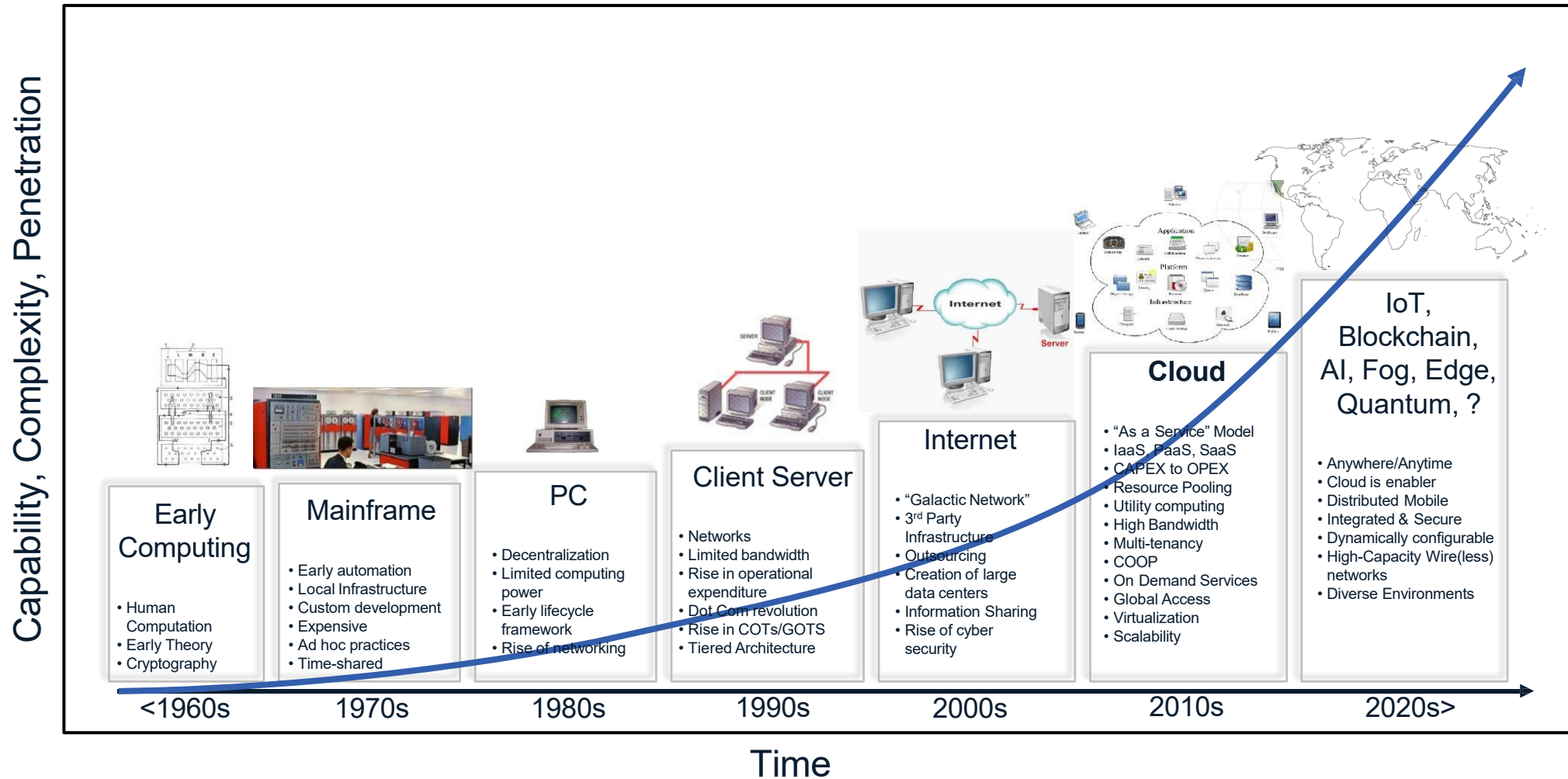# Enterprise Cloud Adoption Framework (ECAF)
Version 2

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Rock Sabetto

May 2022

MITRE | SOLVING PROBLEMS FOR A SAFER WORLD™

IT Evolution – Cloud is a Link in the Chain...

Y-axis: Capability, Complexity, Penetration
X-axis: Time

Early Computing (<1960s)
- Human Computation
- Early Theory
- Cryptography

Mainframe (1970s)
- Early automation
- Local Infrastructure
- Custom development
- Expensive
- Ad hoc practices
- Time-shared

PC (1980s)
- Decentralization
- Limited computing power
- Early lifecycle framework
- Rise of networking

Client Server (1990s)
- Networks
- Limited bandwidth
- Rise in operational expenditure
- Dot Com revolution
- Rise in COTs/GOTS
- Tiered Architecture

Internet (2000s)
- "Galactic Network"
- 3rd Party Infrastructure
- Outsourcing
- Creation of large data centers
- Information Sharing
- Rise of cyber security

Cloud (2010s)
- "As a Service" Model
- IaaS, PaaS, SaaS
- CAPEX to OPEX
- Resource Pooling
- Utility computing
- High Bandwidth
- Multi-tenancy
- COOP
- On Demand Services
- Global Access
- Virtualization
- Scalability

IoT, Blockchain, AI, Fog, Edge, Quantum, ? (2020s>)
- Anywhere/Anytime
- Cloud is enabler
- Distributed Mobile
- Integrated & Secure
- Dynamically configurable
- High-Capacity Wire(less) networks
- Diverse Environments

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Enterprise Cloud Adoption and Operations

Cloud adoption enables mission focus

Government missions are rarely IT delivery, but…

Government missions are highly dependent upon IT

Cloud adoption is not just a tech thing

Holistic approach is required to cover all dimensions and complexities

Success requires strong leadership

MITRE Enterprise Cloud Adoption Framework (ECAF)

Integrates policy, mission, and technology	Covers all dimensions of cloud
Flexible enough to support all levels from enterprise to application	

ECAF is a recognized framework in the *GSA Cloud Information Center*

ECAF versions:
ECAF V1: 2018
ECAF V2: 2022

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Enterprise Cloud Adoption Framework (ECAF) overview

- **ECAF:**
  - Comprehensive cloud adoption framework
  - Built for leaders like CIOs, CISOs, PMs, and others in key cloud adoption roles

- **Cloud adoption is a "whole of business" leadership challenge**
  - Requires all parts of the organization to contribute
  - Must address Political, Organizational, Economic, Technical (POET) dimensions. See MITRE [Systems Engineering Guide (http://www.mitre.org/sites/default/files/publications/se-guide-book-interactive.pdf)](http://www.mitre.org/sites/default/files/publications/se-guide-book-interactive.pdf)
  - Must include Security and Privacy. ECAF adds an "S" to the POET analysis technique

