Abstract of the Thesis

Development of the Management Information System for Hospitals Using Process Mining Techniques

The purpose of the thesis is to improve the health management system. For this reason, the development of appropriate tools for the management of a hospital was pursued. To achieve this purpose, the possibility of developing the management information system is analyzed, using algorithms for data mining and process mining. In this thesis, a comparison is made between different methods and the advantages, disadvantages and applications of each existing method are presented.

The second phase is to analyze healthcare systems and their components such as hospitals, clinics, pharmacies, laboratories or any healthcare provider, and identify the problems of the healthcare system, and discuss the main objectives of these systems.

In order to eliminate the disadvantages of health information systems, a new algorithm called β Algorithm is proposed, for which the soundness and correctness have been mathematically demonstrated. The β algorithm is a method of identifying processes due to its ability to extract knowledge and its ability to detect process models and their characteristics. This new algorithm can work with a huge amount of data from hospitals using Petri nets. The β algorithm is also a probabilistic technique and provides good results by processing big data that are grouped and studied on the Hadoop engine.

Finally, a computer platform called "MYL Software" was built which is designed on the basis of Algorithm β. The platform was implemented in two medical centers, one in Kuwait and the other in Syria. A few weeks after the implementation, a survey was carried out among patients and doctors, who gave a positive feedback on the new changes arising from the implementation of the MYL platform, the main effects being the improvement of the quality of the medical service and the increase of patient satisfaction.