Accelerating the Digital Edge: From Enterprise to Orbit

Upskilling for the AI Age

Building an AI-Fluent Workforce for Mission Success

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The New Workforce Reality



Live Poll: How many of you have used generative AI in the last week?

AI won't replace people. People who effectively leverage AI will.

Every profession in the Air Force is changing. The future requires AI literacy, digital confidence, and data-informed reasoning combined with critical thinking and mission judgment.

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Defining AI Fluency Through the Microsoft Office Analogy

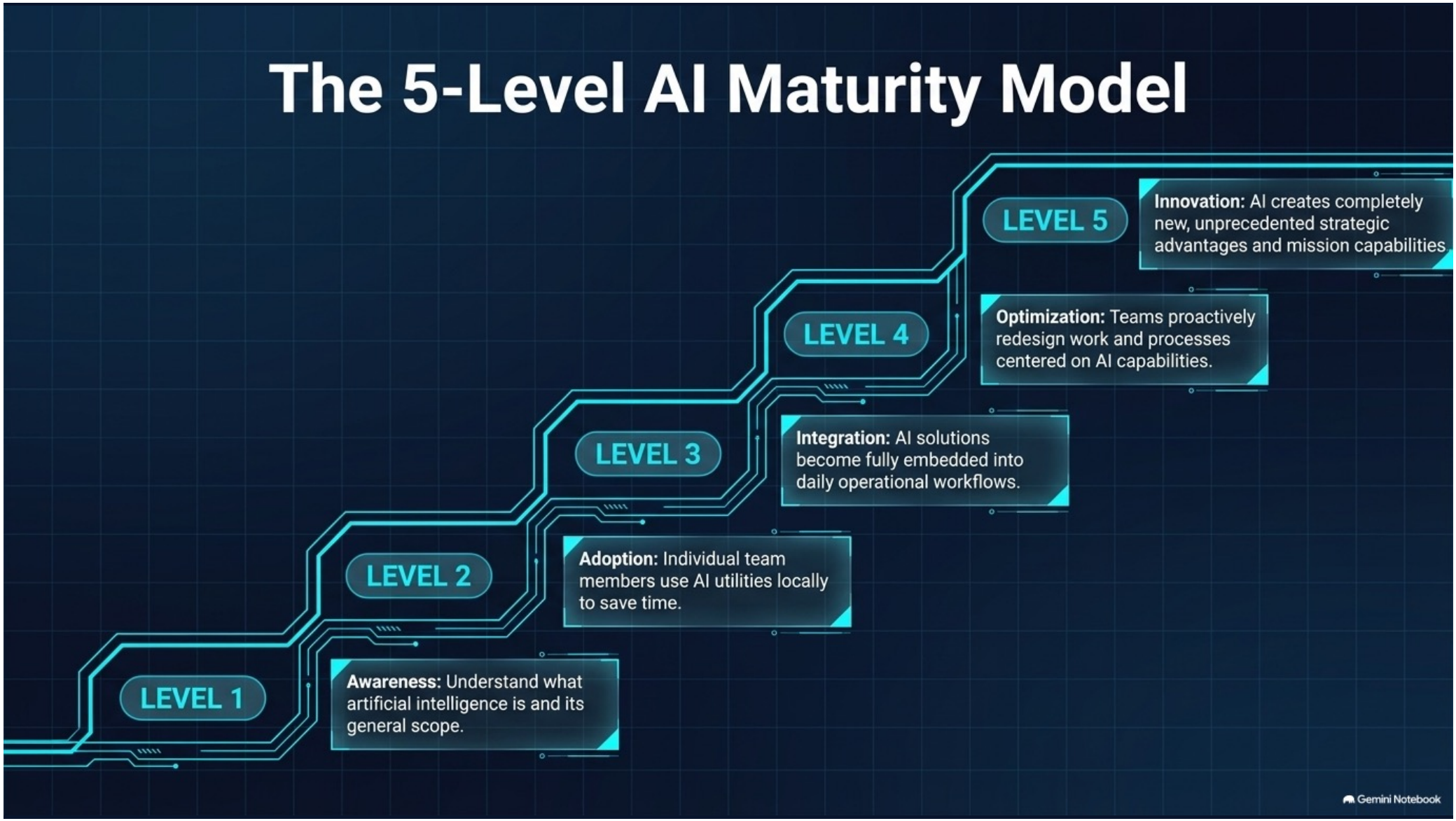


The 1990s: We didn't train everyone to build Excel from scratch. We trained them to use it.

