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Best Practices for Enterprise Data Management

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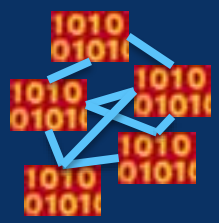
Topics

1. Procurement Approaches
2. Necessary Features and COTS Architecture
3. Deployment Considerations
4. Summary
5. Questions

Procurement Approaches

Enterprise System Procurement Approaches

A spectrum of system implementation patterns



Custom System

Built entirely with custom code

Component System

Uses stand alone COTS components with significant development

COTS System

Configured with minimal development

Comparing Approaches

Custom	COTS Components	COTS System
Custom built to meet business goals	Custom system, using some COTS elements	Orchestrates COTS to meet business goals
Emphasis on software development	Emphasis on component-based software development	Emphasis on workflows and configuration
Design based on detailed functional requirements	Design based on detailed functional requirements	Design based on business goals and COTS capability
Considerable development time / effort	Reduced development time / effort	Minimized development time / effort
Static system	Some capability evolves with COTS releases	Evolving system with COTS releases

COTS System follows standard system development lifecycles, but activities are different than traditional developmental systems

What is the COTS Approach?

"Going with the grain"

- **Maximizes investment** in *commercial off the shelf* software in a GIS system
- **Meets business goals** by leveraging COTS
  - Configures and extends COTS
  - Avoids developing software
- **Provides immediate capability**… continually improving via COTS release cycles
- **Engages users** early and often to iteratively improve system

A Different Way of Thinking

- **Challenges common procurement models**
  - **Requirements focused on *business goals* vice detailed feature functions**
  - **Select COTS that best meets business goals and implement "with the grain" for best results**
  - **Schedule linked to COTS release cycles**

- **Asks users to consider new business processes**
  - **New workflows based on COTS strengths (usually better)**
  - **People resist change**
  - **Organizations resist change**

- **Avoid temptation to overly customize**
  - **Best intentions of many people often push systems towards customization**

