How to Define Short and Usable CMMI[SM] Based Processes

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“I have made this letter longer than usual because I lack the time to make it shorter”

Blaise Pascal

Presentation Objectives

Describe common problems with process documentation, and discuss some people aspects of using process documentation.

Provide motivation for improving documentation.

Present some best practices for defining processes and procedures.

Provide some real examples from industry.

Provide some lessons learned and answer any questions.

Outline

Common Process Documentation Problems

Some People Aspects of Using Processes

Why Improve Your Process Documentation?

Some Process Definition Best Practices

Real Examples

Some Lessons Learned

Questions and Answers

Common Process Problems

Too Big: Processes become "Big Honkin' Binders".

Poor Usability: Not "fit for use" by process users. Many processes contain mixed information types.

Poor Design: Process documentation usually violates good definition and writing principles.

Lack of Pictures: Processes need to be defined by well thought out diagrams or models.

Defined Sequentially: Processes are not novels.

Shelfware or Unused Webware: Unused processes.

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Some People Aspects

People Perform Processes: People process information using human behaviors (e.g., cognitive psychology). What do people like?

Chunking: Information should grouped into small, manageable units (e.g., 7 plus or minus 2).

Labeling: A label should be used for each "chunk" of information (people like to find things quickly).

Hierarchy: Small, relevant units of information should be organized into a hierarchy and labeled.

• Adapted from "Developing Procedures, Polices & Documentation", Horn, Robert E., Information Mapping, Inc., 1992.

People Aspects, Continued

Relevance: All the information in one chunk should relate to one main point based on that information's purpose and function for the user.

Level of Detail: Information should be written at a level of detail that meets the users needs, and provides accessibility to more detail if the user needs it.

Consistency: Wording should be used consistently for similar subject matters, labels, formatting, etc.

Integrated Graphics: Diagrams, tables, models, etc., should be used as an integral part of the text.

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Why Define Processes?

Promotes Continuous Improvement: It is difficult to improve a process in someone's head.

Retains Corporate Knowledge: If experienced people leave an organization, their corporate "know how" is written down.

Improves Productivity: Defined processes can help dramatically improve productivity.

Saves Time and Money: Users can dramatically reduce cycle time and reduce rework.

Reduces Defects: Defined processes can help reduce and prevent defects.

Why Use Best Practices?

Reduces Size: Expert mode dramatically reduces size (e.g., cut 100 pages to 30 pages).

Better Usability: Expert mode requires speaking to the "experts", and defining what "chunks" they use.

Better Designs: Expert mode requires good process definition and writing principles.

Use of Pictures: Processes need to be defined by well thought out diagrams or "process models".

Defined Non-Linearly: Processes are dynamic, parallel, and concurrent.

Why Best Practices?

