



Technical Leadership Development Framework

SERC RT-149

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Agenda



- Motivation
- Framework
- Framework Applications
- Conclusions



Challenges

- Building leadership capability is a primary workforce challenge (IBM's Global Human Capital Study, 2008)
- U.S. GAO has identified strategic human capital management as a high risk since 2001

Figure 9. Which are the most significant capability-building challenges facing your organization today?

(Percent)



Source: IBM Global Human Capital Study 2008.



Goals

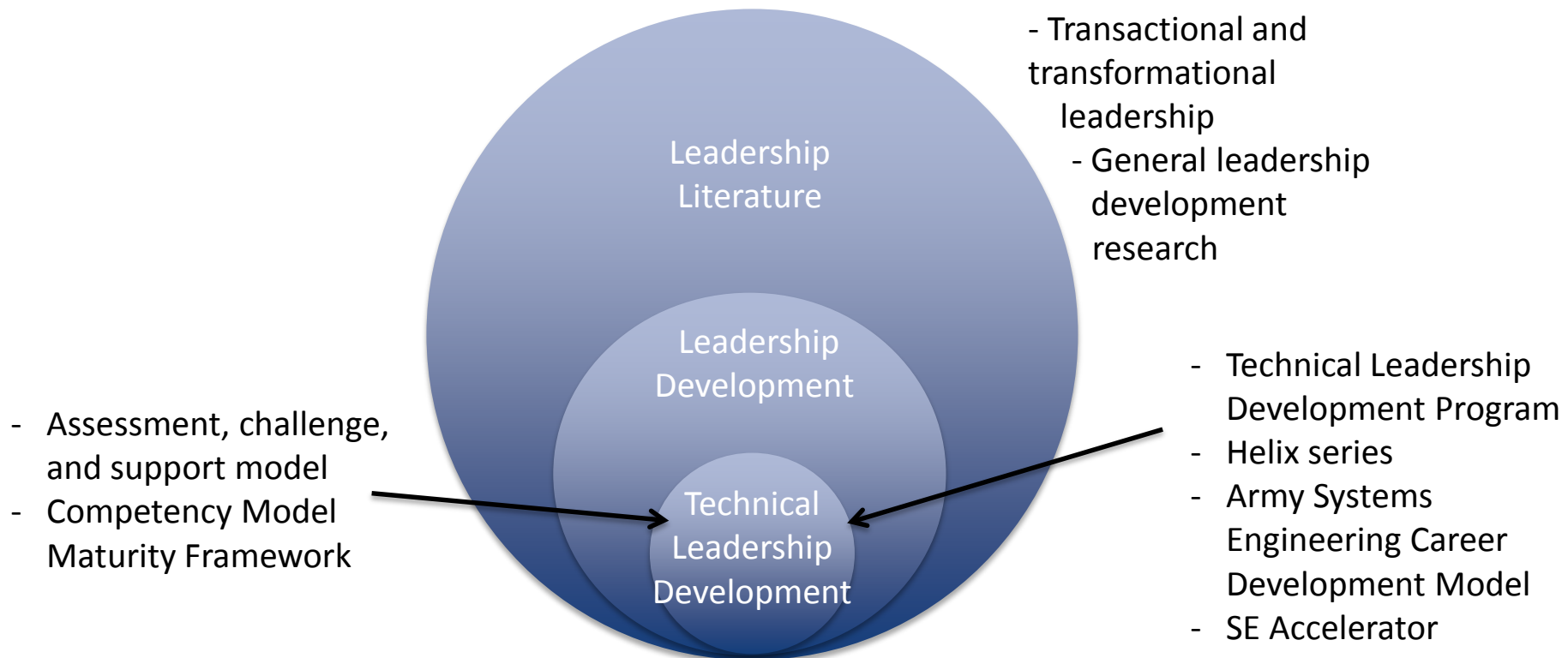
- Build bench strength of the technical (acquisition) workforce
- Mitigate personnel retirement risk
- Technical leadership required for the U.S. to maintain its lead globally (Kendall, 2013)
- DoD currently has Executive Core Qualification (ECQs) for executive-level positions, and therefore requires a structured roadmap for technical leadership to get to the ECQs from entry-level career stage



