IBM – NALAIYA THIRAN PROJECT

ANALYTICS FOR HOSPITALS HEALTH-CARE DATA

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CONTENT

1. INTRODUCTION

1.1 PROJECT OVERVIEW

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.

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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.

1.2 PURPOSE

Data analytics in health care is vital. It helps health care organizations to evaluate and develop practitioners, detect anomalies in scans and predict outbreaks in illness, per the Harvard Business School.

Data analytics can also lower costs for health care organizations and boost business intelligence. Hospital data analytics can look over patient data and any prescribed medication to alert doctors and patients of incorrect dosages or wrong prescriptions, which lessens human error and the cost to your hospital.

2. LITERATURE SURVEY

2.1 EXISTING PROBLEM

● The already existing model is trained with minimal parameters by leaving the necessary parameter
● Low accuracy in prediction
● No feature extraction done
● High complexity.

2.2 REFERENCES

1. Cortada J.W., Gordon D., Lenihan B. The Value of Analytics in Healthcare. IBM Institute for Business Value; Armonk, NY, USA: 2012. Report No.: GBE03476-USEN-00. [Google Scholar]

2. Center for Medicare and Medicaid Services. [(accessed on 1 August 2017)]; Availableonline: https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-TrendsandReports /NationalHealthExpendData/NationalHealthAccountsHistorical.html

3. S. Axryd. Why 85% of big data projects fail. [Online]. Available: https://www.digitalnewsasia.com/insights/why-85-big-data-projects-fail. Accessed on: Apr. 16, 2019.

4. A.A. Kramer, J.E. Zimmerman A predictive model for the early identification of patients at risk for a prolonged intensive care unit length of stay BMC Med Inform Decis Making, 10 (1) (2010), p. 27

5.. J. Rapoport, D. Teres, Y. Zhao, S. Lemeshow Length of stay data as a guide to hospital economic performance for icu patients Med Care, 41 (3) (2003), pp. 386-397

6. F. Barili, N. Barzaghi, F.H. Cheema, A. Capo, J. Jiang, E. Ardemagni, M. Argenziano, C. Grossi An original model to predict intensive care unit length-of stay after cardiac surgery in a competing risk framework

7.M.N. Diringer, N.L. Reaven, S.E. Funk, G.C. Uman Elevated body temperature independently contributes to increased length of stay in neurologic intensive care

unit patients Crit Care Med, 32 (7) (2004), pp. 1489-1495

8. R. Paterson, D. MacLeod, D. Thetford, A. Beattie, C. Graham, S. Lam, D. BellPrediction of in-hospital mortality and length of stay using an early warning scoring system: clinical audit Clin Med, 6 (3) (2006), pp. 281-284

9.Teno JM, Fisher E, Hamel MB, Wu AW, Murphy DJ, Wenger NS, et al. Decisionmaking and outcomes of prolonged icu stays in seriously ill patients. J Am Geriatr Soc 2000; vol. 48, no. S1.

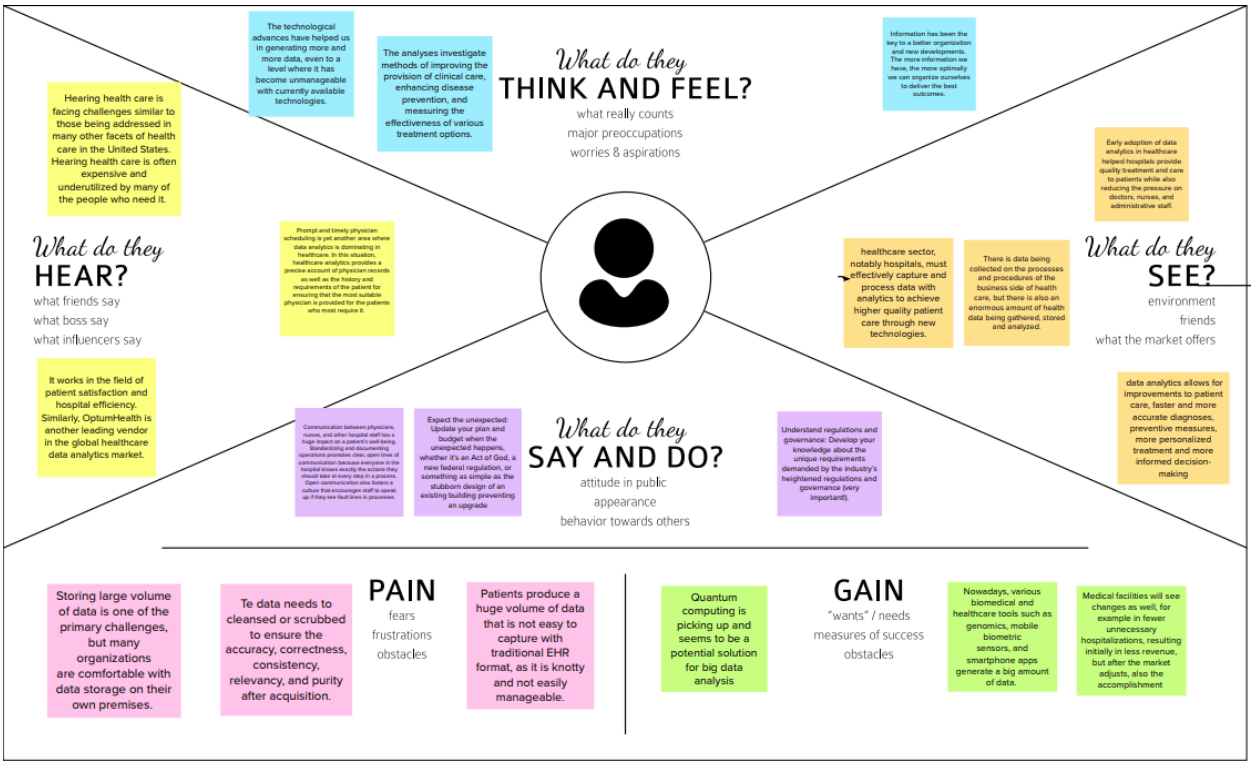
2.3 PROBLEM STATEMENT DEFINITION

● 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.

