Developing an Approach for Effective Transition of a TSP Team to Meet Project Goals

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Trademarks and Service Marks

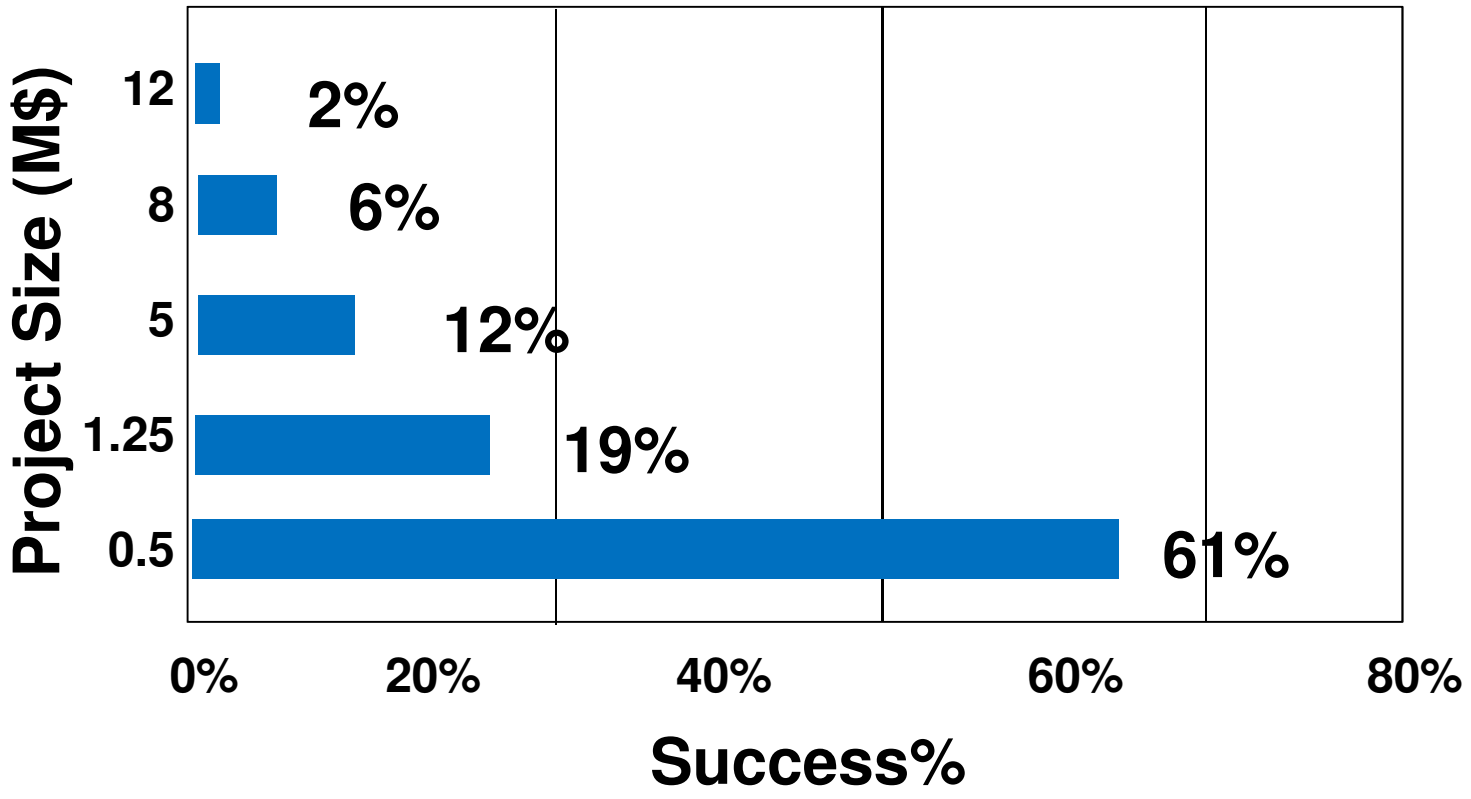
The following are service marks of Carnegie Mellon University.

- Team Software Process[SM]
- TSP[SM]
- Personal Software Process[SM]
- PSP[SM]
- CMMI[SM]

Overview

- Problem: Poor knowledge management contributes to the failure of most large development projects
- How TSP teams use knowledge management to produce superior results
- The Tacit Knowledge Management Method
- PSP/TSP Tacit Knowledge Management
- Conclusion

Traditional Large Software Projects Are Rarely On Time and On Budget



Adapted from the Standish Chaos Report – 2009 (presented by W. Humphrey, TSP Symposium 2009)

Why Traditional Large Software Projects Fail

- Large, non-TSP projects often fail to meet delivery schedule, cost, and product quality objectives.
- Such projects require larger teams and teams of teams where communication is challenging.
- Schedule, cost, and quality failures often occur when customers, management, and team members do not communicate effectively.
- Other development team failures usually include:
  - Poor project planning (poorly defined project goals and inaccurate, imprecise, biased estimates)
  - Ineffective management of progress and quality

First Key: Managing Knowledge Work

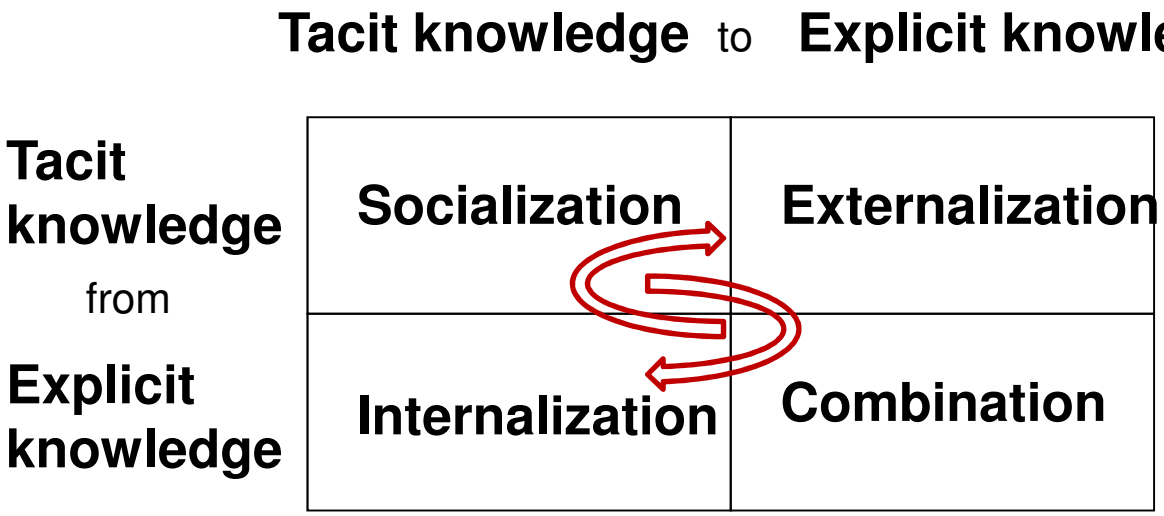
Managing project knowledge work can make the difference between success or failure of large projects.

