

Healthcare quality improvement using agent systems

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Abstract:

Paper [1]:

Patient satisfaction is the most essential factor for any hospital. A survey questionnaire of patient satisfaction showed that the long waiting time of patients is the most dissatisfied service quality for service providers. Our study totally focused on improving the services provided by the healthcare providers by using collaborative approaches to make patient's waiting time to get reduced.

Paper [2]:

In health care domain the quality improvements are being experimented, this paper concentrates on quality improvements through Quality Improvements Collaborative (QIC'S) between healthcare institutions. The data from network of hospitals was examined for the enhancement of quality of treatment. The points of the data security is concentrated and sensitive analysis is considered for studying the real world data. To facilitate this a secure virtual collaboration system is proposed (data-driven diffusion).

Paper [3]:

The paper modelled and analysed community healthcare group (CHG)

Service through multi-agent simulation. The statistical and transactional data from CHG is studied for estimating system's financial sustainability in various situations. The paper also suggests that cost effective results can be obtained by combining capitation model with proper risk estimates. Many scenarios were considered and results are extracted.

Keywords:

Paper [1]:

Scheduling approach, Agent based model, simulation, Out-patient waiting time.

Paper [2]:

Agent based modelling, Collaborative learning, Healthcare quality, Knowledge diffusion, Quality improvement, Team collaboration, Team learning.

Paper [3]:

Capitation, Healthcare, Multi agent, Simulation, SWARM.

Introduction:

Paper [1]:

In recent years, service sector has become one of the largest economic systems, quality of the service is a growing concern in which healthcare plays major role [1]. Paper showed that waiting time is the most dissatisfied index among 26 indices for the hospital service in 2011, the waiting time is an urgent problem to be improved [1].

Paper [2]:

Much research has focused on studying team collaboration for joint solving as groups of diverse problem solvers can outperform more homogeneous groups of

higher ability problem solvers, because diverse individuals bring different perspectives and heuristics that aid in creativity of the collective intelligence [2].

Paper [3]:

In the context of capitation payment system, medical service providers could be motivated to enhance collaboration to better take care of their patients, reducing patients medical expenditures and thus increasing provider revenue, for this the results of different scenarios are simulated and analysed identifying important factors determining the sustainability of capitation payment mechanism in a community Health Group (CHG) typed system [3].

Summary:

Comparative points	Paper [1]	Paper [2]	Paper [3]
What is the problem area being addressed in each of these articles?	This study focused on improving clinical services to reduce outpatient waiting time for the healthcare providers.	Team learning through collaborations for healthcare quality improvement.	Simulating different scenarios for zhishan community healthcare group service system.
How is the research question	How can the healthcare problems such as	How different team characteristics affect	How to solve the capitation problems in knowing

formulated?	patient waiting time etc., can be reduced using agent-based model?	quality improvement of agents in clinical fitness landscapes with varying degrees of complexity and noise?	healthcare policies using multi-agent communication?
What method or methods have been used in the reported studies?	Hospital service process through flowchart, collect and analyse patients data, build a simulation model.	Analization of binarized clinical practices in real hospitals that participated in QIC's and some new methods.	SWARM [multi-agent simulation system].
How and why are these methods chosen?	After exploring the healthcare problems and experiments from the research, these methods have been chosen as the best healthcare quality	Selecting teams of homophilous agents for generating synthetic agents that are similarly clustered in feature space.	These methods are adopted to simulate stakeholders of service system and sensitivity analysis for variables of quality index and retention rate.

	improve ment.		
How were these methods applied in the study?	These methods were applied according to the patient's age and type of the health problem the patient facing and according to the consultation timings.	Explains a new virtual collaborative framework (for healthcare quality improvement) and challenges and improvement.	To mend the financial gap created by fee-for-service scheme, which motivated medical institutes to provide more services than needed to generate more income.
How are the results presented in each study?	Different scenarios gave different results and those results are shown as numerical statistics compared between the scenarios according to the consultation timings.	Results are presented in the form of Graphs, Tables and Figures.	Results are represented through Flowcharts, Diagrams, Graphs and Tables.

How do the presented results relate to the problem area and stated research questions being addressed?	The results address the problem area properly. The patient satisfaction is main important factor in the problem area and operating room efficiency is maintained properly.	Homophilus team formation in clustered population was the best performing method.	Huge data, Theories and many methods and simulations were used and there was improvement along with positive impact on reducing medical points, mitigating the financial burden.
How were the references used in each study?	References are just put as the numbers at the end of sentences without author names.	Many are used for justification of real-world data and were mentioned with numbers at end of sentences without author names.	References were kept with author name as this paper has largely gathered resources for simulation and results.

References:

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