



# INCOSE Spring 09



## Knowledge Management (KM)

As an Integral Component of Systems  
Engineering

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2-4 April 2009

The views expressed are those of the author and do not necessarily reflect those of the Department of the Navy or the Department of Defense.

# Objectives

1. What is KM?
2. Benefits of KM
3. KM's organizing framework
4. KM principles
5. An implementation approach
6. Developing a KM Plan
7. KM & the SE Handbook

# What is Knowledge Management?

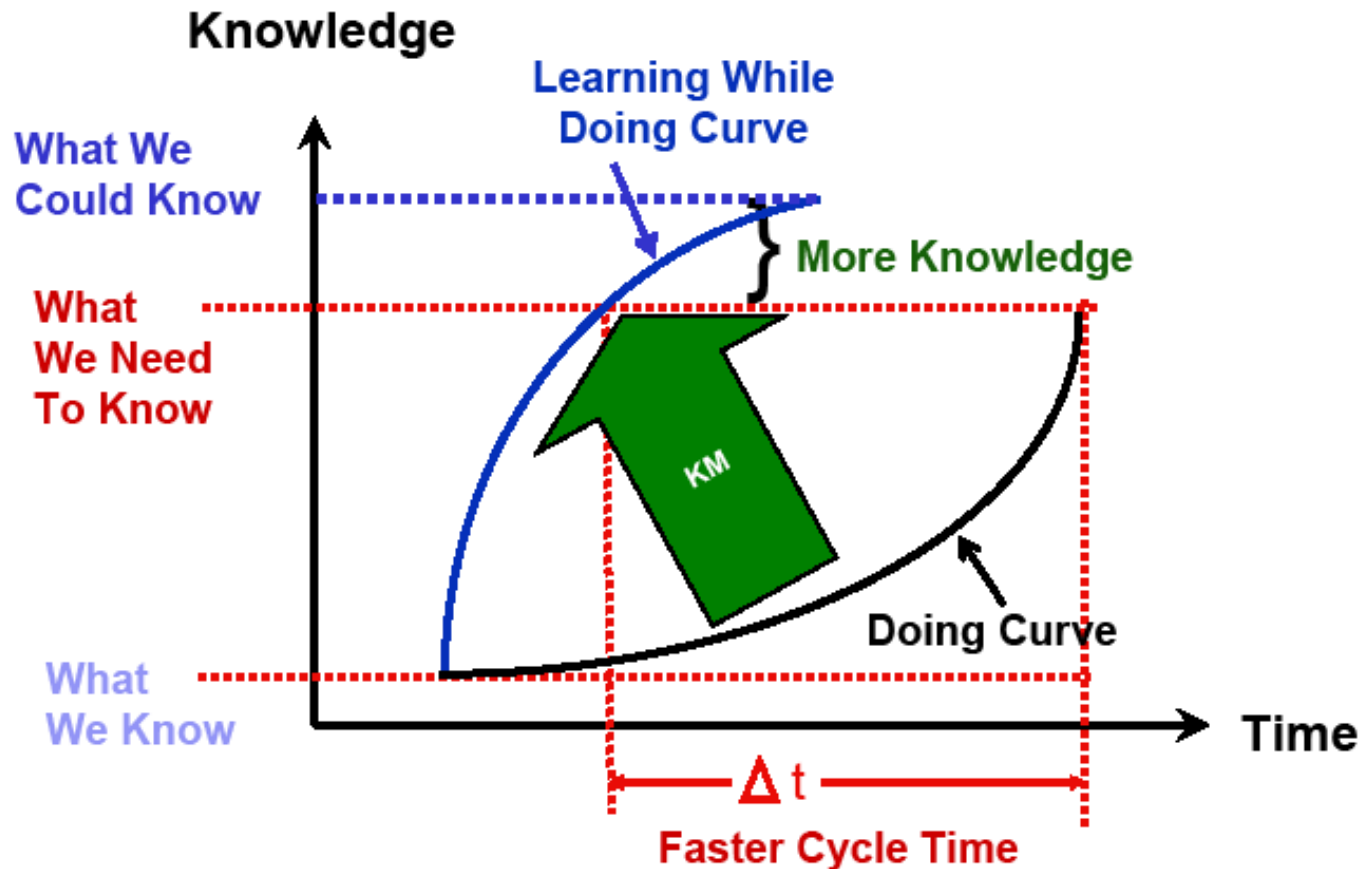
- A Definition -