Two Types of Knowledge by Nonaka I., Takeuchi H

Tacit Knowledge (Subjective)	**Explicit** Knowledge (Objective)
•Knowledge of experience (no appropriate reasoning) •Simultaneous knowledge (here and now) •Practice (analog knowledge)	•Knowledge of rationality (with justified reasoning) •Sequential knowledge (there and then) •Theory (digital knowledge)

Ref. Nonaka I., Takeuchi H., The Knowledge Creating Company, (1995), Oxford University Press.

Knowledge Is Created and Evolves …



SECI Model

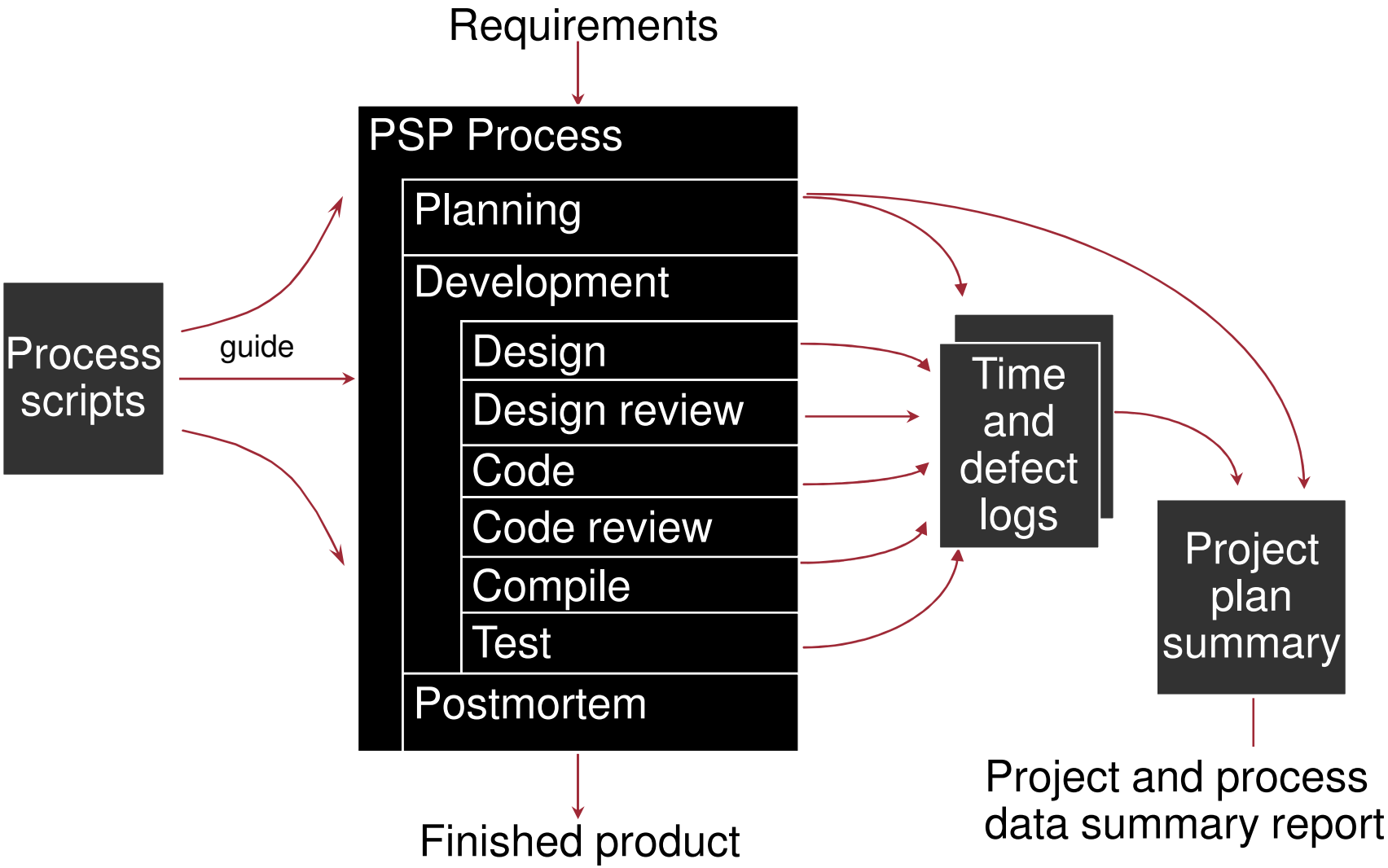
Nonaka I., Takeuchi H., The knowledge creating company, (1995), Oxford university Press.

