Transforming application development and maintenance operating models on AWS with generative AI

# AWS Prescriptive Guidance

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# AWS Prescriptive Guidance: Transforming application development and maintenance operating models on AWS with generative AI

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# Transforming application development and maintenance operating models on AWS with generative AI

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Organizations face unprecedented challenges in application development and maintenance (ADM) practices today. Generative AI is fundamentally changing how applications are built, designed, tested, documented, and deployed—transforming the entire software development lifecycle (SDLC).

ADM encompasses the complete application lifecycle from business requirements analysis through development and maintenance, representing a comprehensive practice of managing applications. The SDLC defines the structured methodology and phases for building software within this broader ADM framework.

To assist your organization's transformation journey to AI-powered ADM practices, this strategy document offers:

- Comprehensive analysis of AI's impact on ADM, including operating model and role-specific changes
- Strategies for enhancing organizational capabilities and addressing key challenges
- A framework for building and implementing an AI-powered ADM operating model
- A phased implementation approach to an AI-powered ADM operating model, from quick wins to full AI integration

## Intended audience

This strategic document is recommended for the following audiences:

- IT leaders, such as chief technology officers (CTOs), technical directors, technical leads, architects, and program managers
- Business leaders, such as chief information officers (CIOs), chief data officers (CDOs), vice presidents (VPs) of product engineering, and VPs of business operations

# Objectives

This strategy document can help your organization achieve the following objectives:

- Examine your current ADM operating model for transition to the AI era.
- Address the unique challenges of generative AI integration.
- Implement a phased transformation strategy to integrate generative AI into your organization's ADM.

# Benefits of integrating generative AI into ADM

For *IT leaders*, integrating generative AI into your organization's ADM can provide the following benefits to enhance your organization's capabilities:

- Accelerate innovation cycles through rapid prototyping and responsive software development.
- Automate routine tasks in architecture definition, code generation, and testing.
- Enhance software quality and reliability, minimizing defects and mitigating risks.
- Improve operational scalability by handling increased complexity and development volume.

For *business leaders*, integration of generative AI can deliver benefits that extend beyond technical improvements to create business value:

- Deliver customer-centric applications faster, adapting quickly to market demands.
- Gain competitive advantages by increasing operational efficiency with AI technologies.
- Position your organization as a leader in AI-driven development, attracting top talent.
- Achieve cost efficiency through improved productivity and optimized resource allocation.

Early adopters across industries are reaping the benefits from using AWS generative AI services in ADM:

- **Development speed** – BlackBerry improved SDLC agility and quality with Amazon Q Developer.
- **Code generation** – BT Group automated 12 percent of repetitive tasks using Amazon CodeWhisperer, which is becoming part of Amazon Q Developer.

- **Modernization** – Novacomp used Amazon Q Developer to reduce a Java application modernization time from 3 weeks to 50 minutes.
- **Documentation** – ADP used Amazon Q Developer to cut legacy system documentation time from weeks to less than a day.
- **Productivity** – National Australia Bank used Amazon Q Developer to achieve 50 percent acceptance of AI-generated code suggestions.
- **Application modernization** – Deloitte uses Amazon Q Developer to accelerate modernization phases, reducing project complexity and completion times. TCS used Amazon Q Developer to accelerate mainframe modernization, quickly analyzing and documenting legacy COBOL code.
- **Application migration** – Cognizant uses Amazon Q Developer to automate complex migration processes, increasing speed and simplicity in transformation projects. Also using Amazon Q Developer, HCLTech employs AI agents for accelerating VMware, .NET, and mainframe workloads.
- **Application efficiency** – IBM Consulting's AI-based SDLC solution on AWS Marketplace makes use of Amazon Bedrock to enhance efficiency and quality throughout the application lifecycle.

# Understanding operating models in ADM

Before exploring the transformative impact of AI on ADM, it's important to understand the fundamentals of an operating model in the context of ADM. This section provides an overview of a typical IT operating model. Then, review the key components and layers of an ADM operating model, which sets the stage for AI-driven changes.

In this section

- Overview of a typical IT operating model
- Overview of an ADM operating model

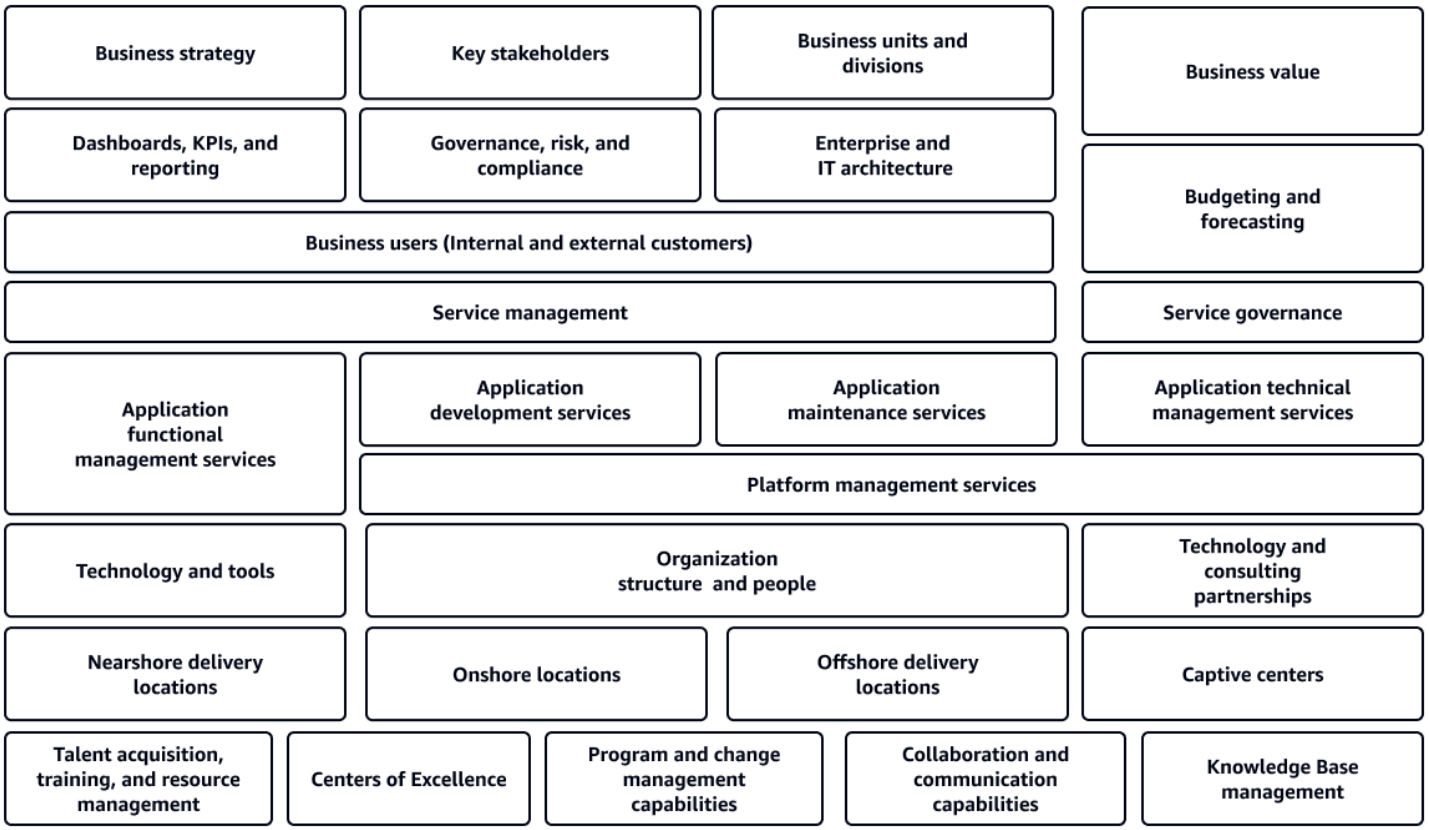
## Overview of a typical IT operating model

An operating model serves as the cornerstone of successful IT service delivery in any organization. It's the blueprint that defines how an organization creates and delivers value through its operations. At its core, an operating model aligns people, processes, and various technologies with business strategy. (For more information about operating models, see Defining the IT Operating Model on The Open Group website.)

As shown in the following diagram, a typical IT operating model encompasses multiple key components:

- Organizational structure and roles
  - Key stakeholders
  - Business units and divisions
  - Business users (internal and external customers)
  - People roles
  - Technology and consulting partnerships
- Governance and decision-making frameworks
- Enterprise and IT architecture
- Core processes and workflows
  - Business strategy
  - Business value

    - Budgeting and forecasting
    - Application functional management services
    - Application development services
    - Application maintenance services
    - Application technology management services
    - Platform management services
- Technology and tools
- Performance metrics
    - Dashboards, key performance indicators (KPIs), and reporting
- Organization capabilities
    - Program and change management
    - Collaboration and communication
    - Knowledge base management
- Culture and ways of working
    - Talent acquisition, training, and resource management
    - Center of Excellence (COE)
    - Nearshore delivery locations
    - Offshore locations
    - Offshore delivery locations
    - Captive centers




A well-designed operating model does more than explain day-to-day operations. It's a strategic asset driving competitive advantage. The operating model enables organizations to respond quickly to market changes, innovate effectively, and deliver greater customer value. A key strength of a well-designed operating model is adaptability. Your organization's operating model must flex to support its chosen practices while maintaining consistency and efficiency. This ability to adapt applies whether you use traditional waterfall methodologies, agile frameworks, or a hybrid approach for your ADM.