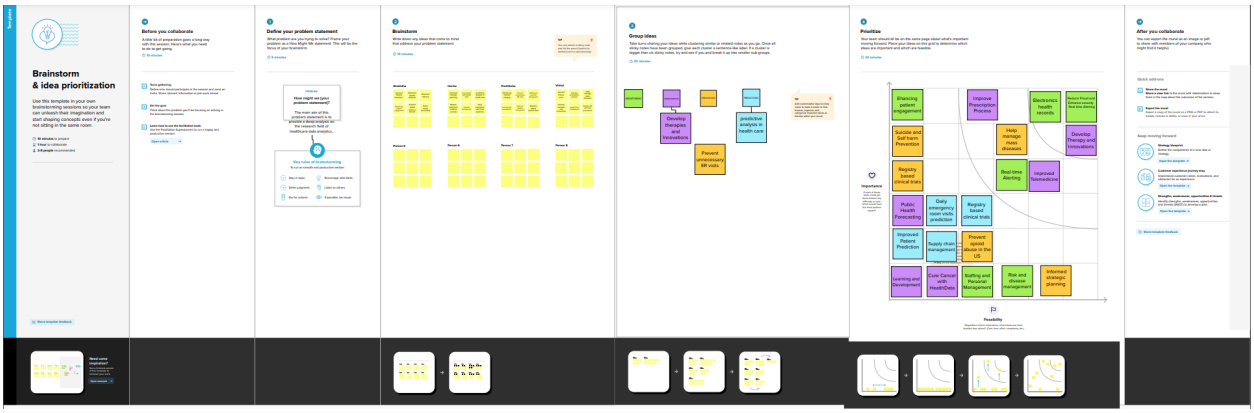
● The length of stay is divided into 11 different classes ranging from 0- 10 days to more than 100 days.

3. IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS



3.2 IDEATION & BRAINSTORMING



3.3 PROPOSED SOLUTION

Predict the length of stay of patients: The length of the stay can be predicted using either Random forest or Decision Tree for more accuracy. Certain parameters like age, stage of the diseases, disease diagnosis, severity of illness, type of admission, facilities allocated, etc., are used for prediction.

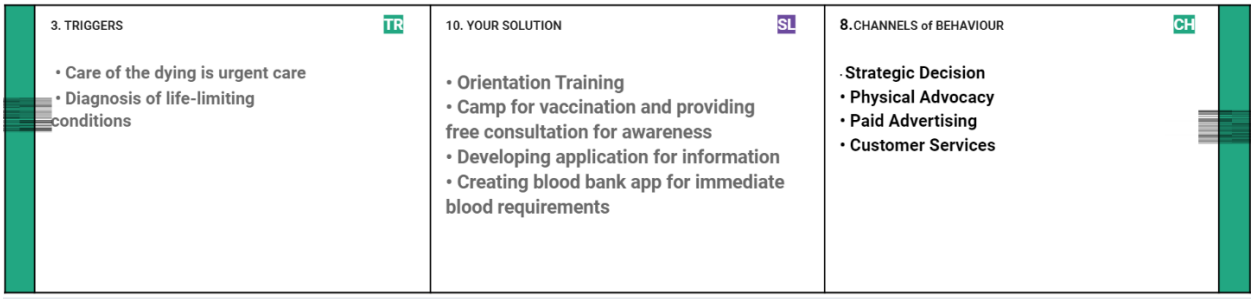
IBM Cognos will be used for data analytic s. The model will be trained using colab.It predicts the length of stay (LOS) of the patients with more accuracy. As a result proper resources and therapy can be provided.Patients can get proper treatment and better medical care than before which helps them for their faster recovery.

So the prediction minimizes the overflow of patients and helps in resource management and optimize their resource utilization. Hence this leads to faster recovery and lower the expenses for treatment. It improves the trust in hospital management.

It avoids the major risk of spreading infection among the hospital staff. This leads to overall safety of hospital staff and patients.Resource consumption is optimized.

This model can be used by all government hospitals, private hospitals, and even in The model is trained with the real world hospital survey for better prediction small clinics.Length of the stay will be predicted with more accuracy.This model predicts the length of the stay for all kinds of patients and predicts with more accuracy.

3.4 PROBLEM SOLUTION FIT



4. REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

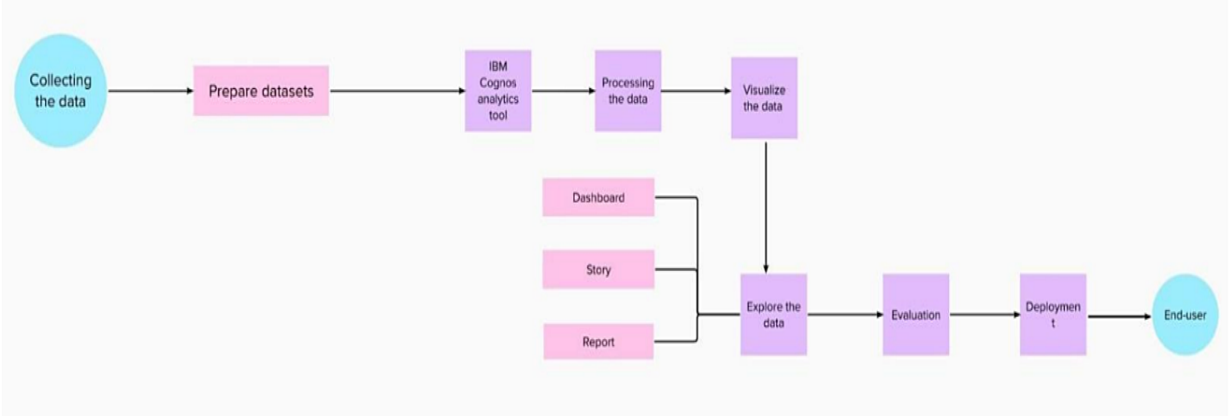
Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
User Registration	Registration through Form Registration through Gmail Registration through LinkedIN
User Confirmation	Confirmation via Email Confirmation via OTP
Interoperability	Dashboard helps to share the patient's information interoperable to the hospitals in timely manner
Accuracy	Dashboard helps predict the patient's Health risks accurately based on LOS (Length of Stay).
Compliance	The compliance of a dashboard is like to use very interactively in real time by the hospitals.
Concise	These dashboards are clear, intuitive, and customizable and interactive in manner

