

Project Portfolio Management Prototype Application Design

Paul POCATILU

Academy of Economic Studies, Bucharest

The management of project portfolio in a company requires the use of specific software, especially when the number of projects is significant. This paper is based on the Methodology for the development of IT projects portfolio management applications research project. This paper presents some of the results of a project portfolio application design.

Keywords: project management, project portfolio management, applications development.

Introduction

Project portfolio management has a high level of importance in project oriented companies in order to achieve the business goals. The project portfolio management has to be supported by software tools that cover various needs of the managers.

Many IT-oriented companies and research institutes from Romania are developing software systems through the projects. The number of projects running at a given time is significant, which leads to difficulties in ascertaining the development stage of certain or several projects and the amount of resources involved in these projects. By organizing the projects in a portfolio, their management becomes a much easier task for the persons in charge, but this should be done only by using specialized software applications.

The objective of the *Methodology for the development of IT projects portfolio management applications* project is to develop a methodology for building software applications for project management portfolios based on research of the running IT projects

inside various organizations. During this research, were analyzed by comparison how the projects portfolio management is done in some companies and organizations from Romania and abroad in order to identify the main characteristics that shall represent the basis of the software system development. The methodology allows the development of classical, distributed and mobile applications for PPM. One of the deliverable of the *Methodology for the development of IT projects portfolio management applications* project is an application prototype for IT project portfolio management.

This methodology will help in building applications for PM and PPM, applications that could be customized based on the managers and clients' needs.

The design process

The design phase had the following levels: conceptual design, logical design and physical design (figure 1). The physical design was used for the prototype.

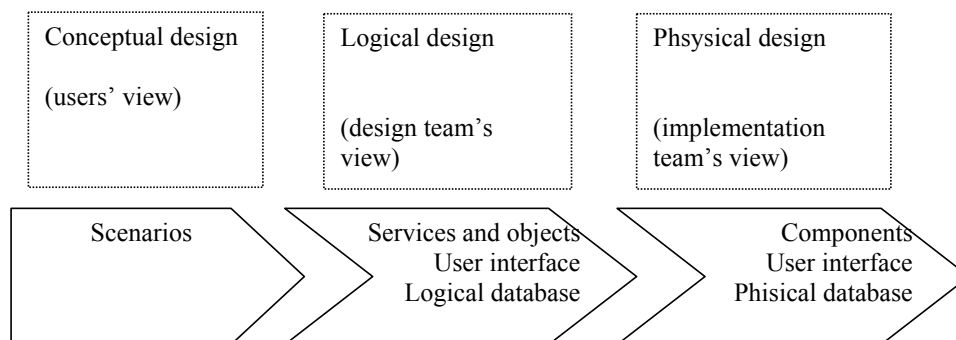


Fig. 1 Design levels and the resulting models

The *conceptual model* presents the problem from the users and business view, and the problem are define using scenarios. This

model identifies the business specifics, user's activities and requirements. The generated scenarios have to show the requirements

completely and exactly. The clients, users and other stakeholders are involved in scenarios' development.

The *logical model* results from the design team's view over the problem. The scenarios defined at a conceptual model are used and an abstract model of the solution is built. The abstract model is composed by object and services, user interface and a logical database design.

The *physical model* presents the problem from a developer point of view. The output from the logical level is used as input for the components and user interface specifications and for the database physical design.

The main objects identified are *Proiect*, *Portofoliu* and *Resursa*. Figures 2, 3 and 4 depict the identified classes' members.

Proiect
-IDProiect
-Denumire
-Versiune
-Buget
-Tip
-DataDeInceput
-DataDeIncheiere

Fig. 2 *Proiect* class

The members of *Proiect* class are:

- *IDProiect* – the unique id of the project
- *Denumire* – project name
- *Versiune* – project version
- *Buget* – project initially budget
- *Tip* – project type; the type is associated to IT domain of which the project belongs to: software development, maintenance, hardware configuration etc.
- *DataDeInceput* – project start date
- *DataDeIncheiere* – project finish date (fixed or estimated)

Portofoliu
-IDPortofoliu
-Denumire
-TipPortofoliu
+AdaugaProiect()
+CalculeazaValoare()
+StergeProiect()
+NumarProiecte ()

Fig. 3 *Portofoliu* class

Portofoliu class has the following members:

- *IDPortofoliu* – portfolio unique id
- *Denumire* – portfolio name
- *TipPortofoliu* – portfolio type; possible values for this field are: SW (IT project portfolios focused on software development) and HW (IT projects portfolios focused on hardware development and implementation); portfolio type is used depending on the organization specific
- *AdaugaProiect()* – methods for adding a new project to the portfolio
- *StergeProiect()* – method for the removal of a project from a portfolio
- *CalculeazaValoare()* – method that returns the value of a portfolio at a given date
- *NumarProiecte()* – returns the number of projects within the portfolio

Resursa
-ID Resursa
-Denumire
-UnitateMasura
-Categorie
-PretUnitar

Fig. 4 *Resursa* class

The *Resursa* class includes the following members:

- *IDResursa* – resource unique id
- *Denumire* – resource name
- *Categorie* – resource type
- *UnitateMasura* – unit of measure
- *PretUnitar* – resource medium price

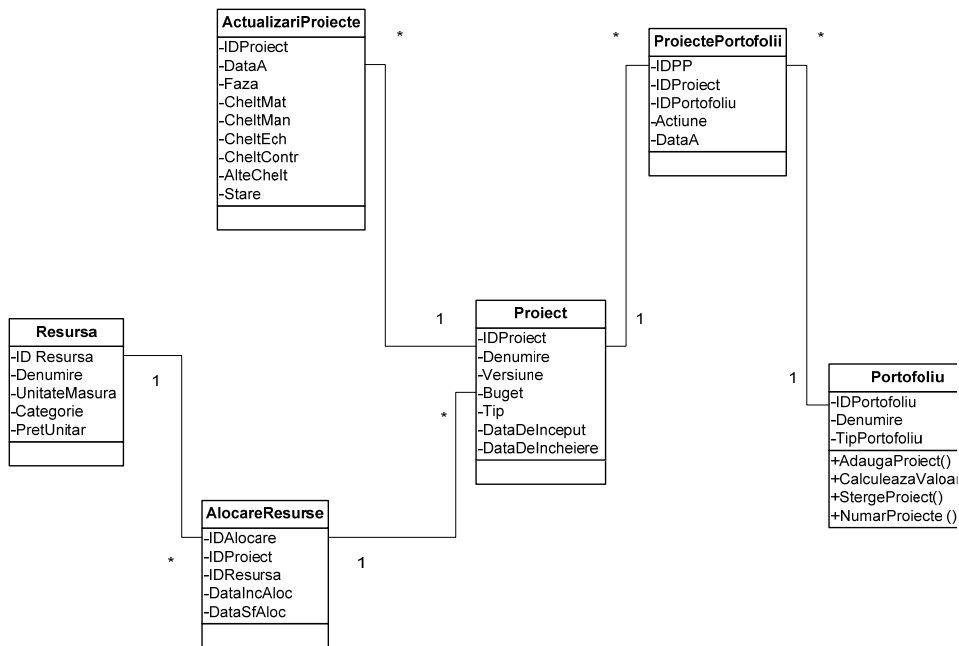


Fig. 5 A sequence from class diagram

Figure 6 depicts a sequence diagram that shows how a project is evaluated based on provided criteria. If the criteria are fulfilled, the project is accepted to be included in the

portfolio, otherwise the project is rejected. In the same manner where developed the other diagrams.