Second Key: Effectively Managing Knowledge Work with PSP/TSP

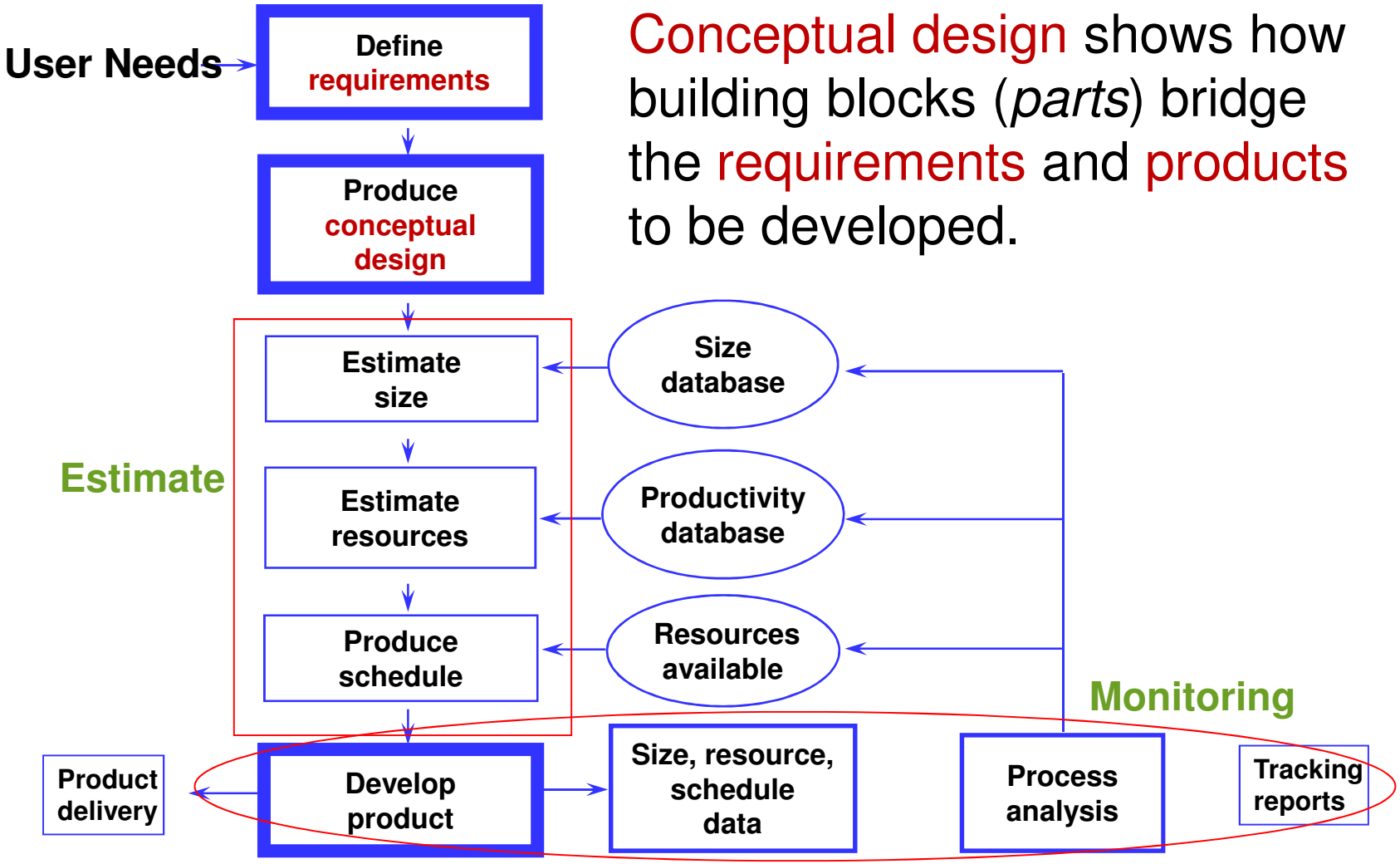
PSP and TSP provide tools to realize the SECI knowledge transition model

This managing of knowledge work enables the success of your large projects.

