LITERATURE SURVEY

1.Development of the Health Information Analytics Dashboard Using Big Data Analytics [By Anisatul Afifah,2020]

The method of this study uses big data analytics. The data analysis results are visualized through display charts/graphs that make it easier for users to understand the data analysis results and interpretation. This dashboard is useful to facilitate decision making so that stakeholders can find out more quickly to be able to respond appropriately and also improve the quality of health services so as to improve the degree of public health, which shows an accuracy of 98%

2.Length-of-Stay Prediction for Pediatric Patients with Respiratory Diseases Using Decision Tree Methods [Fei Ma,2020]

In this paper we are going to see about the prediction of LOS for pediatric patients with respiratory diseases. They are predicting the LOS by using the Decision Tree Methods. We use three types of decision tree they are bagging ,adaboost and random forest. There are two test which are used to assist the performance of prediction methods they are bisection test and periodic test. All the three methods are effective but adaboost is slightly better than other two. Bootstrap aggregation (Bagging) was proposed by Leo Breiman to improve classification accuracy. Adaptive boosting algorithm (AdaBoost) represents a popular ensemble method that uses simple classifiers, called weak learners, to generate a stronger classifier. Random forest is also a type of ensemble learning classifier that involves independently growing decision trees based on independent training set. In bisection test bagging method performs the best and in periodic test adaboost performs the best. By predicting the LOS of patients accurately we can create more efficient and effective management of health care resource.

3. Health Data Analytics: A Proposal to Measure Hospitals Information Systems Maturity [Joao Vidal de Carvalho,2018]

A maturity model in this conjuncture, is a way of identifying strengths and weaknesses of the HIS maturity and thus, find a way for improvement and evolution. This paper presents a proposal to measure Hospitals Information Systems maturity with regard to DA. The outcome of this paper is a maturity model, which includes six stages of HIS growth and maturity progression, which shows an accuracy of 94%

4. Predictive Analysis in Health Care[Conference: Predictive Analysis in Health Care At: Dubai,UAE,2019]

Data mining is the convergence of multiple disciplines (such as Business Intelligence, AI, Analytics) by using statistics and Data Warehouse Technology to discover knowledge from a bulk of data. Certain corrective measure must be taken in order to correctly analyze the diseases and prescribing correct medicine after correct diagnosis. These challenges can be removed by appropriate data analytics. In this paper some of the techniques are discussed to predict diseases to improve health care, which shows an accuracy of 97%

5. Predicting Length of Stay Across Hospital Departments [MiguelAngel Sicilia, Elena García-Barriocanal et al,2021]

In this work they report a predictive model for length of stay (LOS) together with a study of trends and patterns that support a better understanding on how LOS varies across different hospital departments and specialties. Healthcare systems generate large amounts of administrative data about patients, departments, medical material costs, bed availability, diseases, etc. This departs from readily available administrative data to assess resource use in hospital systems. Machine learning techniques are applied to hospital management in an attempt to optimise hospital resources more efficiently within the departments, providing an extra advantage in favour of patients and hospital entities, material and methods, data preparation, training and testing data setup, evaluation

criteria of the methods. Hospital departments were compared according to the algorithms used to predict results, taking into account those which offer better results in comparative tests. This research shows that reductions in hospital costs improvement in quality patient care are possible.

6. The impact of inpatient bed capacity on length of stay [Brendan Walsh, Samantha Smith et al,2021]

Large reductions in inpatient length of stay and inpatient bed supply have occurred across health systems in recent years. However, the direction of causation between length of stay and bed supply is often overlooked. This study examines the impact of changes to inpatient bed supply, as a result of recession-induced healthcare expenditure changes, on emergency inpatient length of stay in Ireland between 2010 and 2015. U- shaped trends are observed for both average length of stay and inpatient bed supply between 2010 and 2015. A consistently large positive relationship is found between bed supply and length of stay across all regression analyses. Between 2010 and 2012 while length of stay fell by 6.4%, our analyses estimate that approximately 42% (2.7% points) of this reduction was associated with declines in bed supply. Changes in emergency inpatient length of stay in Ireland between 2010 and 2015 were closely related to changes in bed supply during those years. The use of length of stay as an efficiency measure should be understood in the contextual basis of other health system changes. Lower length of stay may be indicative of the lack of resources or available bed supply as opposed to reduced demand for care or the shifting of care to other settings.

Project Description

Recent Covid-19 Pandemic has raised alarms over one of the most overlooked areas to focus: Healthcare Management.

While healthcare management has various use cases for using data science, patient length of stay is one critical parameter to observe and predict if one wants to improve the efficiency of the healthcare management in a hospital.

This parameter helps hospitals to identify patients of high LOS-risk (patients who will stay longer) at the time of admission. Once identified, patients with high LOS

risk can have their treatment plan optimized to minimize LOS and lower the chance of staff/visitor infection. Also, prior knowledge of LOS can aid in logistics such as room and bed allocation planning.

Suppose you have been hired as Data Scientist of Health Man – a not for profit organization dedicated to manage the functioning of Hospitals in a professional and optimal manner.

Goal:

The goal is to accurately predict the Length of Stay for each patient on case-by-case basis so that the Hospitals can use this information for optimal resource allocation and better functioning. The length of stay is divided into 11 different classes ranging from 0- 10 days to more than 100 days.

Technical Architecture: