ABSTRACT

Workflow technology is being researched in healthcare domain to manage complex tasks involved in treating a patient particularly for the one suffering from complex ailments. Currently corporate healthcare units have started in making use of workflow technology to deliver smart services to patients. But, thesis is limited to management issues e.g. healthcare resource management. In this work we focus on modeling a workflow that is patient-centric. It integrates the roles of doctor(s) as well as healthcare staffs (diagnostic staff, nurses etc.) associated in treatment of a patient. We propose a model called Treatflow to specify a treatment by sequencing treatment activities as required to treat a patient. Structured design specifies a system diagrammatically while formal methods use mathematical techniques. In order to avail advantages due to both the approaches, we propose a hybrid approach to specify healthcare workflow. Primitives with mathematical rules are proposed for Treatflow design and verification.

Models for healthcare processes could be complex like the processes observed in business domains. Modeling healthcare activities at one level could be complex and cognitively loaded. Hence we propose a modular approach to healthcare process specification. We have several operators to facilitate modular composition of healthcare workflow. Using these operators a medical practitioner can specify a treatment plan in an expression. We also propose rewriting rules to generate alternate equivalent treatment plans to facilitate decision making by doctors, patients as well as healthcare managers.

Healthcare workflow as directly deals with human life must specify precautions to exception i.e. undesired situations during its executions. We analyze the domain and present a comprehensive view on genesis of exceptions and corresponding actions. Treatflow Management System (TFMS) aims at automating a treatment process for creation, monitoring and termination of a Treatflow with maintenance of healthcare history. We propose an architecture to implement Treatflow Management System. A requirement analysis for such a system considering users viz. (doctors, patients and staffs) and their roles in treatment process have been discussed. Some of the results due to this research are reported in [[65],[64],[63],[55]].