

DRAFT

**Domain Independent Reuse Methodology
Development Document
Version 1.0
25 June 1996**

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DRAFT

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1. Introduction

The purpose of this document is to provide a record of the RASSP Domain Independent Methodology Development Activity. The purpose of this activity is to provide an overall reuse methodology that is independent of the domain that it is resident.

2. Task Descriptions

The following four (4) tasks comprise the RASSP Domain Independent Methodology Development Activity.

2.1 Domain Independent Reuse Process/Workflow Modeling

This task involves the modeling of two (2) types of reuse activities. The first activity involves adding a new Reuse Element to the Reuse Database and the second is actually utilizing the Reuse Element. Process modeling is performed using the IDEF3 Integrated DEFinition 3 technique. The tool used for this modeling is ProCap 2.1.2, provided by KBSI (Knowledge Based Systems, Inc.). The tool used to provide workflows is Intergraph's Data Methodology Manager (DMM).

2.2 Class Hierarchy Modeling Using OMT

This task involves the modeling of the current RASSP Reuse Design Object Class Hierarchy (RDOCH). The methodology used for this modeling is Dr. James Rumbaugh's Object Methodology Technique (OMT). The tool used to perform the modeling is CADRE Technologies ObjectTeam OMT version 4.0.

2.3 Develop RASSP Specific Domain Assessment Guidelines

This task involves the development of guidelines that can be used to implement a reuse methodology and system in an enterprise environment.

2.4 Design For Reuse Guidelines Updates

This task involves updating the RASSP Methodology Document with Design for Reuse Guidelines.

3. Applicable Documents

RASSP Methodology, Version 2.0, October 1995,

4. Domain Independent Reuse Processes/Workflows

This section contain both Reuse Processes and their associated Workflows.

4.1 Reuse Element Creation and Maintenance - Top Level Processes

These are the Top Level Processes for creating and/or maintaining a reusable design object. These processes are illustrated in Figure 1.

4.1.1 Propose Reuse Element Addition [1]

Description

The Design Engineer proposes the addition of a Reuse Element to the Reuse Database to his/her supervisor.

Objects

Design Engineer
Supervisor
Reuse Element Proposal Material

4.1.2 Identify Reuse Element [2]

Description

The Design Engineer identifies the Reuse Element by providing utility documentation, the Reuse Element data, and descriptive documentation.

Objects

Design Engineer
Reuse Element Utility Documentation
Reuse Element Data
Reuse Element Descriptive Documentation

4.1.3 Analyze Reuse Element For Class Determination [3]

Description

The Design Engineer and the Database Engineer analyze descriptive documentation and Reuse Element data for determination of the Class of the Reuse Element.

Objects

Database Engineer
Design Engineer
Reuse Element Utility Documentation
Reuse Element Data
Reuse Element Descriptive Documentation
Class Determination Analysis Results

4.1.4 Define New Class [4]

Description

The Database Engineer and Design Engineer define a new class for the Reuse Element.

Objects

Design Engineer
Database Engineer
Class Determination Analysis Results
Class Description and Attributes

4.1.5 Modify Current Class [5]

Description

The Database Engineer and Design Engineer modify the attributes of a current Reuse Class for the Reuse Element.

Objects

Design Engineer
Database Engineer
Reuse Database Class

4.1.6 Instantiate Class [6]

Description

The Database Engineer instantiates the Reuse Database Class with the new Reuse Element.

Objects

Database Engineer
Reuse Database Class
Reuse Element

4.1.7 Transit To Operations [7]

Description

The Database Engineer and RDMS Administrator transit the updated Reuse Database to Operations.

Objects

Database Engineer
RDMS Administrator
Reuse Database

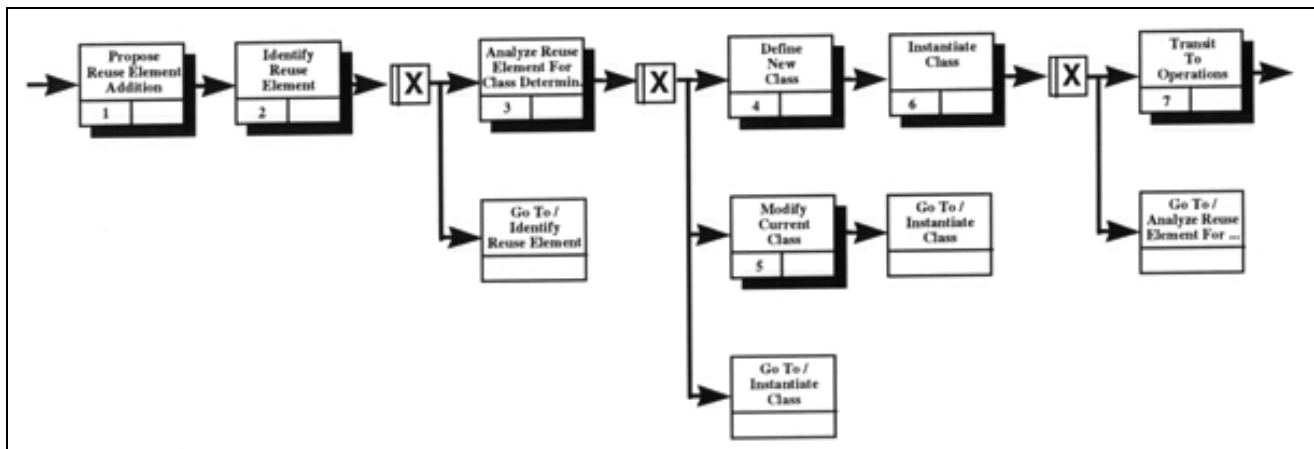


Figure 1: Top Level Process Diagram: Reuse Element Addition

4.2 Reuse Element Addition Decompositions

These are the decompositions for adding a Reuse Element to the reuse database.

4.2.1 Decomposition For: Propose Reuse Element Addition Process

This is the decomposition for proposing the addition of a Reuse Element. These processes are illustrated in Figure 2.

