CAPSTONE PROJECT

IMPROVED SOURCE OF DRINKING WATER

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OUTLINE

- **Problem Statement** (Should not include solution)
- **Proposed System/Solution**
- **System Development Approach** (Technology Used)
- **Algorithm & Deployment**
- **Result (Output Image)**
- **Conclusion**
- **Future Scope**
- **References**

PROBLEM STATEMENT

- **The Challenge: The Sustainable Development Goal 3.1 aims to reduce the global maternal mortality ratio to less than 70 per 100,000 live births by 2030. Monitoring progress towards this goal requires analyzing country-wise data on maternal mortality and associated health indicators such as antenatal care coverage, births attended by skilled personnel, adolescent birth rates, and healthcare expenditures. Despite global efforts, maternal health outcomes vary drastically between regions and income groups, raising the need for data-driven insights into the factors influencing maternal health.**

PROPOSED SOLUTION

DATA COLLECTION :

• **Geospatial Maps**: Plot bike rental locations using latitude and longitude to detect hotspots and underutilized zones
• **Time Series Plots**: Visualize hourly/daily rental trends over time to identify peaks and seasonal behavior.
• **Heatmaps**: Show demand distribution by hour and day of the week (e.g., high rentals during weekdays at 9 AM).

DATA PREPROCESSING VISUALIZATION :

• **Missing Data Matrix/Bar Plot**: Identify and display patterns in missing values using plots.
• **Outlier Detection**: Boxplots or scatter plots to detect anomalies in rental counts, temperature, or humidity.
• **Correlation Matrix**: Heatmap to show correlation between features (e.g., temperature, wind, weather) and demand.

DEPLOYMENT:

•Create a user-accessible interface or dashboard using IBM Cognos Dashboard Embedded.
•Visualize maternal health indicators interactively, allowing filtering by country, region, or year.

Visualization Techniques:
•Interactive map-based dashboards highlighting country-wise MMR.
•Filter panels for selecting country, income group, or indicator.
•KPI cards showing each country's MMR gap from the SDG target.

SYSTEM APPROACH

The "System Approach" section outlines the overall strategy and methodology for developing and implementing the rental bike prediction system. Here's a suggested structure for this section:

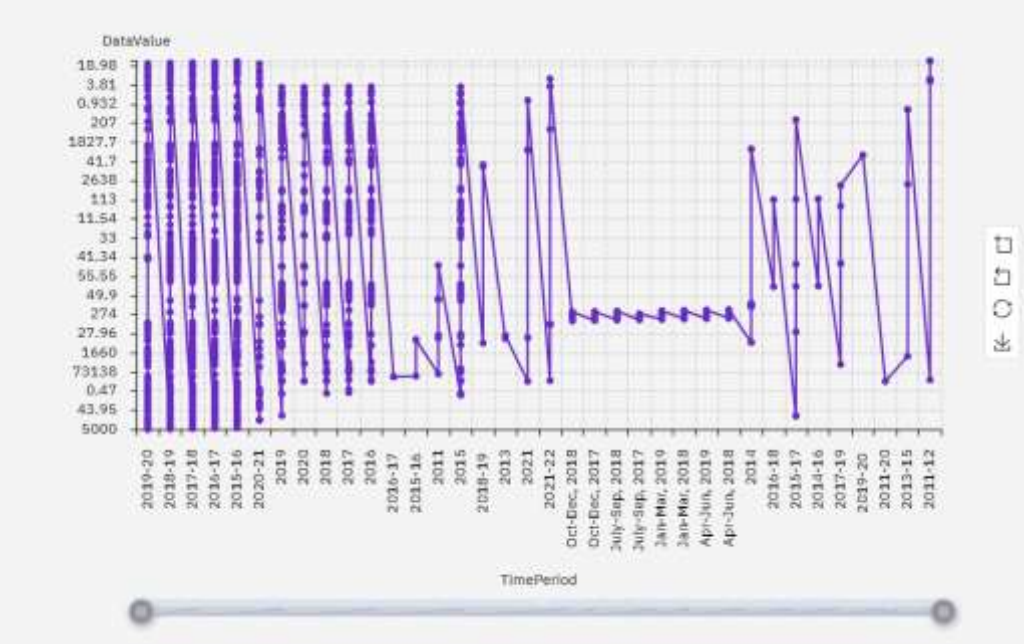
- System requirements
- Library required to build the model