Knowledge Management is a discipline that promotes an integrated approach to identifying, retrieving, evaluating, and sharing an enterprise's tacit and explicit knowledge assets to meet mission objectives. The objective is to connect those who know with those who need to know (know-why, know-what, know-who, and know-how) by leveraging knowledge transfers from one-to-many across the enterprise.

- Proposed Army Regulation 25-1 revised definition

# KM Achieves Productivity Improvement through Learning Curve Reduction

## Meeting the Knowledge Challenge



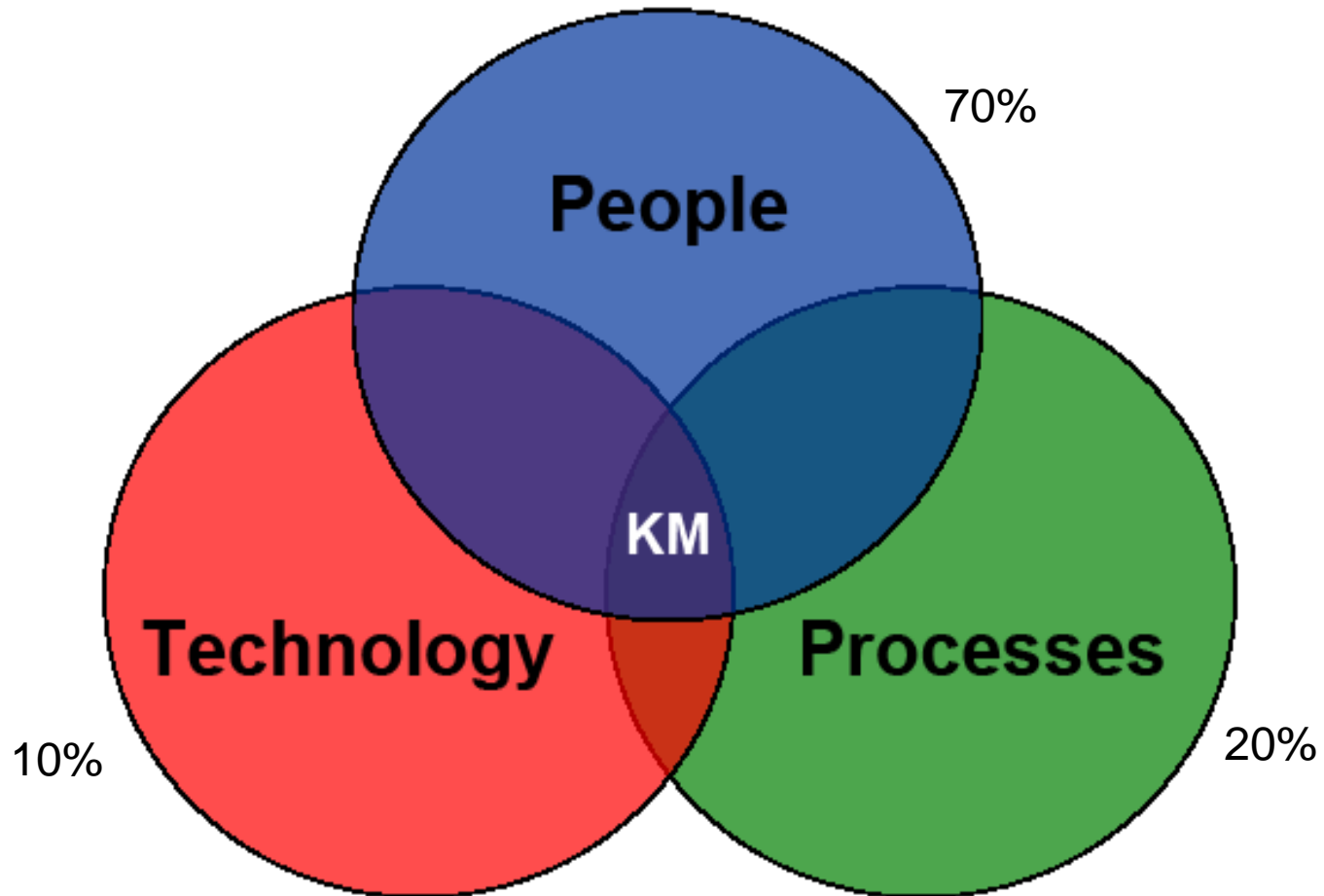
## Leverage Knowledge to Optimize Organizational Efficiency & Effectiveness