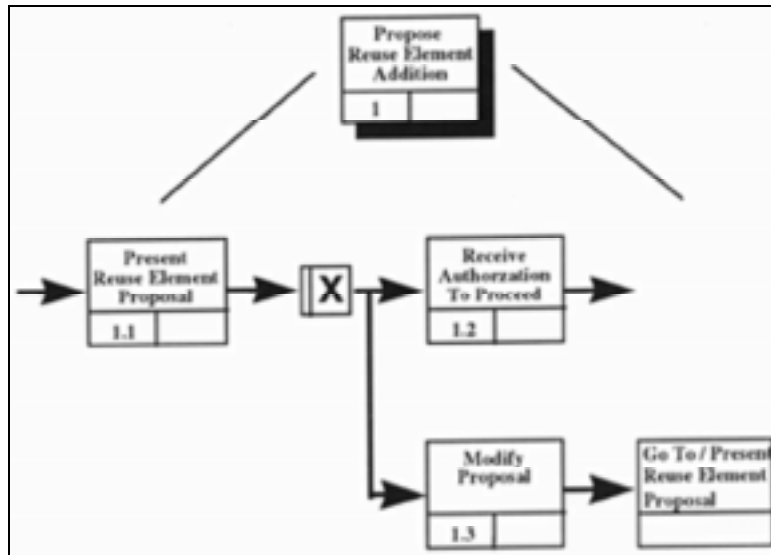


Figure 2: Process Decomposition: Propose Reuse Element Addition

4.2.1.1 Present Reuse Element Proposal [1.1]

Description

The Design Engineer presents the Reuse Element proposed for addition to the Reuse Database to his/her supervisor.

Objects

Design Engineer
Supervisor
Reuse Element Proposal Material

4.2.1.2 Receive Authorization To Proceed [1.2]

Description

The Design Engineer receives authorization to proceed from his/her supervisor.

Objects

Design Engineer
Supervisor
Authorization To Proceed

4.2.1.3 Modify Proposal [1.3]

Description

The Design Engineer modifies the Reuse Element proposal based on the discussion with his/her supervisor.

Objects

Design Engineer
Reuse Element Proposal Material

4.2.2 Decomposition For: Identify Reuse Element Process

This is the decomposition for identifying the Reuse Element. These processes are illustrated in Figure 3.

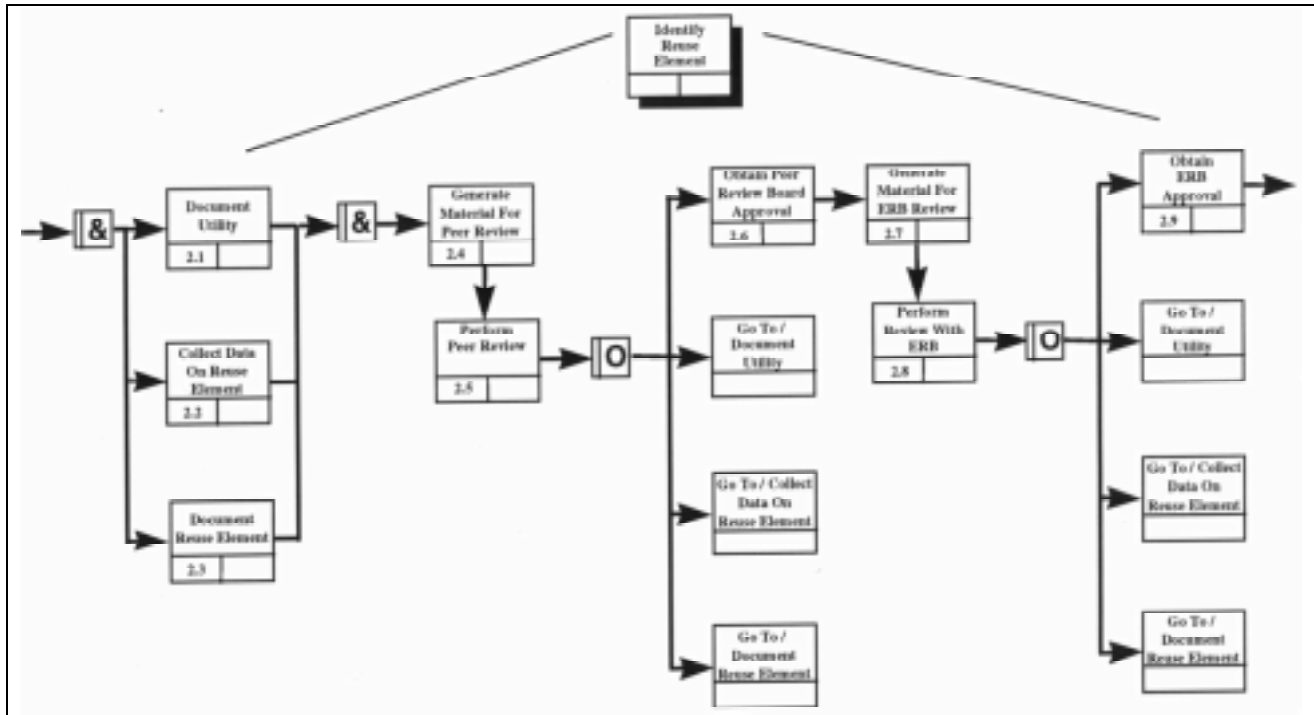


Figure 3: Process Decomposition: Identify Design Reuse Element

4.2.2.1 Document Utility [2.1]

Description

The Design Engineer documents the utility of the Reuse Element.

Objects

Design Engineer
Utility Documentation

4.2.2.2 Collect Data On Reuse Element [2.2]

Description

The Design Engineer collects data on the Reuse Element.

Objects

Design Engineer
Reuse Element Data

4.2.2.3 Document Reuse Element [2.3]

Description

The Design Engineer documents the Reuse Element.

Objects

Design Engineer

Reuse Element Descriptive Documentation

4.2.2.4 Generate Material For Peer Review [2.4]

Description

The Engineer generates material for the Peer Review

Objects

Design Engineer

Peer Review Presentation Material

4.2.2.5 Perform Peer Review [2.5]

Description

The Engineer presents the Peer Review Presentation Material to the Peer Review Board.

Objects

Design Engineer

Peer Review Board

Peer Review Presentation Material

4.2.2.6 Obtain Peer Review Board Approval [2.6]

Description

Obtain approval from the Peer Review Board.

Objects

Design Engineer

Peer Review Board

Peer Review Board Approval

4.2.2.7 Generate Material For ERB Review [2.7]

Description

The Engineer generates presentation material for the Engineering Review Board (ERB) Review.

Objects

Design Engineer

ERB Review Presentation Material

4.2.2.8 Perform Review With ERB [2.8]

Description

The Engineer presents the Engineering Review Board (ERB) Review Presentation Material.

Objects

Design Engineer

Engineering Review Board (ERB)

Engineering Review Board (ERB) Review Presentation Material

4.2.2.9 Obtain ERB Approval [2.9]

Description

Obtain Engineer Review Board (ERB) approval.

