Abstract:

Project Title: Cloud-Based Real-Time Data Analytics Dashboard

Problem Statement: Modern businesses operating in fields such as smart manufacturing and connected devices produce enormous amounts of live data every second. Conventional data processing methods work on stored information in large groups, creating delays that block instant analysis and decision-making. This slowdown affects how quickly companies can respond to operational needs, maintain equipment, and understand current performance.

Proposed Solution: This initiative focuses on creating a flexible, cloud-based system for instant data analysis using Microsoft Azure's on-demand services. The plan uses Azure Event Hubs to collect incoming data efficiently and Azure Stream Analytics to examine this information immediately using specialized queries. These queries will spot unusual patterns and calculate important metrics over specific time frames. The refined data then moves to Azure Synapse Analytics for fast access and deeper examination. A live updating display created with React and Azure's real-time communication service will present the findings without noticeable delay.

Expected Outcome: The completed project will be an operational monitoring system that handles substantial data flows while delivering information within 30 seconds of creation. The technical documentation will compare different design options, measure system performance, and review operational expenses. This work will serve as a practical guide for creating effective instant analysis systems using modern cloud technology.