The PSP Training

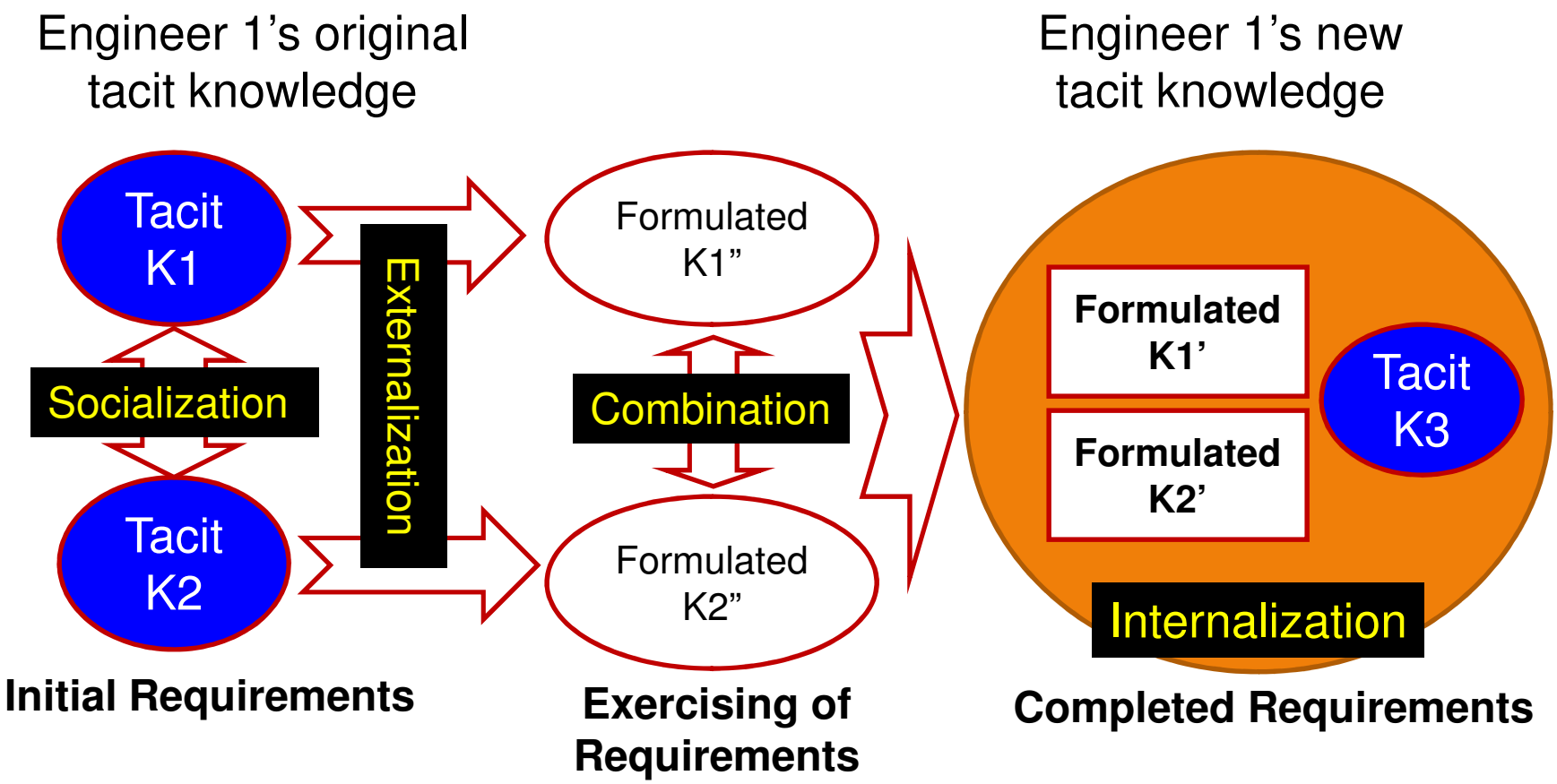


PSP – The Planning Framework

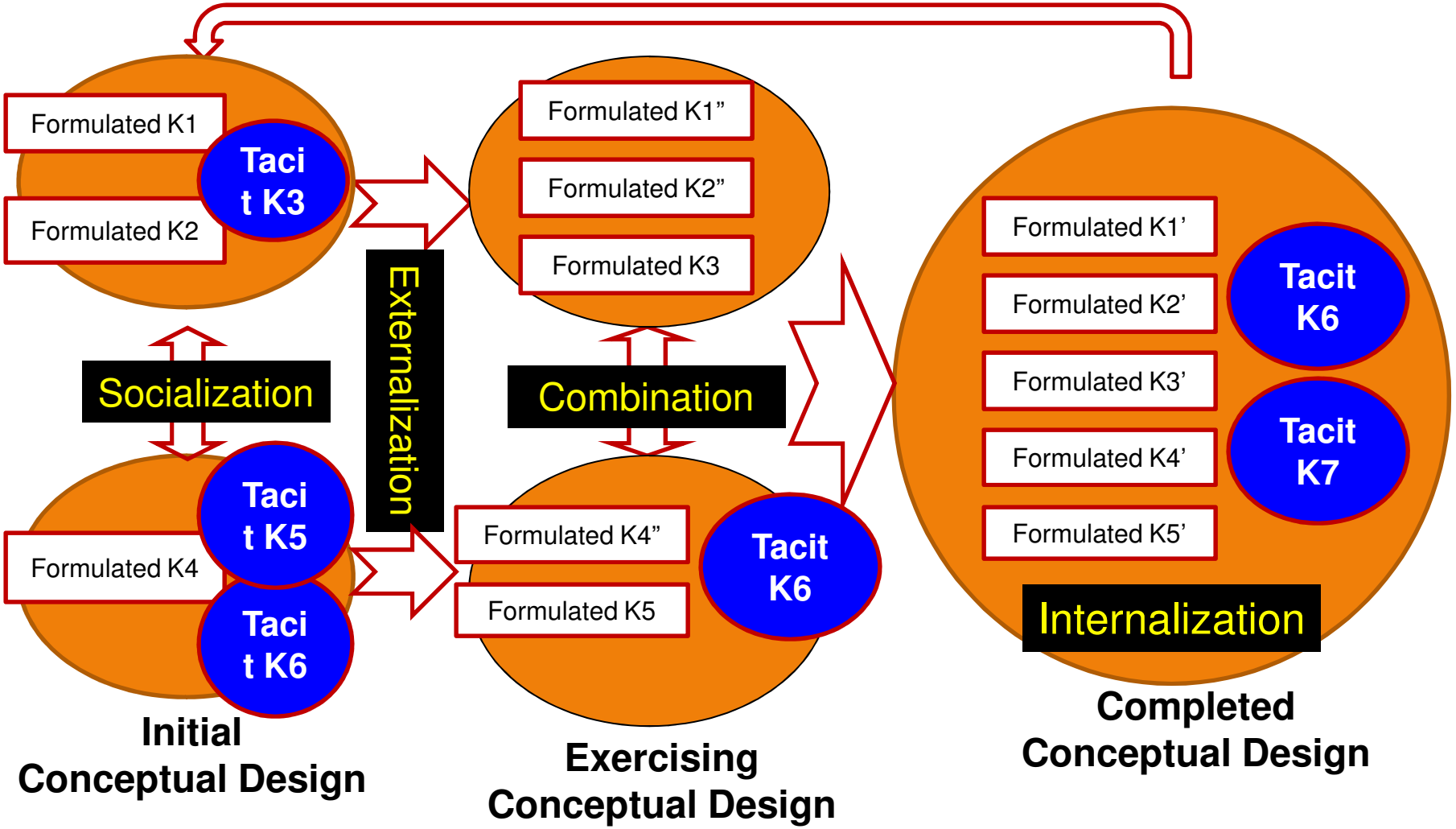


Conceptual design shows how building blocks (*parts*) bridge the requirements and products to be developed.