## Overview of an ADM operating model

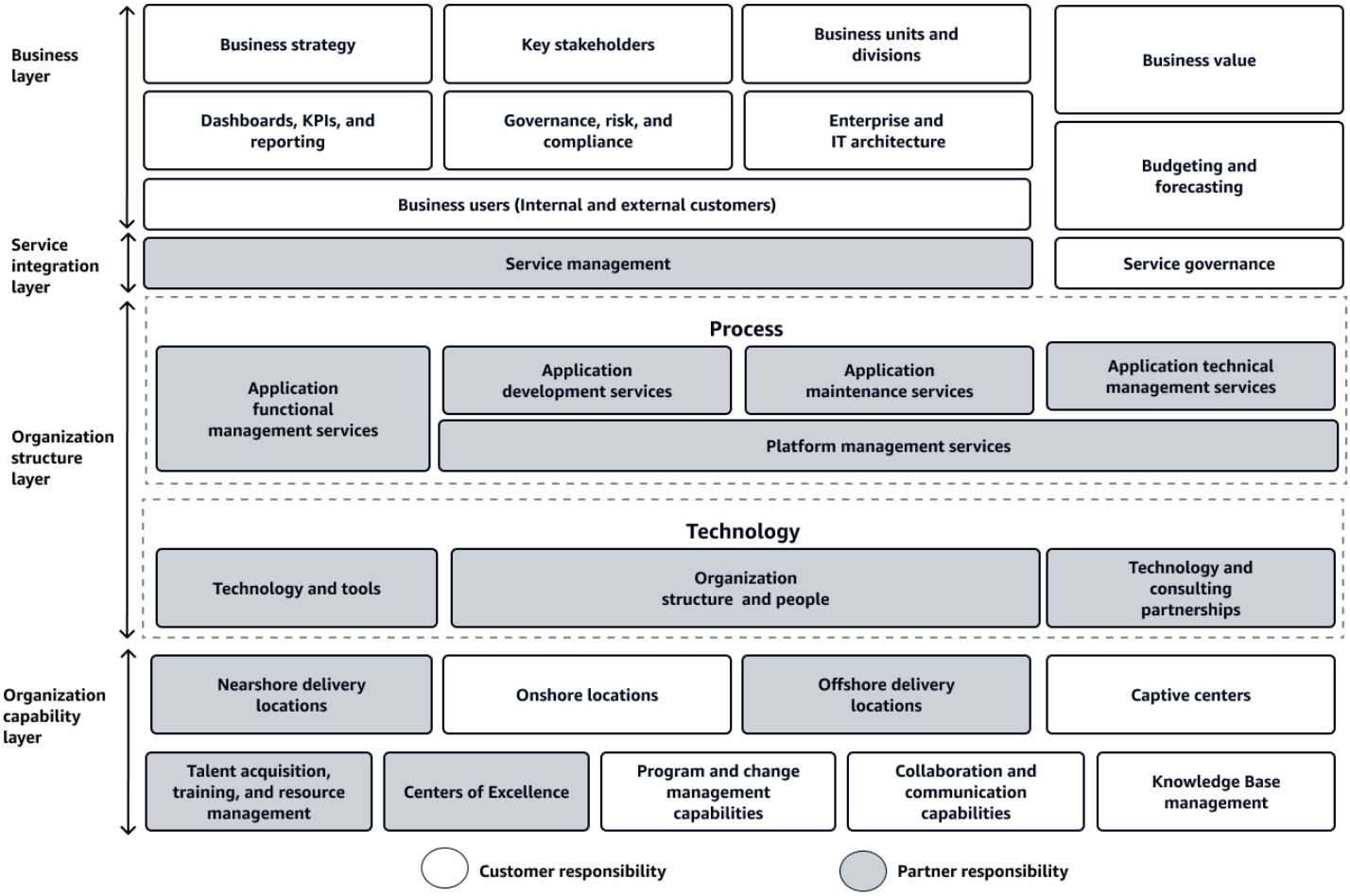
Transitioning from typical IT operating model concepts to the specific context of ADM requires understanding how these principles apply to software development and maintenance processes. The ADM operating model provides a comprehensive framework to manage the entire application lifecycle from planning to development to maintenance. It helps achieve successful alignment between business goals and IT execution.

Creating an ADM operating model is typically a shared responsibility between the *customer* (business and in-house IT) and/or *partners* (application managed services (AMS) delivered by

consulting and technology partners). This collaborative approach makes use of diverse expertise and aligns with the organization's specific needs and technological landscape.

As shown in the following diagram, an ADM model consists of interconnected layers that play critical roles:

- Business layer – This top layer aligns ADM activities with the organization's strategic goals. Here, leaders define business strategy, shape enterprise architecture, and establish governance mechanisms. As generative AI integration becomes more prevalent, this layer becomes increasingly dynamic. It facilitates rapid and continuous alignment between business objectives and development activities.
- Service integration layer – This operational nexus bridges the gap between business needs and technical implementation. As organizations introduce generative AI, this layer orchestrates complex interactions between human teams and AI systems to deliver seamless services.
- Organization structure layer – This layer focuses on people, process, and technology, and it experiences significant changes during AI integration. Roles will evolve, teams will reimagine processes, and the technology stack will expand to include AI tools. This layer drives the practical implementation of an organization's generative AI transformation.
- Organization capability layer – This foundational layer involves the strategic distribution of resources globally and the cultivation of essential skills and expertise needed for AI-augmented ADM. As AI integration progresses, this layer plays a crucial role in developing new competencies, establishing Centers of Excellence (COE), and fostering a culture of continuous learning.




As organizations prepare to integrate generative AI into their ADM practices, they can reshape each layer of this model as necessary. Organizations can reimagine SDLC processes, redefine roles, and recalibrate technology stacks to benefit fully from generative AI.

The true power of an ADM operating model lies in its ability to transform and manage change. This transformation requires close collaboration among all stakeholders to help ensure a cohesive and effective implementation of AI-augmented ADM practices.

For more details about each layer, see the following sections:

- Business layer elements in an ADM operating model
- Service integration layer elements in an ADM operating model
- Organization structure layer elements in an ADM operating model
- Organization capability layer elements in an ADM operating model

# Business layer elements in an ADM operating model

The customer is responsible for activities related to the following elements:

- Business strategy
  - Improve the customer experience and drive key business outcomes
  - Modernize core systems for high business impact
  - Enhance agility and innovation capabilities
- Business line and support functions (Geographic areas and country)
  - LOBs
  - Marketing
  - Human resources
  - Procurement
  - Legal
  - Information technology (IT)
- Dashboards, KPIs, and reporting
  - Service performance reporting
  - Service level agreement (SLA) and operating level agreement (OLA) monitoring and reporting
  - Business performance reporting
- Governance, risk, and compliance
  - Steering committee and quarterly review
  - Risk assessment and management
  - Audits, compliance, and regulatory reporting
- Enterprise and IT architecture
  - Business-aligned IT strategy
  - Architecture and design principles
  - Technology standards and policies
- Budgeting and forecasting
  - Budget planning and control
  - Financial performance management
  - Demand forecasting and planning

- Business value
  - Improve resiliency
  - Improve productivity
  - Improve business agility
  - New feature release

## Service integration layer elements in an ADM operating model

This layer includes the following key areas of service management (responsibility of the consulting and technology partners) and service governance (responsibility of the customer):

- **Service management** encompasses delivery of IT services including service desk, incident and problem management, change management, and service level management. AI-powered automation and intelligent support capabilities enhance service quality and efficiency.
- **Service governance** focuses on oversight and control mechanisms including service validation, availability management, capacity planning, and configuration management. With effective service governance, services align with business objectives while maintaining compliance and performance standards.

## Organization structure layer elements in an ADM operating model

The organization layer focuses on people, process, and technology.

Partners are responsible for activities related to *people* elements. In some cases, customers have a co-sourced engagement model resulting in shared responsibility for the following:

- Organization structure and people roles
  - Product management – Project owner and business analyst
  - Project management – Project manager, Scrum Master, and Agile Coach
  - Architecture and design – Solution architect, technical lead, and user experience (UX) designer
  - Development – Software developer and user interface (UI) designer
  - Quality assurance – Testing lead, quality assurance (QA) tester, and performance engineer
  - Operations – DevOps engineer and release manager
  - Support and maintenance – Support engineer and technical writer

    - Subject matter experts (SME) – Security subject matter experts (SMEs), integration SME, and domain-specific SMEs

Partners are responsible for activities related to the following *process* elements:

- Application functional management services
    - Business process management
    - Information and data management
    - Functional management
- Application development services
    - Project and requirement management
    - Architecture
    - Design and development
    - Testing and quality assurance (QA)
- Application maintenance services (Operations)
    - Services support management (ITSM)
    - Service request management
    - Updates and patch management
    - Service improvements
- Application technical management services
    - Application basics support (Level 1)
    - Middleware management
    - Database management
    - Service improvements
- Platform management services
    - Managed landing zone
    - Managed operating system (OS)
    - Database
    - Observability
    - Security
    - Network

- Backup
- Integration
- Cloud financial
- Other services

Partners are responsible for activities related to implementation and management of the following *technology* elements:

- Technology and tools
  - Includes cloud, virtualization, containers, operating systems, databases, and other management tools
  - Developer tools and integrated development environments (IDEs)
  - Continuous integration and continuous development (CI/CD) tools
  - Bug fix and IT service management (ITSM) tools
- Technology and consulting partnerships
  - Hyperscaler (AWS and others)
  - Technology ISVs
  - IT/Service desk supplier
  - Infrastructure outsourcing (Network, data center, security, and workplace services)

## Organization capability layer elements in an ADM operating model

Generally, customers hold accountability for making the key decisions about the following activities:

- Program and change management capabilities
  - Portfolio management
  - Feature and backlog management
  - Organization change management
- Collaboration and communication capabilities
  - Productivity tools
  - Collaboration tools

    - Communication tools
- Knowledge base management
    - Market research
    - Customer feedback and issues resolutions
    - Business and domain knowledge
- Onshore locations, such as corporate office, regional office, or remote sites
- Captive centers

One or more consulting partners are responsible for implementing and managing activities related to the following elements:

- Nearshore delivery locations
- Offshore delivery locations
- Talent acquisition, training and certification, and resource management
- Centers of Excellence
    - Innovation
    - Technology evaluation and proof of concept (POC)
    - POVs, best practices, standards, and policies

# Integrating generative AI into ADM practices

Generative AI reshapes ADM practices across all layers of the operating model. This transformative technology can shift an organization's focus from cost management to value creation and innovation, enabling more agile and customer-centric approaches.

