



LM Data & AI Enablement

# Accelerating Systems Engineering with Generative AI

## A Lockheed Martin Case Study for Digital Transformation

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# About Lockheed Martin

The context for our case study

# Lockheed Martin – Overview

Lockheed Martin is a global defense technology company driving innovation and advancing scientific discovery. Our all-domain mission solutions and 21st Century Security® vision deliver transformative technologies that deter potential adversaries and ensure America and its allies can achieve peace through strength.

121K

Employees  
worldwide

93%

Employees located  
in the U.S.

20%

Employees who  
are veterans

70K

Engineers, scientists  
and technologists

350+

Facilities  
worldwide

100+

Years of  
innovation



# Lockheed Martin – Business Areas

Our corporation, headquartered in Bethesda, Maryland, is organized around our core business areas specializing in defense tech.



**Aeronautics**, with approximately \$28.6 billion in 2024 sales, which includes tactical aircraft, airlift, sustainment and aeronautical research and development lines of business.



**Missiles and Fire Control**, with approximately \$12.6 billion in 2024 sales, which includes the High Mobility Artillery Rocket System (HIMARS) and PAC-3 Missiles as some of its high-profile programs.



**Rotary and Mission Systems**, with approximately \$17.2 billion in 2024 sales, which includes Sikorsky helicopters, maritime systems, sensors, radar systems, command and control, combat simulation and training, undersea systems and full-spectrum cyber capabilities.



**Space**, with approximately \$12.4 billion in 2024 sales, which includes development of national security, civil, commercial, commercial and weather spacecraft, strategic and missile defense solutions and hypersonics missions.

# Data & AI Enablement Center of Excellence Mission

Operate as a catalyst for business growth by providing innovative and common data products for intelligent decision making, and ensuring our data is AI ready.

“

Unlocking the full potential of AI, business value generation, and intelligent decision making, is only possible with a **foundation of high-quality data.**



# Lockheed Martin's OneLM Transformation: Building Our Future

## Infrastructure & Platforms (I&P)

enable efficient operations by establishing common processes, leveraging common platforms and core systems, automating tasks, and facilitating better integration and interoperability among people, materials, capacity, and cost.



**Artificial Intelligence (AI)** drives transformative impact by enhancing productivity, improving efficiency, yielding cost savings, reducing risk, and ultimately delivering a strategic competitive advantage.

**Model-Based Enterprise (MBE)** utilizes integrated digital threads across the design-buy-build-sustain lifecycle to reduce cost, minimize rework, and enhance product reliability.





