Template for a System Design File Using OODPM Version 2015

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Abstract

Object Oriented Design by Prototype Methodology (OODPM) integrates two known technologies: the object approach and the prototype concept. Object oriented methodology is used for internal system design, and prototype methodology is used for external system design. This document is a template for a system design file using OODPM version 2015 (titles of paragraphs only). For full explanations for each paragraph look at [1]. This version developed after tens of projects that developed and plan using version 6 in a very vast projects for national information systems. This version companion by "OODPM - Methodology for Management Information Systems life Cycle" (meanwhile only in Hebrew).

Keywords: OODPM, template for OODPM, OODPM2015, SHILUV (The name of the methodology in Hebrew).

Introduction

In object-oriented design, the object is the building block upon which the system is constructed. It comprises a method (the algorithm according to which the object operates), data that the object activates, and an area in which data is transferred between the object and other programs or objects [2] [3] [4]. While in OO design an object is a building block, at the same time objects do not exist (or behave) in isolation. Rather, they participate in actions together with other objects in order to satisfy some objective. Also, relationships between objects defined by relationship invariants define the stable properties of the system that should not be violated by those actions [5] [6].

Prototype methodology bases system planning and design upon the construction of a prototype, which is used to test, demonstrate, and evaluate the proposed system. Although there are several kinds of prototypes, they all allow the system to be perceived from the user's point of view. Instead of relying on the user's imagination, the prototype provides a tool that fully simulates the future system, thereby minimizing the risk of errors and misunderstandings [7].

OODPM embodies an integration of these approaches. The system is planned by defining objects (as well as relationships and behavior); while the users interface (the graphical design) is presented by means of a prototype. This approach has been presented in several publications [8] [9] [10] [11]. A survey of large software houses in Israel (2003) [12], which examined the use of methodologies and tools in information systems development phases, found that 42% of the firms use UML methodology, 15% use OODPM [1], 12% use OMT, 10% use *Mafteach* [13], and 7% use Code & Yourdon.

In the OODPM model, the activity (object) comprises six components (See Fig. 1):

(a) The user interface - window/screen of the computer system, depicting the activity of the future system.

(b) Verbal description of the process used by the activity (free text or pseudo-code). If the process will be automated, this description must be explicit, integral, and unambiguous – in other words, pseudo-code.

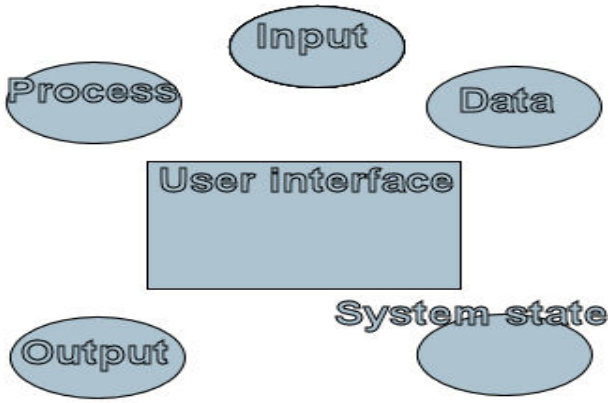
(c) Input data that will be entered into the window/screen of the information system.

(d) Output of the computer system window/screen (for example, a computer record consisting of the input fields and additional data, such as a user ID, date, etc.).

(e) Data format used in the activity.

(f) System state (Common communication area for objects, for example, Response Code Table).

Components (a), (b), (c), (e) and (f) are preconditions of the activity (they should be true before the activity can occur), and components (d) and (f) are post conditions of the activity (what should be true as an immediate result of the activity).



