Consistency rules between UML use case and activity diagrams using logical approach

Noraini Ibrahim[a]; Rosziati Ibrahim[a]; Mohd Zainuri Saringat[a]; Dzahar Mansor[b] and Tutut Herawan[c]

[a]Department of Software Engineering Faculty of Computer Science and Information Technology Universiti Tun Hussein Onn Malaysia

[b]Microsoft Malaysia

[c]Faculty of Computer System and Software Engineering Universiti Malaysia Pahang Lebuhraya Tun Razak, Gambang 26300, Kuantan, Pahang, Malaysia

ABSTRACT

Consistency is one of the attributes in measuring the quality of UML model. It is the situation where two or more overlapping elements of different diagrams that describe behavior of system are jointly satisfiable. Although there are increasing researches on consistency management, there is still lack of researches of consistency driven by use case. Therefore, this paper proposes three consistency rules between use case and activity diagram. The elements of each diagrams and their consistency are described using logical approach. Based on an example of UML model consists of both diagrams, we show how the diagrams fulfilled our proposed consistency rules. Finally, the elements involved in the consistency rules are detected and formally reasoned.

KEYWORDS:

UML; Consistency rules; Use case diagram; Activity diagram; Logical approach.

ACKNOWLEDGEMENT
The authors would like to thank Ministry of Higher Education, Malaysia for supporting this research under the Scheme of Academic Training Initiative (SLAI).

REFERENCES

1. Sommerville, I. (2004). Software Engineering 7 (Seventh ed) (Second ed.). Harlow: Pearson Addison Wesley.

2. Huzar, Z., Kuzniarz, L., Reggio, G., & Sourrouille, J. L. (2005). Consistency Problems in UML-Based Software Development. In N. J. Nunes, B. Selic, A. R. d. Silva & A. T. Alvarez (Eds.), UML Modeling Languages and Applications (Vol. 3297, pp. 1-12): Springer, Heidelberg.

3. Object Management Group (OMG) (2010). OMG Unified Modeling LanguageTM (OMG UML), Superstructure Version 2.3. Needham, MA 02494, U.S.A. : Object Management Group (OMG).

4. Lucas, F. J., Molina, F., & Toval, A. (2009). A Systematic Review of UML Model Consistency Management. Information and Software Technology, 51, 1631-1645.

5. Ibrahim, N., Ibrahim, R., Saringat, M., Mansor, D., & Herawan, T. (2010). On Well-Formedness Rules for UML Use Case Diagram. In F. Wang, Z. Gong, X. Luo & J. Lei (Eds.), Web Information Systems and Mining (Vol. 6318, pp. 432-439): Springer Berlin / Heidelberg