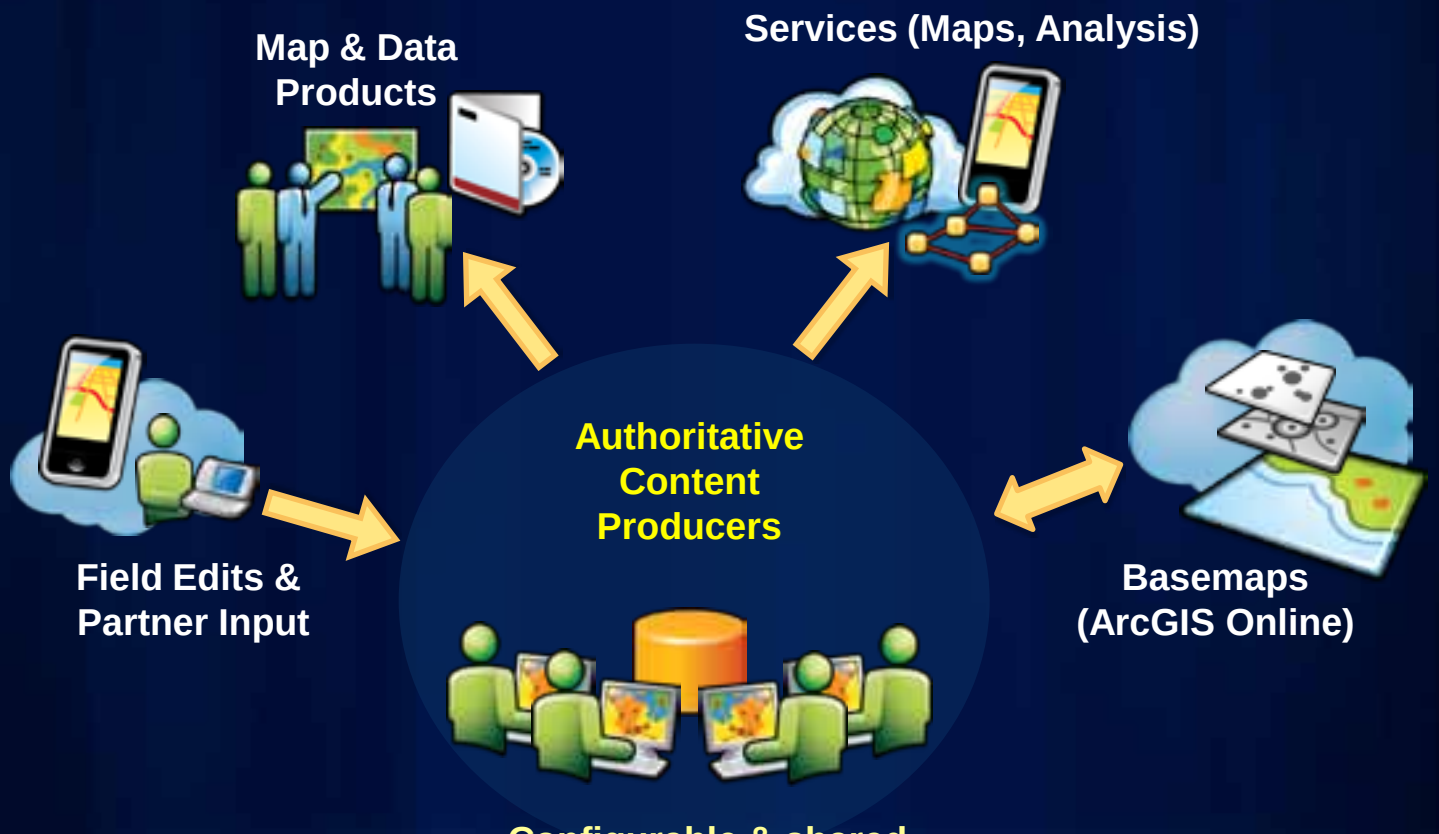
ArcGIS System Concept

The backbone of a COTS based, enterprise data management system…

…with flexibility to support wide range of user roles

Enterprise GIS System Pattern @ ArcGIS 10

Power to configure how content is produced, shared, and used



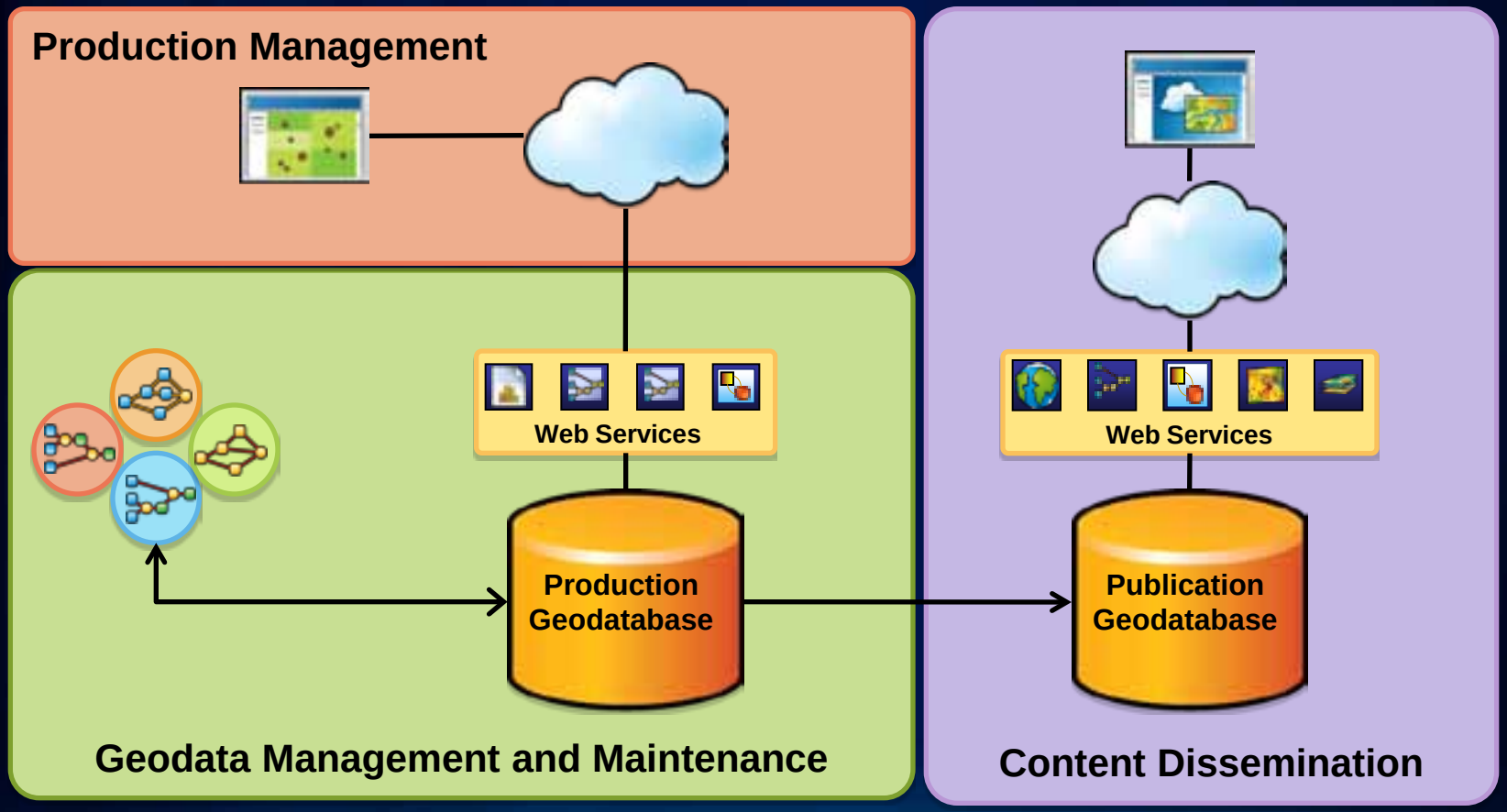
Configurable & shared

- workflows
- production tools
- business rules

Necessary features and COTS architecture

