

TOWARDS EFFECTIVENESS ASSESSMENT OF DOMAIN MODELING APPROACHES TO SOFTWARE DEVELOPMENT

Martinkus I.O., Gamzayev R.A., Tkachuk M.V.

National Technical University «Kharkiv Polytechnic Institute», Kharkiv

Domain-driven software development is the collection of principles and schemes that help developers to create effective software solutions, especially with usage of different domain models (DM) [1]. Nowadays there are a set of domain modeling approaches (DMA), which differ each other in the type of model's components to be reused. Most popular approaches to build DMA are JODA (Joint integrated Avionics – object oriented domain analysis) and ODM (Organizational Domain Modeling), and it is important to have some methods to assess their effectiveness with respect to appropriate criteria.

To apply DMA in software development it is needed to perform some steps. First one is a domain requirements specification, and it can be represented with user stories [2]. Next step in DMA elaboration is a usage of appropriate CASE-tools, which also are quite varied in their features. One of the main important such a feature is a possibility to generate so-called “code-framework”, which is a collection of appropriate classes to implement DM. This target source code can be automatically changed according to DM changes, and a structural complexity of this code can be considered as effectiveness indicator of an appropriate DMA effectiveness. To calculate this parameter in quantitative way the appropriate metrics have to be applied, and they can be calculated automatically with special CASE-tool.

<i>Metrics</i>	<i>EMF / ODM</i>	<i>Actifsource / JODA</i>
WMC	44.1	10.6
McCabe Cyclomatic Complexity	2,0	1,0
Coupling Between Objects	8.6	9.5
Abstractness	0.3	0.25
Instability	0.6	0.57

To test this approach two CASE-tools: Actifsource (for JODA) and EMF (for ODM) have been chosen. After creating two different domain models and getting their “code-framework” we have calculated the appropriate metrics values (see the given Table). Taking into account these results we make conclusion that finally domain modeling with JODA-approach and Actifsource - tool is more effective because of the lower structural complexity.

In future we are going to elaborate an integral estimation criterion for DMA effectiveness, which is supposed to combine all these metrics.

References:

1. Eric Evans. Domain-Driven Design: Tackling Complexity in the Heart of Software 1st Edition. - Prentice Hall, 2003. - 560p
2. S.W.Ambler “Agile/Evolutionary Data Modeling: From Domain Modeling to Physical Modeling” <http://agiledata.org/essays/agileDataModeling.html#DisasterStrikes>