

Synthesis Prototype Report: MS-CISBA Curriculum in the Southwest Airlines Review Analyzer

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Southwest Airlines Review Analyzer: Web Application for Sentiment Analysis

MS-CISBA Capstone CIDM-6395-70

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Summary

The Southwest Airlines Review Analyzer is a web application for sentiment analysis of a specified number of reviews from the airline. The app asks for the user to input their desired number of reviews (or the default 100 if left unchanged) then generates a sentiment (five levels) for each review as well as some useful visualizations for them. Future implementations of this project include a more advanced NLP system for improved accuracy as well as using the TrustPilot API to gain more useful insights from the data. The Southwest Review Analyzer includes aspects from three of the MS-CISBA foundational topics, those being Data Analytics, Data Mining and Management, and Systems Development. The inclusion of Networking and Cybersecurity can be easily achieved through adding a user login function as well as an analysis history for them.

Foundations and Experience in the Curriculum Areas

Data Analytics

Data Analytics emphasizes the use of data to support strategic decision-making through visualization, modeling, and interpretation. My hands-on work with Power BI, Tableau, and predictive modeling has equipped me to create data-driven solutions. These experiences directly enhance my ability to turn raw data into actionable insights for real-world business problems.

The Southwest Review Analyzer uses data analytics to extract insights from customer reviews. Through visual tools like bar charts, pie charts, and word clouds, it highlights trends in sentiment, word usage, and review patterns. This helps stakeholders quickly understand customer feedback and make informed decisions based on the data.

Data Mining and Management

Data Mining and Management involves organizing, processing, and storing data efficiently for reliability, accuracy, and accessibility. My foundation in Python and SQL, along with work in data cleaning and structured querying, supports this area well. I'm also expanding my knowledge in big data tools and unstructured data, aligning with the evolving needs of data-driven environments.

This project applies data mining by processing raw text reviews to uncover frequent terms and sentiment trends. It involves cleaning, tokenizing, and analyzing text data to extract useful patterns. Proper data management ensures that the processed insights are accurate, consistent, and ready for visualization.

Networking and Cybersecurity

This area centers on protecting digital systems and data through security practices, risk assessments, and network analysis. My background in network scanning, vulnerability assessment, and fraud detection—using tools like Wireshark and Zenmap—has prepared me to address security challenges. Python-based projects in cybersecurity further reinforced this expertise.

Systems Development

Systems Development focuses on the design, development, and maintenance of applications and platforms using programming languages, frameworks, and development tools. With my experience in Python, SQL, JavaScript, Django, and web development, I've built and optimized web applications and resolved technical challenges—skills directly aligned with this area.

The analyzer is a complete system developed using Flask, Python, and HTML templates. It handles everything from data input to visual output, demonstrating effective system design and integration. The project reflects real-world development practices by combining back-end processing with a clear and accessible user interface.

Connections Between Areas

Data Analytics

- Data mining involves extracting valuable information from datasets, while data analytics takes that information and ensures that it is meaningful. Data management on the other hand makes sure data is stored in a manner that can be used in data analytics and decision-making.
- Systems development is aided by data analytics as it allows software engineers and developers to optimize system performance through analyzing user behavior and system efficiency. Additionally, predictive models can be used to detect potential system failures before they occur.
- Networking and cybersecurity make use of data analytics through analyzing network traffic patterns to detect any anomalies and cyber security threats. Organizations can also improve their cybersecurity strategies by analyzing past attacks and/or security breaches.

Data Mining and Management

- Data mining extracts meaningful patterns from raw data, which are then analyzed to generate actionable insights. Effective data management ensures that data sets are structured and accessible for analytics workflows.
- Data management plays a crucial role in software applications, especially those that rely on real-time data processing and storage. Database management and optimization directly impact system performance.
- Large-scale network data can be mined to detect anomalies and security threats. Proper data management ensures secure storage and retrieval of critical cybersecurity data.

Networking and Cybersecurity

- Cybersecurity principles can be applied to data management and systems development to enhance security protocols and risk mitigation strategies.
- Network security concepts overlap with data mining when analyzing cyber threats and vulnerabilities.
- Ethical hacking and penetration testing techniques complement system development best practices.

Systems Development

- Systems development supports data analytics by providing the necessary infrastructure for data collection, storage, and processing, ensuring smooth data flow for analytical applications.
- Effective systems development ensures databases and data pipelines are structured for efficient querying and analysis.
- Secure software development practices, authentication mechanisms, and API integrations help in maintaining the integrity of networked systems.

Conclusion

The Southwest Airlines Review Analyzer embodies a practical synthesis of the foundational pillars of the MS-CISBA program. By combining skills in data analytics, data mining and management, and systems development—with potential for cybersecurity and networking features, the project demonstrates how these disciplines intersect to create impactful, real-world solutions. My evolving portfolio, hands-on experience with tools and languages, and understanding of interrelated concepts affirm my readiness to tackle

complex challenges in modern data-driven environments. This capstone not only reflects my academic growth but also prepares me for future contributions in analytics and software-driven innovation.