Enterprise Data Management

Key features



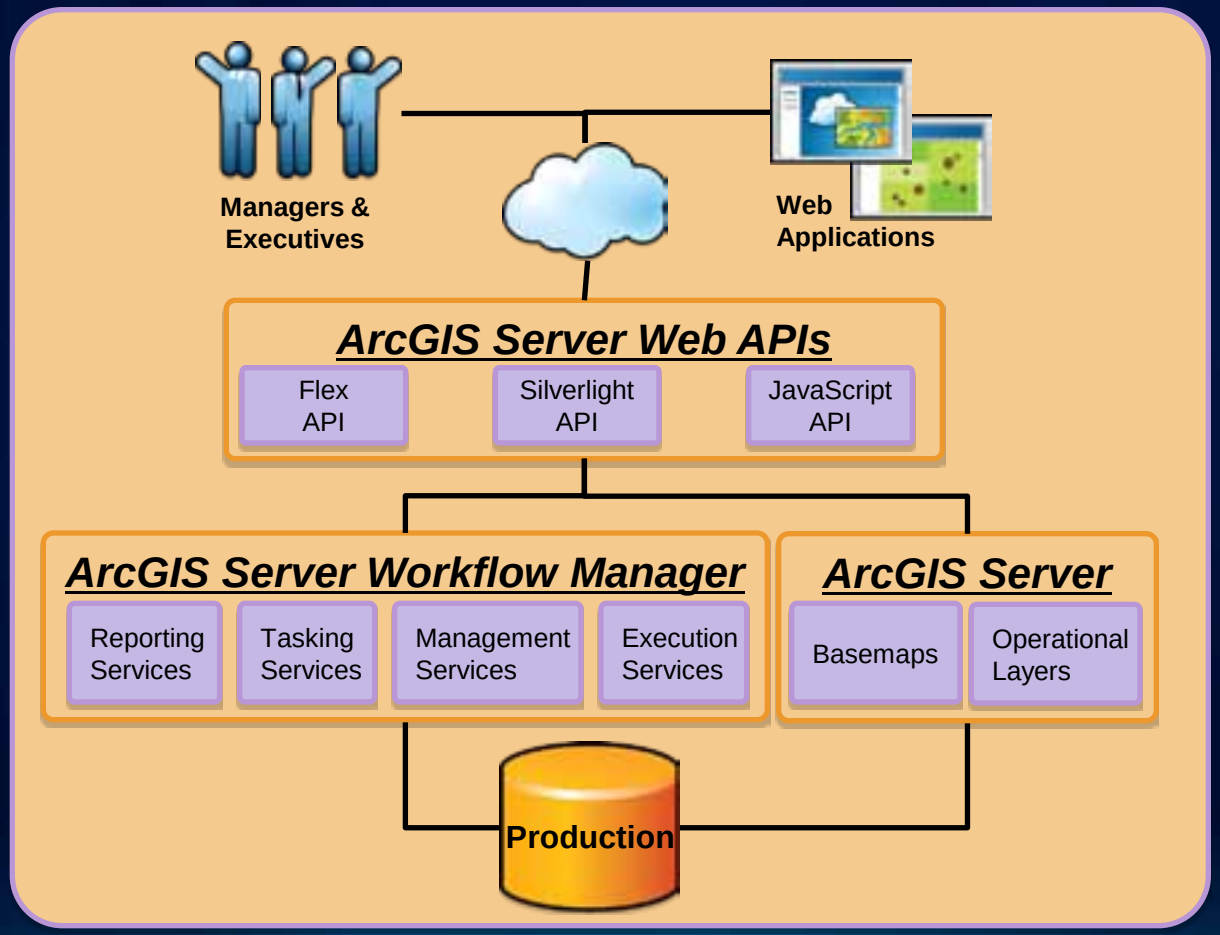
Production Management

Configuring COTS to support work tasking, reporting, and management

- **Provide transparency**
  - **Task and manage production**
  - **Provide status and reporting**
- **Utilize role-based functionality**
  - **Targeted user experience**
  - **Keep it simple**
- **Extend the reach of GIS workflows**
  - **Simple, web-based access**
  - **Enable non-GIS users**

