ABSTRACT

Software architecture is the blueprint of the system to be built. Architecture portrays holistic view of the system to be developed and drives for balanced view of the system in terms of their quality attributes. A number of frameworks, patterns and styles have been researched to solve complexity of the system to be implemented. All these styles, patterns and frameworks tilt towards a couple of quality attributes and this inhibits its future expansion in terms of their functionality and quality attributes.

Researchers and Practitioners have recorded a number of architectural analysis techniques like SAAM, ATAM, CBAM, SAAMER and SSAR to evaluate the architectures before being moved to design stage. All these techniques required on-board participation of the system stakeholders for number of days, which is time consuming and expensive in terms of project cost. Further, all these techniques are heuristic in nature.

In order to bridge the above gap in the existing architecture evaluation system, an ancient Indian civil architecting style called vastu has been researched and presented in this research. Patterns from vastu are mined and mapped to the existing software architectural styles. Patterns found in vastu can be applied to very complex architectural system like interplanetary exploration. Research also proposes a new hybrid model for balancing quality
attributes. This proposed model selects the right architectural style dynamically when there arises a change in the quality requirements.

Researched hybrid model consists of following steps: Architectural styles mapping, best mandala selection and best architectural style selection. Hybrid model takes quality attributes as input and brings out the best mandala with appropriate style. Past research considered three to four architectural styles for the evaluation based on their expertise, where as the hybrid model considers twelve architectural styles for the evaluation. The model is flexible in design to add more styles in future. Clearly our research focuses more on the availability of the selection. A special point of our research is that the architecture styles are classified based on the mandalas which provide higher level of abstraction. Hybrid model is agile in nature. The proposed model is least expensive and less time consuming for the design selection from the total project cost perspective.