



World Wide Technology

Make a new world happen



Vimesh Patel

Chief Technology Advisor
World Wide Technology

AI Journey



@vimeshpatel-dc

Who We Are

With \$20B in annual revenue, WWT is a financially strong, privately held global technology solution provider.

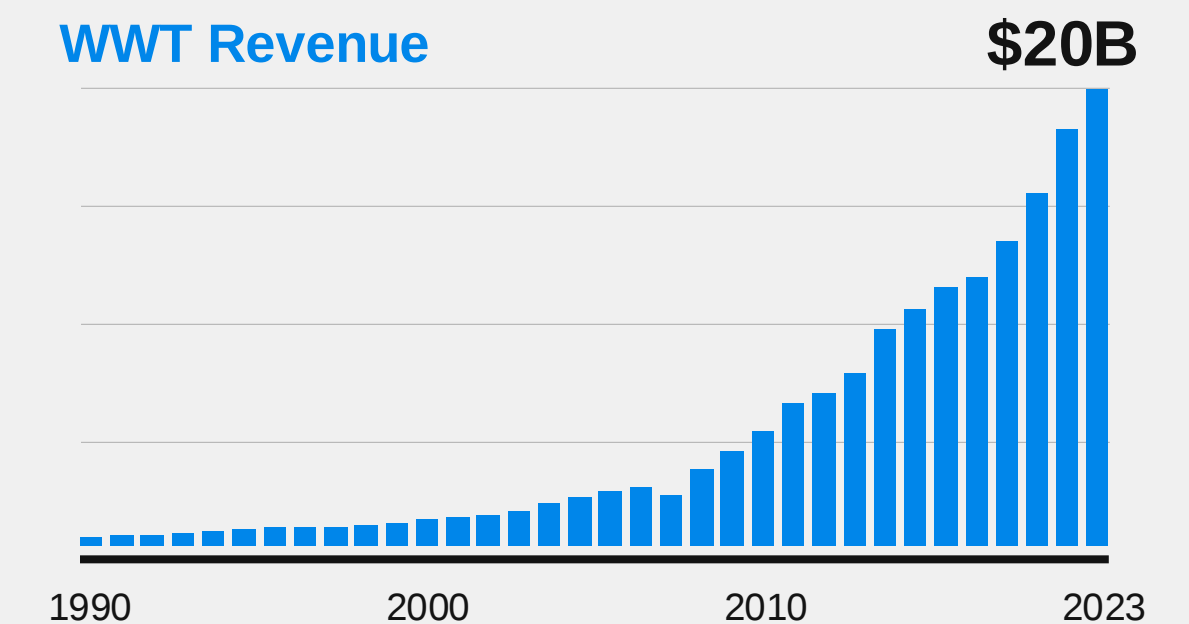
- More than 10,000 team members globally
- Thirteen years in a row on FORTUNE “100 Best Companies to Work For” list
- Honored as one of the 50 "Best-Led Companies of 2024" by Glassdoor
- Recognized as one of the “100 Most Influential Companies of 2021” by TIME
- Technology provider to more than 80 of the FORTUNE 100
- Top Partner with Cisco, HPE, Dell Technologies, VMware, NetApp, F5, Intel, Palo Alto Networks, Cohesity, Fortinet and many others
- \$6.3B in international revenue

“ Our culture of innovation creates a force multiplier of knowledge, speed and agility, allowing us to accelerate digital transformation for our customers.

Jim Kavanaugh, CEO



Founded in 1990 by
Jim Kavanaugh, CEO &
Dave Steward, Chairman



Deployment at Scale: Global Supply Chain

100,000+ orders processed each year with 99.4% accuracy

4 million

Square feet
on 3 continents



325

Concurrent rack
build stations

800,000+

Integrated systems
shipped annually



Staging and Integration • Material Planning •
Order Management • Just-in-time Delivery

WWT's Advanced Technology Center (ATC)

Today's leading and emerging technologies accessible in a physical and virtual environment to help you make the right decisions faster



\$500M+

Infrastructure
investment

20,000+

Virtual machines
in the cloud

200+

OEM partner
ecosystem

500+

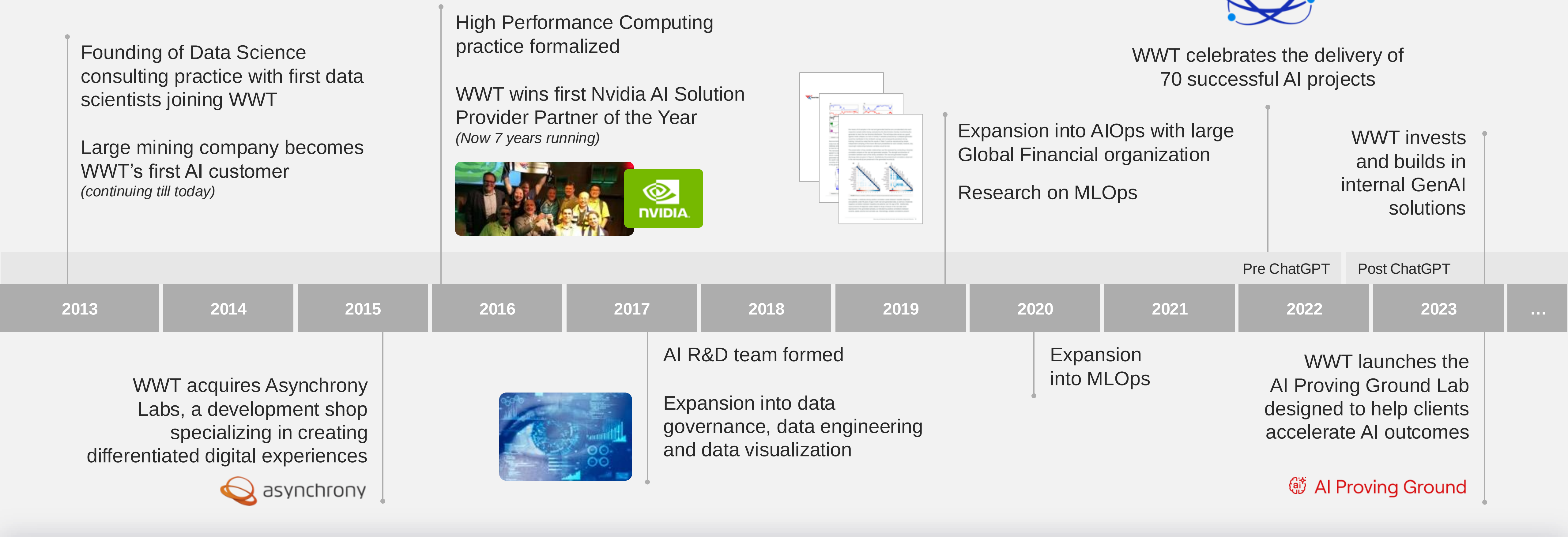
Rack
capacity

5,000+

Customer
engagements

Compare, contrast and validate integrated architectures • **Build** skill sets with learning paths, labs and research
Mitigate security risks with innovative Cyber Range • **Streamline** costs and time with Lab as a Service

WWT has 10+ years of AI experience



WWT AI project showcase



AI transformation
Harnessing the power of AI and data to drive productivity and safety gains across globally dispersed mining operations.



NLP
Converting natural language queries into SQL in order to answer pointed questions about an organizations IT environment



Generative AI
Making internal data sources accessible via a secure and private GPT chatbot designed to assist with a wide range of tasks.



Computer vision
Mudslide detection in underground mines to prevent mines from shutting down for an extended period of time



Sustainability
Using advances in liquid cooling to accelerate compute power while reducing costs and energy consumption.