Today: We don't need to turn every Airman into a data scientist. We need AI-Enabled Professionals.

Asking better questions | Prompt Engineering | Verifying AI outputs | Understanding system limitations | Protecting sensitive OPSEC information

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The 5-Level AI Maturity Model
LEVEL 1
Awareness: Understand what artificial intelligence is and its general scope.
LEVEL 2
Adoption: Individual team members use AI utilities locally to save time.
LEVEL 3
Integration: AI solutions become fully embedded into daily operational workflows.
LEVEL 4
Optimization: Teams proactively redesign work and processes centered on AI capabilities.
LEVEL 5
Innovation: AI creates completely new, unprecedented strategic advantages and mission capabilities
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AI acts as a Force Multiplier Across Every Career Field



The Hybrid Skill Spectrum: Technical Tooling vs. Human Judgment



Technical Skills

- **Prompt Engineering:** Directing LLMs effectively.
- **Data Literacy:** Understanding dataset bias and formatting.
- **AI Tooling:** Operating modern assistant platforms.
- **Workflow Automation:** Building triggers and chaining LLM calls.



Human Skills

- **Critical Thinking:** Evaluating accuracy and logical integrity.
- **Ethical Decision Making:** Identifying algorithmic biases.
- **Collaboration:** Integrating human oversight into machine loops.
- **Cognitive Adaptability:** Continuous learning as tools iterate.

Edge Lethality requires functional competence combined with the cognitive skills to validate outputs and manage risk.

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Interactive Prompt Challenge: Garbage In vs. Mission-Ready Out

PROMPT: "Write me code."

RESULT: Generates generic, unoptimized code with no pipeline structure, no security scans, and zero mission context.

>

PROMPT: "You are a DevSecOps engineer building a GitLab CI pipeline for a Java app hosted in Cloud One. Include SAST scanning, container scanning, SBOM generation, artifact publishing, and deployment stages."

RESULT: Delivers clean, secure, custom pipeline scripts ready for Cloud One environments with appropriate security baselines.

>

Adding precise context completely transforms the output quality of modern LLMs.

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Responsible & Secure AI Mandates for the DoD



Data Sovereignty: Never copy or input classified, proprietary, or sensitive military documents into public, commercial AI tools.

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OPERATIONAL IMPACT: QUANTIFYING EFFICIENCY GAINS

BEFORE AI (MANUAL TASKS) - TOTAL 6.0 HOURS

- 3 hours documenting
- 2 hours searching local configuration files
- 1 hour writing unit tests

WITH AI-FLUENCY (ASSISTED WORK) - TOTAL 2.0 HOURS

AI drafts documentation and unit tests; the engineer reviews and validates.



~67% TIME SAVINGS

Reclaiming 4 hours daily for high-level tactical work and strategic warfighter support.