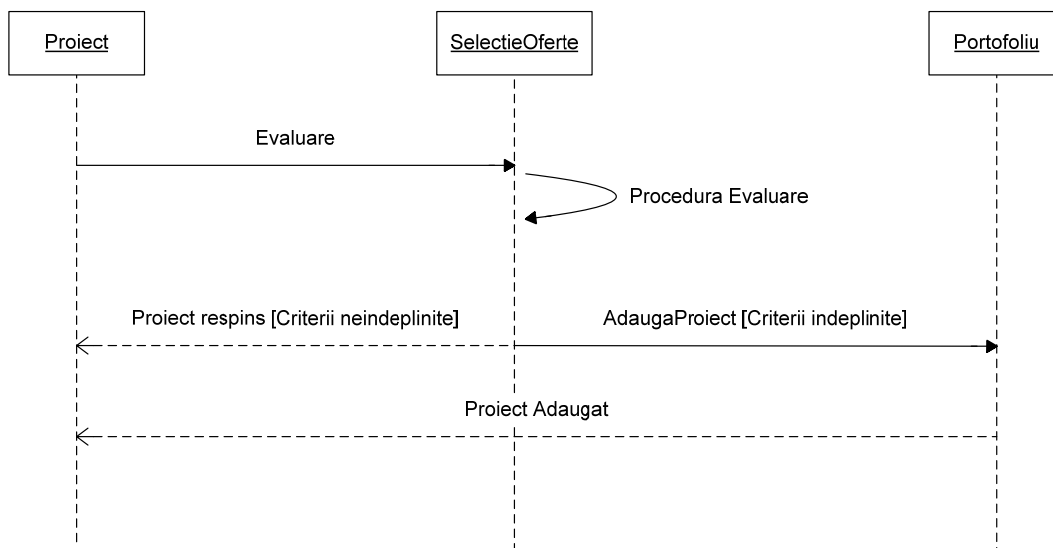


Fig. 6 Sequence diagram

Database structure

Databases object were designed according to the classes and object identified during the analysis and design phases. All the information about projects and programs has to be stored in database. About every project or program, at least the following information needs to be stored:

- Project name
- Project owner information
- Project mangers data
- Company information
- Project type
- Start and finish date
- Investment costs
- Expected profit

- Risks involved
- Current relationships.

Resurse, *Portofoliu* and *Proiecte* database tables.

Tables 1, 2 and 3 describe the structure of

Table 1 *Resurse* table structure

Field name	Type	Length
CodResursa	Text	10
Denumire	Text	50
IDCategorie	Long Integer	4
Unitate	Text	5
Pret Unitate	Single	4

The primary key of *Resurse* table is *CodResursa*.

Table 2 *Portofoliu* table structure

Field name	Type	Length
IDPortofoliu	Long Integer	4
Denumire	Text	50
TipPortofoliu	Byte	1

The primary key of *Portofoliu* table is *IDPortofoliu*.

Table 3 *Proiecte* table structure

Nume câmp	Tip	Lungime
CodProiect	Text	6
DenumireProiect	Text	50
Buget	Single	4
DataStart	Date/Time	8
DataIncheiere	Date/Time	8
TipProiect	Byte	1

The primary key of *Proiecte* table is *CodProiect*.

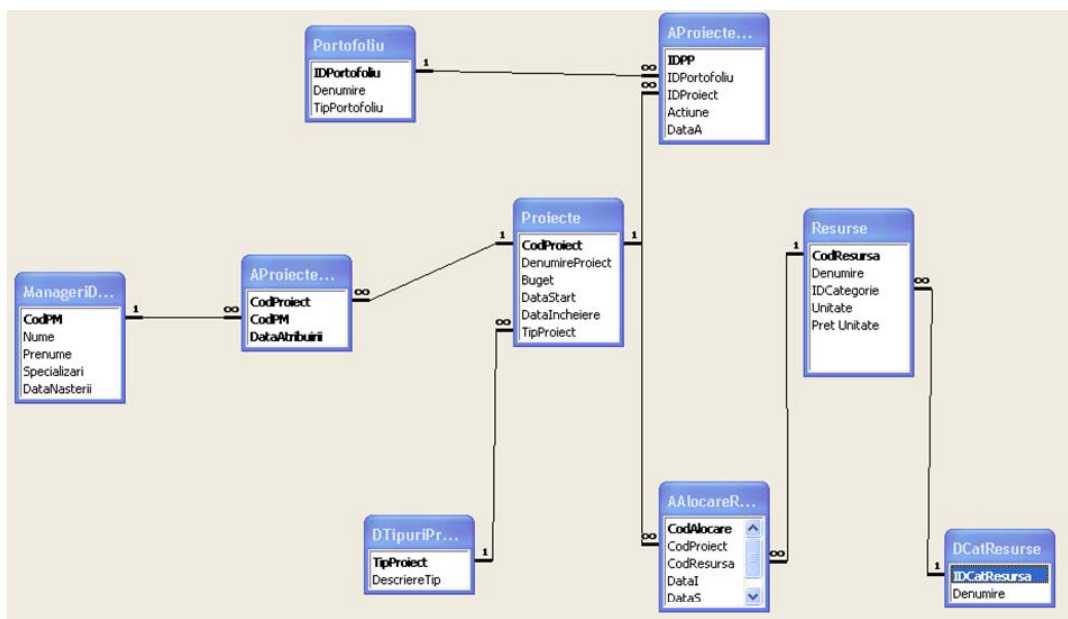


Fig. 7 Database structure

Figure 7 shows the database structure and relationships for the prototype application. The database prototype is developed in Microsoft Access and can be exported in other RDBMS.

Conclusions

It is recommended that project portfolio management software to be integrated within the company information system and also with the project management software, in order to transfer data automatically.

The design is based on the following steps:

- project oriented company analysis
- project management processes analysis
- multilevel design.

The methodology uses an object oriented approach having in mind the software development techniques performances that exists today.

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