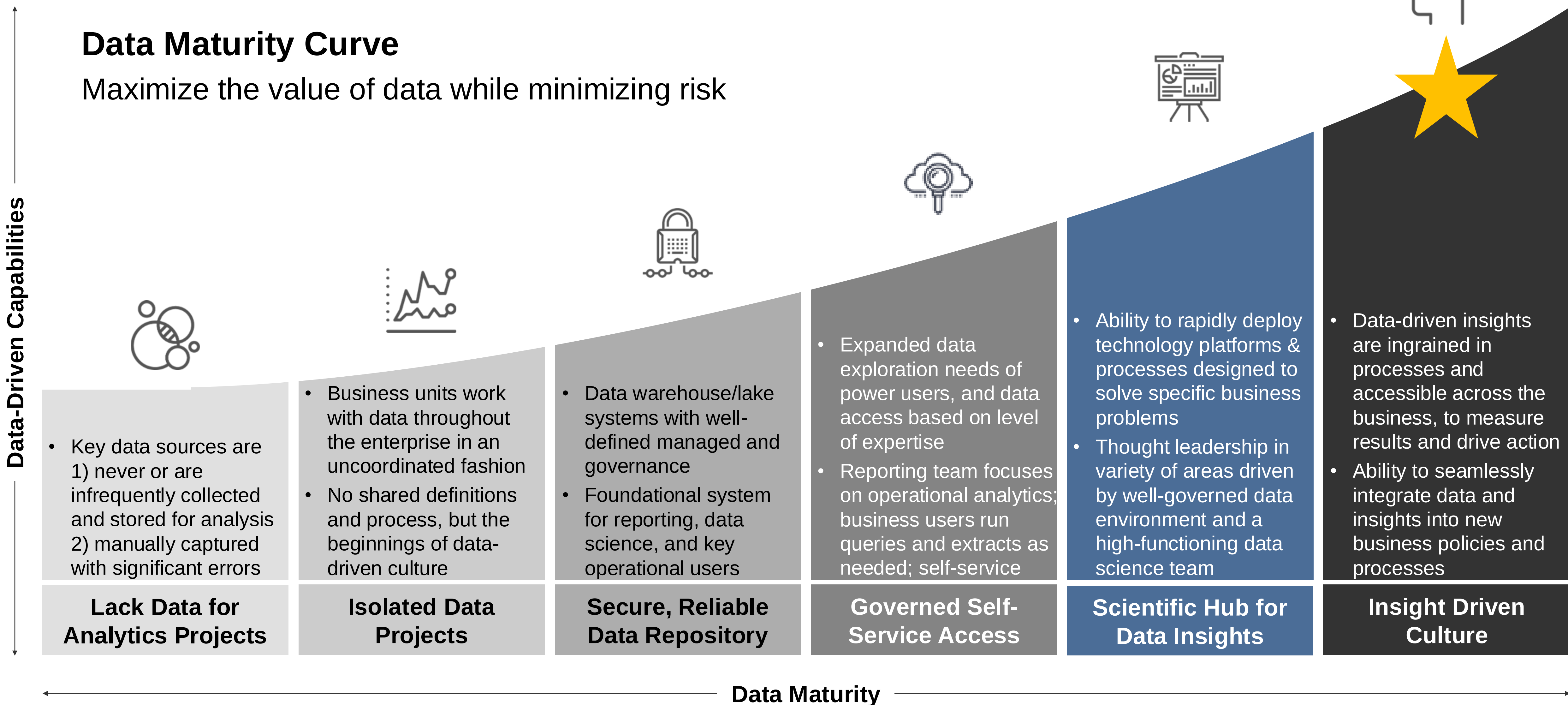


Prediction
Building a demand forecasting model for restaurants to reveal the hidden sales patterns of their customers.



Data engineering and visualization
Building cloud-based data pipelines and visualizations to track drone delivery metrics and optimize routing.

Determining Data Strategy Objectives With WWT's Data Maturity Curve



Enabling Data as an Asset Requires:

Five Fundamental Data Competencies



Data Strategy & Roadmap

Data Strategy must ensure alignment between business & data objectives

Use Case Prioritization

Data Maturity Assessment

Stakeholder Engagement

Implementation Roadmap



Data Engineering & Architecture

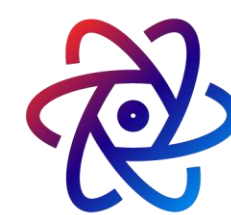
Integrate & automate data pipelines, leveraging advanced cloud solutions

Data Architecture

Automated Integration

Data Warehousing

Cloud Solutions



Data Analytics & Visualization

Modernize reporting through actionable analytics and data driven insights

Dynamic Dashboards

Insight Driven Alerting

Set-Service Datasets

Cross Org Collaboration



Data Governance & Management

Framework, governing policies and data capabilities to bolster data as an asset

Governing Council

Polices & Procedures

Ownership & Stewardship

Tools & Technology



Data Science & Machine Learning

Enabling and optimizing data & analytics through applied AIOps & MLOps

Computer Vision

Natural Language

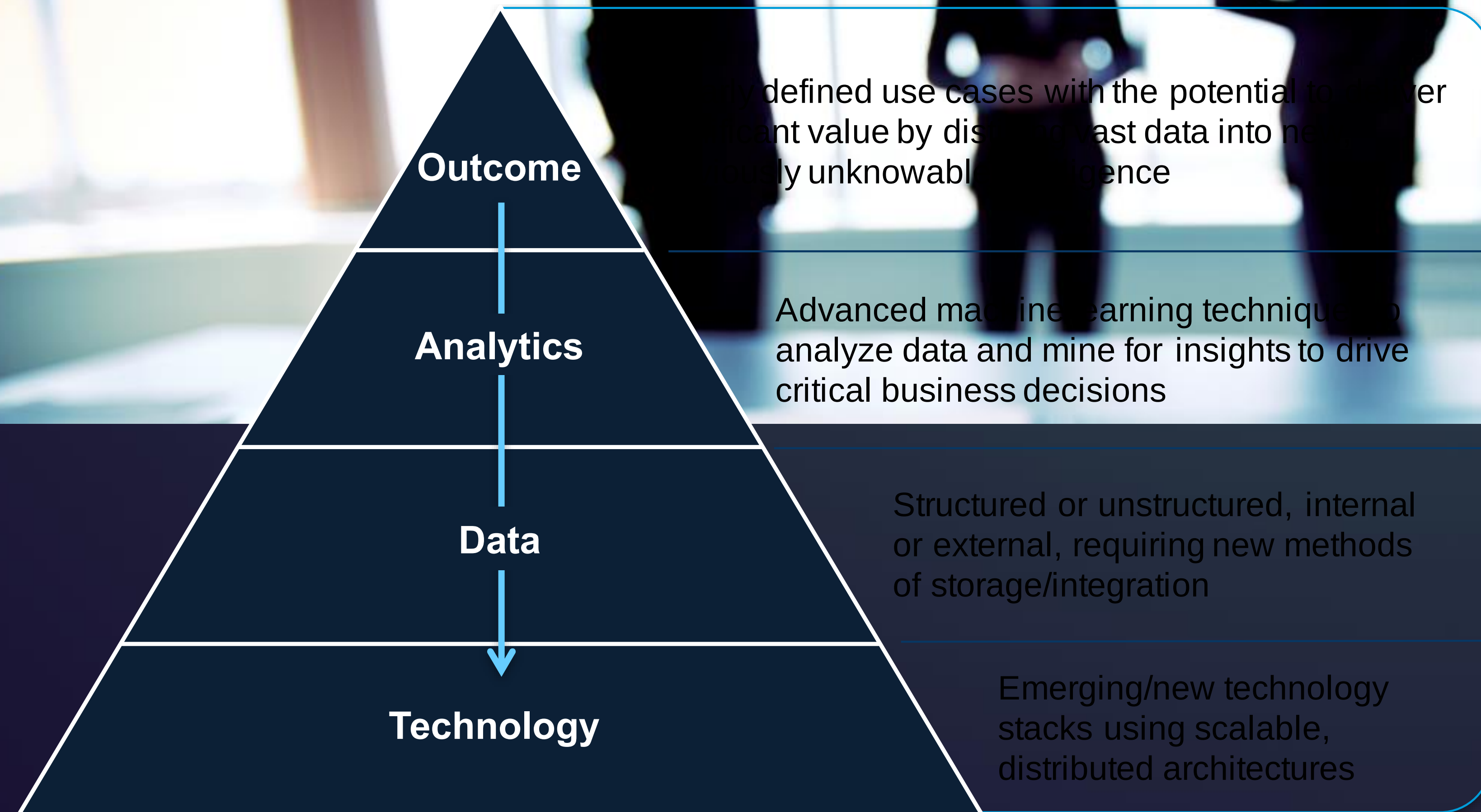
IoT & Automation

ALOps & MLOps

← **Cross capability implementations enable true data transformation** →

Use Case Development

To be successful, innovation decisions need to be grounded in business value. Our cross-functional team works with clients to fully align business outcomes to innovation use cases to meet today's and tomorrow's needs.



Clearly Defining the Need

A detailed business use case includes objectives and scope, performance requirements, data acquisition and organization, analytics requirements, and workflow requirements.



WWT Use Case Development, Prioritization, & Roadmap Creation Methodology

1 Discovery Interviews, Challenge Identification, & Use Case Development

Use Case Value & Complexity Prioritization Rubric

Value Factors



Complexity Factors



- | Category | Value Factors | Complexity Factors |
|----------|--|---|
| BUSINESS | <ul style="list-style-type: none">High number of departments benefitedPredecessor for other use casesIncreased process efficiency, Cost reductionCompliance, audit adherence, and risk mitigation | <ul style="list-style-type: none">Changes to existing process structure and policiesCultural and institutional challengesHigh automation complexityHigh operational complexity and level of effort |
| DATA | <ul style="list-style-type: none">Increased accessibility and understanding of dataStandardization, simplification, and clarityImproved data quality and accuracy | <ul style="list-style-type: none">Source information inaccuracy and incompletenessDifficulty of data integrationHigh volume of metadata |

- Conduct discovery interviews to identify challenges
- Develop strategic use cases to solve identified challenges
- Customize Value Complexity prioritization factors & weightings to client's requirements

