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## **1. Introduction/Background Information**

This study focuses on the healthcare sector. With the current healthcare affairs of the world - such as *‘COVID-19 and its variants*, as well as *‘monkeypox*’ - it is of utmost importance that we remain vigilant and aware of such diseases.

Our healthcare faculty and facilities must be readily prepared to handle and accommodate patients that contracted contagious diseases. COVID-19 is a very serious coronavirus disease that has taken more than 6 million lives globally to this day. Many of our talented doctors and physicians around the world have dwindled due to this disease and it is crucial that we contain it and prevent more individuals from contracting this disease or any other fatal diseases for that matter.

Thankfully, the number of cases has gone down but it is still at large. Therefore, in this project, we will be focusing on identifying the factors that can help the healthcare sector **improve the quality of providing healthcare services**.

We will be focusing on four different factors: **Finance, Accessibility, Manpower,** and **Prevention**. These factors will serve as the focus for the business objective that will help to answer our business scenario.

## **2. Business Scenario**

***“To improve the quality of providing healthcare services”***

## **3. Business Objectives**

|  |  |
| --- | --- |
| **Four Business Objectives** | |
| **Factor** | **Explanation & Benefits** |
| **Finance**  **(Bo Yu)** | * Focus on **Finance** - to determine the number of factors that contribute to a higher hospital bills **(Correlation )** * Profile the segment of customers with higher hospital bills**(Clustering)** * To identify factors that will affect customer hospital bills * *Success Criteria*: To identify factors such as Uninsured Rate Change and enrollment that can **reduce the** cost of **hospital bills** and make sure that **more than 50%** of thepatients in US are fully covered by insurance when paying hospital bills. **(Hospital Bills = All factors, Correlation and Linear Regression)** To identify factors that will affect State Medicaid Expansion * For the **Finance** factor, it will allow patients to monitor the availability of resources for health insurance and the extent to which they are used **efficiently** and **equitably**. This, in turn, helps ensure health services are **available** and **affordable** when people need them * With the **Finance** visualization, patients will **reduce unnecessary spending** on finding good insurance when being hospitalized and hospitals will be able to understand spending when cost data is collected more regularly, hospitals can identify more quickly areas where systemic variation in activity may be occurring, how and where it may be best to target any **service improvement** or **transformation activities** to **ensure optimum value** for its spending. * That is why the study wants to find out which **factors** can be improved so that we can ensure patients would have more **benefits** when being hospitalized. |
| **Manpower**  **(Tristan)** | * Focus on Manpower - to **determine the number of personnel** needed to carry out services pertaining to **protection** against various diseases. * *Success Criteria*: ensure hospitals have a sufficient **nurse-to-patient ratio** (e.g. at least 1 nurse to 4 patients), make sure that at least 95% of patients are **protected** (under schemes, insurance plans, quality of treatment), and **reduce the time** a patient needs to wait before treatment, and time taken during treatment/surgery etc. * Include the **availability** of vaccination booths or infectious disease containment centers, and hospital staff able to accommodate infected patients * There should be **enough staff** to fill a role assuming maximum capacity, and **coverage in different fields** (are there **specialists** for most, if not all fields * The issue of time constraints and lack of manpower can be prevented by workers having higher efficiency. This is influenced by experience and work ethic. On that note, we should take into account inconsistencies and base our expectations based on a pessimistic scenario (e.g. many patients in critical condition AND not enough manpower at the time). This also raises the issue of overstaffing and understaffing. |
| **Prevention**  **(Mark)** | * Focus on **Prevention** - to determine the **number of factors that can reduce** hospitalisation for mild diseases. * *Success Criteria*: To **identify** the **factors** that can **reduce hospitalisation rates**. * Hospitalisation generally occurs for patients that are in dire states. Some patients had mild conditions but ignored the signs which put them at risk for hospitalisation. * If individuals ignore these symptoms, hospitals are affected due to the large hospitalisation intake. * Hospitals can only accommodate a certain per cent of the population, hence they won’t be able to provide **efficient and effective quality service** to patients who need it more. * That is why this study is to find out the **leading factors** that contribute to the hospitalisation rate so that we can discover ways to minimize it. * This will not only benefit **hospitals** and their **faculty**, but it can also save **individuals money** and **time**. |
| **Accessibility**  **(Sam)** | * Focus on **Accessibility** - to assess the **level of inclusivity offered**, and the overall level of Quality of Life (QOL). * *Success Criteria*: To identify the **factors** that need improvement for several scopes of accessibility in order to **support the patients’ mental and physical well-being.** * Some **essential services** are needed for patients such as **water, electricity or food**. Moreover, numerous **less developed countries** might lack these essential services which could be due to **rationing** happening within the country. Thus, a minimal provision of these services for those patients in need might make them feel more **distressed** about the situation they are held in (E.g. Worrying about a successful recovery). These could potentially affect the mental health of patients. * The number of **healthcare resources** such as the amount of **blood bags** or **medical equipment** are equitably sequential for the aiding of surgery. The lack of access to some of the healthcare resources can prevent certain **recovery procedures** to be **successful**. * The **accessibility** of the **hospital** is of paramount importance in case of an emergency. The **distance** from the hospital or the **presence** of one in the state or province can affect how patients access healthcare-related help in an emergency. * That is why the study wants to find out which **scope** of the **factors** can improve so that we can **maximise** the **quality of life of patients.** |