- **Cloud adoption is complex and challenging**
  - ECAF's holistic framework uncovers blind spots and to help your organization realize cloud computing benefits
  - ECAF is scalable, you tailor it to address your organization's specific challenges

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Enterprise Cloud Adoption Framework (ECAF) overview

Cloud adoption efforts require organizations to collaborate <u>internally</u> and <u>externally</u>

- **<u>Internal collaboration</u>**
  - Horizontal – address all POETS dimensions of cloud adoption. Coordinate cloud adoption across the organization (e.g., involve all business units)
  - Vertical – engage all levels necessary, from C-suite to 'hands on keyboard'. Coordinate cloud adoption work up and down the organization
  - Stakeholders – ensure that stakeholder experience is positively impacted through adoption
- **<u>External collaboration</u>**
  - Mission and Business Partners – ensure that organizational and technical interfaces work seamlessly in the cloud
  - Regulatory – ensure that regulatory and oversight bodies fully support adoption
  - Cloud Service Providers and Vendors – ensure that performance, cost, and security support the mission

ECAF helps to address the entire challenge through collaboration with the right stakeholders

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ECAF supports leaders at all levels

Executive Leadership

Programming, funding

Law, Regulation & Policy (LRP) compliance

Enterprise cloud strategy and roadmap

Governance of integrated strategy for transformation (acquisition, security, operators, technology)

CIO/CTO

IT modernization planning and strategy

Data center consolidation

IT modernization planning and execution

CISO

Cloud security strategy and plan

Multi-cloud security

Zero Trust

Program Manager

Migration plan for mission critical applications

Cloud-hosted capability (or migration) deployment

Cloud contracting

Integration and coordination of acquisition, security, operators, technology

Application rationalization or trade study (Software as a Service (SaaS) vs. Application Hosting)

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The ECAF framework

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Enterprise Cloud Adoption Framework (ECAF)

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Organizations don't have to "do" every box, but every box must be carefully considered
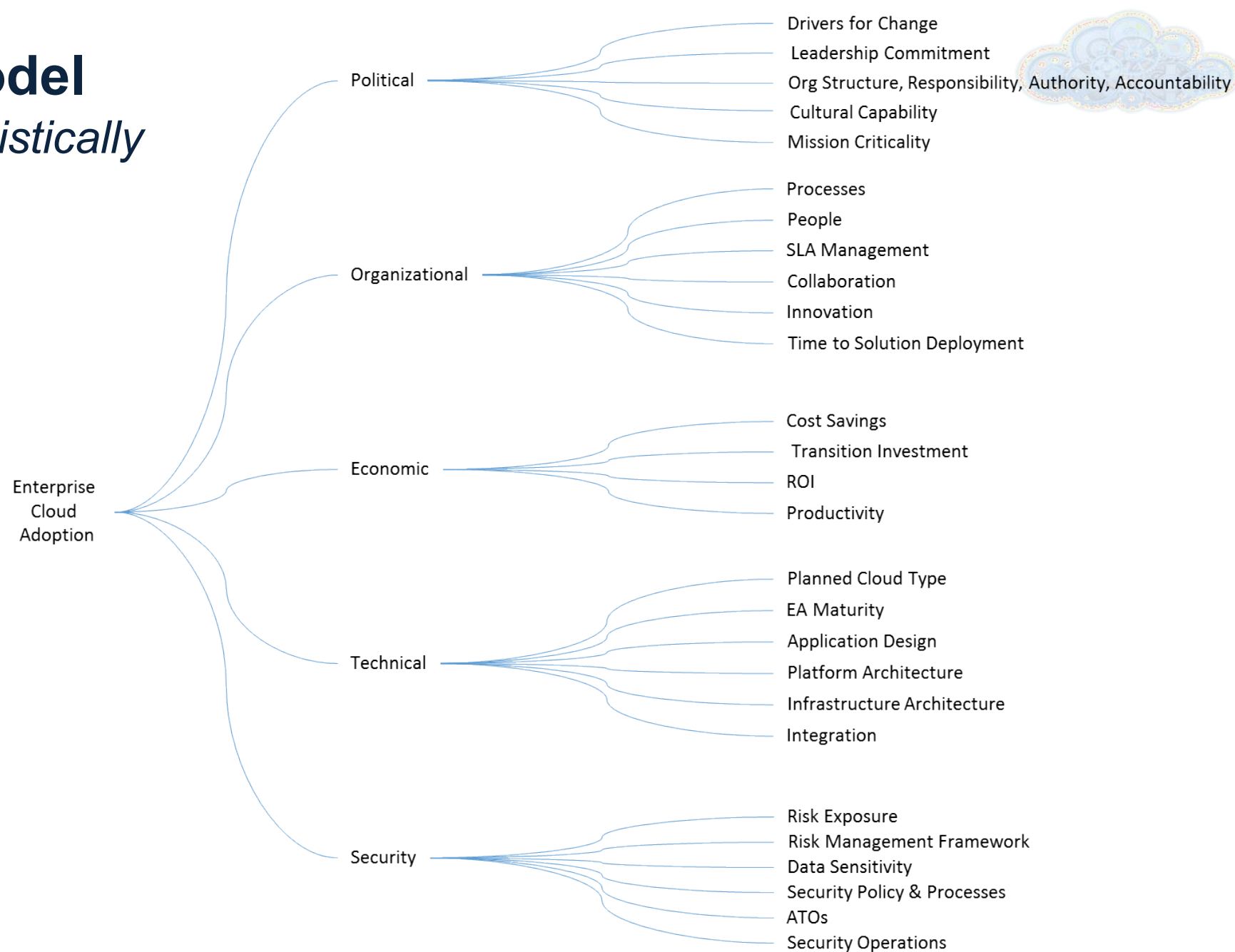
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ECAF POETS Model
See the challenge holistically

- Dimensions
  - **P**olitical
  - **O**rganizational
  - **E**conomic
  - **T**echnical
  - **S**ecurity