2 Value Complexity Based Use Case Prioritization

Use Case Prioritization Matrix Built on Value Complexity Rubric

High Value – Low Complexity

Easy to implement solutions with large potential impact

Low Value – Low Complexity

Targeted quick solutions requiring minimal data feeds

High Value – High Complexity

Sophisticated solutions with the largest potential impact

Low Value – High Complexity

Implement solutions after high impact use-cases addressed

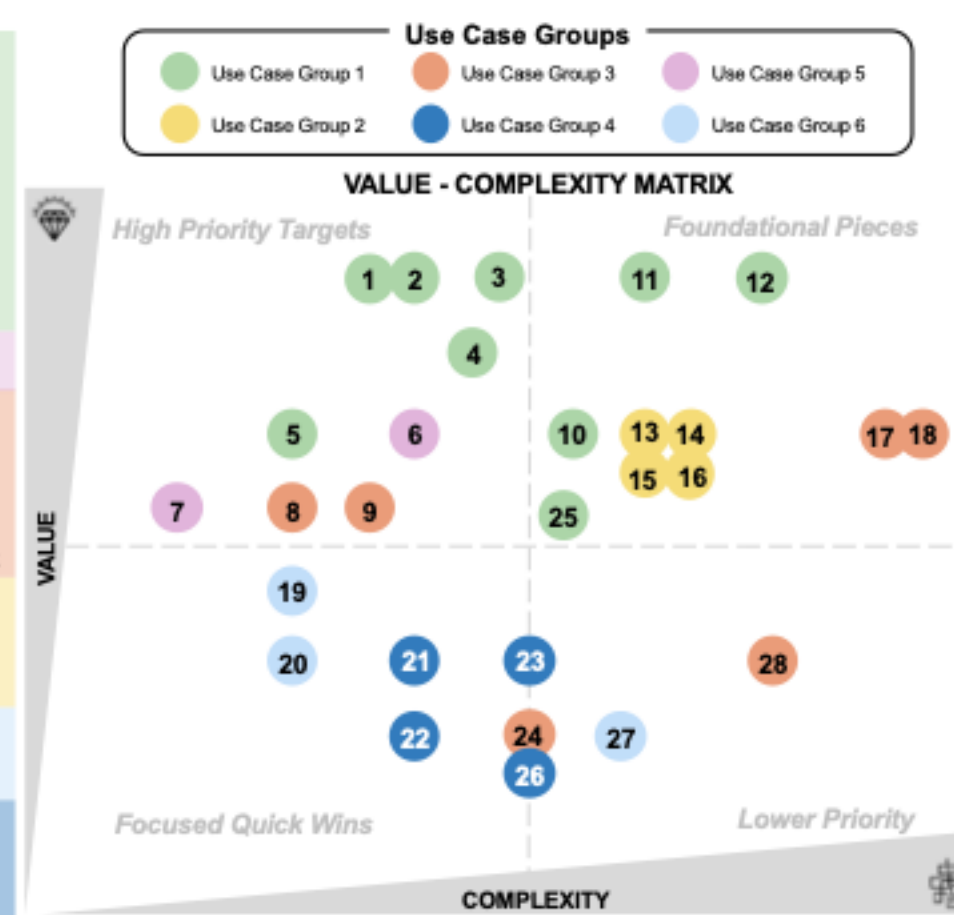


- Prioritize use cases based on Value Complexity Rubric
- Identify use case inter-dependencies
- Plot use cases on a prioritization matrix
- Refine prioritization in collaboration with stakeholders

3 Use Cases Plotted on Value Complexity Matrix

Use Cases

- TDL Aircraft Comms for LOS and BLOS
- Standard Fly-Away Kit
- Standard Gray Tail Comms RORO Kit
- Connect Flight Line with Private 5G Cellular
- 5G Enabled Devices for Airmen/Crew
- Gray Tail Comms Planning
- Mission Systems Interfacing in the Cockpit
- Mount Satellite Antennas on Gray Tails
- Logistics Modernization for Cargo Tracking
- Mission Area Integration Offices
- Program Awareness Campaign for AMC Directorates
- Appoint a Client Authorizing Official
- Implement Out Of Band (OOB) Management
- Design a Battle-Ready, Client Owned Network
- Implement Client Owned Network Infrastructure
- Enterprise Security Toolset for Client Owned Network
- Assessment & Authorization (A&A) for Client Owned Network
- EBOC Operations Team
- EBOC Spectrum Team
- EBOC Networks Team
- EBOC Systems Team
- Standardize Commercial Internet Access on Base
- Add Resiliency to Current Network Infrastructure
- Evaluate Phone System
- IT Incident and Service Management Strategy
- IT Service Catalog
- Client Operational Change Management
- HW/SW Lifecycle Management



- Plot use cases on client's customized Value Complexity Prioritization Matrix and refine with stakeholder feedback
- Finalize High Priority Targets, Foundational Pieces, Focused Quick Wins, and Lower Priority Use Cases

4 Detailed Use Case 1- Pagers

1 Use Case Title

Use Case Category

Suggested Predecessors

Summary of Use Case: Implementable capabilities, processes, and technologies

CHALLENGES ADDRESSED

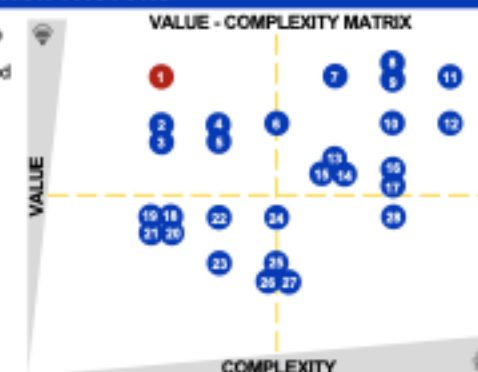
Challenges Addressed

- User Challenge 1
- User Challenge 2
- User Challenge 3
- ...
- User Challenge X

PRIORITIZATION FACTORS

Value Complexity Factors For This Use Case

- High number of directorates/mission areas benefited
- Predecessor for other use cases
- Increases autonomy
- Improves connectivity and communication
- Increases situational awareness and data accessibility to decision makers
- Improves network infrastructure
- Limited control over implementation and funding
- High implementation level of effort



ROADMAP

Steps to accomplish a goal and add value within a process or system

- Step 1
- Step 2
- ...
- Step x

- Develop deep-dive 1-Pagers for each use case, including:
 - Summary of Use Case
 - Challenges Addressed
 - Value Complexity Factors
 - Roadmap Steps

5 Use Case Implementation Roadmap



- Collaborate with stakeholders to build accurate timelines for each use case and build a comprehensive roadmap integrating key milestones and a phased rollout approach

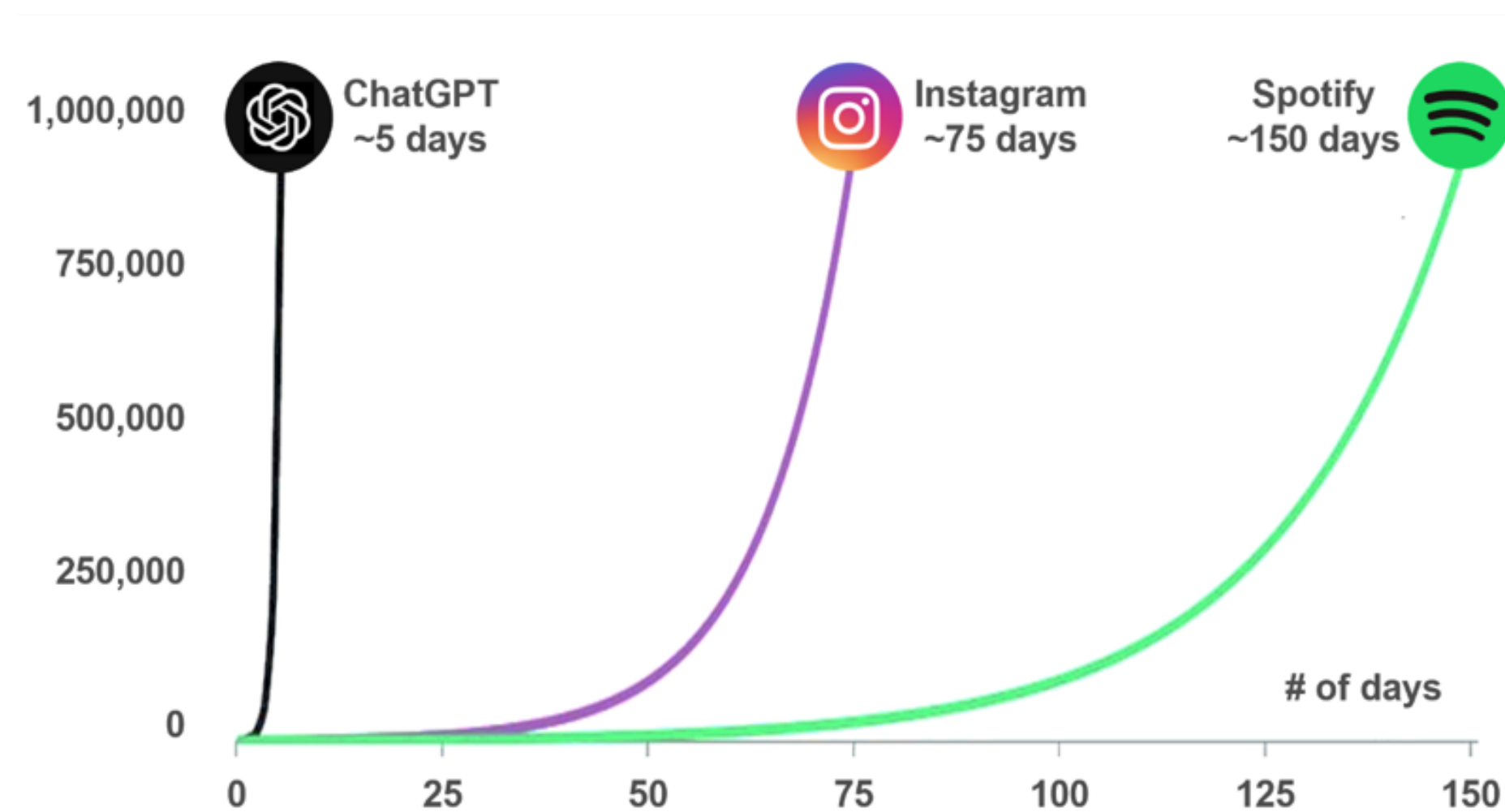


WWT's Internal AI Journey and lessons learned

June 2024

Accessibility of ChatGPT drove rapid consumer adoption and excitement at the corporate level

