
Business Process Modelling in Software Requirements Engineering Context

Manju Pandey

National Institution of Technology Raipur

ABSTRACT *Business information system development continues to be major source of revenue for the IT industry. In this paper the role of business modelling and analysis in software requirements engineering prior to application development has been discussed. The need for creating a model of the visualization of the client organization with its processes, roles and responsibilities is discussed. The business use case model, the business object model and the domain models which are the three primary components of any business domain analysis exercise have also been discussed.*

KEYWORDS

Business Process , Modeling, Requirement, Knowledge

INTRODUCTION

Business process modelling is undertaken to understand the structure and the dynamics of the organization in which an information system is to be deployed. It is by building models of the business models of the business process of an organization that we try to comprehend the current problems in a client organization and identify the area where improvements are possible [1]. In a requirement engineering context, business process modelling is undertaken for ensuring that the various stakeholders of a business information system development project, like the client organization, the end users and the developers have a common understanding of the client organization and specific needs. The key for successful business information system development is an in-depth understanding of the business domain before or along with development of an information system. The application developed by an IT organization as part of the overall business information system development must fit within the client's organization in that the delivered business information system must be in line with the client organizations business goals. Business process modelling, in particular facilitates the development of software requirements. It involves people at relatively higher levels in an organization these are the people who can have an appreciation of the overall organization and can help in the identification of the major cost centres inherent in the organization [2][3]. It also involves some of the decision makers, especially those decision makes who can take decisions in the organizations which involve structure of process changes as opposed to those who simply know the business well, the like of which are often present in small and medium sized enterprises. The new de facto standard governing business information system development today incorporates business modelling as the first discipline addressed and the key to acquiring the crucial artefacts that will underpin further development work. It is very important factor during the inception phase of a business information system development project.

THE IMORTANCE OF DOMAIN KNOWLEDGE

The term domain as used here stands for a general field of business, as for example, the automotive domain, the education domain, the healthcare domain, the manufacturing domain, retail domain, the telecommunications domain, the transport domain and other specialized sectors. It is a very important step to learn and further an understanding of the background knowledge of the underlying domains for the developers of business information systems. This shall enable them to communicate effectively with the end users of the system they intend to develop and to make relatively better and intelligent decisions. This will also lead to enhanced understanding and appreciation of the client's problems and will help in defining the scope of the

software development project that might follow. Business modelling or domain analysis is the process by which a software engineer learns the background information to understand the problem at hand and to make good decisions during requirements analysis and other phases of the software engineering process.

SOURCES OF DOMAIN KNOWLEDGE AND KEY PLAYER

For the purpose of carrying out domain analysis, and IT organization needs to devote human resources for gathering and fusing information from a number of different source. These resources can be senior software developers or managers, business analysts especially hired for the purpose of it can hire the services of experts in domain knowledge in the form of external consultants. The various sources of domain knowledge include high-level statements of the problem, overall or expert vision of the client's organization or enterprise, preferably documented in some place, and all information about the organization. Every model or document which contains a description of the problem space and the desires needs of its stakeholders is also a useful source of information in this regard. These include interviews, questionnaires, quarterly reports and personal research. In many instances successful identification of the domain knowledge of a specific sector may require individual initiative and research and on the part of the analyst.

KEY POINTS IN DOMAIN ANALYSIS

An IT organization must never undertake a serious business information system development project without committing itself first to a sound business process modelling initiative since the change of the success of the delivered business information system and its associated software applications depends critically on a good and thorough knowledge of the business domain for which the system is being developed. Furthermore a better understanding of the business domain enables an IT development organization to transition smoothly to the requirements analysis phase for solving the problem. It also enables the visualization for new and enhanced applications to better serve a client organization's needs. It must be recognized in this context that the problem of domain analysis is an ever continuing one as developers aggregate more and more domain knowledge with time.