4.2 NON-FUNCTIONAL REQUIREMENTS

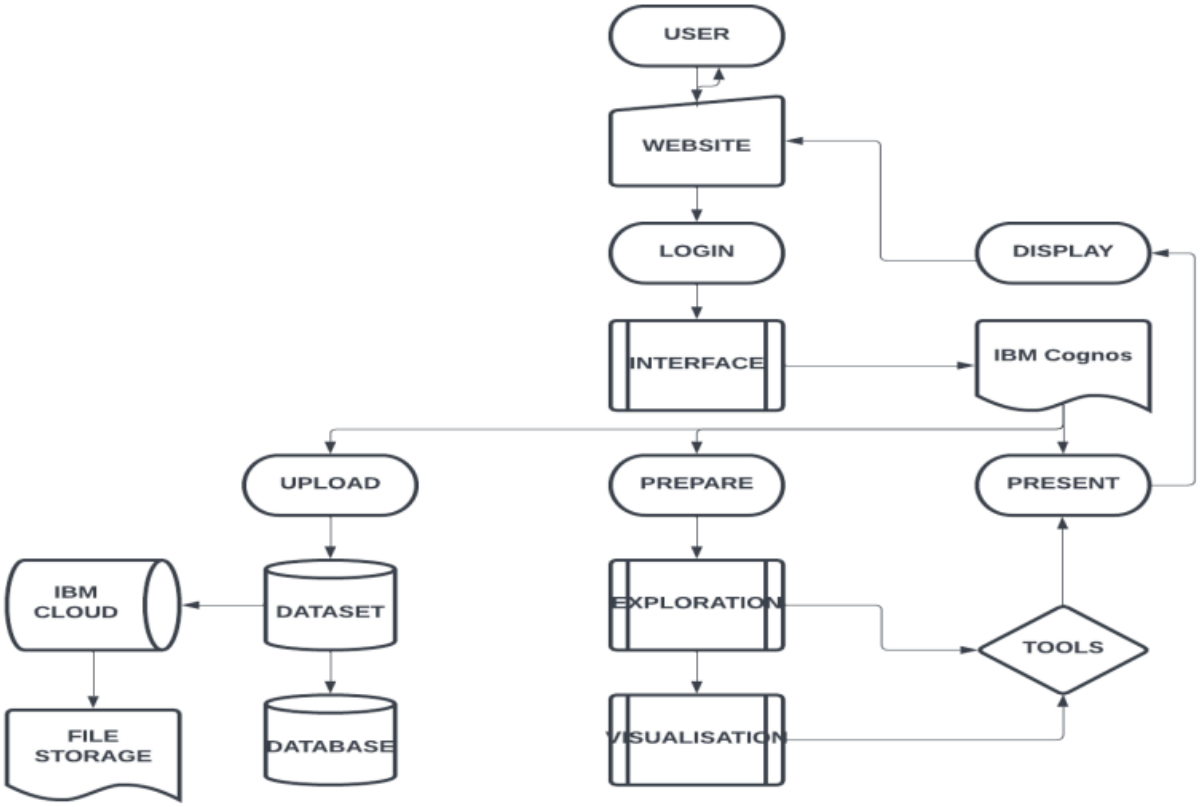
Non-Functional Requirement	Description
Usability	User can view and visualise the data through the interactive dashboard and predict the length of stay of patients with machine learning algorithm
Security	IBM Cognos provides better security. The dataset uploaded to the dashboard cannot be downloaded or accessed by external sources
Reliability	The dashboard and the prediction is very reliable and provide prediction with more accuracy
Performance	The length of stay of patients is predicted with more accuracy
Availability	The predicted length of stay and the visualization will be available in cognos analysis
Scalability	The software is scalable and extendable. Because it allow multiple user to handle the data at the same time

5. PROJECT DESIGN

5.1 DATA FLOW DIAGRAM



5.2 SOLUTION & TECHNICAL ARCHITECTURE



5.3 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2
		USN-4	As a user, I can register for the application through Gmail	I can register & access the dashboard	Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email & password	I can access the dashboard	High	Sprint-1
	Dashboard	USN-6	As a user, I can upload the datasets to the dashboard	I can access various operations	High	Sprint - 1
Customer (Web user)	View	USN-7	As a user, I can view the patient details	I can view the visual data and the result after the prediction	High	Sprint - 2
Customer Care Executive	Analyse	USN-8	As an admin, I will analyse the given dataset	I can analyse the dataset	High	Sprint - 2
Administrator	Predict	USN-9	As an admin, I will predict the length of stay	I can predict the length of stay	High	Sprint - 2

6. PROJECT PLANNING & SCHEDULING

6.1 SPRINT PLANNING & ESTIMATION

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	20	High	Shahidha K Prathiksha S
Sprint-1	Data uploading	USN-2	As a user, I will receive confirmation email once I have registered for the application	10	High	Vishal V Harine R
Sprint-2	Data Analysis	USN-3	As a user, I can register for the application through Facebook	20	High	Shahidha K Harine R

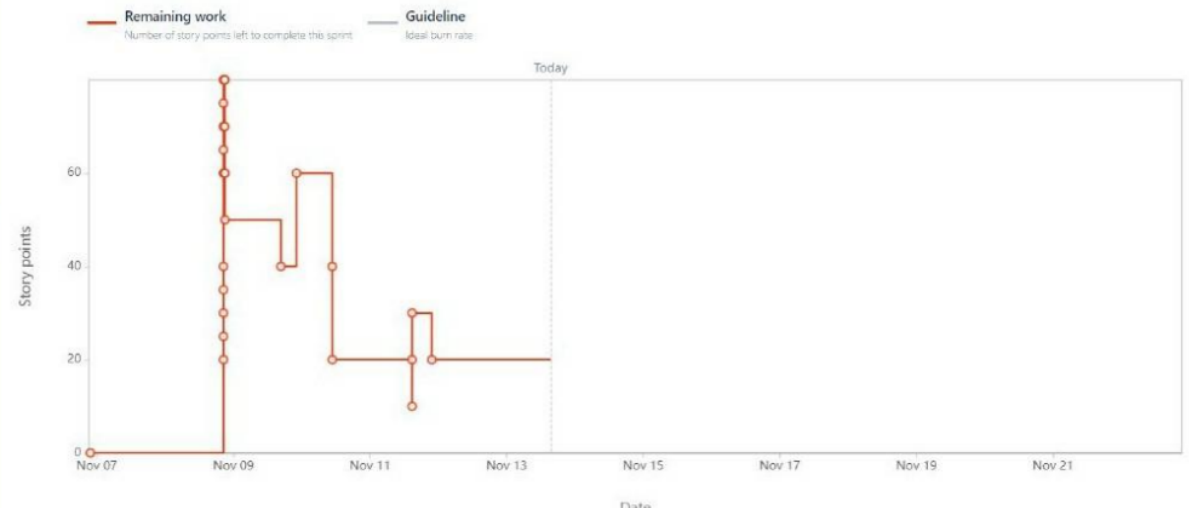
6.2 SPRINT DELIVERY SCHEDULE

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-2	Dashboard	USN-4	As a user, I can register for the application through Gmail	20	High	Prathiksha S Vishal V
Sprint-3	Login	USN-5	As a user, I can log into the application by entering email & password	10	High	Harine R Prathiksha S
Sprint-4	Report	USN-6	As a user, I will be making a report from the analysis and dashboards	20	High	Shahidha k Vishal V