Objects

Design Engineer

Engineering Review Board (ERB)

Engineering Review Board (ERB) Approval

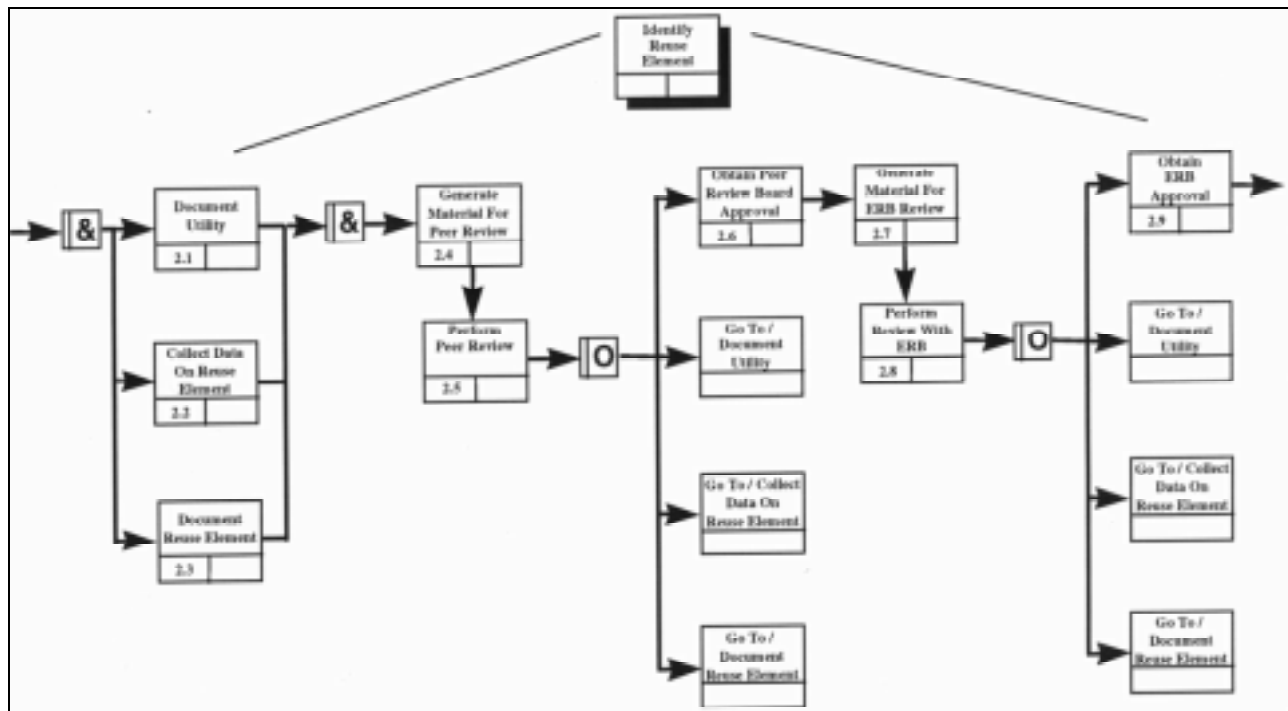


Figure 3: Process Decomposition: Identify Design Reuse Element

4.2.3 Decomposition For: Analyze RE For Class Determination Process

This is the decomposition for analyzing the Reuse Element for class determination. These processes are illustrated in Figure 4.

4.2.3.1 Review Current Class Hierarchy [3.1]

Description

The Design Engineer and Database Engineer review the current reuse database class hierarchy.

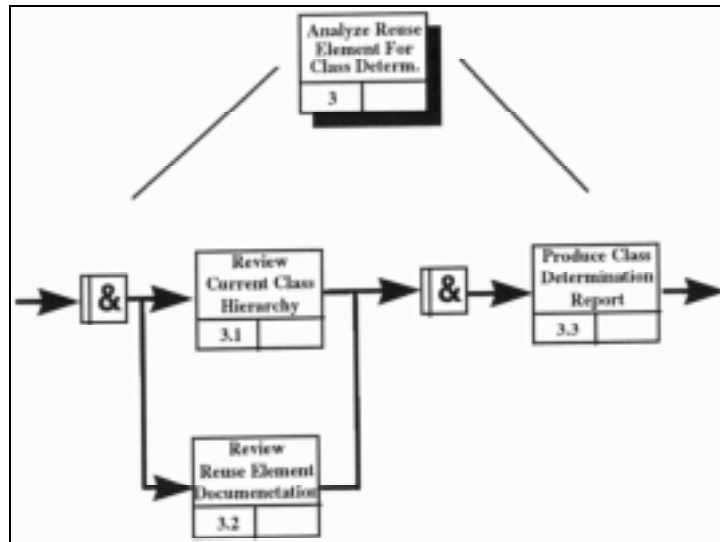


Figure 4: Process Decomposition: Analyze Reuse Elements for Class Determination

Objects

Design Engineer
Database Engineer
Reuse Database Class Hierarchy

4.2.3.2 Review Current Class Hierarchy [3.2]

Description

The Design Engineer and Database Engineer Review the Reuse Element Documentation.

Objects

Design Engineer
Database Engineer
Reuse Element Data
Reuse Element Descriptive Documentation

4.2.3.3 Produce Class Determination Report [3.3]

Description

The Design Engineer and Database Engineer produce a report containing the results of the class determination analysis.

Objects

Design Engineer
Database Engineer
Reuse Class Determination Report

4.2.4 Decomposition For: Define New Class Process

This is the decomposition for defining a new class in the reuse database. These processes are illustrated in Figure 5.