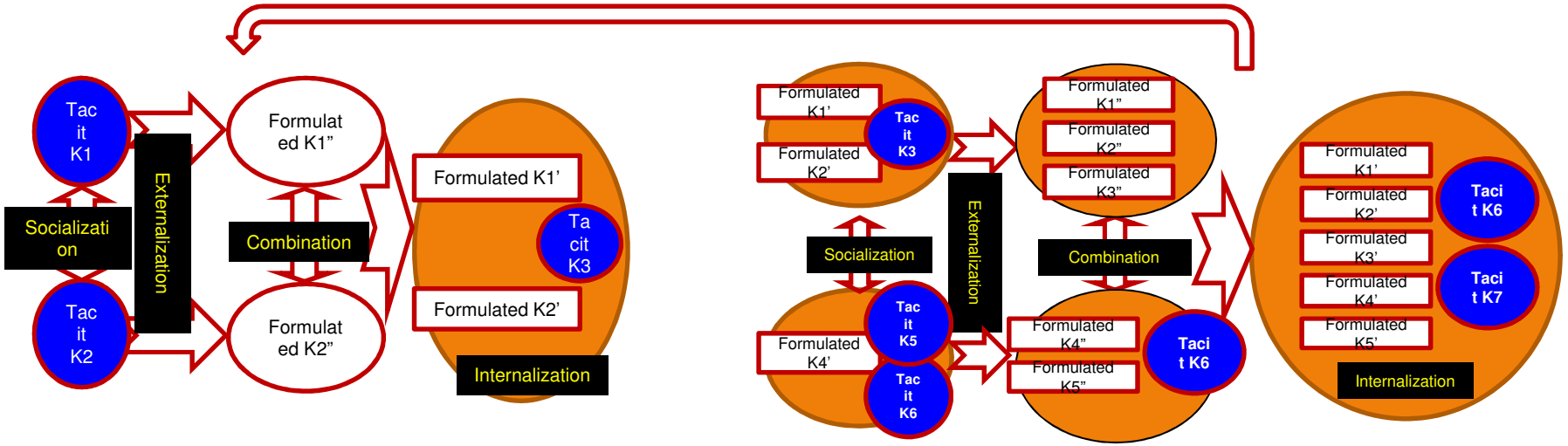
SECI Model for PSP Training -1



SECI model for PSP Training -2



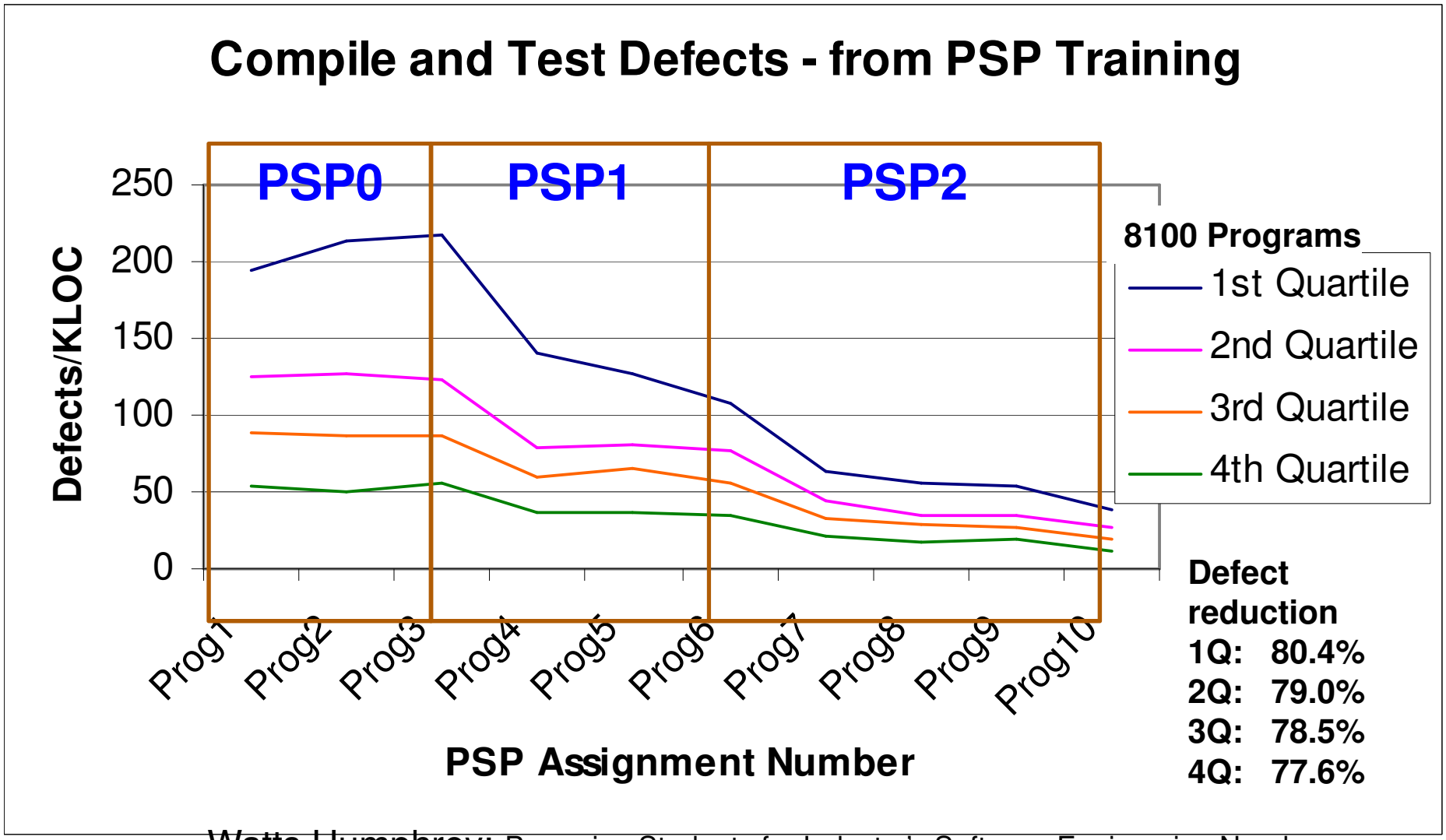
SECI model for PSP Training -3



- Estimate
- Task Plan/Schedule Plan
- Design/Design Review
- Code/Code Review
- Test
- Report

- PIP
- Etc.

Improving Quality

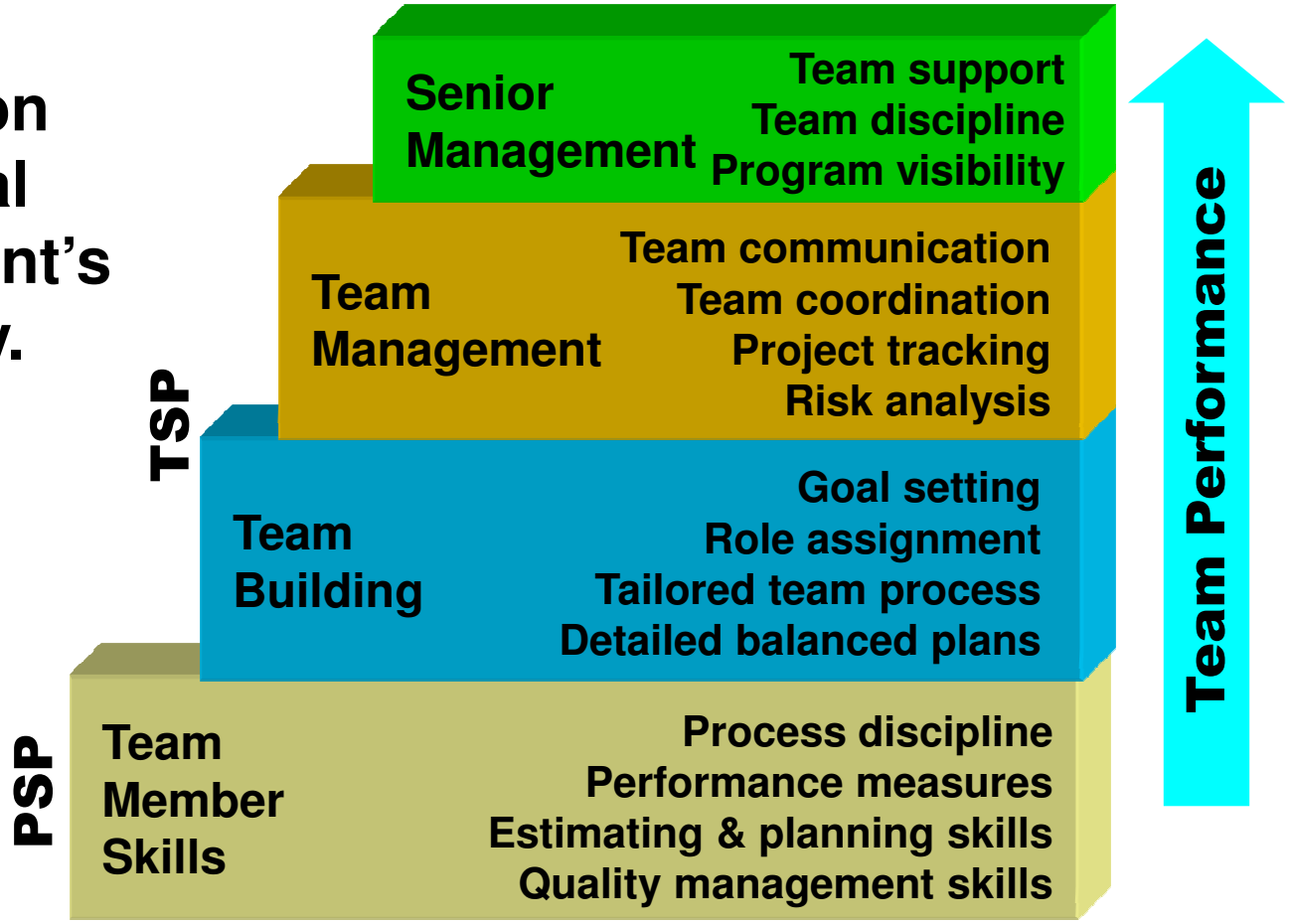


Watts Humphrey: Preparing Students for Industry's Software Engineering Needs, CSEET2008.