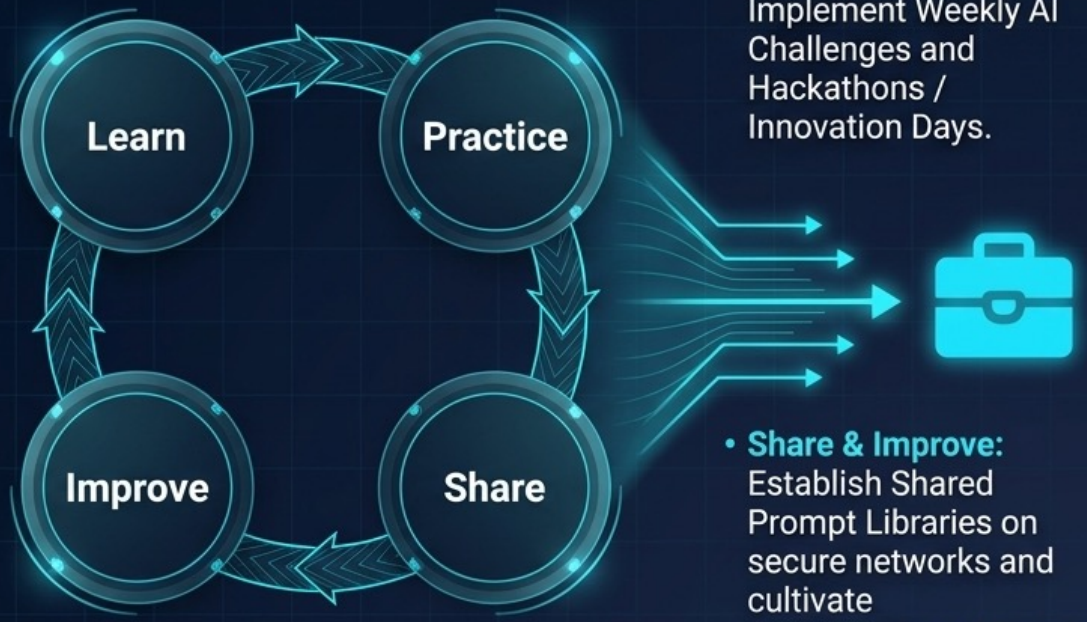
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The Organizational Playbook: Building an AI Learning Culture

Addressing Friction

Problem: People don't resist AI; they resist uncertainty (fear of replacement, lack of trust).

Solution: Leaders must provide psychological safety, clear policies, and secure sandboxes.



- **Learn & Practice:** Implement Weekly AI Challenges and Hackathons / Innovation Days.
- **Share & Improve:** Establish Shared Prompt Libraries on secure networks and cultivate Communities of Practice.

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The Path Forward: Leadership's Role in the AI Age

Invest in Learning:

Create clear budget lines for continuous, hands-on AI training.

Reward Experimentation:

Accept responsible failures as a necessary vehicle for optimization.

Build Governance, Not Barriers:

Draft clear guardrails and secure sandboxes, rather than administrative roadblocks.

If AI saved you an hour every day, how would you reinvest that time to improve mission outcomes?

Mission success depends not only on adopting new AI systems, but on empowering Airmen and Civilians to use them safely, securely, and confidently.

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QUESTIONS?



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Questions & Discussion

DISCUSSION TOPICS

How can we accelerate AI-Fluency upskilling in your specific command?

- Reinvesting time saved: If generative assistants free up 4 hours daily, where should we focus? [9]
- Security & Governance: Ensuring OPSEC compliance while fostering rapid development sandboxes. [8]

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TECHNICAL APPENDIX

BACKUP MATERIALS & SYSTEM ARCHITECTURE

- S14. AWS Hosting Environment (Cloud One)
- S15. VS Code Mainframe Migration Workspace
- S16. Repository Directory Structure
- S17-18. Mainframe System Architecture & Application Maps
- S19-20. Database ERD & Detailed Entity Model Specifications
- S21-22. User Interface Navigation & COBOL Transaction Flows

AWS Environment: Active GenAI Cloud One Instances

ACTIVE EC2 INSTANCES (REGION: US-GOV-WEST-1B)

Instance Name	Instance ID	State	Instance Type	Status Check
Gen AI Class February	i-08b0430b552303338	Stopped	t2.xlarge	-
Gen AI Josh Hudson	**i-03e0373e55cf2d1c2**	**Running**	**t2.xlarge**	**Initializing**
Gen AI Shaun Lindsey	i-0c6d89eff54ec114f	Stopped	t2.xlarge	-
GenAIMaster	i-0033f5b79dcb06690	Stopped	t2.xlarge	-

CLOUD CONFIGURATION DETAILS

Secure Sandbox Model

- Compute: t2.xlarge nodes (4 vCPUs, 16 GiB RAM)
- Network: Air-gapped VPC on Cloud One gov-cloud
- Target VM: Dedicated host running custom mainframe emulation and the COBOL-to-Java LLM processing engine.
- Active node 'Gen AI Josh Hudson' hosts current demonstration environment.