- POETS – ensures we look at all dimensions of the cloud adoption challenge

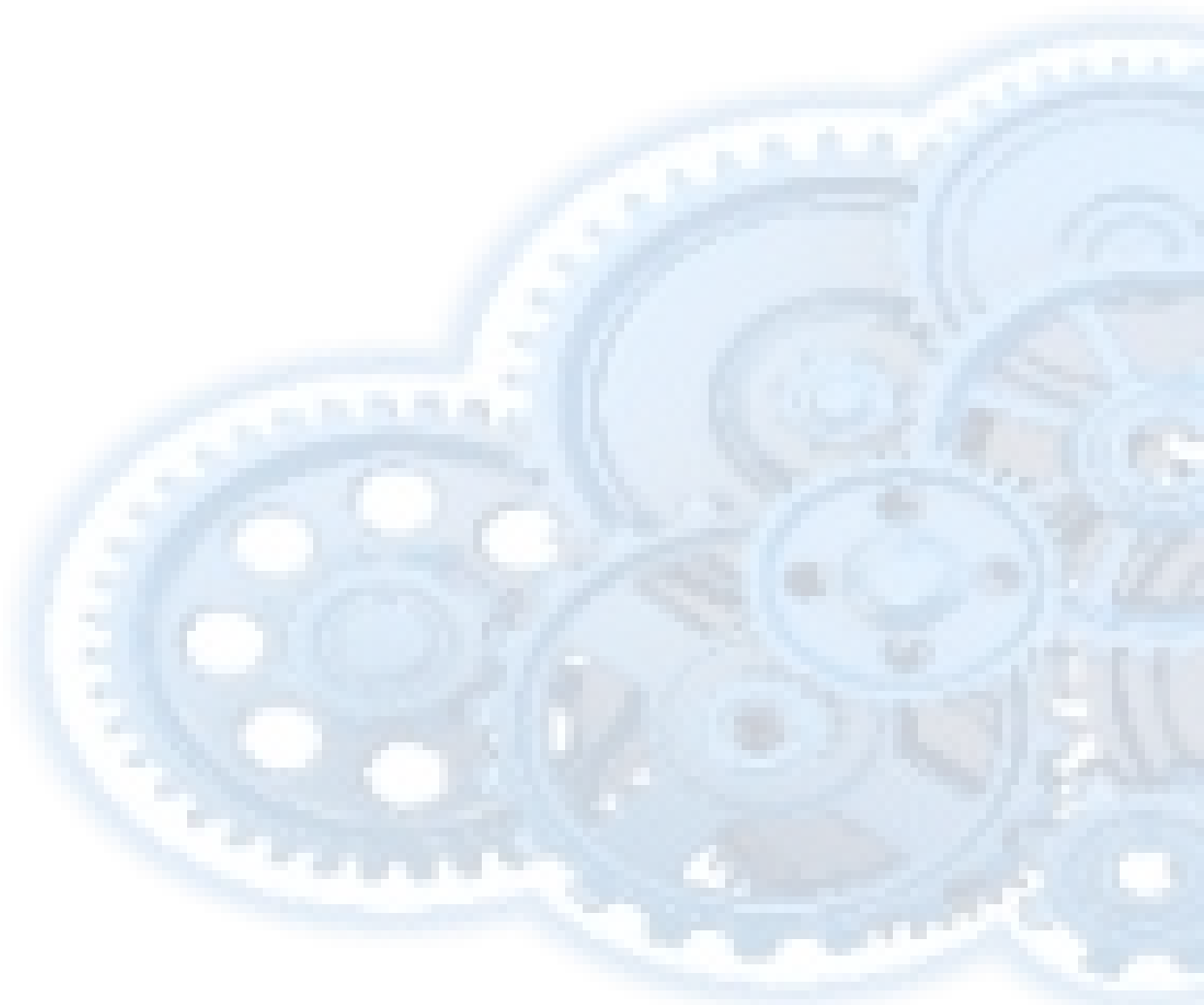- POETS – helps avoid the risks that commonly plague large IT projects

Enterprise Cloud Adoption

- **Political**
  - Drivers for Change
  - Leadership Commitment
  - Org Structure, Responsibility, Authority, Accountability
  - Cultural Capability
  - Mission Criticality

- **Organizational**
  - Processes
  - People
  - SLA Management
  - Collaboration
  - Innovation
  - Time to Solution Deployment

- **Economic**
  - Cost Savings
  - Transition Investment
  - ROI
  - Productivity

- **Technical**
  - Planned Cloud Type
  - EA Maturity
  - Application Design
  - Platform Architecture
  - Infrastructure Architecture
  - Integration

- **Security**
  - Risk Exposure
  - Risk Management Framework
  - Data Sensitivity
  - Security Policy & Processes
  - ATOs
  - Security Operations

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Cloud Adoption

Why we do it.
Why it's hard.
Why it's worth it.

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Why we do it: Cloud Adoption Drivers

- **Focus on your operational mission**
  - Let the Cloud Service Provider (CSP) handle details of availability, maintainability, reliability, and scalability
  - Avoid dedicating large cadre of internal staff to IT infrastructure operations

- **Enhance stability and sustainability**
  - Cloud performance, cost, and security factors remain stable or improve over time
  - CSPs take IT infrastructure and platform modernization off the table. No need for customers to maintain, upgrade, refresh

- **Support diverse set of mobile users**
  - Business users, partners, customers

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Why it's hard: Cloud Adoption Challenges

- **Acquisition Approach**
  - Current government IT acquisition policy written for traditional IT
  - Cultural shift from buying to renting
- **Complexity**
  - Multi-Cloud Operations and Management
  - Hybrid Environment Operations and Management
  - Increased complexity = increased cost
- **Security**
  - Cost and complexity associated with securing a more complex topology
  - Shift from direct control of a defined network to oversight of the provider's security implementation
- **Staffing with highly trained personnel (applies to all phases of adoption)**
  - Need real experts to drive down cloud cost
  - Over reliance on single expert; migration requires dedicated team
- **Risk aversion and resistance to change**

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# Why it's worth it now: Cloud Adoption Immediate Benefits

- **Location independent**
  - Consistency in services delivered to employees and customers regardless of location

- **Sustained operations during a crisis**
  - Regional data centers ensure redundancy

- **Elasticity, you pay only for the compute you need**
  - Support one-time events, annually recurring surges

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Why it's worth it: Cloud Adoption Sustained Opportunities

- **Reduced need to operate and maintain IT (hardware and software)**
  - Continuous opportunities for efficiencies and effectiveness

- **Enables a remote workforce to operate seamlessly in crisis situations**
- **Highly competitive marketplace**
  - Provides options and drives down cost
  - Incentivizes innovation and development of new services
  - Vendors are motivated to be secure

- **Market is acting to address integration and security challenges**
  - SaaS offerings to help with security and multi-cloud management are increasing (e.g., Software Management, Identity Management, Endpoint Security, etc.)
  - CSPs are offering:
    - More native capabilities out of the box
    - More Federated options for multi-cloud (e.g., Azure AD)

- **Provides a path for adoption of emerging technologies (e.g., IoT, Blockchain, AI/ML, Quantum)**

