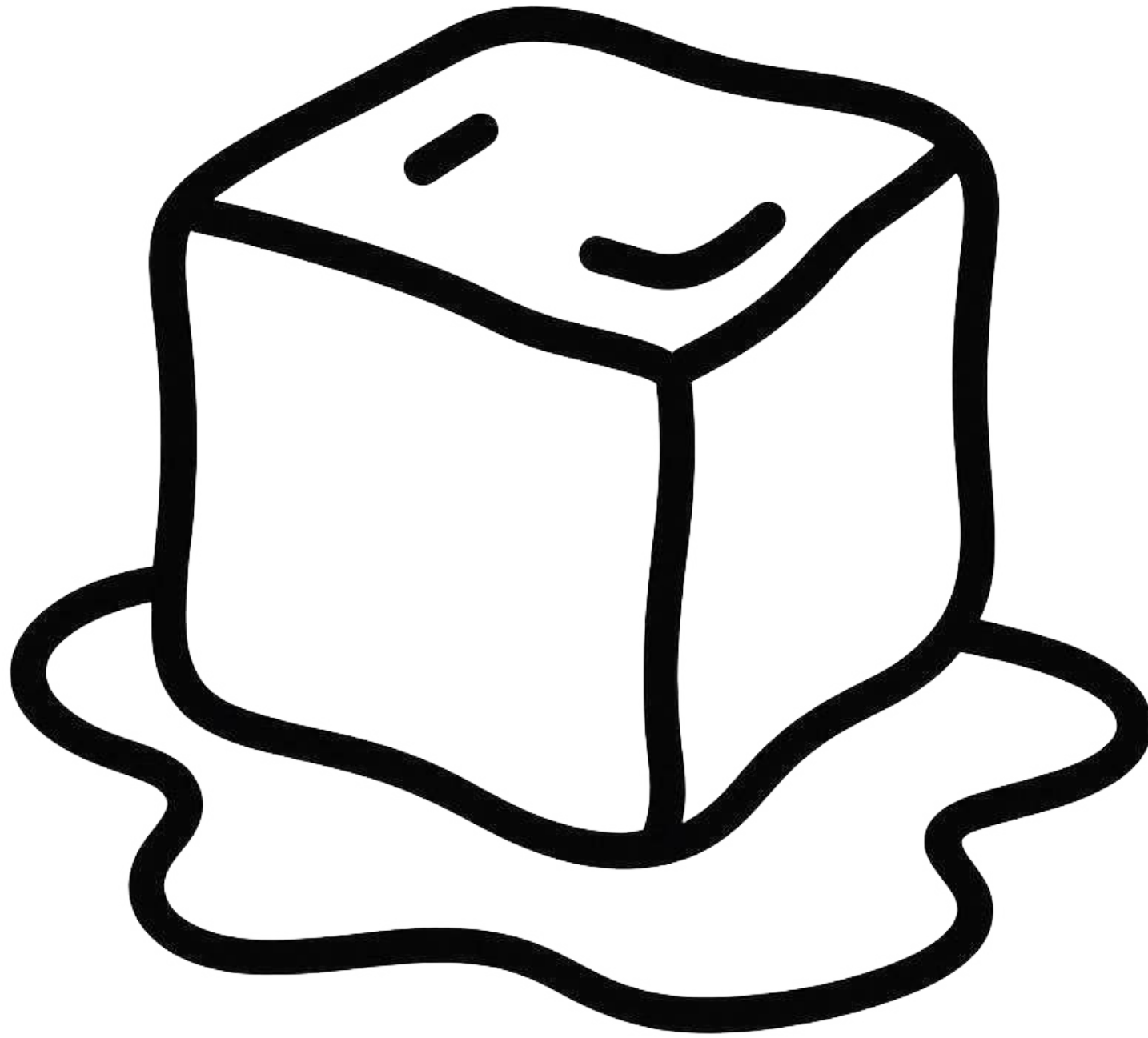|	NOW.	NEW!	NEXT?	
INDUSTRY	NOW **Market Intelligence**	NEW **Competitor Intelligence**	NEXT **Structural Intelligence**	*Arena Intelligence*
HUMANITY	NOW **Customer Intelligence**	NEW **Audience Intelligence**	NEXT **Lifestyle Intelligence**	*Cultural Intelligence*
TECHNOLOGY	NOW **Operational Intelligence**	NEW **Technology Roadmaps**	NEXT **Frontier Intelligence**	*Tech Intelligence*
	Business Intelligence	**Trend Intelligence**	**Futures Intelligence**	

STRATEGIC INTELLIGENCE

Decoding the NEXT: Agenda-Setting Insights

Strategic Intelligence, acts as a connective layer across the full spectrum of intelligence types—integrating insights from industry, humanity, and technology while spanning the temporal range from **NOW and NEW to NEXT**.

Unlike traditional Business Intelligence, which often leans heavily on internal data and present-focused metrics, our mission emphasizes external sensing and forward-looking insight.

By triangulating market signals, cultural shifts, emerging technologies, and long-term futures thinking, Strategic Intelligence ensures the organization is not just responsive to change, but actively anticipates and shapes it.
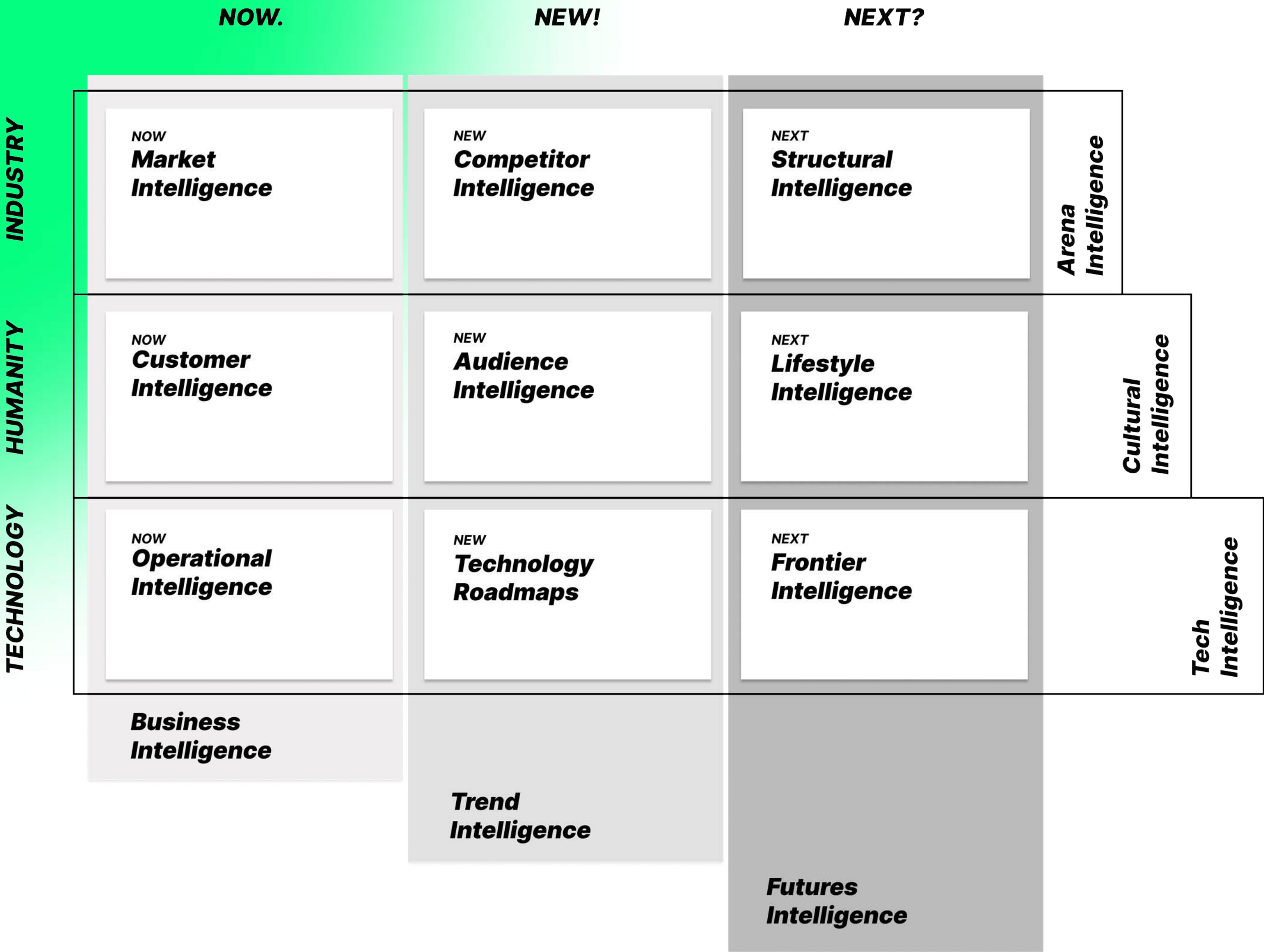
GENESIS

SYNTHESIS

ANALYSIS

INDICATOR STACK

**Decoding the NEXT:
Agenda-Setting Insights**

The Indicator Stack is our foundational framework for systematic data collection and analysis. It provides an architectural approach to building a comprehensive **intelligence foundation.**

Dynamic Adaptation:

— Evolves with new data sources and capabilities

— Adapts to changing strategic priorities

— Scales with organizational maturity

Bias Mitigation:

— Ensures comprehensive coverage across signal types

— Prevents over-reliance on familiar sources

— Reduces confirmation bias through diversity

LAGGING INDICATORS   ## LEADING INDICATORS

IMPACT	OUTCOME	OUTPUT	INPUT
Making sense of results	Making sense of resonance	Making sense of action	Making sense of interest

CONSUMER SENTIMENT	**INDUSTRY NARRATIVE**	**ACTOR DYNAMICS**	**FUNDING DYNAMICS**
Reviews	Media Sentiment	Founding Dynamics	Venture Capital
Social Listening	Earnings Calls	Product Launches	CVC
NPS & Customer Satisfaction	Trend Reports	Startup Partnerships	R&D Expenditure
	Features & Awards	Personnel Dynamics	
kimola NETBASE QUID	feedly NETBASE QUID	feedly Thinknum	PitchBook dealroom.co

MARKET DYNAMICS	**USER BEHAVIOUR**	**TECHNOLOGY DYNAMICS**	**SCIENTIFIC INTEREST**
Stock Performance	Search Behaviour	Patents	Research Grants & Projects
Market Shares	App DLs & Usage	Wikipedia Edits	Published Papers
Sales Data, Growth Rates	Website Visits	Tech Momentum	
statista	Google data ai	PATENTSIGHT WIKIPEDIA	feedly Google Scholar

VENTURE CAPITAL
FUNDING

VC FUNDING DYNAMICS

The Rise and Fall of Venture Capital

Reviewing the past decade of Venture Capital investments in Travel and Mobility Tech.

Prior to 2020, the Venture Capital market, particularly within Travel and Mobility Tech, experienced rapid expansion.

This period was marked by the winner-takes-all playbook of asset-light tech startups in segments such as ride-hailing, shared accommodations, and electric scooters and bikes.

Since the pandemic, however, there has been a significant shift.

The once-celebrated model of (unprofitable) VC-backed hypergrowth has been scrutinized, shifting perceptions about what constitutes a disruptive and sustainable startup.

A Mega Decade: The Rise & Fall of Venture Capital Investments
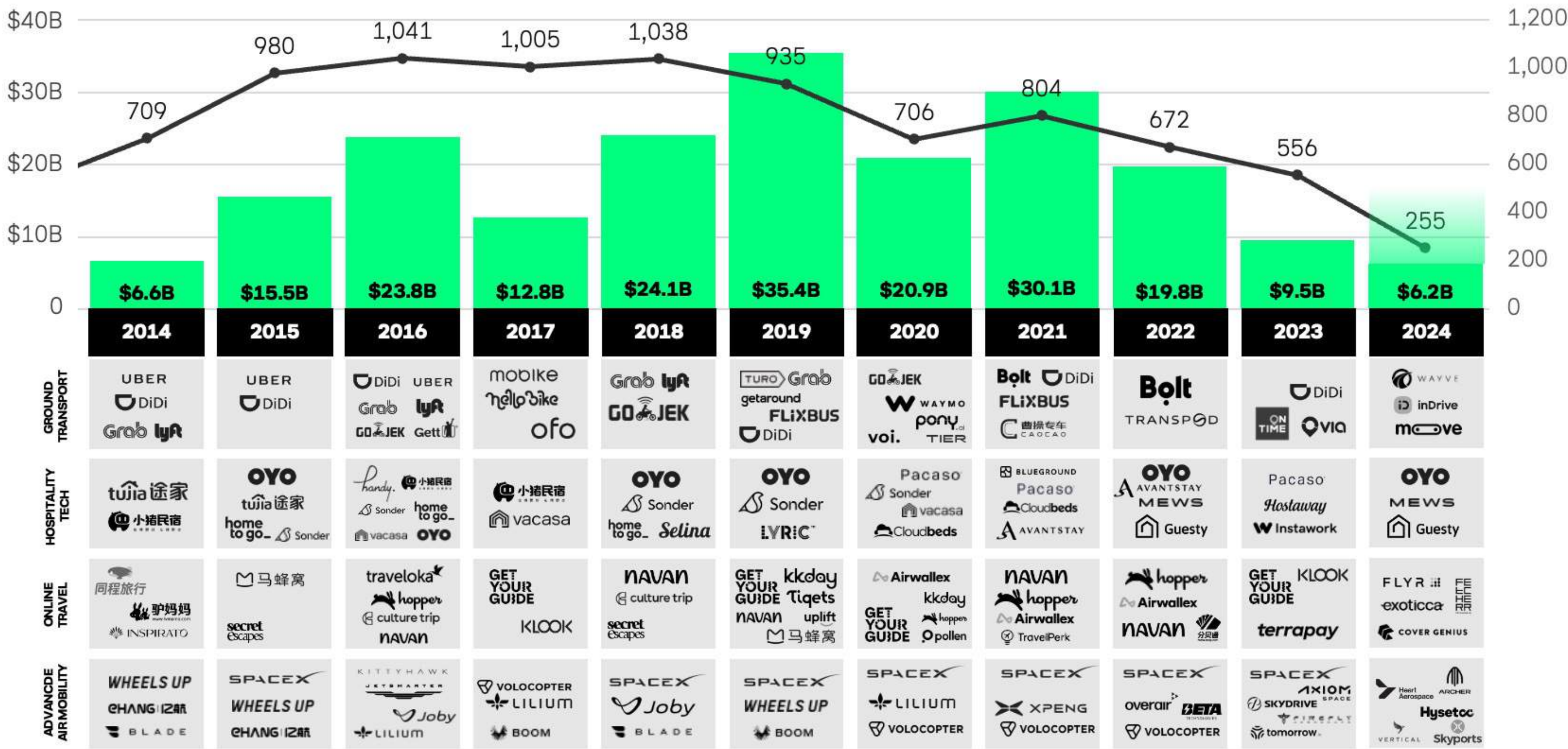
Source: Lufthansa Innovation Hub, TNMT.com, PitchBook Data Inc.

Ground Transportation
59,4%

New Air Travel
19,2%

WAYMO	易航智能 YIHANG.AI	TIER	OXA Universal Autonomy	Lime	LUUP
Yassir	UFO DRIVE	SPOT HERO	SHARE MOBILITY	CIRCUIT	TRANZER
WeMo Scooter	TURO	轻舟智航 QCRAFT	Gridwise	hiyacar	NECTURE
A I	FLiXBUS	optym	daytrip	SWAT MOBILITY	voi.
Fuuse	LIZY	Transreport	zeelo	yulu	pony.ai
pathao	BUSUP	ZYPP	invygo	tembici	DiDi
	UNAGI	spare	LIMOLANE THE OTHER SIDE OF TRAVEL	inDrive	BLACKLANE UPGRADE YOUR TRAVELS
TURBI CAR ON DEMAND	dott	DEEPROUTE.AI	rapido BIKE TAXI	WAYVE	distribusion
kyte.	haydenAI	Applied Intuition	BluSmart	moove	...

深蓝航天 DEEP BLUE AEROSPACE	twelve	HERMEUS	Engine
FLYR	VERTICAL	Skyports	OYO
FIREFLY AEROSPACE	ZEROAVIA	ARCHER	Guesty
KOLOMA	Joby	BETA TECHNOLOGIES	MEWS
Heart Aerospace	Hysetco	...	...

Online Travel
13,5%

COVER GENIUS	Tourlane	TripFactory	mindtrip.
exoticca	point.me	Cruisebound	...

Ground Transport leads the charge of new unicorn formations

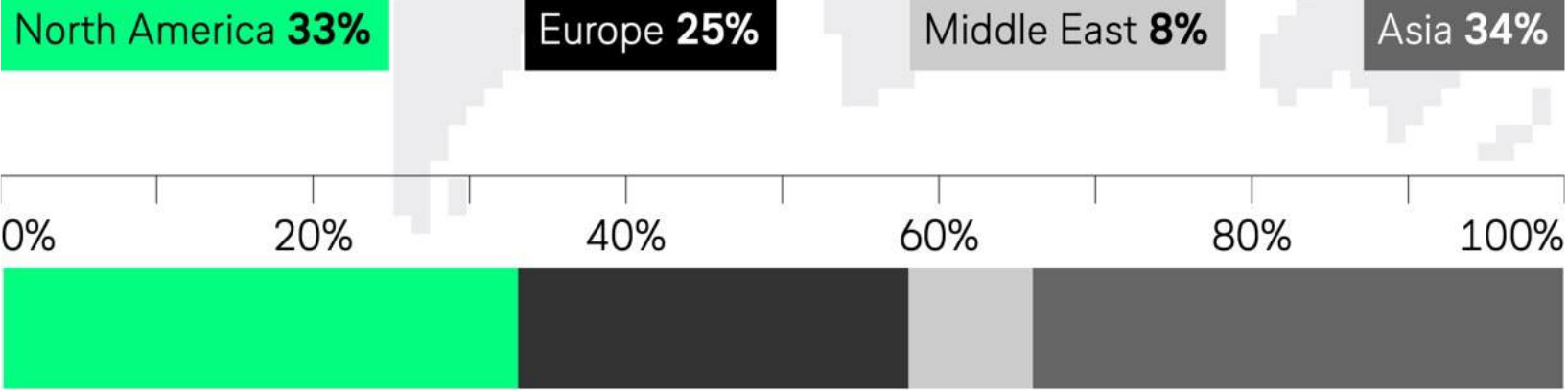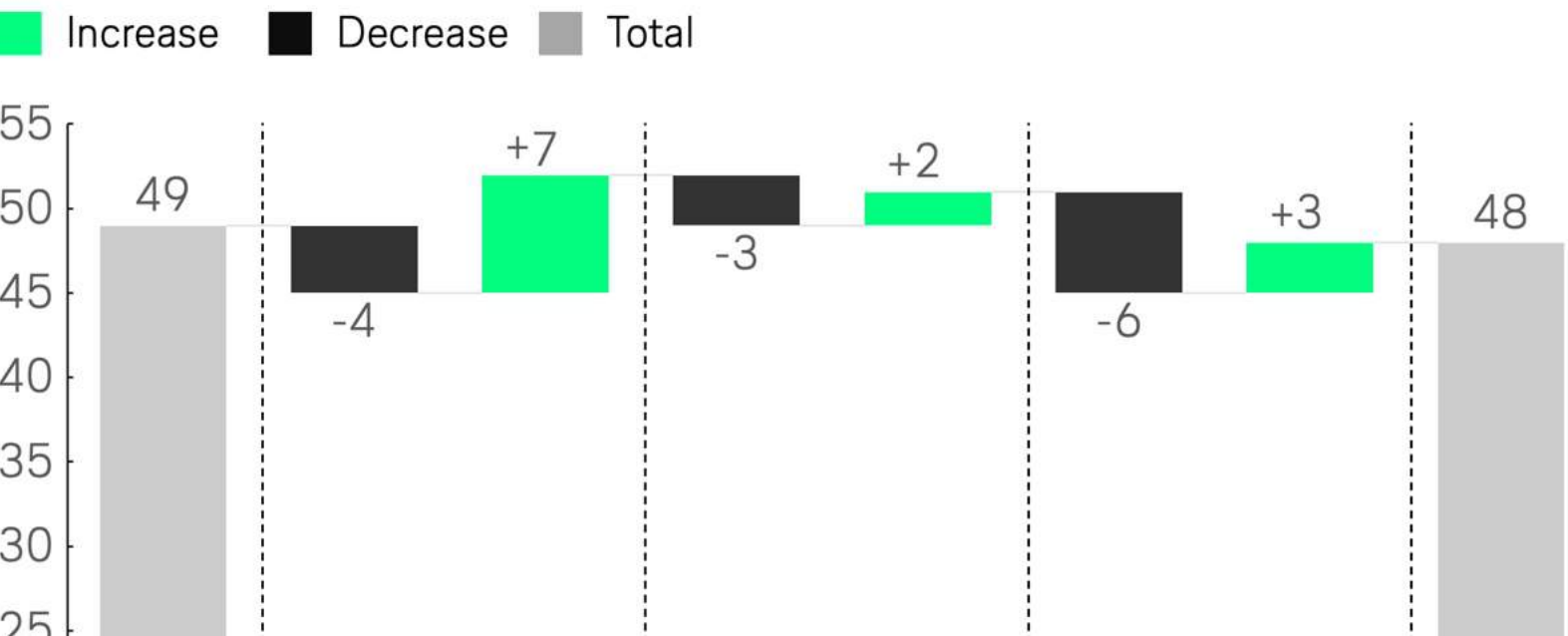**New Travel and Mobility Tech unicorns since 2022, by category**

| Ground Transportation 67% | Hospitality 17% | |
| | New Air Travel 8% | Travel Rewards 8% |

The unicorn mix-up: dynamic shifts in Travel and Mobility Tech

Number of unicorns in Travel and Mobility Tech

- Increase
- Decrease
- Total

Values: 49, −4, +7, −3, +2, −6, +3, 48

(Y-axis: 55, 50, 45, 40, 35, 30, 25)

North America **33%**   Europe **25%**   Middle East **8%**   Asia **34%**

(X-axis: 0%, 20%, 40%, 60%, 80%, 100%)