Technical Leadership Development Framework

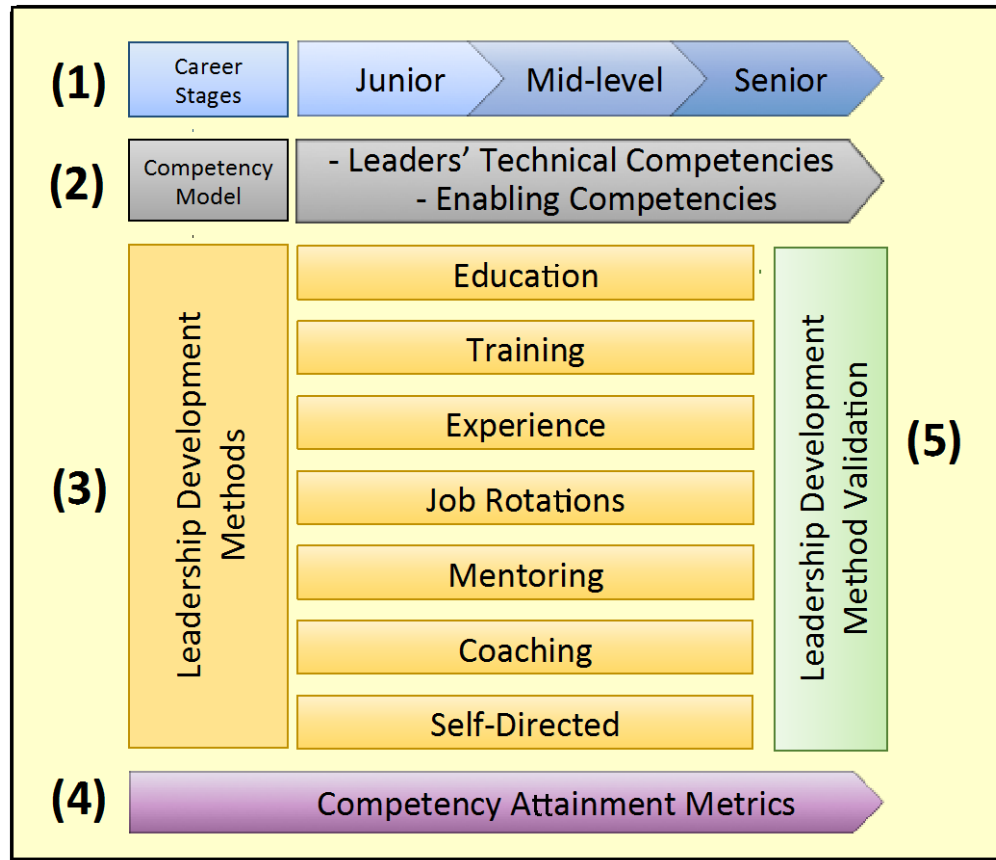
Previous Research

- Reviewed previous literature on leadership and leadership development, with a particular focus on technical leadership development



Framework Overview

- Created a five element architecture for building an effective career development model