6.3 REPORTS FROM JIRA

BURN UP CHART

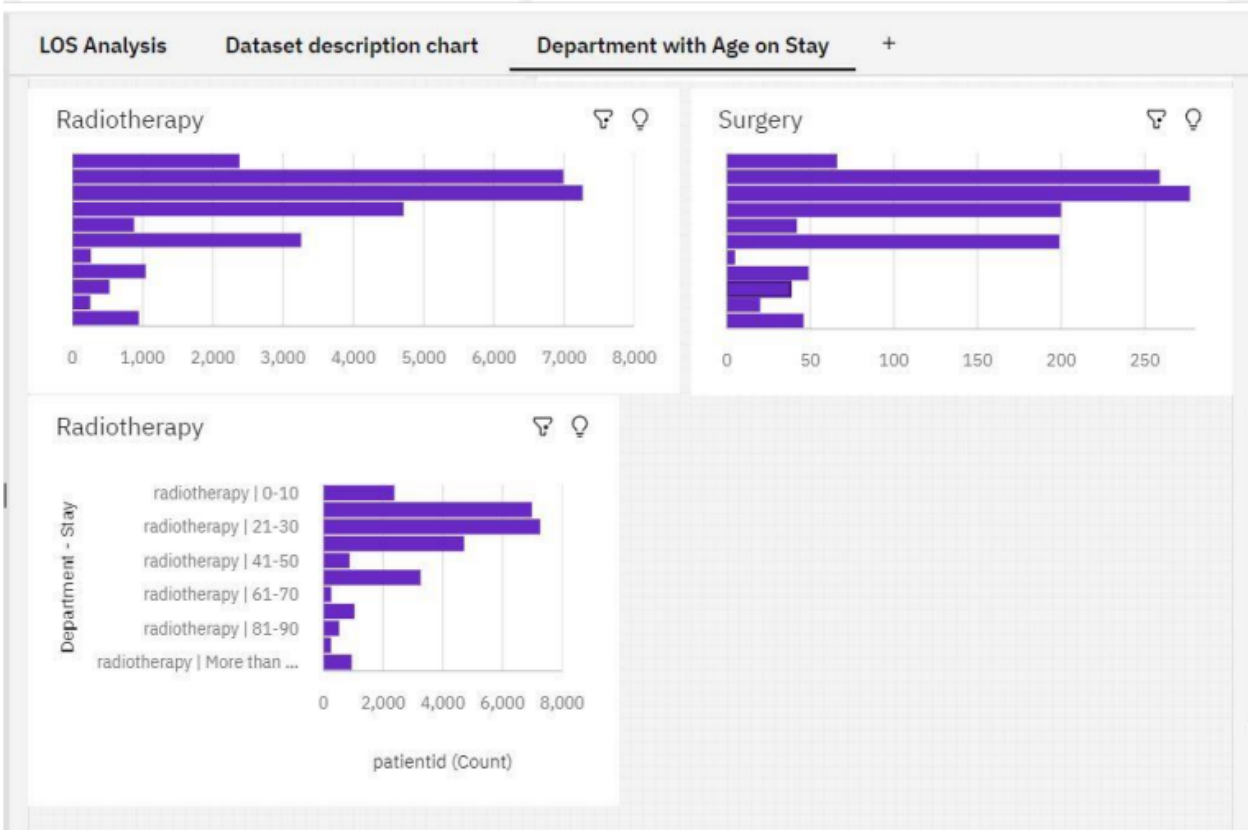
BURN DOWN CHART



7. CODING & SOLUTIONING

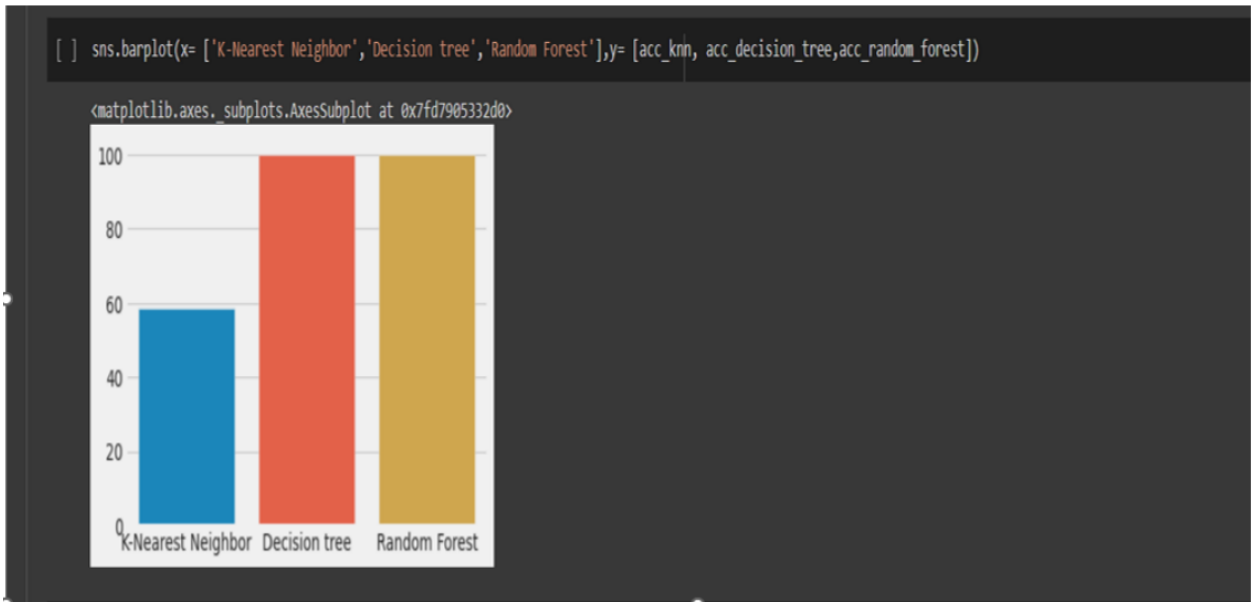
7.1 FEATURE


LOS Analysis
Dataset description chart
Department with Age on Stay
+
patientid by Type of Admission
patientid (Count)
150,000
100,000
50,000
0
Emergency
Trauma
Urgent
Type of Admission
patientid by Department colored by Department
Department
TB & Chest disease
anesthesia
gynecology
radiotherapy
0
50,000
100,000
150,000
200,000
250,000
patientid by Ward_Type
Ward_Type
P
Q
U
R
T
S
0
20,000
60,000
100,000
140,000
patientid by Ward_Facility_Code
patientid (Count)
100,000
50,000
0
A
B
C
D
E
F


