Module 3: Critical Thinking

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Critical Thinking

Different industries struggle to handle massive data quantities which need immediate processing. Healthcare providers who manage patient records along with social media platforms tracking user interactions and telecommunications companies monitoring network traffic all require speed and efficiency when processing massive datasets. The growing volume of data makes processing files with millions of rows in fractions of a second ever more essential. Businesses benefit from this capability through improved operational efficiency and they gain the ability to make rapid informed decisions while delivering better customer experiences and proactively addressing issues before they grow.

Healthcare Records

Hospitals and clinics within the healthcare sector gather large volumes of data every day through Electronic Health Records (EHR). The healthcare records contain complete details about patient demographics, medical histories along with diagnoses, prescriptions and lab results. As time goes on hospitals accumulate massive amounts of data which leads to databases containing millions of rows particularly in systems that manage large patient numbers. Timely and accurate healthcare services depend on quick data processing. Medical professionals require immediate data access to make sound decisions particularly during emergency situations because any delay could affect patient outcomes (Moore, J., 2024, January 5). In emergency situations when doctors review patient medical histories delays in data access can lead to misdiagnosis or improper medical treatment. Healthcare systems allocate resources to advanced technologies that enable real-time patient data access through in-memory databases and ultra-fast cloud-based solutions. These systems must process patient data as soon as it arrives, which includes test results and new diagnoses to maintain accurate medical records and enable timely medical decisions. Through system optimization healthcare providers achieve maximum care quality while eliminating any delays.

Social Media Data

Data generation is massive on social media platforms and grows with every second that passes. Interactions such as posting, liking, commenting, and sharing are just a few examples of how active users are on social media. With millions of users across the globe contributing to Facebook, Twitter, and Instagram, the amount of data out there is festive. For companies, this data is helpful in identifying how users behave, managing content distribution, and even focusing their ads more accurately. To provide tailored experiences for users, social media companies constantly monitor data for changes in popularity and serve relevant ads on the fly. Failure to process data in real time leads to discontent users and valuable advertising opportunities being forfeited.

For seamless user experience, real-time data on interests and browsing history has to be integrated with algorithms designed for recommendation. If a user decides to change an interest, updates to suggestions have to happen instantly. Delivering real-time maintenance can be achieved through technologies such as Kafka, which allow platforms to manage massive amounts of time-based interaction data. With the rate at which trends and user behaviors shift, being able to understand and respond decreases the rate of user disengagement and maximizes the opportunity.

Network Traffic Data

Those engaged in the telecommunications business stand to profit from a massive amount of network activity, which consists of many millions of user data packets, voice calls, and other communications. They also keep categorize network data including traffic logs, connection logs, IP address logs, and other users' and telecommunication towers' metrics. With the scope of data being processed, networks can easily reach millions or billions of rows of information, especially at a large scale. This information must be processed rapidly in order to maintain health of the network and services employed over it, and to resolve any problems that

may arise. Network activity must be checked on a constant basis to scope out problems which may affect users of the communication service.

For instance, a spike in network traffic which might lead to network congestion or a security breach is a situation that the telecommunications provider needs to attend to at once (Kidd, C., 2024, April 3). Delay in solving these issues could lead to gaps in service, security problems or a negative experience for customers. With the rise in telecom predictive network maintenance, companies are finding new ways to improve security and performance, including using telemetry and implementing system-wide processing solutions that catch breaches in real time. These architectures and storage systems allow for more efficient data analysis, enabling companies to get the performance for network activity data they require.

Conclusion

Fast data processing is no longer a luxury but a necessity. From healthcare systems ensuring patient safety to social media platforms optimizing user engagement and telecom companies maintaining network integrity, the ability to process large datasets in real time can make or break an organization's success. By leveraging advanced technologies and optimizing data processing methods, businesses can stay ahead of the curve, improving both their operational performance and the value they deliver to their customers.

References

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