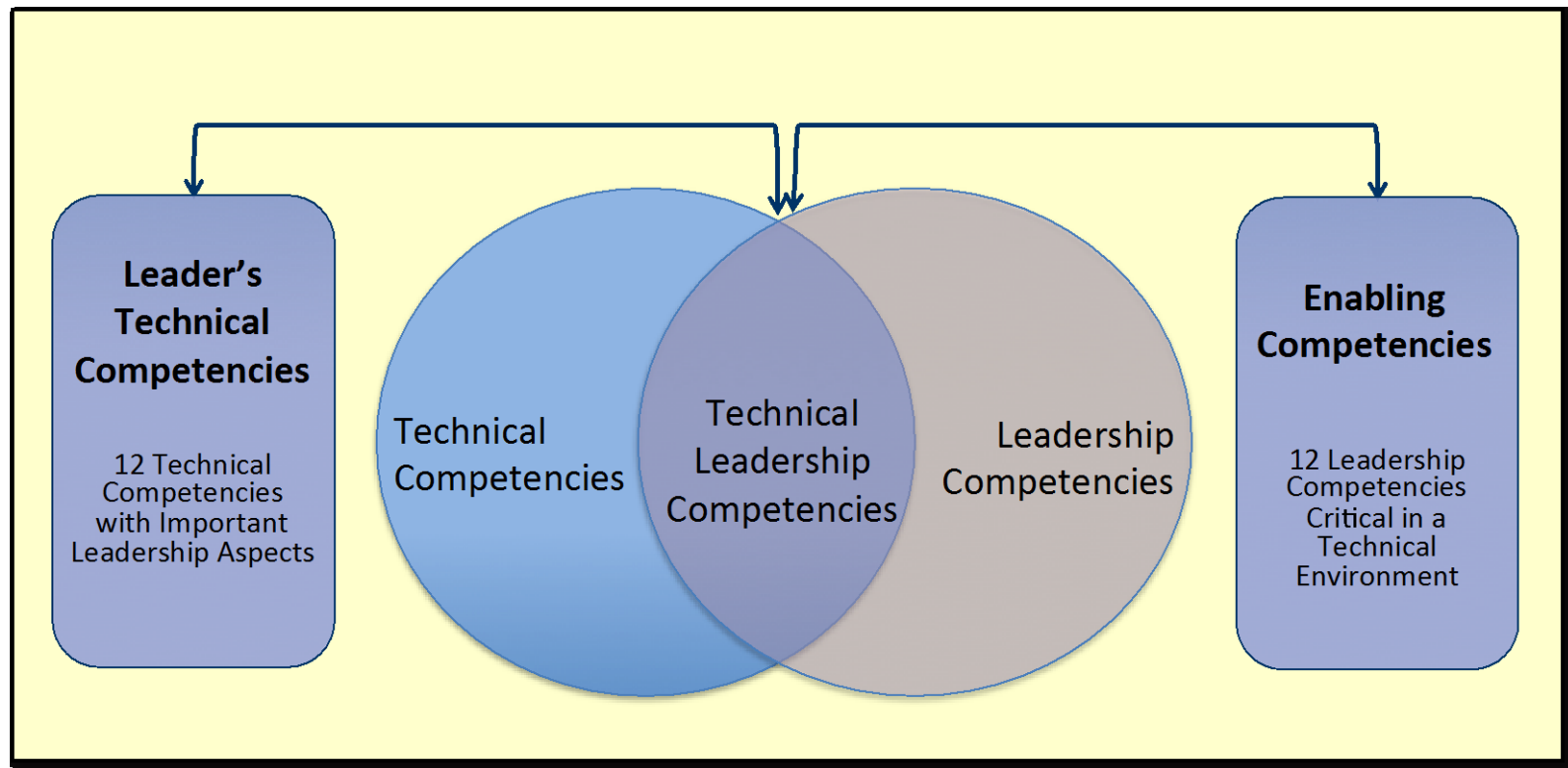
(1) Career Stages

- Examined existing models; found general consistency; incorporated GSA model features

Career Stage	Junior	Mid-level	Senior
People Responsibility	Managing one's self	Managing the team	Managing managers
Program Responsibility	Not responsible for any programs	Decision-making authority over programs having a limited to moderate level of size, scope, and complexity	Decision-making authority over programs having a large level of size, scope, and complexity
Knowledge Responsibility	Introductory level of professional expertise	Intermediate level of professional knowledge and expertise	Expert level of subject matter expertise, expanding breadth and depth

(2) Competencies

- Identified 24 existing technical leadership competencies, and validated them through interviews with recognized technical leaders





(2) Competencies

- 24 technical leadership competencies

Leader's Technical Competencies

- 1.1 Technical Planning
- 1.2 Technical Requirements Definition and Analysis
- 1.3 Logical Decomposition
- 1.4 Product Verification and Validation
- 1.5 Product Transition
- 1.6 Lifecycle
- 1.7 Technical Risk Management
- 1.8 Systems Thinking
- 1.9 System Complexity
- 1.10 Big Picture Thinking
- 1.11 Abstraction
- 1.12 Paradoxical Mindset

Enabling Competencies

- 2.1 Developing People
- 2.2 Leading People
- 2.3 Thinking Critically
- 2.4 Building Trust
- 2.5 Communicating Effectively
- 2.6 Establishing & Maintaining Stakeholder Relationships
- 2.7 Influencing Others
- 2.8 Developing Strategy and Vision
- 2.9 Fostering Agility
- 2.10 Promoting Innovation
- 2.11 Building Government Acumen
- 2.12 Possessing a Macro Perspective