AWS EC2 HOST INFRASTRUCTURE SUMMARY

Infrastructure deployment matches strict DoD cybersecurity baselines, operating within isolated environments on AWS gov-west-1b to guarantee absolute data sovereignty and prevent leakage of legacy source code. [8]

VS Code Mainframe Migration Workspace

PROJECT EXPLORER TREE

```
CARDDEMOGREEN [C:\repos\carddemogreen]
└── carddemomaingreen
    └── AI Output
        ├── 00-IMPROVED_PROMPT.md
        ├── 01-REQUIREMENTS.md
        ├── 02-DOMAIN_MODEL.md
        ├── 03-DATA_MODEL_ER.puml
        ├── 04-WORKFLOWS_USE_CASES.md
        ├── 05-EXECUTION_PATHS.md
        └── ... (11 files total)
    ├── app/
    ├── diagrams/
    ├── NewDocsGreen/
    └── NewSourceCodeGreen/
```

DOCUMENT VIEWER: 01-REQUIREMENTS.MD

```
# CardDemo System - Requirements Documentation

## Executive Summary
CardDemo is a comprehensive mainframe credit card management application designed
to simulate real-world transactions. The system encompasses online user-facing
functions, batch billing runs, and VSAM database layers.

## 1. Functional Requirements
### 1.1 User Functions (CICS Online Transactions)
• ACTU (Account Update): Modify account details and status.
• ACTV (Account View): Display details and status records.
• ACTA (Account Administration): Manage limits and overrides.
• COTRN0xC (Transaction Process): Authorize & post credits.
```

Mainframe Migration Workspace: Directory Layout

AI ANALYSIS OUTPUTS

AI Output/
Contains markdown requirements, architecture UML specs, and reverse-engineered data schemas.

NewDocsGreen/
Generated specifications for target architecture mapping.

NewSourceCodeGreen/
Modernized target code matching refactored design structures.

APPLICATION SOURCE & DIAGRAMS

app/
Legacy application container and source mainframe components.

diagrams/
Dynamic flowchart renders and UML visual models.

samples/ & scripts/
Pre-configured mock transactions and deployment utilities.

WORKSPACE CONFIGURATION

README.md
Complete reverse engineering step-by-step guides.

PROJECT_INDEX.md
Directory indexing maps linking components together.

STARTUP_COMMANDS.md
Initialization shell script parameters for fast start.

Mainframe CardDemo System Architecture

EXTERNAL INTEGRATION LAYER

Yellow boundary with mock TCP/IP connectivity endpoints.

- Merchant System Interface
- FTP File Server Host
- DoD SMTP Email Node
- Monitoring Agent Dashboard

ONLINE & BATCH COMPUTE LAYER

Core system processing transactions and batch updates.

- CICS Transaction Server (Online)
- MQSeries Message Broker
- COBOL Process Automation
- Batch Job Scheduling Core

DOD SECURE STORAGE LAYER

Secure dataset storage and transactional databases.

- VSAM Accounts (KSDS Keys)
- VSAM Customers (Indexed)
- DB2 Relational Audit Log
- IMS Database (Hierarchical)

CICS Transaction Programs & VSAM Dataset Mapping

CICS ONLINE PROGRAMS

Customer Management (COUSR0xC)
Queries CUSTDATA & CARDDATA to authorize transactions and update profiles.

Transaction Processing (COTRN0xC)
Validates and posts account balances, modifying TRANSACT & CARDXREF.

Account Reporting (CORPT00C)
Synthesizes monthly billing reports. Queries ACCTDATA & TRANSACT VSAM structures.

Data Export / Import (CBEXPORT)
Extracts indexed data into sequential flat files for cloud ingest processing.

SCHEDULED BATCH JOB CORE

Daily Interest Calculation (INTRST)
Executes Daily at 03:30 UTC. Processing time: ~45 min.
Calculates outstanding finance rates and updates ledger records.

Monthly Data Archive (DATARCH)
Executes Monthly. Processing time: ~120 min.
Extracts settled billing records and compresses database structures.