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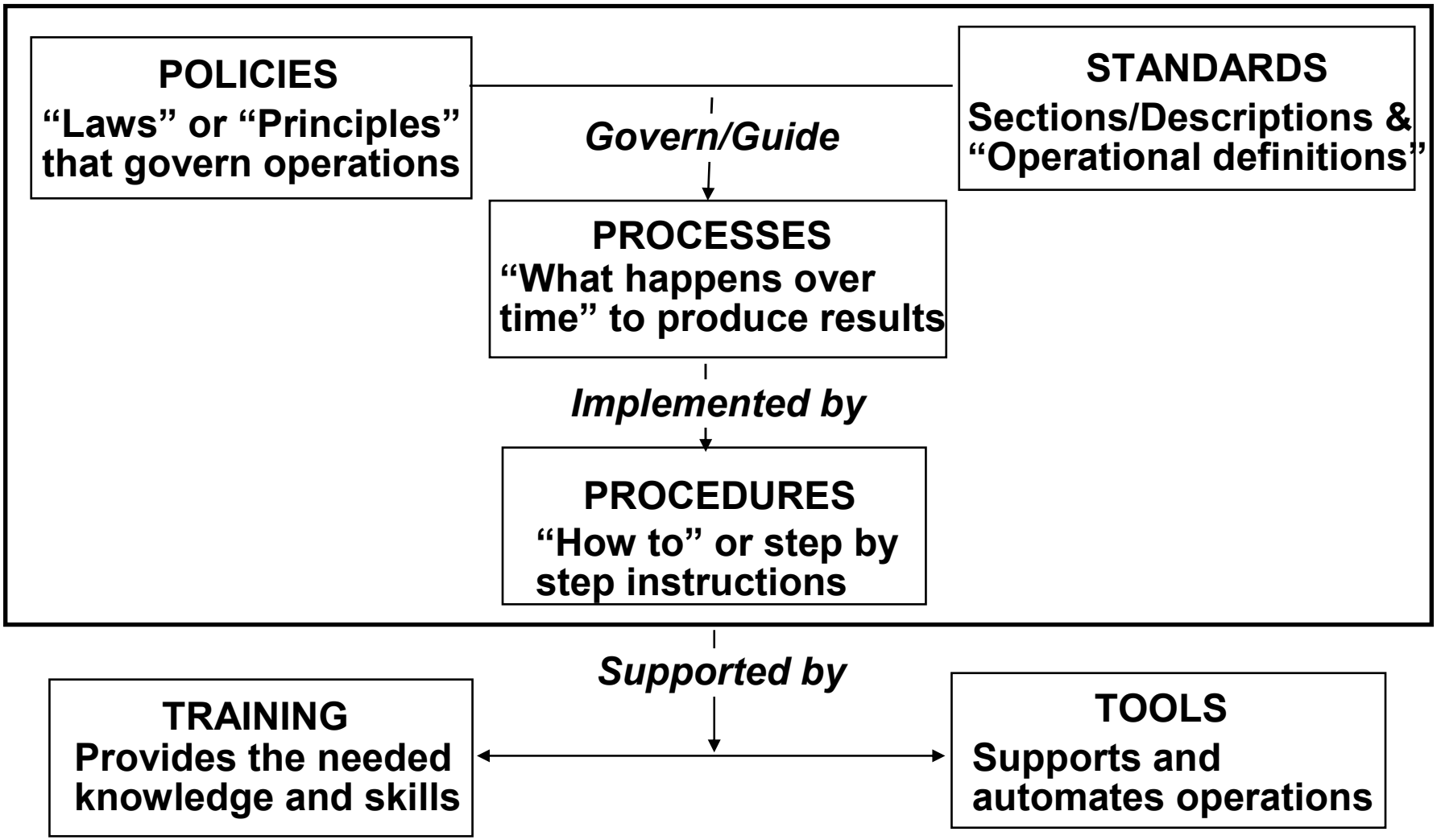
Documentation Framework



• Adapted from"A Software Process Framework for the SEI Capability Maturity Model", Olson, Timothy G., et al, CMU/SEI-94-HB-01, 1994

What is a "Good Process"?

Key Process Question	Process Element
Why is the process performed?	1. Purpose
Who performs the process?	2. Role(s)
What work products are used?	3. Input(s)
What work products are produced?	4. Output(s)
When does the process begin?	5. Entry criteria
When does the process end?	6. Exit criteria
What happens to produce results?	7. Activities
How is the process implemented?	8. Procedure(s)
Where is process performed?	9. Context (e.g., hierarchy)

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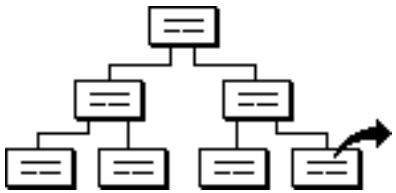
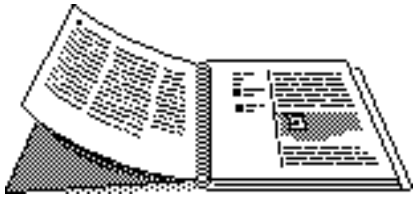
"Pictures" and "Words"



Pictures

Pictures

- Pictures can be worth a 1000 words, and most people are visually oriented
- Organizations have reached "best-in-class" with pictures and words
- Pictures can be formalized into models
- Models are a graphical representation for analyzing entities and their relationships, e.g., data flow, work flow, dependencies, etc.
- Pictures are necessary, but not sufficient



Words

Words

- Words fill in the needed details that pictures or models miss
- Some people are textually oriented
- Words are necessary, but not sufficient

Process Definition Modes

Beginner Mode:
- Assumes user has little or no experience
- Includes training material
- Includes process guidance and lessons learned

Intermediate Mode:
- Assumes user has some experience with process
- Includes process guidance and lessons learned

Expert Mode:
- Assumes user is very experienced
- Concise and precise as possible

All Modes should be "Chunked" and Include:
- Process models, checklists, forms, and tables
- Pointers to detailed explanations

What is Expert Mode?