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Using ECAF

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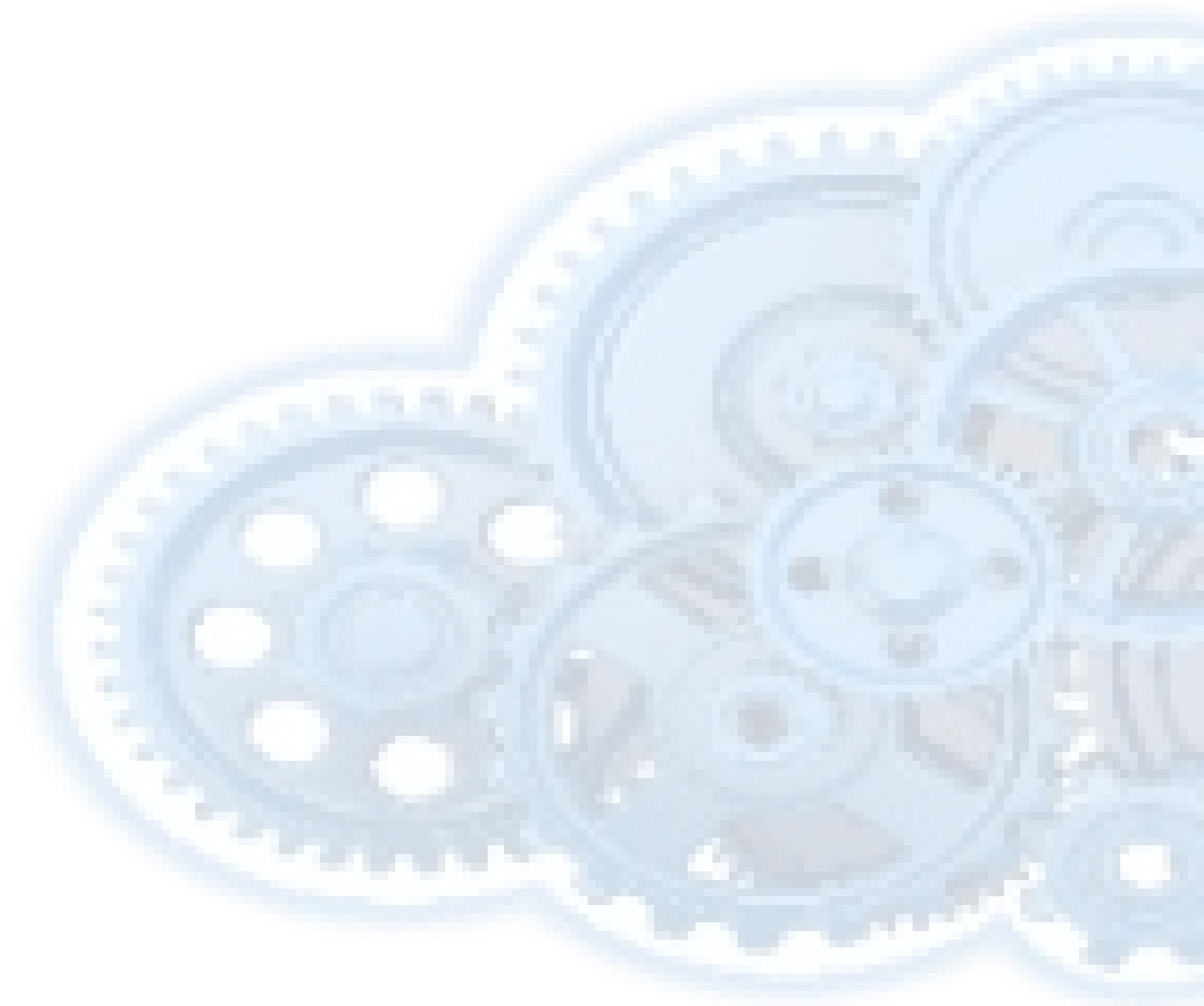
Using ECAF – the Basics

- **Create Vision, Goals and Priorities first. This is key to adoption success**
- **Use ECAF to conduct a Cloud Readiness Assessment**
  - Identify specific strengths and weaknesses

- **Use ECAF to create cloud adoption roadmap**
- **Use ECAF to identify interactions and interdependent activities**
- **Use ECAF to revisit and revise activities as necessary**
  - ECAF is flexible, tailor it to meet your needs
  - ECAF is not a linear framework or a schedule – some activities may be quick, others may be projects

- **Use ECAF to ensure you are addressing the whole challenge**
  - Not every box in the framework is necessary for every situation
  - Some activities may already be complete
  - Not performing an activity potentially increases risks

Use ECAF to Establish an Information-Driven Cloud Adoption Program to Ensure a Successful Outcome

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ECAF Cloud Adoption Process

ECAF Cloud Adoption Process

Cloud Readiness Assessment → Preparation, Policy, & Strategy → Adoption & Implementation → Operations & Optimization
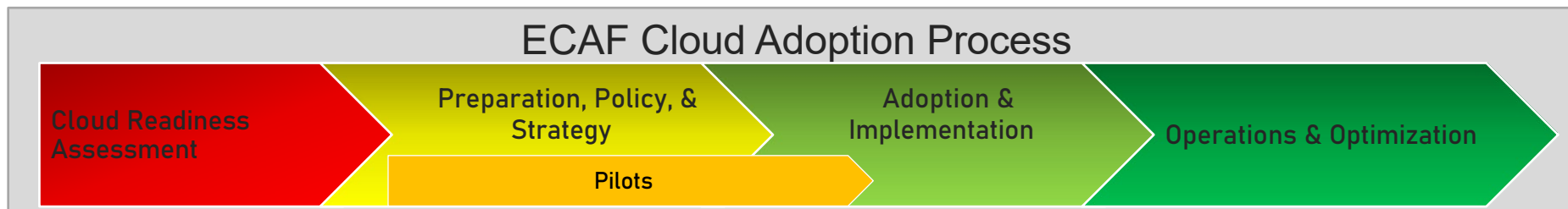
Pilots

Cloud Readiness Assessment
Use ECAF to create heat chart of current cloud readiness for all POETS swim lanes