The unicorn inception has slowed down considerably after 2021

Number of new Travel and Mobility Tech unicorns by year

New VC era

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Value	1	2	1	4	7	6	3	15	7	2	3
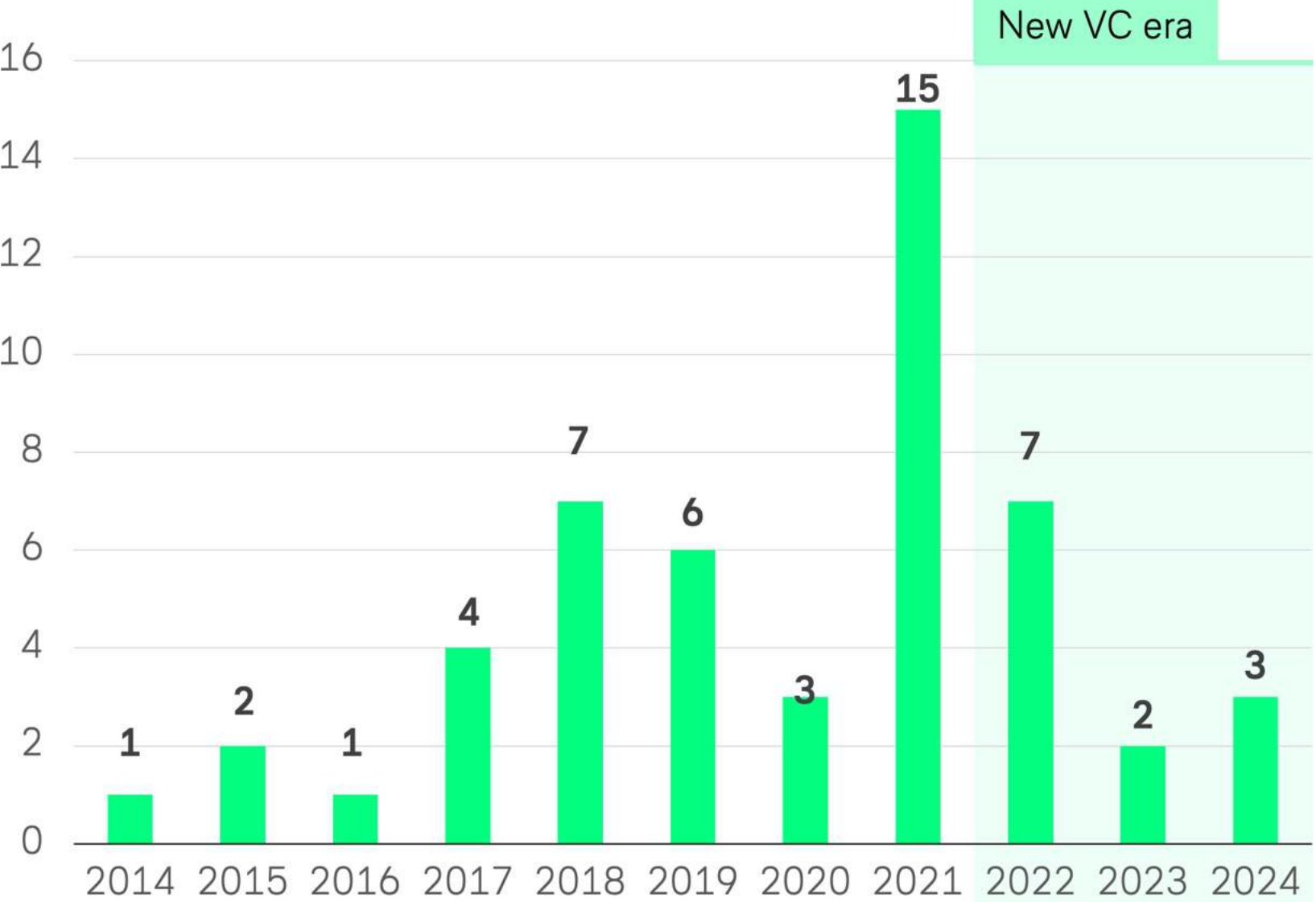
Most new unicorns come from Asia and North America

Companies shown on map: klook, hopper, OXA, BLUEGROUND, zongmu, Bolt, SIERRA SPACE, navan, cabify, optibus, NIUM, via, THE BORING COMPANY, AXIOM SPACE, S, MEWS, OLA, fullstory, SPACEX, OYO, Engine, AWAY, traveloka, TURO, BETA, rapido, BOOM, Applied Intuition, Pacaso, BILT

Countries: France, Germany, Canada, UK, Estonia, USA, Spain, Israel, China, The Netherlands, India, Singapore, Indonesia
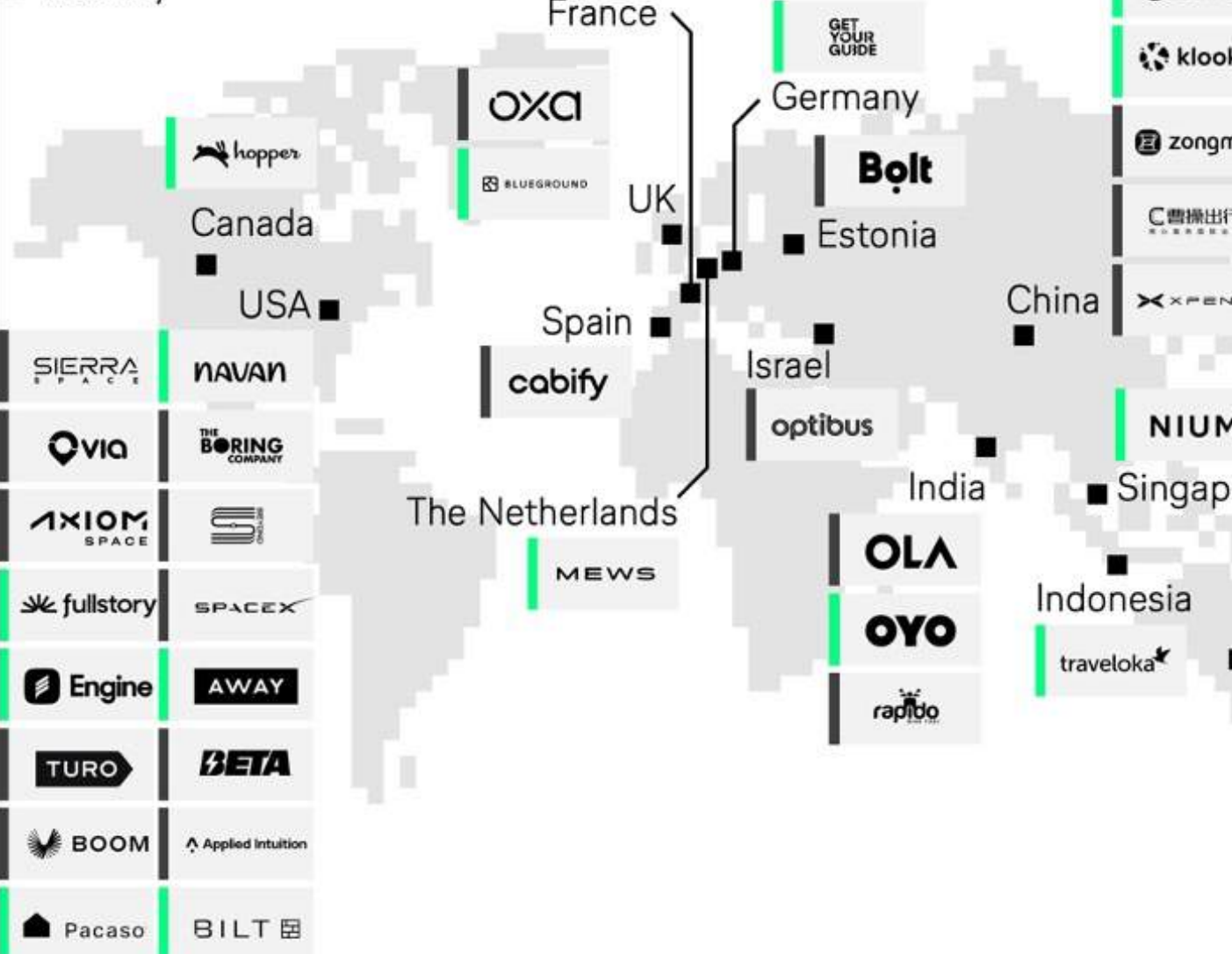
Most unicorns that left the list w on to become public companies

Number of unicorns in Travel and Mobility Tech that left billion-dollar startup club since 2022 by event type

Event type	Value
Went Public	(4)
Valuation Decline	3
Acquired/Merged	2
Bankrupted	1
Excluded on basis of methodology	2

(X-axis: 0, 1, 2, 3, 4)
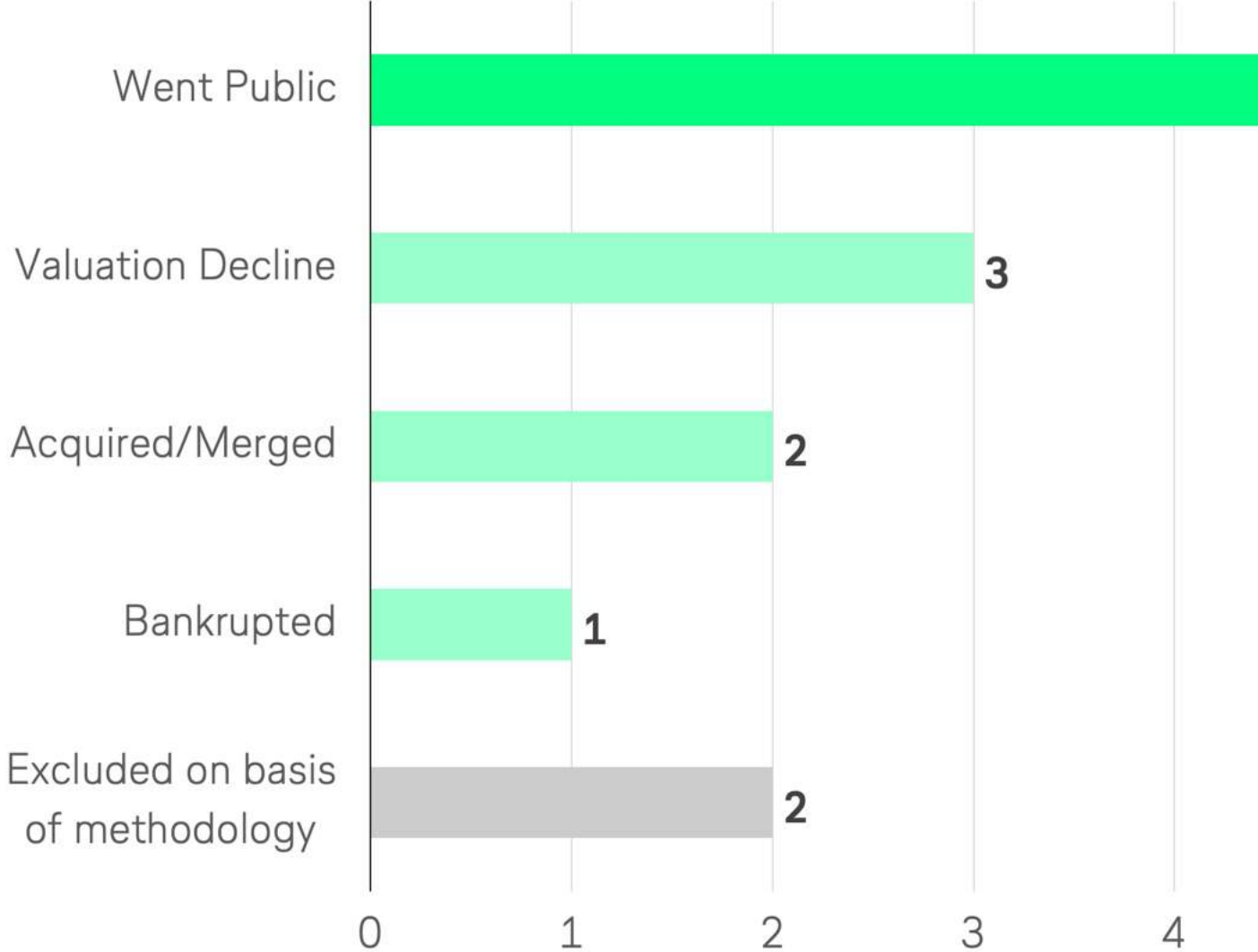
CVC
FUNDING

TNMT INDUSTRY INVESTMENTS

The 2024 TNMT Sector Attractiveness Report analyzes over 1,200 corporate startup investments across the travel and mobility industry, revealing how major players—especially in aviation and ground transport—are strategically investing to drive innovation amid a decline in traditional venture capital. While expansion and operational efficiency remain core priorities, sustainability investments are rising, particularly in aviation, which is under regulatory and environmental pressure.

Artificial intelligence stands out as the most consistently funded technology, underpinning efforts to automate operations, enhance decision-making, and improve customer support. The report highlights a shift from opportunistic to mission-driven investment, with corporations using startup partnerships to solve specific industry pain points and future-proof their businesses.

Travel and Mobility Sectors Have Distinct Strategic Investment Priorities

DEAL ACTIVITY (#) OF TRAVEL AND MOBILITY SUB-SECTORS, BY PRIORITY AREA

- Expansion
- Operational Efficiency
- Sustainability
- Digital Consumer Experience
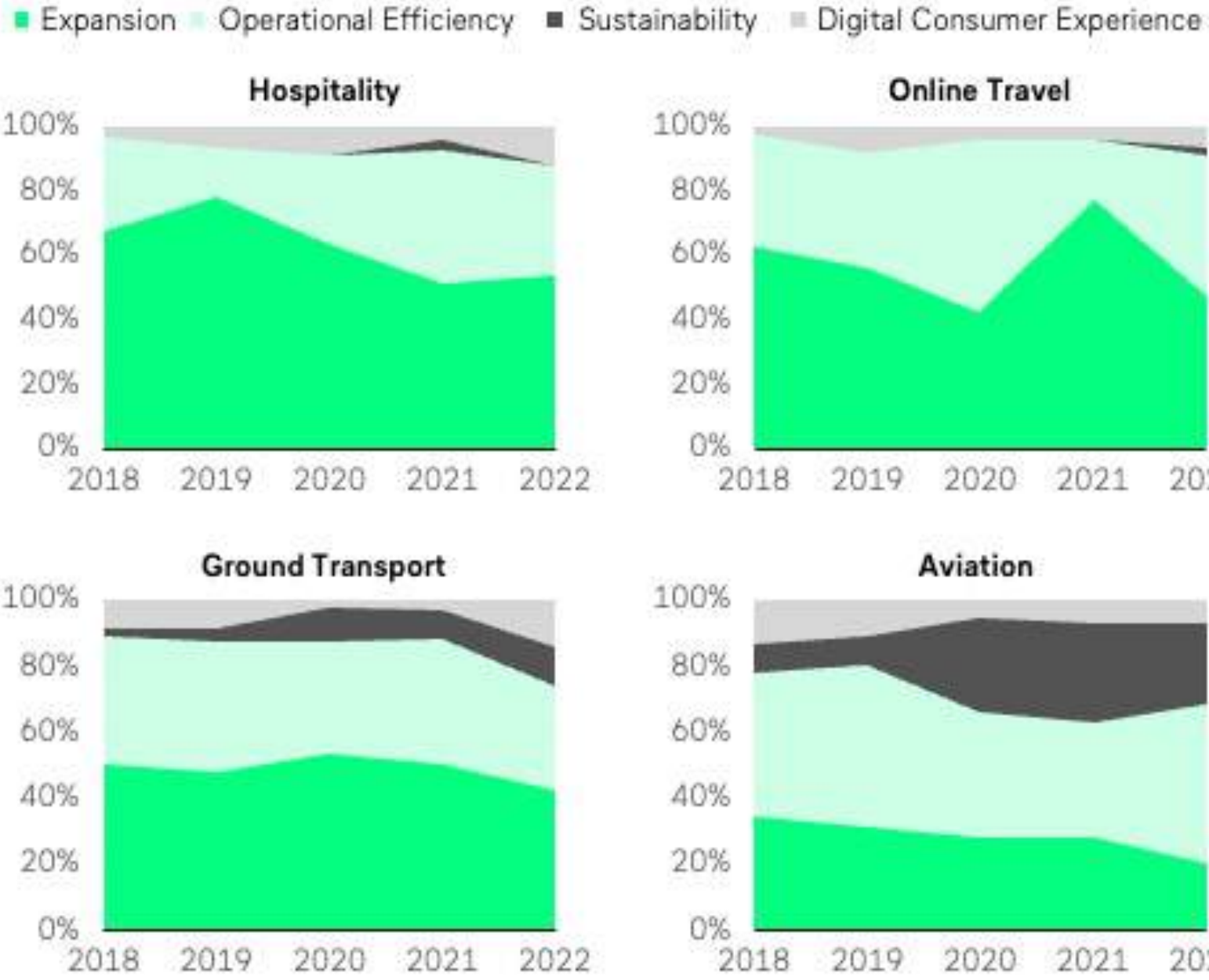
Sources: Lufthansa Innovation Hub, TNMT.com, PitchBook Data Inc.

Aviation Focuses Most of Its Operational Efficiency Efforts on Core Operations

DEAL ACTIVITY (#) OF AVIATION CORPORATIONS INTO OPERATIONAL EFFICIENCY, BY FUNCTIONAL AREA, SINCE 2018

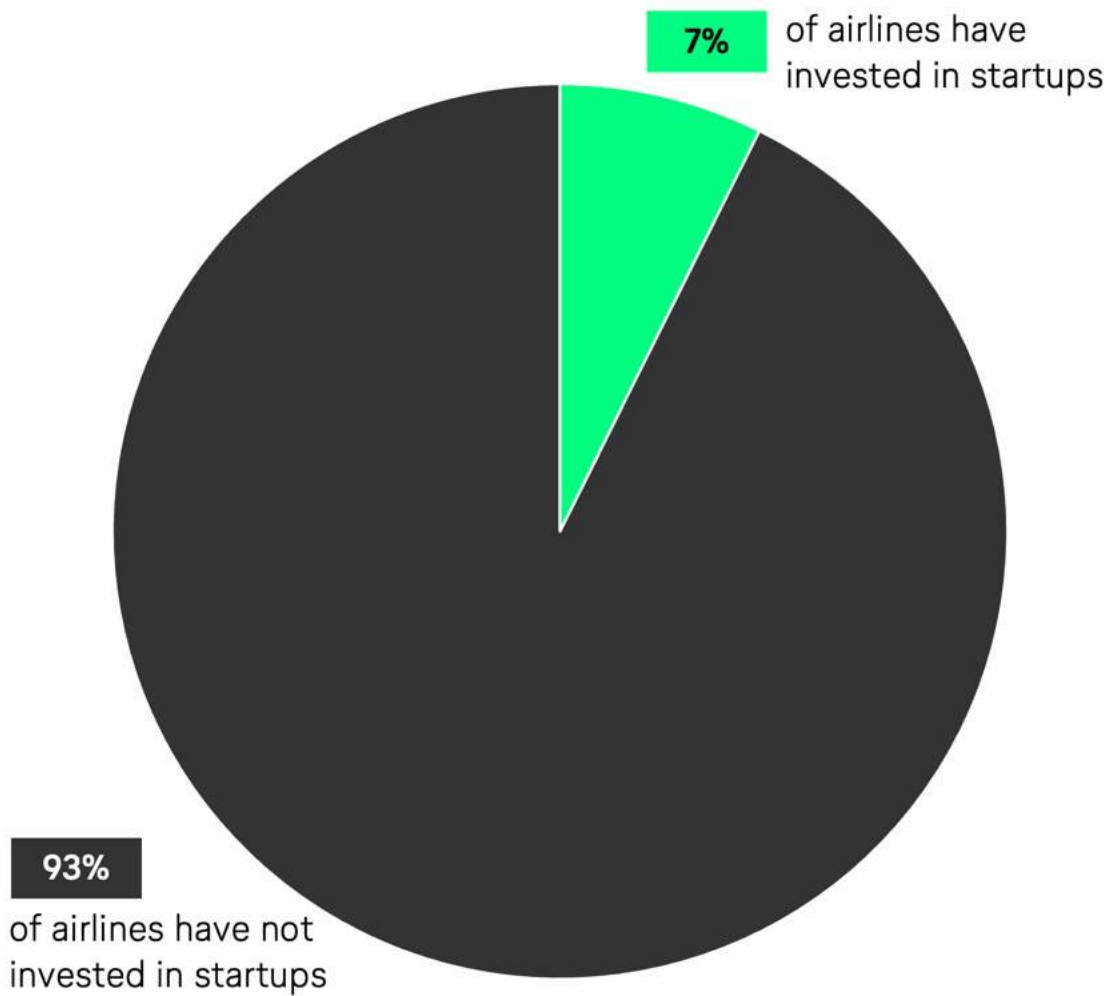Sources: Lufthansa Innovation Hub, TNMT.com, PitchBook Data Inc.

AIRLINE INVESTMENTS

In 2024, airline startup investments were limited but highly strategic, focusing on sustainability and AI to drive innovation agendas. Leading carriers like JetBlue, KLM, and United Airlines spearheaded these efforts, investing in technologies such as carbon capture, electric propulsion, and AI-driven solutions to future-proof their operations.

TNMT
The big picture: Only a few airlines have invested in startups so far

Share of 340 IATA members that have invested in startups

7% of airlines have invested in startups

93% of airlines have not invested in startups

Source: Lufthansa Innovation Hub Analysis, TNMT.com, Pitchbook, company websites, IATA

TNMT
Startup investments by airlines have stabilized post-pandemic

Number of startup investment deals by airlines, globally
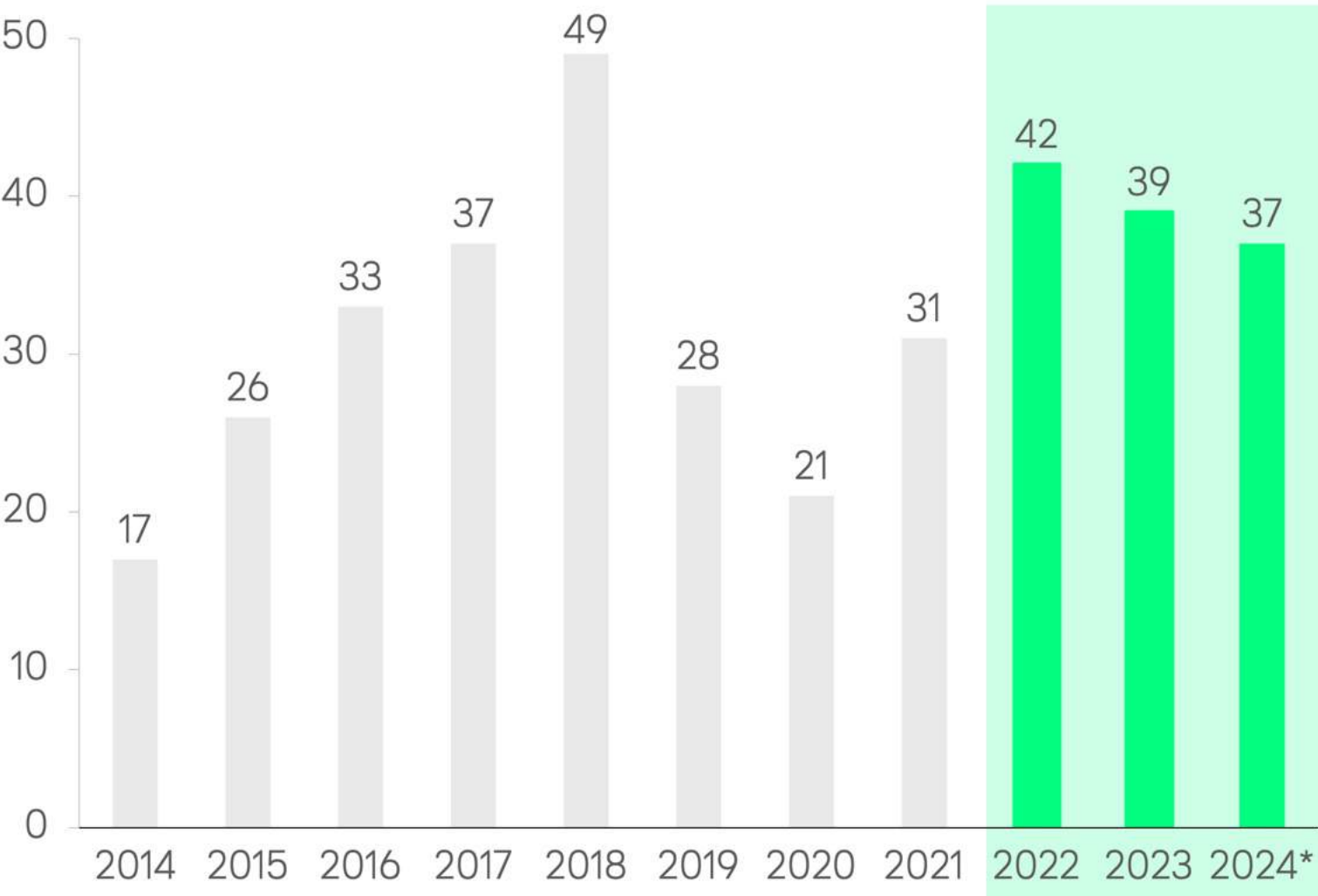
Year	Deals
2014	17
2015	26
2016	33
2017	37
2018	49
2019	28
2020	21
2021	31
2022	42
2023	39
2024*	37