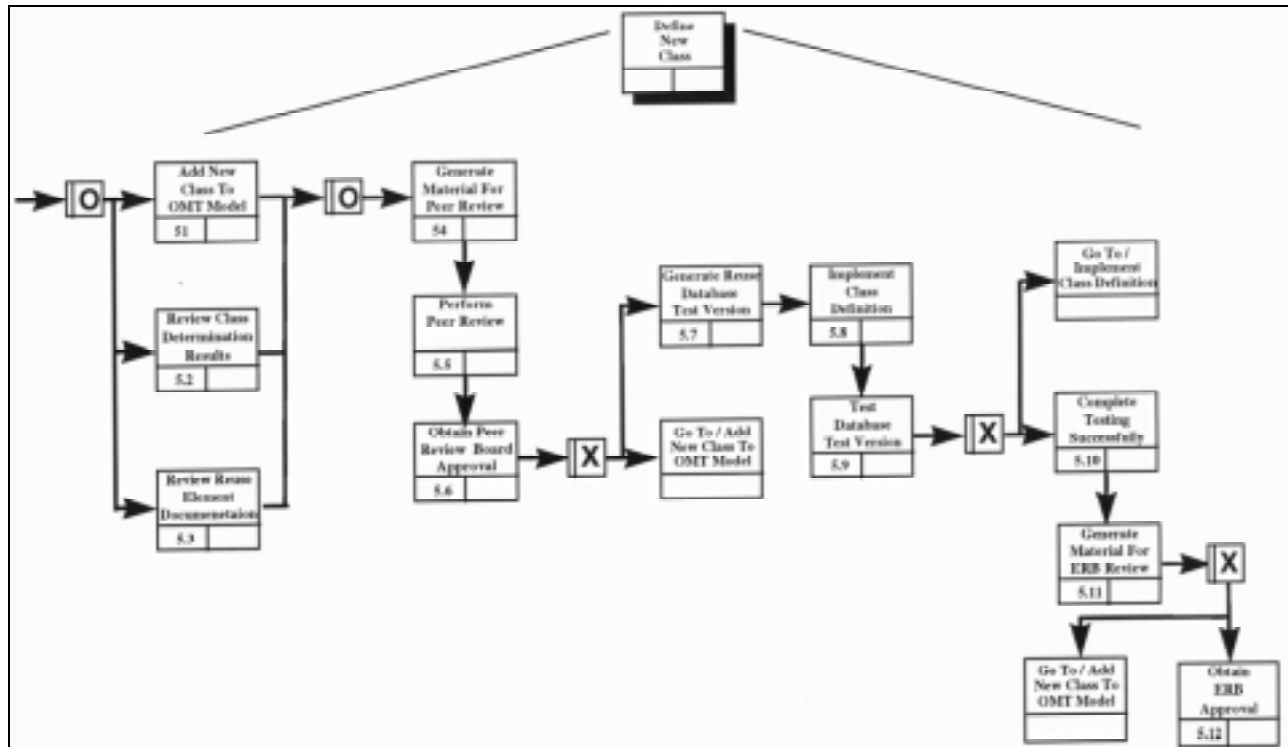


Figure 5: Process Decomposition: Define New Class

4.2.4.1 Add New Class To OMT Model [4.1]

Description

The Database Engineer adds the new class to the OMT Model.

Objects

Database Engineer
OMT Model
OMT Modeling Tool

4.2.4.2 Review Class Determination Analysis [4.2]

Description

The Database Engineer reviews the class determination analysis report.

Objects

Database Engineer
Class Determination Results

4.2.4.3 Review Reuse Element Documentation [4.3]

Description

The Database Engineer Reviews the Reuse Element Documentation.

Objects

Database Engineer

Class Determination Results
Reuse Element Descriptive Documentation

4.2.4.4 Generate Material For Peer Review [4.4]

Description

The Engineer generates material for the Peer Review.

Objects

Database Engineer
Peer Review Presentation Material

4.2.4.5 Perform Peer Review [4.5]

Description

The Engineer presents the Peer Review Presentation Material to the Peer Review Board.

Objects

Database Engineer
Peer Review Presentation Material
Peer Review Board

4.2.4.6 Obtain Peer Review Board Approval [4.6]

Description

Obtain approval from the Peer Review Board.

Objects

Database Engineer
Peer Review Board
Peer Review Board Approval

4.2.4.7 Generate Reuse Database Test Version [4.7]

Description

The Database Engineer generates a test version of the reuse database.

Objects

Database Engineer
Reuse Database Test Version

4.2.4.8 Implement Class Definition [4.8]

Description

The Database Engineer implements the new class in the test version of the reuse database.

Objects

Database Engineer
Reuse Database Test Version
OMT Model

4.2.4.9 Test Database Test Version [4.9]

Description

The Database Engineer tests the database test version with the new class implemented.

Objects

Database Engineer

Reuse Database Test Version

4.2.4.10 Complete Testing Successfully [4.10]

Description

Testing of the implementation of the new class into the test version of the database is completed successfully.

Objects

Database Engineer

Test Results

4.2.4.11 Generate Material For ERB Review [4.11]

Description

The Engineer generates presentation material for the ERB Review.

Objects

Database Engineer

Engineering Review Board (ERB) Review Presentation Material

4.2.4.12 Obtain ERB Approval [4.12]

Description

Obtain Engineer Review Board (ERB) approval.

Objects

Database Engineer

Engineering Review Board (ERB)

Engineering Review Board (ERB) Approval

4.2.5 Decomposition For: Modify Current Class Process

This is the decomposition for modifying a current class in the reuse database. These processes are illustrated in Figure 6.

4.2.5.1 Modify Current Class In OMT Model [5.1]

Description

The Database Engineer modifies the appropriate current class in the OMT Model.

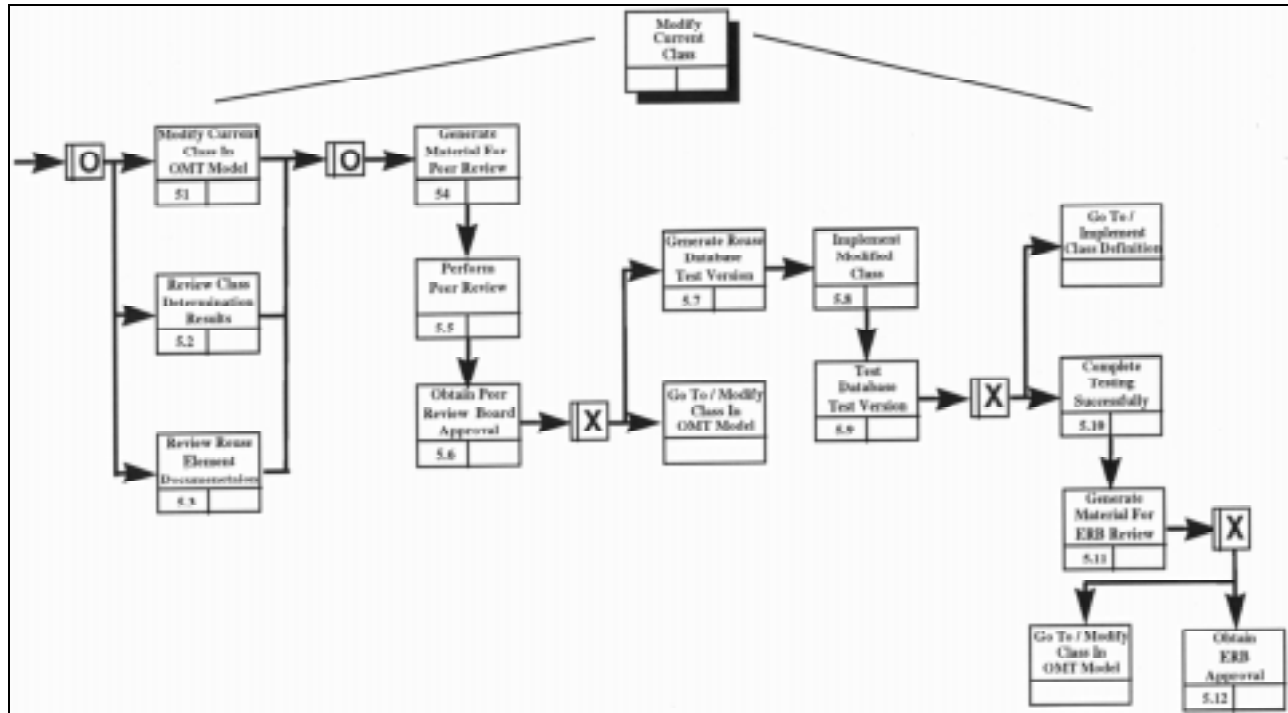


Figure 6: Process Decomposition: Modify Current Class

Objects

Database Engineer
 OMT Model
 OMT Modeling Tool

4.2.5.2 Review Class Determination Analysis [5.2]

Description

The Database Engineer reviews the class determination analysis report.