1. **Increase quality & speed decision-making** even with geographic & time zone diverse organizations.
2. **Increase productivity** through reuse of proven methods & processes and avoid duplication of effort.
3. **Obtain return on investment (ROI)** from time & cost savings.
4. **Retain corporate knowledge** of people leaving the organization & for infrequently performed processes.

## Leverage Knowledge to Optimize Organizational Efficiency & Effectiveness

5. **Improve support services** for more responsive user & customer needs providing easily accessible relevant knowledge.
6. **Increase individual ownership** & awareness of organizational goals.
7. **Improve organizational cohesion** through collaboration, shared knowledge, & expertise.
8. **Replicate gains** from improvement methodologies such as Lean/Six Sigma.
9. **Create a learning organization.**

# Organizing Framework



## People Principles

1. Train & educate KM leaders, managers, & champions.
2. Reward knowledge sharing & make knowledge management career rewarding.
3. Establish a *doctrine of collaboration*.
4. Use every interaction whether face-to-face or virtual as an opportunity to acquire & share knowledge.
5. Prevent corporate knowledge loss.

# Process Principles

1. Protect & secure information & knowledge assets.
2. Embed knowledge assets (*links, podcasts, videos, documents, simulations, wikis.....*) in standard business processes & provide access to those who need to know.
3. Use legal & standard business rules & processes across the enterprise.

- Organizing Framework -

# Technology Principles

1. Use standardized collaborative tool sets.
2. Use Open Architectures to permit access & searching across boundaries.
3. Use a robust search capability to access contextual knowledge & store content for discovery.
4. Use portals that permit single sign-on & authentication across the global enterprise including partners.

# KM Framework Model

Create, Capture, Validate, Share and Reuse Knowledge (K)

People	Processes	Tools
<ul style="list-style-type: none"><li>• Broaden awareness of KM and KM/Business Plan alignment</li><li>• Facilitate Communities of Interest/Practice</li><li>• Reward and recognize knowledge sharing</li><li>• Encourage collaboration and retention of Corporate Knowledge</li><li>• Drive an innovative K-sharing culture with education</li></ul>	<ul style="list-style-type: none"><li>• Develop and maintain KM standards/structure</li><li>• Encourage KM initiatives and methodologies as part of process improvement efforts</li><li>• Embed K assets in daily business</li><li>• Manage information</li><li>• Create a Learning Organization</li><li>• Initiate measures to evaluate KM success</li></ul>	<ul style="list-style-type: none"><li>• Build an eStrategy for KM Implementation</li><li>• Maximize enabling technologies by enlisting existing capabilities</li><li>• Enhance system integration and access</li><li>• Deploy technology that supports collaboration, K-sharing and reuse</li></ul>

## Supporting Components

Strategy

Standards/Structure  
(Institutionalizing)