*Investments up until December 18, 2024
Source: Lufthansa Innovation Hub Analysis, TNMT.com, Pitchbook, company websites, press

TNMT
Six airlines placed multiple startup investments last year

Number of startup investment deals in 2024*
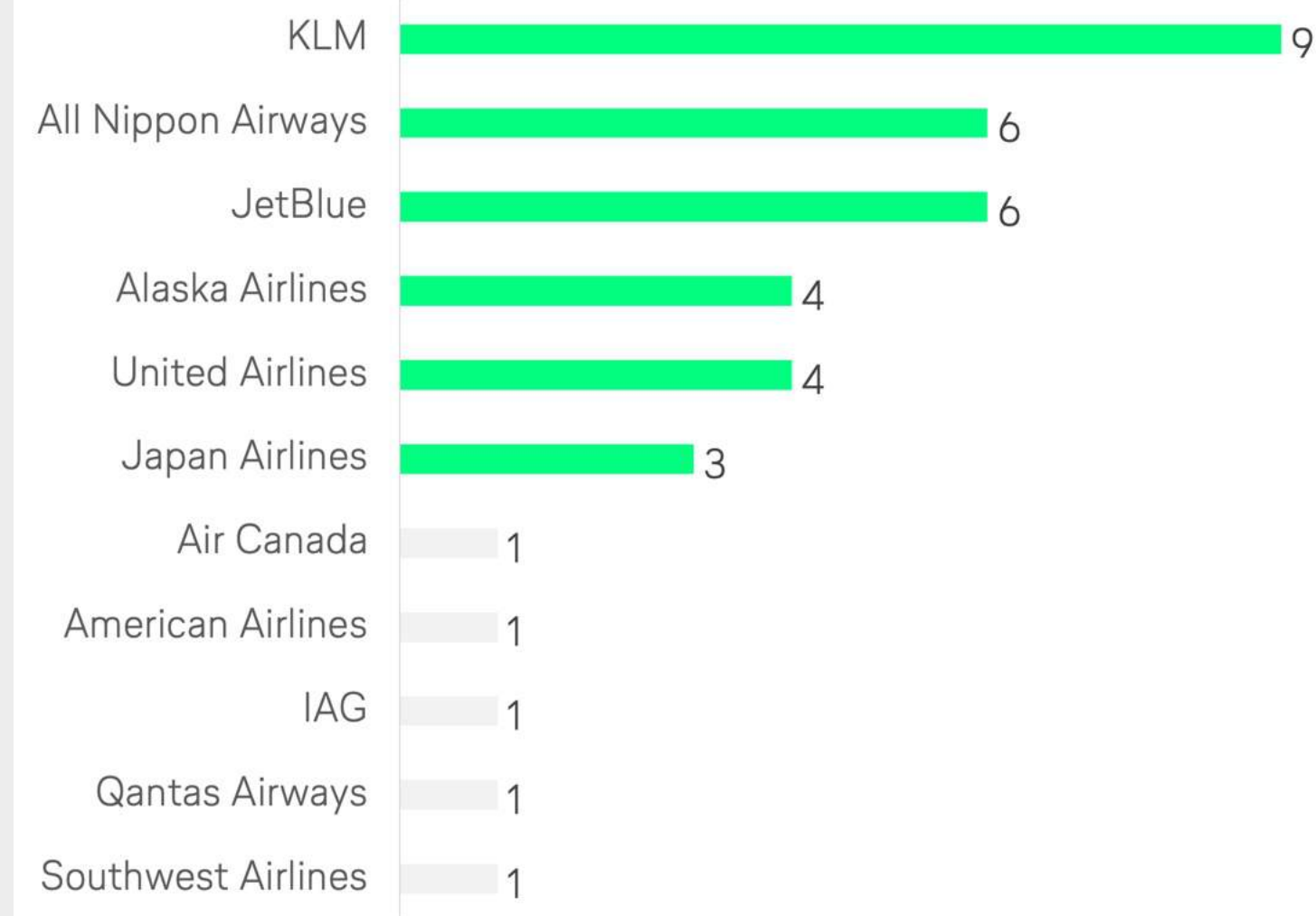
Airline	Deals
KLM	9
All Nippon Airways	6
JetBlue	6
Alaska Airlines	4
United Airlines	4
Japan Airlines	3
Air Canada	1
American Airlines	1
IAG	1
Qantas Airways	1
Southwest Airlines	1

*Investments up until December 18, 2024
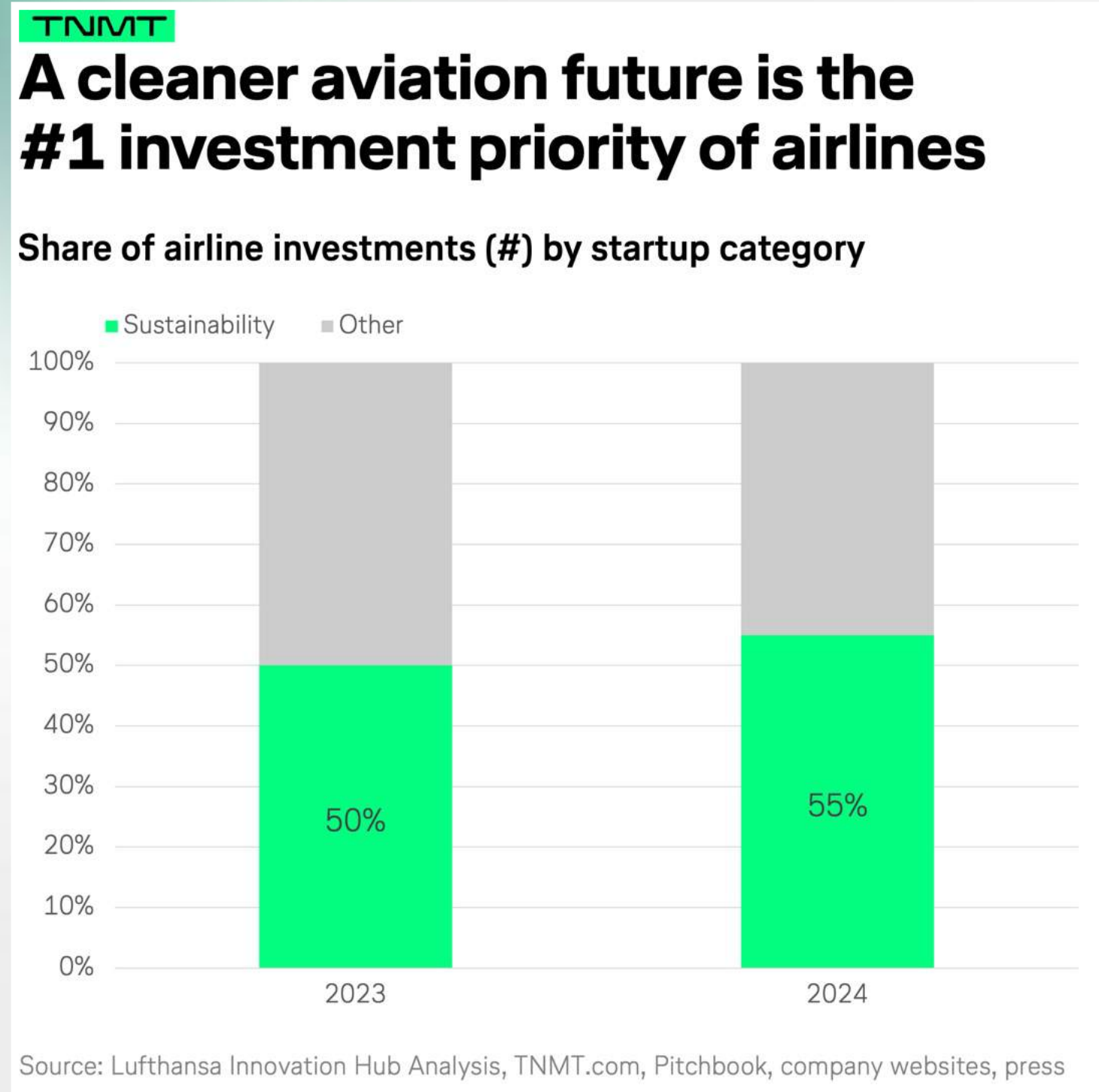Source: Lufthansa Innovation Hub Analysis, TNMT.com, Pitchbook, company websites, press

AIRLINE INVESTMENTS

Airline startup investments in 2025 are increasingly drawn to two main areas: sustainability and AI-driven innovation. On the sustainability front, carriers are seeking startups that offer cleaner propulsion technologies, carbon offset tools, and eco-friendly operations to meet rising consumer and regulatory demands. At the same time, AI is fueling new solutions in predictive maintenance, route optimization, and customer personalization, promising both cost savings and enhanced passenger experiences.
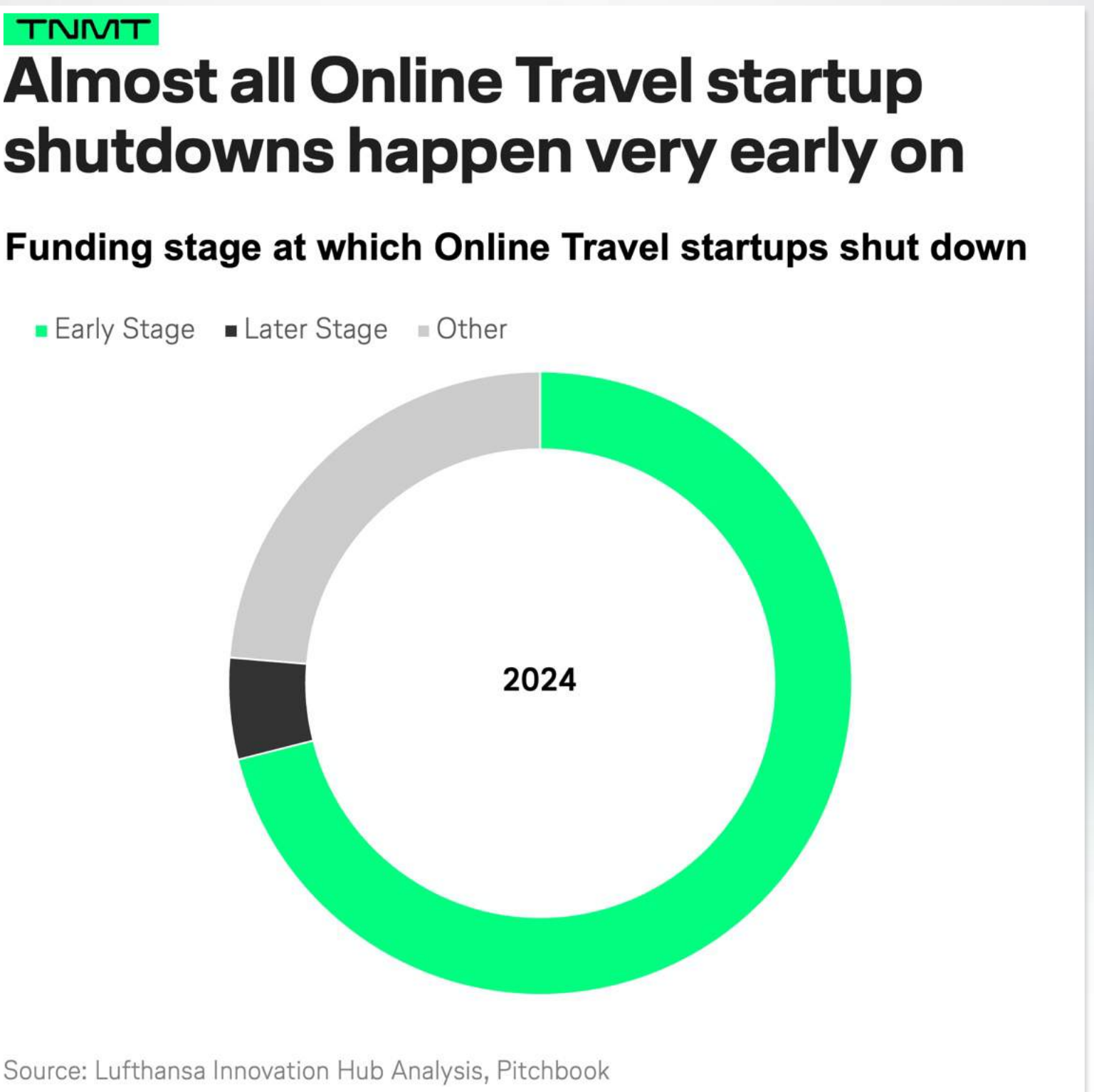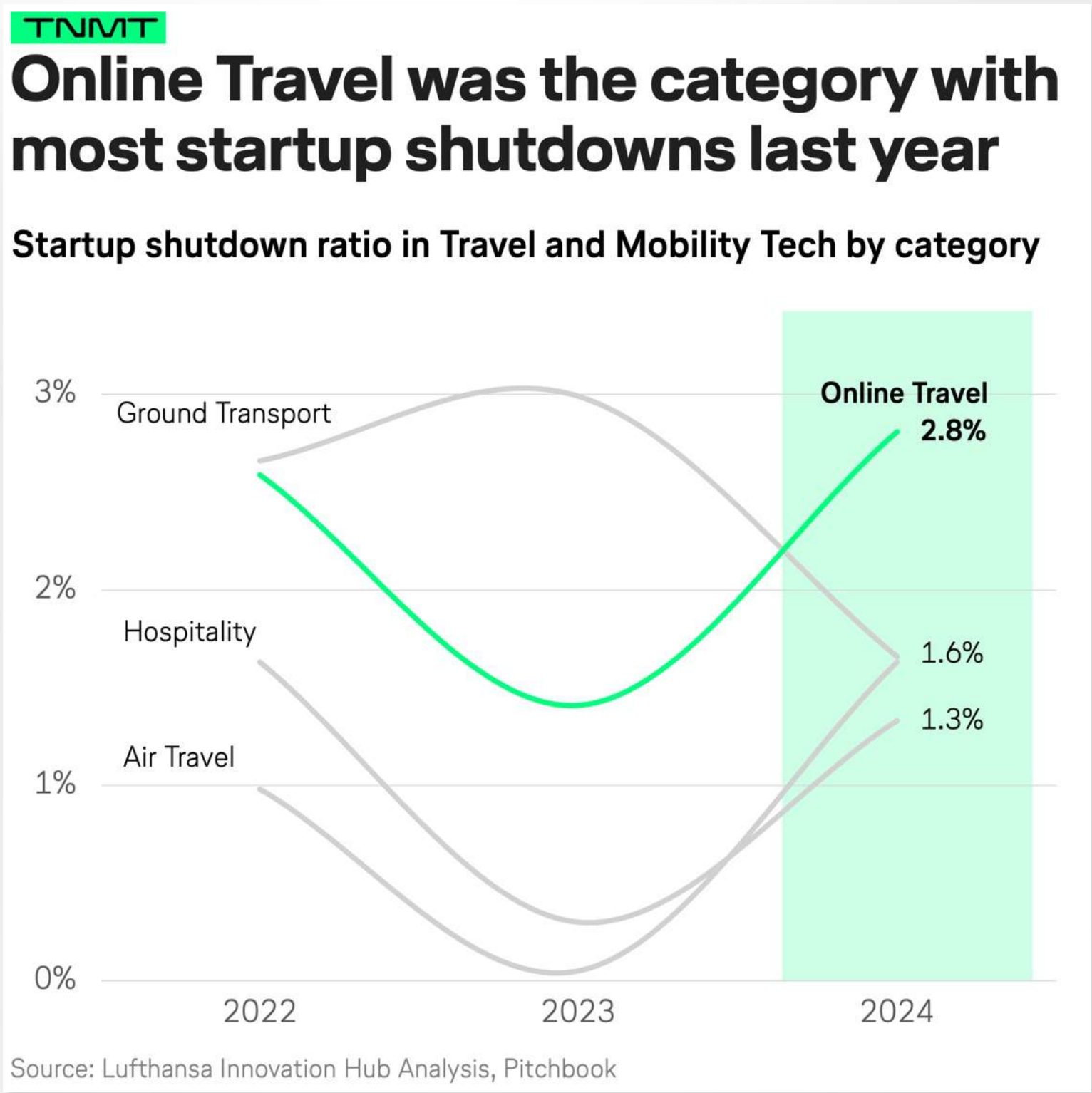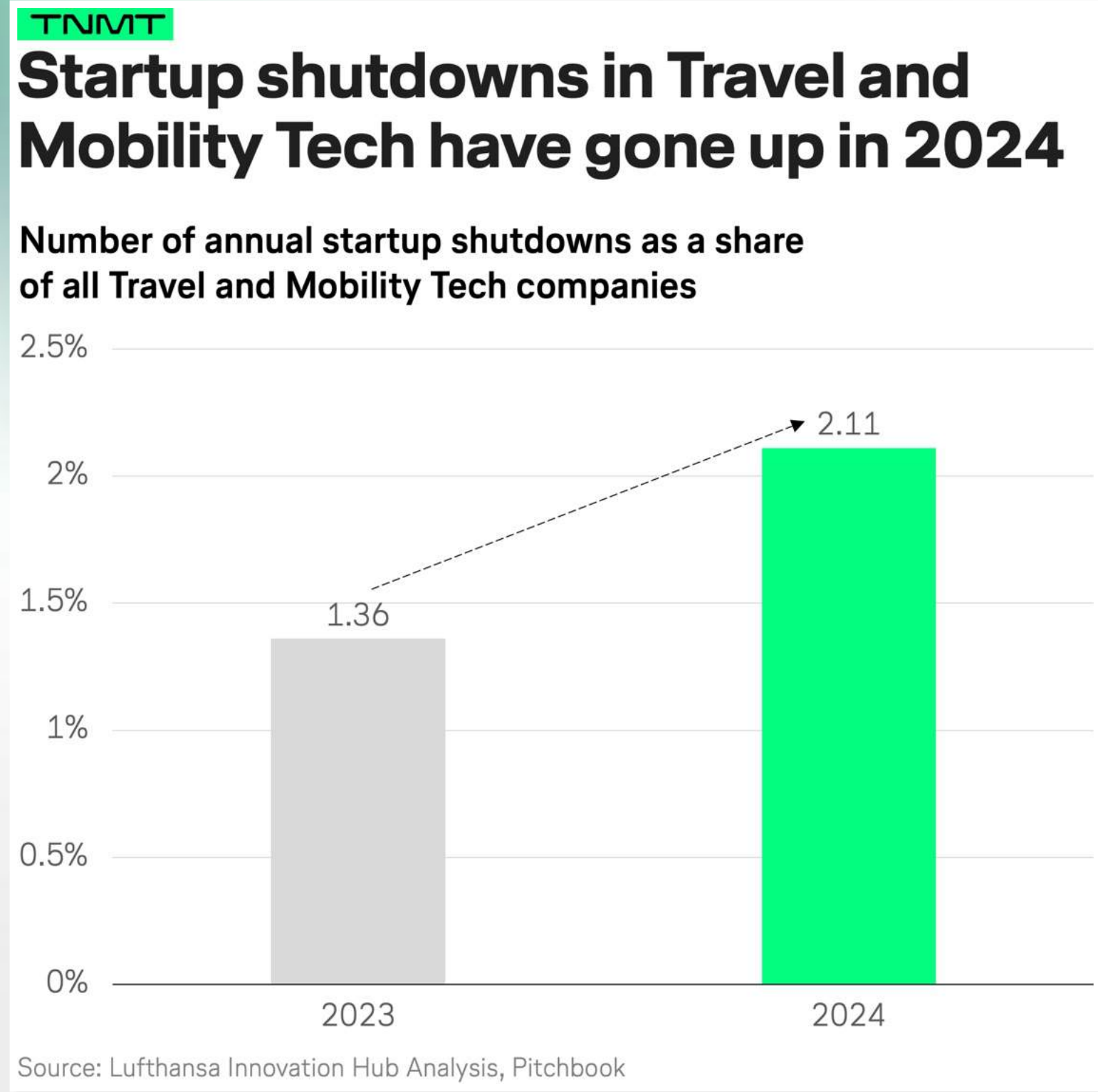
TNMT
A cleaner aviation future is the #1 investment priority of airlines

Share of airline investments (#) by startup category

- Sustainability
- Other

Year	Sustainability
2023	50%
2024	55%

Source: Lufthansa Innovation Hub Analysis, TNMT.com, Pitchbook, company websites, press

TNMT
Artificial Intelligence has gained major airline investor interest

Share of airline investments (#) by startup category

- Sustainability
- AI & ML
- Other

Year	AI & ML
2023	18%
2024	22%

Source: Lufthansa Innovation Hub Analysis, TNMT.com, Pitchbook, company websites, press

TNMT
All airline investments in 2024 were either Clean-Tech or AI focused

Top 10 startup founding rounds with airline investors in 2024 (ranked by deal size)

Startup	Airline Investor	Deal size (in USD)	Description	Category
KOLOMA	UNITED AIRLINES	246M	Geologic hydrogen company using data-driven technology to reduce carbon emissions.	Clean-Tech
twelve	Alaska	245M	Developer of CO₂ recycling devices that convert emissions into valuable chemicals using water and electricity.	Clean-Tech
sakana.ai	ANA	214M	AI company developing nature-inspired models for generating text, images, video, and code.	AI&ML
Heirloom	JAPAN AIRLINES	150M	Developer of a carbon capture and utilization (CCU) tech to enhance carbon dioxide absorption from the atmosphere.	Clean-Tech
Heart Aerospace	UNITED AIRLINES / AIR CANADA	107M	Developer of electric airliners reducing costs, emissions, and infrastructure needs.	Clean-Tech
AIR COMPANY	Alaska / jetBlue	70M	Provider of carbon-negative products converting CO₂ into alcohols and fuels, including eco-friendly vodka.	Clean-Tech
MATTER	JAPAN AIRLINES	46M	Manufacturer of clean energy vehicles with liquid cooling and hyper-shift transmission.	Clean-Tech
captura	JAPAN AIRLINES	45M	Developer of ocean-based carbon capture technology using renewable energy with no by-products.	Clean-Tech
Aether Fuels	jetBlue	37M	Developer of sustainable fuel technology for aviation and shipping using waste biomass and CO₂.	Clean-Tech
LANZAJET	Southwest	30M	Operator of a sustainable fuels company producing low-carbon fuels from waste to reduce aviation emissions.	Clean-Tech

Source: Lufthansa Innovation Hub Analysis, TNMT.com, Pitchbook

STARTUP
SHUTDOWNS

TNMT STARTUP SHUTDOWNS

Startup failures surged due to rising interest rates, reduced venture capital, and a sluggish recovery in business travel, with annual failure rates peaking between 1.3% and 2.2%. Notably, online travel startups (particularly consumer-facing platforms) were the hardest hit, underscoring the challenges of competing in a saturated market with limited investor interest in B2C models.

TNMT
Startup shutdowns in Travel and Mobility Tech have gone up in 2024

Number of annual startup shutdowns as a share of all Travel and Mobility Tech companies

- 2023: 1.36
- 2024: 2.11

Source: Lufthansa Innovation Hub Analysis, Pitchbook

TNMT
Online Travel was the category with most startup shutdowns last year

Startup shutdown ratio in Travel and Mobility Tech by category

- Ground Transport
- Hospitality
- Air Travel
- Online Travel: 2.8%
- 1.6%
- 1.3%

(2022 – 2023 – 2024)

Source: Lufthansa Innovation Hub Analysis, Pitchbook

TNMT
Almost all Online Travel startup shutdowns happen very early on

Funding stage at which Online Travel startups shut down

- Early Stage
- Later Stage
- Other

2024

Source: Lufthansa Innovation Hub Analysis, Pitchbook

TNMT FAILS
> $2bn

culture trip
2011-2024*
$232M

JOURNERA
2016 – 2024
$36M

LILIUM
2015-2024*
$375M

Fulcrum BIOENERGY
2007 – 2024*
$348M

whim MaaS GLOBAL
2015-2024
$62,4M

Sonder
2014-2024*
$680M

Selina
2014-2024*
$405M

FOUNDING
MOMENTUM

LESS FOUNDING MOMENTUM

The travel startup landscape is experiencing a noticeable shift in momentum, with founding activity showing a slowdown in early 2024. However, what's particularly striking is where founders are placing their bets - there's a clear preference for digital business models over asset-heavy ventures. Online travel solutions dominate the new ventures, while traditional segments like hospitality and transportation take a back seat, reflecting founders' strategic focus on scalable digital opportunities in the travel sector.

