ABSTRACT

Interaction studies how its components behave in the system. In an interactive system, the characteristics of the components affect the system performance. This study introduces an approach to verify interaction using Coloured Petri Nets (CPN). First, the interaction in the Unified Modeling Language (UML) sequence diagram was modeled. Then, the diagram was transformed into CPN model. To do the transformation, a set of transformation rules was introduced. The analysis techniques in CPN were applied to verify the interaction. They were state space analysis, liveness properties, and fairness properties. In addition, error identification techniques using the state space were introduced.

The output of this study was a method. This method had three essential parts. The first was the formal semantics of use case diagram and sequence diagram. A graph was used to define the semantics of those diagrams using the denotational semantics writing style. The second was the set of transformation rules which transformed the sequence diagram into CPN model. The third was the verification of CPN model. This verification detected whether some errors existed. They were initialization error, post-completion error, and order error. The method was implemented in a case study of chocolate machine. This machine is an interactive system which has rich interaction between the user and machine.

Keywords: Interaction, Unified Modeling Language, Coloured Petri Nets