The Strategic Role of Intelligent Decision Support Systems in Enhancing Decision-Making to Achieve Corporate Leadership in a Digital Business Environment: The Case of Alibaba

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Abstract

This study examines the role of intelligent decision support systems as a strategic tool in organizations operating in a digital environment, focusing on Alibaba's experience as a practical model. The study aims to demonstrate how artificial intelligence, machine learning, and big data analytics can enhance the effectiveness and accuracy of strategic decisions within digital companies. It also seeks to analyze the contribution of these systems in improving operational efficiency, fostering innovation, and better risk management. The results showed that using intelligent decision support systems helped improve inventory management, customize marketing offers, and accelerate the decision-making process, thereby enhancing the company's competitive capability. Additionally, these smart systems contributed to improving customer experience and increasing loyalty through personalized and effective recommendations. The study highlighted the importance of high interaction between users and intelligent systems, supporting teamwork, and flexibility in adapting to market changes. It also indicated that analyzing big data and converting it into strategic insights can strengthen informed decision-making. Based on Alibaba's experience, other companies can adopt these systems to achieve sustainable competitive advantage in the digital business environment. Overall, the study confirms that intelligent decision support systems are a vital tool for enhancing decision quality and achieving superior organizational performance.

***Keywords**: Intelligent Decision Support Systems, AI, Digital Environment , Alibaba*
Jel Codes Classification : C08,L86, M15, O33

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الدور الاستراتيجي لنظم دعم القرار الذكية في تعزيز اتخاذ القرار لتحقيق الريادة المؤسسية في ظل بيئة الاعمال الرقمية - شركة **Alibaba** أنموذجا-

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ملخص

تستعرض هذه الدراسة دور نظم دعم القرار الذكية كأداة استراتيجية في المؤسسات العاملة في بيئة رقمية، مع التركيز على تجربة شركة Alibaba كنموذج عملي. تهدف الدراسة إلى توضيح كيف يمكن لتقنيات الذكاء الاصطناعي والتعلم الآلي وتحليل البيانات الضخمة تعزيز فعالية ودقة القرارات الاستراتيجية داخل الشركات الرقمية. كما تسعى إلى تحليل مساهمة هذه النظم في تحسين الكفاءة التشغيلية، دعم الابتكار، وإدارة المخاطر بشكل أفضل. أظهرت النتائج أن استخدام نظم دعم القرار الذكية ساهم في تحسين إدارة المخزون، تخصيص العروض التسويقية، وتسريع عملية اتخاذ القرار، بما يعزز القدرة التنافسية للشركة. كما أسهمت النظم الذكية في تحسين تجربة العملاء وزيادة ولائهم من خلال تقديم توصيات مخصصة وفعالة. وقد أبرزت الدراسة أهمية التفاعل العالي بين المستخدمين والنظم الذكية، ودعم التعاون الجماعي، والمرونة في التكيف مع التغيرات السوقية. كما بينت أن تحليل البيانات الضخمة وتحويلها إلى معلومات استراتيجية يمكن أن يعزز القدرة على اتخاذ قرارات مستنيرة. واستنادا إلى تجربة Alibaba، يمكن للشركات الأخرى تبني هذه النظم لتحقيق ميزة تنافسية مستدامة في بيئة الأعمال الرقمية. في المجمل، تؤكد الدراسة أن نظم دعم القرار الذكية تمثل أداة حيوية لتحسين جودة القرارات وتحقيق الأداء المؤسسي المتميز.

الكلمات المفتاحية: نظم دعم القرار الذكية، الذكاء الاصطناعي، البيئة الرقمية، شركة علي بابا.

التصنيف jel: C08,L86, M15, O3 .

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Introduction:

In light of the accelerating digital transformation, the ability to make accurate and timely decisions has become one of the key determinants of organizational success. Intelligent Decision Support Systems (IDSS) play a pivotal role in this context, as they rely on big data analytics and the application of artificial intelligence technologies to provide strategic recommendations based on precise and reliable data. These systems enhance companies' competitiveness by improving operational efficiency and reducing human errors in decision-making. Alibaba, as a leading global model in e-commerce, has adopted these systems to optimize its sales and marketing strategies, inventory management, and customer service. By integrating artificial intelligence and advanced analytics, Alibaba has been able to accurately forecast demand and personalize offerings in alignment with customer preferences. Moreover, these systems have contributed to increasing responsiveness to market changes and to developing sustainable growth plans. Analyzing Alibaba's experience provides practical evidence of how intelligent decision support systems can evolve into an effective strategic tool within a complex digital environment. Therefore, understanding and implementing these systems has become a vital necessity for companies seeking to enhance efficiency and achieve a sustainable competitive advantage.