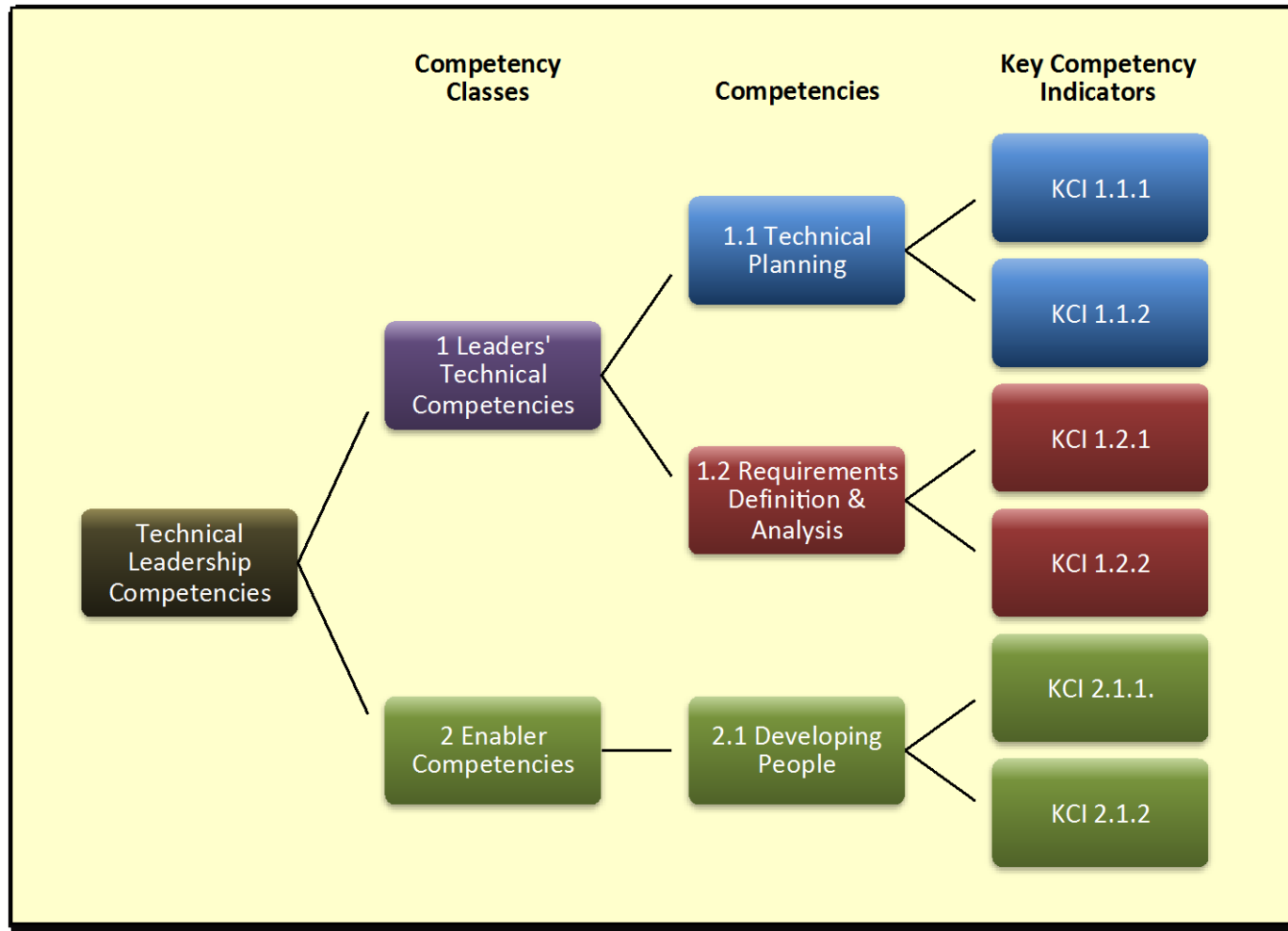


(2) Competencies

- For every combination of competency and career stage, identified key actions – key competency indicators

Career Stage		
Junior	Mid-Level	Senior
Competency Class 1: Leaders' Technical Competencies		
<i>1.1 Technical Planning</i>		
<ul style="list-style-type: none"> • Develops technical plan for a specialized item, under the coaching of mid-level leaders; • Relays convincing, clear and relevant information from the specialized item technical plan to mid-level leaders. 	<ul style="list-style-type: none"> • Develops and details out the technical plan for a system to fit into the overall technical plan for a large (or complex) system; • Reviews and approves technical plans for specialized items developed by junior-level leaders; • Guides, directs and coaches junior-level leaders to detail out a technical plan for a technical component; • Provides clear direction from the system-level technical plans down the hierarchical levels to junior-level leaders; • Relays convincing, clear and, relevant information from the system-level technical plan to senior-level leaders; 	<ul style="list-style-type: none"> • Develops overall technical plans, for a large (or complex) system, that: <ul style="list-style-type: none"> – Support the strategy, vision, mission and long range goals (which recognize needs) of the organization or enterprise; – Provide direction to mid-level leaders; – Is aligned with and supports the plans and objectives of peer organizations, both technical and non-technical; – Reflect the technical impact of the superior organization or enterprise's strategies and missions. • Reviews and approves technical plans for a product or a system developed by subordinate suborganizations; • Guides, directs and coaches mid-level leaders to detail out the overall technical plan for a large (or complex) system into the appropriate detailed plans; • Provides clear direction from the technical plans down the hierarchical levels to subordinate suborganizations and their leaders; • Relays convincing, clear and, relevant information from technical