Object components in OODPM

The first version of OODPM developed in 1994 and was for Hebrew language users only. Version 2 published in 1995, Version3 in 1997, Version 4 developed at 1999 only version 5 that developed at 2003 was for Hebrew and English languages users. Version 5.1 developed at 2005 and used in many projects in Israel also in Europe (Denmark, Finland and Germany) and Asia (Indonesia, Pakistan). OODPM version 6 (2010) developed after tens of projects that developed and plan using 5.1 version in a very vast projects for national information systems. This version, OODPM 2015 (7) companion by "OODPM - Methodology for Management Information Systems life Cycle, User Guide Version 2010 (7)" – meanwhile only in Hebrew. The OODPM method studied in The Hebrew University of Jerusalem, The University of Haifa, The Ben Gurion University and Ariel University.

OODPM version 2015 contains also project management component and tracking the progress of project development. These two components improve the ability to complete the project on time and according to specifications [15].

Template for OODPM version 2015 (ver. 6)

1 Chapter on Initiation and Introduction

1.1 Initiation

1.2 Description of Background

1.2.1 General description of the organization
{Include here general organizational structure diagram}
1.2.2 Characteristics of activity
1.2.3 Quantitative operational data

1.3 Definition of the Problem

1.3.1 General diagnosis of the problems from the point of view of the consumer.

1.4 Aims
1.4.1 Aims of the organization
1.4.2 The aims of the organizational unit examined
1.4.3 Aims and gauges of an information system

1.5 Fundamental Assumptions, Framework and Limitations
1.5.1 Scope of operation and its domain
1.5.2 Budgetary limitations
1.5.3 Timetable

1.6 Program for Carrying Out the Survey Previous System Analysis work
1.6.1 Method
1.6.2 Budget estimate
1.6.3 Timetable
1.6.4 Approval from the authorized decision-making level

2 Chapter on Description of Existing System

2.1 System and Structure
2.1.1 Organizational structure.
{Include here organizational unit structure diagram}
{Include here organizational work team structure diagram}
2.1.2 Technological character of the organization
2.1.3 Management characteristics
2.1.4 Development plans.

2.2 Flow of Information
2.2.1 The flow of information between principals in the organization.
{Include here functional flow chart}
{If needed use here Data Flow Diagram (DFD) content only}
2.2.2 Analysis of Information

2.3 Procedures
2.3.1 Description of procedures
2.3.2 The timing and coordination of times between the procedures.

2.4 Processes
2.4.1 Description of processes
2.4.2 The timing and coordination of times between the processes and activities
2.4.3 Handling inadequacies.

2.5 Forms
2.5.1 Description and characteristics
2.5.2 Examples
2.5.3 Division of fields in forms

2.6 Files
2.6.1 Description, characteristics and structure
2.6.2 Records
{Include here examples of records structure}
2.6.3 Special fields and specifications

2.7 Reports
2.7.1 Description, structure and characteristics
2.7.2 Contents of reports.
2.7.3 Examples

2.8 Linkages with Other Systems
2.8.1 Direction and depth of linkages

2.9 Resources in the System
2.9.1 Manpower
2.9.2 Equipment
2.9.3 Software
2.9.4 Hardware
2.9.5 Communication
2.9.6 Miscellaneous

2.10 Definition of Problems of Existing System
{Include here 2 dimensions table: problems and symptoms}
2.10.1 Process problems
2.10.2 Information problems
2.10.3 Coordination problems
2.10.4 Technological problems

3 Chapter on Feasibility Research

3.1 Requirements of the New System
3.1.1 Required tasks
3.1.2 Inadequacies to be corrected.
3.1.3 Additional improvements.
3.1.4 Aims and gauges
3.1.5 Constraints

3.2 Alternative Solutions
3.2.1 Description of solutions
3.2.2 Describe the solutions as responses to requirements and problems
3.2.3 Advantages and disadvantages of each solution

Paragraphs 3.3, 3.4 and 3.5 can be presented (in some cases) using table in 3.6.1

3.3 Economic Feasibility
3.3.1 Lifetime of the system
3.3.2 Development cost
3.3.3 Operating cost
3.3.4 Comprehensive analysis for each solution.

3.4 Technological Feasibility
3.4.1 Possibility of development from a technological standpoint.
3.4.2 Possibility of integration into an existing technology
3.4.3 Technological stability and its reliability
3.4.4 Comprehensive analysis for each solution.

