ABSTRACT

Globalization has enforced multilingualism as the order of the day. The multinational corporations are emerging as multilingual community, with parent functional language and subunit functional language concurrently used and recursively linked through information technology. In order to meet the growing demand for multilingualism, appropriate software has to be designed. The development of multilingual software is driven by stakeholders of multilingual software namely software engineers, computational linguists, language engineers and end users.

A literature review is carried out to present the essential points of the existing multilingual software and its development approaches. Also, multilingual software qualities like maintainability, reusability, understandability, adaptability and language neutrality are derived from the existing development approaches.

Model for multilingual software is essential in the design process. But there are no explicit models available for multilingual software. In order to achieve this, models are mined from the existing multilingual software and they are analyzed for the multilingual software qualities. The mined multilingual software models have some inadequacies and these inadequacies are analyzed using design space approach. Based on the analysis, a new model, named as aspect based language library model, is proposed addressing the inadequacies and formalized using the algebraic structure.

An Architectural Reference Model for Multilingual Software (ARMMS), which is an abstract model, is designed using the aspect-based language library model by applying the unit operations. This reference model exhibits the expected multilingual software qualities. ARMMS is applied to develop a framework for the multilingual software development. PONN, KURAL, MAYAN and PONN SMS are some of the multilingual software designed using ARMMS. These design experiences are stated from the architectural and multilingual perspectives.