(2) Competencies



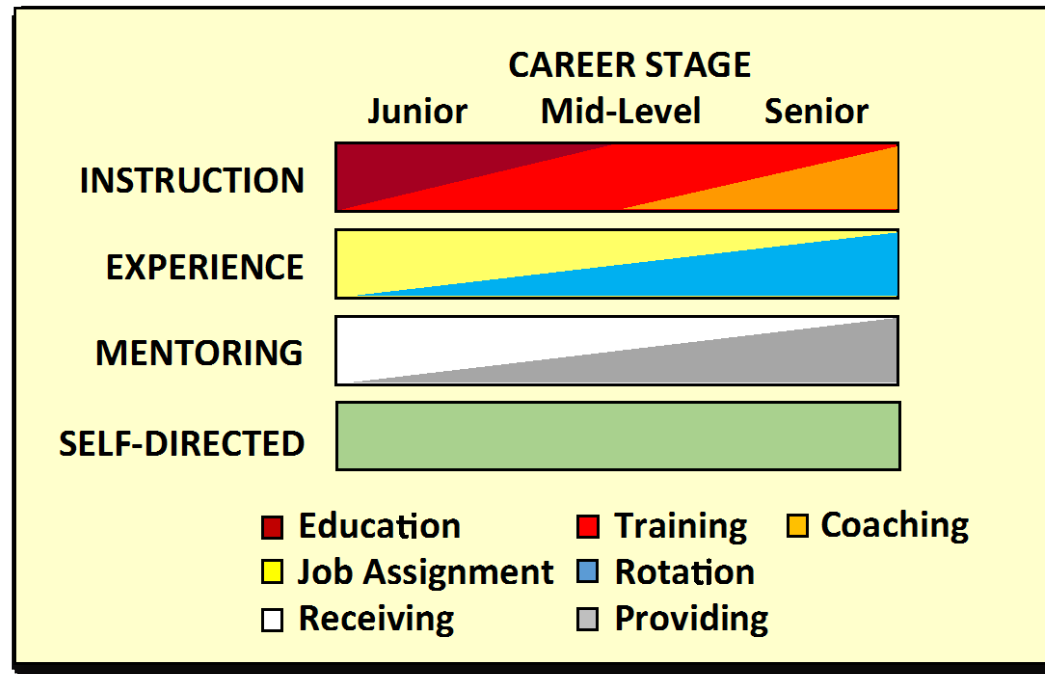
(3) Development Methods



Development Method	Definition
Education	The formal instruction received from academic or government institutions, typically resulting in a Bachelor, Master or Doctoral degree.
Training	The formal instruction received from government, corporate, or academic institutions, spanning multiple weeks to multiple years, such as DAWIA Levels I – III, focusing on technical and/or leadership instruction.
Experience	The process of gaining work knowledge and skills from performing in a specific role directly.
Rotational Assignments	Allows the leader to broaden their skills by providing different experience in terms of function, role, or geographic location.
Mentoring	Mentoring consists of formal or informal advising or developmental relationship with a more senior leader, in a one-to-one context.
Coaching	Coaching is distinguished by a focus on applied, goal-oriented learning and behavioral change, also in a one-to-one context.
Self-directed	Taking the initiative to learn without direction from someone else, such as through reading books, or observing other leaders

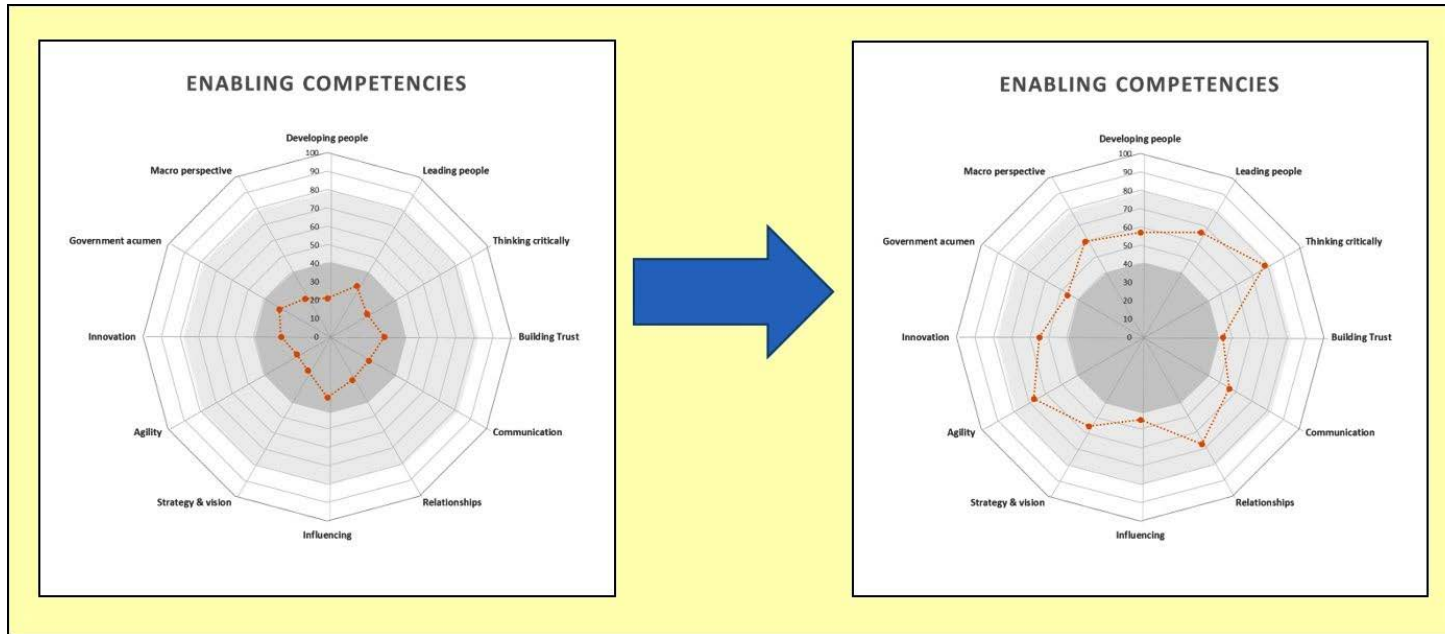
(3) Development Methods

- Evaluated the generally accepted development methods and assessed their applicability for developing technical leaders at each career stage



(4) Competency Attainment

- Identified a number of approaches in use and selected one with demonstrated effectiveness