"Make three correct guesses consecutively and you will establish a reputation as an expert." (Lawrence Peter)

Expert: "possessing special skill or knowledge; trained by practice; skillful or skilled." (Websters)

"Expert Mode" is defining processes that:

- **are as concise and precise as possible**
- **are at an appropriate level of detail for an expert**
- **are "chunked" so that an expert will use them**
- **use process models, checklists, forms, and tables**
- **are free from training material**
- **are free from beginner information**
- **have pointers to detailed explanations**

QIC Process Measurement Framework℠

GOALS	KEY QUESTIONS	METRICS	DC	DS
PLAN		Cost, defects, effort, size, schedule, etc.		
CONTROL		Cost, defects, effort, size, schedule, etc.		
IMPROVE		Cost, defects, effort, size, schedule, etc.		

• DC = Data Collection; DS = Data Storage

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Some Best-In-Class Examples

Process Diagrams

Process Models

When/Then Tables

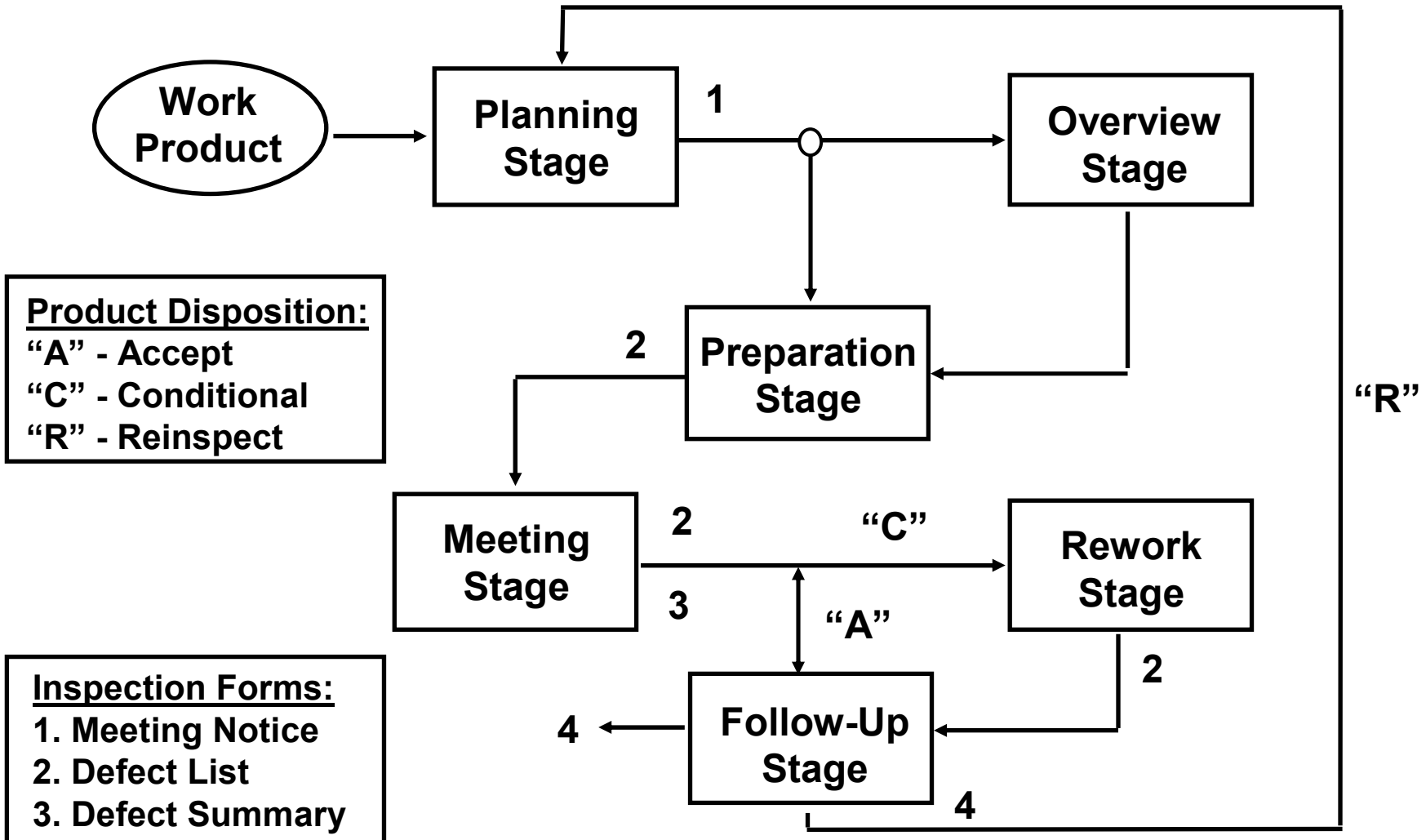
Checklists

Step/Action Tables

Forms

Process Guides

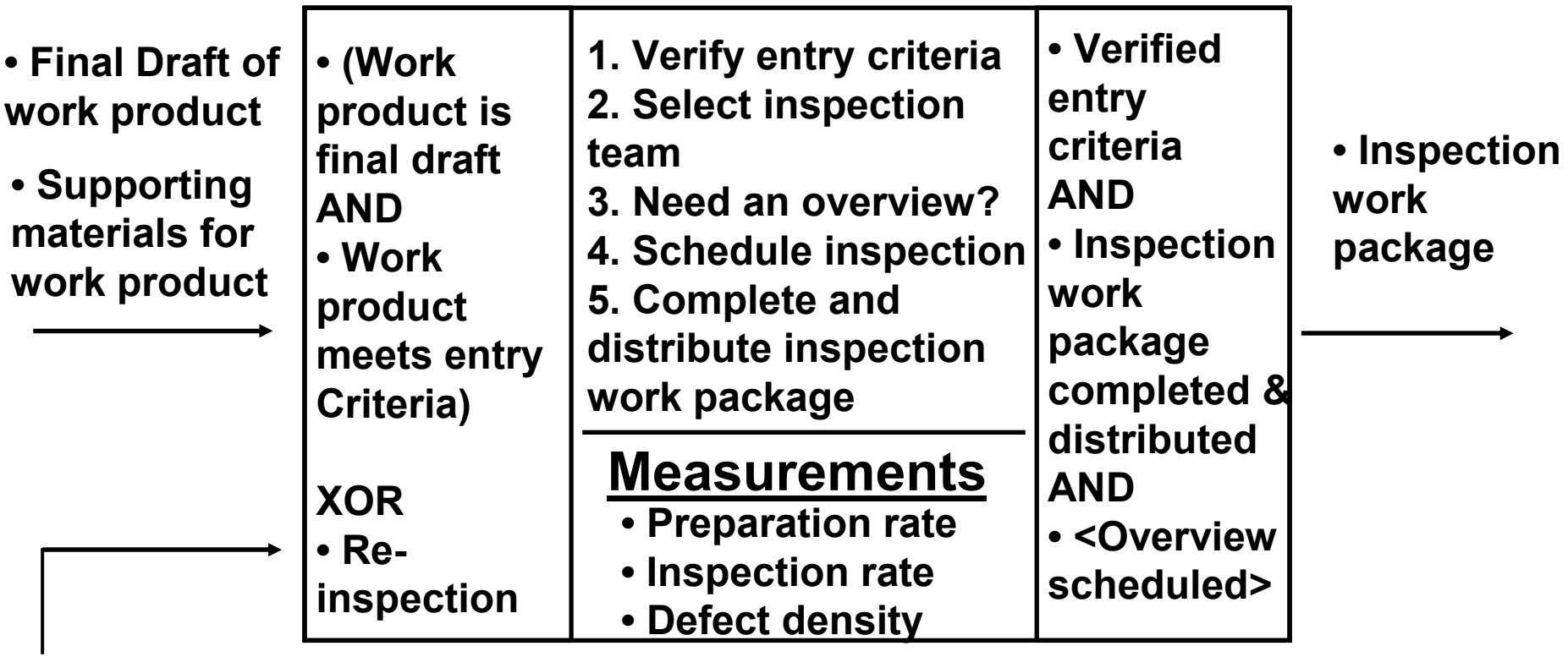
