PRESENTATION 8

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The Web-SynDic System: Use-case Driven Development

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Abstract

Nonnegative linear Diophantine equations (NLDE) are linear equations with integer coefficients and with solutions in nonnegative integers. NLDE and their systems are well-known area of mathematical research, which goes back to Ancient Greece. Nowadays the algorithmic issues of this area are the nest of diverse topical problems.

An interesting case is NLDE systems associated with context-free (CF) grammars (ANLDE systems).

The aim of the Project is development of a web system for demonstrating the work of the syntactic algorithms for solving ANLDE systems. The users of the web system are researches that have an access to the Internet and use standard Internet browsers. The main objectives of the web system are the following.

- Presenting the key facts of the ANLDE systems theory for the international scientific community.
- Demonstrating and testing the efficiency of the syntactic algorithms with the visual tool on various examples including user's ones.
- Providing the student team with the experience what the process of competent development of real software systems is.

One of the main tasks of the project was a development use-case model and also web-system implementation and testing based on this model.

In the UML language use-case model includes use-case diagram and descriptions of each use-case with corresponding sequence diagram.

Use-case model implementation

- On the Design phase system architecture model, behevioral model and form (the main part of the user interface) were based on the use-case model.
- Also 32 validation tests were executed on the Testing phase. Each test implements one use case.

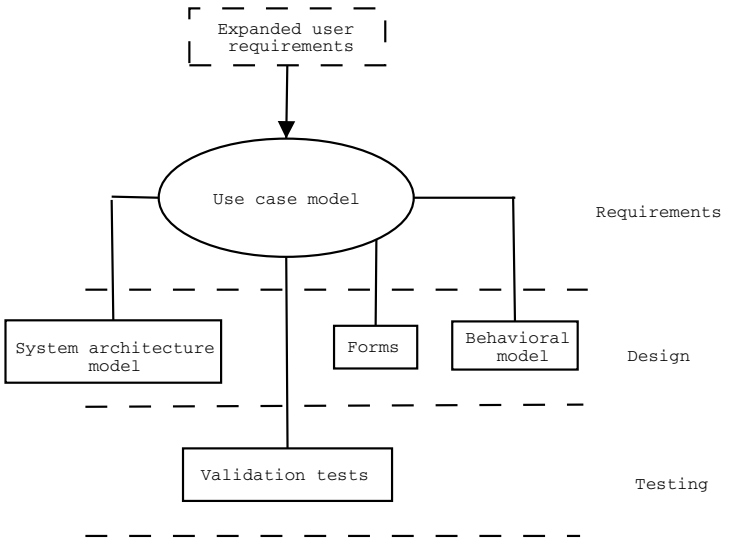

Figure 2: Usage of the use-case diagram on the different stages

Use-case model

Use-case model was built on the expanded user requirements which was based on the preliminary user requirements on the Requirements Analysis stage.

Each expanded user requirement describe one use-case.

Then links and external objects was selected and defined. Use-case diagram is shown on Fig. 1

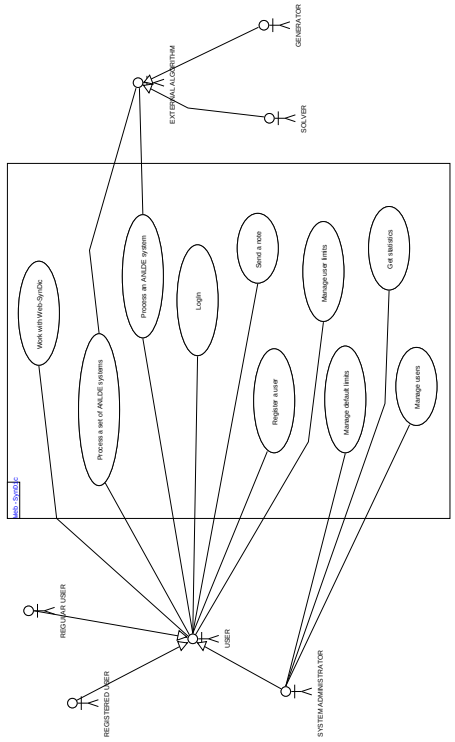

Figure 1: High-level usc-case diagram

Example of the sequence diagram with forms

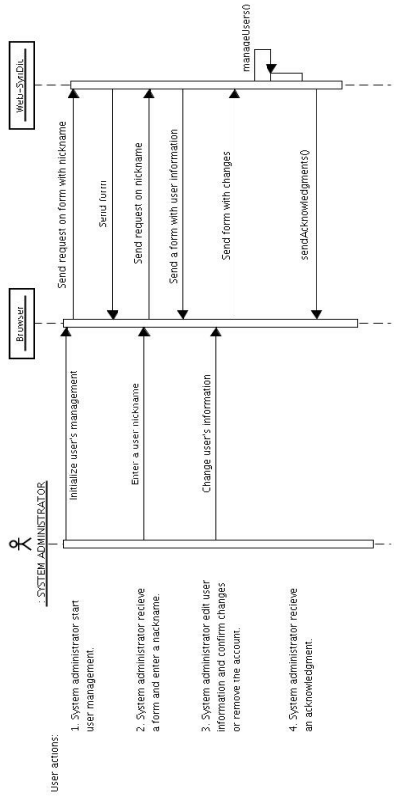

Figure 3: Manage Users sequence diagram