Objects

Database Engineer
 Class Determination Results

4.2.5.3 Review Reuse Element Documentation [5.3]

Description

The Database Engineer Reviews the Reuse Element Documentation.

Objects

Database Engineer
 Reuse Element Descriptive Documentation

4.2.5.4 Generate Material For Peer Review [5.4]

Description

The Engineer generates material for the Peer Review.

Objects

Database Engineer
Peer Review Presentation Material

4.2.5.5 Perform Peer Review [5.5]**Description**

The Engineer presents the Peer Review Presentation Material to the Peer Review Board.

Objects

Database Engineer
Peer Review Presentation Material
Peer Review Board

4.2.5.6 Obtain Peer Review Board Approval [5.6]**Description**

Obtain approval from the Peer Review Board.

Objects

Database Engineer
Peer Review Board
Peer Review Board Approval

4.2.5.7 Generate Reuse Database Test Version [5.7]**Description**

The Database Engineer generates a test version of the reuse database.

Objects

Database Engineer
Reuse Database Test Version

4.2.5.8 Implement Modified Class [5.8]**Description**

The Database Engineer implements the modified class in the Reuse Database Test Version

Objects

Database Engineer
Reuse Database Test Version
OMT Model

4.2.5.9 Test Database Test Version [5.9]**Description**

The Database Engineer tests the database test version with the modified class implemented.

Objects

Database Engineer

Reuse Database Test Version

4.2.5.10 Complete Testing Successfully [5.10]

Description

Testing of the implementation of the modified class into the test version of the database is completed successfully.

Objects

Database Engineer
Test Results

4.2.5.11 Generate Material For ERB Review [5.11]

Description

The Engineer generates presentation material for the ERB Review.

Objects

Database Engineer
Engineering Review Board (ERB) Review Presentation Material

4.2.5.12 Obtain ERB Approval [5.12]

Description

Obtain Engineer Review Board (ERB) approval.

Objects

Database Engineer
Engineering Review Board (ERB)
Engineering Review Board (ERB) Approval

4.2.6 Decomposition For: Instantiate Class Process

This is the decomposition for instantiating a reuse class in the reuse database. These processes are illustrated in Figure 7.

4.2.6.1 Generate Reuse Database Test Version [6.1]

Description

The Database Engineer generates a test version of the reuse database.

Objects

Database Engineer
Reuse Database Test Version

4.2.6.2 Update Metadata [6.2]

Description

The Database Engineer updates the Reuse Database with metadata corresponding to the Reuse Element.

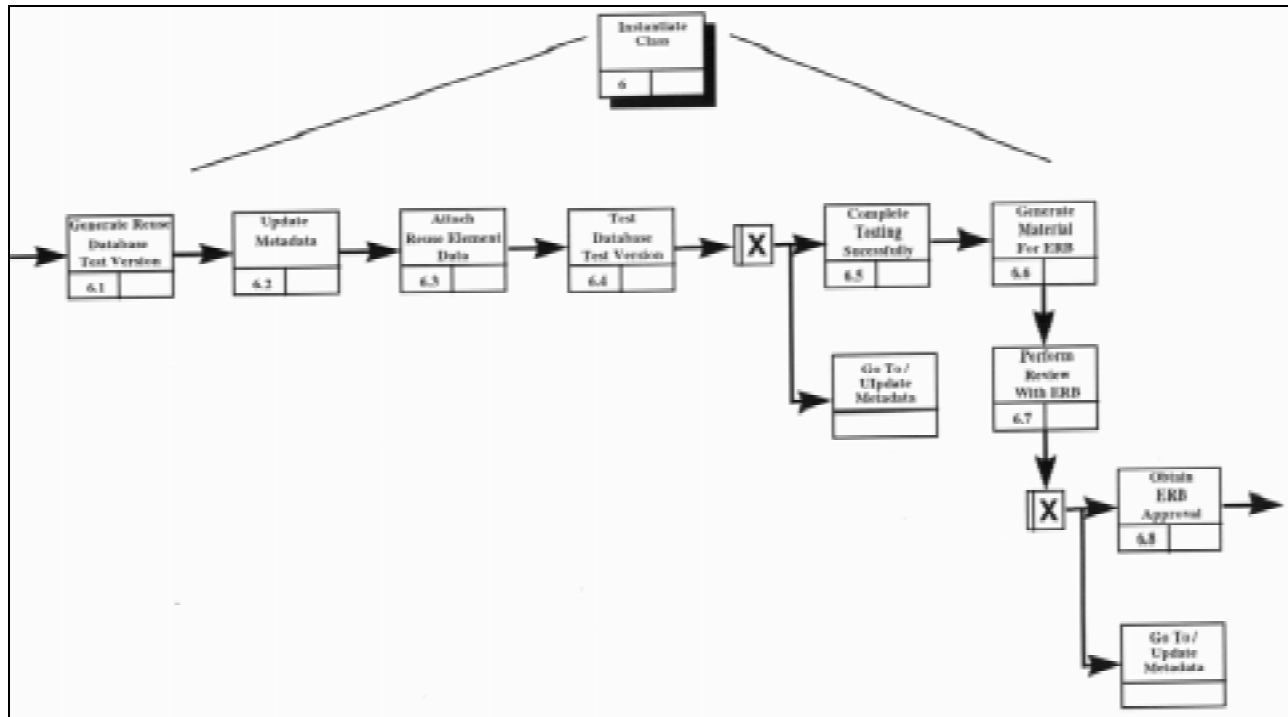


Figure 7: Process Decomposition: Instantiate Class

Objects

Database Engineer
Reuse Database Test Version
Reuse Element Descriptive Documentation

4.2.6.3 Attach Reuse Element Data [6.3]

Description

The Database Engineer either attaches the Reuse Element data to the Test Version of the Reuse Database or provides a pointer to the location of the data.