ALGORITHM & DEPLOYMENT

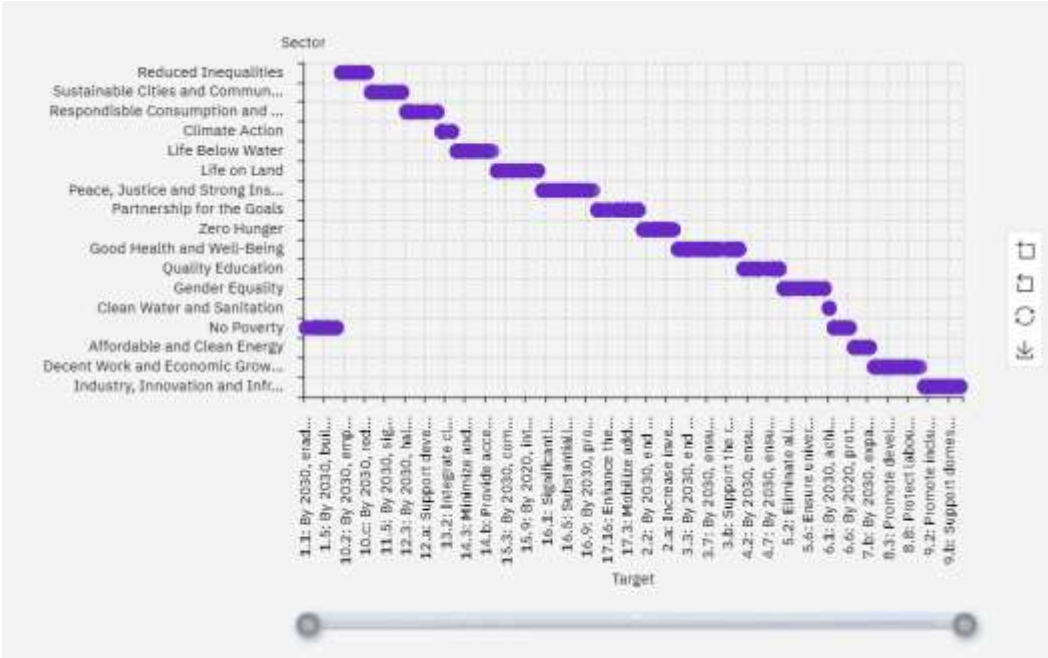
- In the Algorithm section, describe the machine learning algorithm chosen for predicting bike counts. Here's an example structure for this section:
- **Algorithm Selection:**
  - Provide a brief overview of the chosen algorithm (e.g., time-series forecasting model, like ARIMA or LSTM) and justify its selection based on the problem statement and data characteristics.
- **Data Input:**
  - Specify the input features used by the algorithm, such as maternal mortality ratio, antenatal care coverage, percentage of births attended by skilled health personnel, adolescent birth rate, and healthcare expenditure..
- **Training Process:**
  - he cleaned and preprocessed dataset is split into training and testing sets.
    A suitable machine learning model, such as linear regression or ARIMA, is trained on historical maternal health data.
    The model learns patterns between input features (e.g., antenatal care, health spending) and maternal mortality ratio..
- **Prediction Process:**
  - The prediction process involves analyzing historical data on maternal health indicators to forecast future trends in maternal mortality and identify regions at risk of not meeting SDG 3.1 targets. This process is implemented using machine learning techniques within IBM Watson Studio on IBM Cloud Lite..