TNMT
Founding momentum H1-2024

Monthly Distribution

■ 2023 Actual ■ 2024 Actual ■ 2024 Projected
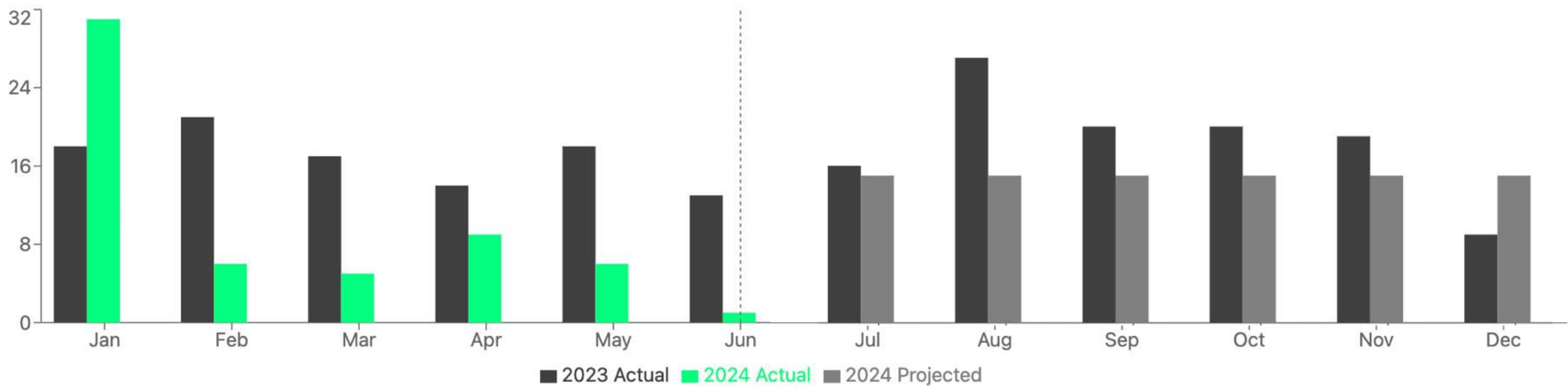
Annual Comparison & 2024 Scenarios
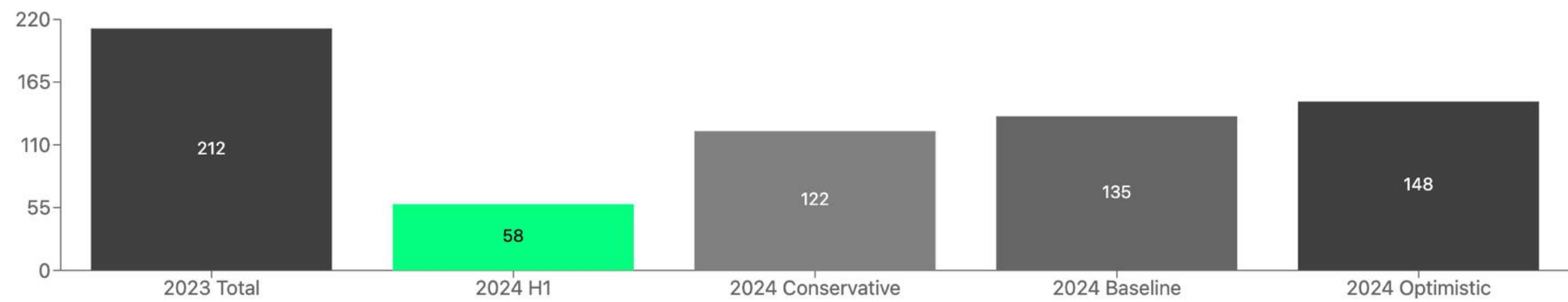
Source: Lufthansa Innovation Hub, TNMT.com, Venture Signals

TNMT
Founders focus on digital over asset-heavy verticals in Travel

2024 Travel startups by category

■ Online Travel ■ Hospitality ■ Ground Transportation ■ Advanced Air Mobility
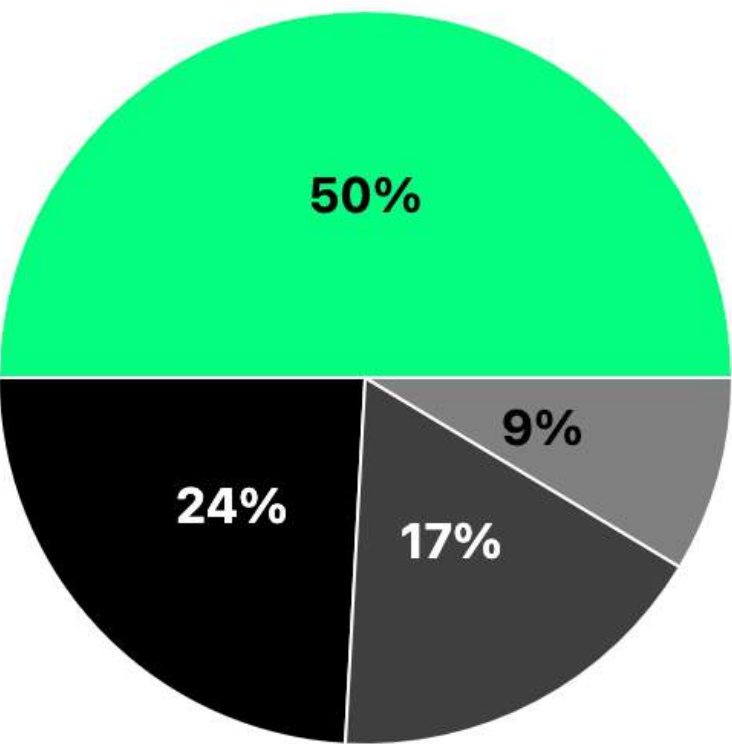
Source: Lufthansa Innovation Hub, TNMT.com, Venture Signals

FOUNDERS FOLLOW THE BUZZ

Founder momentum in the travel industry shows a clear shift towards technological innovation and environmental responsibility. Data from 2023-2024 reveals that travel startup founders are increasingly focusing on AI and sustainability solutions, often combining both themes.

The trend is particularly pronounced in the Search, Inspire, and Book segment, where AI startups now represent 48% of new ventures. This strategic focus on AI-powered solutions, especially in trip planning and booking, reflects founders' preference for scalable digital solutions that don't require physical assets.

The data demonstrates this shift, with AI and sustainability-focused startups growing from 41% in 2023 to 70% in 2024, indicating a strong belief in technology-driven, sustainable travel solutions for the future.

TNMT

Founders focus on core industry themes of AI & Sustainability

Focus Areas of Travel Startups

2023
- 33%
- 8%
- 35%
- 24%

2024
- 36%
- 5%
- 24%
- 34%

■ AI & Sustainability ■ AI only ■ Sustainability only ■ Other
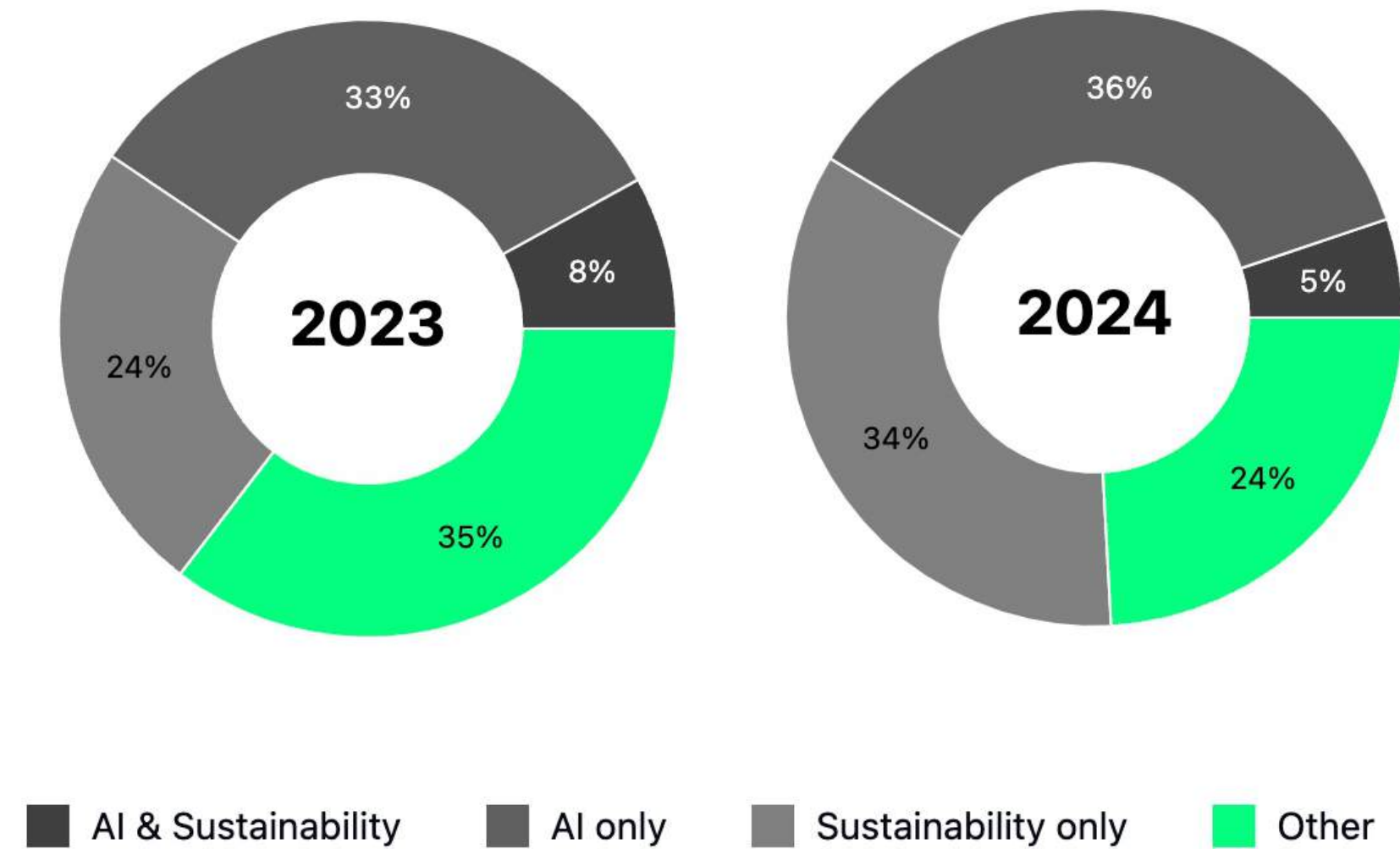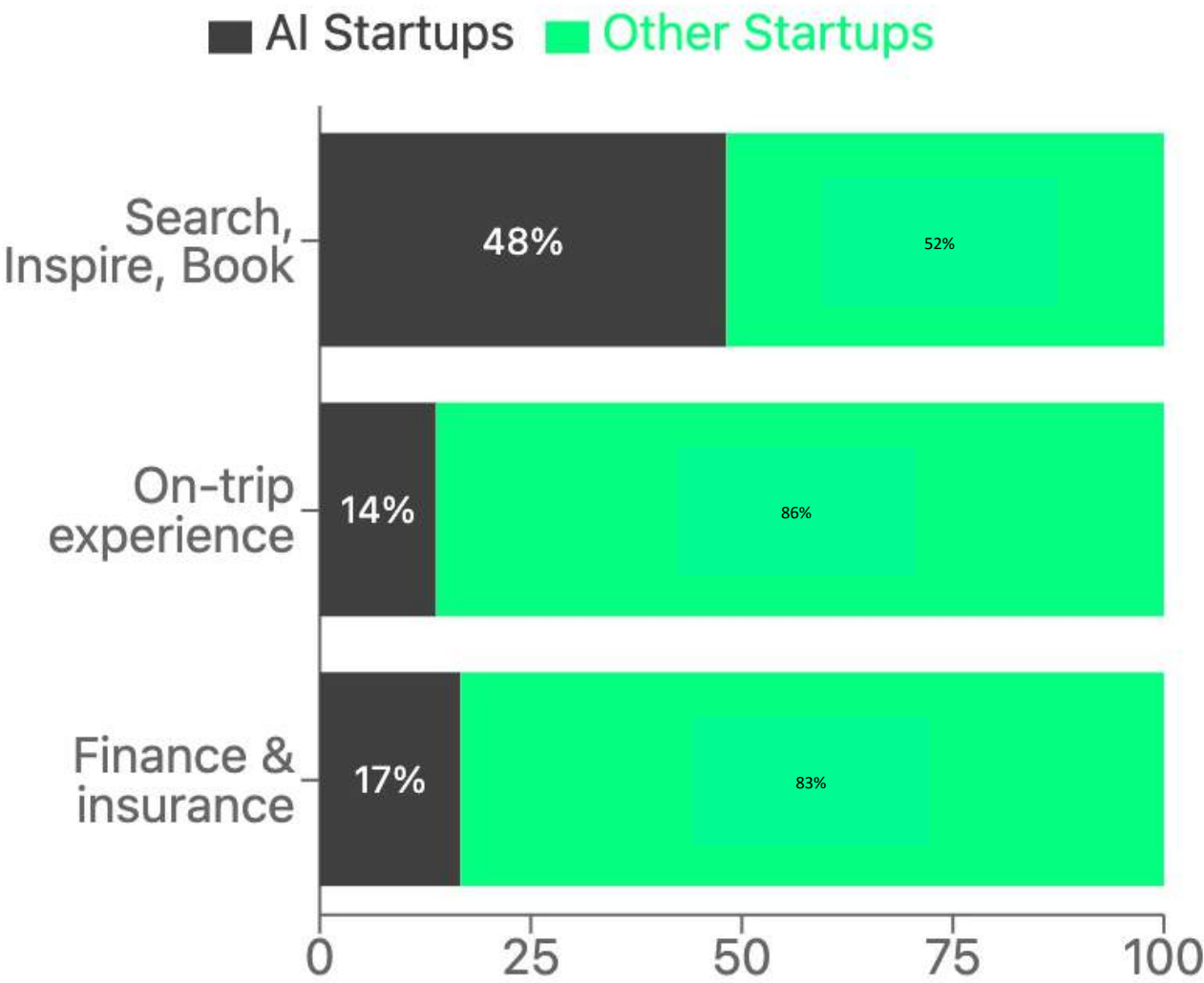
Source: Lufthansa Innovation Hub, TNMT.com, Venture Signals

TNMT

The next wave of Search, Inspire, Book will be AI-powered

AI Adoption by Online Travel Category

■ AI Startups ■ Other Startups

- Search, Inspire, Book: 48% / 52%
- On-trip experience: 14% / 86%
- Finance & insurance: 17% / 83%

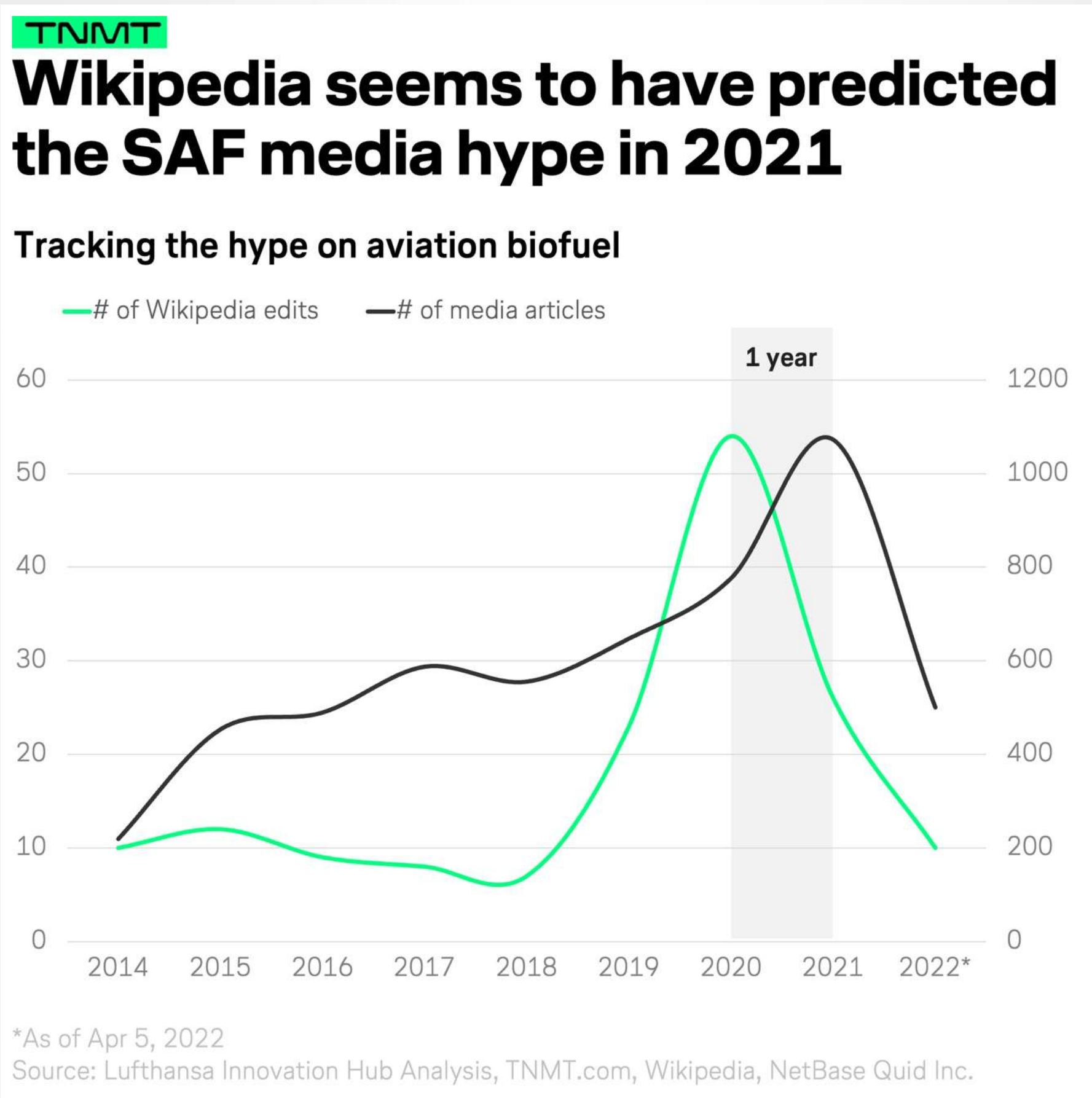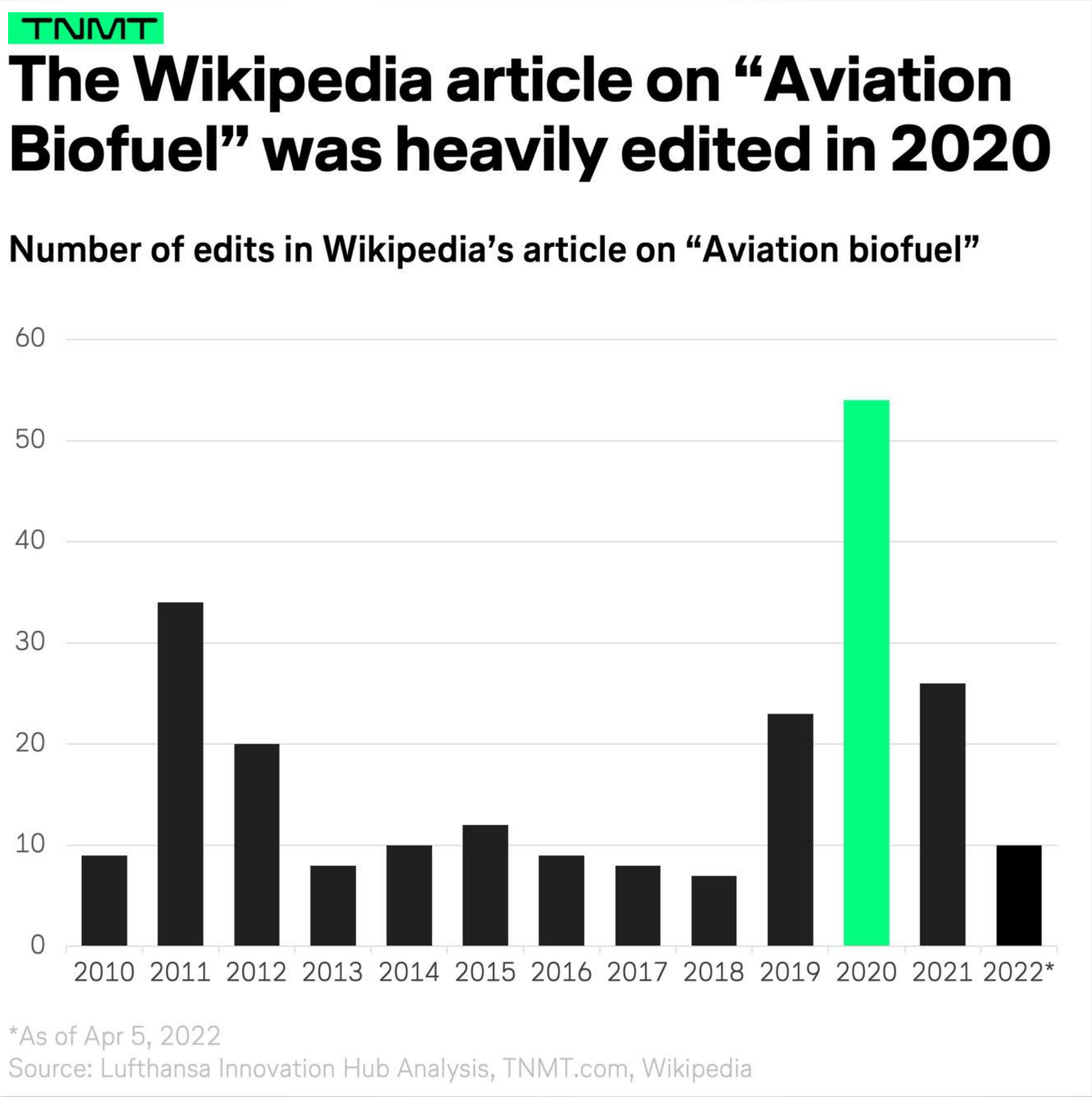Source: Lufthansa Innovation Hub, TNMT.com, Venture Signals

WIKIPEDIA
EDITS

WIKIPEDIA

The power of Wikipedia in predicting hype cycles

Wikipedia is a fascinating trend indicator. Aviation biofuel aka sustainable aviation fuel (SAF) is a good example for this.

–Frequency of the edits made to existing Wikipedia pages

TNMT

The Wikipedia article on "Aviation Biofuel" was heavily edited in 2020

Number of edits in Wikipedia's article on "Aviation biofuel"

*As of Apr 5, 2022
Source: Lufthansa Innovation Hub Analysis, TNMT.com, Wikipedia

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TNMT

Wikipedia seems to have predicted the SAF media hype in 2021

Tracking the hype on aviation biofuel

— # of Wikipedia edits   — # of media articles

*As of Apr 5, 2022
Source: Lufthansa Innovation Hub Analysis, TNMT.com, Wikipedia, NetBase Quid Inc.