Objects

Database Engineer
Reuse Database Test Version
Reuse Element Data

4.2.6.4 Test Database Test Version [6.4]

Description

The Database Engineer tests the database test version with the modifications made to the Reuse Element metadata and attachment.

Objects

Database Engineer
Reuse Database Test Version

4.2.6.5 Complete Testing Successfully [6.5]

Description

Testing of the implementation of the modifications made to the Reuse Element metadata and attachment, into the test version of the database is completed successfully.

Objects

Database Engineer
Testing Results

4.2.6.6 Generate Material For ERB Review [6.6]

Description

The Engineer generates presentation material for the ERB Review.

Objects

Database Engineer
Engineering Review Board (ERB) Presentation Material

4.2.6.7 Perform Review With ERB [6.7]

Description

The Engineer presents the ERB Review Presentation Material.

Objects

Database Engineer
Engineering Review Board (ERB)
Engineering Review Board (ERB) Presentation Material

4.2.6.8 Obtain ERB Approval [6.8]

Description

Obtain Engineer Review Board (ERB) approval.

Objects

Database Engineer
Engineering Review Board (ERB)
Engineering Review Board (ERB) Approval

4.2.7 Decomposition For: Transit To Operations

This is the decomposition for transitioning the Reuse Database with the added Reuse Element to operations. These processes are illustrated in Figure 8.

4.2.7.1 Freeze Test Version Of Reuse Database [7.1]

Description

The Database Engineer freezes the test version of the Reuse Database.

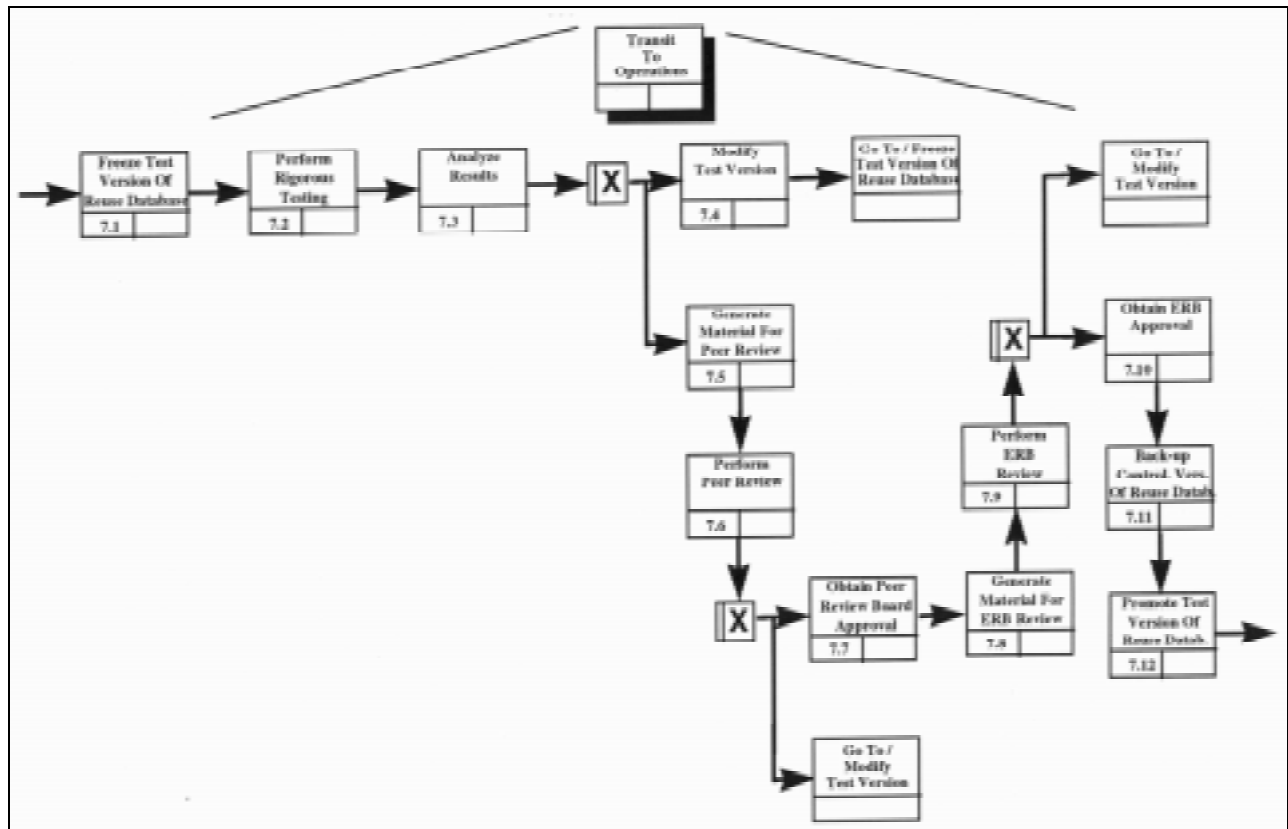


Figure 8. Process Decomposition: Transition to Operations

Objects

Database Engineer
Reuse Database Test Version

4.2.7.2 Perform Rigorous Testing [7.2]

Description

The Database Engineer and RDMS Administrator perform rigorous testing on the frozen configuration.

Objects

Database Engineer
RDMS Administrator
Reuse Database Test Version

4.2.7.3 Analyze Results [7.3]

Description

The Database Engineer and RDMS Administrator analyze the results of the rigorous testing.

Objects

Database Engineer
RDMS Administrator
Testing Results

4.2.7.4 Modify Test Version [7.4]

Description

The Database Engineer performs appropriate modifications to the Reuse Database Test Version.

Objects

Database Engineer
Reuse Database Test Version

4.2.7.5 Generate Material For Peer Review [7.5]

Description

The Engineer generates material for the Peer Review.

Objects

Database Engineer
Peer Review Presentation Material

4.2.7.6 Perform Peer Review [7.6]

Description

The Engineer presents the Peer Review Presentation Material to the Peer Review Board.

Objects

Database Engineer
Peer Review Board
Peer Review Presentation Material

4.2.7.7 Obtain Peer Review Board Approval [7.7]

Description

Obtain approval from the Peer Review Board.

Objects

Database Engineer
Peer Review Board
Peer Review Board Approval

4.2.7.8 Generate Material For ERB Review [7.8]

Description

The Engineer generates presentation material for the ERB Review.

Objects

Database Engineer
ERB Presentation Material

4.2.7.9 Perform Review With ERB [7.9]

Description

The Engineer presents the ERB Review Presentation Material.

Objects

Database Engineer

ERB Presentation Material

4.2.7.10 Obtain ERB Approval [7.10]

Description

The Engineer presents the ERB Review Presentation Material.