Purpose of PSP and TSP: Building High-Performance Teams

Capitalizing on team potential is management's responsibility.

The strategy starts with PSP training.



Managing Knowledge Work with PSP/TSP -1

The four principles of knowledge management are:

- Only the workers understand the work.
- Knowledge workers must know how to manage themselves.
- The workers must be trusted to manage their own work.
- Knowledge workers need motivation, leadership, and coaching.

Ref. TSP Executive Strategy Seminar – Module 2

Managing Knowledge Work with PSP/TSP -2

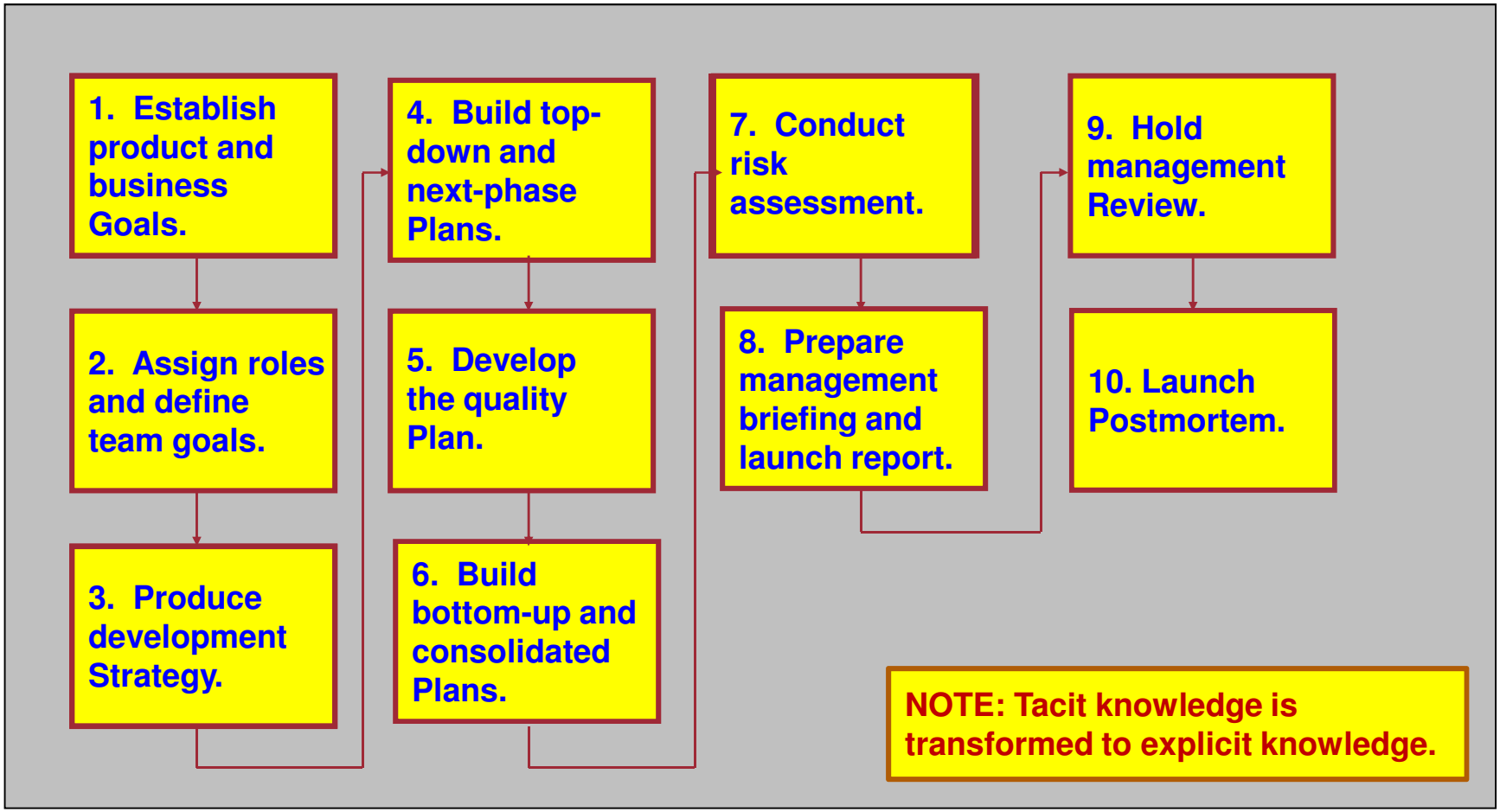
To manage themselves, knowledge workers must behave like responsible managers. They must:

- Make accurate plans.
- Negotiate commitments.
- Consistently meet their commitments.
- Do quality work.

PSP and TSP enable responsible management.

