Introduction to Unified Modeling Language

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Unified Modeling Language

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Abstract

This paper presents the uses of Unified Modeling language (UML) for describing cadastral information systems in terms of functional, static and dynamic models. These models enhance the transparency of the national cadastral organization by visualizing its business in the forms of UML diagrams and notations.

With describing the key concepts for modeling the organization's enterprise architecture using the Unified Modeling Language (UML). Enterprise architecture consists on defining and understanding the different elements that shape the organization and how these elements are inter-related with the purpose of understand and facilitate organizational evolution and change.

It separates core organizational concerns as different architectural views; the authors argue that modeling the multidimensional aspects of the enterprise should be organized into five architectural components: Organization, Business, Information, Application and Technological architectures.

These five components are supported in a small set of fundamental concepts described using UML 2.0. Furthermore, the authors argue that any organization model may be abstracted to three elements: Activity, Role and Entity. The authors also propose a set of rules for assessing the alignment between the enterprise architectural elements.

Introduction

It is difficult to integrate the systems that are designed to work independently for attaining functionality done, for example SCM, CRM, and ERP etc. these systems are not designed to work together. More generally, the integration between ERP and CRM can be defined as a medium to collaborate front-end and back office operation of an organization that applied them. They enable customers and business partner to be included into value chain inward to and outward from the organization, and encourage the collaboration between companies. It is also identified by Chong Kwong Chen (May2011) that in this era of competitive business world SCM, CRM and ERP has become the most influential enterprise systems in term of improving competitive advantages of an organization. But it is also found that these systems running in companies are continuing to exist in isolation and become less relevant in today business context due to lack of integrated information achievable through each of the system respectively. The four major reasons that Chong K.C suggested are existing systems lack of functional interoperability, customer and supplier insufficiently collaborated with existing ERP, no standards or open standard methodology for information exchange and lack of interfacing mechanism or tool to cater system change.

Considering these researches, it is obvious that any isolated system be it ERP, SCM, CRM, though very efficient in its own is not good enough to improve the competitive advantages due to lack of collaboration among the company, customers and suppliers in the business context. These systems need to be integrated with each other to cater with continuous changes in business over a period.

The main objective of this work is to design and simulate a service based system that enables interoperability among ERP, CRM and SCM for any SME. To understand the overall integration, we first discuss important concept that are used to represent the overall business values chain integrated architecture i.e. Unified Modeling Language (UML), Model Driven Architecture (MDA), Uses cases (UC) and Service Delivery Life Cycle (SDLC).

Review of Literature

The Unified Modeling Language (UML) is a family of graphical notations, backed by a single meta-model that help in describing the designing software systems, particularly software systems built using the object oriented(OO)style. Graphical modelling languages have been around in the software industry for a long time. The fundamental driver behind them is that programming languages are not a high enough level of abstractions to facilitate discussions about designs. UML is a relatively open standard, controlled by the Object Management Group (OMG), an open consortium of companies. The OMG was formed to build standards that supported interoperability, specifically the interoperability of object oriented systems. The elements of the UML map directly to elements in the software systems. UML has been identified as a way of providing a solution to modelling bottle neck.

Model Driven Architecture (MDA) is the standard approach to using the UML as programming language; the standard is controlled by the OMG. By producing a modelling environment that conforms to the MDA, vendors can create models that can also work with other MDA complaints environments. MDA divides development work into two main areas- Platform Independent Model (PID) and Platform Specific Model (PSM). The PIM is a UML model that is independent of any technology, whereas PSM is a model of a system targeted to a specific execution environment. There are certain tools that can turn PIM into PSM. In this paper we have focused on to the design that is independent of any technology and presented the PIM model for integration of business values chain activities of any SME. Later this can be run on J2EE or .NET by using some vendor tools to create PSMs, tools would generate code for these platforms.

Service Delivery Life Cycle (SDLC): SDLC in context of SOA starts with Service oriented analysis followed by service oriented design, service development, service testing and finally service deployment. Throughout this process Service Administration is necessary to monitor the designed service and their orchestration for ad-hoc functionality. The task performed at each phase is as follows:

- Service-oriented analysis, moreover, determines potential scope of SOA within the organization, Service are identified and mapped out from traditional legacy system to model as smart services

- In Service-oriented design phase, standards and protocols are designed conforming service level agreement (SLA), along with business processes.

- service Development phase is actual construction phase where services identified in design phases are coded using suitable language

- Service Testing phase is required to undergo rigorous testing of services prior to deployment

- Service Deployment needs to configure distributed components, service interfaces, and any associated middleware products onto the production servers.

Services Administration is needed from service development phase onwards to keep monitor the design services and their orchestration for ad-hoc functionality

Customer Relationship Management (CRM): In today's global trading environment, a flexible and robust customer data model is needed to capture customer's information to keep track of their customer's behavior, to interact with them and prospect potential customers to forecast what their customer's trend will be in future.

Not just commercial companies need these functions, but any institution that interacts with other institutions, such as universities, clubs, or social associations, though universities, social associations and clubs for example, do not really trade, they keep track of students' information, need to attract them in many ways
There has been much work done in domain-specific areas, such as analysis patterns for Accounting, Reservations, and Course Management for educational settings, but none of them capture a generic model that can be applied to the entire trading community.

The following section describes some aspects of recording information about customers for an organization in a trading community that sells item to its customers, item may be any product or any kind of service. A trading community is defined as a group of entities taking part in some type of commerce.

It includes persons and organizations. Besides seller and buyer, entities in a trading community can be Partner, Contac tractor, Distributor, Dealer, Agent, Influencer, etc. organizations need to interact with these entities to operate their business. Customer relationship has a broader context than classical customers, not only it represents the customer model; it also represents multiple organizations and multiple relationships that exist in a complex matrix-like environment.

A more generic customer model must reflect their prospective customer and their relationship with them; these relationships may be dynamic and can change at any time. Use case diagram representing the model are depicted.

Actor can be any individual or a company, Relationship links to two entities to indicate the nature of relationship between them. Examples of such relationship are: supplier to distributor for, client of/contractor to, report to/ manager of, customer of seller to etc.

Supply chain management (SCM): is the process of planning, implementing, and controlling the business operations throughout, from product inception to delivery as efficiently as possible.

Thus, Supply chain activities cover everything from product development, sourcing, production, and logistics, as well as the information systems needed to coordinate these activities. SCM spans a movement and storage of raw materials, work in progress inventory, and finished goods from point of origin to point of consumption.

The development of a practical supply chain management (SCM) system can not only realize the high-efficiency of operations flows in business value chain but also can establish a new information management solution (IMS) for any industry. To achieve a SCM system, retailer needs to manage the supply chain effectively and apply IT to system such as communications technology, computer technology.

To promote the SCM, retailer must establish a management system. System model must be established before the establishment of management system.

We have used in general and retail SME industry. Any supply chain enterprise has the possibility to win in the competition only when it forms the strategic alliance with the upstream

Conclusion

In our work we have presented the operation and representation of three popular enterprise systems ERP, CRM and SCM with their respective objectives and architecture. It has been observed that in marketplace the maintenance of each enterprise systems independently is more costly and timely consuming than to develop an integrated system. Thus, proposed diagrams enable business processes to be fully automated in between supplier, customer and the company.

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