Inspection Process Model



•Adapted from Ebenau, *Software Inspection Process*, McGraw Hill, 1994

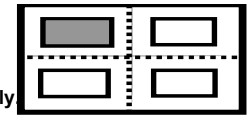
ETVX Model: Planning Stage

Purpose: Organize and plan resources for inspection



Roles: Moderator; Author

Role/Flow Process Model

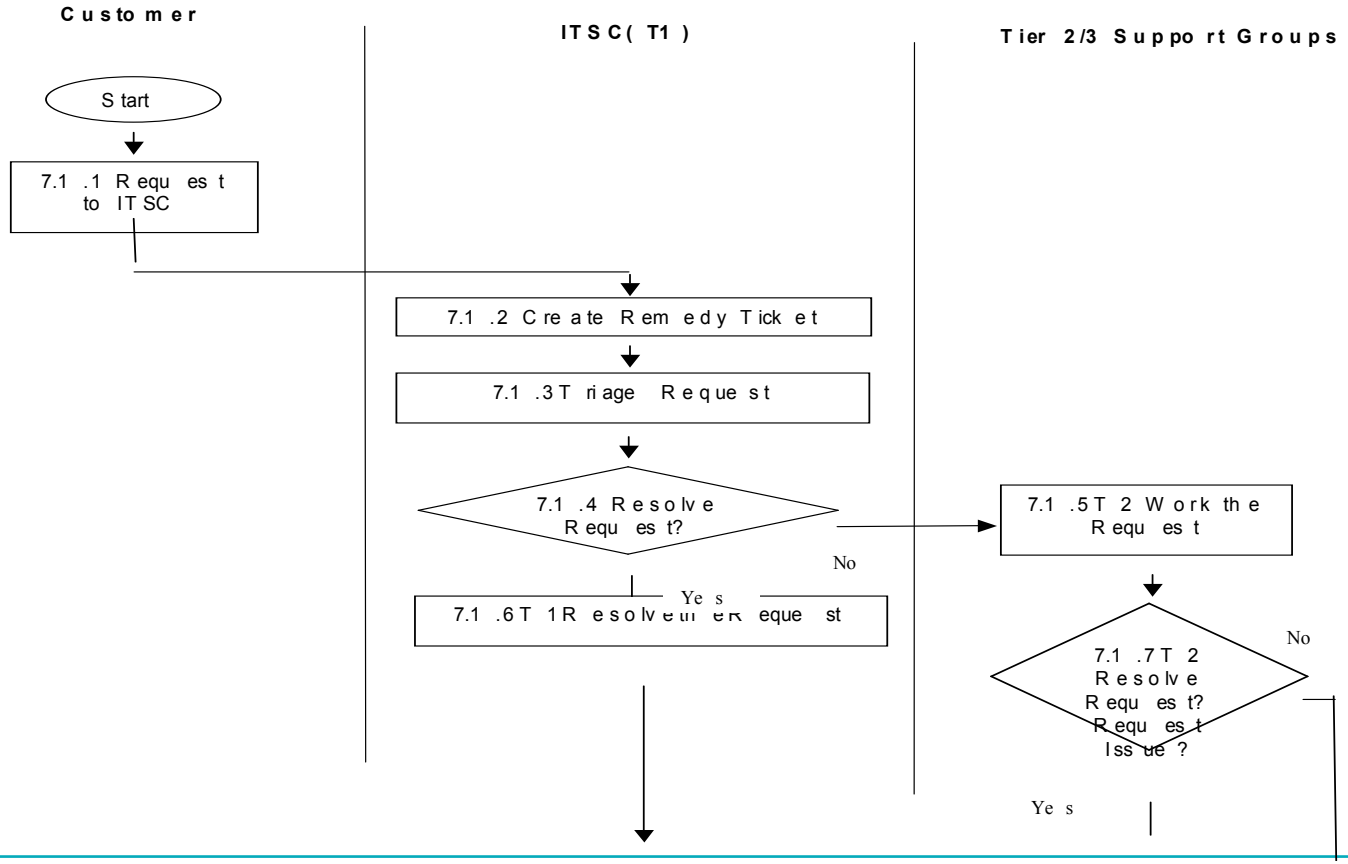


Appendix A: Customer Request Process

Purpose: **To address customer requests effectively and efficiently.**

Inputs/Entry Criteria

4. **Customer request received (i.e., phone call, voicemail, email, fax, inter-office mail, walk-thru)**
5. **<Remedy ticket created>**