PATENT
ANALYSIS

AIRLINE PATENT ANALYSIS

Patent analysis as proxy for industry innovation

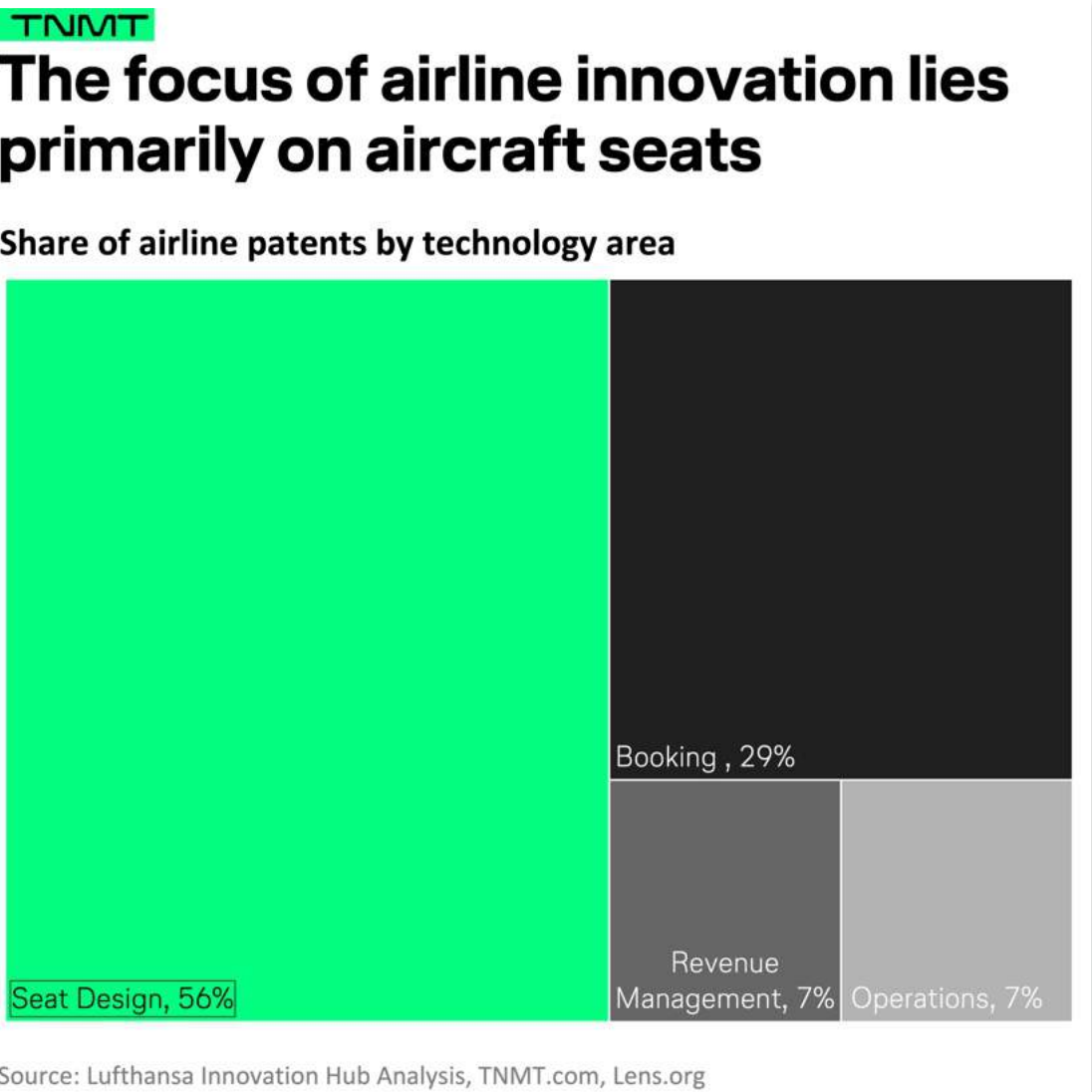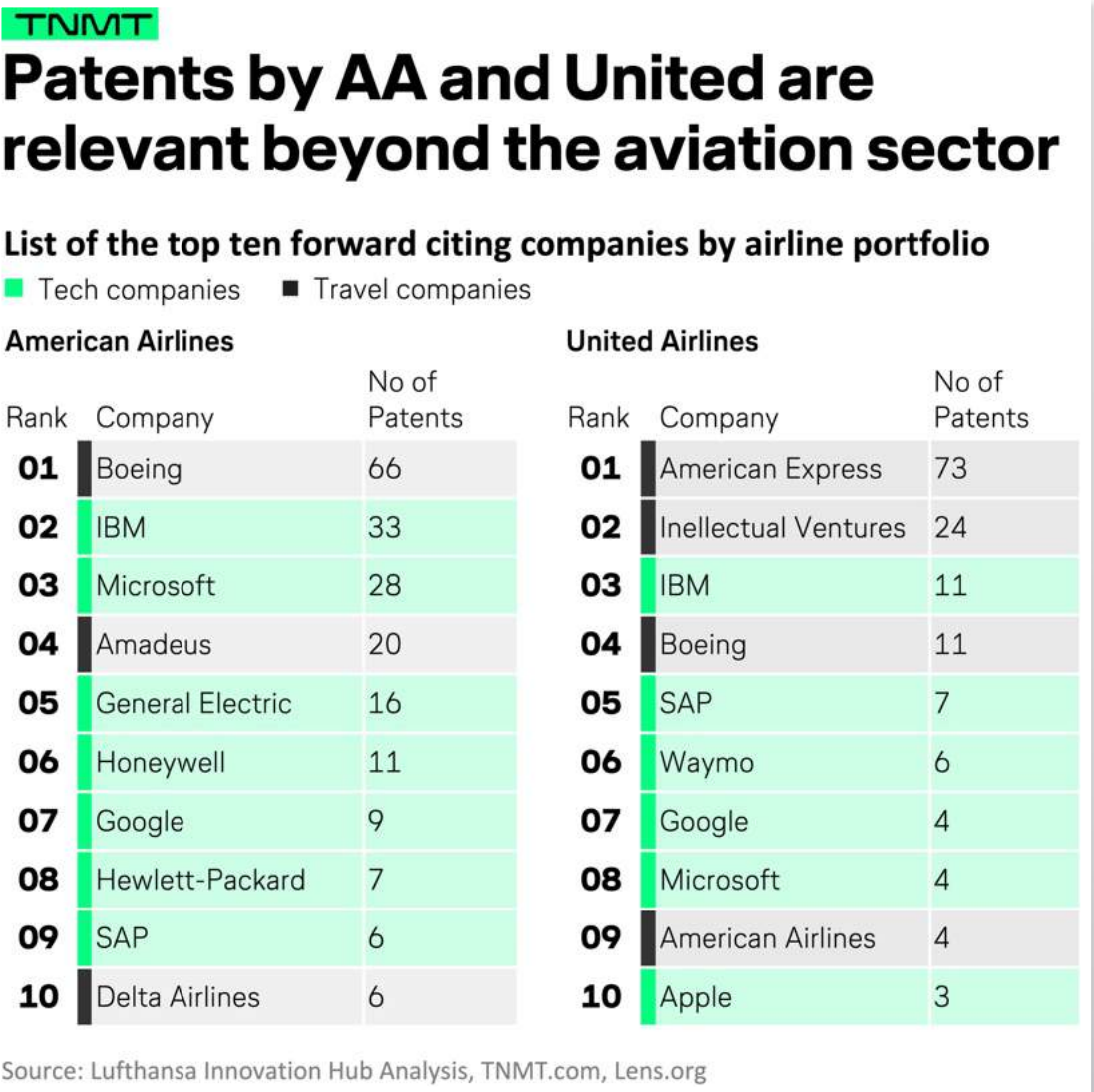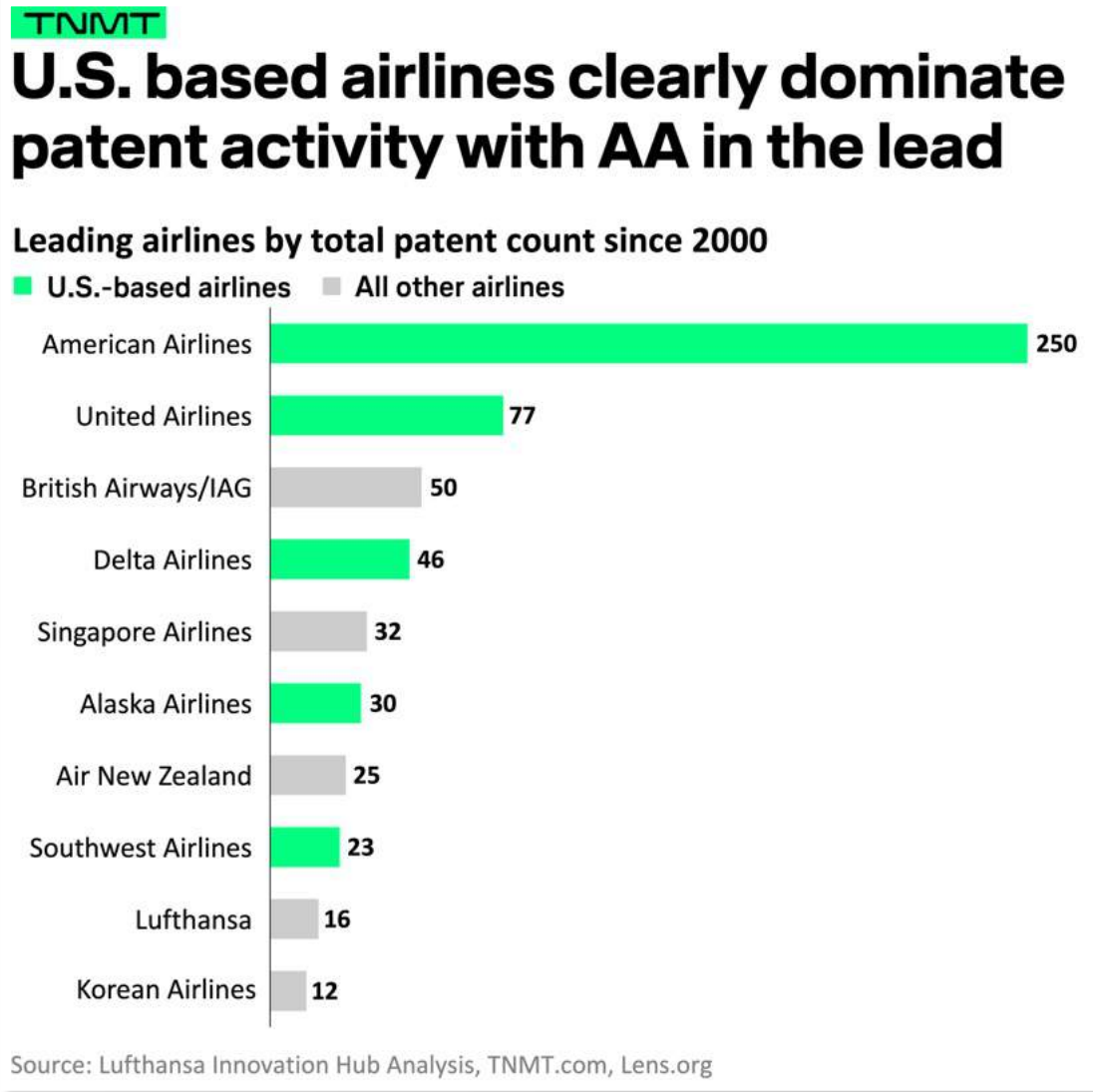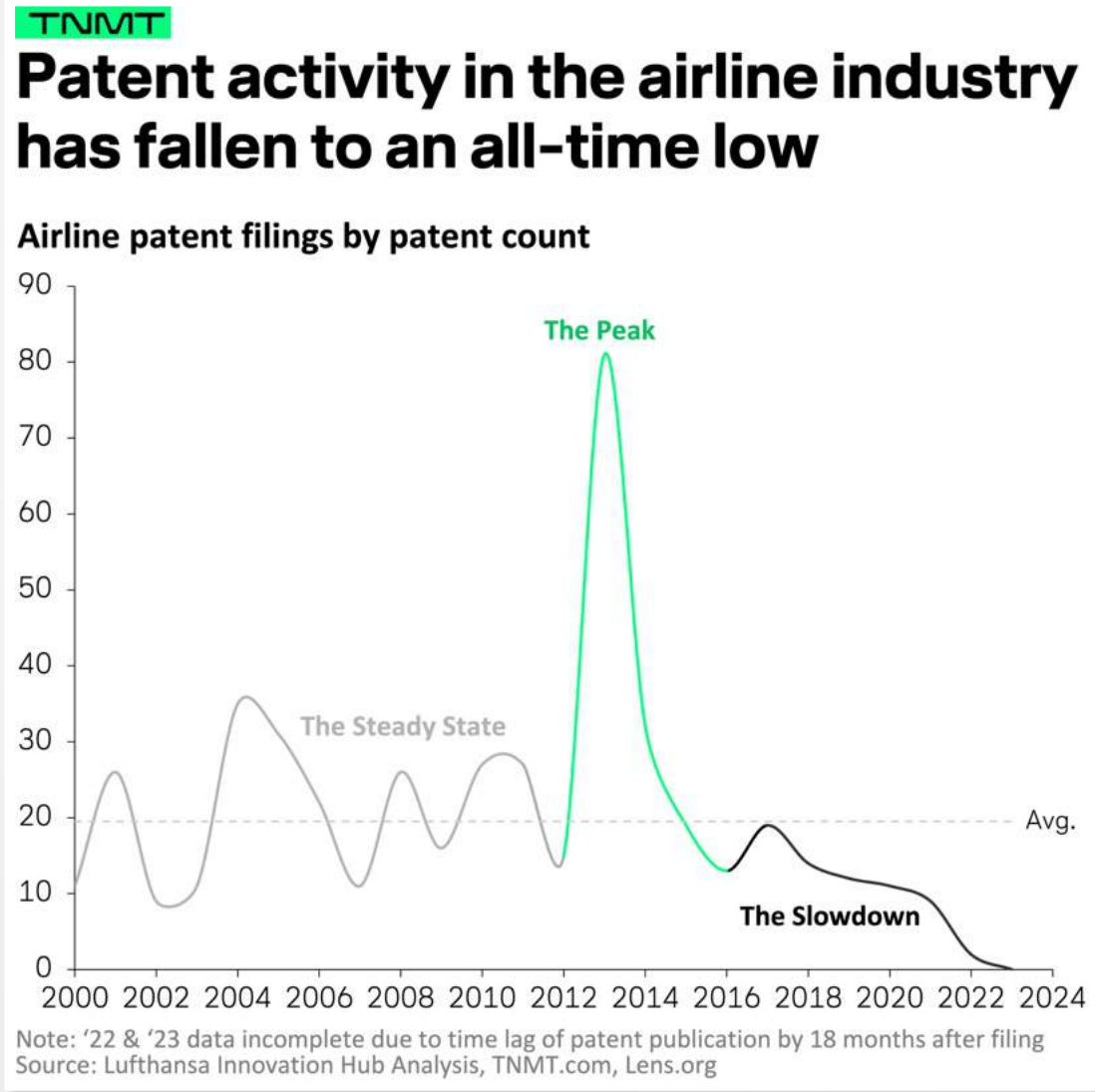Analysis of 50 top airline's patent portfolios worldwide, focusing on core operations - not in line with actual traveler pain points!

57% seat design

29% booking & ticketing

7% operations

7% rev mgmt

TNMT

Patent activity in the airline industry has fallen to an all-time low

Airline patent filings by patent count

The Peak

The Steady State

Avg.

The Slowdown

Note: '22 & '23 data incomplete due to time lag of patent publication by 18 months after filing
Source: Lufthansa Innovation Hub Analysis, TNMT.com, Lens.org

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TNMT

U.S. based airlines clearly dominate patent activity with AA in the lead

Leading airlines by total patent count since 2000

■ U.S.-based airlines   ■ All other airlines

Airline	Count
American Airlines	250
United Airlines	77
British Airways/IAG	50
Delta Airlines	46
Singapore Airlines	32
Alaska Airlines	30
Air New Zealand	25
Southwest Airlines	23
Lufthansa	16
Korean Airlines	12

Source: Lufthansa Innovation Hub Analysis, TNMT.com, Lens.org

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TNMT

Patents by AA and United are relevant beyond the aviation sector

List of the top ten forward citing companies by airline portfolio

■ Tech companies   ■ Travel companies

American Airlines

Rank	Company	No of Patents
01	Boeing	66
02	IBM	33
03	Microsoft	28
04	Amadeus	20
05	General Electric	16
06	Honeywell	11
07	Google	9
08	Hewlett-Packard	7
09	SAP	6
10	Delta Airlines	6

United Airlines

Rank	Company	No of Patents
01	American Express	73
02	Inellectual Ventures	24
03	IBM	11
04	Boeing	11
05	SAP	7
06	Waymo	6
07	Google	4
08	Microsoft	4
09	American Airlines	4
10	Apple	3

Source: Lufthansa Innovation Hub Analysis, TNMT.com, Lens.org

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TNMT

Air New Zealand turns patented ideas into marketable products

Details of Air New Zealand's Skynest™ patent

■ Six sleep pods in a bunk bed configuration

■ between economy and the premium economy class, cutting out nine regular economy seats

■ Offered on certain long-haul routes, incl. the 17-hour direct between NYC and Auckland

■ Passengers can pre-book for 250 to 400 USD for a four-hour block, in addition to the regular cost of their ticket

Source: Lufthansa Innovation Hub Analysis, TNMT.com, Lens.org

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TNMT

The focus of airline innovation lies primarily on aircraft seats

Share of airline patents by technology area

Booking, 29%

Seat Design, 56%

Revenue Management, 7%   Operations, 7%

Source: Lufthansa Innovation Hub Analysis, TNMT.com, Lens.org

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TNMT

Focus of innovation areas varies by geography and business model

Patent activity by major airlines along the traveler journey

		Pre-Trip		At Airport		Inflight	
Region	Company	Booking & Ticketing	Revenue Mgmt.	Security & Biometrics	Operations	Seats	IFE
NA	American Airlines	■		■	■		
	Delta Airlines	■			■		
	United Airlines	■				■	
	Southwest Airlines				■		
	Alaska Airlines						
	Air Canada						■
	Virgin America						
APAC	Singapore Airlines					■	
	Japan Airlines					■	
	Air New Zealand					■	
	Cathay Pacific						
EMEA	BA & IAG				■		
	Lufthansa						
	Emirates	■					
	Total	**5**	**1**	**1**	**3**	**7**	**2**

Note: Time range considered for patents: 2000 until 2023
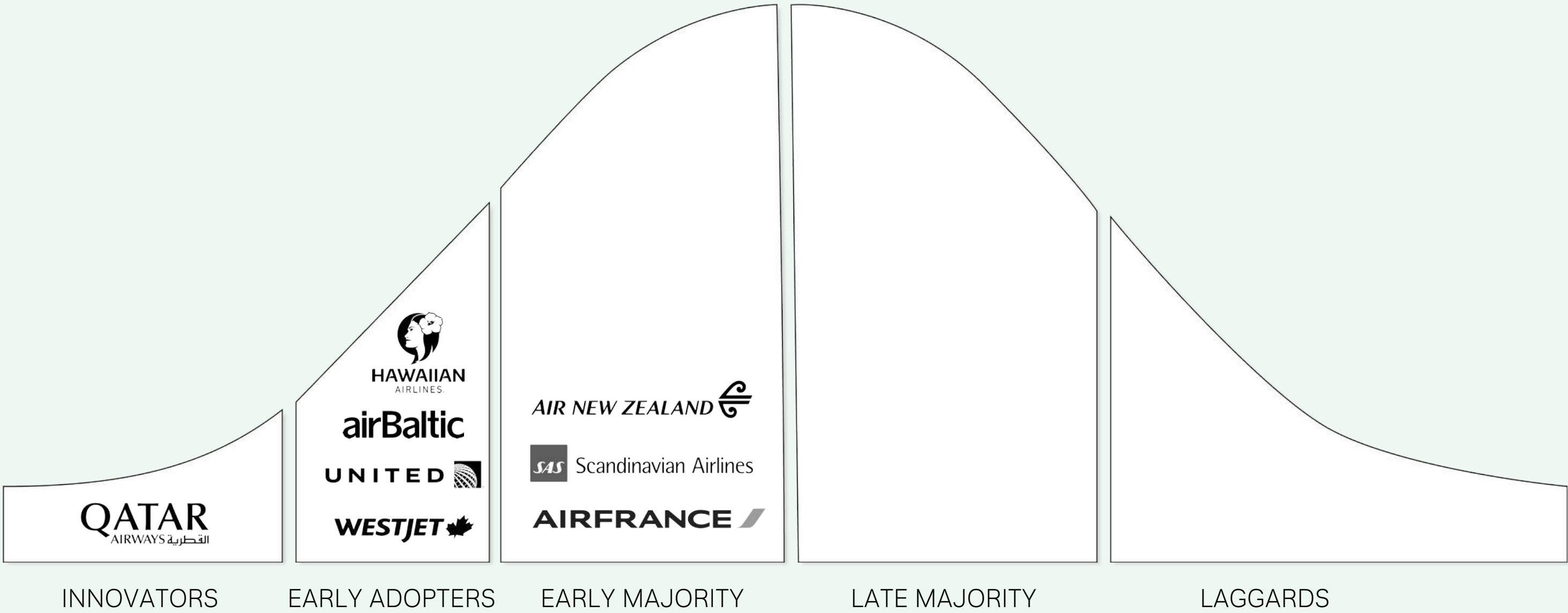Source: Lufthansa Innovation Hub Analysis, TNMT.com, Lens.org

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ACTOR
DYNAMICS

STARLINK

The integration of Starlink's satellite internet into commercial aviation marks a transformative shift in in-flight connectivity, replacing legacy systems with high-speed, low-latency connections that actually meet modern passenger expectations. This technological leap has disrupted the traditional revenue model where airlines charged premium fees for subpar Wi-Fi, as carriers increasingly offer superior connectivity as a complimentary service, recognizing reliable internet as an essential amenity rather than a luxury add-on.

US LEADS THE WAY

After announcements from 2023 we see the first flights by US carriers as well as Qatar. Major carriers like United or Air France announce their deals – creating an industry inflection point.

22.10.2024 - Qatar Airways Operates its First Flight With Elon Musk's Starlink Wi-Fi

07.10.2024 - Air France selects Starlink for IFC on entire fleet

24.09.2024 - Hawaiian Airlines Now Offering Fast and Free Starlink Wi-Fi Across Entire Airbus Fleet

13.09.2024 - United Signs Starlink Deal to Provide Industry-Leading Connectivity in the Sky - For Free

24.07.2024 - WestJet and TELUS form partnership to revolutionize guest experience, including free inflight Wi-Fi, delivered by Starlink

EUROPE FOLLOWS

The year starts strong with more announcements, trials and roll-outs.

22.02.2025 - airBaltic Becomes First European Airline to Offer Free SpaceX Starlink Internet

27.01.2025 - Scandinavian Airlines Taps Starlink for IFC Services

23.01.2025 - Starlink takes flight on ATR 72-600 turboprop as ANZ preps for trial

07.08.2025 - Virgin Atlantic becomes first U.K. airline to announce free Starlink internet

20.08.2025 - Alaska Airlines selects Starlink, the fastest Wi-Fi in the sky, to launch new era of connectivity

2024 2025

INDUSTRY TREND DIFFUSION

Industry trend diffusion refers to the process by which new ideas, products, or technologies spread and are adopted within a specific industry. This diffusion process is crucial for understanding how quickly and widely an innovation becomes accepted, impacting market penetration and overall industry evolution.

Adoption Curve:
Diffusion models often describe the adoption of a trend as a curve, with early adopters, early majority, late majority, and laggards.

Understanding industry trend diffusion is vital for businesses to anticipate market changes, manage innovation adoption, and develop effective strategies for growth.

INNOVATORS   EARLY ADOPTERS   EARLY MAJORITY   LATE MAJORITY   LAGGARDS

STARLINK

SATELLITE CONNECTIVITY

The integration of Starlink's satellite internet into commercial aviation marks a transformative shift in in-flight connectivity, replacing legacy systems with high-speed, low-latency connections that meet modern passenger expectations. This technological leap has disrupted the traditional revenue model, where airlines charged premium fees for subpar Wi-Fi.

