REVOLUTIONIZING CANADIAN **BLOOD BANK**

MANAGEMENT: AN AZURE CLOUD BASED SOLUTION

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Contents

1.Abstract

Blood bank management systems play a crucial role in ensuring efficient allocation of blood resources to those in need. However, existing on-premise architectures often face challenges such as limited data visibility, scalability constraints, and vulnerability to disasters. This article proposes a comprehensive solution by migrating the blood bank system to Microsoft Azure's cloud platform. Leveraging Azure's scalability, security features, and data processing capabilities through Azure Data Factory, this solution aims to revolutionize blood bank management by providing real-time insights, efficient inventory management, and enhanced disaster recovery mechanisms.

2.Introduction

Blood banks serve as lifelines for patients in need of blood transfusions. However, the efficiency of blood bank management systems is often hampered by outdated on-premise architectures. The following sections discuss the existing architecture's limitations, identified problems, proposed objectives, vision for improvement, and the proposed cloud architecture using Microsoft Azure.

3.Existing Architecture

The current system relies on an on-premises RDBMS to store critical data such as blood donor information, blood inventory, and patient databases. However, disconnected systems hinder real-time data visibility across the blood bank ecosystem, limiting efficient blood management.

4.Problems & Statement

The on-premises RDBMS faces limitations in terms of limited data visibility, scalability constraints, and vulnerability to disasters. These issues impede the seamless operation of blood bank management systems and hinder timely access to critical information.

5.Objective

The project aims to address the aforementioned issues by migrating the existing RDBMS to a scalable and secure cloud platform, specifically Microsoft Azure. The objectives include ensuring scalability, implementing disaster recovery mechanisms, and leveraging cloud security features to protect sensitive blood bank information.

6.Vision
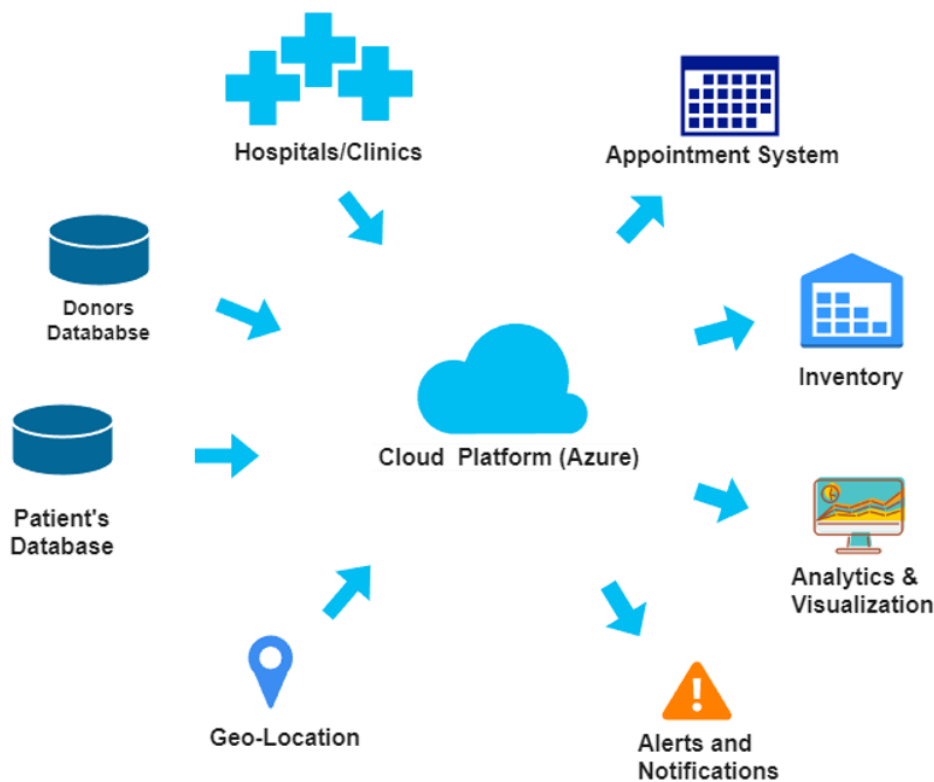
The cloud-based blood bank system envisions a future where donors can conveniently schedule appointments, real-time visibility into blood inventory is provided across locations, data-driven insights optimize resource allocation, and location-based services match donors with patients based on compatibility.