This section provides an overview of how generative AI reshapes each of the following layers of the ADM operating model:

- Business layer
- Service integration layer
- Organization structure layer
- Organization capability layer

For each layer, an overview of its current state and an AI-powered future state provides insights into the transformative potential of generative AI integration. Additionally, the following sections can help you navigate the AI-driven evolution in ADM practices:

- Integration challenges and mitigation strategies
- Action areas and recommendations

Understanding these changes can help you make use of generative AI effectively in enhancing your organization's software development and maintenance capabilities.

# Business layer of an ADM operating model

The business layer forms the strategic foundation of the ADM operating model. Generative AI is transforming business strategy, stakeholder roles, and key areas such as enterprise architecture, reporting, governance, and budgeting.

## Strategy and key stakeholders

The ADM operating model includes both internal and external stakeholders focused on aligning business strategy and goals with organizational operations and outcomes. Traditionally, these

stakeholders prioritized application reliability, release velocity, operational efficiency, cost reduction, and application rationalization.

In a shift from traditional methods to AI-enhanced processes, the following key changes occur in stakeholder roles and priorities:

- **Strategic focus** – Shift from cost management to value creation and innovation.
- **Collaborative decision-making** – AI-driven insights inform cross-functional strategies.
- **Agile responsiveness** – Faster adaptation to market changes and user needs.
- **Customer-centric approach** – Enhanced focus on user experience and satisfaction.
- **Continuous learning** – Emphasis on AI literacy and ongoing skill development.

These changes ripple through various aspects of the business and service integration layers, affecting the following key areas:

- Enterprise and IT architecture
- Dashboards and reporting
- Governance, risk, and compliance
- Budgeting and forecasting

## Enterprise and IT architecture

The following table provides the current state and a corresponding future state with generative AI for key issues related to enterprise and IT architecture.

| Current state | Future state with generative AI |
| --- | --- |
| Manual creation and updating of architecture documentation | Automated architecture documentation and reviews |
| Static impact analysis of architectural changes | Real-time impact analysis of architectural changes |
| Fixed roadmaps with infrequent updates | Adaptive roadmaps responding to market changes |

| | |
|---|---|
| Technical jargon-heavy communication of architectural concepts | AI-powered natural language interfaces for architectural concepts |

## Dashboards and reporting

The following table provides the current state and a corresponding future state with generative AI for key issues related to dashboards and reporting.

| Current state | Future state with generative AI |
|---|---|
| Static dashboards with generic insights | Real-time adaptive dashboards with user-specific insights |
| Reactive issue management | Predictive analytics for addressing issues proactively |
| Technical query languages for data access | Natural language querying for non-technical stakeholders |
| Manual report generation and key performance indicator (KPI) tracking | Automated report generation and intelligent KPI suggestions |

## Governance, risk, and compliance

The following table provides the current state and a corresponding future state with generative AI for key issues related to governance, risk, and compliance.

| Current state | Future state with generative AI |
|---|---|
| Manual policy checking and compliance audits | Automated policy checking and compliance monitoring |
| Periodic risk assessments based on historical data | Intelligent risk assessment with early warnings and mitigation strategies |

| | |
|---|---|
| Static compliance documentation | Dynamic compliance documentation generation and updates |

## Budgeting and forecasting

The following table provides the current state and a corresponding future state with generative AI for key issues related to budgeting and forecasting.

| Current state | Future state with generative AI |
|---|---|
| Historical data-based manual cost modeling | Predictive cost modeling based on historical data |
| Periodic resource allocation adjustments | Dynamic resource allocation in real time |
| Limited scenario planning due to time constraints | Automated scenario planning for budget evaluations |
| Subjective project prioritization | Intelligent project prioritization aligned with business objectives |

# Service integration layer of an ADM operating model

The service integration layer acts as a critical bridge between business requirements and technical execution, orchestrating interactions across IT services. The integration of AI into this layer brings changes in *service management* and *service governance*.

## Service management

The following table provides the current state and a corresponding future state with generative AI for key issues related to service management.

| Current state | Future state with generative AI |
|---|---|

| | |
|---|---|
| Self-help using internal knowledge base search and manually created standard operating procedures (SOPs) | AI-powered self-service agents that generate dynamic SOPs using an enterprise repository |
| Self-service tools for standard service requests such as access to data and software installat ion | Automated service requests using AI-powered agent workflows |
| Human agents responding to user inquiries | AI-powered chatbots for instant, context-a ware responses |
| Limited language and communication channel options | Multi-language, multi-channel support across chat, voice, SMS, and virtual assistants |
| Reactive issue management | AI-powered service desk that predicts common issues and proactively suggests solutions to users before they encounter problems |

## Service governance

The following table provides the current state and a corresponding future state with generative AI for key issues related to service governance.

| Current state | Future state with generative AI |
|---|---|
| Reactive approach to service level agreement (SLA) management | Predictive service level management to forecast potential SLA breaches |
| Manual availability management | AI-enhanced availability management for continuous service delivery |
| Static capacity and performance management | Intelligent capacity and performance management for optimized resource allocatio n |
| Manual service validation and testing | Automated service validation and testing |

| | |
|---|---|
| Periodic configuration management database (CMDB) updates | AI-driven configuration management for real-time CMDB updates |

The previous examples of future state with generative AI for the business layer and the service integration layer are just the beginning. As AI technologies evolve, expect more innovative solutions to emerge. These advancements can help to enhance proactive, efficient, and automated IT service management and governance.

Use these examples as a starting point for your organization's approach to generative AI transformation. Consider these examples along with your ADM operating model changes. Continuously evaluate new AI applications that align with your organization's needs and goals. This forward-thinking approach can help to keep you at the forefront of IT service management (ITSM) innovation.

# Organization structure layer of an ADM operating model

The organization structure layer encompasses people, process, and technology. This layer is where the most visible and profound changes occur when organizations introduce generative AI in the ADM operating model. Roles evolve, organizations reimagine processes, and technology stacks expand to include generative AI tools.

This section provides insights into the practical implementation of generative AI in your organization's ADM transformation, covering changes in organizational structure, individual roles, and core processes. By embracing these strategic shifts, you can position your organization to integrate generative AI in the ADM operating model effectively. This transformation can improve development speed, software quality, and innovation capacity, potentially enhancing your competitive edge. The actual impact will vary based on your organization's specific context and implementation.

## Platform management services, technology and tools, and partnerships

Platform management services provide a core set of shared capabilities and standardized services for application teams, including:

- Codified reference architectures and design patterns
- Self-service mechanisms for deploying approved architectures and configurations

- Standardized development, observability, and operational tools
- Support for setting up environments, continuous integration and continuous deployment (CI/CD) pipelines, and management processes
- Centralized governance and security standards

Typically, platform engineering and cloud operations teams manage these services, collaborating to support application teams and drive continuous improvement.

Generative AI is transforming platform management services in the following ways:

- **An AI assistant for architecture recommendations** suggests optimal reference architectures based on project requirements, recommended design patterns and organizational standards.
- **Intelligent self-service provisioning** uses AI to automate and optimize the deployment of resources and services addressing complex workflows.
- **AI-powered observability** provides deeper insights and automates anomaly detection across the platform.
- **AIOps agents** handle multiple automated remediation workflows using approved standard operating procedures (SOPs).
- **Automated compliance checking** continuously verifies and enforces governance and security standards using AI.

These AI-powered enhancements allow infrastructure teams to focus on resolving complex time-consuming issues and improving an application's reliability, enhancing the efficiency and effectiveness of platform management.

Integrate generative AI capabilities into your managed services partners' existing platform offerings. With this strategy, you can achieve the following benefits:

- Harness advanced AI technologies and make use of your partners' expertise and proven processes.
- Enhance your platform engineering and cloud operations with integrated AI capabilities.
- Maintain the benefits of your established managed services partner relationships while advancing your AI capabilities.

## Organization structure and roles

Generative AI integration necessitates a reimagining of ADM organizational structure. Adapting the responsibilities of key roles within your organization structure is crucial. These AI-driven changes can help your teams to work more efficiently and deliver higher value.

The organization structure depends on several factors:

- **Engagement size** – Examples include the scope and complexity of applications such as trading systems, drug discovery, and enterprise resource planning (ERP).
- **Specific customer needs** – Examples include Payment Card Industry Data Security Standard (PCI DSS) compliance for payment systems and Good Practice (GxP) compliance for pharmaceutical industries.
- **Methodology used** – Examples include agile and waterfall methodologies.

Some roles combine or expand based on project requirements. Projects involving advanced technologies or strict compliance needs often include specialized roles such as data scientists, machine learning (ML) specialists, Advanced Business Application Programming (ABAP) developers, and compliance officers.