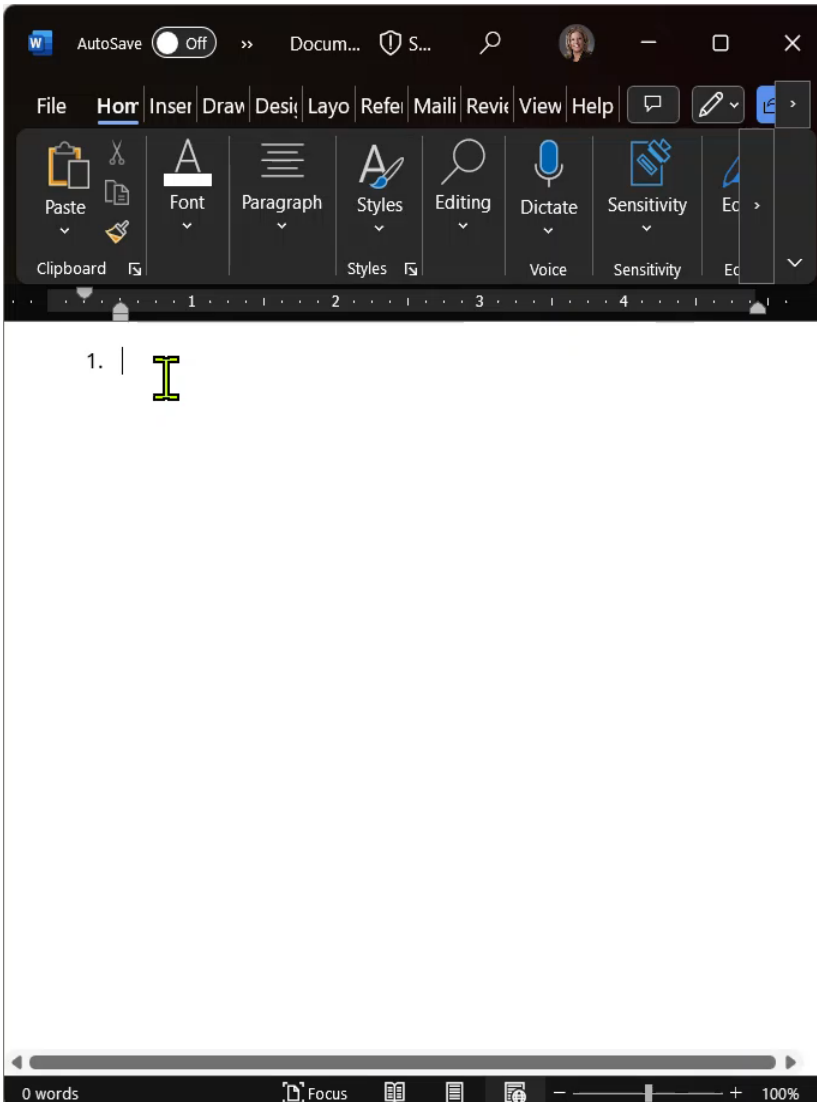
# Step 1: Explore Possibilities

Demonstrating the art of the possible with Generative AI

# Requirements Generation

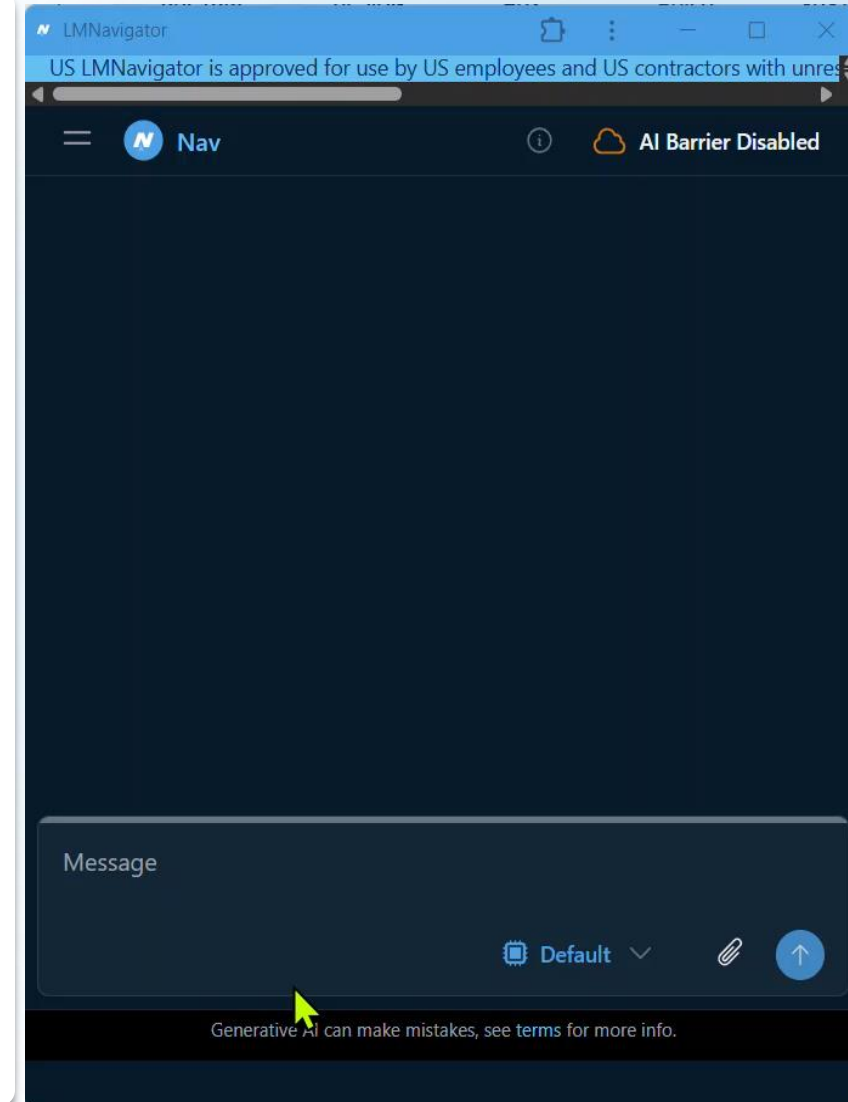
## Before

- Microsoft Office (i.e. Microsoft Word / Excel) tools as a means of engineering
- Challenging in developing initial requirements set without existing requirements to start with
- Error prone to create full exhaustive set of necessary requirements
- Time consuming to create individual requirements for new systems
- Requires human review to ensure requirements are verifiable / testable
- New System Engineers might have difficulty understanding all aspects of the system to fully document with requirements
- Inconsistent requirements generation across multiple system engineers



