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GRAPHICAL METHODS FOR DESIGNING HOUSE HEATING SYSTEM

This article analyzes graphical methods for designing engineering system. The creation tasks of the house heating automated design system are solved with Unified Modeling Language. Collaboration diagram describes collection of objects, which in special situations work as united ensemble. The diagram presents ensemble's static (connections that link objects) and actions (sending messages). It accents the static ensemble structure. The messages in collaboration diagrams numbered for showing the sending order. Collaboration diagram describes particular situation and is useful to present objective range analysis results, but is limited because we can show few messages in the diagram.

In this collaboration diagram (Fig. 1) user controls a form from which it begins to design the house heating system. Then the system automatically finds fund-required radiators in the database and draws the heating devices. After that, the system automatically finds fund-required pipes and valves in the database and draws the pipes and valves. Finally, the system automatically designs the house heating system with specification and draws it. The collaboration diagram presents the overall scheme of all objects belonging to ensemble and their functions. It is possible that not all objects showing up in the collaboration diagram are going to end up in the final class structure. Designer can change some objects to other class properties or define additional methods.

The class diagram presents system's static structure. The house heating system in the drawing composed from aggregation links connected classes: radiator, valve, pipe and specification. All messages from collaboration diagram example for the object's radiator (design, connect, find, draw) are presented as class operations.

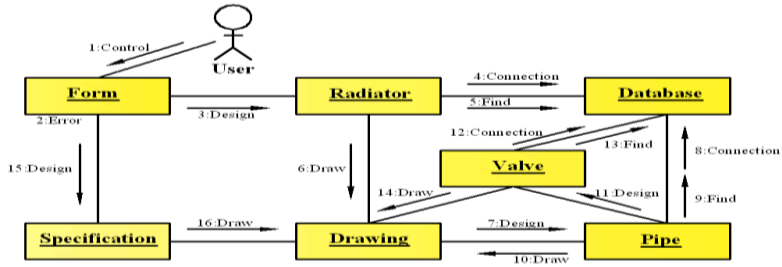

Fig. 1. Automated house heating design system collaboration diagram

Graphical methods of the house heating automated design system:

The system modeled by UML. Presented project shows system's object classes and their methods and properties.

Object-oriented programming language, which directly allows to implemented UML project, used for designing the graphical system. Breaking down the system into classes with specific properties and methods allows writing a program with individual modules, which simplifies and clarifies programmer's work.

Designing systems' connection with databases is necessary. Engineering objects selected from objects' assortment tables. Such tables can easily be written to the database tables and the program automatically finds the right parameters of graphical element.

Extended data with object's actual information attached to the drawing graphical objects. That makes it easy to form specifications for the drawing's objects.

A graphical environment and a working programming language in this environment are required for design of such systems. For example, Visual Basic for Application programming language works with the AutoCAD environment.

Four graphical objects are defined: radiator, valve, pipe and specification. The radiators, pipes and valves selected from the database and while drawing them the extended data with object's actual information appended.