Chapter IX

A Comparison of the FOOM and OPM Methodologies for User Comprehension of Analysis Specifications

Judith Kabeli, Ben-Gurion University of the Negev, Israel

Peretz Shoval, Ben-Gurion University of the Negev, Israel

ABSTRACT

FOOM (Functional and Object-Oriented Methodology) and OPM (Object-Processes Methodology) are methodologies used for analyzing and designing information systems. Both integrate functional and object-oriented approaches, but differ in that the analysis specification of FOOM utilizes OO-DFDs (Data Flow Diagrams with object classes that replace traditional data-stores) and a class diagram, while OPM defines a new notational model for specifying the system's structural and procedural requirements, which combines processes and classes in a unified diagrammatic notation. In this study, we compare FOOM and OPM from the point of view of both user comprehension of analysis specifications and user preference of specifications. The comparison is based on a controlled experiment that measured: (a) comprehension of the analysis specifications,

which includes both structural and behavioral aspects of the system; (b) the time it takes to complete the task of specification comprehension; and (c) the user's preference of models. Our results show that FOOM performed better than OPM and that the users preferred FOOM to OPM.

INTRODUCTION

FOOM is a methodology used for analyzing and designing information systems. It combines two essential software-engineering paradigms: the functional/data approach (or process-oriented) and the object-oriented (OO) approach (Shoval & Kabeli, 2001). FOOM utilizes known methods and techniques such as DFDs (Data Flow Diagrams), and provides simple visual modeling and notations. It covers the structural and the behavioral aspects of a system through the analysis and design phases, and provides a natural and smooth transition from one stage to the other. Since users express their information needs in terms of both functions and data structure — rather than in terms of object classes and their behavior — it seems to us that an appropriate method to carry out the analysis task is to combine functional and data analysis. For designing an information system, however, OO design should be applied since it has been shown to be a better approach to implement software.

The Object-Processes Methodology (OPM) is used for analysis and design of information systems. It combines process and object approaches, and provides a unified notation for the structural and behavior aspects of a system (Dori, 2001). OPM utilizes a single graphic tool, the Object-Process Diagram (OPD), in all of its development phases. However, since OPD defines a new notation that combines DFD and OO diagrams, it incorporates many symbols and rules. In our opinion, such diagrams are not very easy to construct and comprehend for large-scale systems. In our mind, reality should be modeled with simple notations that are easy to comprehend and utilize. A single hybrid notation like OPM must be very rich in order to elicit all points of view, thus leading to a complex, perhaps misunderstood model of reality. On the other hand, multiplicity of models and corresponding diagramming tools, as in UML (Unified Modeling Language), may also be too complicated. Too many diagram types may hamper coherent understanding and lead to the production of erroneous models and systems.

Methodologies can be evaluated and compared for various dimensions, e.g., quality of the analysis and design products, comprehensibility, learning ability, ease of use, preference by users or professional developers, and others. In this chapter, we present an experimental comparison of FOOM and OPM methodologies from the point of view of end-user comprehension of specifications, time to complete tasks of comprehension, and user preference of models to determine which methodology is better comprehendible. OPM was selected to be compared with FOOM since it also combines and integrates the two essential

18 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/comparison-foom-opm-methodologies-user/23014

Related Content

Bridging Relational and NoSQL Worlds
(2018). *Bridging Relational and NoSQL Databases (pp. 177-238).*
www.irma-international.org/chapter/bridging-relational-and-nosql-worlds/191984

Random Forest Algorithm Based on Linear Privacy Budget Allocation
Yanling Dong, Shufen Zhang, Jingcheng Xu, Haoshi Wangand Jiqiang Liu (2022). *Journal of Database Management (pp. 1-19).*
www.irma-international.org/article/random-forest-algorithm-based-on-linear-privacy-budget-allocation/309413

Experimental Study of a Self-Tuning Algorithm for DBMS Buffer Pools
Patrick Martin, Wendy Powley, Min Zhengand Keri Romanufa (2005). *Journal of Database Management (pp. 1-20).*
www.irma-international.org/article/experimental-study-self-tuning-algorithm/3329

Rough Sets: A Versatile Theory for Approaches to Uncertainty Management in Databases
Theresa Beaubouefand Frederick E. Petry (2009). *Database Technologies: Concepts, Methodologies, Tools, and Applications (pp. 1127-1150).*
www.irma-international.org/chapter/rough-sets-versatile-theory-approaches/7962

Research Commentary on IS/IT Role in Emergency and Pandemic Management: Current and Future Research
Wen-Lung Shiau, Keng Siau, Yuan Yuand Jia Guo (2021). *Journal of Database Management (pp. 67-75).*
www.irma-international.org/article/research-commentary-on-isit-role-in-emergency-and-pandemic-management/276500