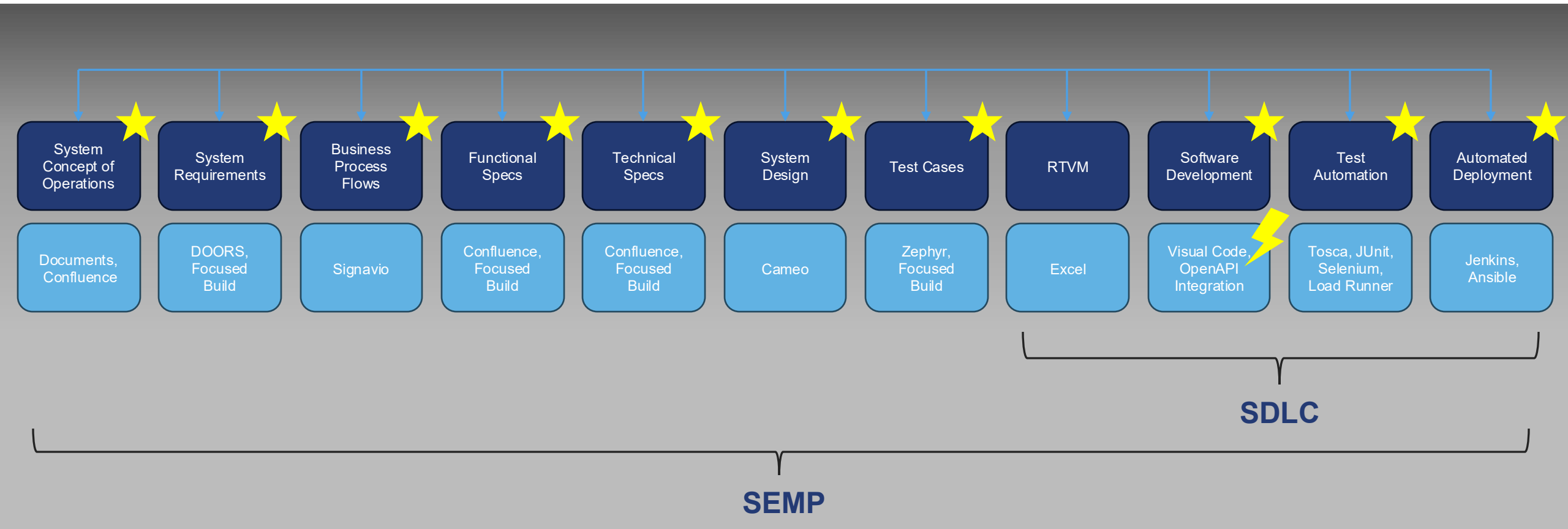
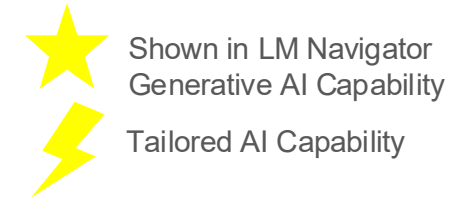
## After

- Requirements management software tools (i.e. Doors) leveraged for orchestration and buyoff of requirements
- Navigator used to generate new requirements based off existing systems of record or via Internet resources
- Better system coverage with requirements covering all aspects of the overall system
- Fast creation of requirements allowing System Engineer to focus on the high value additions to the requirements set
- Requirements generate are typically easier to verify / test
- New System Engineers can quickly develop requirements even with new systems
- Better consistency of requirements generation across the entire system





# Generative AI Experiments across the Systems Engineering Lifecycle in 2024



# Anticipated Benefits for 1LMX

## Gen AI Capabilities:

- Allow us to deliver superior products, maintain operational excellence and stay ahead in a competitive landscape.
- Enhance efficiency, quality, collaboration and innovation across **Systems Engineering Management Plan** and **Software Development Lifecycle**.



Optimization of Processes  
*Efficiency Gains*



Enhancement of Quality and Reliability  
*Error Reduction*



Strengthening Collaboration and Knowledge Sharing  
*Unified Documentation*



Strategic Insights and Innovation  
*Data Driven Decisions*



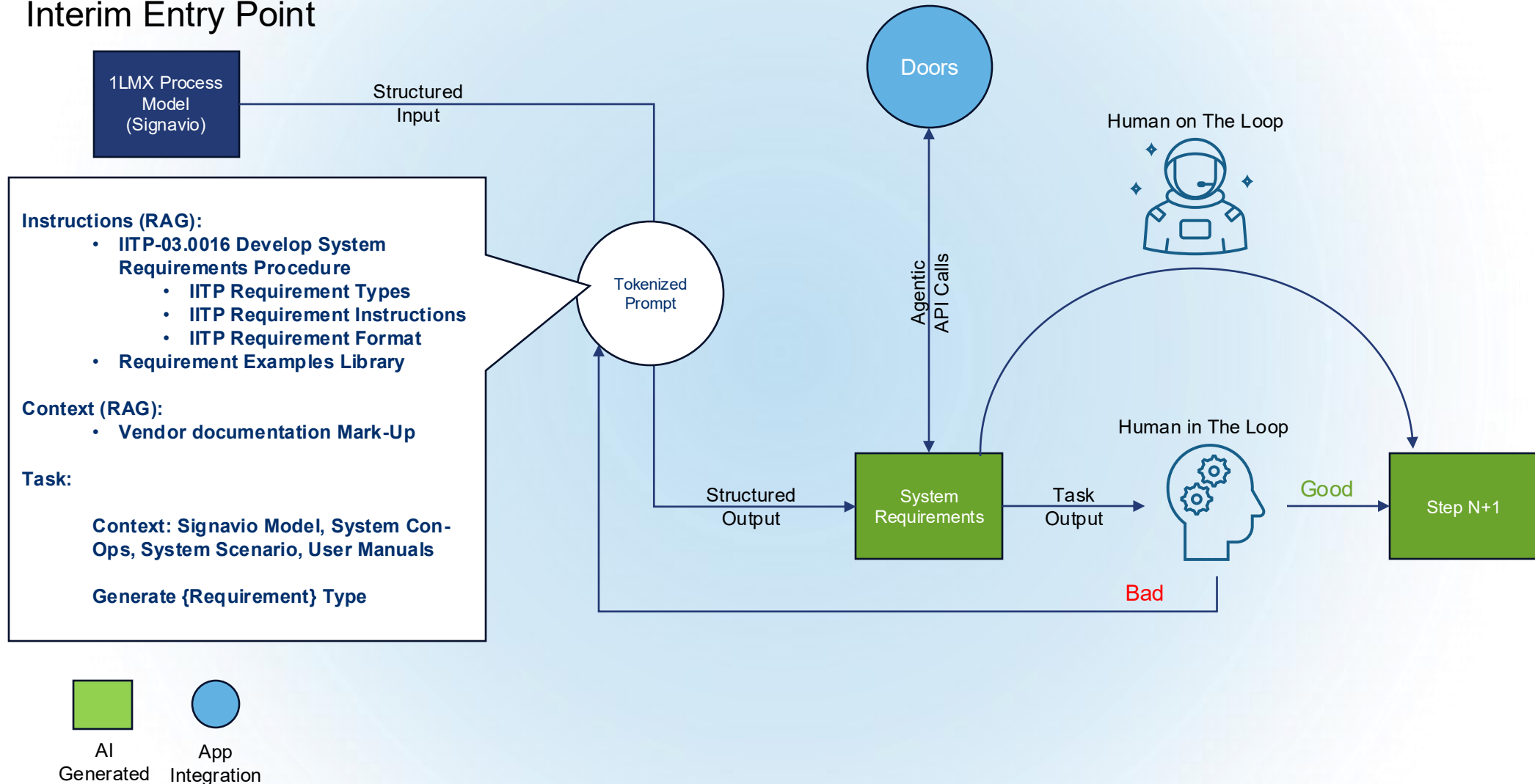
Proactive Issue Management  
*Predictive Maintenance*