As carriers increasingly offer superior connectivity as a complimentary service, recognizing reliable internet as an essential amenity rather than a luxury add-on, the trend is shifting.

INNOVATORS — QATAR AIRWAYS

EARLY ADOPTERS — HAWAIIAN AIRLINES, airBaltic, UNITED, WESTJET

EARLY MAJORITY — AIR NEW ZEALAND, SAS Scandinavian Airlines, AIRFRANCE

LATE MAJORITY

LAGGARDS

Emirates
KLM
IAG
QATAR AIRWAYS
UNITED
SINGAPORE AIRLINES
AIRFRANCE
AIR CANADA
TURKISH AIRLINES
ANA

INDUSTRY NARRATIVE

RATHER SOONER THAN LATER

Acceleration of technology adoption is evident across all industries, with most innovations showing impact within a 5-year horizon rather than traditional longer cycles. Aviation and Travel demonstrates a consistent early-to-mid-term adoption profile (1-7 year timeframe) for most technologies, positioning it in the middle of the innovation curve - less aggressive than Agriculture and Telecommunications but more forward-leaning than Consumer Packaged Goods.

This signals a period of significant technological transformation that will reshape the competitive landscape within the next half-decade.

TNMT

Time of impact of trends will vary by industry
Moderately aggressive tech adoption for Aviation & Travel

| | NOW | 1–3 YRS | 3–5 YRS | 5–7 YRS | 7–10 YRS | LOW RELEVANCE |
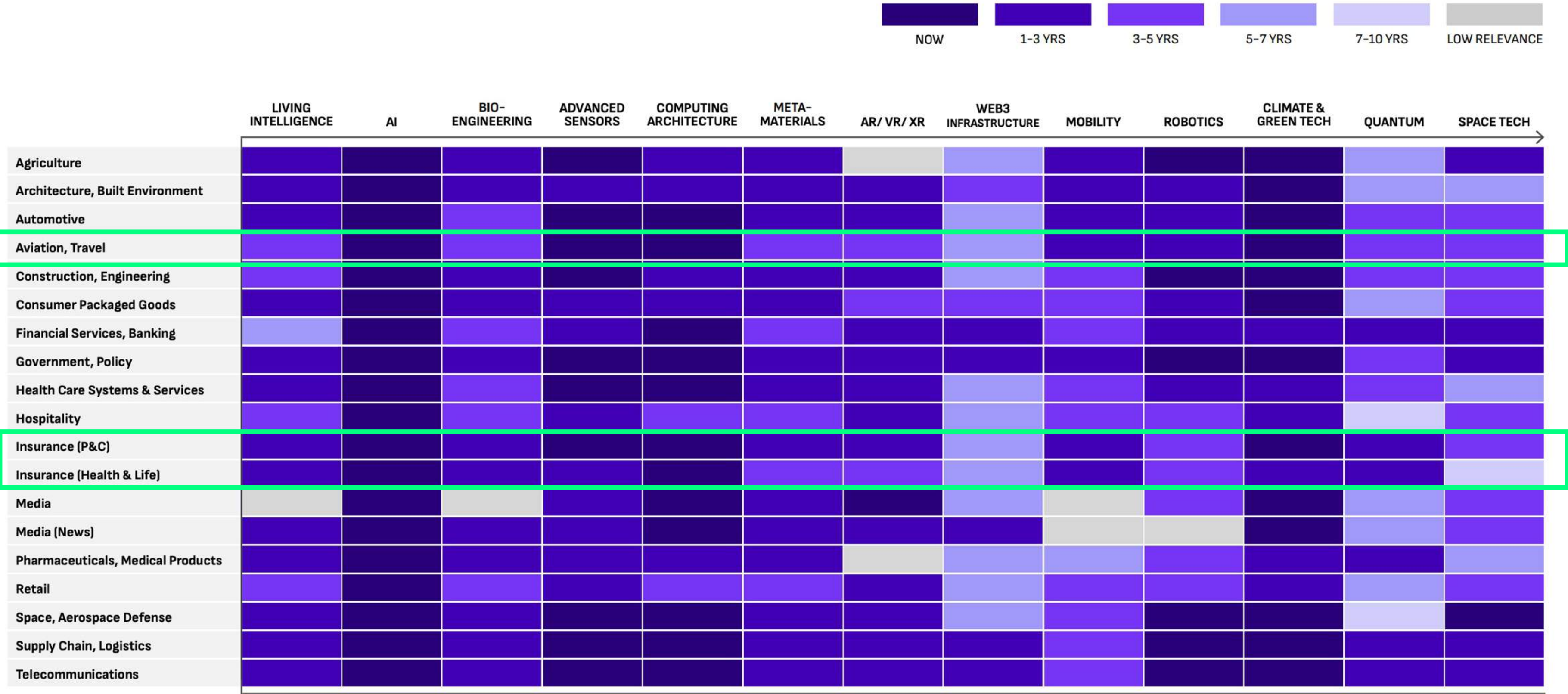
Source: Future Strategy Group – 2025 Tech Trends Report

Exploring Differently, Travelling Better.

Euronews Travel Trend Report

2025 Edition

With the kind contribution of

TOURISM ECONOMICS
AN OXFORD ECONOMICS COMPANY

UN Tourism

EUROPEAN TRAVEL COMMISSION

WHERE TO NEXT?

The movements that are shaping 2025 travel

priceline

Un pack '25™

The Trends in Travel

Expedia Hotels.com Vrbo

Luxury Travel Trend Watch: 2025

VIRTUOSO

In association with

GLOBETRENDER

Now Next '24

Travel Report

UNPACKING THE TRENDS

A closer look at the 2025 travel themes

Booking.com Expedia Skyscanner

GO GET IT:

How Gen Z/Y Will Travel in 2025

ibis STYLES ibis ibis budget

Lemongrass Annual Travel Trend Report 2025

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priceline euronews. Hilton ACCOR ibis ibis ibis TUI Intrepid VIRTUOSO omio Byway TRAVEL+LEISURE Rustic Pathways

TREND REPORT META ANALYSIS

Meta-Analysis of 36 Traveler Trend Reports & 316 Trends in 16 Clusters

The travel industry continues to elevate conscious consumer experiences as its dominant narrative, with Mindful Travel emerging as this year's most discussed theme across trend reports, slightly overtaking last year's frontrunner, Passion Travel—which maintains strong relevance through evolving expressions of destination-driven entertainment and culinary tourism.

This narrative shift reflects the industry's increasing focus on sustainability and authenticity, with Pattern Breaking and Transformative Travel further reinforcing a collective pivot toward more meaningful experiences that challenge conventional tourism patterns.

While established themes dominate the conversation, the emergence of AI Travel in over a third of industry reports signals growing attention to technological integration, though traditional experience-focused narratives remain central.

Source: Lufthansa Innovation Hub, TNMT.com, Company Websites & Reports

77 Mentions   **27/36** Reports

PASSION TRAVEL

#SET JETTING
#GIG TRIPPING
#SPORTS FAN TRAVEL
#CULINARY TRAVEL
#LONGTAIL HOBBIES

77 Mentions   **29/36** Reports

MINDFUL TRAVEL

#LOW FOOTPRINT – HIGH IMPACT
#SLOW TRAVEL
#DESTINATION DUPES
#SMALL DESTINATIONS
#AUTHENIC & LOCAL

47 Mentions   **27/36** Reports

PATTERN BREAKING

#ALTERNATIVE SEASONS
#DESTINATION DUPES
#SMALL DESTINATIONS
#COOLCATIONING

44 Mentions   **25/36** Reports

TRANSFORMATIVE TRAVEL

#WELLBEING & SLEEP
#SLOW TRAVEL
#CELESTIAL GUIDANCE

COLLECTIVE TRIPS

#FAMILY & FRIENDS
#SOLO TRAVEL

OPTIMIZED BUDGETS

#TRIP OPTIMIZATION
#ALL INCLUSIVE

LUXURIOUS DIVIDE

#BUDGET PREMIUM
#EXCLUSIVE ASSETS

VIRAL TRAVEL

OTHER

AI IN TRAVEL

#AI TRIP PLANNING

RAIL RENAISSANCE

BLURRED TRAVEL

SPORT & ACTIVITY

#SPORT & ACTIVITY

CRUISES

CELEBRATORY TRAVEL

DEI

GENESIS

SYNTHESIS

ANALYSIS

TRIANGULATION MATRIX

Triangulation is the practice of using multiple data **sources, methods, or perspectives** to validate a pattern—just as ancient navigators used multiple reference points to determine their precise location.

By combining different types of evidence and analytical approaches, triangulation builds confidence in pattern recognition while reducing bias and false positives.
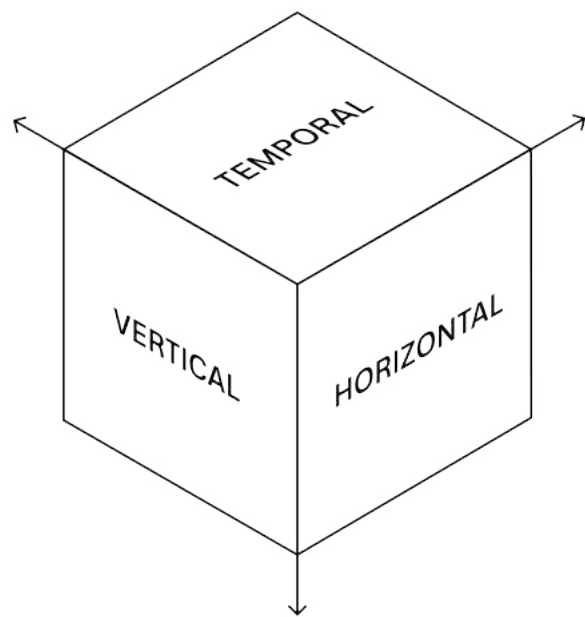
VERTICAL
PATTERN DEPTH & STRENGTH

– Evaluates pattern significance and implications

– Assesses pattern persistence and resilience

– Distinguishes surface changes from structural shifts

– Examines root causes and driving forces

– Maps impact chains and dependencies

HORIZONTAL
CROSS-DOMAIN PATTERNS

– Maps pattern spread across industries, markets, and domains

– Measures pattern strength through cross-domain validation

– Reveals reinforcing patterns across different contexts

– Identifies opportunities invisible from single-domain views

TEMPORAL
PATTERN EVOLUTION

– Tracks pattern lifecycle and momentum

– Identifies acceleration points and velocity changes

– Maps pattern convergence and divergence

– Distinguishes cyclical from linear patterns

– Projects potential trajectories

VERTICAL
TRIANGULATION

UNSOLICITED FEEDBACK

Our updated analysis of 15,000+ airline reviews reveals what bothers travelers the most in the post-pandemic travel era.

Flight irregularities emerged as the most discussed topic, accounting for 36% of all airline reviews posted on Tripadvisor.

This means that nearly one in every three reviews highlighted issues related to delayed, canceled, or missed flights.

TNMT

While the airline industry recovers, passenger needs are largely ignored

The Demand vs. Satisfaction Gap in the airline industry

— Air traveler sentiment, indexed to 100
— Number of commercial flights in Europe (in '000)
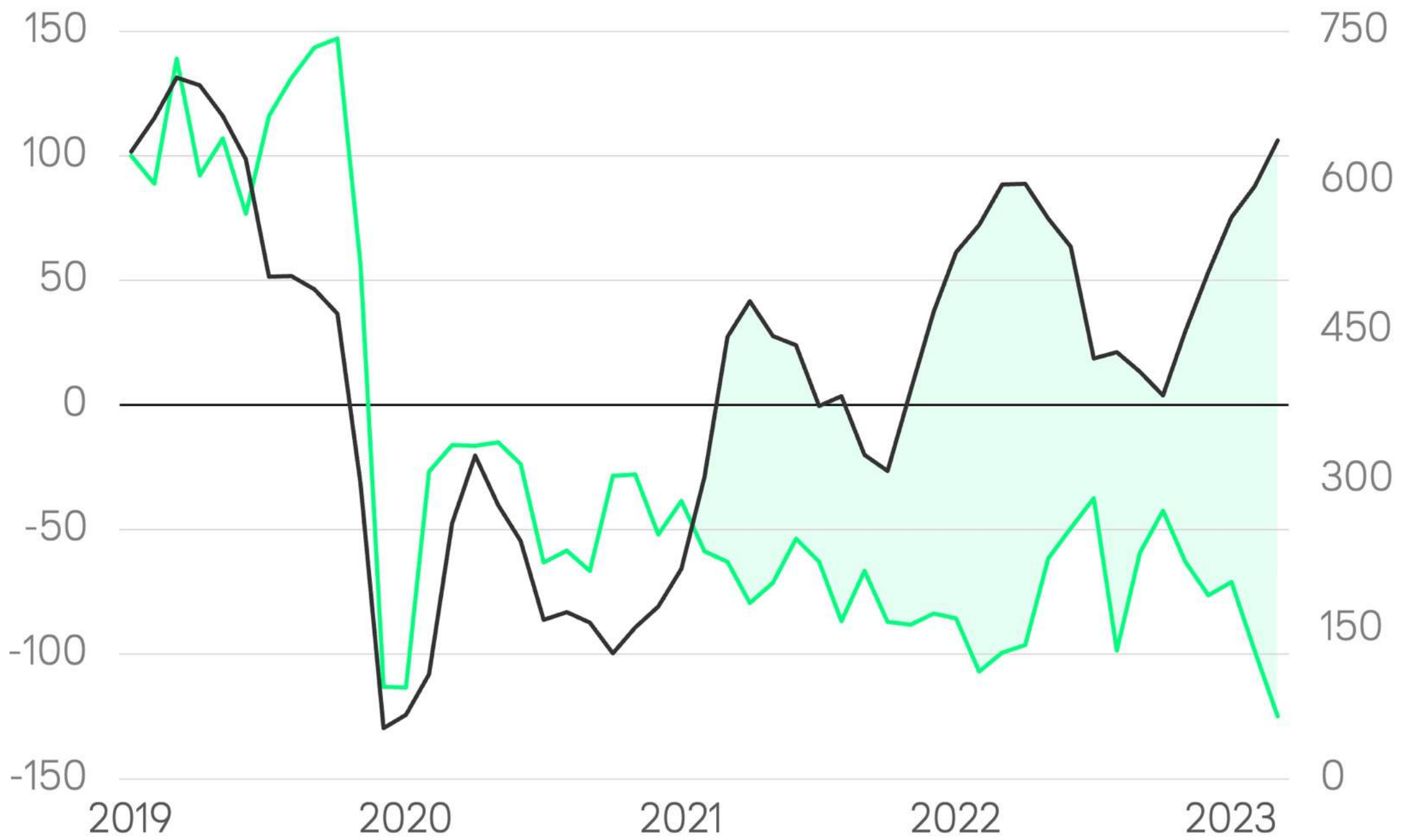
Source: Lufthansa Innovation Hub Analysis, TNMT.com, Tripadvisor, Quid Discover, Eurocontrol

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TNMT

Flight irregularities are the most mentioned review topic by travelers

Share of all airline reviews on Tripadvisor by topic

35.9% Flight Irregularities	14.0% Luggage	6.4% Onboard service	3.1% Business Class & Upgrades
			2.5% Other
		5.6% F&B	1.6% Queues
			2.2% IFE
			2.1% Covid-19
11.8% Check-in & Boarding	7.8% Seat Comfort & Legroom	3.8% Punctuality	1.1% Car Rental
			2.2% Value for Money
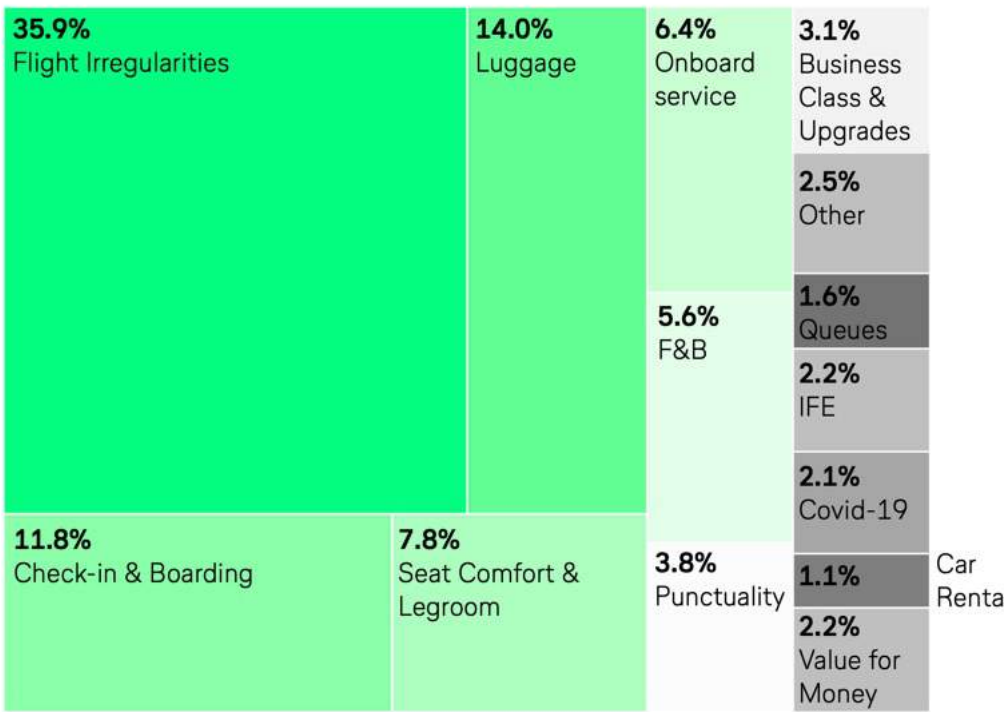
Source: Lufthansa Innovation Hub Analysis, TNMT.com, Tripadvisor, Quid Discover

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TNMT

The sentiment has worsened across all three major traveler pain points

Top three negative sentiment clusters (% of negative reviews)

Flight Irregularities
- 2023 ☹ 39%
- 2019 ☹ 33%

Luggage
- 2023 ☹ 17%
- 2019 ☹ 12%

Check-in & Boarding
- 2023 ☹ 13%
- 2019 ☹ 5%
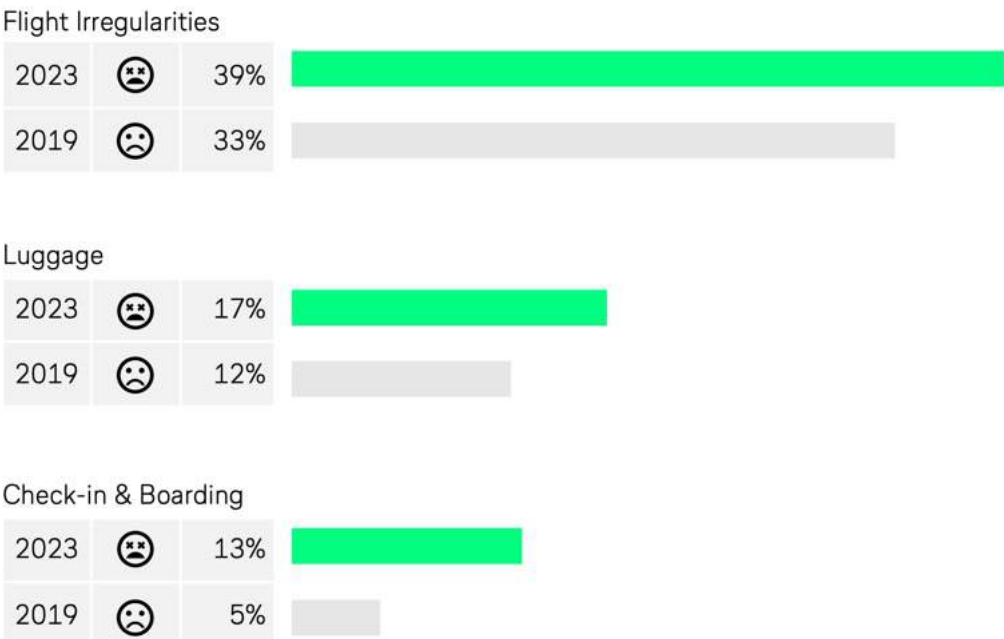
Source: Lufthansa Innovation Hub Analysis, TNMT.com, Tripadvisor, Quid Discover

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CROSS SECTOR SENTIMENT

TNMT

Traveler sentiment has declined across transportation modes

Air, Rail and Bus traveler sentiment, indexed to 100 in Q1/2020

— Air traveler sentiment — Rail traveler sentiment — Bus traveler sentiment*

Source: Lufthansa Innovation Hub Analysis, TNMT.com, Tripadvisor, Quid Discover
*Excluding National Express

CROSS ACTOR SENTIMENT

TNMT

Travelers, media and airline execs show a stark contrast in sentiment

Airline industry sentiment score (% change from 2019)

— Travelers — Executives — Media

+129%

-10%

-193%

Source: Lufthansa Innovation Hub Analysis, TNMT.com, Tripadvisor, Quid Discover, Koyfin

HORIZONTAL
TRIANGULATION

X
STARLINK

SATELLITE CONNECTIVITY

The integration of Starlink's satellite internet into commercial aviation marks a transformative shift in in-flight connectivity, replacing legacy systems with high-speed, low-latency connections that meet modern passenger expectations. This technological leap has disrupted the traditional revenue model, where airlines charged premium fees for subpar Wi-Fi.

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| INNOVATORS | EARLY ADOPTERS | EARLY MAJORITY | LATE MAJORITY | LAGGARDS |

INTERNET SERVICE USED (OR PLANNED) BY CRUISE SHIP BRAND

Source: Quilty Space 2023

CRUISE INDUSTRY AHEAD OF AVIATION

Starlink on July 19 2023 tweeted that "Nearly 300 cruise ships are now set to use Starlink to keep their passengers and crews connected with high-speed internet while on rivers and at sea."

In August 2022, Royal Caribbean Group said it has become the first cruise liner to adopt SpaceX's Starlink LEO satellite broadband services. Since then, Starlink has signed most major cruise lines except for MSC Cruises.

Update
28 February 2024 -Two thirds of MSC Cruises' ships are now equipped with SpaceX's Starlink onboard connectivity and the fleet roll out programme will be completed by May 2024.

Source: Quilty Space

AT WHICH INDUSTRIES DO YOU LOOK FOR INSPIRATION?

LEARN FROM SIMILAR CHALLENGES, NOT THE SAME SECTOR

We benchmark against airlines, but customer journeys are now hybrid, emotional, and multi-touch.

They fly, but they also stream, shop, and dine—all in one journey.

It's Not About Airlines Anymore

AVIATION

— Geography

— Beyond Peer Group

— History

HOSPITALITY

— Seamless guest profiles, pre-arrival personalization

— Extend PNR personalization into service scripting

RAIL

— Seat Zoning & Cabin Comfort

— Design for dwell time, comfort profiles, silent zones

CRUISES

— Ancillary Revenue Mastery

— Bundling, upsells, and monetizing on board

THEME PARKS

— Crowd Management and Dynamic Pricing

— Steering guests and monetizing line skipping

CASINOS

— Loyalty Engineering

— Real-time micro incentives

— behavioral rewards

E-COMMERCE

— Merchandising at Checkout

— Add-ons that make sense, when they make sense

ENTERTAINMENT

— Contextual personalization,

— emotional UX, mood-based content

— Entertainment offerings, pre-flight curation

FINTECH

HEALTH

AUTOMOTIVE

RETAIL

...

