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*Process Definition Method*

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Oxford Software Engineering Limited.  
9 Spinners Court,  
53 West End,  
Witney,  
Oxfordshire.  
OX8 6NJ

Tel. +44 (0) 1993 700878  
Fax. +44 (0) 1189 773562

Signature on file  
Author: \_\_\_\_\_  
*(C C Shalley)*  
Signature on file  
Approved: \_\_\_\_\_  
*(I.E.Seward)*

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## **1 Introduction**

### **1.1 Purpose of this Document**

This document describes and provides guidance on OSEL's Process Definition Method.

### **1.2 Scope of this Document**

This description limits itself to the description of the Process Definition Method. It does not prescribe when the method or individual stages can be used.

## **2 Background and Objectives**

### **2.1 Background**

The Process Definition Method has been developed over number of years working defining processes and developing coherent, readable procedures and guidelines.

The method described here is intended to be simple, straightforward, informal and flexible.

### **2.2 Objectives**

The objective of the Process Definition Method is to enable practices and activities within software development (and other) organizations to be captured as defined processes and then described as procedures and guidelines. These may then provide a baseline for further process improvement.

It is intended that each of the stages described below be self-contained and applicable in a wide variety of situations and environments.

## **3 Description of the Process Definition Method**

### **3.1 Overview**

The method has 5 stages:

- a) Modelling;
- b) Data Gathering and Refinement;
- c) Identification;
- d) Production and Validation;
- e) Publication.

Each of these stages is described in detail below.

### **3.2 Stage 1 - Modelling**

#### **3.2.1 Objective**

The objective of modelling is to derive a reasonable, draft process model that can be used as the basis for learning and discussion during data gathering. An important secondary objective

is to ensure that the people conducting the process definition exercise have had the opportunity to develop a reasonable understanding of the process *prior* to discussions with process owners and users.

### **3.2.2 Entry Criteria**

The following entry criteria are required:

- a) Process area is scoped. The extent and nature of the objectives, tasks and activities in question should be reasonably well understood before modelling. A simple verb-noun description of the process should help define the scope (e.g. 'manage facilities'). A policy or statement of requirements for the process area is helpful in scoping.
- b) Owners of the process to be modelled are sponsoring the modelling activity and adequate plans and resources are available.

### **3.2.3 Producing the Preliminary Model**

There are a number of steps in the production of the preliminary model:

- a) Brainstorm and list concepts related to the process area.
- b) Identify the entities involved in the process. These may include:
  - people
  - interactions
  - resources
  - tools
  - etc.
- c) Map concepts onto entities to determine coverage. That is, list concepts against each of the entities and determine how well balanced the distribution is. The objective of steps a, b and c is to determine the understanding and coverage of the process by early ideas.
- d) Develop a context diagram (level 0) for the process. IDEF 0 notation is recommended for this (see Annex A) but other notations may be used. Identify all the:
  - inputs
  - requirements or needs
  - outputs
  - outcomes
  - controls or constraints
  - resources, mechanisms or tools used.
- e) Decompose the context diagram to level 1. To begin with it is sometimes easier to limit diagramming to flows, perhaps using Data Flow Diagrams (DFDs). However these should be developed into IDEF 0 to show controls and resources.
- f) *Attempt* to decompose level 1 diagrams to level 2. It is unlikely that useable level 2 diagrams can be produced at this stage but it is useful to attempt to produce them to test understanding of level 1 diagrams.
- g) Review the context diagram and level 1 diagrams against any organizational policy or process requirements. Also review for completeness and consistency.

### **3.2.4 Exit Criteria**

Modelling stage can be exited when:

- a) A reasonable draft process model has been developed and reviewed comprising:
  - context diagram
  - level 1 diagrams
  - supporting notes or narrative.
- b) Those developing the model have a reasonable understanding of the process requirements and the working of the process model.

### 3.3 Stage 2 - Data Gathering and Refinement

#### 3.3.1 Objective

The objectives of data gathering are:

- a) Refine or revise the process model by collecting information about activities and tasks in the process area;
- b) Gain 'buy in' from those performing activities and tasks in the process area.

#### 3.3.2 Entry Criteria

The following entry criteria are required:

- a) Preliminary process model is available;
- b) Process modellers have sufficient understanding of process area to talk sensibly with people using or owning the process.