Production Management

Providing transparency and extending the reach of GIS workflows



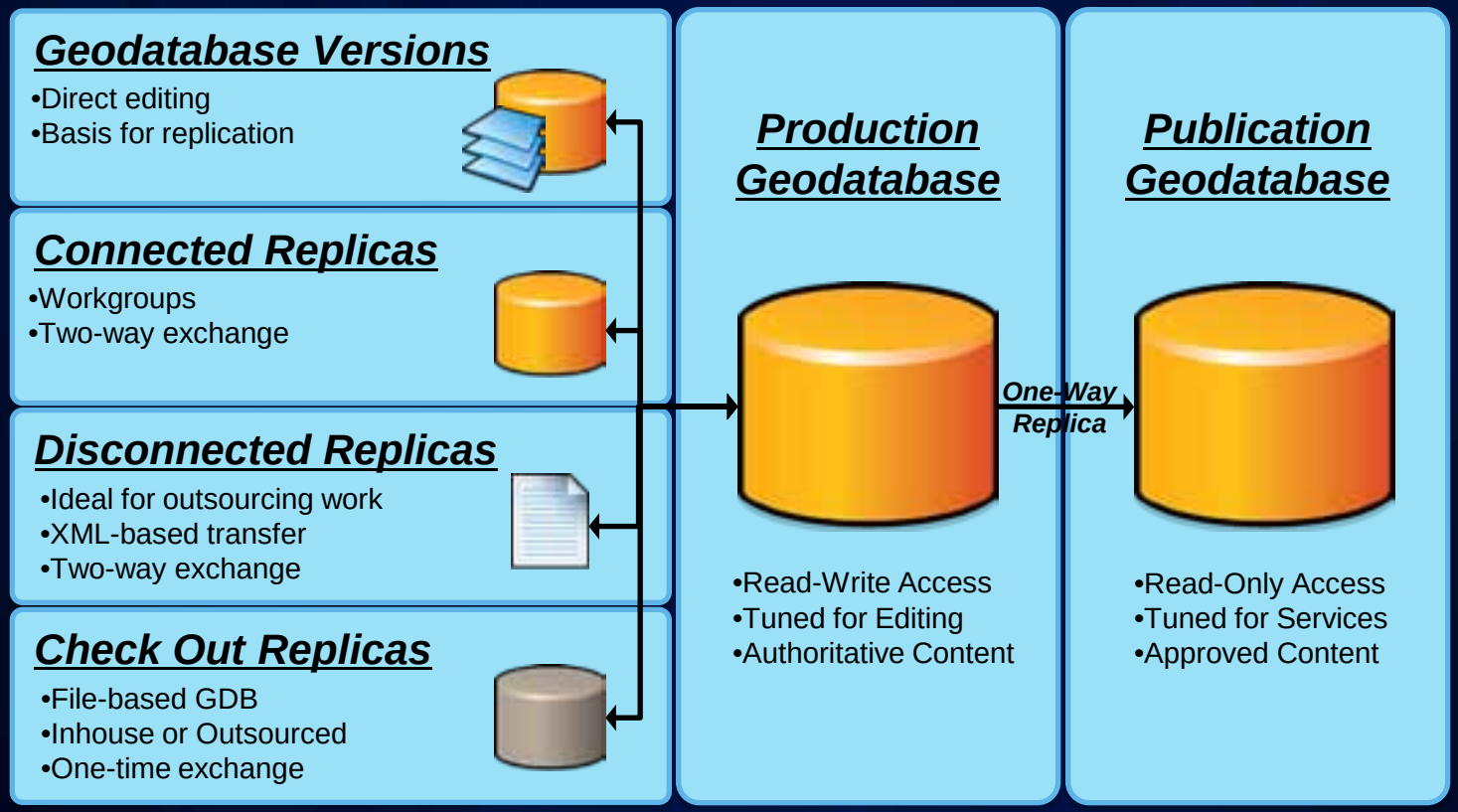
Geodatabase Design Best Practices

Delivering high performance, application-ready geodata

- **Emphasize end-user capabilities**
  - Define detailed information products
  - Build to deliver, avoid the “what ifs”
- **Embrace federated compilation and maintenance**
  - Be realistic, prioritize compilation capabilities
  - Leverage data content provided by the enterprise
  - Integrate content at the service level, not RDBMS
- **Design for COTS usability**
  - Leverage geodatabase concepts (FCs, subtypes, etc)
  - Balance tradeoffs for maintenance and dissemination