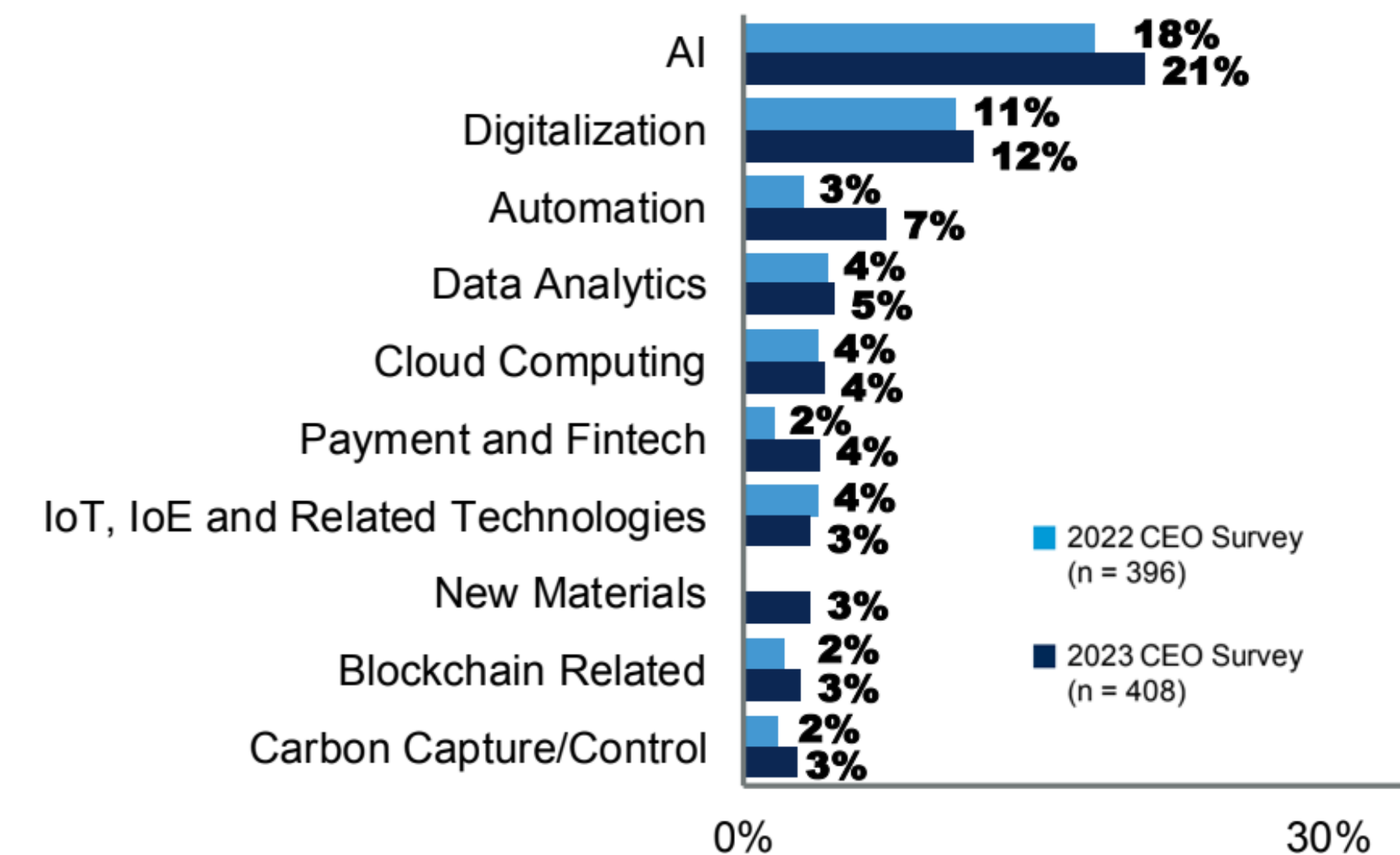
Consumer Adoption. *Path to 1 million users.*



Note: ChatGPT is built on an LLM
Source: Google; Subredditstats; Media Reports

CEOs believe AI will most significantly impact their industries over the next 3 years.

Coded responses – Showing top 15



n varies, all respondents excluding NA/None/DK; Numbers may not total 100% due to rounding; IoT = Internet of Things; IoE = Internet of Everything
Source: Goldman Sachs, Gartner

What is an LLM anyways?

- A model is a 'digital brain' consisting of...
 - Knowledge
 - Instructions
 - Parameters
- We can influence behavior of a model by adjusting...
 - Guardrails
 - Prompts
 - Fine-tuning
 - Access to Supplemental Information (RAG)



LLM = The Biggest Game of Plinko Ever



- Discs are token (1-3 letters)
- Pegs are a parameter
- Parameters change size as each token passes through
- The bigger the model, the higher quality the output, at an expense of performance (generally speaking)
- GPUs accelerate LLM token computations many times faster than CPU
- Is bigger always better, or in this case, even necessary?

Myth or Fact – Model Size

Myth or Fact: I should go for the biggest model size, as that will achieve the highest quality output.

Myth

- Model “appropriateness” is based on Mission Objectives
- Efficient design dictates that we start as small as possible and move up, as efficiency = speed and user concurrency
- “Master of All” models are costly and difficult to scale, unless you want to centralize all use cases
- Enterprise AI workflows require rapid testing of multiple models and model parameters throughout product lifecycle



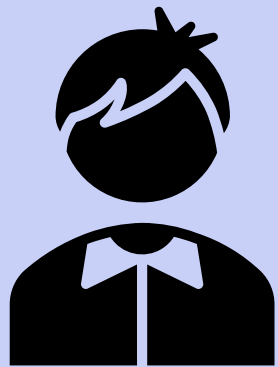
Myth or Fact – Retrieval Augmented Generation

Myth or Fact: If I have private corporate data, I need to train a model on it.

Myth (Generally Speaking)

Your LLM Bot

What I know



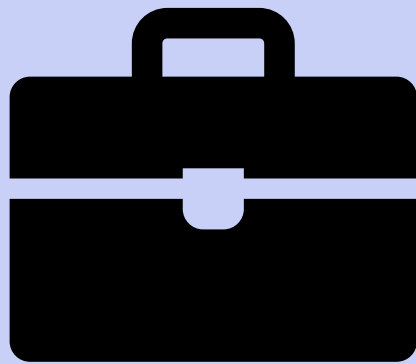
Foundation Model

Meta, Google, Cohere, Mistral,
OpenAI, etc.

Level of Education (Parameters)

Use Case (Training Data)

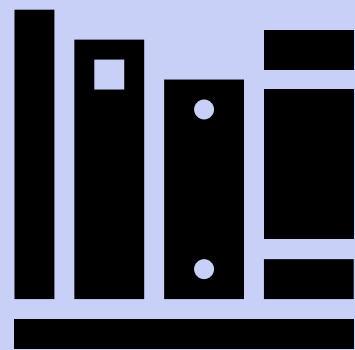
What I do



Prompt

Job Description
Purpose
Guardrails
Fine-Tuning

What I can look up



**Retrieval Augmented
Generation (RAG)**

“On the Job” Training

Vectorized Corporate Data
Accessible by Model

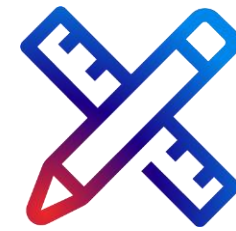


Getting started can be the hardest part for any organization

Prerequisites for getting started



**Executive-level
buy in**



**Commitment and focus
from lines of business**



**Viable and compelling
use cases**



**Coordinating disparate
GenAI POCs**

Leverage related activity occurring pre-ChatGPT. At WWT we had two areas...