Overview Decision Table

When...	Then...
• The work product is large, or complex, or interrelates extensively with other work products. • The work product represents a use of technology that is new or infrequently used by the other inspectors. • The work product is critical to the project, and sets direction for subsequent work. • There is a division of technical responsibility among the inspectors, with a sharing of the role of reader because of differences in inspector expertise.	Schedule an Overview Meeting
• The inspectors are already familiar with the work product	Skip the Overview Stage, and proceed to the Preparation Stage

• **Reference: " World-Class Inspection Process Guide", by Olson, Timothy G., 1994**

Example Checklist Questions

Design Checklist:

- **Completeness: Does the design completely implement the requirements?**
- **Traceability: Does the design trace back to the requirements?**
- **Interfaces: Are the interfaces identified and correct?**

Example Step/Action Table

Preparation Procedure for Inspector Role	
Step	**Action**
1	Inspector tracks his or her time while examining work product for defects.
2	Inspector uses the appropriate defect checklist to examine the work product for defects for the estimated time on the inspection meeting notice.
3	Inspector records defects on the Defect List according to the defect classification scheme.
4	Continue steps 1-3 until work product is completely inspected (record prep. time).

• Reference: " World-Class Software Inspection Process Guide", by Olson, Timothy G., 1994

Forms

Forms are procedures (i.e., "how to", step by step information) to support and implement processes.

Example Inspection Forms:

- **Meeting Notice**
- **Defect List**
- **Defect Summary**
- **Meeting Summary**

Forms should be:

- **for one (or more) people to complete a repeatable activity**
- **hard-copy, automated, or both.**
- **instrumented in order to collect data.**

Example Defect List Form

Software Inspection Defect List

Page _____ of _____

Project:	_____	**Meeting Date:**	_____
Phase:	_____	**Release:**	_____
Component:	_____	**Document:**	_____
Preparation Time:	_____	**Inspector:**	_____

#	Location				Defect Description	Defect			Rwk Tm *
	Pg	Sec	Para	Sen		Type	Class	Sev	

 Version 2.1

• **Reference: " World-Class Software Inspection Process Guide", by Olson, Timothy G., 1994**

Process Guide Example

Stage 1: Planning

Section Overview

Purpose The purpose of the planning stage is to schedule and organize the software inspection, select the inspection team and roles, and ensure checklist coverage. The quality of an inspection is greatly influenced by effective planning.

Active Roles The author and moderator have tasks that they must perform during this stage.

In This Section The following table identifies where to find the planning subsections:

Planning Stage Subsections	See Page
Planning Stage Process Model	Plan-2
Inspection Work Package Checklist	Plan-2
Entry Criteria Checklist for the Planning Stage	Plan-3
Author Planning Procedure	Plan-4
Moderator Planning Procedure	Plan-4
Selecting the Inspectors and Determining Roles	Plan-5

Example of a Process Guide Section for the Inspection Planning Stage

- **Reference: " World-Class Software Inspection Process Guide", by Olson, Timothy G., 1994**

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Some Lessons Learned - 1

The Documentation Framework helps organize your process documents and reduces maintenance costs.

Model based process guides are much more organized, precise, concise, and defect free.

Use a proven process to define your processes.

Applying process definition, process modeling, and Information Mapping® principles greatly enhances usability and pictures.

Documentation user modes such as beginner, intermediate, and expert are useful distinctions.

Some Lessons Learned - 2

Not all pictures are worth a “1000” words, and some pictures actually do more harm than good.

Process models drive the structure of a process guide, and process models usually produce good pictures.

Make sure to address the people issues of process documentation (e.g., “chunking”)

Use “expert mode” to keep your documents short (e.g., process models, checklists, tables, etc).

No matter what you do, some people will always hate your processes and procedures.

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