CRUISES

The cruise industry, once deemed outdated, has emerged as a leader in travel innovation, leveraging IoT and real-time data to create personalized passenger experiences. Despite severe setbacks during the COVID-19 pandemic, cruise lines have rebounded rapidly,
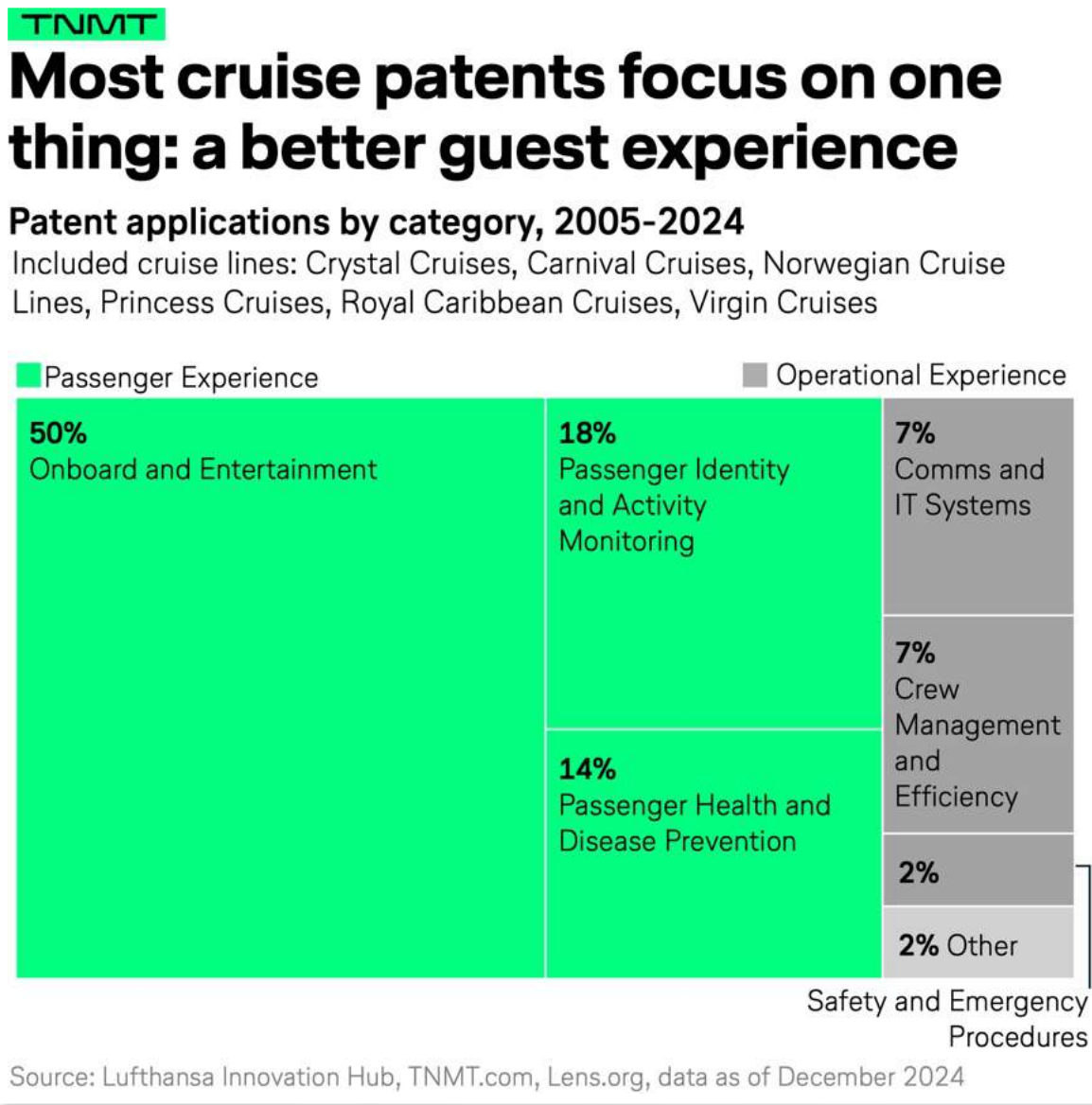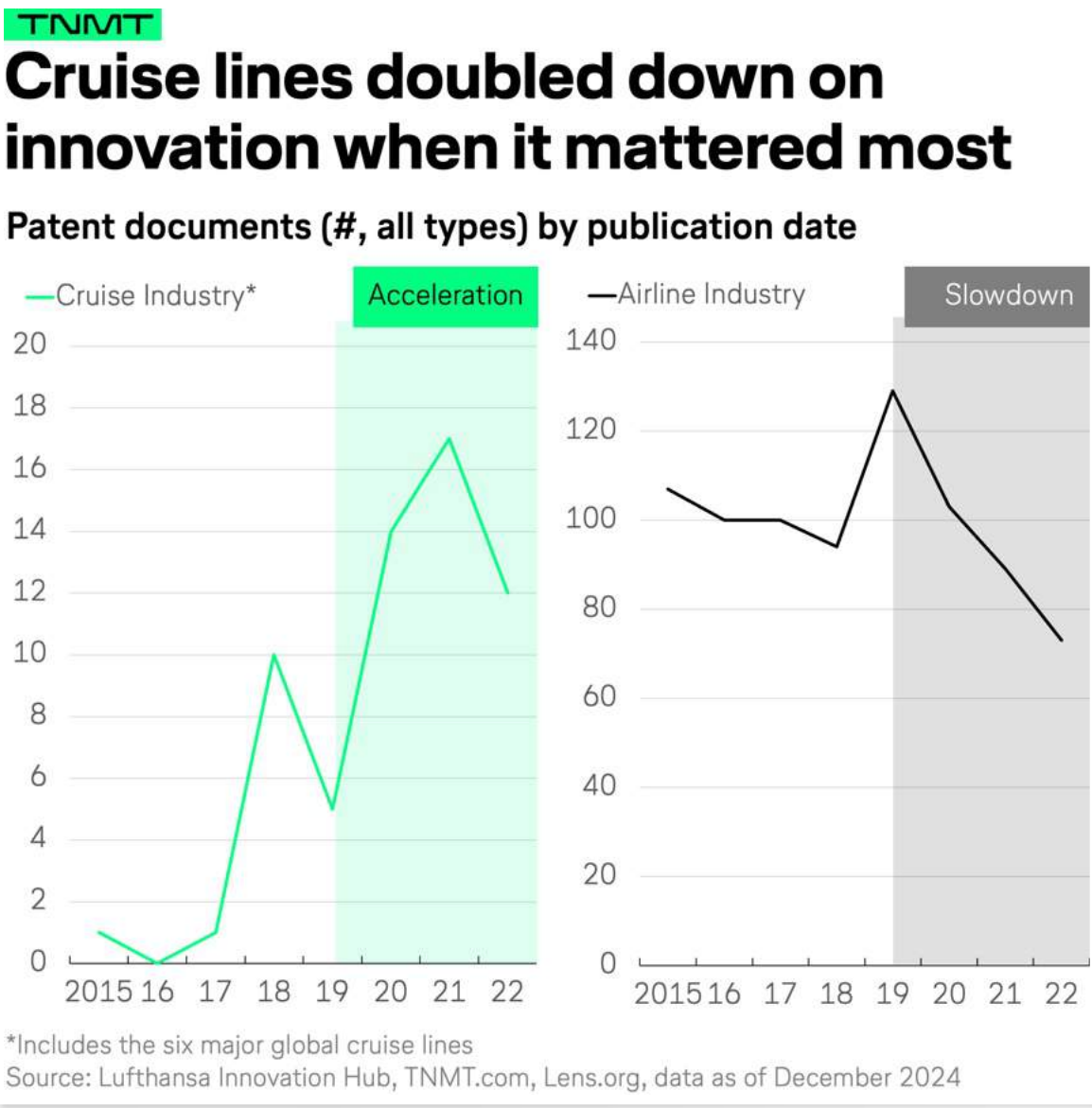
surpassing pre-pandemic passenger volumes by 2022 and achieving record-breaking financial quarters in subsequent years, offering valuable insights for the airline sector's recovery strategies.

TNMT

The cruise industry has outpaced air travel post-pandemic

Travel recovery, indexed to 100 in 2019

— Cruise Industry (passenger volume) — Airline Industry (RPK)

End of Pandemic

120
110

Source: Lufthansa Innovation Hub, TNMT.com, IATA, CLIA Cruise Forecast

TNMT

The generational shift in cruising is driving market growth

Share of U.S. adults (in %) by generation with cruises as their favorite vacation type

34% Millennials 1982-99
34% Baby-Boomer 1946-64
25% Gen X 1965-81
4% Silent Generation 1945 and earlier
3% Gen Z 2000 and later

Source: Lufthansa Innovation Hub, TNMT.com, YouGov

TNMT

Cruises are reviewed much more positively than airlines post-Covid

Passenger review sentiment, indexed

— Air Travelers — Cruise Travelers ❙ No data available

Source: Lufthansa Innovation Hub, TNMT.com, reviews from Cruiseline.com and TripAdvisor

CRUISES

The cruise industry has embraced cutting-edge technologies like wearables and extended reality (XR) to enhance the guest experience and streamline operations. Cruise lines are deploying smart wristbands to enable seamless payments, cabin access, and real-time location tracking, allowing for hyper-personalized service on board. Additionally, XR technologies are being piloted for immersive onboard entertainment and virtual excursions, signaling the industry's commitment to blending physical and digital experiences to redefine leisure travel.

These innovations offer valuable inspiration for other travel sectors seeking to elevate customer engagement through tech-enabled environments.

TNMT

Cruise lines doubled down on innovation when it mattered most

Patent documents (#, all types) by publication date

Cruise Industry* — Acceleration — Airline Industry — Slowdown

*Includes the six major global cruise lines
Source: Lufthansa Innovation Hub, TNMT.com, Lens.org, data as of December 2024

TNMT

Most cruise patents focus on one thing: a better guest experience

Patent applications by category, 2005-2024
Included cruise lines: Crystal Cruises, Carnival Cruises, Norwegian Cruise Lines, Princess Cruises, Royal Caribbean Cruises, Virgin Cruises

■ Passenger Experience   ■ Operational Experience

50% Onboard and Entertainment	**18%** Passenger Identity and Activity Monitoring	**7%** Comms and IT Systems
		7% Crew Management and Efficiency
	14% Passenger Health and Disease Prevention	**2%**
		2% Other
		Safety and Emergency Procedures

Source: Lufthansa Innovation Hub, TNMT.com, Lens.org, data as of December 2024

TNMT

Pandemic-induced contact tracing spurred the adoption of wearables

Facebook post from corporate MSC Cruises account

Source: Lufthansa Innovation Hub, TNMT.com, Facebook, MSC Cruises

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TNMT

Wearables are becoming a new standard in the cruise industry

Patent by Carnival Corporation:
Signal Processing of a Wireless Guest Engagement System

- Function as digital credentials to unlock their cabins, access restricted areas, and verify their identity without physical keycards or tickets.
- Transactions for onboard purchases, dining, and activities, integrating with the ship's payment system.
- Track passenger movement and preferences
- Passenger tracking for safety purposes, allowing crew members to locate individuals quickly during emergencies, monitor crowd density, and streamline evacuation procedures.

Source: Lufthansa Innovation Hub, TNMT.com, Lens.org

TNMT

Extended Reality can enhance the onboard experience on cruise ships

Patent by Royal Caribbean Cruises Ltd.:
Augmented Reality Tour Guide application

- AR-based tour guide system for cruise ships
- Interactive, location-aware information about ship amenities, destinations, and points of interest.
- Addresses challenges in navigation and onboard engagement, replacing traditional maps and brochures with a more immersive and personalized digital experience.

Source: Lufthansa Innovation Hub, TNMT.com, Lens.org

TNMT

Wearables can support a range of functions during cruise trips

Based on existing bracelets available on various cruises today

Location tracking	Payments	Identification and room access	Integration with other digital features
Tracking of relatives and children onboard	Contactless payments onboard	Crew can identify guest incl. details like allergies, preferences	Interactive elements (lights, vibrations) that work in tandem with onboard entertainment
Food and drink deliveries to anywhere on the ship	All transactions on one bill/ Each payment verified by crew (compare image of guest with guest)	Stateroom access, lounge access, activity access	Integration with mobile app for booking activities and services, promotions, etc.
Contact tracing (COVID-related)	Reusable across ships of cruise line (and in case of Disney, in ships and theme parks)	Dis/Embarking the ship (used in tandem with manual or automated facial recognition)	Complete data repository on customer's interactions during trip to support personalization

Source: Lufthansa Innovation Hub, TNMT.com

TNMT

Extended Reality devices can support a range of functions

Based on existing use cases available on various cruises today

Up-to-date and personalized entertainment	Ability to "escape" in confined space of cruise ship	Entertainment at scale	Retail & upsell experience
Cruise ship have a lifetime of 30-50 years and amenities cannot be updated easily. Entertainment evolves rapidly. Using XR entertainment, content can be updated regularly and matched with individual customer preferences.	In the lag time between ports, cruisers need to entertain themselves on-ship. Depending on the length of the cruise, the onboard events and amenities can feel confining. XR can help create alternative and relaxing environments and reduce anxiety.	XR can (in theory) be made available to thousands of passengers onboard at the same time, if they have a cell phone (AR) or headset (VR/MR). This is a rarity on ships, where resources are limited, and crowds and waiting times build up easily.	XR environments can be used to showcase the cabin and amenities during the booking process or can support onboard shopping. These environments have been shown to increase conversion rates.
1. Cost-saving 2. Up-to-date entertainment 3. Personal entertainment	1. Enable ship exploration 2. Increase dwell time on-ship 3. Manage anxiety onboard	1. Cost-saving 2. Entertainment at scale 3. "Community experience"	1. Increased conversion 2. Better information on ship & room amenities 3. Effective upsell

Source: Lufthansa Innovation Hub, TNMT.com

TEMPORAL
TRIANGULATION

WE ALWAYS OVERESTIMATE THE CHANGE THAT WILL OCCUR IN THE NEXT <u>TWO YEARS</u> AND UNDERESTIMATE THE CHANGE THAT WILL OCCUR IN THE <u>NEXT TEN</u>.

Bill Gates

20
14

20
24

TREND
MOMENTUM

Tech Momentum and Innovation Diffusion represent a strategic approach to timing technology adoption decisions. By tracking how actively new technologies are being implemented across different industry use cases and peer organizations, companies can quantify the "momentum" behind specific innovations and gauge optimal entry points.

Rather than focusing solely on being first-to-market, organizations can define their own threshold percentage of peer adoption that triggers action, aligning with their risk tolerance and innovation strategy.

This data-driven approach helps companies avoid both premature investment in unproven technologies and falling too far behind the adoption curve, essentially providing a market-validated signal for when to engage with emerging technologies.
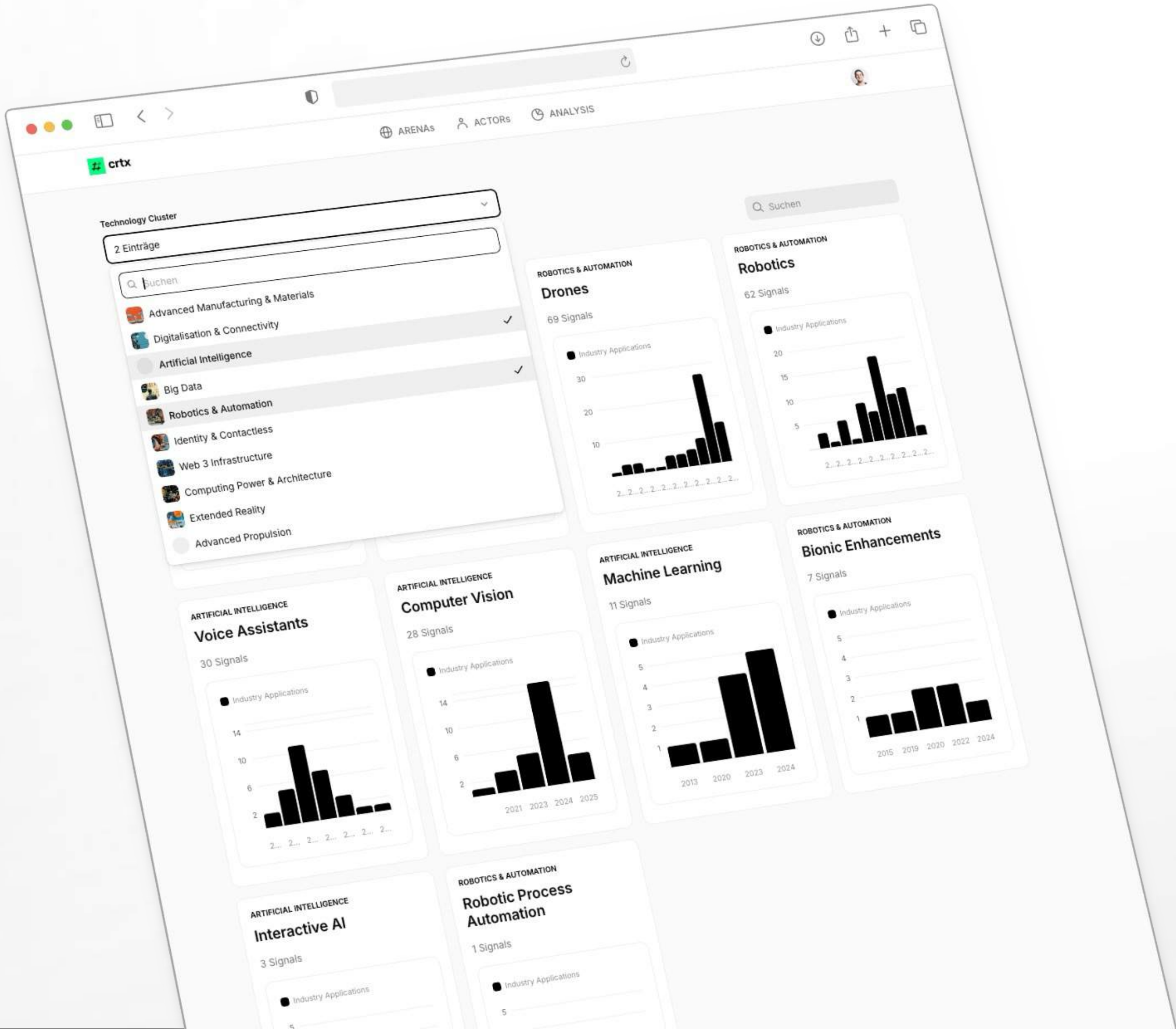
TREND MOMENTUM

AR / VR / MR
106+ PROJECTS IN 10 YEARS

The evolution of VR/AR/MR adoption in the airline industry reveals a decade-long journey of experimentation and gradual implementation. While initial trials began around 2015, the first significant wave of adoption occurred during 2017-2018, as the technology matured and became more commercially viable. Despite a temporary slowdown during the pandemic years (2020-2021), interest rebounded strongly from 2022 onwards.

The industry saw its most dramatic uptick in 2024, catalyzed by Apple Vision Pro's entry, which brought enterprise-grade mixed reality capabilities at a new level of sophistication. This surge reflects how the technology has finally reached a critical point where quality, cost, and practical application converge, making extended reality solutions both technically feasible and economically viable for airlines.

The growth pattern suggests that AR/VR/MR has moved beyond the experimental phase and is now entering mainstream adoption across various airline operations.
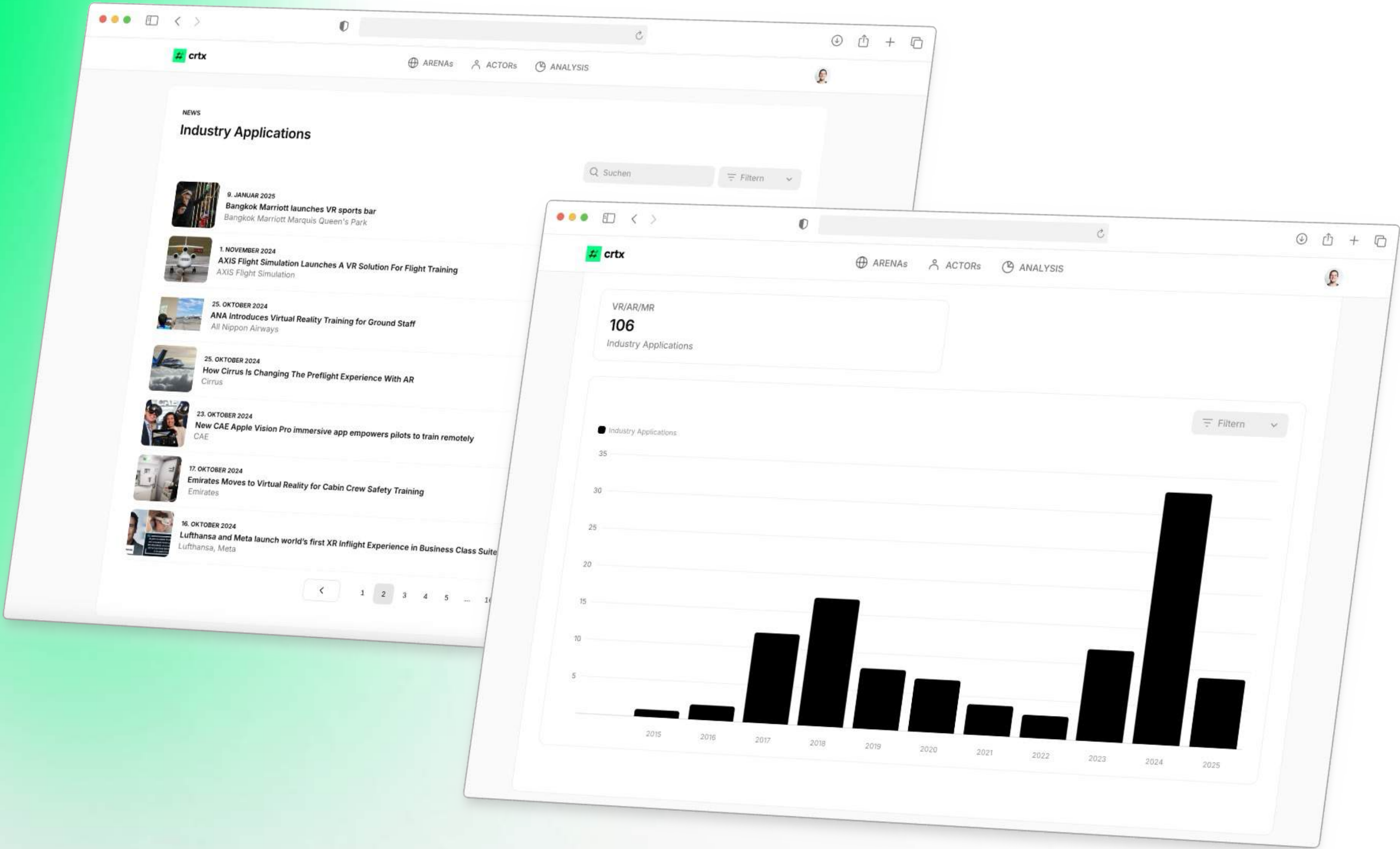
AR/VR/MR
USE CASES

**106 Industry applications across
21 Use Cases (some excluded)**

AR/VR adoption in the airline industry
exhibits a strategic dual focus: internally,
for operational excellence, and externally,
for enhancing customer experience. While
internal applications center on critical
areas like pilot training and maintenance
procedures, external use cases focus on
revolutionizing passenger entertainment
and service interactions.

11
Applications

VR IMMERSIVE PILOT TRAINING

10
Applications

VR CREW PROCEDURE TRAINING

10
Applications

IMMERSIVE & AUGMENTED OPEARTIONS

AR WAYFINDING & NAVIGATION

7
Applications

VR IMMERSIVE PRODUCT PREVIEW

11
Applications

AR BAGGAGE SIZE VERIFICATION

5
Applications

VR DESTINATION PREVIEW

18
Applications

IMMERSIVE ENTERTAINMENT

IMMERSIVE MARKETING

6
Applications

IMMERSIVE EXPERIENCES

VIRTUAL TRAVEL & FLIGHT

7
Applications

VR IMMERSIVE INFOTAINMENT

GENESIS

SYNTHESIS

ANALYSIS

SENSEGIVING SPECTRUM

PUSH INTELLIGENCE

PULL INTELLIGENCE

EMBEDDED INTELLIGENCE

Modern delivery systems move beyond traditional static reports to create dynamic, context-aware intelligence flows.