Enterprise Geodata Management

Providing options for distributing geodata management activities



Data Maintenance

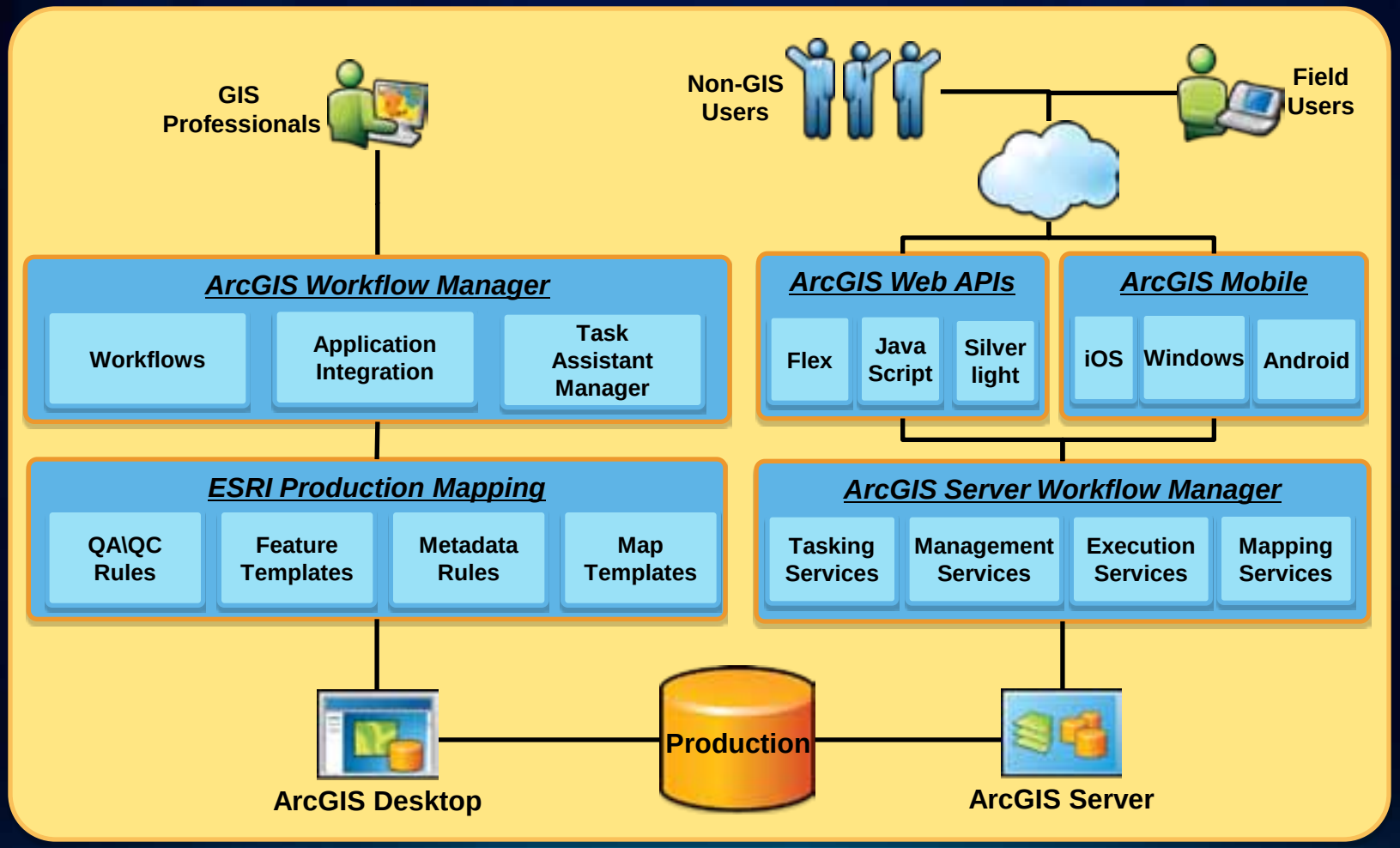
Configuring COTS to support workflow-driven, rule-based production

- **Model new and existing processes**
  - **Integrate GIS and non-GIS**
  - **Standardize and streamline**
  - **Continually evolve workflows**

- **Configure a common rule-base**
  - **Feature templates**
  - **Map templates**
  - **Quality Control rules**

Data Maintenance

Providing standardized workflows and rules-based data maintenance



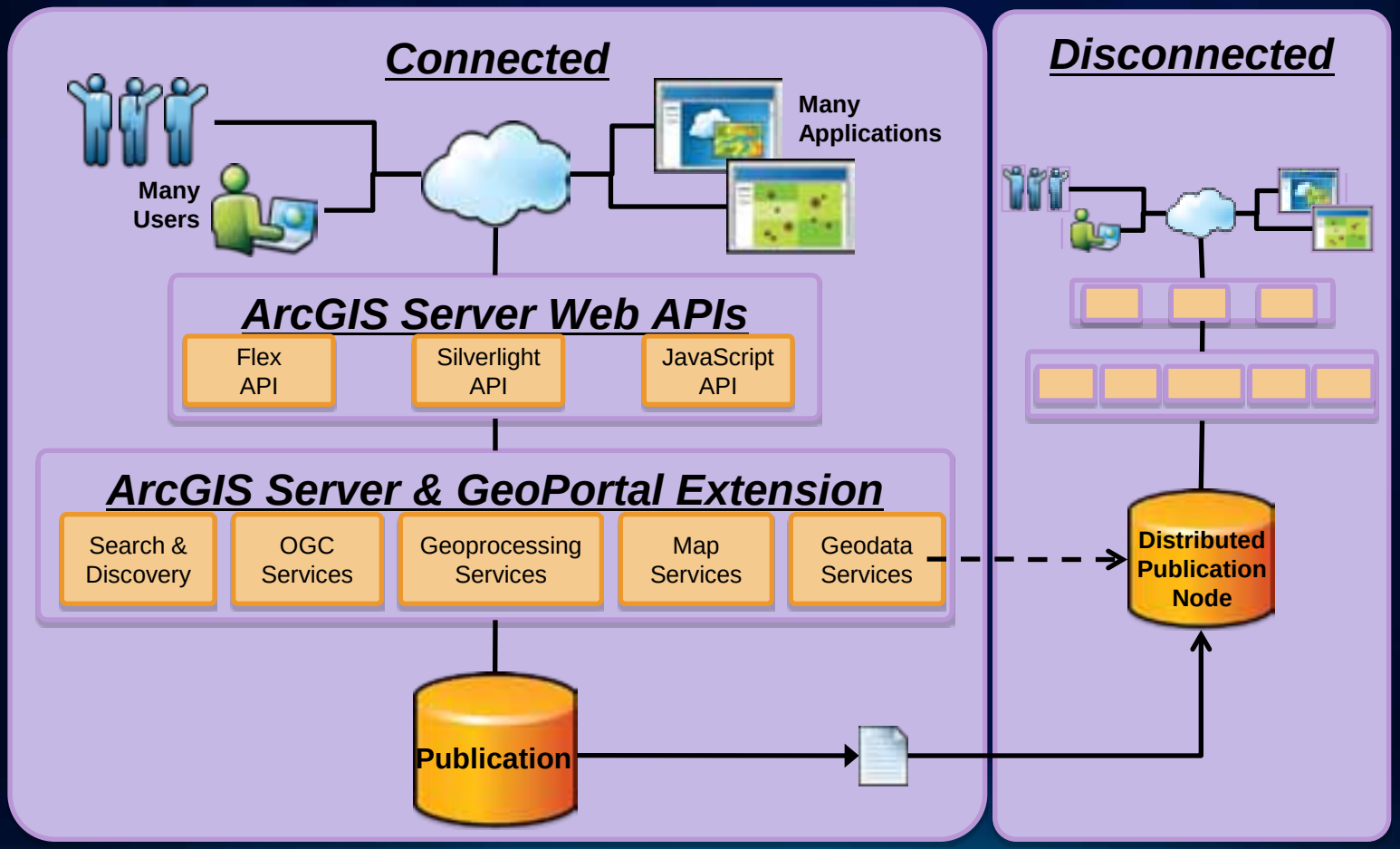
Content Dissemination

Using COTS to support a variety of end-users and applications

- **Deliver diverse information products**
  - **Visualization**
  - **Analysis**
  - **Geodata**
- **Enable search & discovery**
  - **Standards-based (i.e. OGC)**
  - **ArcGIS Online ‘tags’**
- **Support internal and external users**
  - **Web services (connected)**
  - **Traditional media (disconnected)**