#### 3.3.3 Data Gathering and Refinement

There are a number of steps in the production of the process model. A number of them can be performed in parallel:

- a) Collect and review available documentation. This may comprise:
  - organization charts
  - policy statements
  - existing procedures (these may be overlapping, contradictory, of unknown status, incomplete or discredited but will provide insight into the process area. Where feasible retain or develop useable parts of these to demonstrate consistency with previous work and to reduce chances of NIH.
  - existing or *de-facto* standards
  - reports
  - forms
  - data.
- b) Interview people with knowledge of the process (users and owners):
  - prepare checklist for interview with <info provider>
  - schedule interview (no more than two hours and no more than 3 a day)
  - conduct interview
    - in interviewee's own work area
    - attempt to derive *interviewee's* context diagram
    - discuss interactions with people
    - discuss in tray and out tray

- review draft process context and level 1 and encourage redrafting or editing
  - you will be told about problems
  - identify critical incidents (when was the last time <X> occurred?)
  - allow opportunity for divergence from checklist or script
  - thank for time and effort and promise feedback
  - debrief
  - record key points and copy to interviewee for comment.
- c) Review findings from document reviews and interviews to produce a consistent and accurate view of the process.
- d) Revise process model in light of information gathered from interviews and interviewee feedback, and document reviews. Revisions may include changes of emphasis, additions, changes of scope, and cut and paste of process elements.
- e) Review revised process model for:
- consistency, correctness and completeness
  - its place in a process architecture (if there is one).
- f) Consider subjecting to user and owner review (but remember this is a technical process model, not user documentation).

#### **3.3.4 Exit Criteria**

The data gathering and refinement stage can be exited when:

- a) A complete and consistent process model has been developed and reviewed comprising:
- context diagram
  - level 1 diagrams
  - supporting notes or narrative.

### **3.4 Stage 3 - Identification**

#### **3.4.1 Objective**

The objectives of identification are:

- a) to identify potentially generic processes;
- b) to capture and promote best practices;
- c) design a logical framework for user documentation;
- d) to identify and name appropriate elements of defined processes as process guides (including guidance on use and tailoring), procedures and work instructions.

#### **3.4.2 Entry Criteria**

The following entry criteria are required:

- a) A complete and accurate process model is available. (The process model is the process 'technical documentation', the procedures and guidelines will be the 'user manual'.)

#### **3.4.3 Identifying and Producing Draft Procedures**

The production of procedures involves a number of tasks:

- a) Design a structure for user documentation. Procedures and other documentation should be placed within a framework that allows them to be accessed readily and makes their relationship with other procedures and related documents clear.
- c) Review processes for 'best practices'. Best practices are activities that are recognized as effective and useful. Promote best practices within processes where appropriate. (This is not trivial - best practice in one area may be perceived as a waste of time or an overhead in another.)
- d) Identify potentially 'generic' processes. Similar processes used in different contexts may be replaced by the most effective version. To identify generic processes it is necessary to distinguish the process from the data or information it acts on.
- e) Partition process into procedures. Partitioning into procedures should be based on judgement as to what constitutes a coherent procedure. (*Guidance on this should be developed.*)

#### **3.4.4 Exit Criteria**

The Identification stage can be exited when the process model has been partitioned into a complete set of named and identified procedures that are optimized by recognizing best practice and using generic processes, where possible.

### **3.5 Stage 4 – Production and Validation**

#### **3.5.1 Objective**

The objectives of the Produce and Validate stage are:

- a) to produce, for users, procedures and supporting materials;
- b) to gain user and owner acceptance of the procedures.

#### **3.5.2 Entry Criteria**

Procedures have been identified. Typically that is:

- named
- numbered
- specified (an outline of the contents and relation to process model).

#### **3.5.3 Producing and Validating Procedures**

There are a number of steps in the production and validation of procedures:

- a) Design or adopt a format for documentation. This should support:
  - ease of change
  - local formats, if required
  - usability - readability, brevity, coherence, accessibility
  - media - paper or electronic
  - required standards - e.g. ISO 9000, DO178b.

- b) Draft procedures ensuring they meet the needs of the organization and users. These needs should be identified in a) above.

