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An advancement from Software Engineering to Domain Engineering

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Abstract: ***In global sense the areas that organized around classes of system or parts of system are known as domain. Domain engineering itself is an internal process of reusing domain knowledge in the production of new software system. Domain engineering focuses on three major phases i.e. domain analysis, domain design and domain implementation, for defining reusable requirements, common architecture and to implements the reusable assets. Domain engineering is a continuous process. The domain concerning the domain should be maintained and updated the entire tie according to new experience, scope broadening and new trends.***

Keywords: Domain, Software engineering, Domain analysis, Domain Design.

I. INTRODUCTION

Domains are groups or families of systems sharing similar capabilities, attributes, functionality or data. Because similar domains require similar architecture a key preconditions for the effective development of a software architecture is the use of domain engineering.

In many application we observe that those systems can be classify according to the busness area and the types of task they have, like bus reservation system, air line management system and inventory management system etc. like wise we can maintain a hierarchy of software system according to their modularity and functionality for eg: library management, library packages etc. those areas that organized around classes of system or parts of system is known as ***domain***.

Domain engineering is the internal process of reusing domain knowledge in the production of new softwaresystem. In other words domain engineering is concerned with the activity of collecting, organizing and storing past experience in building system in a particulardomain in the form of reusable assets like retrival, qualification, dissemination, adaptation, assembly etc at the time of building new system.

PURPOSE OF DOMAIN ENGINEERING

It is designed to improve the quality of developed software products through reuse of software artifacts. Domain engineering normally shows variants of other systems within the same field. Domain Engineering focuses on capturing knowledge gathered during the software engineering process. By the use of domain engineering components can be reused in new software system at low cost and high quality. Because of reusable artifcts in domain engineering that can also be applicable to all phases of software develeopment life cycle.

PHASES OF DOMAIN ENGINEERING

Domain Engineering focuses on 3 major phases i.e. domain analysis: which defines a set of reusable requirements for the system in the domain, domain design: that establishes a common architecture for the system in the domain and domain implementation: that implements the reusable assets.While the conventional software engineering concentrates on satisfying the requirements for a single system, domain engineering concentrates on providing reusable solution for function of systems. The current software engineering trends generally have a strict aim towords a specific goal w.r.t. a specific context. On the other hand domain engineering aims at the development of reusable software or we can say at a generic system from which we can instantiate concrete system or components to be reused in different system.The phases of domain engineering are like:--

1. **Domain Analysis:**The purpose of domain analysis is to select & define the domain of focus and to collect relevant domain information and integrate it into a coherent domain model. The sources of domain information include existing systems in the domain, domain experts, textbooks, prototyping, experiments, already known requirements on future systems etc.Domain analysis does not only involve recording the existing domain knowledge besides this it is acreative activity.

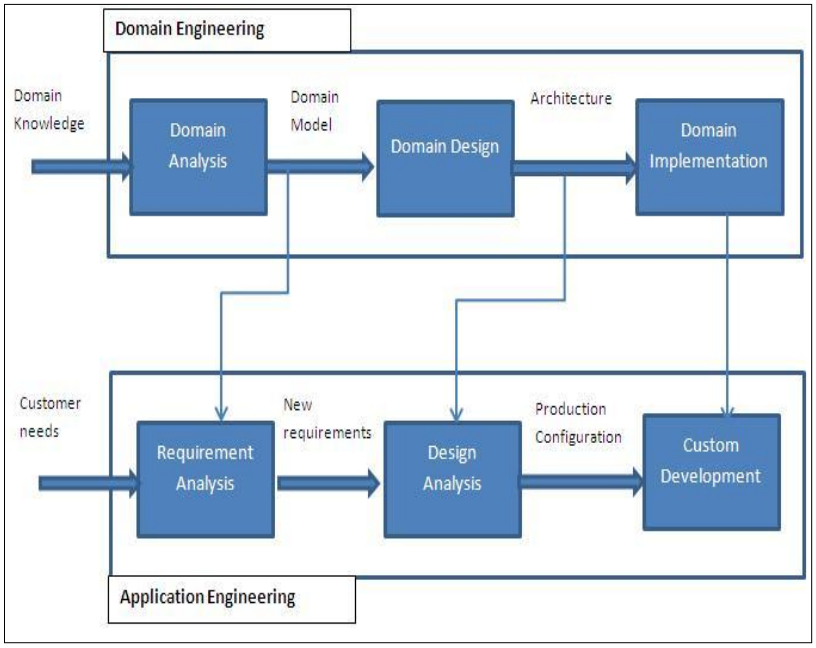

Figure: Software Development based on Domain Engineering

Domain analysis generally involves the activities like

1) ***Domain Planning,*** identification and scoping: planning of the resources for performing domain analysis, identifying the domain of interest and defining the scope of domain &

2) **Domain Modeling:** developing the model.

2. **Domain design:** The main purpose of domain design is to develop an architecture for the systems in the domain. Basically software architecture has the description of elements from which systems are built, interaction among those elements, patterns that guide their composition and constraints on these patterns. In short domain design takes the domain model produced during the domain analysis and aims to produce a generic architecture through which all systems within the domains can configured.

Domain design aims to produce architecture patterns which solve a problem common across the systems within the domain, despite differing requirement confifurations. In addition to the development of patterns during domain design one must also take care to identify the scope of the patterns and the level to which context is relevant to the pattern. Domain design also aims to satisfy as many domain requirements as possible while retaining the flexibility offered by the developed feature model. The

architecture should be sufficiently flexible to satisfy all of the systems within the domain while rigid enough to provide a solid framework upon which to base the solution.

3. Domain Implementation:

In domain implementation we apply appropriate technologies to implement components generators for automatic component assembly, reuse infrastructure and application production process. Domain implementation covers the implementation of the architecture, components and tools designed in the previous phase. The purpose of domain engineering is to produce reusable asseys that are implemented in this phase. Thus the result of whole domain engineering phase comprises components, feature models, analysis and design models, architecture patterns, frameworks, domain specific languages, production plans and generators.

II. Conclusion

Domain engineering is a continuous process. The domain concerning the domain should be maintained and updated all the tie according to new experience, scope broadening and new trends.

In addition domain engineering should adapt according to the feedback from application engineering. Thus domain model can never be completed it could always be refined to be more accurate. In addition , domain model usually contains some kind of compromize about different and perhaps inconsistent view from several experts.

Acknowledgement

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