Dataset Maintenance (TRANPURGE)
Executes Monthly. Processing time: ~30 min.
Purges transaction logs, resetting ledger indexes to optimize IOPS.

Mainframe Credit Card System: Database Model (ERD)

CUSTOMER (VSAM INDEXED)

CUST_ID (PK) - CHAR(9)
FIRST_NAME - VARCHAR(25)
MIDDLE_NAME - VARCHAR(25)
LAST_NAME - VARCHAR(25)
ADDRESS - VARCHAR(50)
PHONE - CHAR(10)
SSN - CHAR(9)
DOB - DATE
FICO_SCORE - SMALLINT

ACCOUNT (VSAM INDEXED)

ACCT_ID (PK) - CHAR(11)
CUST_ID (FK) - CHAR(9)
ACCT_TYPE - CHAR(1)
STATUS - CHAR(1)
BALANCE - DECIMAL(11,2)
CREDIT_LIMIT - DECIMAL(11,2)
OVERDRAFT_FEE - DECIMAL(7,2)
OPEN_DATE - DATE

USER (VSAM INDEXED)

USER_ID (PK) - CHAR(8)
USER_NAME - VARCHAR(30)
USER_ROLE - CHAR(1)
STATUS - CHAR(1)
LAST_SIGNON - TIMESTAMP
PASSWORD_HASH - CHAR(64)

Detailed Database Entity Model Specifications

CARD (VSAM KEYS)

CARD_NUM (PK) - CHAR(16)
ACCT_ID (FK) - CHAR(11)
CARD_TYPE - CHAR(1)
STATUS - CHAR(1)
ISSUE_DATE - DATE
EXPIRY_DATE - DATE
DAILY_LIMIT - DECIMAL(9,2)
TRANSACTION_LIMIT - DECIMAL(9,2)

TRANSACTION (VSAM KSDS)

TRANS_ID (PK) - CHAR(16)
ACCT_ID (FK) - CHAR(11)
CARD_NUM (FK) - CHAR(16)
TRANS_TYPE - CHAR(2)
TRANS_DATE - DATE
TRANS_TIME - TIME
AMOUNT - DECIMAL(11,2)
MERCHANT_NAME - VARCHAR(50)
STATUS - CHAR(1)

BALANCE_CATEGORY

ACCT_ID (PK/FK) - CHAR(11)
CATEGORY_CODE (PK) - CHAR(2)
BALANCE - DECIMAL(11,2)
TRANSACTION_COUNT - INT
LAST_UPDATED - TIMESTAMP

Application Interface Flow & Menu Navigation Map

NAVIGATION ARCHITECTURE OVERVIEW

The application navigation hierarchy starts at the secure CICS terminal Login screen, branching through the Main Menu into specialized transaction columns. Custom GenAI-driven extensions are highlighted in Cyan.

ACCOUNT MGMT

[Legacy Core]

- View Account
- Update Account
- Admin Controls

CARD MGMT

[Legacy Core]

- View Cards
- Update Info
- List Cards

TRANSACTIONS

[Legacy Core]

- View Details
- List Log
- Add Ledger

BILL PAY

[Legacy Core]

- Check Balance
- Submit Pay
- Auto-Draft

AUTHORIZATIONS

[GenAI Extension]

- Auth Summary
- View Profile
- Mark Fraud

System Diagram: Transaction & Payment Authorization Flow

1. INGESTION LAYER (AWS CLOUD)

- User swipe triggers transaction.
- Sent to Payment Network Emulator.
- **Secure TLS call to Cloud One API Gateway.**
- AWS Lambda processes initial token payload.

2. MQ SERIES MIDDLEWARE

- **Lambda publishes to 'Response MQ' queue.**
- **Triggers internal CICS MQ trigger process.**
- High-speed messaging decouples ingestion.
- **Response messages written to 'Reply MQ'.**

3. COBOL CORE & DATABASES

- **CICS COBOL Application processes request [A.0].**
- Queries indexed VSAM datasets (Account/Customer DB).
- Interactive IMS DB handles pending clearances.
- Fraud logs published to DB2 mainframe database.



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