APPLICATION TYPES

E-business is a reflection of the nature of business of an organization besides being a representation of what the business is all about. The application types defined in the context of E-business are: C2B applications that allow a customer to order goods over the Internet, such as books, mobile phones, gift items, etc. B2B automation of a supply chain across two companies, B2C application for the provision of information to customers, as for instance by distributing product brochure C2C applications allow customers to share and exchange information with little input from the service provider, as for example online auctions.

BUSINESS MODELLING FOR APPLICATION DEVELOPMENT

ORGANIZATION CHART

A simple organization chart of a business and its associated processes are made for an understanding of the application under development. The emphasis is on the organization. Questions that are asked include, "which organizations or part of organizations might be impacted by a given application?" This is done as part of the software engineering process, perhaps as part of the inception phase itself.

Domain Modelling: This involves building an information model e.g. of banking, order management, etc. that will be present at the business level. Development of the domain model is a part of the software engineering project and is performed during inception and elaboration phases. It is started in the inception and refined in the elaboration phase [5]. A domain model is produced among other things in the second deliverable. The domain model is part of domain analysis i.e. it is a component of business modelling.

Single Business Model for Different Systems: Here a single business-modelling effort is input to several development projects. The same business model shall serve as inputs to building the architecture of the application family. Individual applications may then use this model for individual projects, and will use this system as a baseline or domain, which may then be tailored or used in a dependency role. This business modelling effort is a project by itself.

GENERIC BUSINESS MODEL FOR DIFFERENT ORGANIZATIONS:

This is done if a single general model is being built for the alignment of several organizations within a business. This is done for reducing overall complexity, or at least understanding how the different organizations might use the application.

New Business: Essential refers to business modelling performed for a new line of business.

Revamp Modelling or Business Process Reengineering: This refers to a complete redo of the way of doing business. This is done in several discrete stages and involves envisioning the new business, reverse engineering the existing business, forward engineering new business, and finally installing the new business [9].

IMPORTANT ARTIFACTS OF BUSINESS MODELING

The chief artefacts of business process modelling include the business vision document which defines the objective and goals of the business modelling effort. The business use case is a model of the business's intended functions. It is used as an essential input to identify the roles and deliverables in the organization.

The business object model realizes the business use cases. The business rules are the policies/conditions that must be satisfied. These are the heuristic during business operations. The business glossary is a definition of the important terms that are important to the business, e.g., acronyms like KLOC, and other commonly used terms. The domain model captures core abstraction/business entities- in the organization [6].

Business Use Case Model: The business use case model contains the business actors which refer to roles external to the business such as customers, existing systems, devices, triggers, etc and contains business use cases of business processes. To summarize, the business use case diagrams plus the underlying specifications. The business use case model is simple in structure. It shows the relationship between the business use cases and the business user's i.e the business actors [4].

Business Object Model: The business object model includes the business use case realizations. It includes the interacting roles and the entities involved. The business object model is far more detailed than the business use case model. Each business use case is realized with business object model is focused on the organization. The model is built by using business entities and customers i.e., actor and business workers again actors.

Business Model and Entity classes: A business entity that is to be managed by an information system will correspond to an entity in the domain model as stated. Example entities might include menu, work schedule, food order, an account, a loan, or a course.

Domain Model: The domain models are at higher levels of abstractions than application use cases[7][8]. Thus for instance a class at business level represent a responsibility in an organization whereas application level classes generally represent a business entity, such as customer, book, inventory item, salesperson, etc.

CONCLUSION

The importance and the need for business process modelling and analysis in software requirements engineering has been highlighted. The importance of domain knowledge in a requirements engineering context is brought out. The different resource of domain knowledge and the key players have been identified. Four different types of E-business applications have been defined and the different levels of business modelling in application development context have been discussed. The business use case model, the

business object model, and the domain models which are the three primary components of any business domain modelling and analysis have also been discussed. The major focus of domain analysis is developing visual models to reflect the organization. The different artefacts developed are essential in a requirements engineering context. They will prove to be of great help in effective requirements analysis that involves gathering, capturing, and modelling uses requirement.

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