10+ years

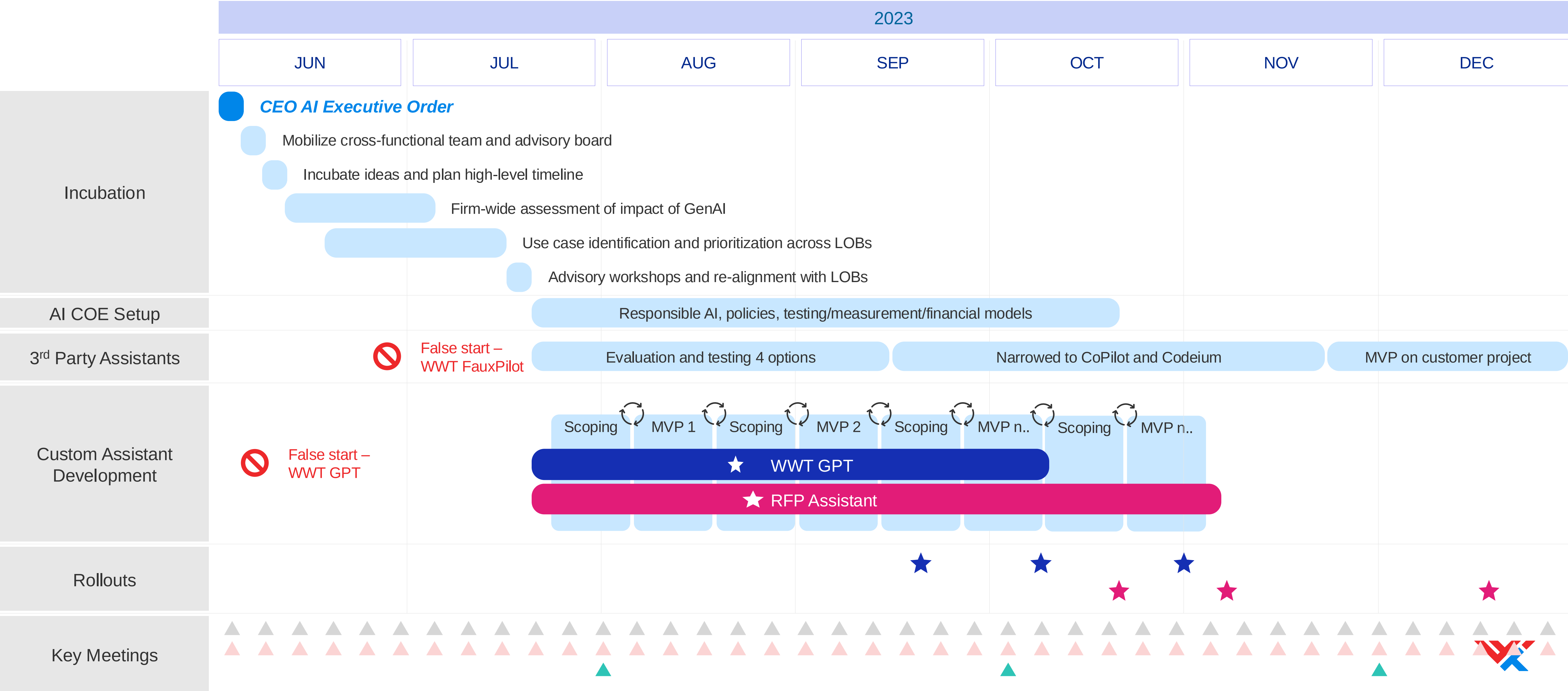
“Traditional AI” project work

6+ years

AI Research & Development

The Journey: Driven from the top-down, executed through action-oriented collaboration

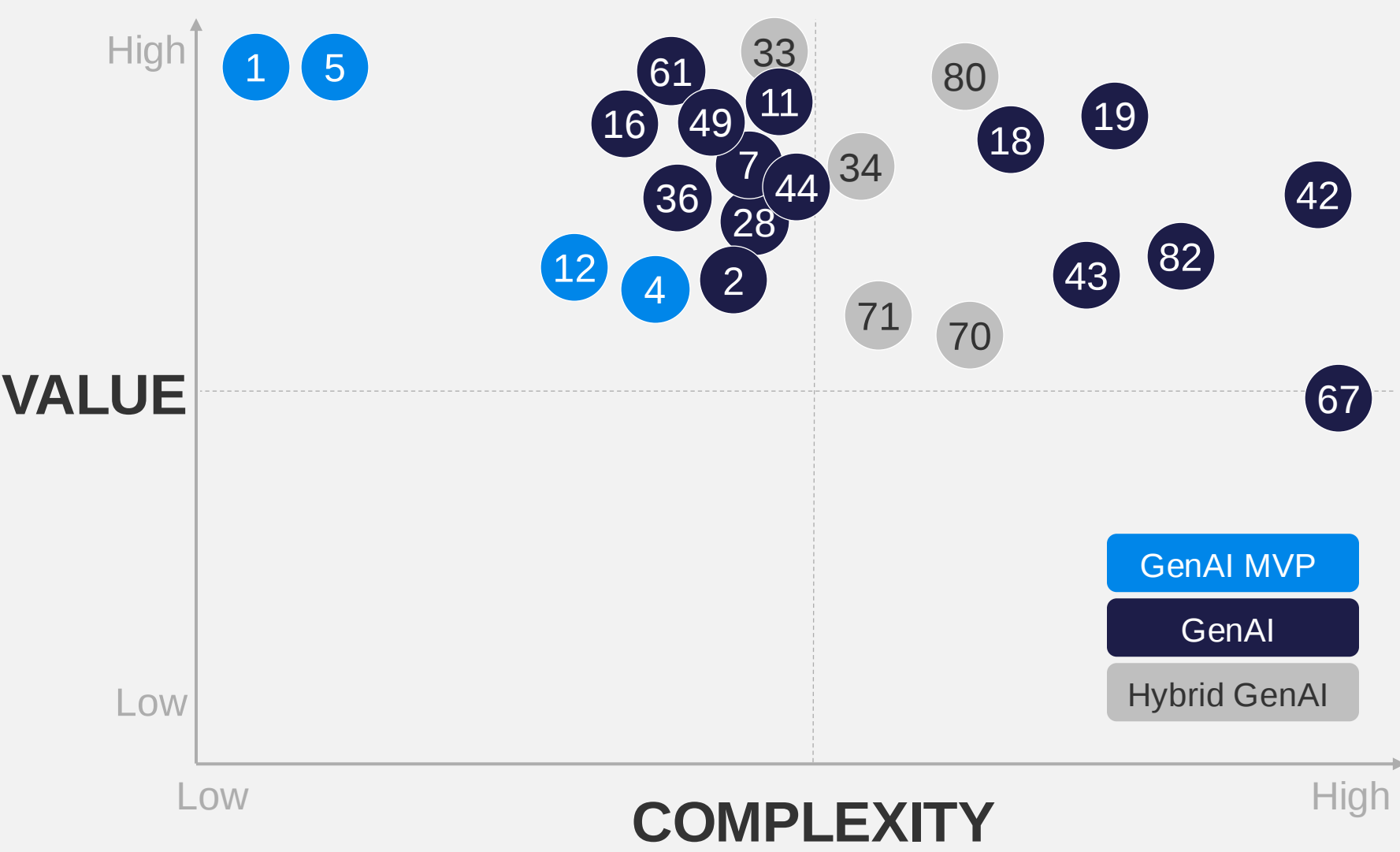
- Weekly SLT
- Weekly Demo
- War Room



WWT's evolving AI & Data capabilities are leveraged for internal use cases, improving efficiency and employee experience

Immediate priority
Upcoming priority

Collected 75+ ideas from lines of business



Immediate Priorities

Description

1. WWT GPT

Secure and private GPT access indexed on WWT internal data

2. Coding Assistant

Improve code productivity for developers

3. RFP Assistant

Generate quality RFP summaries and proposal responses to lift sales velocity

4. ATC Assistant

Generate detailed ATC test cases and answer ATC related questions

5. Pricing Optimization

Identify pricing strategy opportunity areas to lift GP across product lines

6. PO Insights & Invoice Auditor

Ensure purchase order match with invoice for timely payment collection

7. Service SOW Generator

Generate standardized quality statements of work to lift sales velocity

8. Material Routing for Logistic

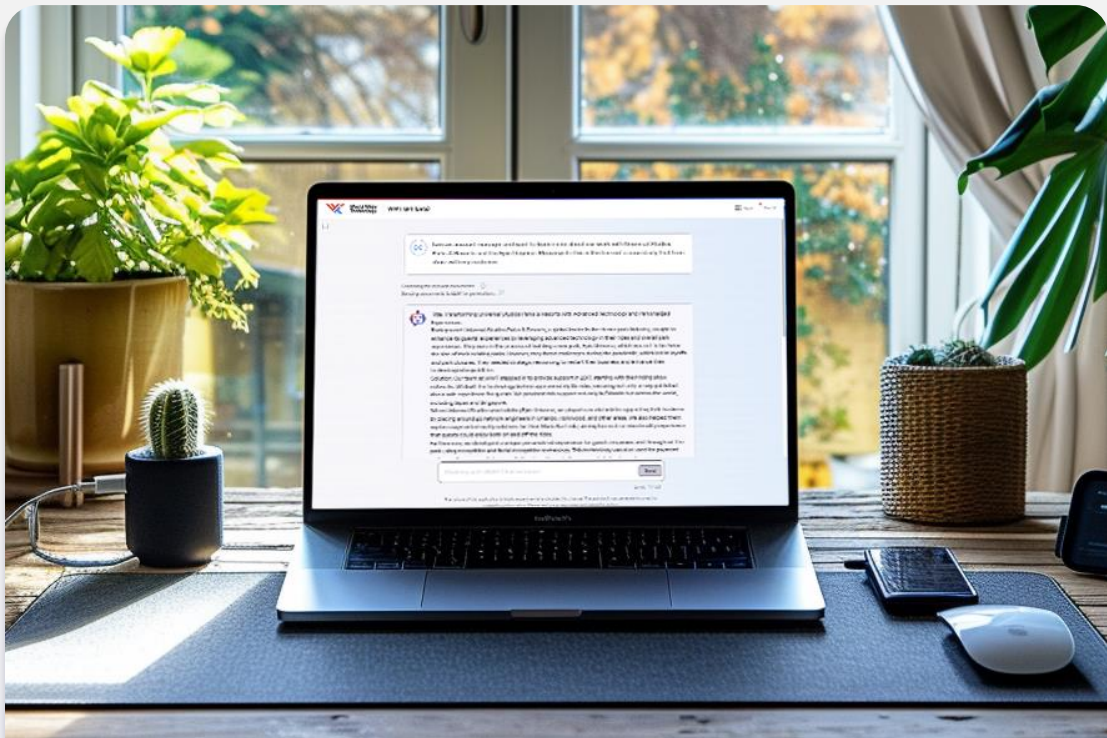
Ensure timely material delivery to central warehouse for consumption

Our **AI War Room** assembles stakeholders from departments across the company to create a cohesive, cross-functional team whose purpose is to prioritize topics, develop prototypes and solicit feedback efficiently in order to rapidly construct intricate components of the overarching AI system.