Preparation, Policy
Review IT policy, test with pilot projects, train staff

Leverage strengths, improve weaknesses

Plan for operations & continuous improvement

Pilots can be used to start the transition and to build experience

Strategy
Use assessment results to drive strategic plans

Adoption & Implementation
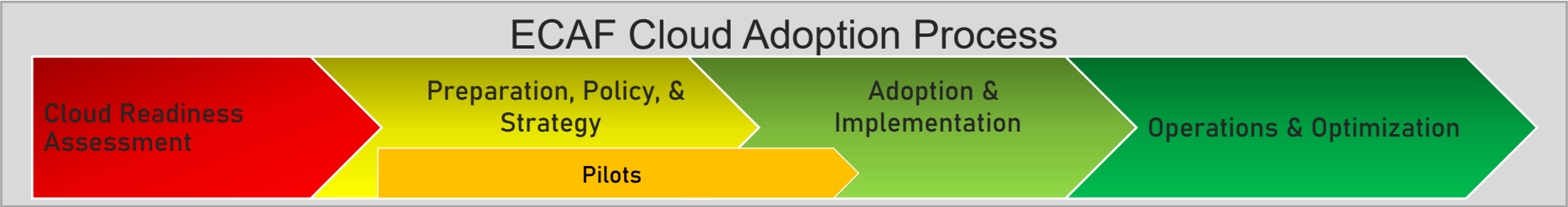Apply lessons learned from preparation phase

Operations & Optimization
Practice continuous improvement to optimize

Cloud Readiness Assessment → Preparation, Policy, & Strategy → Adoption & Implementation → Operations & Optimization

Pilots

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ECAF Cloud Adoption Process: Use Case Example
CIO Vision and Strategy

ECAF Cloud Adoption Process

Cloud Readiness Assessment → Preparation, Policy, & Strategy → Adoption & Implementation → Operations & Optimization

Pilots

Use Case

CIO needs to create a cloud adoption vision and strategy

Key Considerations
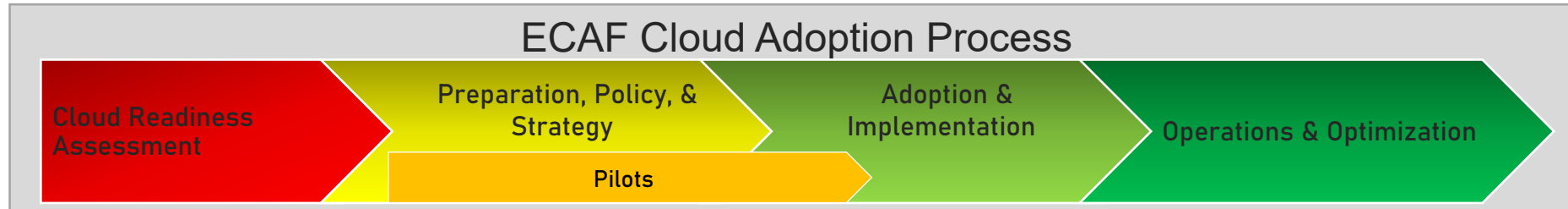
Cover all POETS swim lanes:

- Ensures all stakeholder equities are addressed
- Establishes cross functional leadership team

Ensures strategy not only supports the vision, but is also based upon organizational and technical readiness

Cloud Readiness Assessment → Preparation, Policy, & Strategy → Adoption & Implementation → Operations & Optimization

Pilots

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CIO Vision and Strategy Area

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ECAF Cloud Adoption Process: Use Case Example
Zero Trust

ECAF Cloud Adoption Process

Cloud Readiness Assessment → Preparation, Policy, & Strategy → Adoption & Implementation → Operations & Optimization

Pilots

Use Case

Organization is adopting Zero Trust Architecture (ZTA) and must align cloud adoption efforts to the ZTA

Key Considerations

Focus on Technical and Security dimensions, but other areas will likely be impacted

Requires integrated planning between ZTA and cloud adoption leadership

ZTA and cloud adoption vision and strategy may be integrated into unified approach, and minimally ZTA and cloud must be in alignment
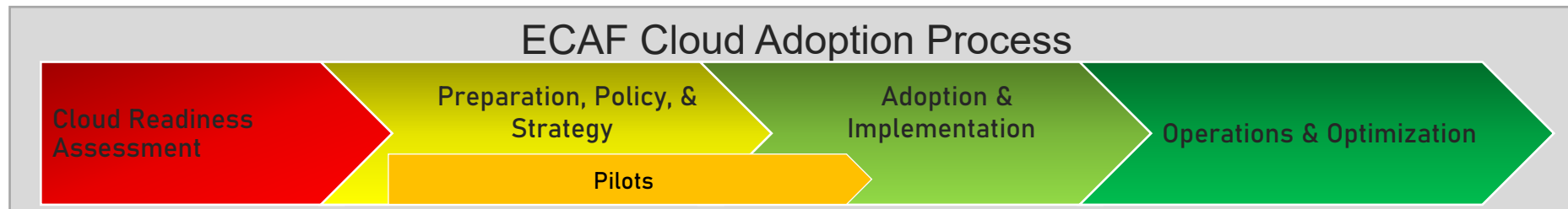
Piloting is recommended to ensure that the organization's ZTA solutions will support its cloud requirements

Cloud Readiness Assessment → Preparation, Policy, & Strategy → Adoption & Implementation → Operations & Optimization

Pilots

Zero Trust Area

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ECAF Cloud Adoption Process: Use Case Example
Program Management

ECAF Cloud Adoption Process

Cloud Readiness Assessment → Preparation, Policy, & Strategy → Adoption & Implementation → Operations & Optimization

Pilots

Use Case

Organization is ready to execute cloud adoption program

Key Considerations

Focus on Operations and Economic dimensions

Program Manager responsible for executing strategy and managing cost, schedule, performance objectives

Success is both governed and realized via measures established at the beginning of the program lifecycle
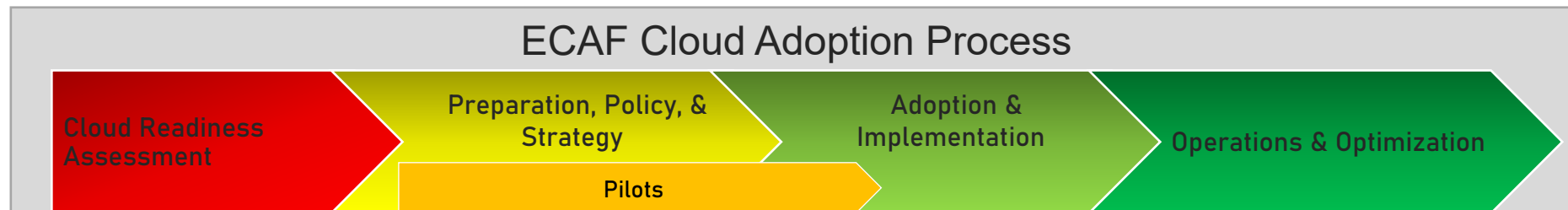
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Program Management Area

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ECAF Cloud Adoption Process: Use Case Example
Pilot Implementation

ECAF Cloud Adoption Process

Cloud Readiness Assessment → Preparation, Policy, & Strategy → Adoption & Implementation → Operations & Optimization