The following sections spotlight common roles in ADM that are evolving with generative AI integration. These roles are expanding and adapting to use AI capabilities, which can enhance their value and impact within the organization. This evolution represents opportunities for skill development and career growth across many roles. The following aspects provide insights into how each role evolves as it integrates with generative AI:

- **Current focus** – The primary tasks that the person in the role performs currently
- **AI-driven shift** – The ways in which generative AI can be incorporated into the role
- **Key benefits** – The benefits gained by incorporating generative AI into the role
- **Key considerations** – The considerations when considering an AI-driven shift for the role
- **Key steps** – The primary steps that the person in the role can take to help them adapt to AI

This comprehensive view can help you understand the current state, direction of change, and steps needed to navigate the AI-driven transformation for each role successfully. You can gain insights into how AI is enhancing existing roles, and how to prepare your organization structure for these advancements.

### Product owner or business analyst

The following table provides an overview of how the product owner or business analyst roles can adapt to use generative AI capabilities.

| Aspect of the role | Description |
| --- | --- |
| Current focus | • Requirements gathering<br>• Feature prioritization<br>• Stakeholder communication |
| AI-driven shift | Make use of AI for:<br>• Data-driven decision-making process and accelerated market insights<br>• Business requirements document (BRD) creation, prioritizing the features based on customer feedback and demands |
| Key benefits | • Faster requirements gathering and analysis<br>• Improved feature alignment with market needs<br>• More comprehensive user stories and use cases |
| Key considerations | • Ensuring that AI comprehends complex business contexts<br>• Maintaining meaningful stakeholder relationships |
| Key steps | • Implement AI-powered market analysis and requirements tools.<br>• Develop prompt engineering skills for effective AI interaction.<br>• Establish stakeholder processes to validate AI-generated insights |

### Project manager

The following table provides an overview of how the project manager role can adapt to use generative AI capabilities.

| Aspect of the role | Description |
| --- | --- |
| Current focus | • Activity planning<br>• Resource allocation<br>• Risk management |
| AI-driven shift | • Adopt AI for enhanced predictive planning and real-time project intelligence. |
| Key benefits | • Improved resource allocation accuracy<br>• Enhanced risk identification and mitigation<br>• Real-time project health monitoring and predictive analytics |
| Key considerations | • Balancing AI recommendations with human judgment<br>• Ensuring team adoption of AI-driven methodologies |
| Key steps | • Integrate AI-driven project planning and risk assessment tools.<br>• Develop protocols for AI-human collabora tive decision making.<br>• Upskill team in AI-augmented project management practices. |

### UI/UX designer

The following table provides an overview of how the user interface/user experience (UI/UX) designer role can adapt to use generative AI capabilities.

| Aspect of the role | Description |
| --- | --- |
| Current focus | • Creating user interface designs and prototypes<br>• Conducting user research and usability testing<br>• Ensuring optimal user experience across applications |
| AI-driven shift | • Use AI for rapid design iteration, data-driv en user insights, and automated usability testing. |
| Key benefits | • Faster generation of UI design alternatives<br>• Enhanced user research analysis and persona creation<br>• Automated usability testing and feedback analysis |
| Key considerations | • Balancing AI-generated designs with brand guidelines and user needs<br>• Maintaining creativity and innovation in an AI-assisted design process |
| Key steps | • Integrate AI-driven project planning and risk assessment tools.<br>• Develop protocols and process for AI-human collaborative decision making.<br>• Upskill team in AI-augmented project management practices. |

**Full-stack developer**

The following table provides an overview of how the full-stack developer role can adapt to use generative AI capabilities.

| Aspect of the role | Description |
| --- | --- |
| Current focus | • Creating user interface designs and prototypes<br>• Conducting user research and usability testing<br>• Ensuring optimal user experience across applications |
| AI-driven shift | • Embrace AI for comprehensive full-stack development assistance and optimization. |
| Key benefits | • Accelerated full-stack code generation and optimization<br>• AI-driven API design and integration<br>• Automated performance tuning across the stack |
| Key considerations | • Maintaining proficiency across multiple technologies alongside AI tools<br>• Ensuring consistency and integration between AI and manually developed components |
| Key steps | • Develop expertise in AI-assisted developme nt across the full stack.<br>• Establish process and guidelines for integrating AI-generated and manual code.<br>• Implement continuous learning programs for emerging AI tools in full-stack development. |

### Solutions architect

The following table provides an overview of how the solutions architect role can adapt to use generative AI capabilities.

| Aspect of the role | Description |
| --- | --- |
| Current focus | • Designing comprehensive enterprise-wide solutions<br>• Aligning technology solutions with business goals<br>• Ensuring integration and interoperability across systems<br>• Creating detailed design documents |
| AI-driven shift | • Use AI for rapid solution prototyping, data-driven architecture decisions, automated integration analysis, and design document generation. |
| Key benefits | • Faster generation and evaluation of solution alternatives<br>• Enhanced alignment of technology solutions with business objectives<br>• Improved assessment of system integration and interoperability<br>• Accelerated creation of comprehensive design documentation |
| Key considerations | • Ensuring that AI-generated solutions address complex business requirements<br>• Maintaining a holistic view of enterpris e architecture in AI-augmented design processes<br>• Validating the accuracy and completeness of AI-generated design documents |
| Key steps | • Develop expertise in AI-powered solution design tools and methodologies. |

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| | • Establish processes for validating AI-generated solution proposals against business needs.<br>• Implement AI-driven tools for continuous solution optimization and integration assessment.<br>• Adopt AI-assisted documentation tools for creating and maintaining design documents. |

**Software developer**

The following table provides an overview of how the software developer role can adapt to use generative AI capabilities.

| Aspect of the role | Description |
|---|---|
| Current focus | • Code writing<br>• Debugging<br>• Maintenance |
| AI-driven shift | • Embrace AI as a coding companion for enhanced productivity and quality. |
| Key benefits | • Accelerated code generation and completion<br>• Improved code quality and consistency<br>• Faster bug detection and resolution |
| Key considerations | • Maintaining code readability and performance in AI-generated code<br>• Balancing AI tool reliance with core programming skills |
| Key steps | • Improve the use of AI-assisted coding and pair programming techniques. |

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| | • Establish guidelines for reviewing and optimizing AI-generated code.<br>• Implement continuous learning programs for emerging AI dev tools. |

**Test engineer**

The following table provides an overview of how the test engineer role can adapt to use generative AI capabilities.

| Aspect of the role | Description |
|---|---|
| Current focus | • Test case design<br>• Defect identification<br>• Quality assurance |
| AI-driven shift | • Implement AI for comprehensive, automated testing strategies. |
| Key benefits | • Increased automation in test case generatio n and execution<br>• Improved test data quality and coverage<br>• Earlier issue detection through predictive defect analysis |
| Key considerations | • Ensuring thorough coverage beyond AI-generated test cases<br>• Balancing automated testing with explorato ry methods |
| Key steps | • Develop skills in AI test strategy design and data modeling.<br>• Establish processes for continuous refinement of AI testing models. |

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| | • Implement AI-augmented exploratory testing processes and techniques. |

**Release manager**

The following table provides an overview of how the release manager role can adapt to use generative AI capabilities.

| Aspect of the role | Description |
|---|---|
| Current focus | • Planning and coordinating software releases<br>• Managing release schedules and dependenc ies<br>• Ensuring smooth deployment and post-rele ase stability |
| AI-driven shift | • Adopt AI for intelligent release planning, automated deployment, and predictive stability management. |
| Key benefits | • AI-driven release planning and risk assessment<br>• Automated deployment and rollback strategies<br>• Predictive post-release monitoring and issue detection |
| Key considerations | • Balancing AI recommendations with business priorities and constraints<br>• Maintaining control and oversight in automated deployment scenarios |
| Key steps | • Develop skills in AI-powered release management tools and predictive analytics.<br>• Establish processes for human validation of AI-generated release plans. |

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| | • Implement AI-driven post-release monitorin g and rapid response standard operating procedures (SOP). |

**Technical lead**

The following table provides an overview of how the technical lead role can adapt to use generative AI capabilities.

| Aspect of the role | Description |
|---|---|
| Current focus | • Overseeing application development and operational processes<br>• Ensuring alignment between development teams and operational requirements<br>• Managing the application lifecycle from development to production<br>• Driving continuous improvement in development and operational efficiency |
| AI-driven shift | • Make use of AI for enhanced application lifecycle management, automated operation al analytics, and predictive resource optimization. |
| Key benefits | • Improved coordination between developme nt and operations teams<br>• Enhanced application performance monitoring and predictive maintenance<br>• Automated resource allocation and scaling based on operational analytics<br>• Frequent number of changes<br>• Accelerated issue resolution and reduced downtime |

| | |
|---|---|
| Key considerations | • Balancing AI-driven automation with human oversight in critical operations<br>• Ensuring seamless integration of AI tools across the application lifecycle<br>• Managing the cultural shift towards AI-augmented DevOps practices |
| Key steps | • Develop expertise in AI-powered application lifecycle management tools.<br>• Establish processes for integrating AI insights into development and operational decision making.<br>• Implement AI-driven monitoring and predictive maintenance systems.<br>• Create training programs to upskill teams in AI-augmented DevOps practices. |

**DevOps engineer**

The following table provides an overview of how the DevOps engineer role can adapt to use generative AI capabilities.