Our products cater to a broad set of use-cases and WWT employees

Early 2024 release plan

Backlog



WWT GPT

Persona-based AI chatbot, powered by GPT 4 & WWT IP (web, docs, videos, etc.) – secure, multi-user RBAC, with live LLM-search into past WWT labs, POCs, other WWT data/content.



RFP Assistant

Copilot for lead qualification, intake and proposal generation. Leverages LLM-search for past SOW and proposal data.



Coding Assistant

AI-powered Copilot for WWT teams, learning from prior WWT and client code and running securely on-prem using GPUs.



AI Driver's License

A training to educate, enable and excite employees about upcoming innovations and the prospects of AI – in accordance with our **Responsible AI** framework.

Sales Assistant

Smart Logistics and Warehousing

ATC Brain
(Customer facing)

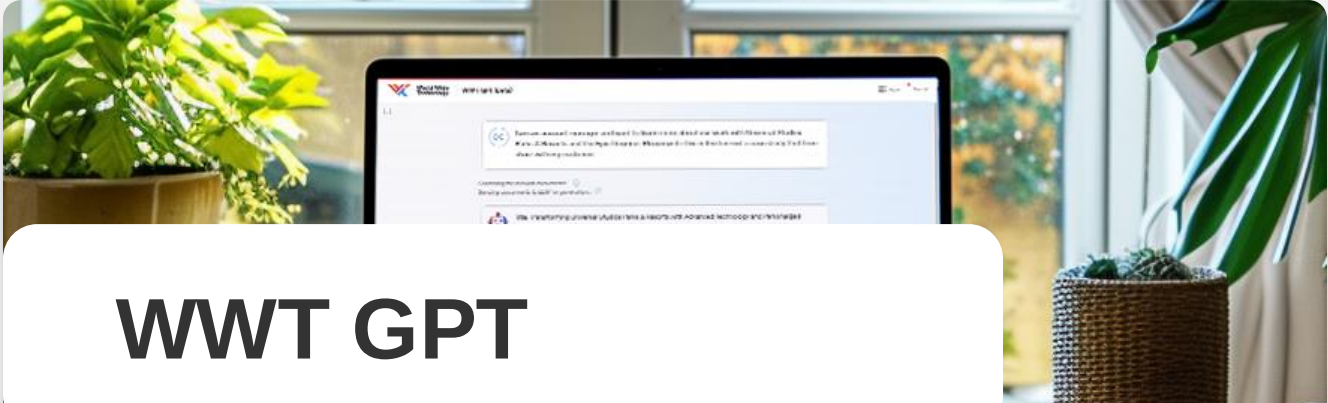
...50+ more

Enhancing productivity, innovation and revenue generation

Metrics below showcase the breadth of our solutions – and how we expect them to impact our workforce and teams

Performance metrics¹

User metrics



WWT GPT

Time per employee / week

Tasks related to content search / curation (WWT capabilities, OEM portfolio, past labs and POCs, etc.)

Human only

4-6 hours

Human + WWT GPT

3-4 hours

25-35% reduction

ROLES IMPACTED	TOTAL USERS
WWT office employees	5,000+



RFP Assistant

Time to respond to RFP

Tasks related to summarization, qualification and response writing

Human only

7-10 days

Human + Assistant

4-5 days

40-50% reduction

800+ RFPs per year • 6,000+ SOWs per year

ROLES IMPACTED	TOTAL USERS
Marketing Engineering Sales Services	1,000+



Coding Assistant

Time per programmer / week

Repetitive/templated programming tasks (code generation, unit testing, code refactoring)

Human only

20-26 hours

Human + Assistant

14-18 hours

~30% reduction

ROLES IMPACTED	TOTAL USERS
Software Data ATC IT	700+

1: Based on a combination of quantitative, survey based, and qualitative efforts to measure out effective time gains across activities per product. Test vs. Control measurements to be conducted post GO LIVE

The Vision: Rapidly develop a GenAI Hub for customers, like we did internally, that solves practical use cases and drive unique value

Clean Interface • Modular Architecture • RAI-by-Design



Intelligent RBAC

Utilizes RBAC to ensure query responses contain only data the inquirer is authorized to access.



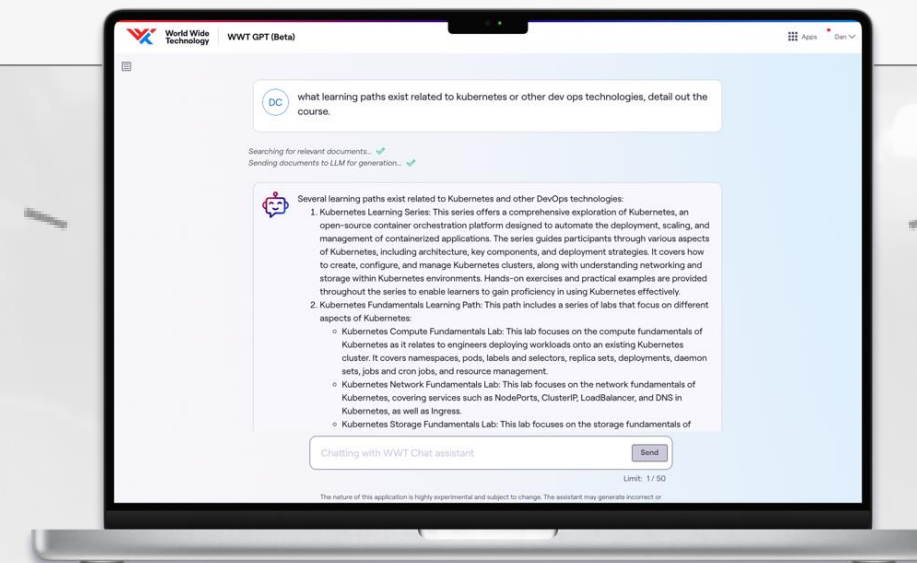
Unified Digital Assistant Architecture

Serve multiple AIs in a common UX for bespoke capabilities - QnA, Search, Summarize, Synthesize, ...



Interconnected Data Sources

Ability to ingest many sources of internal data and IP via secure, near real-time pipelines



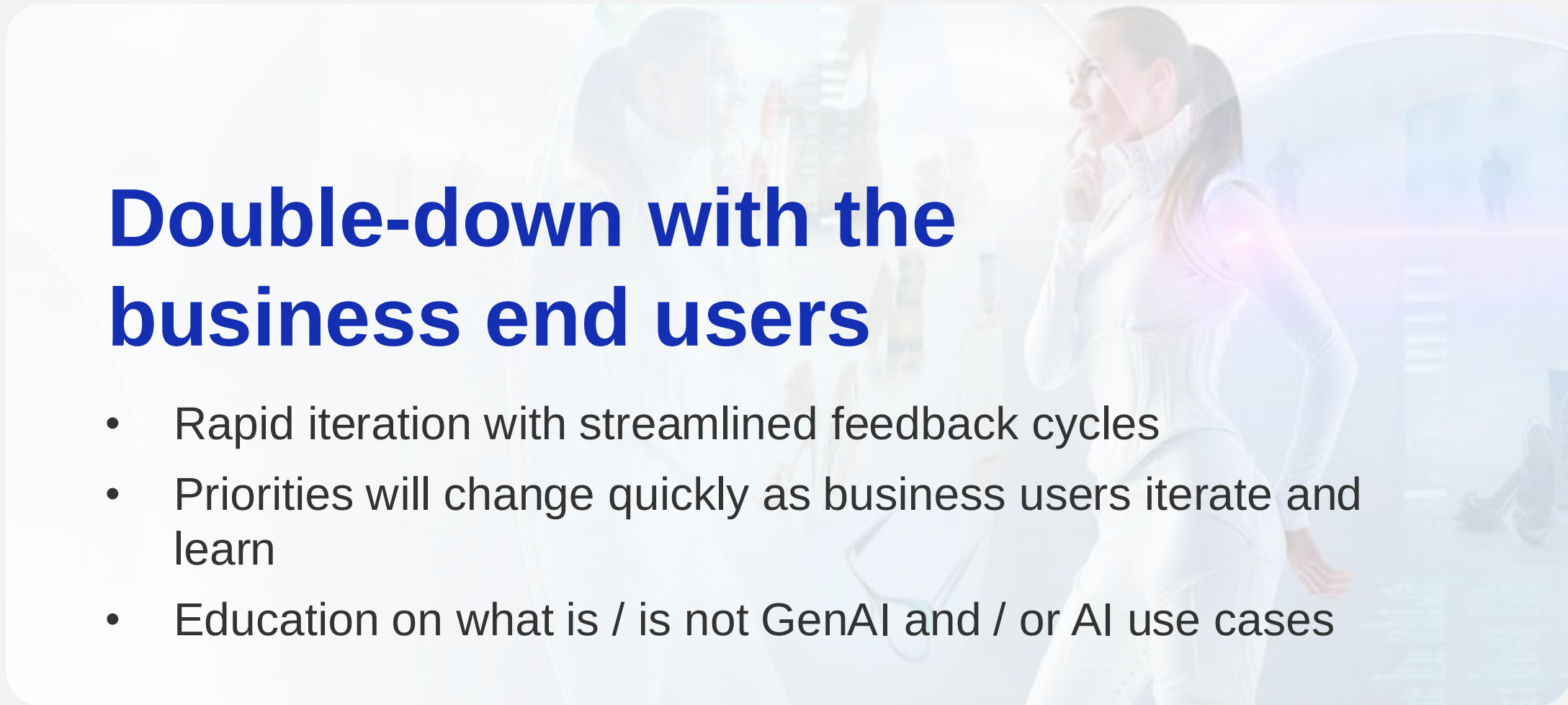
We took this journey at WWT and want to use our proven approach to drive the same outcomes for our customers.