Pilots

Use Case

Organization performs a low complexity, low risk first implementation in the cloud

Cloud Readiness Assessment → Preparation, Policy, & Strategy → Adoption & Implementation → Operations & Optimization

Pilots

Key Considerations

Focus on Technical dimension, with Security and Acquisition support

Pilots enable building experience and learning

Pilots can serve as the initial transition kickoff point

Lessons learned from pilots can be applied to future efforts

Consider complexity, risk, and potential benefits when choosing pilot projects

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Pilot Area

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ECAF: Cloud Readiness Assessment

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Cloud Readiness Assessment

Assess overall readiness to adopt cloud

- Create <u>heatmap overlay</u> to identify strengths and weaknesses across ECAF
- Force leaders, experts to ask <u>key questions</u> across ECAF
- Create early awareness of potential risks

Cloud Readiness Assessment → Preparation, Policy, & Strategy (Pilots) → Adoption & Implementation → Operations & Optimization

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Heatmap Overlay Example

Key Questions (examples):

Legal / Privacy: Will we be legally allowed to move our data into the cloud?

Security: What is our system risk level in the cloud vs. on prem?

Technical Assessment: Do we have funding and staff allocated to conduct application rationalization?

Cost: What additional information do we need to create a lifecycle cost estimate (e.g., 5-year cost)?

Operate: How many operational staff have experience with the CSP?

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ECAF POETS: Political

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Political - Preparation, Policy & Strategy

	Create the Vision	Determine LRP, ROI & Objectives	Establish Governance & EA	Specify Solution Concept	Create Strategy	Develop Measures	Assess IT Investments	Identify Candidates	Implement	Operate	Optimize
Political	Assess Readiness & Drivers Develop Vision, Goals & Priorities	Address Law, Regulation & Policy Develop Objectives	Establish Governance & Oversight	Identify Strategic Partnerships	Establish Technology Investment Strategy	Establish Performance Framework	Review IT Investment Business Cases	Approve & Fund Best Candidates	Manage Strategic Partnerships	Continuously Assess Success	Continuously Improve Governance & Investment

Cloud Readiness Assessment → **Preparation, Policy, & Strategy / Pilots** → **Adoption & Implementation** → **Operations & Optimization**

- **Understand Driving Factors**
  - Look across all POETS areas (Political, Operational, Economic, Technical, Security)
  - Identify primary drivers that can positively or negatively impact cloud adoption

- **Law, Regulation & Policy (LRP)**
  - Understand legal, regulatory and policy impacts
  - Review/revise internal policy and regulations if necessary

- **Establish the Technology Investment Initiatives & Strategy**
  - Focused on meeting goals/objectives
  - Prioritized approach to achieve vision

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Political - Adoption and Implementation

Political	Create the Vision	Determine LRP, ROI & Objectives	Establish Governance & EA	Specify Solution Concept	Create Strategy	Develop Measures	Assess IT Investments	Identify Candidates	Implement	Operate	Optimize
	Assess Readiness & Drivers Develop Vision, Goals & Priorities	Address Law, Regulation & Policy Develop Objectives	Establish Governance & Oversight	Identify Strategic Partnerships	Establish Technology Investment Strategy	Establish Performance Framework	Review IT Investment Business Cases	Approve & Fund Best Candidates	Manage Strategic Partnerships	Continuously Assess Success	Continuously Improve Governance & Investment

Cloud Readiness Assessment → Preparation, Policy, & Strategy / Pilots → Adoption & Implementation → Operations & Optimization

- **Implement the Strategy**
  - Realize benefits of cloud adoption
- **Assures Appropriate Oversight through Governance**
  - Authorities, Responsibilities, Accountability
- **Review IT Investment Business Cases**
  - Mission and cost investments
  - Aligned with goals and objectives
  - Performed by governance body
- **Fund and Acquire Best Candidates**

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Political - Operations & Optimization

	Create the Vision	Determine LRP, ROI & Objectives	Establish Governance & EA	Specify Solution Concept	Create Strategy	Develop Measures	Assess IT Investments	Identify Candidates	Implement	Operate	Optimize
Political	Assess Readiness & Drivers; Develop Vision, Goals & Priorities	Address Law, Regulation & Policy; Develop Objectives	Establish Governance & Oversight	Identify Strategic Partnerships	Establish Technology Investment Strategy	Establish Performance Framework	Review IT Investment Business Cases	Approve & Fund Best Candidates	Manage Strategic Partnerships	Continuously Assess Success	Continuously Improve Governance & Investment

Cloud Readiness Assessment → **Preparation, Policy, & Strategy** / **Pilots** → **Adoption & Implementation** → **Operations & Optimization**

- **Continuously Improve Governance, POP, and Investments**
  - Data-driven Decisions Focused on Priorities
  - Execute the Strategy with Governance Oversight
- **Continuous Governance and Investment Improvement**
  - Execute/update the Strategy
  - Governance Oversight

- **Strategic Partnerships**
  - CSP and Government must work together to achieve best success
    - Performance, Innovations and Cost control
    - Security and Incident Handling

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ECAF POETS: Organizational

MITRE

Organizational - Preparation, Policy & Strategy

	Create the Vision	Determine LRP, ROI & Objectives	Establish Governance & EA	Specify Solution Concept	Create Strategy	Develop Measures	Assess IT Investments	Identify Candidates	Implement	Operate	Optimize
Organizational	Define Scope via Business Scenarios Identify Major Knowledge Gaps	Identify Stakeholders & Objectives Initiate Foundational Education	Plan Stakeholder Engagement & Leader Mobilization	Identify Process, Organization & Personnel (POP) Impacts	Define POP Strategy	Develop POP Measures	Evaluate Processes	Determine POP Changes Plan Training	Implement POP Changes Implement Training	Perform Operations & Collect Data	Continuously Improve Org Refine POP

Cloud Readiness Assessment → Preparation, Policy, & Strategy / Pilots → Adoption & Implementation → Operations & Optimization

- **Develop Business Scenarios**
  - Few, initial, high-level concepts of cloud use

- **Identify Stakeholders and Roles**
  - Users, IT, Acquisition, Security/Privacy, OIG, OGC, Leadership, etc.
  - Stakeholder importance, influence, & relevant current roles

- **Establish Cultural Risk Tolerance**

- **Identify Stakeholder Needs, Values, & Objectives**
  - Mission centric - add value
  - Measurable & Aligned with Goals

- **Plan Initial Stakeholder & Leadership Engagement**
  - Plan for change at all levels
  - Build leadership commitment

- **Address Strategies for Change**

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Organizational - Adoption Implementation