| Aspect of the role | Description |
|---|---|
| Current focus | • Implementing and maintaining continuous integration and continuous deployment (CI/CD) pipelines<br>• Automating infrastructure provisioning and management<br>• Ensuring seamless integration between development and operations |
| AI-driven shift | • Use AI for enhanced automation, predictiv e analytics, and intelligent infrastructure management. |

| | |
|---|---|
| Key benefits | • Accelerated deployment cycles<br>• Improved system reliability and performan ce<br>• Proactive issue detection and resolution |
| Key considerations | • Integrating AI tools with existing DevOps processes<br>• Balancing automation with necessary human oversight |
| Key steps | • Implement AI-powered CI/CD pipeline optimization.<br>• Adopt AI-assisted infrastructure as code (IaC) generation tools.<br>• Develop skills in AIOps for predictive maintenance and automated remediation. |

**Support Engineer**

The following table provides an overview of how the support engineer role can adapt to use generative AI capabilities.

| Aspect of the role | Description |
|---|---|
| Current focus | • Resolving user issues and incidents<br>• Maintaining the system's reliability<br>• Providing technical assistance to end -users |
| AI-driven shift | • Adopt AI for intelligent issue triage, automated problem resolution, and predictive support. |
| Key benefits | • Faster issue resolution times<br>• Improved first-call resolution rates |

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| | • Proactive identification of potential system issues |
| Key considerations | • Ensuring that AI systems accurately understand and categorize complex technical issues<br>• Maintaining the human touch in customer interactions |
| Key steps | • Implement AI-powered knowledge bases for faster issue resolution.<br>• Adopt AI-driven ticket classification and routing systems.<br>• Develop process and skills in working alongside AI chatbots and virtual assistants for customer support. |

# Organization capability layer of an ADM operating model

Traditionally, organizational capabilities such as knowledge management, communication and collaboration, and program or change management tools lack an AI-specific focus. As you integrate generative AI into your ADM practices, your organizational capabilities must evolve. This section outlines key areas for transformation and strategies to make effective use of your AMS partners. This section also explores how AI drives global resource distribution, cultivates essential skills, develops new competencies, establishes AI CoEs, and fosters a continuous learning culture.

**Strategic partners and talent development** – To build strategic partnerships and develop talent for AI integration, focus on these key initiatives:

- Implement comprehensive AI training programs.
- Establish AI Centers of Excellence (COEs).
- Use AI for improved career planning, recruitment, training, and resource optimization.
- Implement location-specific AI adoption change management plans.
- Develop best practices, standards, and point of views (POVs) more efficiently by using AI.

- Conduct technology evaluation and proof of concepts (POCs) that are aligned with IT architecture roadmaps.

**Operating model redesign** – The integration of AI necessitates a redesign of the operating model, including the following changes:

- Redefine roles to incorporate AI-augmented development.
- Assign AI-driven strategic tasks to onshore teams to maintain close collaboration with key decision-makers.
- Develop new QA processes for AI-generated code.

**Enhanced collaboration and knowledge management** – Consider enhancing collaboration and knowledge management through these approaches:

- Implement AI-powered collaboration tools to reduce time zone dependencies.
- Make use of AI to catalog and index enterprise knowledge more effectively.
- Use AI-driven insights from customer feedback, issue resolution, and industry trends for accelerated market research and business requirements analysis.

**Governance and compliance** – To help ensure proper governance and compliance when integrating AI in an operating model, consider implementing the following measures:

- Establish a global AI governance framework with location-specific compliance requirements.
- Address IP ownership of AI-generated assets and mitigate infringement risks.

**Infrastructure and tools standardization** – Efforts to standardize infrastructure and tools across the organization for effective AI integration involves these steps:

- Invest in cloud-based AI-augmented platforms that are accessible from all locations.
- Standardize AI tools and environments globally.

**Performance metrics and engagement model adaptation** – Adapting performance metrics and engagement models for AI-driven processes includes these key actions:

- Develop new KPIs that account for AI contributions.

- Implement AI-assisted project estimation tools.
- Consider flexible engagement models, including outcome-based pricing.
- Define consumption-based pricing models for AI assets, covering licenses, infrastructure, and managed services efforts.

**Program and change management augmentation** – To strengthen program and change management, consider these strategies:

- Enhance the co-source model between in-house talent, consulting and AMS partners by using AI.
- Improve knowledge collection, methodology refinement, and experience reuse for new initiatives.

By focusing on these areas, you can integrate generative AI effectively across your global delivery locations and organizational capabilities. This approach helps to accelerate transforming your ADM operating model. It improves decision-making velocity and enhances the delivery of business outcomes while balancing the strengths of each location and addressing the challenges of AI integration.

## Integration challenges and mitigation strategies

Although the benefits of integrating generative AI into ADM are substantial, challenges exist. Understanding these obstacles is crucial for developing effective mitigation strategies. The following table provides key challenges and corresponding mitigations for areas that are likely to be affected when integrating generative AI into ADM.

| Area | Key challenges | Mitigation strategies |
| --- | --- | --- |
| Data management | Data quality and integration challenges | Ensure consistent, high-quality data across diverse systems and processes. |
| Governance and ethics | AI governance and ethics | Establish clear guidelines for AI use and decision-making. |
| Workforce adaptation | Cultural adaptation | Prepare the workforce for AI-augmented roles. |

| | | |
|---|---|---|
| Process integration | Integration with existing processes | Incorporate AI into established workflows seamlessly. |
| Trust, reliability, and human oversight | Validating AI-generated insights and recommendations for consistent accuracy | Maintain appropriate human control while taking advantage of AI automation. |
| Technical complexity | Lack of skills and experience | Manage the increased intricacy of AI-enhanced systems. |
| Security and compliance | Lack of data protection and IP ownership guidelines | Maintain data protection and regulatory adherence in AI-driven environments. |
| Organizational alignment | AI recommendation alignment | Ensure AI suggestions align with organizational policies and best practices. |
| Platform complexity | Lack of skills and readiness for change | Manage the intricacy of AI-enhanced platform and IT support services. |
| Outsourcing challenges | Capability gaps in outsourced operations | Address AI-readiness in managed service providers. |

# Action areas and recommendations

To integrate generative AI into your ADM operating model successfully, consider the recommendations in the following action areas. These recommendations can help you navigate your organization's transformation journey and overcome common challenges.

**Governance and strategy** – To establish effective AI governance and align it with overall business strategy, consider implementing these key actions:

1. Establish cross-functional AI steering committees with AI champions.
2. Develop clear AI governance policies, including ethical use guidelines.

3. Align KPIs and business objectives with AI capabilities continuously.
4. Collaborate with regulatory bodies on AI-driven compliance processes.

**AI Center Of Excellence** – To maximize the impact of an AI Center of Excellence (COE) in your ADM practices, focus on these initiatives:

1. Establish and launch a dedicated AI COE to drive adoption, ensure best practices, and provide guidance across ADM.
2. Develop comprehensive COE operating procedures and a service catalog outlining AI-related services and support.
3. Continuously expand COE capabilities through advanced AI research and strategic partnerships.

**Education and culture**– To support a culture of AI adoption and continuous learning across the organization, consider these actions:

1. Implement comprehensive AI literacy programs across the organization.
2. Foster a culture of experimentation, learning, and adaptation.
3. Create training programs to upskill platform teams in AI-augmented operations.

**Technology and process**– To integrate AI effectively into your technology stack and processes, prioritize these initiatives:

1. Implement AI-driven tools for architecture recommendation and resource provisioning.
2. Develop AI models for predictive capacity planning and performance optimization.
3. Integrate AI-powered observability and anomaly detection systems.
4. Establish AI-assisted compliance checking and security monitoring processes.
5. Implement standardized data collection frameworks across projects.
6. Develop AI models that accommodate both waterfall and agile methodologies.

**Data and security** – To support data quality and security efforts, focus on these actions:

1. Invest in data integration, quality assurance, and security processes.
2. Create feedback mechanisms for continuous improvement of AI systems.

**Change management** – To facilitate smooth adoption of AI technologies, use these change management approaches:

1. Redesign stakeholder communication channels for AI-enhanced collaboration.
2. Implement change management programs to build trust in AI-generated insights.

**Skill development** – To build the necessary AI capabilities, support this skill development initiative:

- Upskill teams in data science, AI interpretation, and AI-powered tools.

**Partnerships** – To harness external expertise, consider these ideas for partnerships:

1. Make use of application managed services (AMS) partners for AI implementation.
2. Consider infrastructure and/or CloudOps managed services partners for AI integration across platform engineering services.
3. Use IT services management partners for AI integration with service management and governance services.

**Human oversight** – To maintain appropriate human control and accountability, implement the following approach:

- Establish protocols for human oversight of AI-generated recommendations.

Embracing these AI-driven changes and addressing challenges systematically can help you create a more agile, efficient, and innovative ADM operating model. The key to success lies in balancing human expertise with AI capabilities, aligning IT services closely with organizational objectives. This approach can drive significant business value, enhance an organization's competitive advantage, and position the organization to lead in the next era of ADM.

# Building an AI-powered ADM target operating model

As you consider your ADM practices with generative AI, it's important to design a comprehensive *target operating model* (TOM). A TOM describes the desired state of an organization's operating model. Your organization's ADM TOM should align its people, processes, technology, organization, and governance with its strategic vision.

