

SOFTWARE EXPERTS



PROCESS DESCRIPTION

DESIGN AND ANALYSIS

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“**Design and Analysis**” phase precedes the “development and Implementation” phase consists and consists of two parts:

- 1) *Analysis of Requirements; and*
- 2) *Software Architecture Design.*

1) Analysis of Requirements

The goal of analysis consists of gaining and documenting a mutual understanding and overview of the scope of the proposed software system consistent with the customer’s vision, technologies, budget and best options. Here is where the project team and the customer work together to document a joint understanding of the global objectives of the project including many of the smallest details of the system functionality and operation. The purpose is to have an understanding and agreement to the question: “What should the system do?”; and, “How will it function?”

This is a team-work process between the customer and the developers. The result of this stage are clear and congruent paths to achieve these goals.

The analyst should perform the following actions:

	Activity	Goal
1	Determine (classify) groups of users of the systems. Definition of intercommunications, relations, dependencies between these groups.	To gain a complete understanding of requirement to the security and access rights subsystem of the proposed application.
2	Create the «Use Case» diagram for each user group. In case of the large and complicated system, analyst may be limited by aggregated cases, e.g. case “manage users”. If the system is not very complex and the number of cases is limited analyst should define cases more specifically, e.g. “manage user” may be detailed into the following cases: “delete user”,	To understand the total number of user’s actions, which may accessible to be performed in the User Interface of the system.

	“create new”, “search for user”, “view user’s details” etc.	
3	Usually, the customer provides us with the application navigation map, which contains the list (tree) of all pages, forms, reports and other interface elements and describes navigation between these elements (nodes). We can create this map internally based on the “use cases” diagrams, if it is not provided by the customer.	To define the total number of large interface elements like page, form and etc. and to understand the navigation between them.
4	Decompose the system into large modules/subsystems based on the use cases model. Separate common (for all users groups) and particular subsystems.	To define the list of modules on the level of the user interface and their correlations and interactions.
5	Gather requirements (functional, user interface, performance and etc.) to each module.	To define total list of requirements to each subsystem.
6	Analyze the user interface design mockup provided by the customer or create it internally if not provided.	To define key requirements to the user interface of the system

The result of this work will be the “Software requirements specification” document, approved by the customer. Often this is rendered into a Statement of Work, (SOW.) This document should contain a structured list of all requirements to the application defined by the customer including following additions:

- 1) *Application user’s model;*
- 2) *“Use Case” diagrams for each user type (group);*
- 3) *Application navigation map;*
- 4) *Application User Interface mockup;*

2) Software Architecture Design

The main goal of this stage consists in creating of the application architecture design based on requirements collected and analyzed during the previous stage. On this stage, the project team should answer the customer's question: "How the system will do that has been stated in the requirements analysis phase?" And "What is the best way or platform to achieve that objective?"

To answer these questions, the system architect should perform following actions:

#	Activity	Goal
1	Define layers of the application; choose tools, frameworks, libraries to be used while implementing each layer. Define interaction interfaces between layers.	To create the conceptual application architecture design
2	Make decomposition of each layer into separated components and define key interaction interfaces between components. Architect should create "class diagram" for each component and "sequence diagram" for each key interaction flow, reflecting interaction between components.	To create detailed logical model of the application, reflecting classes' hierarchy of application and interaction between these classes.
3	Create a database structure model based on the logic model of application.	To create physical data model.

The result of this work will be the "Application Software Design" document, highlighting the following aspects of the design:

- 1) application logical model (diagrams of packages and classes);
- 2) components and subsystems interaction model (key "sequence" diagrams);
- 3) physical data model (initial DB structure of application).

Together the Analysis and Design are incorporated together into a document Statement of Work which is the design and specifications for the development of the final product.