Ref. TSP Executive Strategy Seminar – Module 2

TSP Team Launch Process

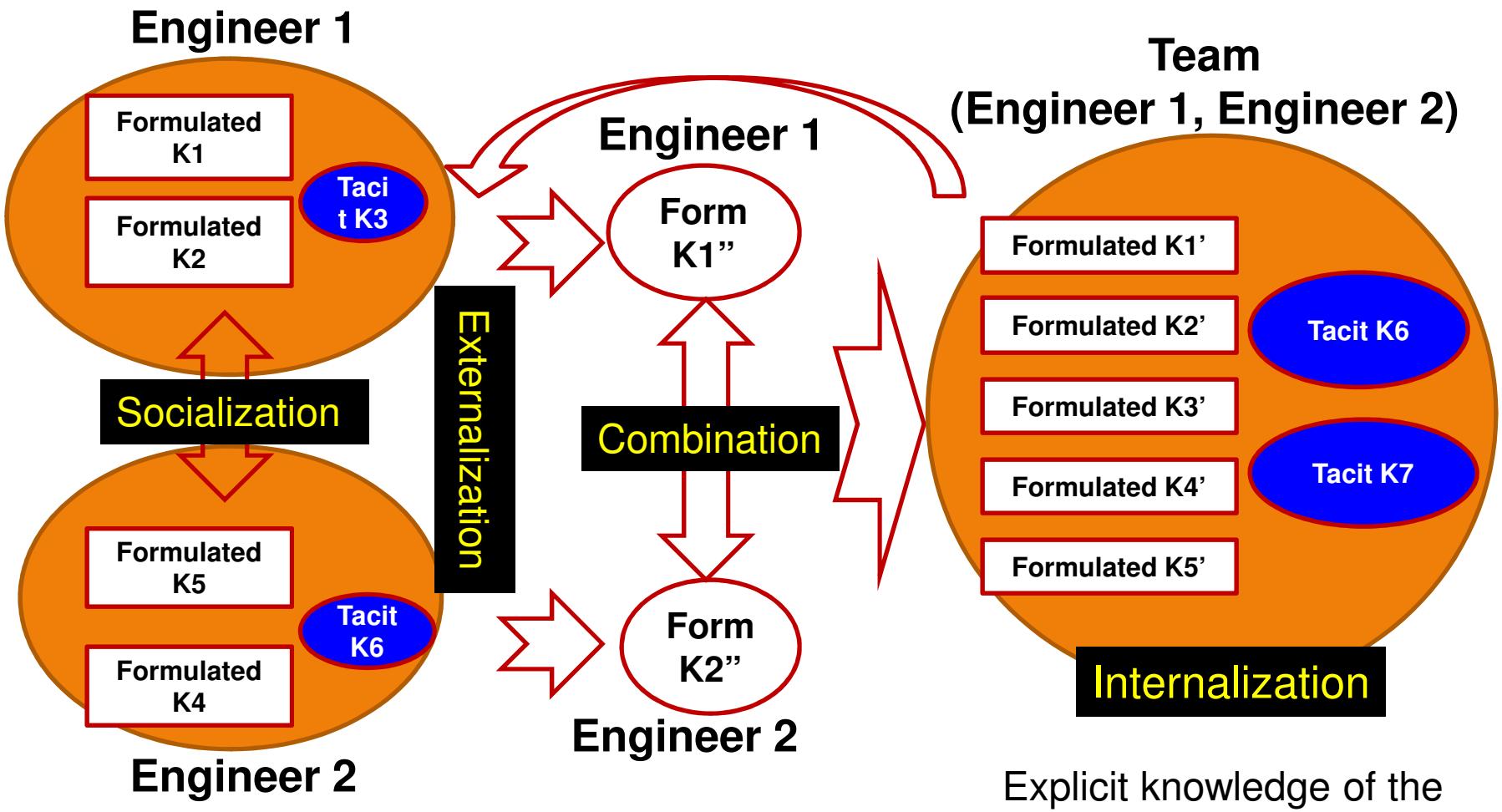


TSP Team Management Process

TSP team collects tacit knowledge, such as requirement changes, progress variation, and strange data. The team then uses that knowledge and the following tools to successfully manage the project:

- **Team members** - Weekly meeting
- **Management** - Status reporting to management and customer
- **Plan** - Re-launching
- **Team data** - Checkpoint meeting
- **Final team performance** - Postmortem

SECI Model for a Team



TSPm Process – Brief

Meeting 1A

- Mini teams defined
- Guidance provided
- Overall conceptual design created

Meeting 2/3

- Mini teams work

Meeting 3A

- Leadership team reviews role manager teams

Meeting 4/5

- Mini teams work on overall and quality plans

Meeting 5A

- Leadership team reviews
  - Summary by PLN team
  - Summary by QAL team

Meeting 5B

- PLN team consolidates

The Coach's Important Responsibilities

From the TSP BOK 2010 C3 Guidelines for Launching a Team:

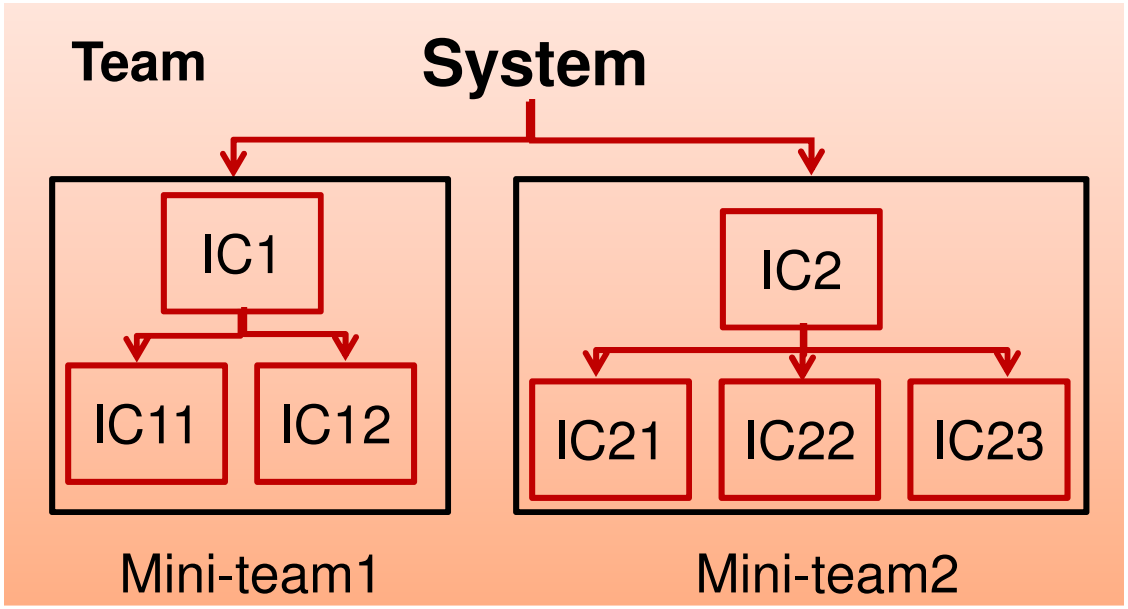
- C3.2 Prepare management for meeting 1
- C3.3 Prepare the team for launch

TSP coach must *foresee* the following before the launch when multi team launch expected:

1. Overall conceptual design (products to be created)
2. Team / Mini-teams structure

In the following scenarios, it is assumed that all engineers completed the PSP training.