The following table lists the eight components of a TOM.

| TOM component | Component elements |
| --- | --- |
| Strategic alignment | • Value drivers<br>• Business goals alignment<br>• AI roadmap |
| Organizational structure | • AI Centers of Excellence<br>• New AI roles<br>• Cross-functional teams |
| Talent and skills | • Career paths<br>• Continuous learning<br>• AI literacy requirements<br>• Skills gap analysis |
| Governance and ethics | • Regulatory compliance<br>• Data privacy framework<br>• AI ethics policies |
| Performance measurement | • Continuous monitoring<br>• Business impact reporting<br>• Feedback loops<br>• AI-specific KPIs |
| Partner ecosystem | • Partner evaluation metrics<br>• Data sharing protocols |

| | |
|---|---|
| | • AI capability requirements<br>• Collaborative innovation |
| Technology and tools | • Data infrastructure<br>• AI tools ecosystem<br>• AI platforms selection<br>• Legacy systems integration |
| Processes | • AI-enhanced SDLC<br>• AI model management<br>• Governance workflows |

Building an ADM TOM is a transformative process that affects every aspect of an organization. Consider each ADM component and its interdependencies carefully to create a robust foundation for your AI-powered SDLC.

Implementing an ADM TOM should be tailored to an organization's specific needs and context. As you implement this model, continuously assess and adjust it based on your organization's unique challenges and opportunities.

The following sections provide more details about the components in the ADM operating model, including their interactions.

## Strategic alignment component

The strategic alignment component defines strategic objectives for AI-powered ADM, aligning AI initiatives with business goals. This component articulates AI's value in ADM processes and sets success criteria for AI integration. This component interacts with other components as follows:

- *Value drivers* influence *AI-specific KPIs* in the *performance measurement* component.
- *Business goals alignment* informs the creation of *new AI roles* in the *organizational structure* component.
- The *AI roadmap* guides *AI platforms selection* in the *technology and tools* component.

# Organizational structure component

The organizational structure component addresses the design of an ADM organization that supports AI-augmented development with new roles. This component establishes an AI Center of Excellence (COE) and evolves existing roles for AI integration.

- The *AI COE* supports *continuous learning* in the *talent and skills* component.
- *New AI roles* influences new *AI capability requirements* in the *partner ecosystem* component.
- *Cross-functional teams* enables agile integration with *AI-enhanced SDLC* in the *processes* component.

# Talent and skills component

The talent and skills component identifies required AI skills and competencies across ADM roles and personnel. This component defines AI literacy requirements and creates AI-focused career paths.

- *Career paths* aligns with *new AI roles* in the *organizational structure* component.
- *AI literacy requirements* supports *AI ethics policies* in the *governance and ethics* component.
- *Skills gap analysis* informs the *AI tools ecosystem* in the *technology and tools* component.

# Governance and ethics component

The governance and ethics component establishes an ethical framework for AI use in ADM, including policies and review boards. This component defines data privacy and security requirements for AI-powered ADM practices.

- *Regulatory compliance* affects *value drivers* in the *strategic alignment* component.
- The *data privacy framework* influences *data sharing protocols* in the *partner ecosystem* component.
- *AI ethics policies* guides *AI model management* in the *processes* component.

## Performance measurement component

The performance measurement component designs a new framework with AI-specific KPIs for ADM performance measurement. This component outlines the methods to measure, report, and optimize AI impact in ADM.

- *Business impact reporting* influences *partner evaluation metrics* in the *partner ecosystem* component.
- *Feedback loops* supports *continuous learning* in the *talent and skills* component.
- *AI-specific KPIs* informs *business goals alignment* in the *strategic alignment* component.

## Partner ecosystem component

The partner ecosystem component defines expectations for AI capabilities in AMS partners and collaborative processes. This component establishes data sharing and model ownership principles for partner interactions.

- *Partner evaluation metrics* informs *AI-specific KPIs* in the *performance measurement* component.
- *AI capability requirements* influences *skill gap analysis* in the *talent and skills* component.
- *Collaborative innovation* supports the *AI tools ecosystem* in the *technology and tools* component.

## Technology and tools component

The technology and tools component specifies AI technologies and tools to support transformed ADM processes. This component identifies integration points and data requirements for AI-powered ADM.

- *Data infrastructure* supports *business impact reporting* in the *performance measurement* component.
- *Legacy system integration* affects *AI-enhanced SDLC* in the *processes* component.
- *AI platforms selection* influences *collaborative innovation* in the *partner ecosystem* component.

# Processes component

The processes component redesigns the SDLC to incorporate AI, enhancing each stage with AI capabilities. This component develops new processes for AI model management and governance in development.

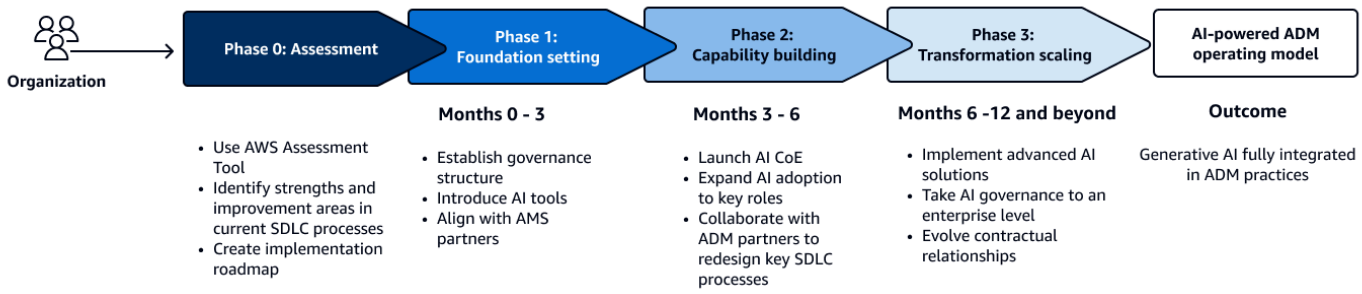
- *AI-enhanced SDLC* affects *continuous monitoring* in the *performance measurement* component.
- *AI model management* relates to *data infrastructure* in the *technology and tools* component.
- *Governance workflows* supports the *data privacy framework* in the *governance and ethics* component.

# Implementing an AI-powered ADM target operating model

Use a structured, phased approach to implement a generative AI application development and maintenance (ADM) target operating model (TOM). The following approach balances quick wins with long-term transformative changes while minimizing disruption to current operations. Each phase addresses specific components of the TOM, highlighting their interdependencies and evolution throughout the implementation process.

As shown in the following diagram, the implementation strategy consists of phases that progress from basic to advanced complexity over a 12-month period:

- **Phase 1: Foundation setting** – This phase occurs in months 1–3. It establishes basic governance structures and introduces essential AI tools while achieving quick wins.
- **Phase 2: Capability building** – This phase occurs in months 3-6. It expands AI adoption and addresses processes of medium complexity. Launch your AI COE, expand AI adoption to project management and operations roles, and collaborate with your ADM partners to redesign key SDLC processes using generative AI.
- **Phase 3: Transformation scaling** – This phase occurs in months 6–12 (and beyond). It implements advanced solutions and tackles higher complexity challenges. For example, implement advanced AI solutions for architecture design, full-stack development, and security monitoring. Mature your AI governance to an enterprise level, and evolve your contractual relationships with ADM partners to reflect the new AI-powered reality.



> **Note**
>
> Before beginning implementation, conduct an AI-powered SDLC readiness assessment to establish a baseline of your organization's current SDLC capabilities and identify key areas for improvement. For more details, see Next steps.

Actual timelines can vary based on organizational context, implementation approach, and other factors such as the size and scale of implementation. Some organizations might achieve results in a shorter or longer time span, depending on their specific circumstances and maturity levels.

By progressing through these phases, you can transform your organization's ADM practices systematically, using AI to drive innovation, efficiency, and competitive advantage. For more information about using a phased approach in your organization, see Roadmap for implementing an AI-powered ADM TOM and Best practices for all implementation phases.

Organizations can enhance their in-house capabilities through this transformation journey. This journey also requires continuous adjustment and clear communication with all stakeholders. The result is an integrated, global ADM target operating model for AI-powered software development and maintenance with your consulting and technology service providers.

## Roadmap for implementing an AI-powered ADM TOM

The following table provides a reference roadmap that uses a phased approach to implement an ADM TOM while minimizing disruption to current operations. For each ADM component, the roadmap describes the relevant activities that occur in each implementation phase.

| ADM component | Foundation setting: Months 1-3 | Capability building: Months 3–6 | Transformation scaling: Months 6–12 and beyond |
|---|---|---|---|
| Strategic alignment | • Enable AI steering committee.<br>• Set vision, mission, and goals with business alignment. | • Continuously align KPIs and business objectives with AI capabilities.<br>• Maintain clear stakeholders | • Continuously align KPIs and business objectives with AI capabilities.<br>• Maintain clear stakeholders |

| | | | |
|---|---|---|---|
| | • Develop AI technology and tools strategy and roadmap. | communication on AI initiatives with impact.<br>• Review business outcomes and ROI. | communication on AI initiatives with impact.<br>• Review business outcomes and ROI.<br>• Integrate AI governance with EA.<br>• Establish cross-functional AI governance with AMS partners.<br>• Standardize AI tools globally across in-house and AMS partner teams. |
| Organizational structure | • Identify cross-functional AI champions.<br>• Identify key roles for AI integration. | • Launch AI COE with dedicated team. | • Implement AI-driven organizat ion and continuous optimization. |

| | | | |
|---|---|---|---|
| Talent and skills | • Implement basic AI training program.<br>• Adopt AI tools for high propensit y roles such as software developers and test engineers.<br>• Implement advance AI training program.<br>• Implement role-specific AI training program. | • Implement role-specific AI training program.<br>• Develop AI-focuse d career paths and progression.<br>• Implement shared training programs for onshore and offshore teams. | • Implement role-specific AI training program.<br>• Extend AI adoption to product owners, BA, SA, and domain SMEs.<br>• Establish AI innovation incentive program.<br>• Establish mechanisms for ongoing AI knowledge sharing between your organization and AMS partners. |

