IBM-Naan Mudhalvan Data Analytics with Cognous

Phase – 2

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**Introduction:**

Public transportation systems play a pivotal role in modern cities, offering a convenient and sustainable mode of transportation for millions of passengers. However, ensuring the smooth operation of public transport networks can be challenging, with disruptions,delays, and passenger sentiment issues being common occurrences. To address these challenges, we propose the integration of machine learning algorithms and IBM Cognos for data analytics to predict service disruptions and analyze passenger sentiment from feedback.

**Predicting Service Disruptions:**

**Data Collection**:

To predict service disruptions, we need to collect historical data from various sources, including:

1. **Transit Logs**: These logs contain information about routes, schedules, and real-time updates.

2. **Weather Data**: Weather conditions can significantly impact public transport. Integrating weather data into the analysis can help predict delays caused by adverse weather.

3. **Maintenance Records**: Data on maintenance schedules, repairs, and vehicle condition can be vital in predicting breakdowns.

4. **Social Media:** Monitor social media platforms for mentions of service disruptions and customer complaints.

**Machine Learning Algorithms**:

1. **Time Series Forecasting**: Utilize time series models like ARIMA or Prophet to predict future delays based on historical data.

2. **Regression Analysis**: Analyze the impact of variables like weather, maintenance, and special events on service disruptions using regression models.

3. **Natural Language Processing**( NLP): Extract insights from passenger feedback using sentiment analysis to identify potential issues leading to disruptions.

**Implementation with Cognos:**

IBM Cognos can be integrated to create visually appealing dashboards and reports for service disruption predictions. The following steps can be followed:

1. **Data Integration**: Import and transform data from various sources into a format suitable for analysis.

2. **Model Training**: Train machine learning models using historical data.

3. **Real-time Updates:** Incorporate real-time data streams to continually update predictions.

4. **Visualization:** Create interactive dashboards and reports in Cognos to monitor and analyze predictions.

5. **Alerting:** Configure alerts in Cognos to notify relevant personnel when disruptions are predicted.

Analyzing Passenger Sentiment:

**Data Collection:**

To analyze passenger sentiment, collect data from multiple sources, including:

1. **Customer Feedback Forms**: Analyze comments, ratings, and feedback from passengers.

2. **Social Media Monitoring:** Monitor social media platforms for passenger sentiment and complaints.

3. **Survey Data:** Conduct regular passenger satisfaction surveys.

**Machine Learning Algorithms:**

1. **Sentiment Analysis**: Utilize NLP techniques to classify passenger sentiment as positive, negative, or neutral.

2. **Topic Modeling:** Identify common topics or issues mentioned in passenger feedback.

3. **Text Analytics**: Extract meaningful insights from unstructured text data.

**Implementation with Cognos**

IBM Cognos can be used to create insightful reports and dashboards for passenger sentiment analysis:

1. Data Integration: Import and preprocess passenger feedback data.

2. Sentiment Analysis: Apply sentiment analysis models to classify feedback.

3. Visualization: Create visualizations in Cognos to display sentiment trends, common issues, and overall passenger satisfaction.

4. Feedback Loop: Use the analysis to inform improvements and monitor changes in passenger sentiment over time.

**Conclusion:**

Incorporating machine learning algorithms and IBM Cognos into public transport analysis can significantly improve service reliability and passenger satisfaction. Predicting service disruptions and analyzing passenger sentiment are critical components of an efficient public transportation system, and the combination of data analytics and machine learning can help achieve these objectives. By implementing these techniques, public transportation authorities can make data-driven decisions and provide a better travel experience for passengers.