# Step 2: Incubate Solutions

Invest in heads down development for key opportunities

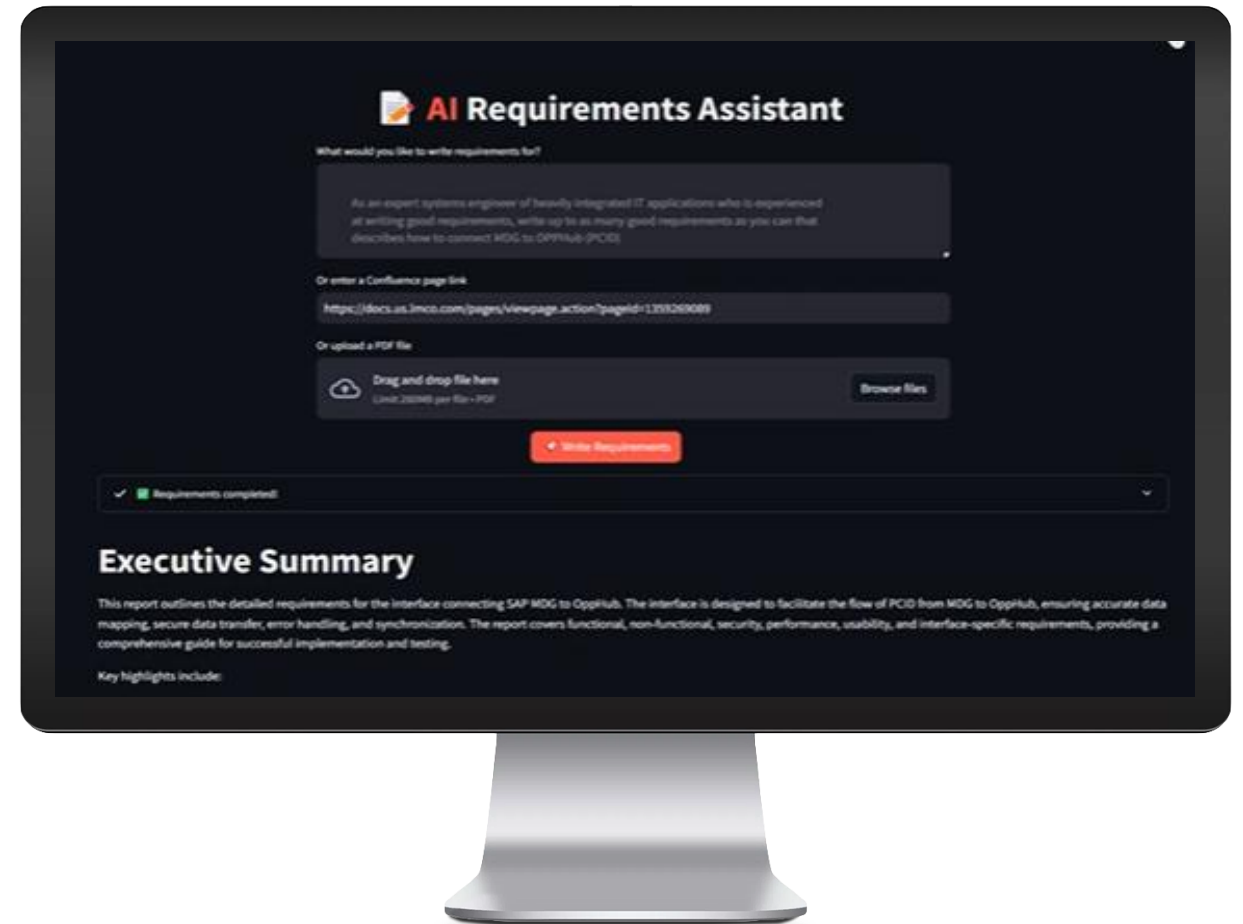
# Example Agentic Framework for Sys Requirements