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## **4.** **Main and Sub Tasks**

**Main**

* Determine business objectives
* Find datasets in **kaggle.com** that can be used for further analysis.
* Create data visualizations using **Tableau**
* Create data reports using **SAS Viya**

**Sub Tasks**

* Data Cleaning
* Data Modification/Preparation
* Data Manipulation & Transformation

**5.Allocation of tasks**

|  |  |
| --- | --- |
| **Name** | **Task** |
| **Mark** | * Data Collection for **Prevention**:   + Hospital Admissions   + Availability of beds   + Severity of Diseases * Business Objective * Determine Success Criteria on **Prevention** * Data Understanding * Data Pre-Processing * Data Modification/Cleaning * Visualizations on **Prevention**:   + Ranking of Disease Severity   + Hospitalisation rate over the years   + Hospitalisation rate predictions * Dashboards of **Prevention** * Stories of **Prevention** |
| **Tristan** | * Data Collection for **Manpower**:   + Coverage across diff fields   + Staff availability   + Vaccination booths in an area * Business Objective * Determine Success Criteria on **Manpower** * Data Understanding * Data Pre-Processing * Data Modification/Cleaning * Visualizations on **Manpower**   + Map of vaccination centres, spread of specialists across hospitals etc * Dashboards on **Manpower** * Stories on **Manpower**   + E.g. how many nurses to one patient etc |
| **Sam** | * Data Collection   + Accessibility to Hospital Facilities   + Availability of Essential resources   + Posession of Healthcare resources * Business Objective * Determine Success Criteria on **Accessibility** * Data Understanding * Data Pre-Processing * Data Modification/Cleaning * Visualizations on **Accessibility**    + Essential Resources by Countries   + Healthcare resources over the years   + Ranking of most number of Facilities per Country * Dashboards on **Accessibility** * Stories on **Accessibility** |
| **Bo Yu** | * Data Collection for **Finance**   - Health Insurance Premium of Customers  - Medical Cost Personal Datasets  - Amount paid from the Healthcare   * Business Objective * Determine Success Criteria on **Finance** * Data Understanding * Data Pre-Processing * Data Modification/Cleaning * Visualizations on **Finance**   - Ranking on which insurance is suitable  - Hosptial Charges over the years  - Coverage of the Insurance for Patients   * Dashboards on **Finance** * Stories on **Finance** |

**6.Project Scheduling (Timeline)**