Objects

Database Engineer

Engineering Review Board (ERB)

Engineering Review Board (ERB) Approval

4.2.7.11 Back-up Controlled Version Of Reuse Database [7.11]

Description

The RDMS Administrator generates a back-up of the controlled Reuse Database.

Objects

RDMS Administrator

Reuse Database

4.2.7.12 Promote Test Version Of Reuse Database [7.12]

Description

The RDMS Administrator promotes the test version of the reuse database to the controlled version.

Objects

RDMS Administrator

Reuse Database Test Version

4.3 Top Level Processes: Reuse Element Utilization

These are the Top Level Processes for utilizing a reuse element. These processes are illustrated in Figure 9.

4.3.1 Characterize Reuse Element [1]

Description

The Design Engineer characterizes the Reuse Element required.

Objects

Design Engineer

Reuse Element Characteristics

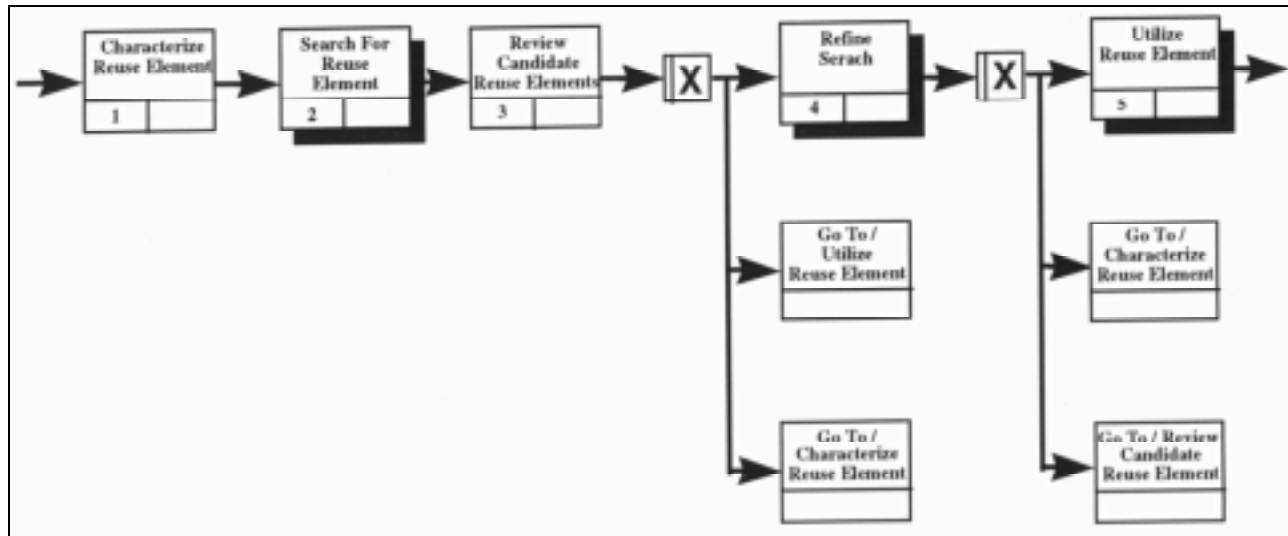


Figure 9: Top Level Process Diagram: Reuse Element Utilization

4.3.2 Search For Reuse Element [2]

Description

The Design Engineer uses a search engine to search for a Reuse Element with the appropriate characteristics.

Objects

Design Engineer
Search Engine

4.3.3 Review Candidate Reuse Elements [3]

Description

The Design Engineer reviews the results of the search for Reuse Elements.

Objects

Design Engineer
Search Results

4.3.4 Refine Search [4]

Description

The Design Engineer Refines The Search using the results of the previous search.

Objects

Design Engineer
Search Results
Search Engine

4.3.5 Utilize Reuse Element [5]

Description

The Design Engineer utilizes the Reuse Element in the design.

Objects

Design Engineer
Search Results
Reuse Element

4.3.6 Decomposition For: Search For Reuse Element

This is the decomposition for searching for a Reuse Element to use in a design. These processes are illustrated in Figure 10.

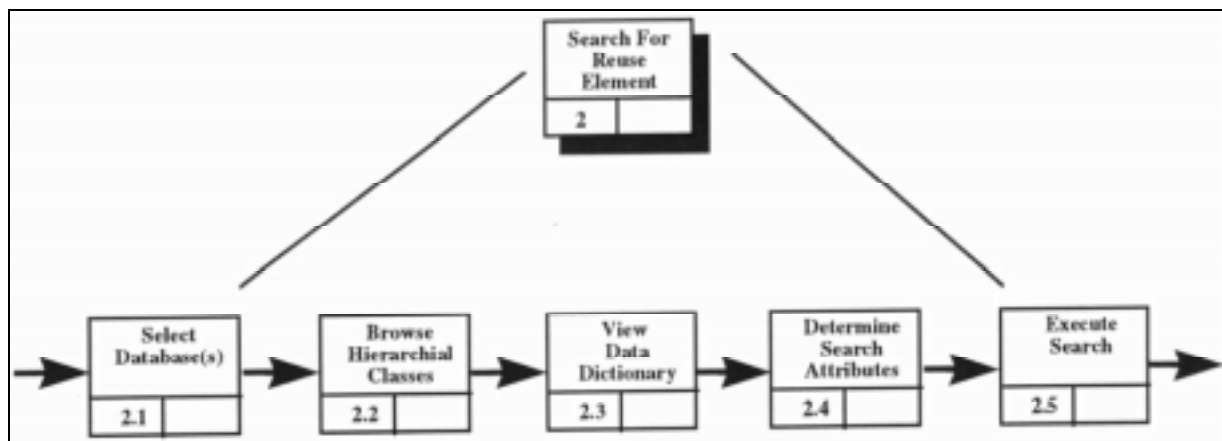


Figure 10: Process Decomposition: Search for Reuse Element

4.3.6.1 Select Database(s) [2.1]

Description

The Design Engineer Selects the appropriate Reuse Database to search.

Objects

Design Engineer
Search Engine

4.3.6.2 Browse Hierarchical Classes [2.2]

Description

The Design Engineer Browses the hierarchial class representation in the selected database(s).

Objects

Design Engineer
Search Engine

4.3.6.3 View Data Dictionary [2.3]

Description

The Design Engineer views the Data Dictionary for the classes.

Objects

Design Engineer
Search Engine

4.3.6.4 Determine Search Attributes [2.4]

Description

The Design Engineer enters search attributes.

Objects

Design Engineer
Search Engine

4.3.6.5 Execute Search [2.5]

Description

The Design Engineer executes the search.

