# DESIGNING ROBUST DECISION SUPPORT SYSTEMS ARCHITECTURE FOR MODERN ENTERPRISES

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## ABSTRACT

*Decision Support Systems (DSS) architecture forms the structural foundation that integrates data, models, and analytical tools to support decision-making. This article examines the core architectural components, their integration mechanisms, and the strategic implications of DSS design for organizations. It emphasizes how modern DSS architectures incorporate AI, cloud services, and real-time analytics to enhance decision precision and responsiveness.*

**Keywords:** Strategic information systems, competitive advantage, digital transformation, IT alignment, strategic planning, enterprise systems.

## INTRODUCTION

Decision Support Systems (DSS) have evolved from simple analytical tools into sophisticated environments capable of supporting complex, data-driven decisions. The architecture of a DSS determines how effectively it can integrate data sources, analytical models, user interfaces, and computational intelligence. A traditional DSS architecture consists of data management, model management, and user interface layers, each performing essential functions to deliver decision insights. In contemporary organizations, DSS architectures increasingly leverage cloud platforms, big data infrastructure, and machine learning algorithms to provide real-time decision intelligence. As decision-making becomes more dynamic and unpredictable, architectural flexibility, scalability, and interoperability become essential requirements. A well-designed DSS architecture not only enhances operational decision-making but also supports strategic planning, risk management, and innovation. Additionally, integrating AI-based prediction engines and rule-based systems allows organizations to derive deeper insights and automate complex decisions, ultimately improving performance outcomes.

## CONCLUSION

A robust Decision Support Systems architecture is fundamental for organizations aiming to achieve high-quality, timely, and data-driven decision-making. With advancements in technology, modern DSS architecture must emphasize flexibility, integration, and intelligence. By incorporating AI, cloud services, and scalable data management mechanisms, organizations can build DSS platforms capable of adapting to evolving strategic needs. Effective DSS architecture strengthens both operational efficiency and strategic foresight, enabling organizations to navigate uncertainty and remain competitive.

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