LOS Analysis
Dataset description chart
Department with Age on Stay
+
Radiotherapy
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
Surgery
0
50
100
150
200
250
Radiotherapy
Department - Stay
radiotherapy | 0-10
radiotherapy | 21-30
radiotherapy | 41-50
radiotherapy | 61-70
radiotherapy | 81-90
radiotherapy | More than ...
0
2,000
4,000
6,000
8,000
patientid (Count)

8. RESULTS

8.1 PERFORMANCE METRICS



9. ADVANTAGES & DISADVANTAGES

ADVANTAGES

- Gaining operational insights from healthcare provider data
- Improved staffing through health business management analytics
- Research and prediction of disease.
- Automation of hospital administrative processes.
- Early detection of disease.
- Analysing clinical data to improve medical research
- Using patient data to improve health outcomes

● More accurate calculation of health insurance rates.

DISADVANTAGES

Security: There have been many security breaches, hackings, phishing attacks, and ransomware episodes that data security is a priority for healthcare organizations. After noticing an array of vulnerabilities, a list of technical safeguards was developed for the protected health information (PHI). These rules, termed as HIPAA Security Rules, help guide organizations with storing, transmission, authentication protocols, and controls over access, integrity, and auditing. Common security measures like using up-to-date antivirus software, firewalls, encrypting sensitive data, and multi-factor authentication can save a lot of trouble.

Meta-data: To have a successful data governance plan, it would be mandatory to have complete, accurate, and up-to-date metadata regarding all the stored data. Te metadata would be composed of information like time of creation, purpose and person responsible for the data, previous usage (by who, why, how, and when) for researchers and data analysts. Tis would allow analysts to replicate previous queries and help later scientific studies and accurate benchmarking. Tis increases the usefulness of data and prevents creation of “data dumpsters” of low or no use.

Querying: Metadata would make it easier for organizations to query their data and get some answers. However, in absence of proper interoperability between datasets the query tools may not access an entire repository of data. Also, diferent components of a dataset should be well interconnected or linked and easily accessible otherwise a complete portrait of an individual patient’s health may not be generated.

Replacing Medical Personnel: Application of technology in every sphere of human life is improving the way things are done. These technologies are are also posing some threat to world of works. Robotics are replacing human labour.

10. CONCLUSION

The conclusion 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.

Data analytics is the science of analysing raw datasets in order to derive a conclusion regarding the information they hold. It enables us to discover patterns in the raw data and draw valuable information from them.

To some, the domain of healthcare data analytics may look new, but it has a lot of potential, especially if you wish to engage in challenging job roles and build a strong data analytics profile in the upcoming years.

In this blog, we have covered some of the major topics such as what is healthcare data analytics, its applications, scope, and benefits, etc. We hope it helps you in your decision-making as a healthcare data analytics professional.

11. FUTURE SCOPE

The Future of Healthcare, Intel provides a foundation for big data platforms and AI to advance health analytics. Predictive data analytics is helping health organizations enhance patient care, improve outcomes, and reduce costs by anticipating when, where, and how care should be provided.

The future of big data in healthcare will be determined by technological breakthroughs from 2022 to 2030. Complete patient care and cost-effective

prescription procedures are required for population health management. To assess clinical and claims data, they must be combined on the same platform.

Countries around the world have started to invest more capital in medical infrastructure, pharmaceuticals, and healthcare smart analytics solutions. The market is growing and will continue to expand, given the benefits of healthcare data analytics.

It has also risen as a good career option for fresh data science and data analytics graduates or professionals who wish to build their career in the healthcare sector. Due to the sensitivity of the profession, the salary offers for healthcare data analysts are lucrative around the world.

Apart from the remuneration, the opportunities to work with some of the biggest names in the healthcare sector is also worth mentioning. Hence, healthcare data analytics is growing to be one of the most rewarding branches of data analytics in the coming future.

12. APPENDIX

SOURCE CODE

```
<!DOCTYPE html>
<html lang="en">

<head>
  <meta charset="utf-8">
  <meta content="width=device-width, initial-scale=1.0" name="viewport">

  <title>MEDSTAY HEALTH CARE</title>
  <meta content="" name="description">
  <meta content="" name="keywords">

  <!-- Favicons -->
  <link href="assets/img/favicon.png" rel="icon">
  <link href="assets/img/apple-touch-icon.png" rel="apple-touch-icon">

  <!-- Google Fonts -->
  <link
href="https://fonts.googleapis.com/css?family=Open+Sans:300,300i,400,400i,
600,600i,700,700i|Roboto:300,300i,400,400i,500,500i,600,600i,700,700i|Popp
ins:300,300i,400,400i,500,500i,600,600i,700,700i" rel="stylesheet">

  <!-- Vendor CSS Files -->
  <link href="assets/vendor/fontawesome-free/css/all.min.css"
rel="stylesheet">
  <link href="assets/vendor/animate.css/animate.min.css" rel="stylesheet">
  <link href="assets/vendor/aos/aos.css" rel="stylesheet">
  <link href="assets/vendor/bootstrap/css/bootstrap.min.css"
rel="stylesheet">
  <link href="assets/vendor/bootstrap-icons/bootstrap-icons.css"
rel="stylesheet">
  <link href="assets/vendor/boxicons/css/boxicons.min.css"
rel="stylesheet">
  <link href="assets/vendor/glightbox/css/glightbox.min.css"
rel="stylesheet">
  <link href="assets/vendor/swiper/swiper-bundle.min.css"
rel="stylesheet">

  <!-- Template Main CSS File -->
  <link href="assets/css/style.css" rel="stylesheet">
```

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  <!-- ======================================================
  * Template Name: Medicio - v4.9.1
  * Template URL: https://bootstrapmade.com/medicio-free-bootstrap-theme/
  * Author: BootstrapMade.com
  * License: https://bootstrapmade.com/license/
  ====================================================== -->
</head>

<body>

  <!-- ======= Top Bar ======= -->
  <div id="topbar" class="d-flex align-items-center fixed-top">
    <div class="container d-flex align-items-center justify-content-center
justify-content-md-between">
      <div class="align-items-center d-none d-md-flex">
        <i class="bi bi-clock"></i> Monday - Sunday, 8AM to 10PM
      </div>
      <div class="d-flex align-items-center">
        <i class="bi bi-phone"></i> Call us now 9341376454
      </div>
    </div>
  </div>