Draft other required materials:

- policy statements
- 'navigation guides'
- user diagrams ('process diagrams' – probably 'flow diagrams' or RADs derived from IDEF 0, or alternative notations )
- local work instructions
- tailoring and scaling guidelines
- checklists
- forms
- templates
- examples
- training materials.

- c) Review draft procedures and other material.
- d) Subject to user and owner review and revise. Care should be taken when subjecting to user and owner review. There may be inappropriate views on what is required. This must be managed to ensure acceptance without compromising the quality of the procedures too much - however some unnecessary changes should be accepted to ensure user acceptance.

### **3.5.4 Exit Criteria**

The Produce and Validate stage can be exited when a complete set of procedures and supporting materials for the process have been produced, reviewed and accepted by users and owners.

## **3.6 Stage 5 - Publication**

### **3.6.1 Objective**

The objective of the Publish Product stage is to introduce the procedures and supporting material into the organization in a manner that ensures they are, and remain, useful to users and the organization.

### **3.6.2 Entry Criteria**

The following entry criteria are required:

- a) A complete set of procedures and supporting materials for the process have been produced, reviewed and approved by users and owners.

### **3.6.3 Publication**

There a number of ways in which process and procedures may be introduced or rolled out. The most appropriate techniques will be a matter of judgement. The following list is intended a checklist rather than a description.

- a) Plan introduction and roll out of processes.
- b) Gain management authorization 'sign off' for procedures and materials.
- c) Issue (numbered) copies of procedures and materials.

- d) Establish point of contact or help desk for enquiries or problems.
- e) Identify change authority for process, procedures and materials.
- f) Deliver required awareness or training.
- g) Provide support to users. This may include hands on coaching or mentoring.
- h) (Periodically) review effectiveness and (later) efficiency of processes.

#### **3.6.4 Exit Criteria**

No exit criteria are specified for this step - it is an ongoing process.

## **4 Guidance**

### **4.1 The Structure of the Definition Method**

The method has a number of stages that have evolved during its development. The most significant point that strikes users of the method is the ordering of the first two stages - modelling before data gathering. This can seem perverse. There are a number of reasons for this:

- a) It is assumed that people experienced in analysis and process modelling use this method. These people will have a reasonable idea of what may be involved and need to prepare themselves for data gathering. The modelling stage provides the opportunity to 'take a position' about the process. If it is not correct then it can be changed.
- b) Preparation is required prior to data gathering. Modelling provides this preparation. Ill prepared data gathering, i.e. evidently ignorant about the process in general terms, can make a bad impression
- c) Data gathering may not yield much useful information. Without a model little sense can be made of poor data.

If the ordering of the first two stages causes problems then reverse them.

It is critical that the last stage of the method is handled smoothly and that it is clear to the organization that the processes are being deployed professionally, however each organization has different needs and the support required by processes will vary greatly.

It is intended that each of the stages be 'stand alone'. They may be used by themselves as appropriate.

### **4.2 Skills**

It is presumed that users of the method are skilled in analysis, process definition, modelling and documentation. The method does not provide guidance on these basic skills.

### **4.3 Reviewing**

Reviewing is critical:

- a) Technical reviewing is the primary quality control technique. Ensure appropriate review within the process definition team to ensure sound processes.

- b) Reviewing by users and owners is valuable in getting support and buy in. It may not yield many benefits in terms of improving the effectiveness of the processes or procedures - and can reduce their quality - however it will increase their acceptability. It is difficult to overdo user review.

#### **4.4 Quality**

The qualities required of the process, the process definition and the process user materials differ. Desirable qualities for the process are:

- a) effective operation;
- b) simplicity;
- c) flexibility (and tailorability);
- d) support.

Desirable qualities for the technical definition of the process are:

- a) accuracy;
- b) completeness.

Desirable qualities for procedures and other user materials are:

- a) accessibility;
- b) clarity;
- c) coherence;
- d) brevity;
- e) attractive appearance.

Distinguish between the three aspects of a process - even in technically oriented organizations where familiarity with complex technical documentation may suggest that users could cope with access to technical process descriptions alone.

*Annex A*

**Contents**

- 1. The IDEF 0 Notation (See FIPS 183)**
- 2. A Framework for Process Documentation**
- 3. Sample Contents Page for a Procedure**