The power of modern delivery systems lies in their ability to match the right intelligence to the right person at the right time in the right format—creating an intelligence ecosystem that adapts to how organizations actually work and make decisions.

Proactively delivers intelligence to users through automated alerts, scheduled reports, and system-triggered notifications, ensuring critical insights reach stakeholders without manual intervention.

Enables users to actively seek and retrieve intelligence on demand through searchable repositories and interactive platforms, supporting deep-dive analysis and exploratory research.

Seamlessly integrates intelligence directly into existing workflows and tools, making insights immediately accessible within the context where decisions are made.

Format Flexibility
_ Static to interactive
- Template to synthetic
- Complete context to focused updates

—System-initiated delivery
—Scheduled updates and alerts
—Triggered by pattern detection
—Proactive distribution

—User-initiated access
—On-demand queries
—Self-service platforms
—Interactive exploration
—Chat Interfaces

—Integrated into workflows
—Connected to existing tools
—Context-aware delivery
—Decision support systems

Contextual Awareness
- User role and knowledge
- Decision timing
- Strategic relevance

—Real-time alerts
—Operational dashboards
—Change detection

—Pattern notifications
—Collaborative analysis
—Trend radars

—Scenario exploration
—Strategic planning workshops
—Future mapping

NEWSLETTER
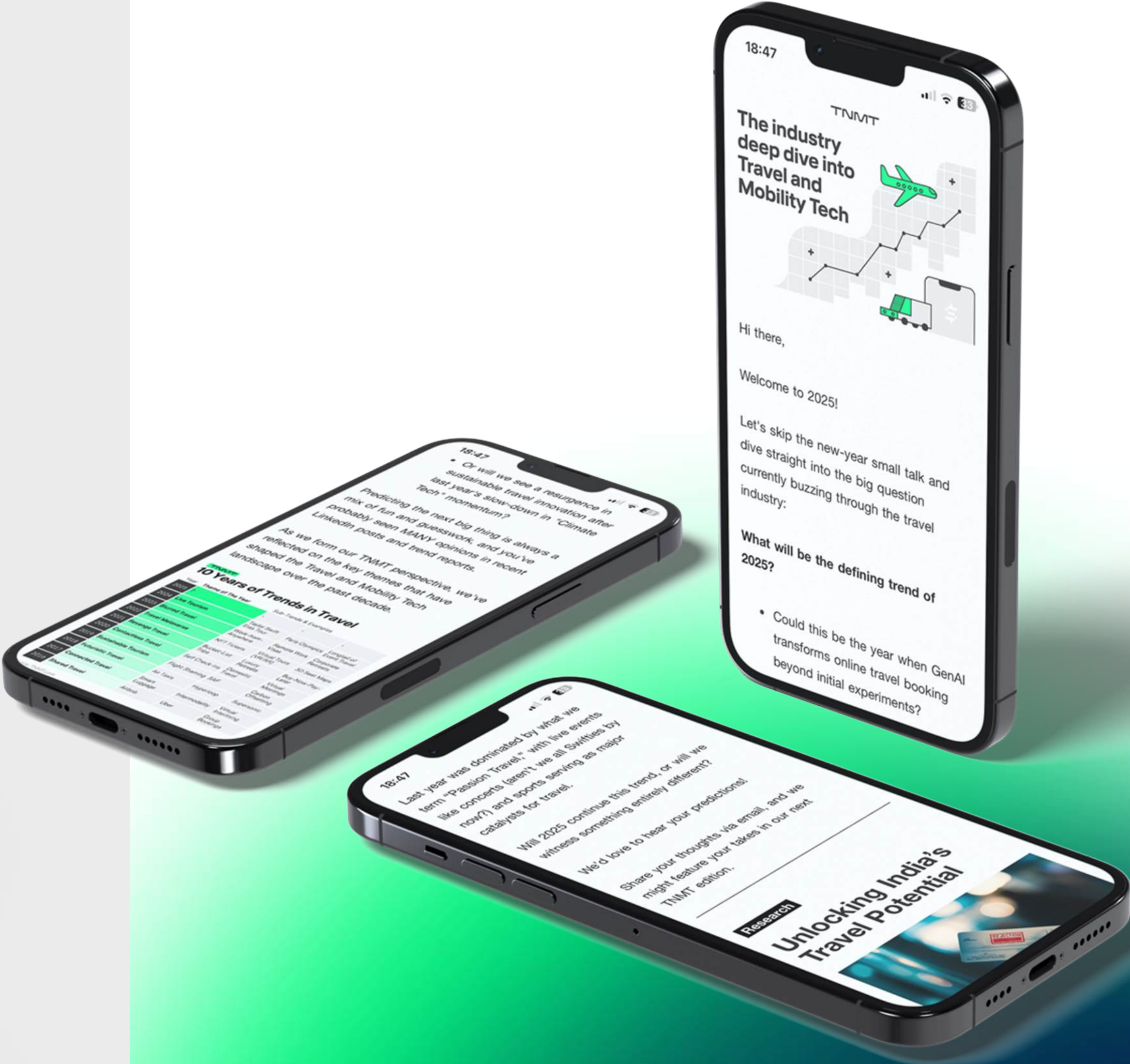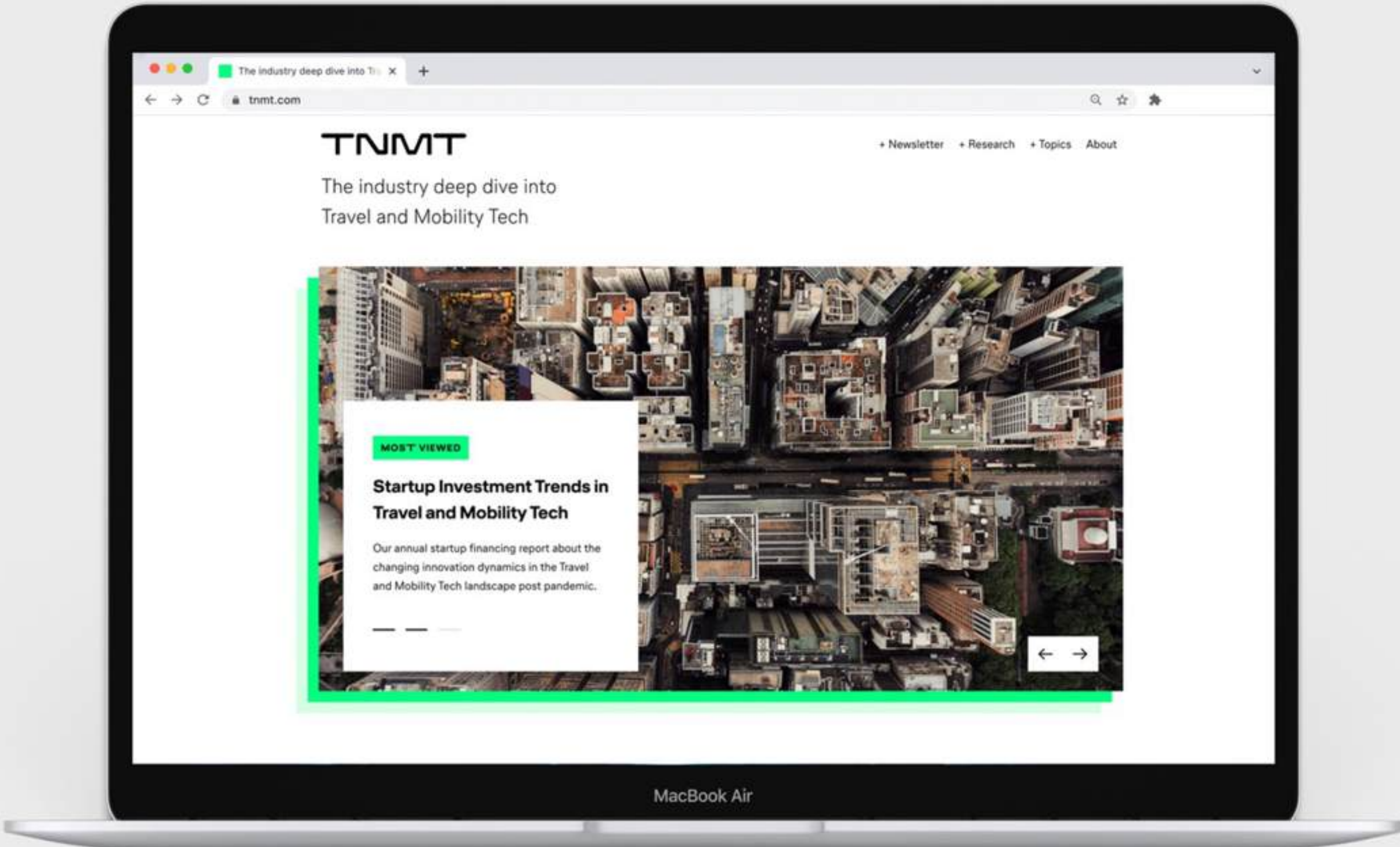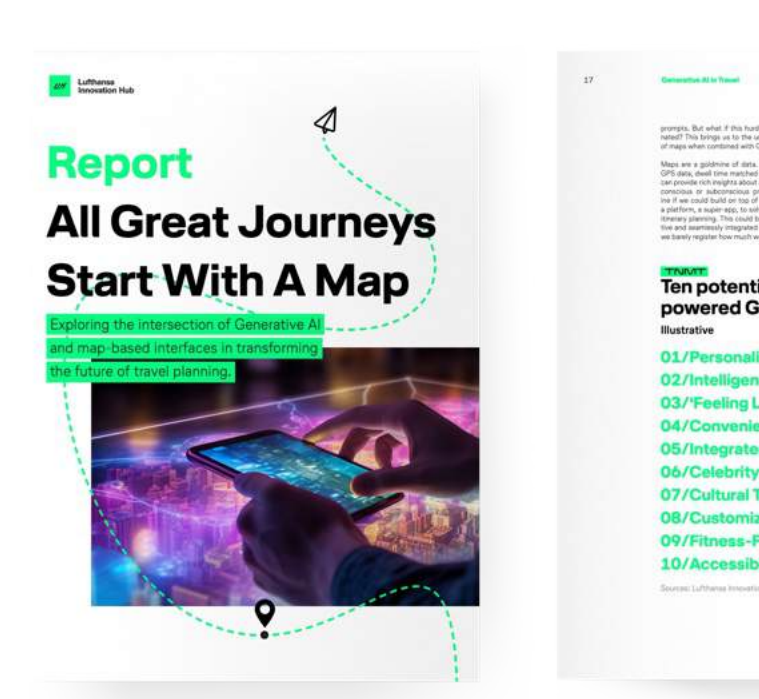
AI & MAPS WHITEPAPER
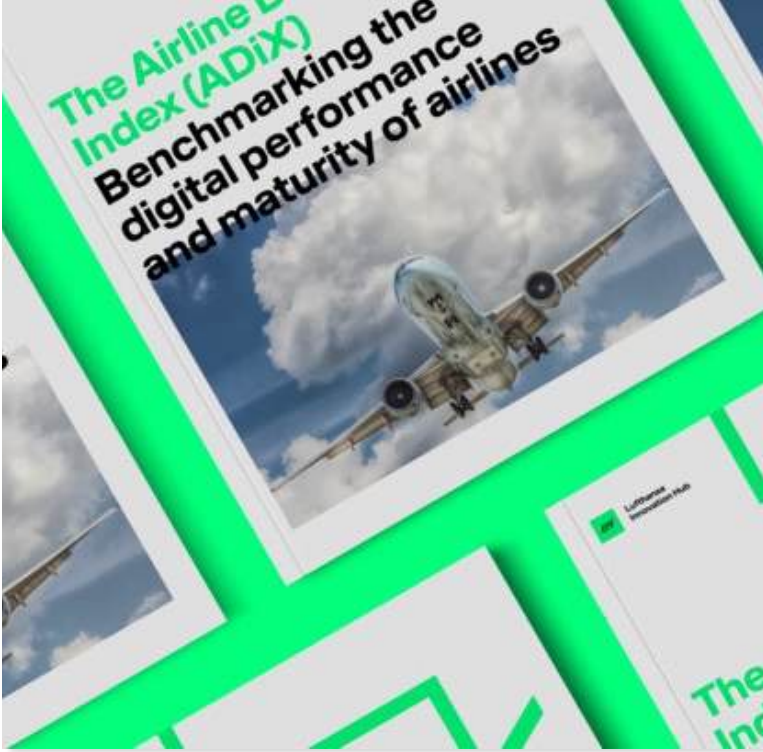
AIRLINE DIGITAL INDEX
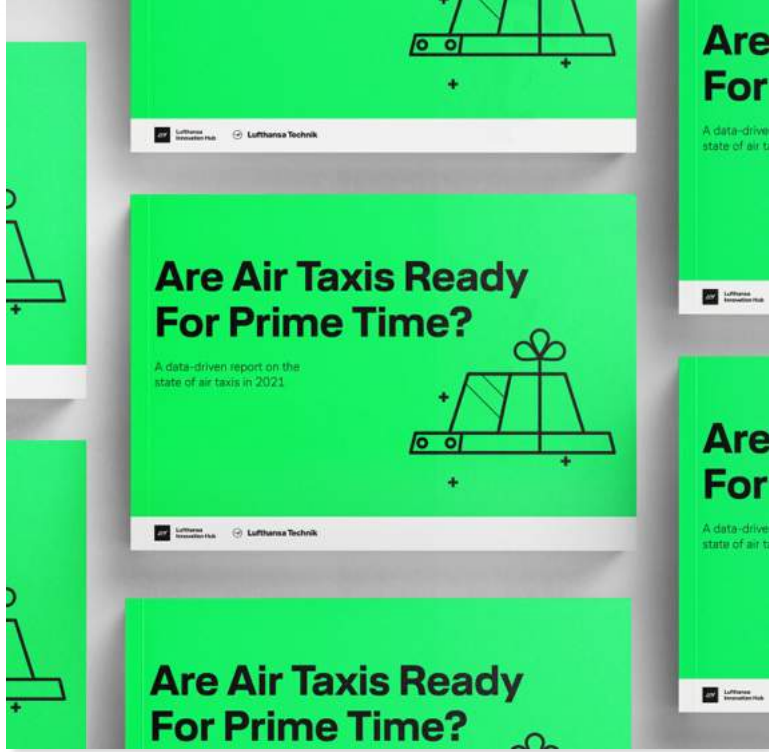
AIR TAXI REPORT

AAM ECOSYSTEM REPORT

SECTOR ATTRACTIVENESS

SPAC INVESTMENT REPORT

SUPERAPPS WHITEPAPER

AIRLINE PATENT ANALYSIS

RESEARCH REPORTS

In the past 10 years LIH has published +15 reports. Additionally we share Deep Dives and Briefings internally within Lufthansa Group.
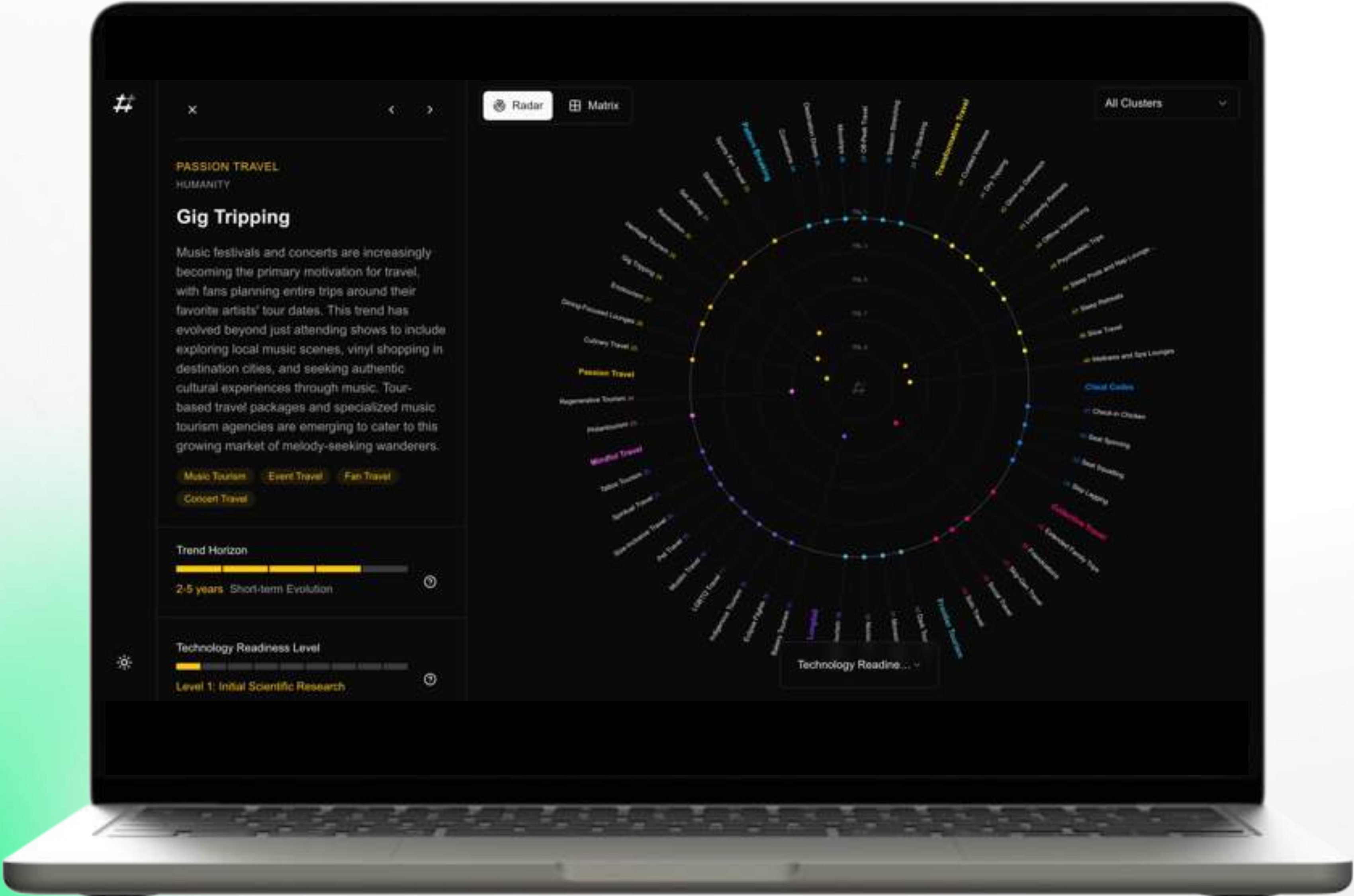
www.tnmt.com

TREND RADAR

PORTAL
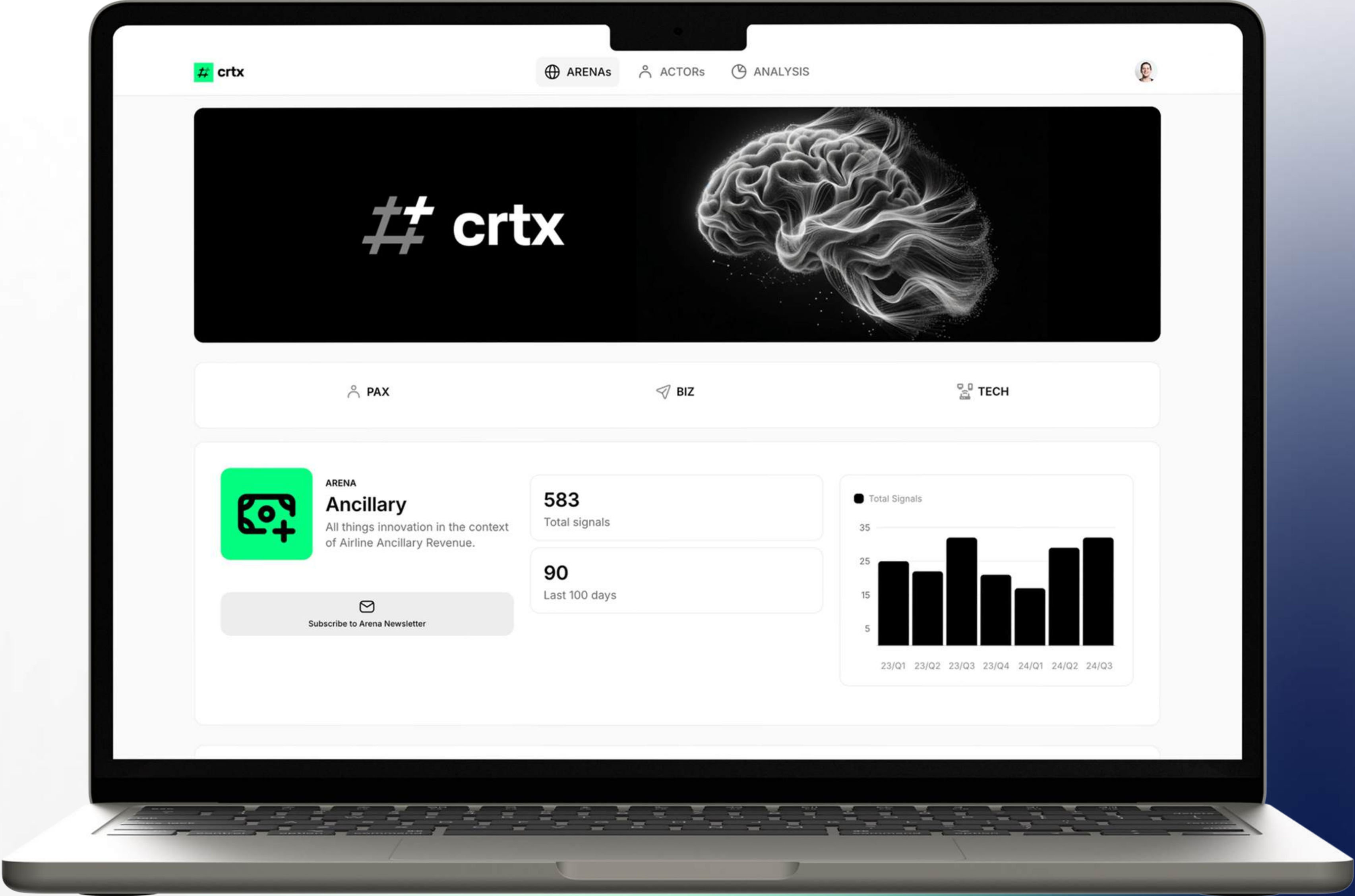
GENESIS

SYNTHESIS

ANALYSIS

INSIGHT OS
ARTICLE SERIES

MI ESSENTIALS

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#01 – Why

#02 - How

#03 - Now

#04 - New

#05 - Next

Strategic intelligence at the speed of change

Tino Klaehne
Strategic Innovation Expert

feedly market intelligence

EXPERT VOICE

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INSIGHT OS
TRAINING

Strategic Intelligence for Innovation Leaders

This training equips innovation managers with frameworks and tools to build effective intelligence systems. In today's fast-paced environment, traditional research methods often fail to deliver timely insights. Our training teaches you to design and implement a robust insight operating system that overcomes these challenges.

Through practical exercises, you'll learn to organize intelligence across three time horizons, develop triangulation processes, and create systems that deliver actionable insights to decision-makers. You'll leave with a customized InsightOS blueprint tailored to your organization's specific needs.

Perfect for innovation teams looking to enhance foresight capabilities and make better decisions in complex, evolving environments.

LET'S
ACCELERATE
THE NEXT
IN TRAVEL
TOGETHER

TINO KLAEHNE
DIRECTOR STRATEGIC INNOVATION & INTELLIGENCE

LUFTHANSA INNOVATION HUB
GMBH BRUNNENSTRAßE 19-21
10119 BERLIN, GERMANY

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