Initial Baseline

Results after applying leadership development methods



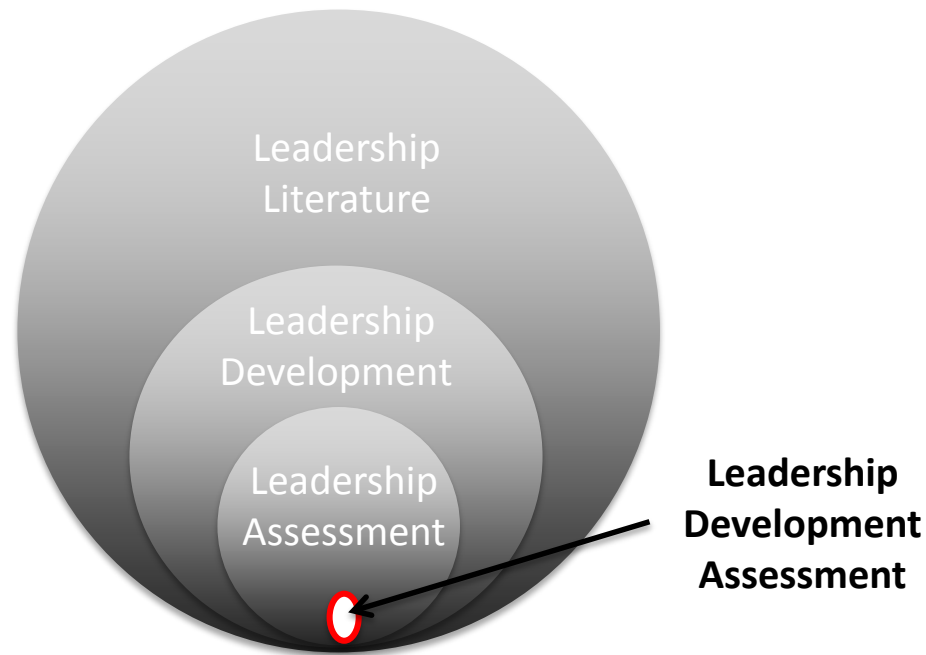
(4) Competency Attainment

- The spider plots are obtained using evidence-based accomplishment and 360 degree feedback

Competency	KCI	Accomplishment	Rater #1
1.1 Technical Planning	Develops technical plan for specialized item	Delivered program plan for milestone 1.0 of Program 1234. Milestone 1.0 was achieved on-time.	○ ○ ○ ● ○
1.1 Technical Planning	Relays clear and relevant info from plan to mid-level leaders	Presented program plan for milestone 1.0 of Program 1234 to mid-level leaders for their review.	○ ● ○ ○ ○

(5) Method Validation

- Reviewed the existing literature and found little systematic assessment of leadership development techniques





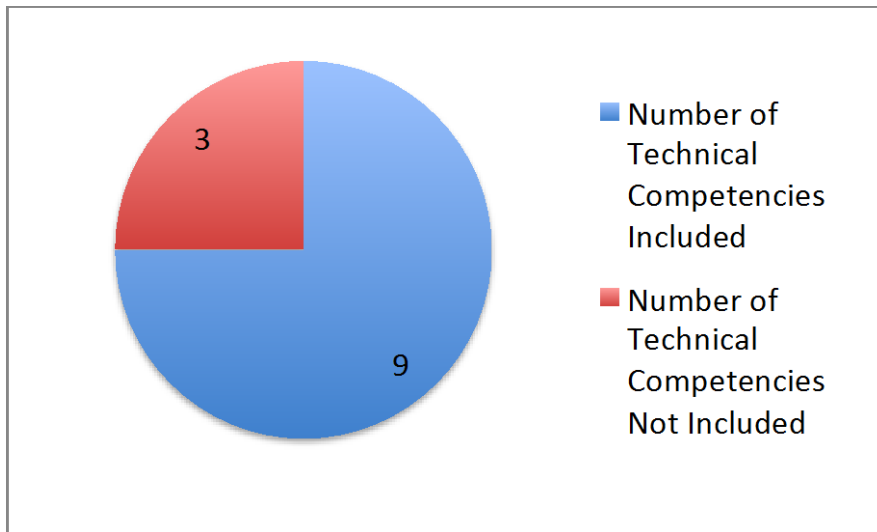
Technical Leadership Development Framework Applications