Lessons Learned: The experience of building inside WWT will accelerate our work with clients



Build the right team structure and organizational support

- Top-down support
- Small, cross-functional, in-person teams
- Siloed POCs may need to be aligned



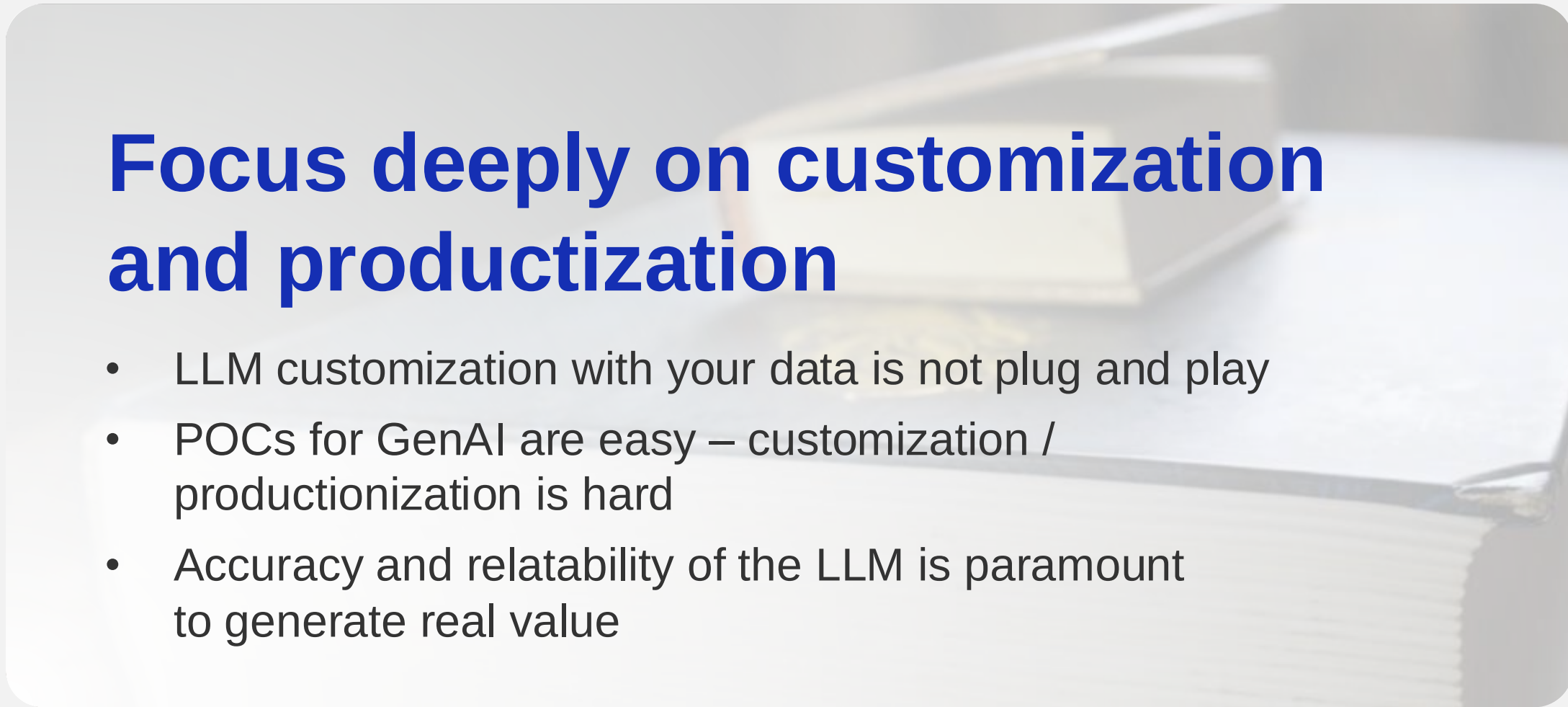
Double-down with the business end users

- Rapid iteration with streamlined feedback cycles
- Priorities will change quickly as business users iterate and learn
- Education on what is / is not GenAI and / or AI use cases



Think differently about development and deployment

- Nuanced statistical ways to treat each dataset
- Microservices and API contracts are key
- Experimentation with data and methodologies is critical
- Product managers and IT teams must embrace the nuances of AI development



Focus deeply on customization and productization

- LLM customization with your data is not plug and play
- POCs for GenAI are easy – customization / productionization is hard
- Accuracy and reliability of the LLM is paramount to generate real value

In large organizations there are major hurdles to overcome to generate unique value



Cutting through the **hype** and ensuring a **practical approach** is taken

Driving **quick decision-making** on challenging topics

Customizing GenAI / LLMs using **proprietary data**

Aligning **dev cycles** of AI, software teams and IT teams

Transitioning from POC to **production at scale**

Introducing **new technologies** that are rapidly challenging

Testing **accuracy** of non-deterministic, human-like output

Optimizing platform for **performance and cost**



WWT has tackled these challenges internally and can accelerate GenAI value creation for our clients.



WWT's AI Proving Ground

AI's potential to completely transform how organizations operate is exciting. Whether AI is used to enable new revenue streams, cultivate client loyalty through personalization, drive efficiencies through automation, or extract data-driven insights to guide decision-making, the possibilities are limited only by the imagination.

As data centers, workflows and applications evolve to support the technical demands of AI, navigating the complexities of this modernization work — including integrating AI solutions with legacy IT systems — can overwhelm even the most seasoned IT professionals.



Common hurdles to AI success



Hardware
Availability



High Costs



Skills Gaps



Power & Cooling
Concerns



Connectivity
Challenges



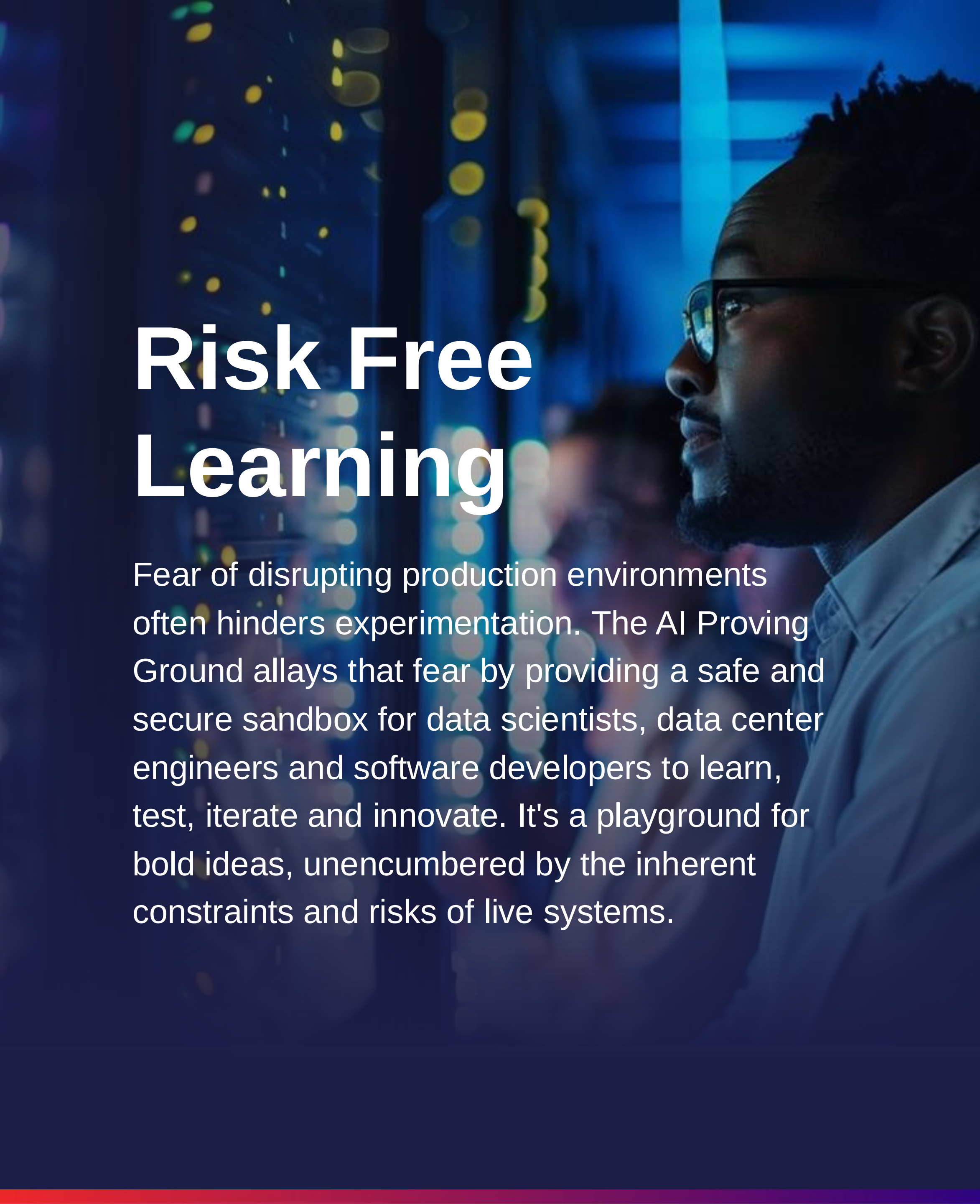
Environment
Management



Complex
Architecture Designs

Addressing these hurdles, the AI Proving Ground enables organizations to quickly, confidently and safely develop transformational AI solutions that deliver real business results in a fraction of the time and expense it would take to achieve on their own.