7.Proposed Cloud Architecture
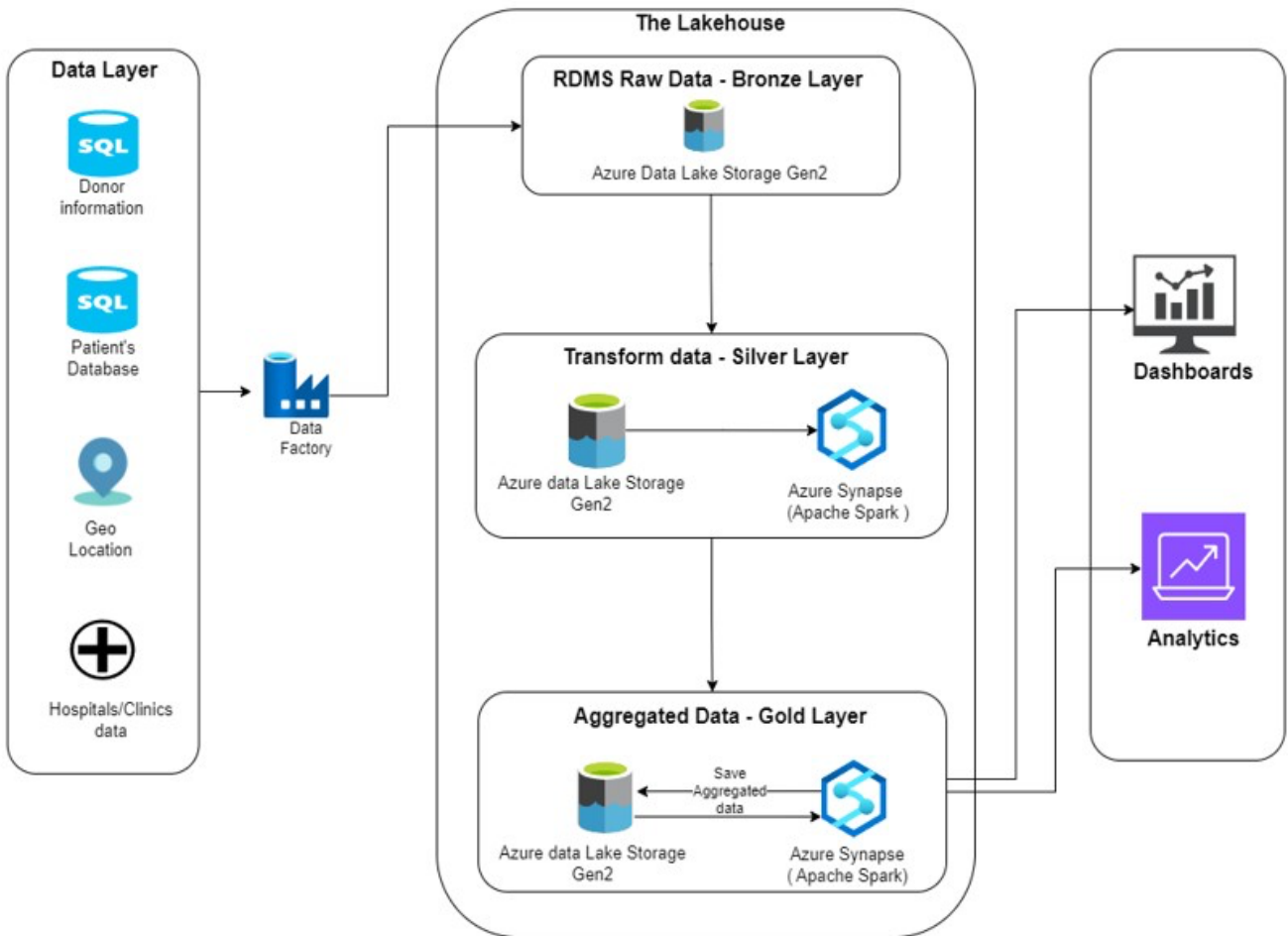
Microsoft Azure's cloud architecture offers a scalable and secure solution to transform the blood bank management system. Key features include automatic scalability based on demand, Azure Data Factory for efficient data processing, and a BSG architecture for optimized data processing.