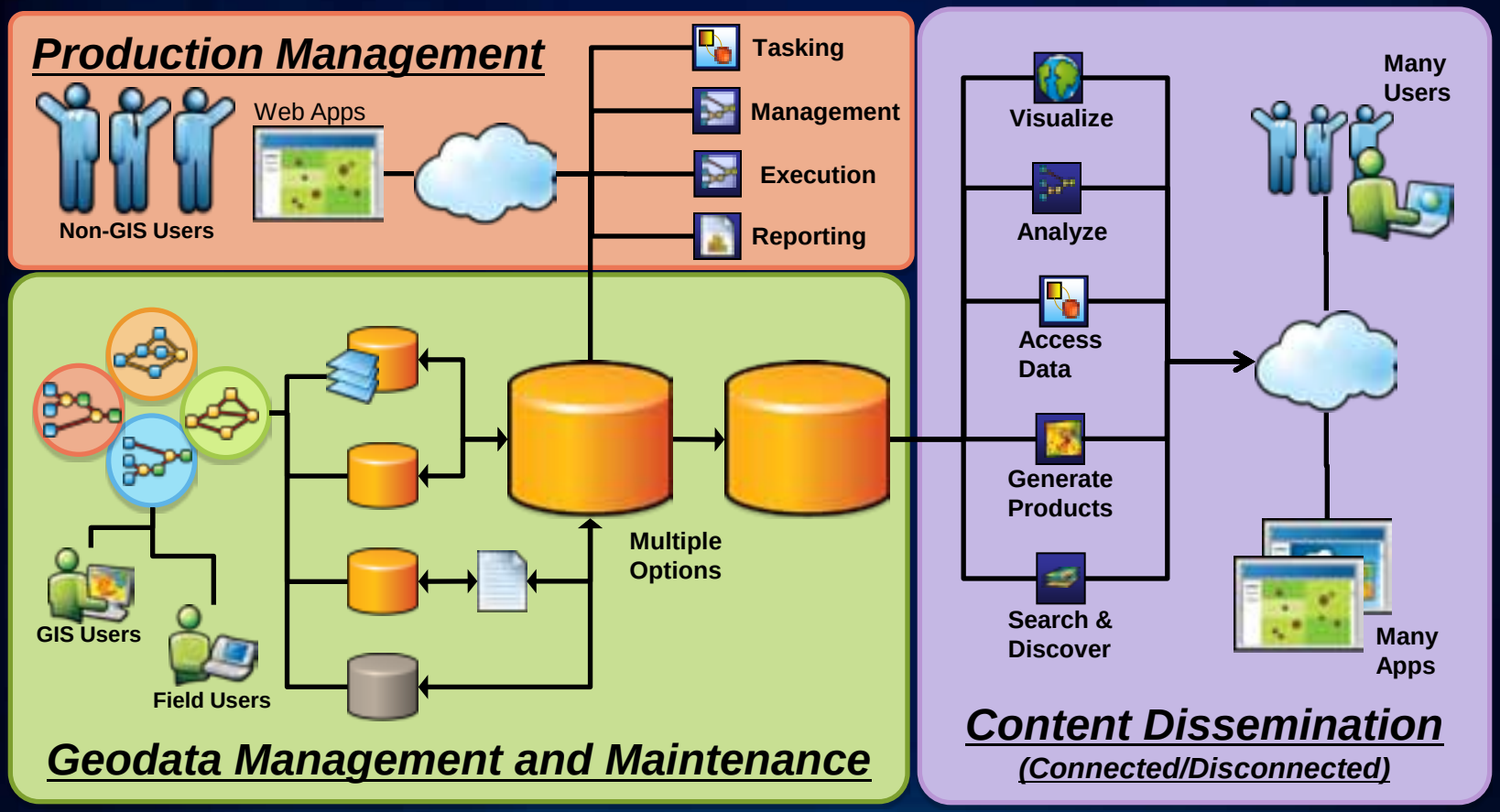
Content Dissemination

Providing well-defined information products to the enterprise and beyond



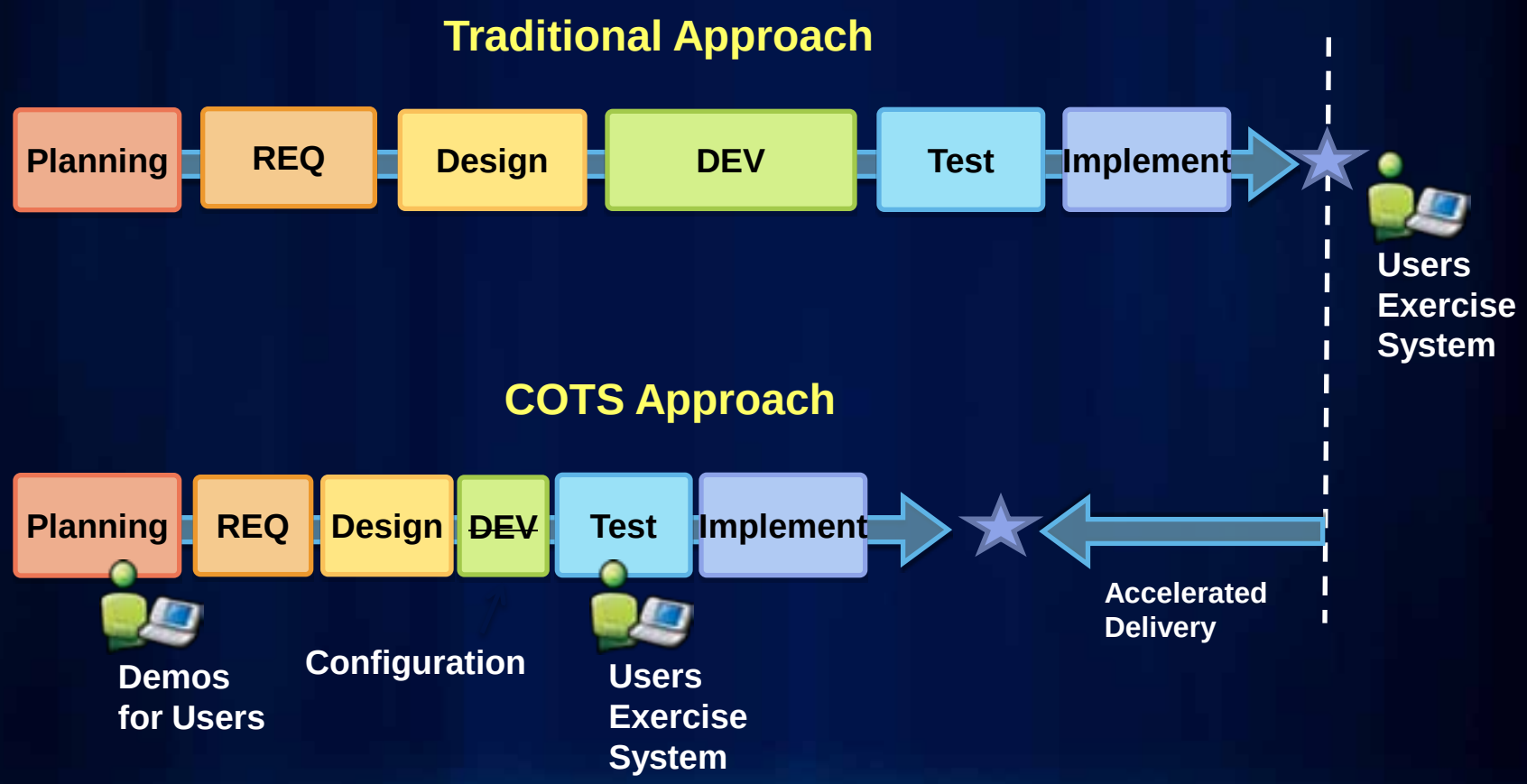
A Complete System for Enterprise GIS

Managing, maintaining, and delivering geodata to the enterprise



Deployment Considerations

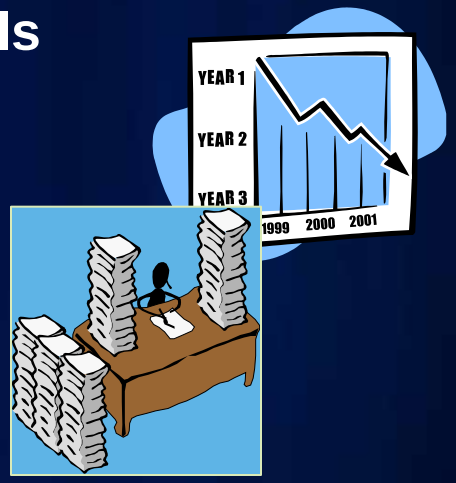
COTS Impacts to System Development Process



Planning

Identify clear project goals

- **Focus on business objectives and goals**
- **What are you trying to accomplish?**
  - **Improving productivity**
  - **Increasing revenue**
  - **Reducing cost**
  - **Supporting regulatory requirements**
- **All system requirements and technical decisions should consider business goals**



Remember you are trying to solve a business problem not engineer a new software module

Planning

Prepare for change

- **Plan project using multiple phases/iterations**
- **Plan for heavy user interaction and validation of capabilities**
- **Allows for integrating new COTS releases**
- **Provides an opportunity for intermittent training**

Phases or iterations should focus on completing a use case or scenario

COTS Based **Phased Planning**

Phase 1:
Out of Box

- **Implement base COTS release**
- Data Model – first release
- Workflows - initial configuration
- Usage Patterns – Identify
- User Roles – Define
- Architecture - establish initial infrastructure

Phase 2:
Refine

- **Implement incremental COTS Release**
- Data Model – modify based on input
- Workflows – elaborate and create new
- Usage Patterns - refine
- Architecture - Integrate with other systems

Phase 3:
Finalize

- **Implement Final COTS Deployment Release**
- Data Model - finalize
- Workflows - finalize workflows
- Architecture – plan for system implementation
- Training – develop plan

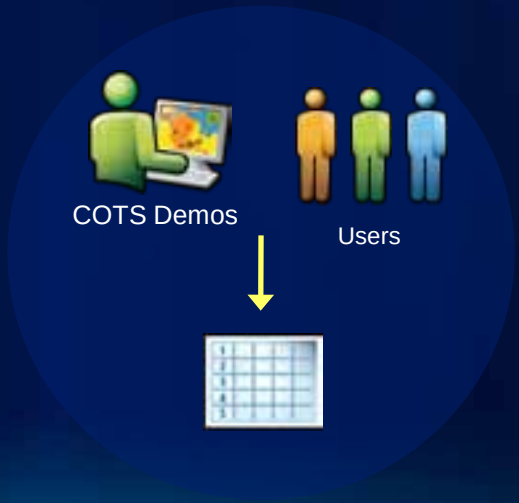
Continuous Learning & Improvement

Requirements

Do not start with a blank slate – understand & leverage existing COTS functionality

- **Focus on the "what" NOT the "how"**
- **Embrace the change – do not modify COTS technology to support an inefficient process**
- **Keep it simple**