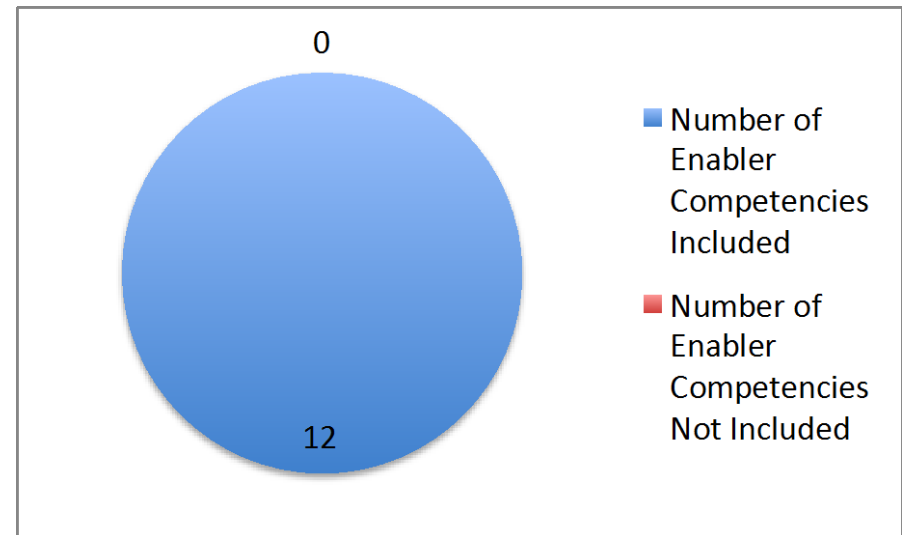
Curriculum Assessment

- Evaluated DAU technical acquisition curriculum by competency, area, career stage, and key competency indicator

Leader's Technical Competencies



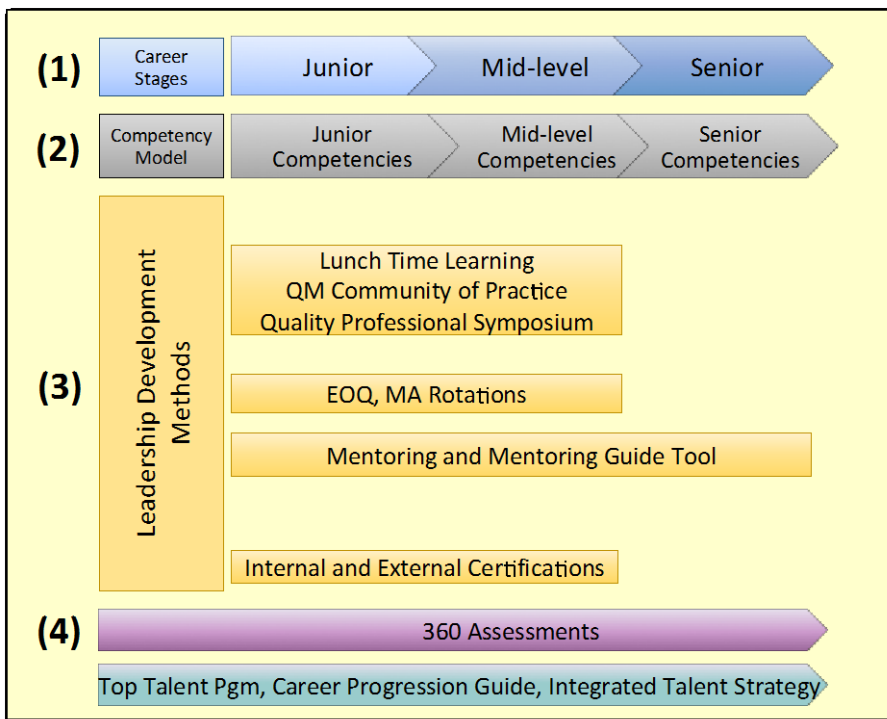
Enabling Competencies



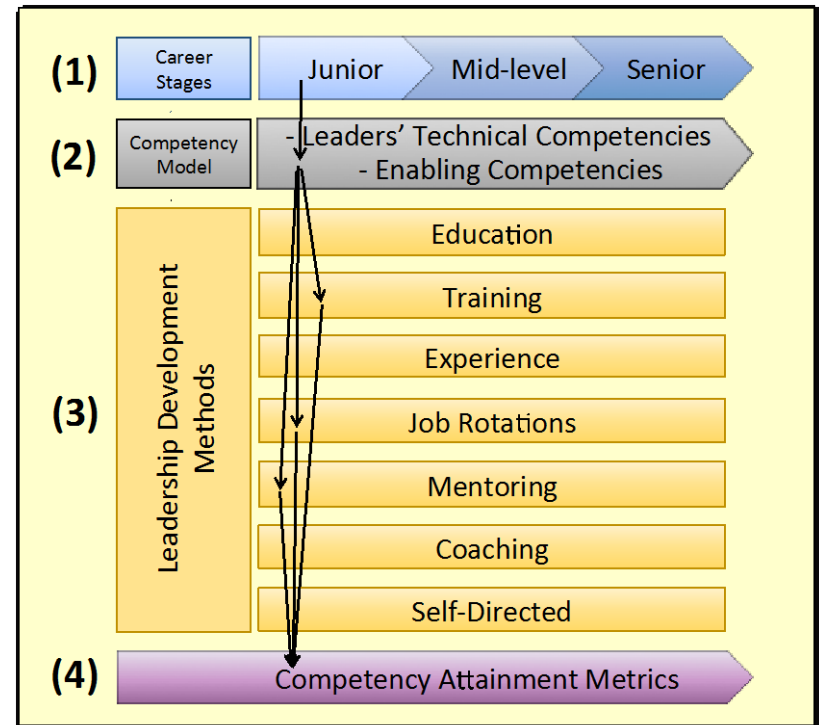
Career Models

- Used Framework to structure benchmarking of career models used in government and industry