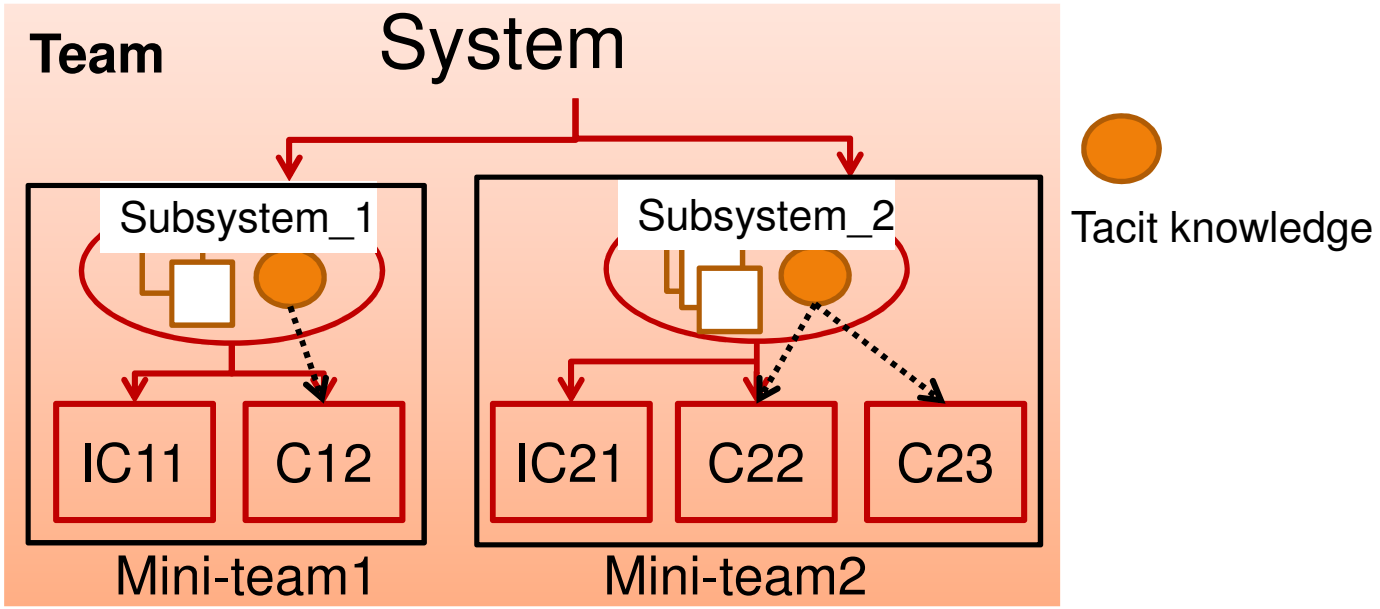
A Conceptual Design / Team Structure – TM0



- Every component independent with no tacit knowledge.
- A mini-team with needed skills and workload balanced.

⇨ The team can be launched.

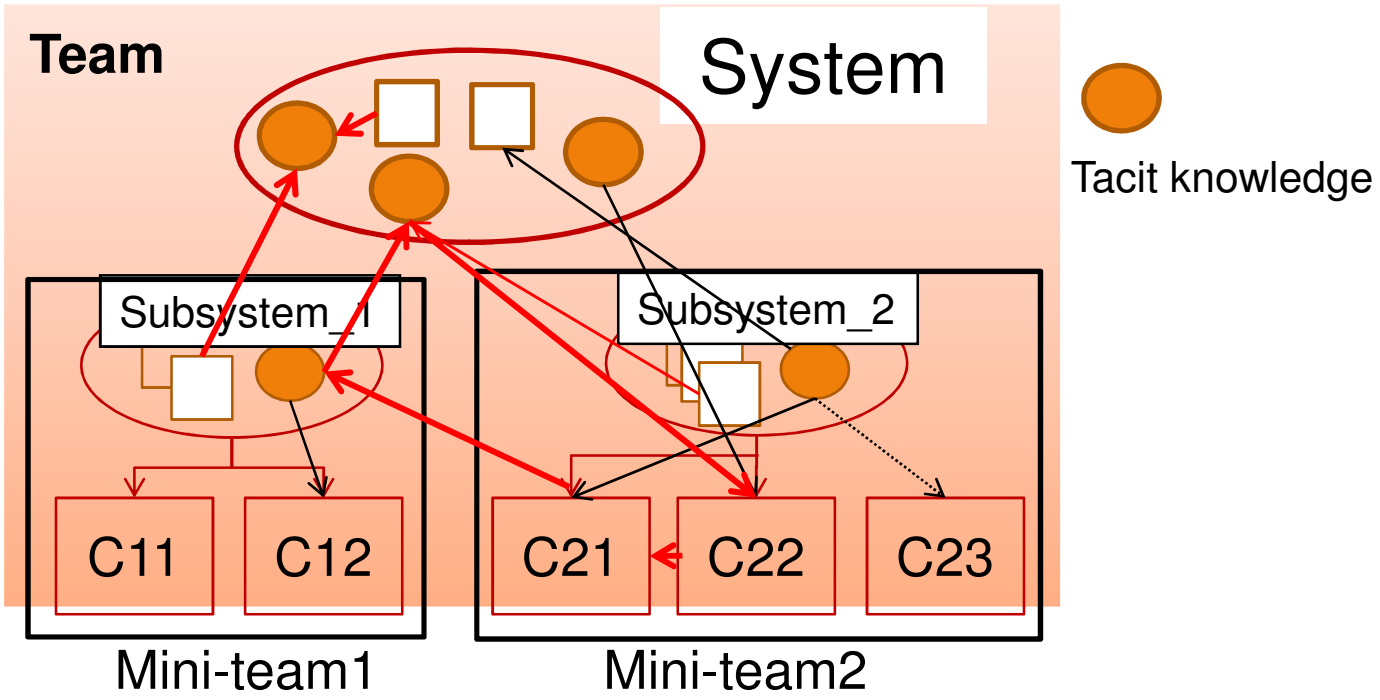
A Conceptual Design / Team Structure – TM1



- The system design can be identified with explicit knowledge.
- Tacit knowledge localized/manageable within each subsystem.
- Subsystem interfaces are properly defined

⇨ The team can be launched.

A Conceptual Design / Team Structure – TM2



- A conceptual design has not been identified.
- Subsystem interfaces cannot be identified easily.

⇨ The team should not be launched.

Effectively Manage TSP Project's Knowledge Work with Tacit Knowledge

- Put base on the stated goals.
- Focus on developing requirements and conceptual designs.
- Use multi-cycle models.
- Establish role managers
- Use concurrent engineering for cross phases or subsystems.
- Communicate sufficiently with customers, managers, and team members.
- Follow process disciplines.
- Review every work product, etc.

Conclusion (1)

- Tacit knowledge exists – whether or not you use it.
- You can apply the steps of the SECI model to transform tacit knowledge into useful explicit knowledge to support your large project's success.
- PSP and TSP processes enable this transformation.
- TSP team members must effectively pool their tacit knowledge during preparation for the launch, the weekly meetings, re-launch, checkpoints, multi-cycles, and concurrent engineering.
- Team leader and role managers guide how the tacit knowledge should be handled.

Conclusion (2)

- Before launch, the TSP coach must anticipate the complexity of the required tacit-to-explicit knowledge transformation.
- Go into the launch only if you can match the complexity of the task, the preparation, and the capability of the team.

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