	Create the Vision	Determine LRP, ROI & Objectives	Establish Governance & EA	Specify Solution Concept	Create Strategy	Develop Measures	Assess IT Investments	Identify Candidates	Implement	Operate	Optimize
Organizational	Define Scope via Business Scenarios Identify Major Knowledge Gaps	Identify Stakeholders & Objectives Initiate Foundational Education	Plan Stakeholder Engagement & Leader Mobilization	Identify Process, Organization & Personnel (POP) Impacts	Define POP Strategy	Develop POP Measures	Evaluate Processes	Determine POP Changes Plan Training	Implement POP Changes Implement Training	Perform Operations & Collect Data	Continuously Improve Org Refine POP

Cloud Readiness Assessment → **Preparation, Policy, & Strategy** / **Pilots** → **Adoption & Implementation** → **Operations & Optimization**

- **Prepare for Operations**
- **Buying to renting**
  – Move from designing solutions to defining needs
  – From CAPEX to OPEX

- **New Skills or Organizations**
  – Tech Skills
  – Acquisition and CSP Contract Management
  – Cloud Security
  – Continuous Improvement

- **Implement POP Strategy**
  – Engagement and Communications Plan
  – Process, role, and organizational structure changes

- **New approaches**
  – Acquisition
  – Contracting
  – Technology Development (e.g., DevSecOps)
  – Security

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Organizational - Operations & Optimization

Organizational	Create the Vision	Determine LRP, ROI & Objectives	Establish Governance & EA	Specify Solution Concept	Create Strategy	Develop Measures	Assess IT Investments	Identify Candidates	Implement	Operate	Optimize
	Define Scope via Business Scenarios	Identify Stakeholders & Objectives	Plan Stakeholder Engagement & Leader Mobilization	Identify Process, Organization & Personnel (POP) Impacts	Define POP Strategy	Develop POP Measures	Evaluate Processes	Determine POP Changes	Implement POP Changes	Perform Operations & Collect Data	Continuously Improve Org
	Identify Major Knowledge Gaps	Initiate Foundational Education							Plan Training	Implement Training		Refine POP

Cloud Readiness Assessment → Preparation, Policy, & Strategy / Pilots → Adoption & Implementation → **Operations & Optimization**

- **Mature Cloud Management**
  - Capture and Apply Lessons Learned
  - Make the Right Thing Easy and the Wrong Things Hard
  - Reward the Results
  - Flexible Approach to Changes

- **Agile Organization**
  - Adaptable Culture
  - Learning Culture
  - Continuous Improvement

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ECAF POETS: Economic

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Economic - Preparation, Policy & Strategy

Economic	Create the Vision	Determine LRP,ROI & Objectives	Establish Governance & EA	Specify Solution Concept	Create Strategy	Develop Measures	Assess IT Investments	Identify Candidates	Implement	Operate	Optimize
	Establish Risk Tolerance	Determine ROI	Build Business Case	Understand Cost Model	Update Acquisition Policy / Develop Cost Recovery Strategy	Build Cost Measures	Reduce Redundancies / Know the CSP Alternatives	Develop Candidate ROIs / Develop Business Cases	Acquire Services / Manage Acquisition Risks	Manage Contracts / Manage Cost	Optimize Value

Cloud Readiness Assessment → **Preparation, Policy, & Strategy / Pilots** → **Adoption & Implementation** → **Operations & Optimization**

- **Establish Risk Tolerance**
- **Focus on Objectives and Mission value**
  - May outweigh costs
- **Determine Cloud ROI**
  - ROI = total benefit – total cost
- **Assess Policy, Update as Needed**
  - Acquisition

- **Build Cloud Business Case**
  - Understand tradeoffs to inform decisions
- **Address Strategies for Change**
  - New Organizations for CSP monitoring
    - CSP performance management
    - Billing and invoicing allocations
  - Cost Recovery Strategy

Moving to a cloud <u>may</u> or <u>may not</u> reduce cost.

However, mission or business benefits may outweigh cost.

MITRE

Economic - Adoption Implementation

Economic	Create the Vision	Determine LRP, ROI & Objectives	Establish Governance & EA	Specify Solution Concept	Create Strategy	Develop Measures	Assess IT Investments	Identify Candidates	Implement	Operate	Optimize
	Establish Risk Tolerance	Determine ROI	Build Business Case	Understand Cost Model	Update Acquisition Policy / Develop Cost Recovery Strategy	Build Cost Measures	Reduce Redundancies / Know the CSP Alternatives	Develop Candidate ROIs / Develop Business Cases	Acquire Services / Manage Acquisition Risks	Manage Contracts / Manage Cost	Optimize Value

Cloud Readiness Assessment → **Preparation, Policy, & Strategy / Pilots** → **Adoption & Implementation** → **Operations & Optimization**

- **Prepare for Operations**
- **Buying to renting**
  - From CAPEX to OPEX
- **Measure the Right Things**
  - Measure outcomes based on Vision, Goals & Priorities
  - Measure progress of activities, milestones & plans compared to strategy
- **Develop Business Case(s)**

- **Continuously Assess Success**
  - Cost savings and mission improvements
  - Lessons learned and build success
- **Measure the Progress**
  - Number of systems in cloud
  - Migration process efficiency/effectiveness
- **Manage Risks**
- **Acquire Services**
  - Consider Replacing Legacy Systems
  - Agile Contracting

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Economic - Operations & Optimization

	Create the Vision	Determine LRP, ROI & Objectives	Establish Governance & EA	Specify Solution Concept	Create Strategy	Develop Measures	Assess IT Investments	Identify Candidates	Implement	Operate	Optimize
Economic	Establish Risk Tolerance	Determine ROI	Build Business Case	Understand Cost Model	Update Acquisition Policy; Develop Cost Recovery Strategy	Build Cost Measures	Reduce Redundancies; Know the CSP Alternatives	Develop Candidate ROIs; Develop Business Cases	Acquire Services; Manage Acquisition Risks	Manage Contracts; Manage Cost	Optimize Value

Cloud Readiness Assessment → **Preparation, Policy, & Strategy** / **Pilots** → **Adoption & Implementation** → **Operations & Optimization**

- **Manage Contracts**
- **Manage Cost Allocation**
  - Develop and implement payment model to allocate costs to organizational units
  - Develop standard tags for resources
  - Automate model
  - Manage CSP Accounts
  - Determine Charge-Back Model

- **Continuously Assess to Improve Processes & Reduce Redundancy**
  - Cost Savings
  - Mission Performance
- **Optimize Benefits per Cost**
- **Maximize IT Capabilities per Cost**

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ECAF POETS: Technical

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Technical - Preparation, Policy & Strategy