Human Capital  
Development

COI/COP  
Formalization

KM Effectiveness Measures

Information Management & Technology

## Collaboration Doctrine: Develop a KM Plan

1. **Strategic Intent Statement** explains an understanding why KM is important to the organization & defines a personalized KM definition unique to the organization.
2. **Directly links to the core business objectives** that are expressed in the organization's business plan.
3. **Defines ROI through performance measures** that help the organization be more effective, more efficient & continuously innovative.
4. **Spells out these goals & objectives**, links them to a timeline in a KM Maturity Model roadmap.
5. **Assigns control & leadership for the KM initiative** while building the foundation for organizational KM Policy.
6. **Addresses performance incentives.**

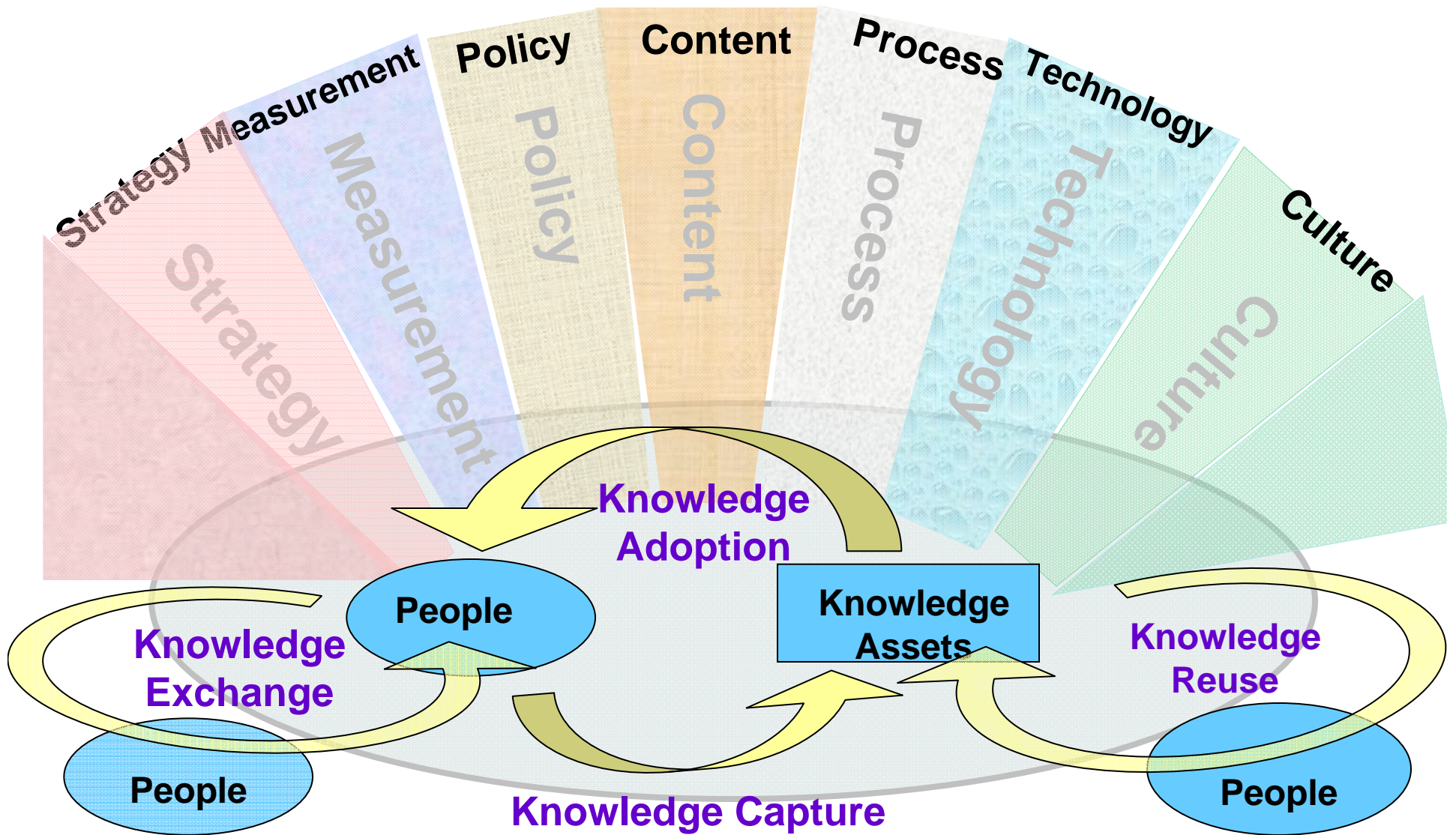
- People Principles -

## Collaboration Doctrine: Develop a KM Plan

7. **Addresses cultural & organizational behavior issues** & develops an environment that nurtures trust & relationship building.
8. **Aligns the users, the knowledge flow & the business processes.**
9. **Addresses the development of a learning organization** & the institutionalization of learning techniques.
10. **Focus is people, connected to people** through communities, sharing & learning.
11. **Directs knowledge capture, sharing, validating & reuse.**
12. **Details an enterprise-wide technology enabler.**