## Interim Entry Point



# Requirements Generator

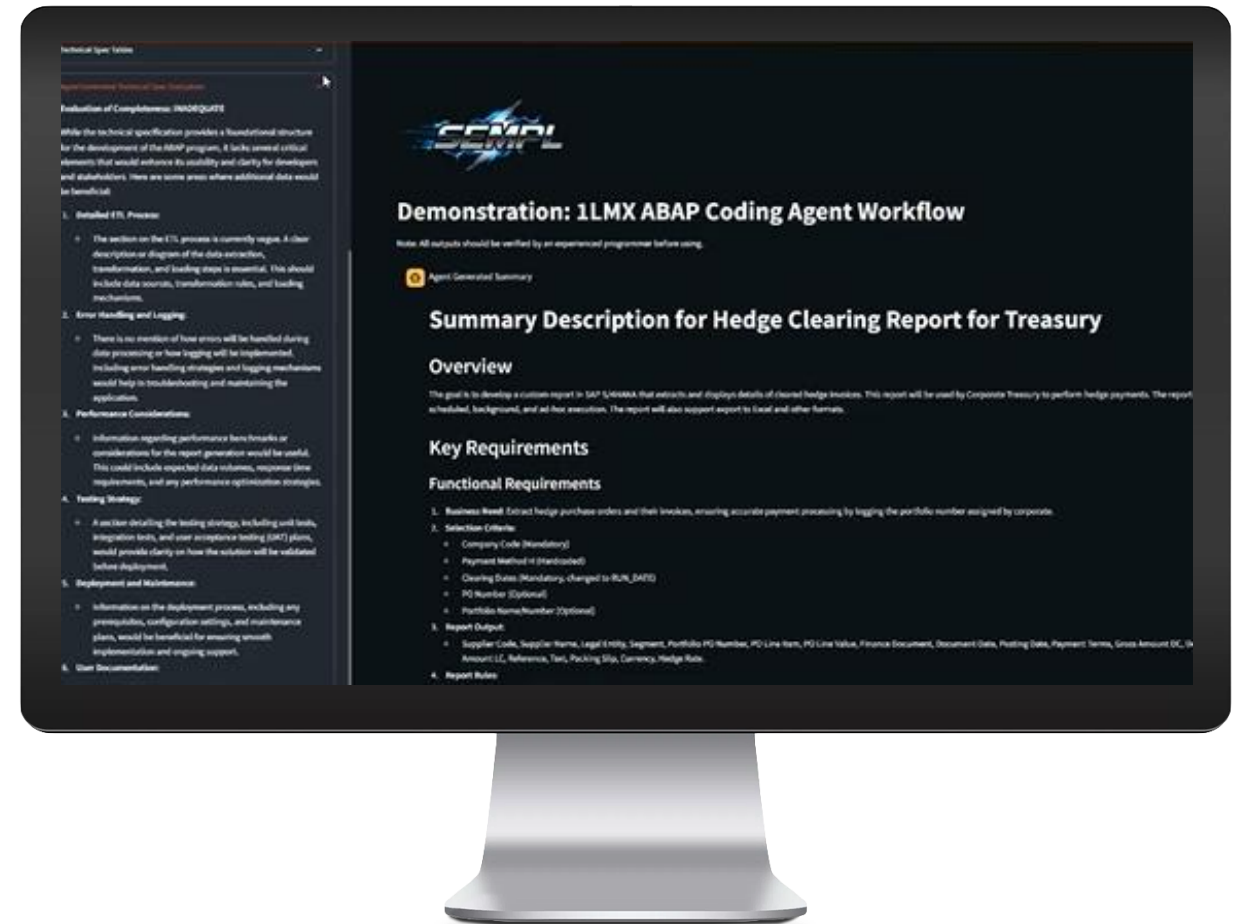
*“As good or better than what a human would write.”*  
– Chief Engineer



# ABAP Code Generator

*“The description and plan docs are really neat. While there are a lot of little diffs, nothing that can’t be ironed out. Overall looks good.”*