Benchmarking Example: Raytheon



Career Model





Concept of Operations

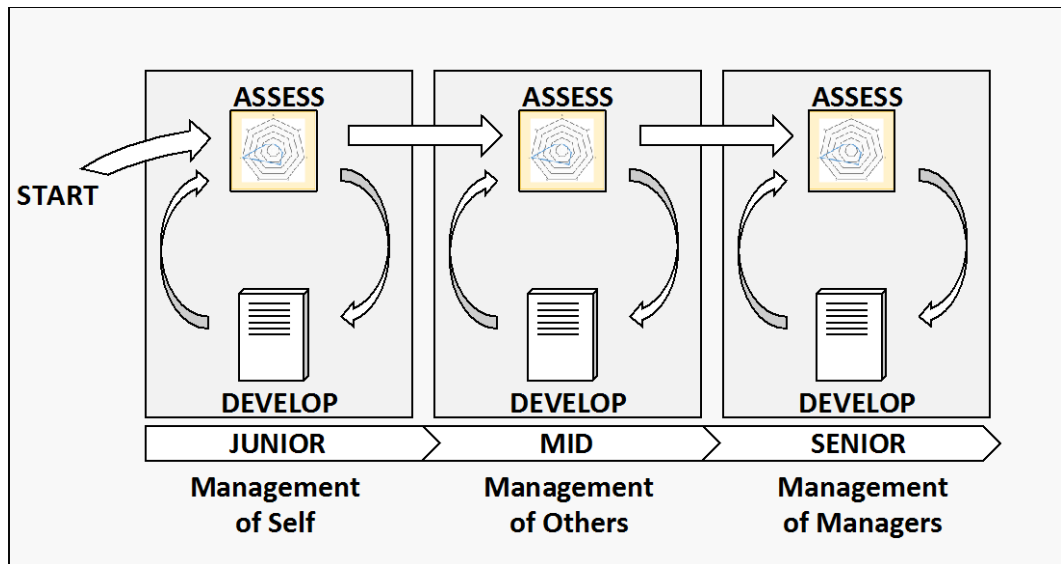
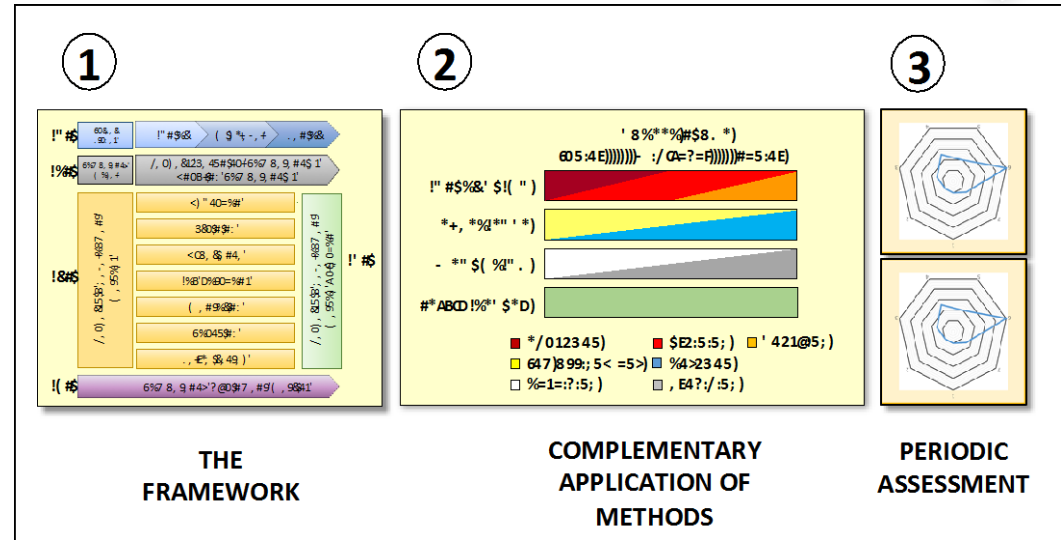
- Formulated and adopted four fundamental principles

Four Fundamental Principles

1. Conscious and systematic application of development methods to foster competencies;
2. Systematic evaluation of capability attainment through the evaluation of individual accomplishments;
3. Flexible application of the Framework and Career Model to meet the needs of individuals, commands and career fields;
4. Personal ownership of each individual's career development

Concept of Operations

- Described how the model can support a process of continual competency building and systematic assessment by individuals and their supervisors





Guidebook

- Developed Guidebook to assist in further operationalization of the Framework

Guidebook Summary

1. Identified roles and responsibilities (executive sponsor, developing technical leader, supervisor);
2. Developed high-level deployment strategy;
3. Gathered preliminary data linking technical leadership competencies with leadership development method by career stage;
4. For the summary results, provided specific sample leadership development methods.



Conclusions

Our research has:

- Established a technical leadership development framework and a career model based on previous research and the best subject matter expertise
- Provided guidance on training and developing technical leaders at the junior, mid-level and senior stages of their careers
- Established a mechanism that can enable technical leaders to take ownership of their own development to advance their careers



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