RESULT

DATA VISUALS



Fig(a): Line Graph Between Data Value and Time Period



Fig(b): Scatter Plot Between Sector and Target

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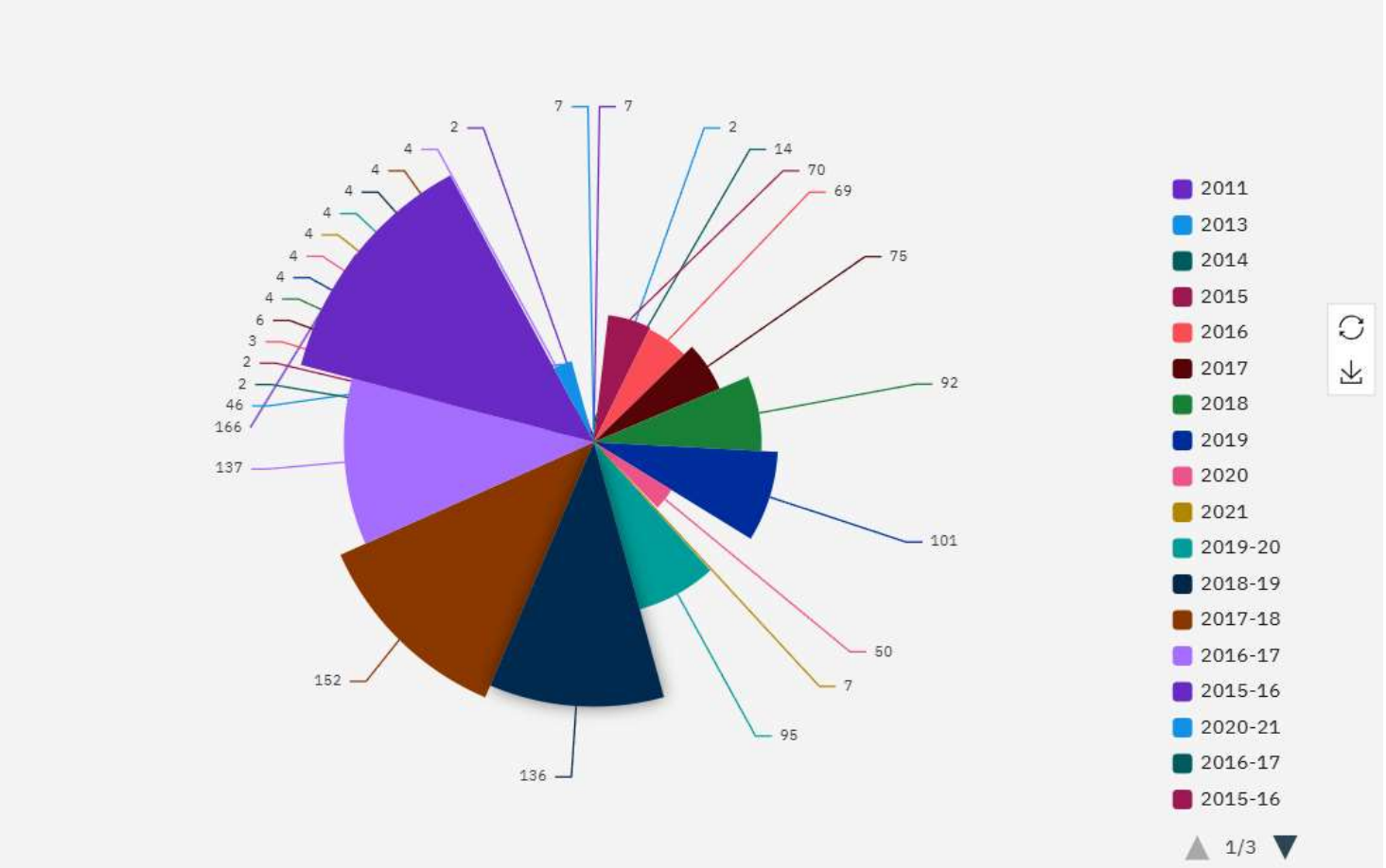
RESULT



Fig(c): Pie Chart of Time Period – This pie chart shows count of each Year

CONCLUSION

- In conclusion, this project provides a data-driven approach to tracking and analyzing maternal health progress toward Sustainable Development Goal 3.1 using IBM Cloud Lite services. By leveraging historical indicators such as maternal mortality ratio, antenatal care coverage, skilled birth attendance, and healthcare expenditure, the system offers valuable insights into regional disparities and areas requiring targeted interventions. Through effective data visualization using Watson Studio and Cognos Dashboard Embedded, the platform enables policymakers, healthcare planners, and global health organizations to monitor trends, evaluate impact, and make informed decisions. This solution lays a strong foundation for future enhancements involving real-time monitoring, predictive analytics, and broader SDG integration..

FUTURE SCOPE

The proposed system serves as a foundational step toward understanding and improving maternal health outcomes using data analytics and visualization. As technology and data availability advance, the system can be expanded and enhanced in the following ways:

- Integration of Real-Time Global Health Data.
- Advanced Predictive Modelling.
- Mobile and Government Portal Integration.
- Collaborative Dashboards and Open APIs

REFERENCES

- Imported Sustainable Development Dataset from AI Kosh.
- AI Kosh dataset link:

  https://www.data.gov.in/resource/sustainable-development-goals-national indicator-framework-version-31-2021

- IBM Cloud Services

IBM CERTIFICATIONS

1.GETTING STARTED WITH ARTIFICIAL INTELLIGENCE

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2.JOURNEY TO CLOUD : ENVISIONING YOUR SOLIUTION

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IBM CERTIFICATIONS

3. RAG LAB

IBM **SkillsBuild** Completion Certificate

This certificate is presented to

Venkatesh Parvatala

for the completion of

Lab: Retrieval Augmented Generation with LangChain

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 25 Jul 2025 (GMT) **Learning hours:** 20 mins

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THANK YOU

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