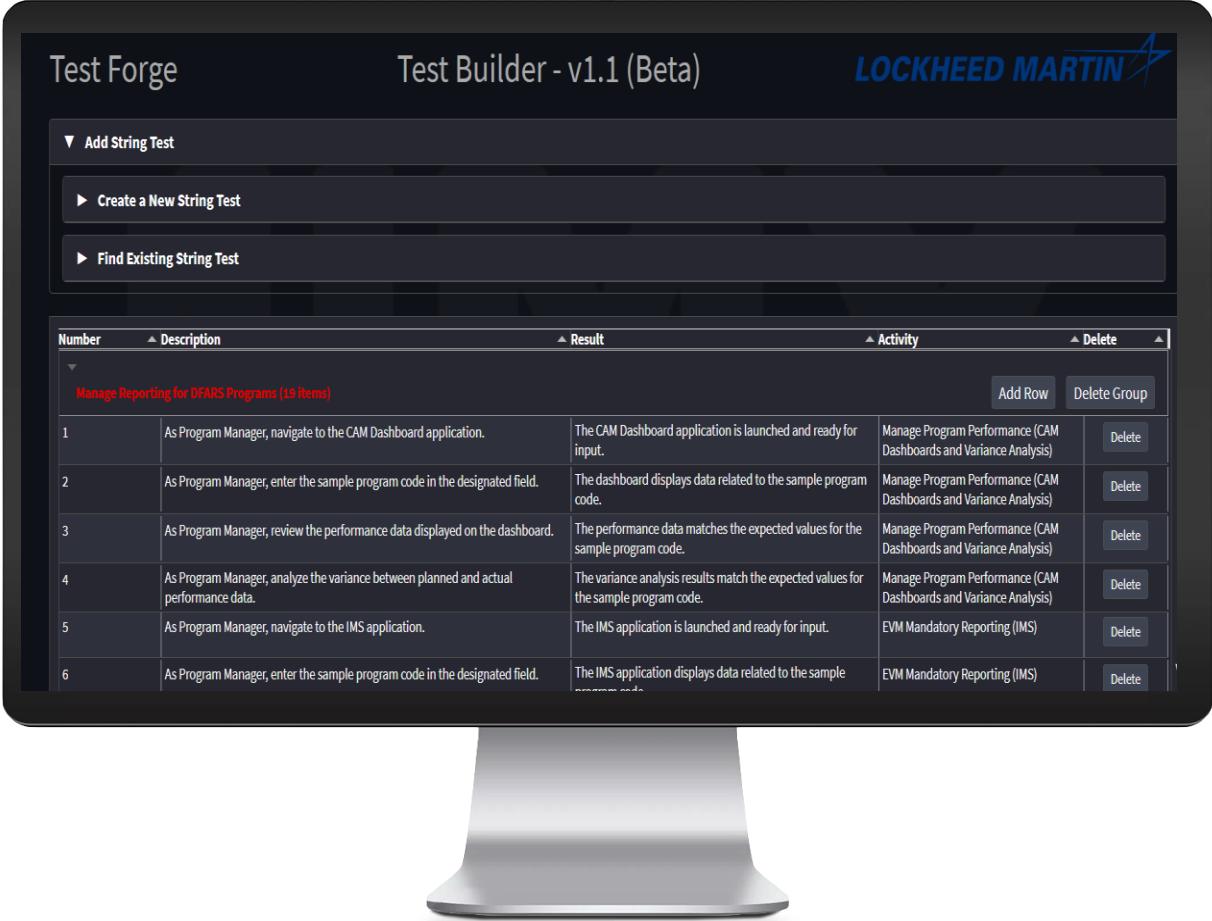
– ABAP Developer





# Test Forge

*“I think I'm in love! I mean how does it do this? It's unbelievable!”*  
– Test Engineer



## ATP Achieved Q1 2025

Four prototypes were developed by partnering with 1LMX Program SMEs. This 6-week tiger team effort suggested a strong potential ROI from the Generative AI solutions when compared to traditional efforts.



67%  
Cost Savings



70%  
Span Reduction



7%  
Quality Increase

# Step 3: Partner with End Users

AI Hackathon enables product refinement and feedback

## First AI Hackathon in Q2 2025



### SPECIAL OPS MISSION:

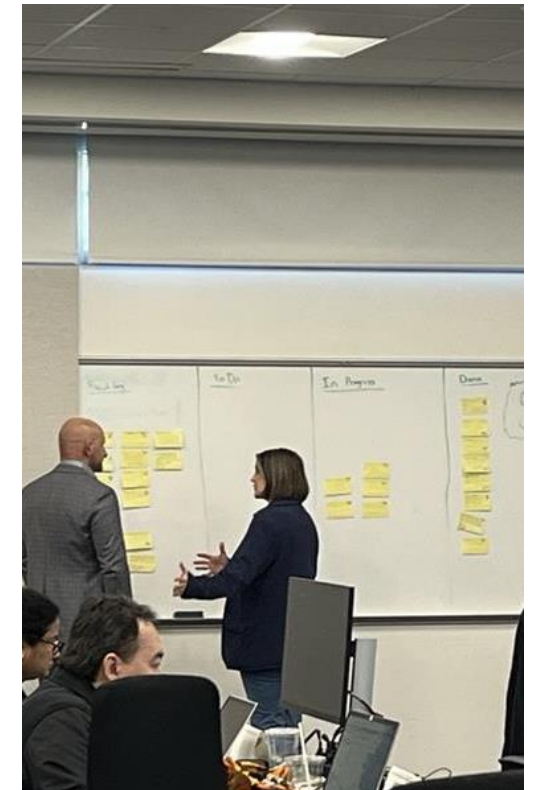
"Burn thru as many ITC4 deliverables as  
hum(Ai)nly possible"

- 100+ AI Developers, Program SMEs & Product End Users Co-located Monday – Thursday with a defined set of program deliverables in mind.
- Special Ops theme where tactical teams were leveraging MVP toolsets to provide feedback and feed real-time code enhancements.
- Leadership support critical for making the event fun, encouraging culture of experimentation and rewarding results.