8.Data Pipeline
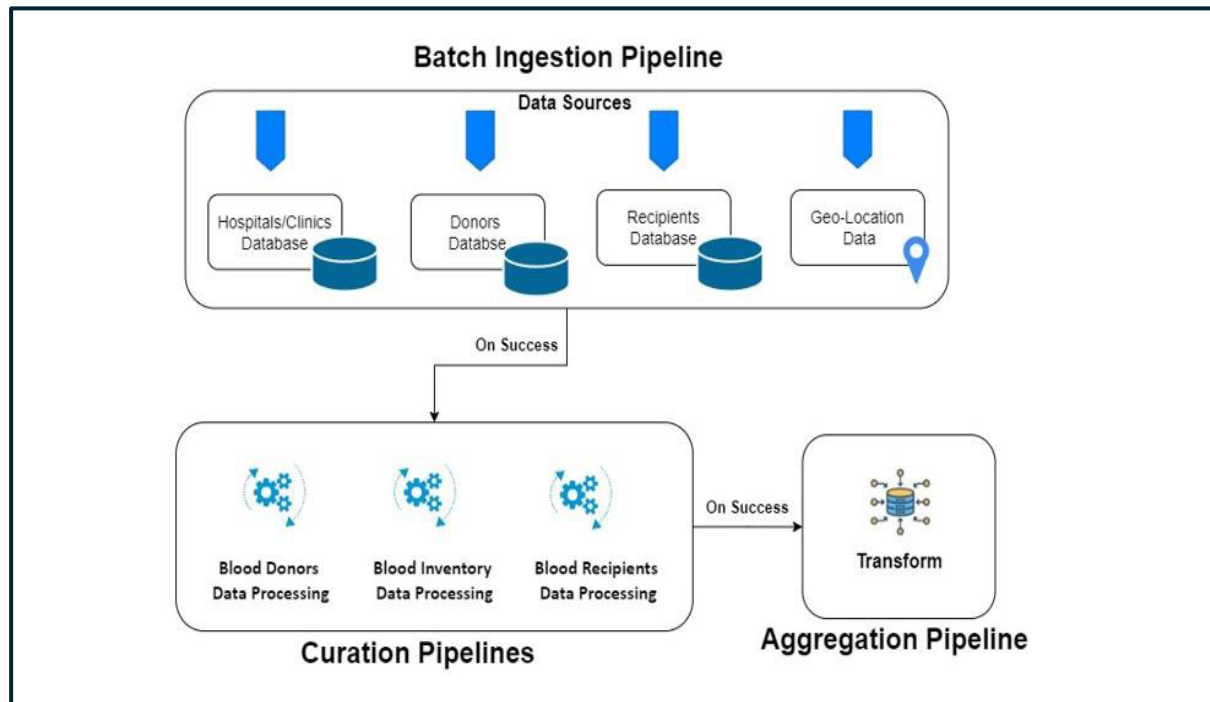
Azure Data Factory facilitates a parent-child approach for automating data processing. The parent pipeline, triggered daily, handles blood donor and inventory updates, while child pipelines process and load data into the Azure SQL Database's Blood Donor and Blood Inventory tables.

9. Data Source

Data originates from various sources including existing SQL databases, hospital databases, donor databases, recipient databases, and geolocation data, highlighting the diverse nature of data inputs in blood bank management systems.

10. Ingestion Strategy: Batch Processing

Batch processing is adopted as the ingestion strategy due to its suitability for stable data such as blood bank information. It offers benefits such as efficiency, reduced resource consumption, simplified development, management, and improved data integrity through validation within the batch.

11. Conclusion

The proposed cloud-based solution using Microsoft Azure offers a transformative approach to blood bank management, addressing existing challenges and paving the way for enhanced efficiency, real-time visibility, and improved disaster recovery mechanisms. By leveraging Azure's scalability, security features, and data processing capabilities, blood banks can optimize resource allocation, improve patient care, and ultimately save lives.