  <!-- ======= Header ======= -->
  <header id="header" class="fixed-top">
    <div class="container d-flex align-items-center">

      <a href="index.html" class="logo me-auto"><img
src="D:\PROJECT\cad911eca761152a9eb515b5de8ae115--logo-ms-awesome-logos.jp
g" alt=""></a>
      <!-- Uncomment below if you prefer to use an image logo -->
      <!-- <h1 class="logo me-auto"><a href="index.html">Medicio</a></h1>
-->

      <nav id="navbar" class="navbar order-last order-lg-0">
        <ul>
          <li><a class="nav-link scrollto " href="#hero">Home</a></li>
          <li><a class="nav-link scrollto" href="#about">About</a></li>
          <li><a class="nav-link scrollto"
href="#services">Services</a></li>
```

```
          </ul>
        <i class="bi bi-list mobile-nav-toggle"></i>
      </nav><!-- .navbar -->

      <a href="#appointment" class="appointment-btn scrollto"><span
class="d-none d-md-inline">Make an</span> Appointment</a>

    </div>
  </header><!-- End Header -->

  <!-- ======= Hero Section ======= -->
  <section id="hero">
    <div id="heroCarousel" data-bs-interval="5000" class="carousel slide
carousel-fade" data-bs-ride="carousel">

      <ol class="carousel-indicators" id="hero-carousel-indicators"></ol>

      <div class="carousel-inner" role="listbox">

        <!-- Slide 1 -->
        <div class="carousel-item active" style="background-image:
url(assets/img/slide/slide-1.jpg)">
          <div class="container">
            <h2>Welcome to <span>Analytics for Hospitals Health-Care
Data</span></h2>
            <p>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</p>
            <a href="#about" class="btn-get-started scrollto">Read
More</a>
          </div>
        </div>

        <!-- Slide 2 -->
        <div class="carousel-item" style="background-image:
url(assets/img/slide/slide-2.jpg)">
          <div class="container">
```

```
            <a href="#about" class="btn-get-started scrollto">Read
More</a>
          </div>
        </div>

        <!-- Slide 3 -->
        <div class="carousel-item" style="background-image:
url(assets/img/slide/slide-3.jpg)">
          <div class="container">
            <h2>Mission of our Project</h2>
            <p>We help 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.

            </p>
            <a href="#about" class="btn-get-started scrollto">Read
More</a>
          </div>
        </div>

      </div>

      <a class="carousel-control-prev" href="#heroCarousel" role="button"
data-bs-slide="prev">
        <span class="carousel-control-prev-icon bi bi-chevron-left"
aria-hidden="true"></span>
      </a>

      <a class="carousel-control-next" href="#heroCarousel" role="button"
data-bs-slide="next">
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aria-hidden="true"></span>
      </a>
```

```
    </div>
  </section><!-- End Hero -->

  <main id="main">

    <!-- ======= Featured Services Section ======= -->
    <section id="featured-services" class="featured-services">
      <div class="container" data-aos="fade-up">

        <div class="row">
          <div class="col-md-6 col-lg-3 d-flex align-items-stretch mb-5
mb-lg-0">
            <div class="icon-box" data-aos="fade-up" data-aos-delay="100">
              <div class="icon"><i class="fas fa-heartbeat"></i></div>
              <h4 class="title"><a href="">DASHBOARD</a></h4>
              <p class="description">A dashboard helps you to monitor
events or activities at a glance by providing key insights and analysis
about your data on one or more pages or screens.</p>
            </div>
          </div>

          <div class="col-md-6 col-lg-3 d-flex align-items-stretch mb-5
mb-lg-0">
            <div class="icon-box" data-aos="fade-up" data-aos-delay="200">
              <div class="icon"><i class="fas fa-pills"></i></div>
              <h4 class="title"><a href="">VISUALIZATION</a></h4>
              <p class="description">Reporting provides you with a preview
of your visualization, using simulated data. This allows you to view your
style changes without running your report.</p>
            </div>
          </div>

          <div class="col-md-6 col-lg-3 d-flex align-items-stretch mb-5
mb-lg-0">
            <div class="icon-box" data-aos="fade-up" data-aos-delay="300">
              <div class="icon"><i class="fas fa-thermometer"></i></div>
              <h4 class="title"><a href="">REPORT</a></h4>
              <p class="description">Reports are usually created by
professional report authors who have a good knowledge of the data and
tools</p>
```

```
            </div>
          </div>

          <div class="col-md-6 col-lg-3 d-flex align-items-stretch mb-5
mb-lg-0">
            <div class="icon-box" data-aos="fade-up" data-aos-delay="400">
              <div class="icon"><i class="fas fa-dna"></i></div>
              <h4 class="title"><a href="">STORY</a></h4>
              <p class="description">A story is a type of view. A story is
composed of a set of scenes that are displayed in sequence over time.
Stories can be used to provide your data with a visual narrative.</p>
            </div>
          </div>

        </div>

      </div>
    </section><!-- End Featured Services Section -->



    <!-- ======= About Us Section ======= -->
    <section id="about" class="about">
      <div class="container" data-aos="fade-up">

        <div class="section-title">
          <h2>About Us</h2>
          <p>Our Medstay Healthcare aspires to deliver outstanding patient
experiences with world class expertise backed by next generation medical
and digital technologies because you deserve the best of care and are at
the core of everything we do</p>
        </div>

        <div class="row">
          <div class="col-lg-6" data-aos="fade-right">
            <img src="C:\Users\DELL\Downloads\image (5).png"
class="img-fluid" alt="">
          </div>
          <div class="col-lg-6 pt-4 pt-lg-0 content" data-aos="fade-left">
            <p class="fst-italic">
```

```
            Predictive analytics is an increasingly important tool in
the healthcare field since modern machine learning (ML) methods can use
large amounts of available data to predict individual outcomes for
patients. For example, ML predictions can help healthcare providers
determine the likelihoods of disease, aid in the diagnosis, recommend
treatment, and predict future wellness. For this project, I chose to focus
on a more logistical metric of healthcare, hospital length-of-stay (LOS).
LOS is defined as the time between hospital admission and discharge
measured in days.The expected outcome of this project is to develop a
model that will be better at predicting hospital LOS than the industry
standards of median and average LOS. The median LOS is simply the median
LOS of past admissions to a hospital. Similarly, a second commonly used
metric in healthcare is the average, or mean LOS.For example, a perfect
prediction model would have an RMSE of 0. The RMSE equation for this work
is given as follows, where (n) is the number of hospital admission
records, (y-hat) the prediction LOS, and (y) is the actual LOS.To measure
performance, I'll compare the prediction model against the median and
average LOS using the root-mean-square error (RMSE). The RMSE is a
commonly used measure of the differences between values predicted by a
model and the values observed, where a lower score implies better
accuracy.
          </p>
        </div>
      </div>