Risk Free Learning

Fear of disrupting production environments often hinders experimentation. The AI Proving Ground allays that fear by providing a safe and secure sandbox for data scientists, data center engineers and software developers to learn, test, iterate and innovate. It's a playground for bold ideas, unencumbered by the inherent constraints and risks of live systems.

The AI Proving Ground [supports IT professionals](#) with hands-on access so they can evaluate AI hardware, software and reference architectures before deploying these solutions in their production environments.

Business leaders: Identify, develop, evaluate and implement AI use cases that lead to immediate and measurable business value.

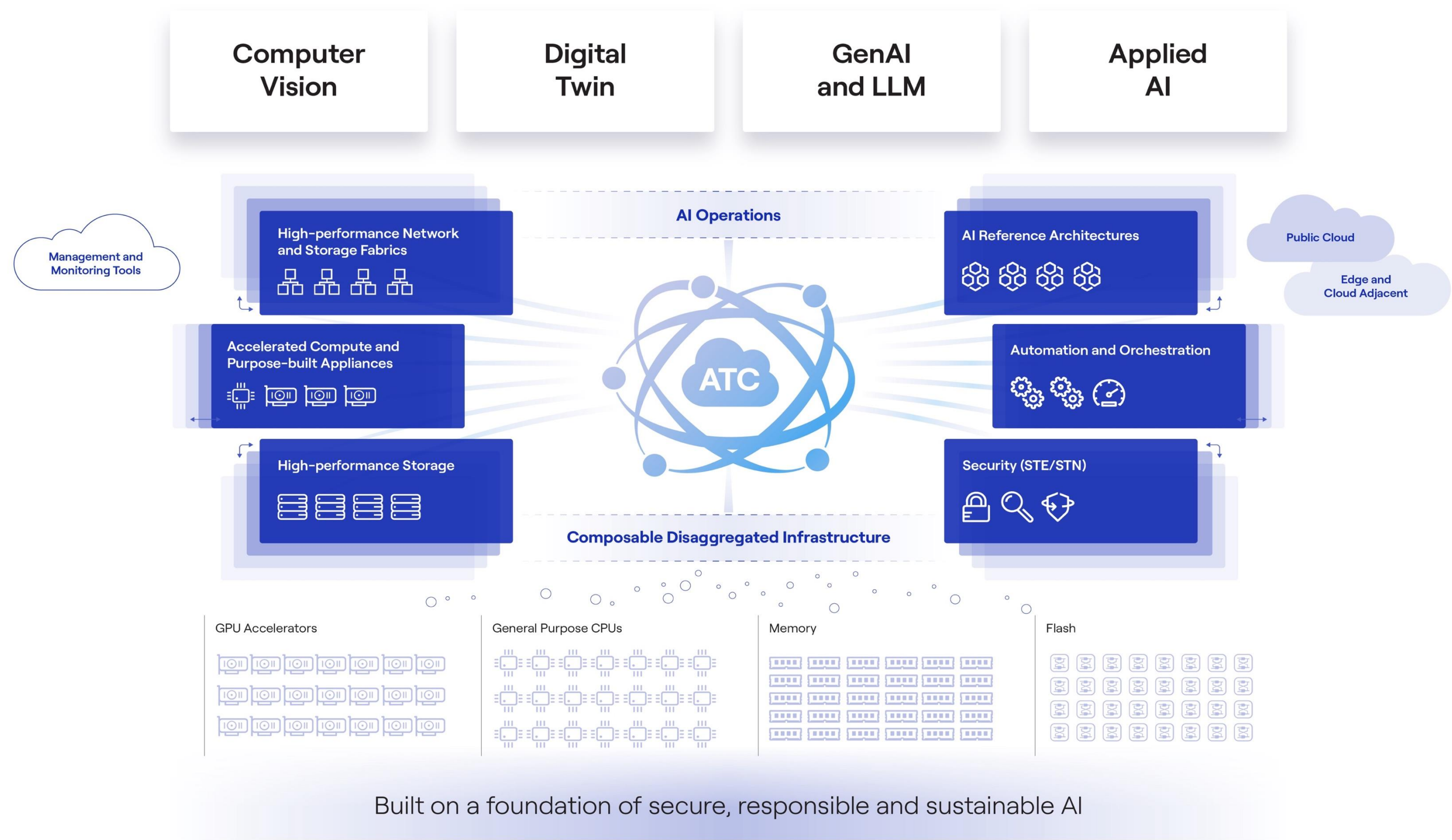
Data scientists: Evaluate AI models, including LLMs for GenAI, NLP models for smart assistants and language translation, and computer vision models for image classification and object recognition.

Infrastructure engineers: Assess hardware and software integration, validate AI workflow performance, ensure supportability, evaluate security solutions, and design and deploy AI applications in hybrid environments.



The AI Proving Ground is a heterogeneous "lab of labs" ecosystem that currently houses 13 different AI environments.

Our AI Proving Ground labs strategically range in focus from reference architectures to automated component orchestrations. By seizing this unique opportunity to validate the performance of the latest AI hardware and software integrations, technologists can quickly and confidently pursue the types of AI-powered solutions that deliver the most business value.



Some of the reasons our clients are leveraging the AI Proving Ground:

Evaluation of market-leading LLMs.

Environment validation for computer vision systems utilizing AI-generated digital twins and LLMs.

Deepfake identification testing.

Validation testing with systems utilizing Nvidia H100 GPUs and Mellanox ConnectedX-7 Cards.

VDI benchmarking with Liquid-provisioned GPUs.

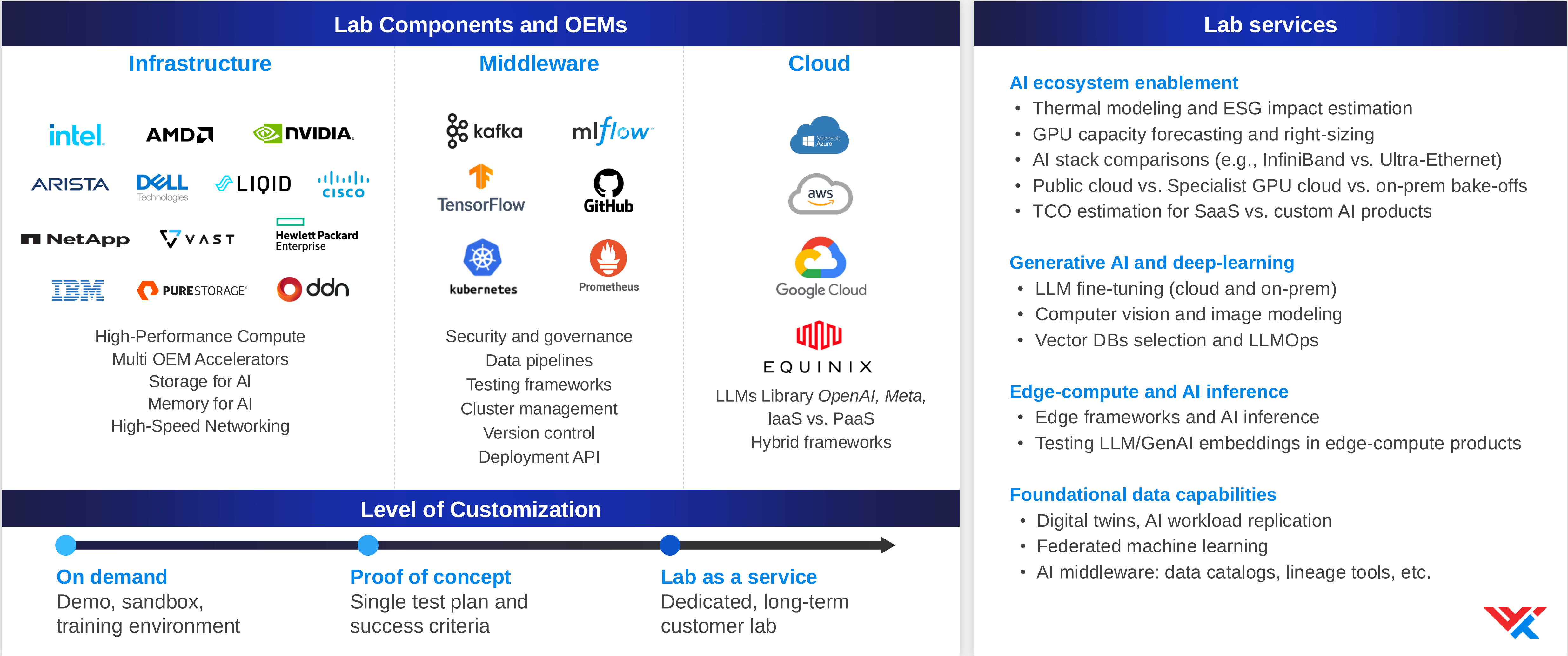


Introducing The AI Proving Ground: Your path to the AI future

WWT's ATC is building the industry's first and only multi-OEM AI testing ground



The ATC now includes The AI Lab! A state-of-the-art environment where product developers can replicate their AI workloads, experiment, test, and innovate with the latest from the world of AI in a secure and scalable manner.





Thank you!