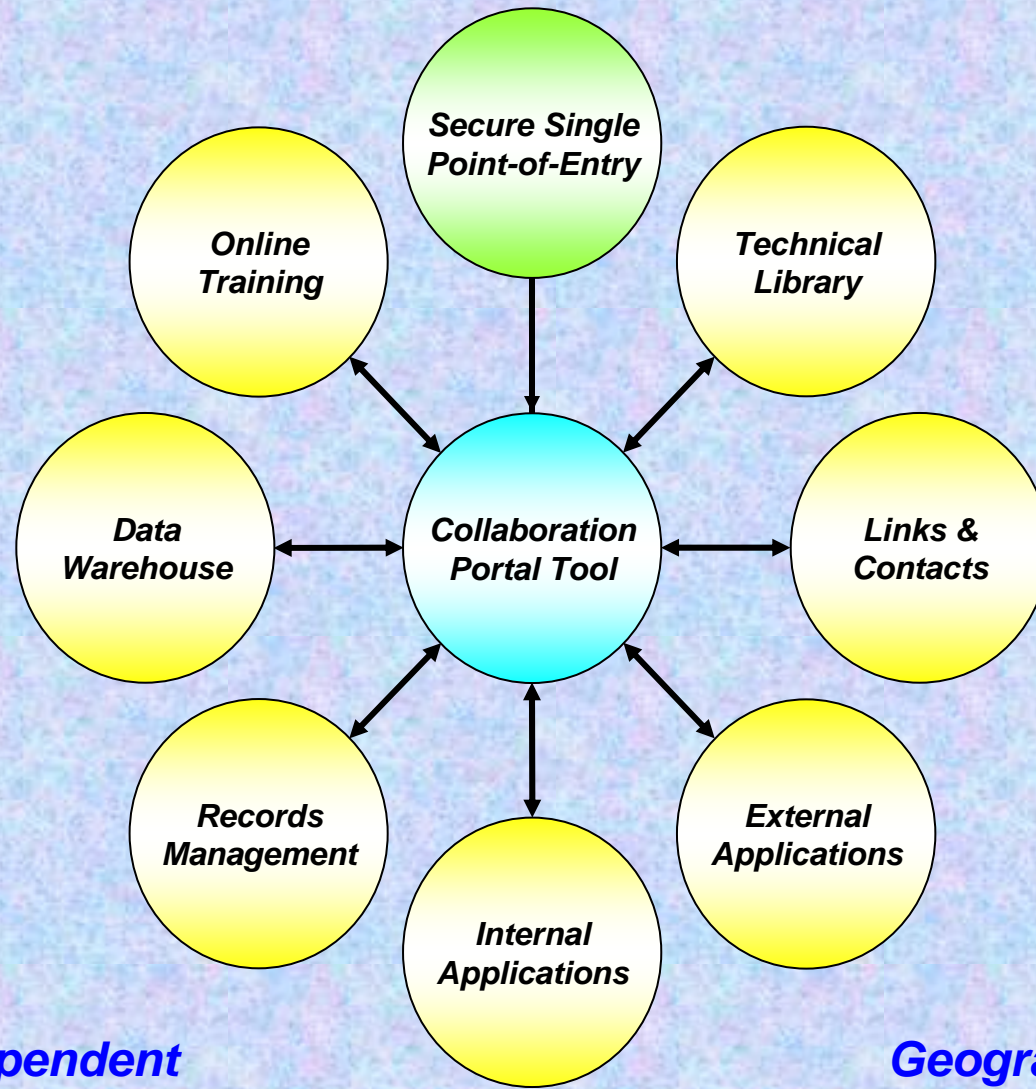
- Process Principles -

# Integrating the KM Process



- Technology Principles -

# Knowledge "Infotecture" Model

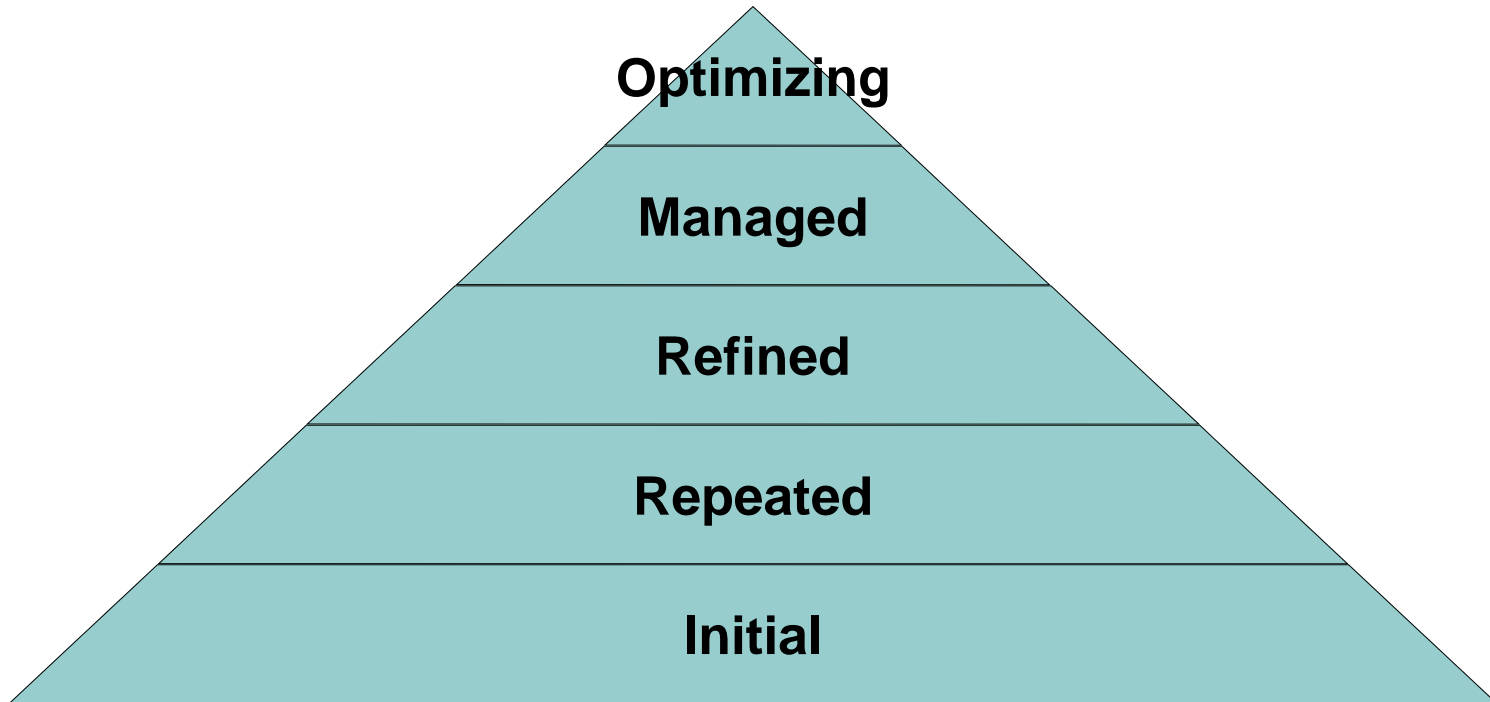


*Time Zone Independent*

*Geography Independent*

- KM Implementation -

# KM Development Model



Like the CMMI\* model, this KM Development Model has five maturity levels. To advance your organization's KM maturity:

- 1) Assess your organization's current level of KM maturity,
- 2) Develop an achievable improvement plan & *Roadmap*, and
- 3) Phase execution & measure the improvements.

\* Capability Maturity Model Integration

# Knowledge Management Roadmap



**Developing KM Strategy**

- Adaptive knowledge infrastructure is in place
- Comprehensive KM Architectural Plan is established to include subsidiary plans
- Formal Models adopted to continually evaluate KM Maturity and address gaps
- Current KM/IT situation assessed
- Resources identified and shared
- KM initiatives identified, aligned with Business Plan, and prioritized
- Virtual Collaborative program established
- Human Capital Strategy supported by KM methodologies (Professional Dev, etc.)
- Communication with suppliers and customers improved through cohesive efforts

**Enables a defined approach to Knowledge Management to support the execution of business objectives**



- Execute customer requirements with the best values solution