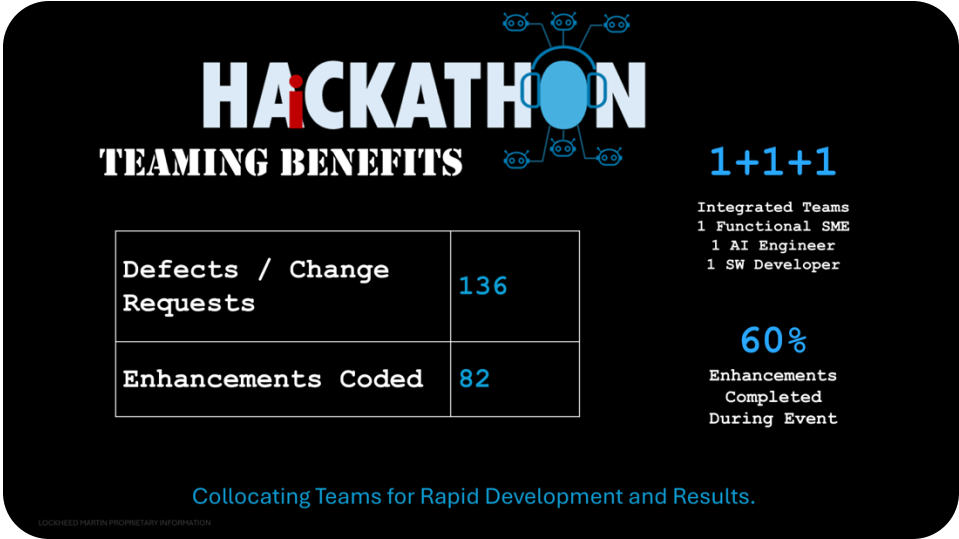
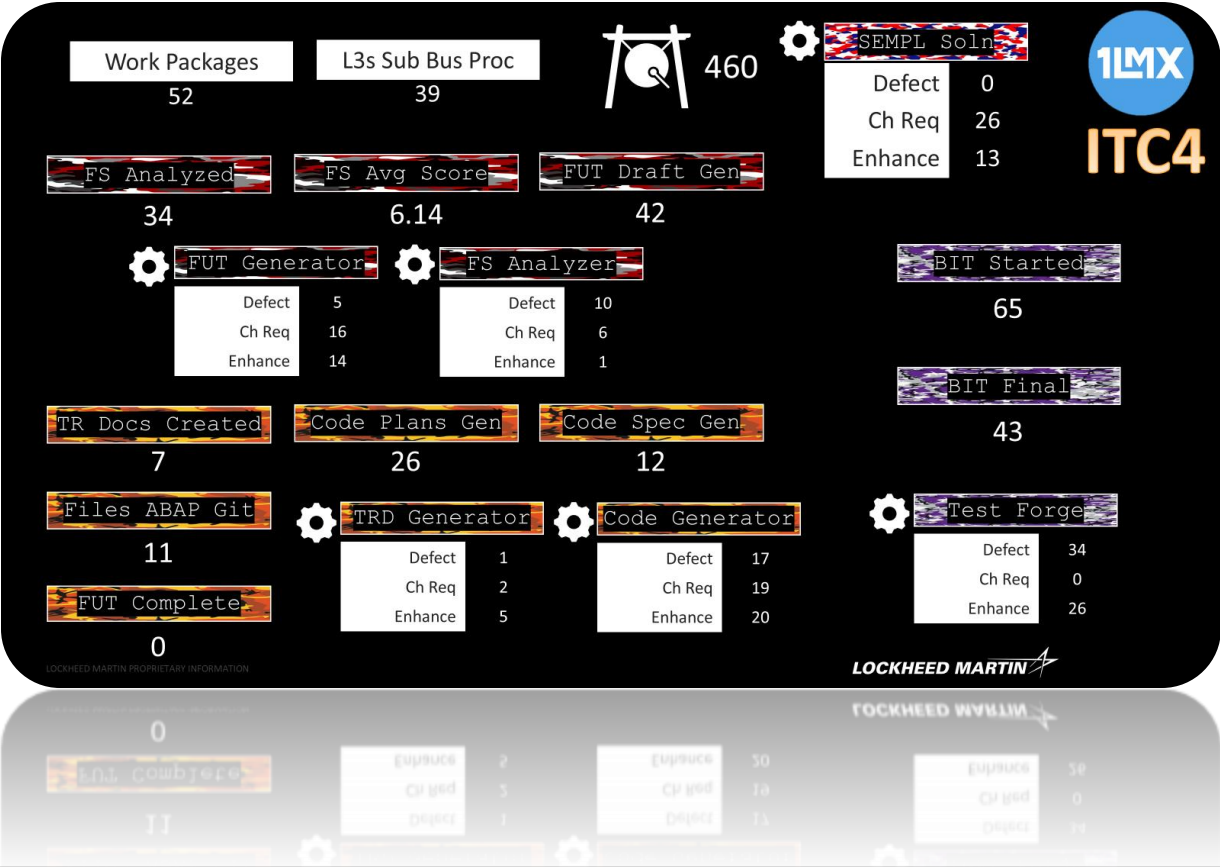