	Create the Vision	Determine LRP, ROI & Objectives	Establish Governance & EA	Specify Solution Concept	Create Strategy	Develop Measures	Assess IT Investments	Identify Candidates	Implement	Operate	Optimize
Technical	Understand State of Technology in Industry	Analyze State of Technology Applied to Objectives	Establish Baseline Technical Architecture	Develop Technical Solution Concept	Develop As-Is to To-Be Transition	Establish Technical Measures	Triage IT Systems Consolidate IT / Analyze IT Risks	Determine Migration Type & Architecture	Develop & Execute Migration Plan Design & Implement System	Operate & Maintain System	Maximize Capability

Cloud Readiness Assessment → **Preparation, Policy, & Strategy / Pilots** → **Adoption & Implementation** → **Operations & Optimization**

- **Understand State of Technology in Industry**
  - Current and Expected Future Capabilities
  - Applied to Objectives
- **Establish Enterprise Architecture**
  - Basis for decision making
- **As-Is to To-Be Transition Plan for EA**

- **Address Strategies for Change**
  - New Processes and Organizations to support operations and CSP monitoring
    - Training
    - DevSecOps
    - Configuration
    - Technical Support
    - CSP performance management

- **Perform Pilot Implementations**
  - Experience and lessons learned
    - Technical Team
    - Acquisition Team
    - Security Team
  - Typical types of cloud pilots
    - Public facing websites
    - Training websites
    - DR/COOP environments
    - DevSecOps environments

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Technical - Adoption Implementation

Technical	Create the Vision	Determine LRP,ROI & Objectives	Establish Governance & EA	Specify Solution Concept	Create Strategy	Develop Measures	Assess IT Investments	Identify Candidates	Implement	Operate	Optimize
	Understand State of Technology in Industry	Analyze State of Technology Applied to Objectives	Establish Baseline Technical Architecture	Develop Technical Solution Concept	Develop As-Is to To-Be Transition	Establish Technical Measures	Triage IT Systems Consolidate IT / Analyze IT Risks	Determine Migration Type & Architecture	Develop & Execute Migration Plan Design & Implement System	Operate & Maintain System	Maximize Capability

Cloud Readiness Assessment → **Preparation, Policy, & Strategy** / **Pilots** → **Adoption & Implementation** → **Operations & Optimization**

- **Training**
  - CSP Tools and Services
  - IT Processes for Dev/Test/Ops
- **Triage IT Systems**
  - Initial assessment for candidate systems
  - Identify and analyze IT Risks
- **Determine Candidates (CSP alternatives)**
  - Requirements Driven
  - FedRAMP status of services
  - Integration with processes and current IT
  - Vendor management and transparency

- **Plan and Perform Candidate(s) Migrations**
- **Operations during and after migration**
- **Provide Technical Migration Oversight**
  - Systems
  - Aggregate considerations
- **New Systems Design and Development**
  - Re-Imagine Systems
  - Re-Architect for Cloud

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Technical - Operations & Optimization

	Create the Vision	Determine LRP, ROI & Objectives	Establish Governance & EA	Specify Solution Concept	Create Strategy	Develop Measures	Assess IT Investments	Identify Candidates	Implement	Operate	Optimize
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Cloud Readiness Assessment → **Preparation, Policy, & Strategy** / **Pilots** → **Adoption & Implementation** → **Operations & Optimization**

- **Operate and Continually Improve Services**
  - Elasticity and Performance
  - DR/COOP
- **Seek and Implement SDLC Improvements**
  - DevSecOps
  - Continuous Delivery
  - Cloud Services

- **Integration**
  - Performance
  - Interoperability
  - Potential redundancies
- **Cloud Performance**
  - Vendor visibility
  - Monitor the important stuff

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ECAF POETS: Security

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Security - Preparation, Policy & Strategy

	Create the Vision	Determine LRP, ROI & Objectives	Establish Governance & EA	Specify Solution Concept	Create Strategy	Develop Measures	Assess IT Investments	Identify Candidates	Implement	Operate	Optimize
Security	Establish Cyber Risk Tolerance	Know Threat Environment Know RMF, FedRAMP & Current Cyber	Perform Cyber Risk Analysis (RMF phases 1&2)	Define Conceptual Cyber Architecture	Update Cyber Policy	Develop Cyber Measures	Assess Cyber Needs & Costs	Perform Candidate Risk Analysis	Manage Migration Risks	Execute Continuous Monitoring & Operations	Continuously Improve Cyber Maturity

Cloud Readiness Assessment → Preparation, Policy, & Strategy / Pilots → Adoption & Implementation → Operations & Optimization

- **Establish Security Risk Tolerance**
- **Know Security Threat Environment**
  - Technical, Mission and Programmatic Risks
- **Evaluate Cloud Security Readiness**
  - Identifying impacted resources and engaging them in security
- **Law, Regulation and Policy (LRP)**
  - Comprehensive Security Policy Review
- **Know RMF and FedRAMP**
- **Execute RMF to drive down risk**

- **Assess Current Security Policy, Update as Needed**
- **Training**
- **Security Strategy**
  - Align with the cloud adoption strategy
  - Address FedRAMP
  - Roles/Responsibilities and Integration
  - Integrating Security Across the Solution Concept
  - Approach During Migration to Cloud
  - Approach For Operations and Continuous Improvement

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Security - Adoption Implementation

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Cloud Readiness Assessment → **Preparation, Policy, & Strategy / Pilots** → **Adoption & Implementation** → **Operations & Optimization**

- **Manage Risks**
- **Know the CSP Alternatives**
  - FedRAMP status of services
  - Integration with processes
  - Vendor security management and transparency
- **Vendor Security and Privacy**
  - Integration with current security and privacy

- **Plan for Trusted Internet Connection (TIC)**
- **Plan for Security Operations During after Migration**
- **Provide Security Oversight**
- **IATT and ATO**
- **Continuous Monitoring**

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Security - Operations & Optimization

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Cloud Readiness Assessment → **Preparation, Policy, & Strategy** / **Pilots** → **Adoption & Implementation** → **Operations & Optimization**

- **Operate and Continually Improve Security**

- **Seek and Implement SDLC Improvements**
  - DevSecOps
  - Continuous Delivery
  - Cloud Services

- **Cloud Security must be equal to or better than traditional IT**

- **CSP implements security ONLY to the Service Level**

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Conclusion and Author Contact Information

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MITRE's ECAF is a Blueprint for IT Modernization

ECAF is a holistic approach

Using ECAF, government organizations have:

Improved mission effectiveness	Saved money	Saved time	Reduced Risk	Reduced waste

MITRE is continually evolving the ECAF and extending its usability

https://www.mitre.org/publications/technical-papers/enterprise-cloud-adoption-framework-briefing

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