| | | | |
|---|---|---|---|
| Governance and ethics | • Develop AI ethics guidelines.<br>• Establish guidelines for AI-related IP and data usage.<br>• Create risk assessment framework.<br>• Collaborate with regulatory bodies for compliance. | • Implement AI governance policies and procedures.<br>• Balance AI automation with human oversight to ensure quality and maintain control. | • Balance AI automation with human oversight to ensure quality and maintain control.<br>• Develop AI-specific project and contract templates and SLAs for AMS partners.<br>• Continuously review and address data privacy and security concerns in AI usage part of the ADM. |
| Performance measurement | • Establish AI goals and key success metrics for ADM.<br>• Establish key success metrics for large language models (LLMs). | • Develop AI-specific KPIs for ADM processes.<br>• Develop AI-specific KPIs for ADM partner performance.<br>• Implement AI cost allocation and ROI tracking. | • Establish KPIs and implement an ADM and SDLC performance dashboard.<br>• Implement AI-driven insights for continuous improvement of the ADM global delivery model.<br>• Continuously monitor and adjust based on feedback and results. |

| | | | |
|---|---|---|---|
| Partner ecosystem | • Engage AMS partner for transformation planning.<br>• Align AI integrati on roles with AMS partners.<br>• Assess AI readiness with AMS and CloudOps partners.<br>• Review existing AMS contracts for AI integration. | • Establish joint AI COE with AMS and CloudOps partners.<br>• Work with ADM partners to integrate AI in the TOM.<br>• Collaborate with AMS partners to implement advanced AI solutions for ADM. | • Collaborate with AMS partners to implement advanced AI solutions for ADM.<br>• Standardize AI tools and environments with AMS partners.<br>• Regularly assess the impact of AI on the AMS outsourci ng value propositi on.<br>• Consider flexible engagemen t models and outcome-based pricing for AI-enhanced services. |
| Technology and tools | • Implement AI-powered knowledge bases for faster issue resolution.<br>• Implement AI-powered collabora tion tools.<br>• Adopt AI-assisted coding and testing tools. | • Integrate AI-driven project planning and risk assessmen t tools.<br>• Implement AI-powered release management and predictive maintenance.<br>• Implement AI-assisted project estimator tools. | • Implement AI-driven architecture decision support tools.<br>• Adopt AI-powere d full-stack code generation and optimization tools.<br>• Implement cloud-based AI-augmen ted platforms for all delivery locations. |

| | | | |
|---|---|---|---|
| Processes | • Establish guidelines for integrating AI-generated and manual code.<br>• Establish process and SOPs for AI-powered tools.<br>• Establish feedback loop for continuous improvement of LLMs. | • Redesign ADM processes to incorporate AI in the TOM.<br>• Develop AI-driven SOPs between onshore, nearshore, and offshore locations. | • Establish processes for AI-driven architecture decision and full-stack code generation.<br>• Establish AI-assisted compliance check and security monitoring processes.<br>• Establish mechanism for process improvements on AI-powered ADM operating model. |

For information about a framework of an AI vision for ADM that includes a mission statement, objectives, and strategic initiatives, see Appendix A: Sample framework of AI vision for ADM. For a detailed implementation checklist covering governance, organizational structure, roles, processes, and tools across all three phases, see Appendix B: Implementation checklist for an ADM TOM.

## Best practices for all implementation phases

The following best practices are important to keep in mind through all implementation phases. For each best practice, its related operating model component is shown, indicating which aspect of the model is most affected:

- Monitor and adjust the approach continuously based on feedback and results. (Performance measurement)
- Communicate clearly with all stakeholders about various AI initiatives and their impact. (Strategic alignment)
- Balance AI automation with human oversight to help ensure quality and maintain control. (Governance and ethics)

- Assess regularly the return on investment (ROI) of AI initiatives and adjust strategy accordingly. (Performance measurement; strategic alignment)
- Address data privacy and security concerns that are specific to AI usage in a global delivery model. (Governance and ethics)
- Evaluate regularly the impact of AI on the outsourcing value proposition and adjust the engagement model as needed. (Partner ecosystem; strategic alignment)

# Next steps

This strategic document explores how generative AI influences each layer of the application development and maintenance (ADM) operating model. It describes how potential benefits can be achieved such as increased development velocity, reduced production defects, and improved customer satisfaction scores. To begin your organization's AI-powered software development lifecycle (SDLC) journey and implement its target operating model for next generation ADM, use the following steps.

Successful AI integration requires balancing AI capabilities with human expertise. This balance drives innovation, efficiency, and competitive advantage throughout your organization's SDLC processes and ADM practices. By following these steps, you can position your organization at the forefront of AI-augmented software development. This approach drives significant business value and enhances your competitive edge in the industry.

## Step 1: Conduct a readiness assessment

Use the AI-powered AWS Assessment Tool to evaluate your current SDLC capabilities and the readiness of your current ADM operating model. This assessment can help you:

- Identify strengths and improvement areas in your existing SDLC processes and ADM practices.
- Pinpoint areas where AI can have the most significant impact to your business.
- Prioritize remediation activities and create an implementation roadmap.

## Step 2: Build foundational capabilities

To understand and help build the foundational capabilities in your SDLC with generative AI, see Accelerating software development lifecycles on AWS with generative AI. This strategic document provides AWS architecture best practices and can help you with the following tasks to implement your roadmap:

- Establish a solid base for AI integration.
- Align your processes with industry best practices.
- Prepare your teams for AI-augmented development.

# Step 3: Implement the phased approach

To implement an ADM target operating model, refer to the roadmap that encompasses all phases from initial quick wins to full AI integration. Make use of the sample framework and implementation checklist.

Success stories from early adopters demonstrate the transformative potential of AI in application development and maintenance.

# Resources

## AWS blog posts

- Significant new capabilities make it easier to use Amazon Bedrock to build and scale generative AI applications – and achieve impressive results
- Transforming the Software Development Lifecycle (SDLC) with Generative AI

## AWS services resources

- Amazon Bedrock Agents
- Amazon Bedrock Agent Flow
- Amazon Bedrock Guardrails
- Amazon Bedrock Knowledge Bases
- Amazon Bedrock Security and Privacy
- Answering business questions with Amazon Quick Q
- What is Amazon Q Business?
- What is Amazon Q Developer?

## AWS Solutions Library

- Generative AI Application Builder on AWS
- Guidance for Creating a Customized Coding Companion with Amazon Q Developer
- Guidance for Custom Search of an Enterprise Knowledge Base with Amazon OpenSearch Service

## AWS other resources

- A practical approach to using generative AI in the SDLC
- Add intelligence to your developer operations
- Generative AI Competency Partners
- Generative AI Customer Stories

- Partner Success with AWS
- What is AIOps?
- What is SDLC (Software Development Lifecycle)?

# Additional resources

- Defining the IT Operating Model, Document No. W17B (The Open Group, September 2017)

# Appendix A: Sample framework of AI vision for ADM

Organizations can adapt this sample framework of an AI vision for application development and maintenance (ADM) to articulate their transformation goals. The sample includes an introduction, a clear mission statement, quantifiable objectives, and strategic initiatives that are aligned with measurable success metrics.

## Introduction

In today's rapidly evolving digital landscape, organizations must continuously innovate to stay competitive. The Project <*Your Project Name*> initiative represents our bold vision to transform our application development and maintenance (ADM) practices through the strategic integration of generative AI technologies.

By harnessing the power of AI, <*Your Company Name*> aims to enhance our development speed dramatically, code quality, and operational efficiency. This approach fosters unprecedented levels of innovation. This transformation will streamline our processes, empowering our teams to deliver superior software solutions. These solutions will drive tangible business value and growth.

The following document outlines our mission, objectives, and key strategic initiatives to achieve an ADM target operating model (TOM) with generative AI.

## Mission statement

To transform our ADM practices and software development lifecycle (SDLC) processes by leveraging generative AI technologies, enabling faster innovation, improved quality, and enhanced business value delivery.

## Objectives

1. Accelerate application development and delivery timelines by <*Your Company Value*> percent through AI-assisted processes.
2. Improve code quality and reduce defects by <*Your Company Value*> percent using AI-powered analysis and optimization.
3. Enhance developer productivity by <*Your Company Value*> percent with AI-augmented tools and workflows.

4. Reduce operational costs by <*Your Company Value*> percent through intelligent automation and predictive maintenance.
5. Increase business agility by enabling <*Your Company Value*> x faster response to market changes and customer needs.