    </div>
  </section><!-- End About Us Section -->
  <section id="about" class="about">
    <div class="container" data-aos="fade-up">

      <div class="section-title">
  <h1>DASHBOARD</h1>
  <iframe
src="https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&amp;pathRe
f=.my_folders%2FDashboard%2B1&amp;closeWindowOnLastView=true&amp;ui_appbar
=false&amp;ui_navbar=false&amp;shareMode=embedded&amp;action=view&amp;mode
=dashboard&amp;subView=model00000184867da35e_00000003" width="1260"
height="800" frameborder="0" gesture="media" allow="encrypted-media"
allowfullscreen=""></iframe>
  <iframe
```

```
src="https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&amp;pathRe
f=.my_folders%2Fdashboard%2B5&amp;closeWindowOnLastView=true&amp;ui_appbar
=false&amp;ui_navbar=false&amp;shareMode=embedded&amp;action=view&amp;mode
=dashboard&amp;subView=model000001848a6f20ea_00000002" width="1260"
height="800" frameborder="0" gesture="media" allow="encrypted-media"
allowfullscreen=""></iframe>
    <section id="about" class="about">
      <div class="container" data-aos="fade-up">

        <div class="section-title">
    <h1>VISUALISATION</h1>
    <iframe
src="https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&amp;pathRe
f=.my_folders%2Fbubbles%2Band%2Bradial%2Bdashboard&amp;closeWindowOnLastVi
ew=true&amp;ui_appbar=false&amp;ui_navbar=false&amp;shareMode=embedded&amp
;action=view&amp;mode=dashboard&amp;subView=model0000018485805219_00000002
" width="1260" height="800" frameborder="0" gesture="media"
allow="encrypted-media" allowfullscreen=""></iframe>
    <iframe
src="https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&amp;pathRe
f=.my_folders%2FAge%2Bwise%2Bpatient%2Bvisualisation&amp;closeWindowOnLast
View=true&amp;ui_appbar=false&amp;ui_navbar=false&amp;shareMode=embedded&a
mp;action=view&amp;mode=dashboard" width="1260" height="800"
frameborder="0" gesture="media" allow="encrypted-media"
allowfullscreen=""></iframe>
    <iframe
src="https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&amp;pathRe
f=.my_folders%2Fdashboard%2Blist%2Bof%2Bpatients&amp;closeWindowOnLastView
=true&amp;ui_appbar=false&amp;ui_navbar=false&amp;shareMode=embedded&amp;a
ction=view&amp;mode=dashboard&amp;subView=model00000184857057a4_00000002"
width="1260" height="800" frameborder="0" gesture="media"
allow="encrypted-media" allowfullscreen=""></iframe>
    <iframe
src="https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&amp;pathRe
f=.my_folders%2FNumber%2Bof%2Bpatients%2Bby%2Bward%2Btype&amp;closeWindowO
nLastView=true&amp;ui_appbar=false&amp;ui_navbar=false&amp;shareMode=embed
ded&amp;action=view&amp;mode=dashboard&amp;subView=model000001848565ef33_0
0000002" width="1260" height="800" frameborder="0" gesture="media"
allow="encrypted-media" allowfullscreen=""></iframe>
    <iframe
```

```
src="https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&amp;pathRe
f=.my_folders%2Fdashboard%2Bshowing%2Bwaterfall%252Cpie%252Cbar&amp;closeW
indowOnLastView=true&amp;ui_appbar=false&amp;ui_navbar=false&amp;shareMode
=embedded&amp;action=view&amp;mode=dashboard&amp;subView=model000001848589
b078_00000000" width="1260" height="800" frameborder="0" gesture="media"
allow="encrypted-media" allowfullscreen=""></iframe>
    <section id="about" class="about">
      <div class="container" data-aos="fade-up">

        <div class="section-title">
    <h1>REPORT</h1>
    <iframe
src="https://us1.ca.analytics.ibm.com/bi/?pathRef=.my_folders%2Freport%2B1
&amp;closeWindowOnLastView=true&amp;ui_appbar=false&amp;ui_navbar=false&am
p;shareMode=embedded&amp;action=run&amp;prompt=false" width="1260"
height="800" frameborder="0" gesture="media" allow="encrypted-media"
allowfullscreen=""></iframe>
    <iframe
src="https://us1.ca.analytics.ibm.com/bi/?pathRef=.my_folders%2Freport%2B2
&amp;closeWindowOnLastView=true&amp;ui_appbar=false&amp;ui_navbar=false&am
p;shareMode=embedded&amp;action=run&amp;prompt=false" width="1260"
height="800" frameborder="0" gesture="media" allow="encrypted-media"
allowfullscreen=""></iframe>
    <iframe
src="https://us1.ca.analytics.ibm.com/bi/?pathRef=.my_folders%2Freport%2B3
&amp;closeWindowOnLastView=true&amp;ui_appbar=false&amp;ui_navbar=false&am
p;shareMode=embedded&amp;action=run&amp;prompt=false" width="1260"
height="800" frameborder="0" gesture="media" allow="encrypted-media"
allowfullscreen=""></iframe>

    <!-- ======= Appointment Section ======= -->
    <section id="appointment" class="appointment section-bg">
      <div class="container" data-aos="fade-up">

        <div class="section-title">
          <h2>Make an Appointment</h2>
          <p></p>
        </div>

        <form action="forms/appointment.php" method="post" role="form"
```

```
class="php-email-form" data-aos="fade-up" data-aos-delay="100">
          <div class="row">
            <div class="col-md-4 form-group">
              <input type="text" name="name" class="form-control"
id="name" placeholder="Your Name" required>
            </div>
            <div class="col-md-4 form-group mt-3 mt-md-0">
              <input type="email" class="form-control" name="email"
id="email" placeholder="Your Email" required>
            </div>
            <div class="col-md-4 form-group mt-3 mt-md-0">
              <input type="tel" class="form-control" name="phone"
id="phone" placeholder="Your Phone" required>
            </div>
          </div>
          <div class="row">
            <div class="col-md-4 form-group mt-3">
              <input type="datetime" name="date" class="form-control
datepicker" id="date" placeholder="Appointment Date" required>
            </div>
            <div class="col-md-4 form-group mt-3">
              <select name="department" id="department"
class="form-select">
                <option value="">Select Department</option>
                <option value="Department 1">Department 1</option>
                <option value="Department 2">Department 2</option>
                <option value="Department 3">Department 3</option>
              </select>
            </div>
            <div class="col-md-4 form-group mt-3">
              <select name="doctor" id="doctor" class="form-select">
                <option value="">Select Doctor</option>
                <option value="Doctor 1">Doctor 1</option>
                <option value="Doctor 2">Doctor 2</option>
                <option value="Doctor 3">Doctor 3</option>
              </select>
            </div>
          </div>