Objects

Design Engineer
Search Engine

4.3.7 Decomposition For: Refine Search

This is the decomposition for refining the search for a Reuse Element to use in a design. These processes are illustrated in Figure 11.

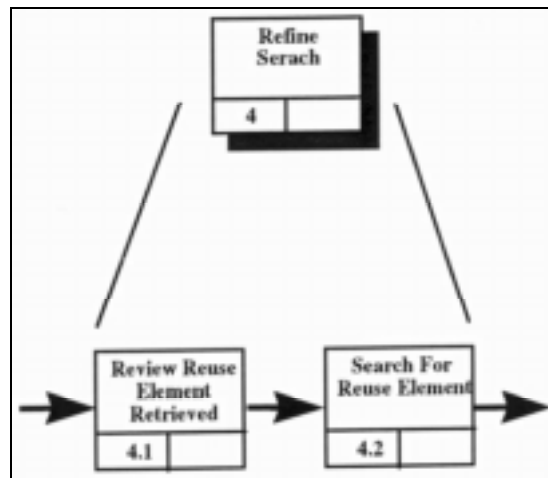


Figure 11: Process Decomposition: Refine Search Details

4.3.7.1 Review Reuse Element Retrieved [4.1]

Description

The Design Engineer reviews the Reuse Elements retrieved from the latest search.

Objects

Design Engineer
Search Results

4.3.7.2 Search For Reuse Element [4.2]

Description

The Design Engineer uses a search engine to search for a Reuse Element with the appropriate characteristics.

Objects

Design Engineer
Search Engine

4.3.8 Decomposition For: Utilize Reuse Element

This is the decomposition for utilizing a Reuse Element in a design. These processes are illustrated in Figure 12.

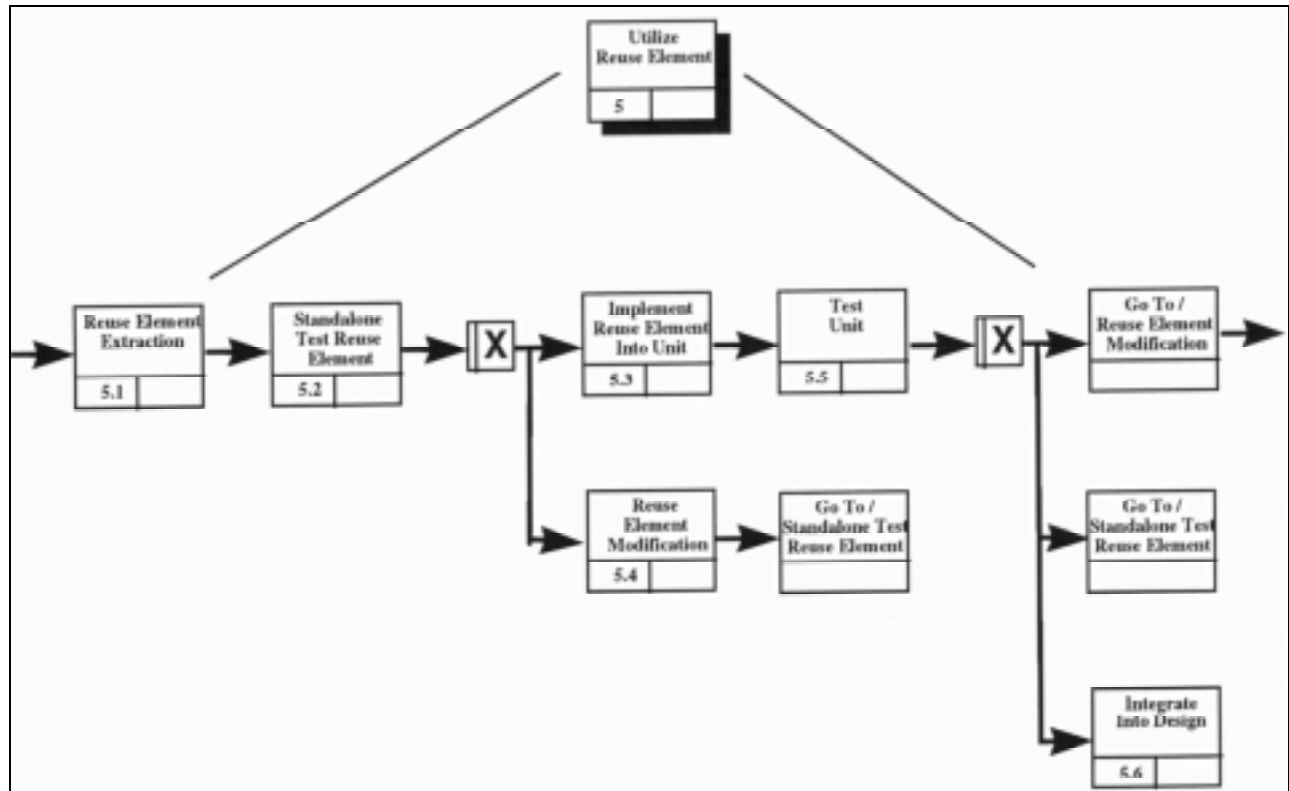


Figure 12: Process Decomposition: Utilize Reuse Element Details

4.3.8.1 Reuse Element Extraction [5.1]

Description

The Design Engineer extracts the Reuse Element From its stored location.

Objects

Design Engineer
Search Results

4.3.8.2 Standalone Test Reuse Element [5.2]

Description

The Design Engineer performs standalone testing of the Reuse Element.

Objects

Design Engineer
Reuse Element

4.3.8.3 Implement Reuse Element Into Unit [5.3]

Description

The Design Engineer implements the Reuse Element into the unit.

Objects

Design Engineer
Reuse Element
Unit Configuration

4.3.8.4 Reuse Element Modification [5.4]

Description

The Design Engineer modifies the Reuse Element

Objects

Design Engineer
Reuse Element

4.3.8.5 Test Unit [5.5]

Description

The Design Engineer tests the unit.

Objects

Design Engineer
Unit Configuration

4.3.8.6 Integrate Into Design [5.6]

Description

The Design Engineer integrates the Unit containing the Reuse Element into the overall design.

Objects

Design Engineer
Unit Configuration
Design Configuration

5. Acronyms

ATL	Advanced Technology Laboratories
CPC	Communications and Power Center
CSES	Commercial Satellite Enterprise Solution
IDEF	Integration Definition
KSL	Knowledge System Laboratories
OMT	Object Methodology Technique
RASSP	Rapid Prototyping of Application-Specific Signal Processors
RDOCH	Reuse Design Object Classification Hierarchy
RDMS	Reuse Data Management System
RRDMS	RASSP Reuse Data Management System
SPC	Software Productivity Consortium