# Intentional Teaming Spaces

- 60 24" Monitors
- 17 34" Dell/HP Curve Monitors
- 60 Keyboard/Mice
- 7 Standard Laptops
- 7 Power Adaptors
- 60 120W Docks
- Mac Laptop



# Scorecard and ROI Tracking



Scorecard kept visible throughout the event.

Celebration of metrics with gong ring created a buzz.



# Step 4: Deliver Products

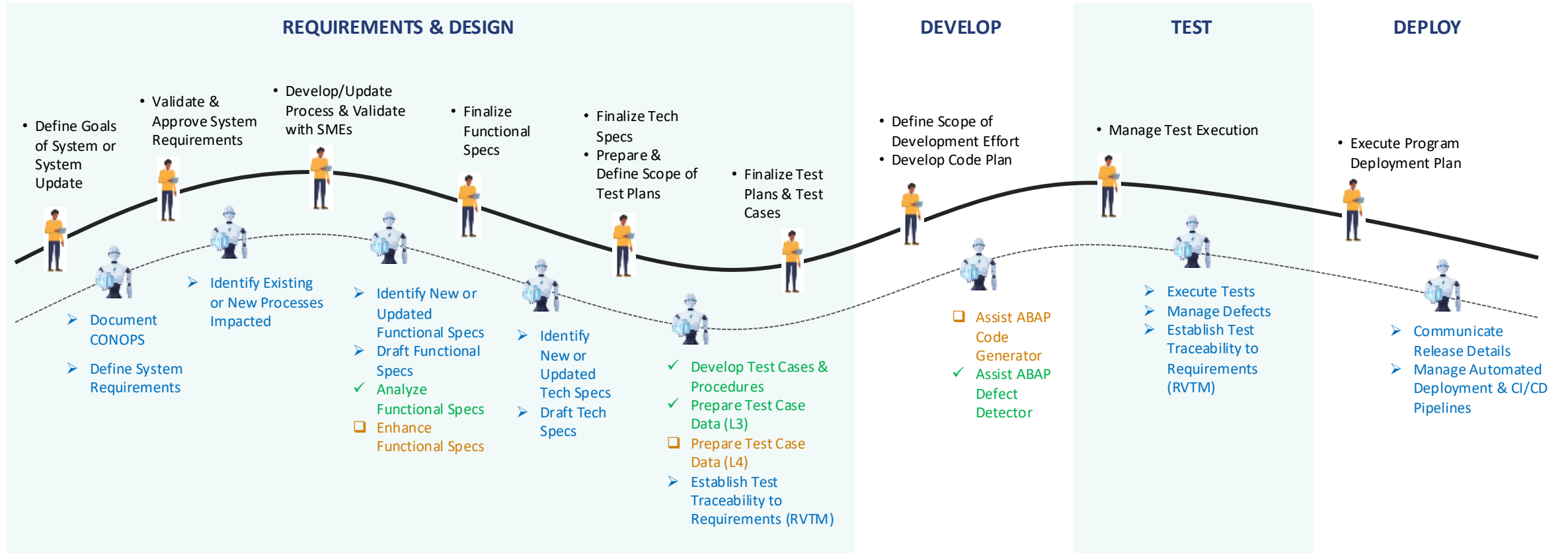
Productionize 1LMX Acceleration Solutions

# SEMP<sup>TM</sup>: Systems Engineering Management Plan – Lightning Fast!

- With key results demonstrated at the AI Hackathon, the team is officially established within the 1LMX Program with dedicated resources.
- They continue product roadmap development and support for targeted AI Hackathon events to partner with end users or develop new specific solutions as needed.
- Demand Management is critical to the value delivery of the team; milestones and risk reduction are top priority for the SEMPL<sup>TM</sup> team.



# SEMPLE™ Roadmap for 1LMX Program Acceleration, Q3 2025



## Key:



Represents human input/intervention.



Represents the set of AI Agents needed to complete the task.

✓ Functionality in Production

□ Functionality in Development

➤ Potential Future Opportunities



LM Data & AI Enablement

# Continued Focus Areas



## AI Governance Framework

Establishing robust governance and frameworks will be crucial to ensuring responsible AI development and deployment, mitigating risks, and driving business value through AI-powered solutions.



## Transformation Culture

Fostering a transformation culture that encourages experimentation, innovation, and continuous learning will empower our teams to drive business value through AI and Generative AI.



## Adoption & Results

By measuring and analyzing adoption and results, we can refine our approach, optimize our processes, and drive continuous value creation through AI-powered solutions.



# Thank you!

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