-Research Problem: How do intelligent decision support systems contribute to enhancing decision-making in order to achieve organizational leadership in a digital environment?

-Research Hypothesis: The use of intelligent decision support systems enhances the effectiveness and accuracy of strategic decisions in a digital environment, as demonstrated by the experience of Alibaba.

-Research Objectives: This study aims to highlight the strategic role of intelligent decision support systems in improving the effectiveness and speed of decision-making within digital organizations. It also seeks to analyze Alibaba's experience in leveraging artificial intelligence and big data analytics to enhance performance and formulate sustainable competitive strategies, while providing practical recommendations for other organizations.

-Significance of the Study: The importance of this study lies in demonstrating the contribution of intelligent decision support systems to improving the efficiency and accuracy of decisions in the context of digital transformation. It also presents Alibaba's experience as a pioneering applied model that can be leveraged both regionally and internationally, thereby adding both theoretical and practical value for researchers and decision-makers.

-Research Methodology: To comprehensively address the aspects of this study, the deductive approach was employed, using descriptive and analytical tools to explain the various concepts and standards governing the study variables and to analyze the case of Alibaba.

-Study Boundaries

- ✓ **Temporal Boundaries:**

The researchers did not specify a precise time frame for the study, as it was based on a descriptive-analytical approach and a case study of Alibaba. However, the analysis relied primarily on recent data and references from the 2024–2025 period, particularly regarding the company's investments in artificial intelligence and cloud computing.

- ✓ **Spatial Boundaries:**

The spatial scope of the study was limited to Alibaba Group in China as the practical case under investigation. The study focused on analyzing the company's experience in employing Intelligent Decision Support Systems within a digital business envir.

Axis 01: Intelligent Decision Support Systems (Concept, Characteristics, Components, and Classifications)

Decision Support Systems (DSS) are computer-based information systems designed to support organizational decision-making activities. These systems assist users in collecting useful information from raw data, models, and other sources to analyze problems and evaluate possible courses of action. They also facilitate semi-structured and unstructured decision-making processes by providing intelligent, relevant, and timely support to decision-makers across various domains (Onwujekwe & Weistrofer, 2025, pp. 31-32). DSS have evolved to incorporate advanced technologies such as machine learning, making them "intelligent" systems capable of automating and enhancing decision-making processes through data-driven insights.

First: Concept of Intelligent Decision Support Systems (IDSS):

- Intelligent Decision Support Systems are advanced systems designed to enhance decision-making processes through the integration of artificial intelligence and data-driven methodologies. These systems facilitate complex interactions among decision variables, stakeholders, and the inherent complexity of real-world problems. IDSS are characterized by their ability to adaptively manage and analyze diverse data sources, providing insights that support stakeholders in making informed decisions based on predictive models, optimized recommendations, and scenario simulations (Sànchez-Marrè, 2022).

- Intelligent Decision Support Systems (IDSS) are sophisticated information systems based on artificial intelligence technologies that assist decision-makers by analyzing data, forecasting potential outcomes, and recommending optimal courses of action (Onwujekwe & Weistrofer, 2025). Unlike conventional Decision Support Systems (DSS), IDSS possess the capability to learn from experience, perform reasoning processes, and adapt to changing environments through the use of advanced techniques such as machine learning (ML), artificial neural networks, and evolutionary algorithms (Ali et al., 2023).

Second: Characteristics of Intelligent Decision Support Systems:

Intelligent Decision Support Systems possess a set of features that make them more advanced and effective than traditional systems. They are not limited to supporting routine decisions but extend to semi-structured and unstructured decisions that require flexibility and adaptability to changing conditions. Among their key characteristics is the integration of self-learning capabilities, logical reasoning, and model management, along with the development of a comprehensive structure that expands the scope of services provided.