          <div class="form-group mt-3">
```

```
            <textarea class="form-control" name="message" rows="5"
placeholder="Message (Optional)"></textarea>
          </div>
          <div class="my-3">
            <div class="loading">Loading</div>
            <div class="error-message"></div>
            <div class="sent-message">Your appointment request has been
sent successfully. Thank you!</div>
          </div>
          <div class="text-center"><button type="submit">Make an
Appointment</button></div>
        </form>

      </div>
    </section><!-- End Appointment Section -->

  </main><!-- End #main -->

  <!-- ======= Footer ======= -->
  <footer id="footer">
    <div class="footer-top">
      <div class="container">
        <div class="row">

          <div class="col-lg-3 col-md-6">
            <div class="footer-info">
              <h3>Medstay</h3>
              <p>
                14B4,Richie Street,Chennai<br><br>
                <strong>Phone:</strong> medstay@gmail.com<br>
                <strong>Email:</strong>9341376454 <br>
              </p>
              <div class="social-links mt-3">
                <a href="#" class="twitter"><i class="bx
bxl-twitter"></i></a>
                <a href="#" class="facebook"><i class="bx
bxl-facebook"></i></a>
                <a href="#" class="instagram"><i class="bx
bxl-instagram"></i></a>
                <a href="#" class="google-plus"><i class="bx
```

```
bxl-skype"></i></a>
                <a href="#" class="linkedin"><i class="bx
bxl-linkedin"></i></a>
              </div>
            </div>
          </div>

          <div class="col-lg-2 col-md-6 footer-links">
            <h4>Useful Links</h4>
            <ul>
              <li><i class="bx bx-chevron-right"></i> <a
href="#">Home</a></li>
              <li><i class="bx bx-chevron-right"></i> <a href="#">About
us</a></li>
              <li><i class="bx bx-chevron-right"></i> <a
href="#">Services</a></li>
              <li><i class="bx bx-chevron-right"></i> <a href="#">Terms of
service</a></li>
              <li><i class="bx bx-chevron-right"></i> <a href="#">Privacy
policy</a></li>
            </ul>
          </div>

          <div class="col-lg-3 col-md-6 footer-links">
            <h4>Our Services</h4>
            <ul>
              <li><i class="bx bx-chevron-right"></i> <a href="#">Web
Design</a></li>
              <li><i class="bx bx-chevron-right"></i> <a href="#">Web
Development</a></li>
              <li><i class="bx bx-chevron-right"></i> <a href="#">Product
Management</a></li>
              <li><i class="bx bx-chevron-right"></i> <a
href="#">Marketing</a></li>
              <li><i class="bx bx-chevron-right"></i> <a href="#">Graphic
Design</a></li>
            </ul>
          </div>

          <div class="col-lg-4 col-md-6 footer-newsletter">
```

```
bxl-skype"></i></a>
                <a href="#" class="linkedin"><i class="bx
bxl-linkedin"></i></a>
              </div>
            </div>
          </div>

          <div class="col-lg-2 col-md-6 footer-links">
            <h4>Useful Links</h4>
            <ul>
              <li><i class="bx bx-chevron-right"></i> <a
href="#">Home</a></li>
              <li><i class="bx bx-chevron-right"></i> <a href="#">About
us</a></li>
              <li><i class="bx bx-chevron-right"></i> <a
href="#">Services</a></li>
              <li><i class="bx bx-chevron-right"></i> <a href="#">Terms of
service</a></li>
              <li><i class="bx bx-chevron-right"></i> <a href="#">Privacy
policy</a></li>
            </ul>
          </div>

          <div class="col-lg-3 col-md-6 footer-links">
            <h4>Our Services</h4>
            <ul>
              <li><i class="bx bx-chevron-right"></i> <a href="#">Web
Design</a></li>
              <li><i class="bx bx-chevron-right"></i> <a href="#">Web
Development</a></li>
              <li><i class="bx bx-chevron-right"></i> <a href="#">Product
Management</a></li>
              <li><i class="bx bx-chevron-right"></i> <a
href="#">Marketing</a></li>
              <li><i class="bx bx-chevron-right"></i> <a href="#">Graphic
Design</a></li>
            </ul>
          </div>

          <div class="col-lg-4 col-md-6 footer-newsletter">
```

```
            <h4></h4>
            <p></p>


          </div>

        </div>
      </div>
    </div>

    <div class="container">
      <div class="copyright">
        &copy; Copyright <strong><span>Medstay</span></strong>. All Rights
Reserved
      </div>
      <div class="credits">
        <!-- All the links in the footer should remain intact. -->
        <!-- You can delete the links only if you purchased the pro
version. -->
        <!-- Licensing information: https://bootstrapmade.com/license/ -->
        <!-- Purchase the pro version with working PHP/AJAX contact form:
https://bootstrapmade.com/medicio-free-bootstrap-theme/ -->
        Designed by <a href="https://bootstrapmade.com/">BootstrapMade</a>
      </div>
    </div>
  </footer><!-- End Footer -->

  <div id="preloader"></div>
  <a href="#" class="back-to-top d-flex align-items-center
justify-content-center"><i class="bi bi-arrow-up-short"></i></a>

  <!-- Vendor JS Files -->
  <script src="assets/vendor/purecounter/purecounter_vanilla.js"></script>
  <script src="assets/vendor/aos/aos.js"></script>
  <script
src="assets/vendor/bootstrap/js/bootstrap.bundle.min.js"></script>
  <script src="assets/vendor/glightbox/js/glightbox.min.js"></script>
  <script src="assets/vendor/swiper/swiper-bundle.min.js"></script>
  <script src="assets/vendor/php-email-form/validate.js"></script>
```

```
  <!-- Template Main JS File -->
  <script src="assets/js/main.js"></script>

</body>

</html>
```

GITHUB & PROJECT DEMO LINK

GIHUB LINK:

https://github.com/IBM-EPBL/IBM-Project-42798-1660709415

PROJECT DEMO LINK

https://drive.google.com/file/d/1Uu0tuFHXFIDz-0ZsV-N07kpXo1OYOnPC/view