Traditional



COTS

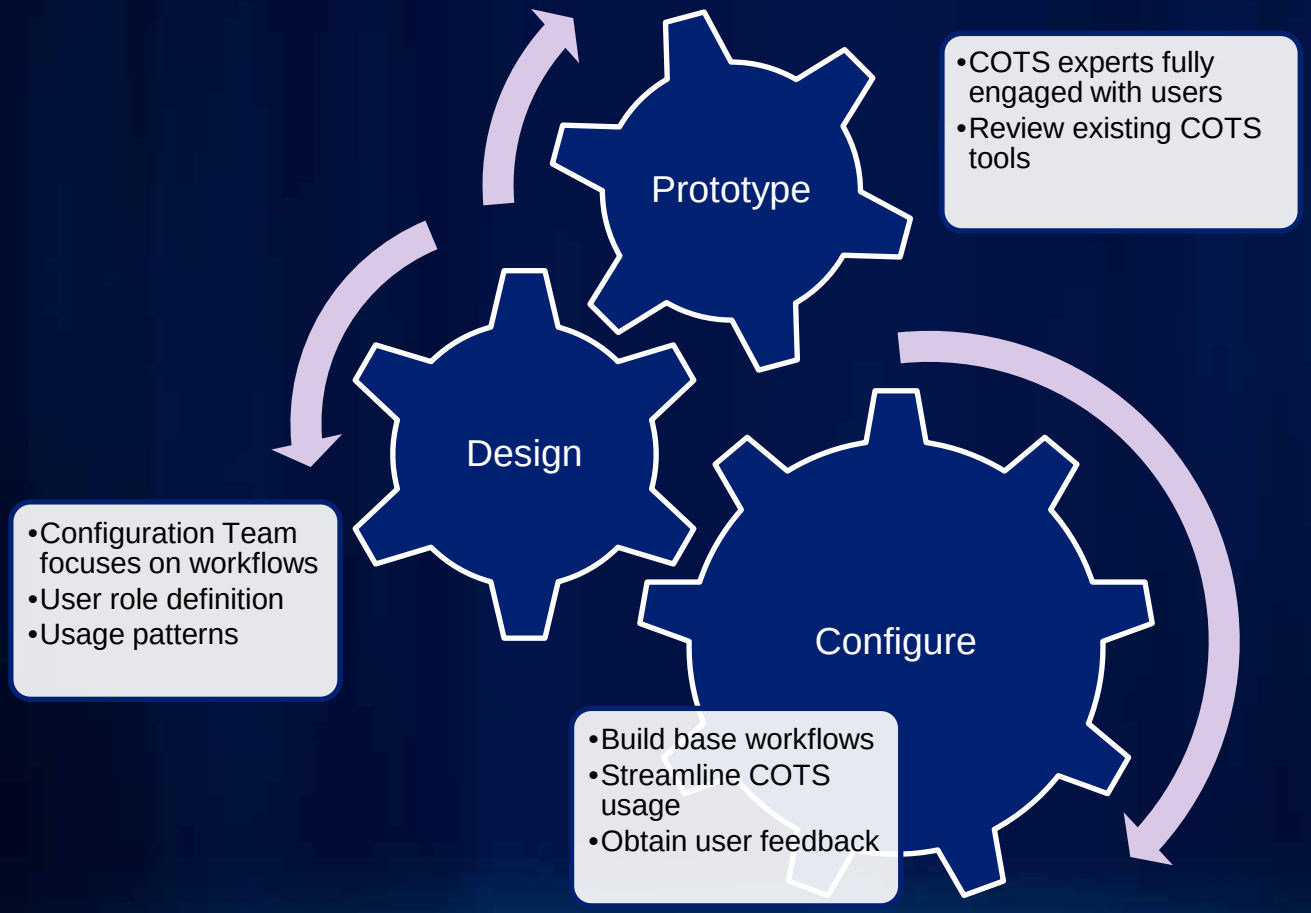
Design

Orchestration of COTS functionality

- Short focused interactive design sessions
- Heavy use of prototyping and lab environment
- End users along with COTS experts
  - Defining user roles
  - Defining workflows
  - Identifying efficiencies
  - Understanding end user access
- Consider future COTS releases

Design should emphasize delivering immediate capabilities

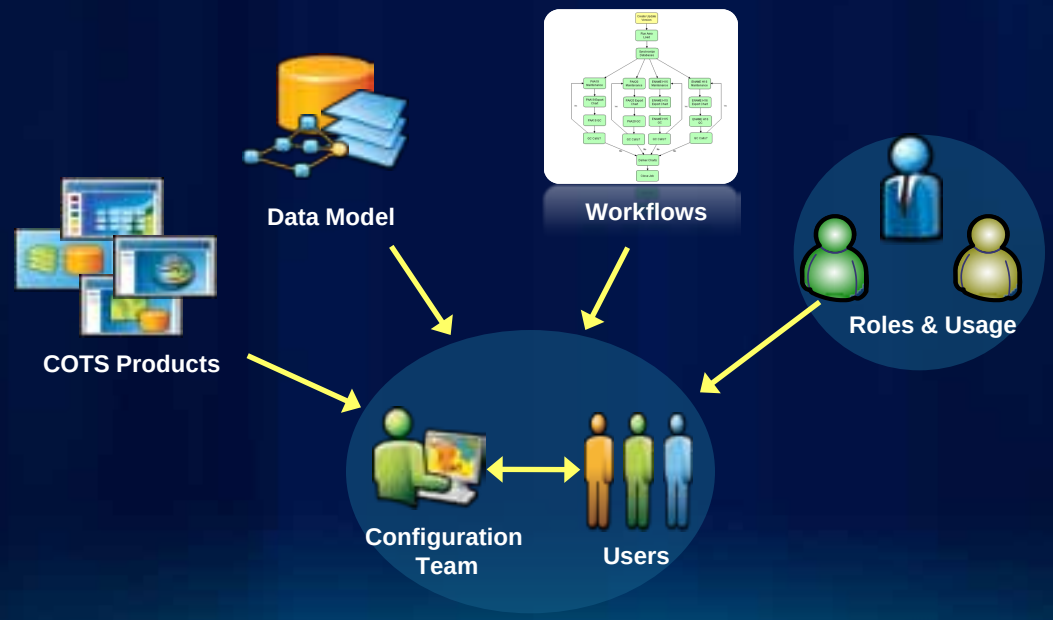
COTS Design/Configuration Process



Develop

Configuration of workflows and business rules

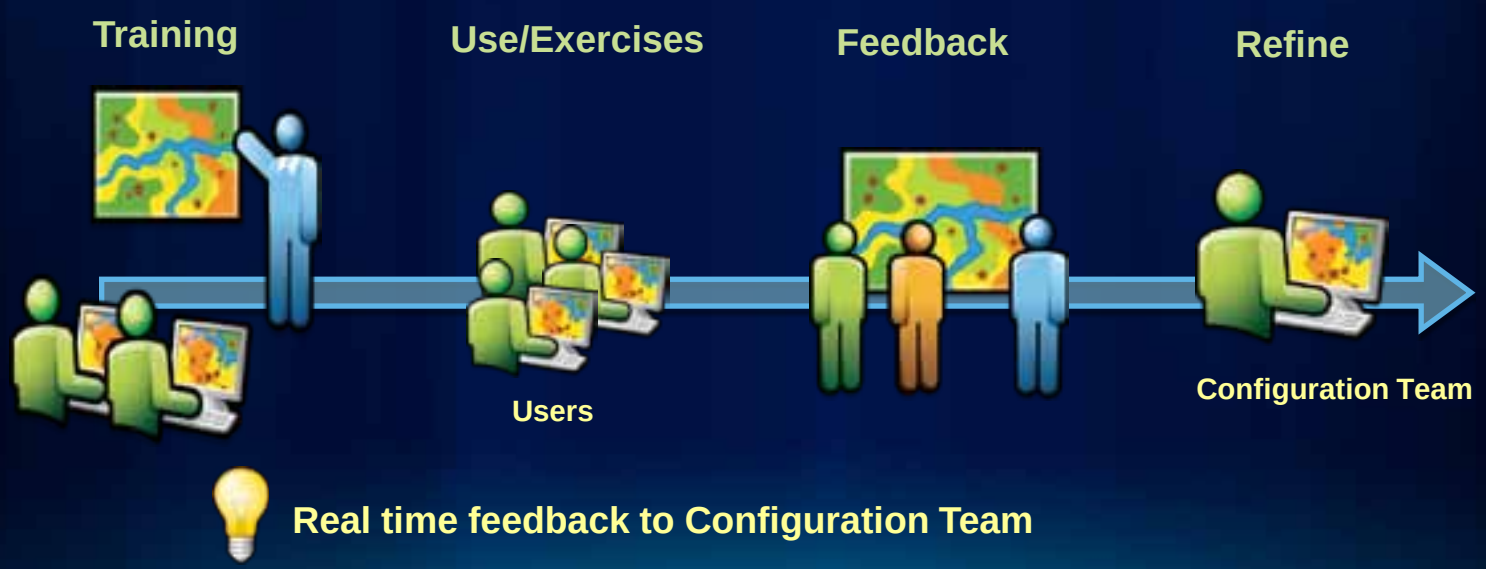
- Based on user input and feedback
- Targeted to configuration not customization
- 90% configuration 10% (or less) development