## Strategic initiatives

To achieve our defined goals and measure success in delivering business value, we will focus on the strategic initiatives that align with our key performance metrics, as shown in the following table.

| Strategic initiative | Key tasks | Performance metric |
| --- | --- | --- |
| 1. AI-powered development environment | 1.1 Implement AI-assisted code generation and completion tools.<br><br>1.2. Integrate AI-driven code review and optimization processes.<br><br>1.3. Develop AI-enhanced testing and quality assurance workflows. | • Time-to-market for new features and applications |
| 1. Intelligent operations and maintenance | 2.1 Deploy AI-powered monitoring and predictive maintenance systems.<br><br>2.2. Implement AIOps for automated incident response and resolution.<br><br>2.3. Leverage AI for capacity planning and resource optimization. | • Defect rates and mean time to resolution<br>• Customer satisfaction scores for delivered applications |
| 1. AI-augmented requirements and design | 3.1 Use AI for rapid prototyping and design iteration. | • Developer productivity (Example: lines of code per |

| | | |
|---|---|---|
| | 3.2. Implement AI-assisted market analysis and requirements gathering.<br><br>3.3. Develop AI-powered tools for translating business needs into technical specifications | day, story points completed) |
| 1. Talent and organization transformation | 4.1 Establish an AI Center of Excellence (COE) for ADM.<br><br>4.2. Develop comprehensive AI training programs for all roles.<br><br>4.3. Redefine job roles and career paths to incorporate AI skills. | • Return on Investment (ROI) for AI implementation in ADM processes |
| 1. Governance and ethics framework | 5.1 Create policies for responsible AI use in ADM processes.<br><br>5.2. Establish an AI ethics review board for ongoing oversight.<br><br>5.3. Develop guidelines for data privacy and security in AI-powered ADM. | • Compliant on policies, standards, and regulatory needs |

Focusing on these strategic initiatives and measuring progress against defined metrics will drive significant improvements in our ADM capabilities. This approach delivers greater value to our business and customers through AI-powered innovation and efficiency. We expect to achieve the following results:

- <*Your Company Value*> percent–<*Your Company Value*> percent increase in development velocity
- <*Your Company Value*> percent–<*Your Company Value*> percent reduction in production defects

- <*Your Company Value*> percent–<*Your Company Value*> percent improvement in customer satisfaction scores

# Appendix B: Implementation checklist for an ADM TOM

This comprehensive checklist provides you with a structured approach to implementing an application development and maintenance (ADM) target operating model (TOM). The checklist considers governance, organizational structure, personnel roles, processes, and tools for each of the following phases of implementation:

- Phase 1: Foundation setting
- Phase 2: Capability building
- Phase 3: Transformation scaling

Each phase builds upon the previous phase, enabling organizations to scale their AI capabilities systematically while managing risks and ensuring sustainable enterprise-wide adoption.

## Phase 1: Foundation setting

This phase occurs in months 1–3. It establishes basic governance structures and introduces essential AI tools while achieving quick wins.

### Governance and organization

1.1. Establish an AI governance steering committee.

1.2. Develop initial AI ethics guidelines for ADM processes.

1.3. Create a baseline AI risk assessment framework.

1.4. Identify key roles for AI integration across ADM teams.

1.5. Define initial AI champion roles within existing teams.

1.6. Outline the vision and mission for an AI Center of Excellence (COE) in ADM.

1.7. Conduct an AI skills gap analysis across ADM teams.

1.8. Develop a basic AI literacy training program for all staff.

1.9. Review existing vendor contracts for AI integration potential.

1.10. Establish initial budgeting guidelines for AI initiatives in ADM.

## Roles

1.11. Software developer

- Adopt AI-assisted coding, pair programming, and code completion tools.
- Establish guidelines for reviewing and optimizing AI-generated code.

1.12. Test engineer

- Adopt AI-powered test case generation, execution, and data quality improvement tools.
- Implement AI-augmented exploratory testing techniques.

1.13. UX designer

- Adopt AI-assisted design tools and data-driven design techniques.

1.14. DevOps engineer

- Implement AI-powered CI/CD pipeline optimization.
- Adopt AI-assisted infrastructure as code (IaC) generation tools.

1.15. Support engineer

- Use AI-powered knowledge bases for faster issue resolution.
- Implement AI-driven ticket classification and routing systems.

## Processes

1.16. Create clear escalation protocols for complex issues.

1.17. Establish guidelines for integrating AI-generated and manual code.

1.18. Develop new QA processes for AI-generated code.

1.19. Establish processes for human oversight of AI-generated designs.

1.20. Establish processes for continuous refinement of AI testing models.

1.21. Improve knowledge collection, methodology refinement, and experience reuse for new initiatives.

### Tools

1.22. Adopt AI-assisted coding, pair programming, and code completion tools.

1.23. Implement AI-driven code quality, consistency checks, and bug detection systems.

1.24. Adopt AI-assisted documentation tools for design documents.

1.25. Implement AI-powered collaboration tools to reduce time zone dependencies.

1.26. Adopt AI-powered test case generation, execution, and data quality improvement tools.

1.27. Implement AI-assisted project estimation tools.

1.28. Set up predictive defect analysis using AI.

1.29. Adopt AI-assisted design tools and data-driven design techniques.

## Phase 2: Capability building

This phase occurs in months 3-6. It expands AI adoption and addresses processes of medium complexity.

### Governance and organization

2.1. Implement AI governance policies and procedures.

2.2. Establish an AI ethics review process for ADM projects.

2.3. Develop AI-specific KPIs for ADM processes.

2.4. Create new AI-focused roles such as an AI integration specialist.

2.5. Realign team structures to support AI-augmented workflows.

2.6. Launch the AI COE with a dedicated team.

2.7. Establish COE operating procedures and service catalog.

2.8. Implement role-specific AI training programs.

2.9. Develop AI-focused career paths and progression models.

2.10. Develop AI-specific procurement guidelines.

2.11. Implement AI cost allocation and return on investment (ROI) tracking mechanisms.

## Roles

2.12. Project manager

- Integrate AI-driven project planning, risk assessment, and resource allocation tools.
- Develop protocols for AI-human collaborative decision making.
- Set up real-time project health monitoring and predictive analytics using AI.

2.13. Release manager

- Adopt AI-powered release management, planning, and risk assessment tools.
- Implement automated deployment and rollback strategies using AI.
- Set up predictive post-release monitoring and issue detection systems.

2.14. Site reliability engineer

- Adopt AI-driven predictive maintenance tools.
- Implement AI-powered anomaly detection and automated remediation systems.

2.15. Technical writer

- Use AI-assisted documentation generation tools.
- Implement AI-powered content optimization and readability analysis.

## Processes

2.16. Create feedback loops to improve AI models continuously based on project outcome.

2.17. Implement continuous learning mechanisms for AI support system.

2.18. Implement continuous learning mechanisms for AI prediction models.

2.19. Establish processes for validating AI-generated solution proposals.

2.20. Establish processes for human validation of AI-generated release plans.

### Tools

2.21. Integrate AI-driven project planning, risk assessment, and resource allocation tools.

2.22. Set up real-time project health monitoring and predictive analytics using AI.

2.23. Implement AI-driven tools for continuous solution optimization.

2.24. Implement AI-driven user research analysis and persona creation systems.

2.25. Set up automated usability testing and feedback analysis using AI.

2.26. Adopt AI-powered release management, planning, and risk assessment tools.

2.27. Implement automated deployment and rollback strategies using AI.

2.28. Set up predictive post-release monitoring and issue detection systems.

2.29. Implement AI-driven monitoring, predictive maintenance, and resource allocation systems.

2.30. Set up accelerated issue resolution processes using AI.

## Phase 3: Transformation scaling

This phase occurs in months 6–12 and beyond. It implements advanced solutions and tackles higher complexity challenges.

### Governance and organization

3.1. Integrate AI governance into overall enterprise governance.

3.2. Implement continuous improvement processes for AI policies.

3.3. Establish cross-functional AI governance committees.

3.4. Fully integrate AI roles across all ADM teams.

3.5. Implement AI-driven organizational design optimization.

3.6. Expand COE capabilities to include advanced AI research.

3.7. Establish partnerships with external AI research institutions.

3.8. Implement AI-powered personalized learning paths.

3.9. Establish an AI innovation incentive program for employees.

3.10. Develop AI-specific contract templates and service level agreements (SLAs).

3.11. Implement AI-driven financial forecasting and optimization for ADM.

## Roles

3.12. Product owner or business analyst

- Implement AI-powered market analysis and requirements gathering tools.
- Develop prompt engineering skills for effective AI interaction.

3.13. Solutions architect

- Adopt AI-powered solution design tools and methodologies.
- Implement AI-driven tools for continuous solution optimization.

3.14. Full-stack developer

- Adopt AI-powered full-stack code generation and optimization tools.
- Implement AI-driven API design and integration systems.

3.15. Technical lead

- Adopt AI-powered application lifecycle management tools.
- Create training programs to upskill teams in AI-augmented DevOps practices.

3.16. Security subject matter expert (SME)

- Implement AI-powered threat detection and response systems.
- Adopt AI-assisted security policy generation and compliance checking tools.

3.17. Domain-specific SME

- Use AI tools for domain-specific knowledge extraction and application.
- Implement AI-assisted domain modelling and simulation tools.

## Processes

3.18. Redesign enterprise architecture (EA) processes to incorporate AI-driven insights and automation.

3.19. Implement continuous learning mechanisms for AI systems to stay current with evolving regulations.

3.20. Establish clear protocols for human oversight of AI-generated compliance recommendations.

3.21. Establish clear protocols for human oversight of AI-generated recommendations.

3.22. Implement a comprehensive change management strategy.

## Tools

3.23. Implement AI-driven architecture decision support systems.

3.24. Set up AI-powered integration and interoperability assessment systems.

3.25. Invest in data integration and quality assurance processes for AI analytics.

3.26. Establish robust security and governance frameworks for AI-driven reporting.

3.27. Implement AI-driven tools for architecture recommendation and resource provisioning.

3.28. Integrate AI-powered observability and anomaly detection systems.

3.29. Establish AI-assisted compliance checking and security monitoring processes.

3.30. Implement AI-powered market analysis and requirements gathering tools.

3.31. Adopt AI-powered solution design tools and methodologies.

3.32. Adopt AI-powered full-stack code generation and optimization tools.

3.33. Implement AI-driven API design and integration systems.

3.34. Set up automated performance tuning across the stack using AI.

3.35. Adopt AI-powered application lifecycle management tools.

3.36. Invest in cloud-based AI-Augmented platforms accessible from all locations.

3.37. Standardize AI tools and environments globally.

# Document history

The following table describes significant changes to this guide.

| Change | Description | Date |
| --- | --- | --- |
| Initial publication | — | April 18, 2025 |