3.5 Operational Feasibility
3.5.1 Extent of required change to the existing situation
3.5.2 Anticipated resistance and/or assistance
3.5.3 Comprehensive analysis for each solution.

3.6 The Chosen Solution
3.6.1 Comprehensive analysis
{Include here Delphi model's weighted grading table summary}
3.6.2 Recommendations for deciding on the system
3.6.3 Decision

3.7 Program of Action for Developing Project
3.7.1 Manpower Required For Development
3.7.2 Hardware and Software required for development
3.7.3 Timetable
3.7.4 Approval of the authorized decision-making level

4 Chapter on Defining the New System
4.1 Perceptions and Principles
4.1.1 Perception of the computerized system
4.1.2 Organizational aspects

4.2 Constraints and Limitations
4.2.1 Constraints and limitations of the computer system
4.2.2 Constraints and limitations of the organization

4.3 General Description
4.3.1 System components
{Include here a structural chart (SC) of the system}
4.3.2 System flow
4.3.3 Scope and frequencies of operations

4.4 Data Structure for System Components
4.4.1 Input contents
4.4.2 Output contents
4.4.3 Structure of files and tables in the system

4.4.3.1 Description and characteristics.
4.4.3.2 Example of records.
{Include here table of record fields}

4.4.4 Databases
    4.4.4.1 Logical organization.
    4.4.4.2 Physical organization.

4.5 Sub-systems
4.5.1 Components of each sub-system.
4.5.2 Inputs of each sub-system.
4.5.3 Outputs of each sub-system.
4.5.4 Files of each sub-system
4.5.5 Operations of each sub-system.
4.5.6 Operational screens of the sub-system.
4.5.7 Developing phases recommended

4.6 Linkages with Other Systems
4.6.1 Technical linkages
4.6.2 Operational and organizational links

4.7 Hardware and Software Requirements
4.7.1 Equipment / hardware requirement
4.7.2 Software requirements
    4.7.2.1 Infrastructure software.
    4.7.2.2 Programming languages and application generators.

4.7.3 Information security and backup requirements.

4.8 Operation, Conversion and Assimilation Requirements
4.8.1 Testing and trial requirements
4.8.2 Conversion requirements
4.8.3 Essential requirements for preliminary operation.

4.9 Control Requirements and Feedback
4. 9.1 Quality.
4.9.2 Timetable.
4.9.3 Resources
4.9.4 Reporting

4.10 Possibilities for Expansion
4.10.1 Possible requirements for increasing the volume of data.
4.10.2 Possible requirements for the increase of functions
4.10.3 Possible requirements for technological changes.
4.10.4 Possible requirements for linkages with other systems.

4.11 Risks in Projects
{Include here table of risks description, risks probability etc.}

5 Chapter on Designing the System
5.1 Detailed Description of the System
5.1.1 Description of the system
5.1.2 Function of various components
5.1.3 Processing procedure.

5.2 Detailed Description of Each System Object (Component)
5.2.1 Description of object 1
5.2.1.1 Drawing of the system screen (or of another main component, such as a printout).
{Include here drawing of the system screen/window comprise the user interface of the object (GUI)}
5.2.1.2 Input of the object.
{Include here table of record fields}
5.2.1.3 Output to each object.
{Include here table of record fields}
5.2.1.4 Processing of each object (the method).
5.2.1.5 Messages from each object.
{Include here 2 dimensions table, response code and translation of the code.
5.2.1.6 Data structure of the object.
{Include here table of record fields}

5.2.2 Description of object 2…N

5.3 System Navigation Diagram
{Include here system navigation diagram}

5.4 Presentation of the User Interface Activation

Summary

For convenient use of the methodology a template for word 2010 is available. The first version of OODPM was published at 1994. The last version (7) published at 2015. This version is both in English and in Hebrew.
More information about the methodology and downloading the template can be available at the methodology site [14].

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