Test

Functionality proven via use case validation

- **Frequent user validation**
- **Multiple user groups to verify usage patterns**
- **Prioritize user feedback – leverage phases**
- **Use validation as training opportunity**

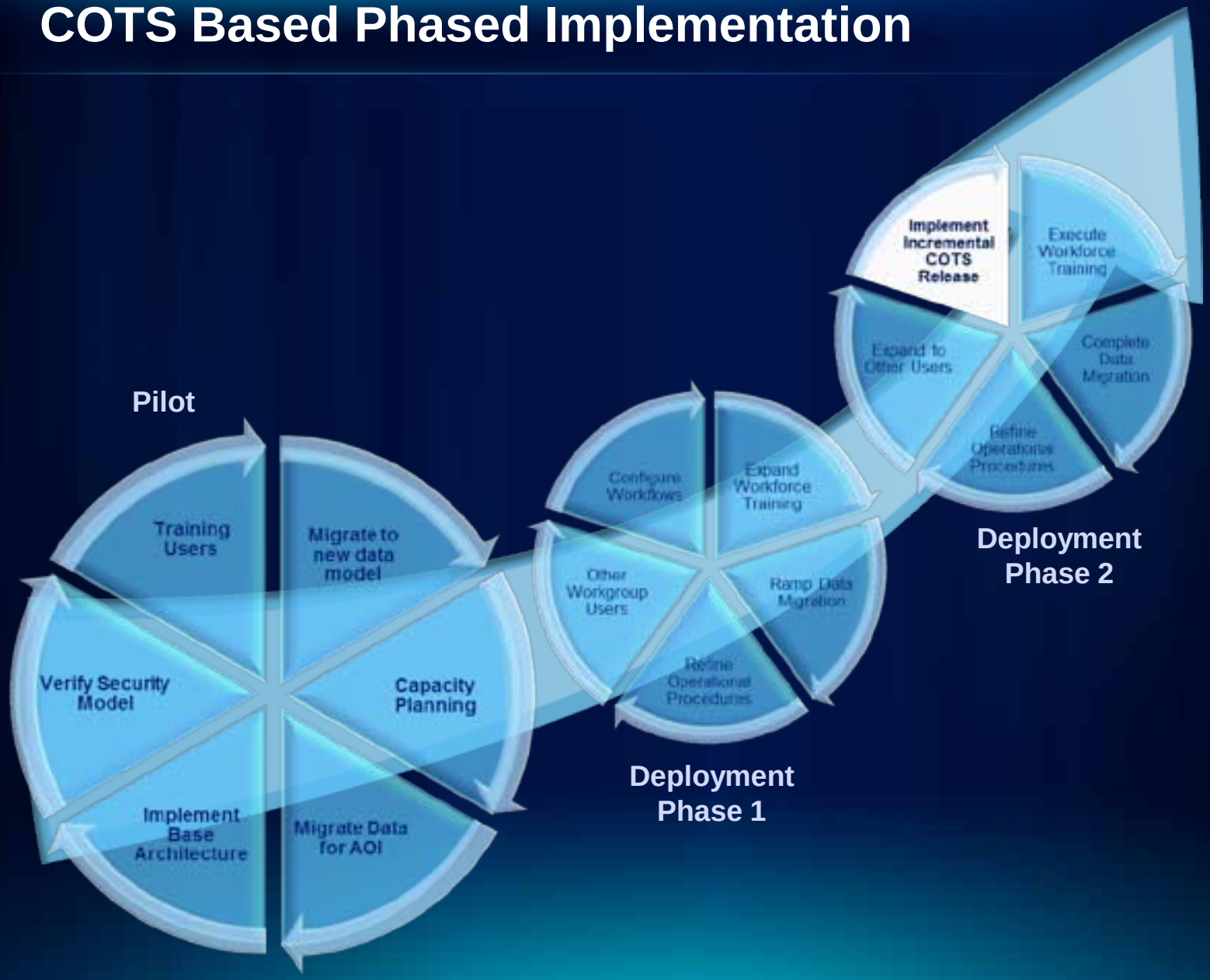


Implementation

Consider COTS release schedule in implementation plan

- **Understand you are changing process not just technology**
- **Leverage COTS training**
- **Data flow patterns**
- **IT Specifications**
- **Security considerations**
- **Administration**
  - **Who? What? Skills?**
- **Don’t forget about the data!**

COTS Based Phased Implementation



Summary

Benefits of a COTS Approach

- Minimized cost to implement
- Shorter schedule – immediate exercising by users
- Reduced risk (technology proven by user-base)
- Lowered maintenance costs
- Evolves with future COTS functionality
- Wider range of qualified people to use and maintain system

Summary

- COTS configuration is a more efficient way to approach system development
- The COTS Approach redefines system development process, with focus on mission instead of building software
- ArcGIS 10 provides a platform for configuration and rapid development – making the COTS Approach viable for many systems

Thank you!

More Info:

- COTS Approach ArcNews article
  - http://www.esri.com/news/arcnews/winter1011articles/the-cots-approach.html
- COTS Approach white paper
  - http://www.esri.com/library/whitepapers/pdfs/cots-based-approach-enterprise.pdf

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Questions?

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