**Designing and Launching KM Initiatives**

- Embed KM methodology into improvement processes
- KM principals are part of enterprise culture and supported by existing IT infrastructure
- Projected ROI is starting to be realized
- Trend analysis is initiated
- Tracking processes enhanced for financial analysis improvement
- eStrategy starting to materialize
- Pilot projects foster knowledge sharing and reuse

**Enables integration of systems, trend analysis, and organization to better understand how to design & implement future KM enabling processes**



- Understand forecast and control cost
- Employ pertinent financial analysis to enable overhead control and streamlining/improving processes
- Reduce enterprise operational cost



**Expanding and Supporting KM**

- KM Maturity continually monitored, gaps identified, approaches developed
- Knowledge created and leveraged globally accessing knowledge assets when needed
- Knowledge lifecycles reviewed
- Technology with intelligent enterprise search capability ready to be evaluated and implemented
- KM initiatives sustained

**Enables a scalable process of knowledge management and additional improvements to initial KM initiatives**



- Adapt best commercial and government practices
- Improve revenue and cost center processes
- Analyze existing data to develop applicable metrics



**Institutionalizing KM**

- Organizational Learning recognized
- Systems model experts' patterns and behaviors to gather knowledge implicitly
- Seamless knowledge exchange
- Knowledge systems collaborate with experts for new and better practices
- Quality of Life increased
- Systems Thinking and Innovation part of culture
- KM approach Re-strategized

**Enables real-time capture of tacit knowledge from experts and new approaches to KM Maturity**



- Retain individual knowledge avoiding loss of corporate knowledge
- Create a Knowledge-Centric Culture

**2009**

**2010**

**2011**

**2012**

# INCOSE Systems Engineering Handbook V3.1

- Chapter 6 - Enterprise & Agreement Processes

- Enterprise Environment Management
- Investment Management
- System Life-Cycle Processes Management
- Resource Management
- Quality Management
- Knowledge Management?

Should Knowledge Management be included in the System Engineering Handbook?

# In Conclusion

1. Quality of access to, capture, & use of knowledge effects enterprise profitability.
2. Knowledge needs to be managed by the enterprise as an enterprise asset.
3. Knowledge management provides tools to achieve optimum effectiveness.
4. Knowledge management needs to be included as a topic in the Systems Engineering Handbook.



# The End QUESTIONS?

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