Furthermore, these systems provide support across different managerial levels and throughout all stages of the decision-making process, while enhancing human–machine interaction. In addition, they are capable of supporting both individual and group decision-making and can flexibly adapt to dynamic environments, thereby improving the quality and effectiveness of the decision-making process without replacing human judgment :

Feature	Description
Self-Learning	The system possesses the ability to learn and continuously evolve, allowing it to update and expand its knowledge base in accordance with decision-making requirements.
Logical Reasoning	The system simulates human thinking through inferential mechanisms and applies relevant knowledge to guide decision-makers toward the most appropriate models via human–machine interaction.
Intelligent Model Management	The system manages models as a knowledge structure and simplifies interaction among different subsystems, facilitating their effective utilization.
Comprehensive System Architecture	It builds an integrated framework for decision support systems, expanding the scope of services and enhancing adaptability to environmental and decision-related changes.

Support for Unstructured Decisions	It focuses on new or non-recurring problems that lack clear routine procedures, thereby increasing flexibility.
Support Across All Managerial Levels	It enables integration between top, middle, and operational management by providing tailored and appropriate solutions for each level.
Comprehensive Decision-Making Stages	It supports all stages of the decision-making process, from problem identification and data collection to evaluating alternatives and selecting the optimal solution.
Adaptability to Decision-Making Styles	It aligns with different models and behavioral patterns of decision-makers based on their context and managerial style.
Support for Individual and Group Decisions	It facilitates collaboration and participation among teams, contributing to more effective collective decision-making.
Ease of Use and Flexibility	It features user-friendly interfaces and high adaptability to users' needs and dynamic environments.
Diversity of Decision Types	It supports a wide range of decision-making processes rather than being limited to a single type.
Independent and Sequential Decisions	It handles both discrete and sequential decisions through precise analysis and improved quantitative and qualitative assessments.
Enhancing Decision Effectiveness	It improves the quality and efficiency of decision-making through analytical tools and evaluation models, without replacing human expertise.

Sources:(Changlin & Yufen, 2017, p. 203))،(mahdi, 2024) (Kurdi,2013)

Third: Comparison Between Traditional and Intelligent Decision Support Systems

Comparing traditional and intelligent decision support systems is essential for understanding the evolution of tools and methods used to support decision-making within organizations. While traditional systems rely on computing and statistical models to support structured decisions, intelligent systems provide advanced capabilities through artificial intelligence, machine learning, and big data analytics. This enables organizations to effectively address complex and unstructured decisions :

Characteristics / Dimensions	Traditional Decision Support Systems	Intelligent Decision Support Systems
Technology Used	Rely on computer-based systems and traditional statistical and quantitative models.	Utilize artificial intelligence technologies, machine learning, knowledge processing, and data mining.
Type of Problems Supported	Support structured and semi-structured decisions.	Support complex, unstructured, and non-routine decisions.
Users	Typically designed for individual users.	Support both individuals and groups, enhancing collaboration.
Information Sources	Primarily rely on internal organizational data.	Rely on both internal and external data sources, leveraging data mining and experiential learning.
Analytical Capability	Relatively limited analytical capacity, focused on traditional mathematical models.	Advanced analytical capabilities with intelligent, inferential models and adaptive learning.
Operating Environment	Operate in local systems and constrained environments.	Support web-based operations, distributed environments, and cloud technologies.
Cost	Relatively high in terms of development and maintenance.	Relatively lower due to the use of modern technologies such as cloud computing.
User Interaction Level	Limited direct interaction, often based on static reports and queries.	High and dynamic interaction using intelligent interfaces, conversational technologies, and inference mechanisms.
Support for Group Collaboration	Limited and does not cover all scenarios.	Strongly supported to facilitate collaborative and group decision-making.
Flexibility and	Less flexible with limited	Highly flexible with strong adaptability

Development Capability	adaptability and development potential.	to changing environments.
Adaptability	Restricted to pre-programmed solutions for routine problems.	Capable of self-learning and continuous knowledge base updating.
Model Management	Rely on fixed and limited models.	Manage models as flexible, scalable knowledge structures.
Decision Interaction	Limited to processing predefined data without simulating decision-maker thinking.	Simulate human reasoning through inferential mechanisms and human–machine interaction.
Support for Unstructured Decisions	Very weak, limited to predefined scenarios.	Strong, through intelligent analysis and adaptability to new problems.

Source: Based on (Mahdi, 2024); (Ghassan & Al-Khafaf, 2012); (Kordi, 2015); (Al-Eryani, 2016).

Fourth: Classifications of Intelligent Decision Support Systems : The classifications can be illustrated as follows:

The table presents the main types of Intelligent Decision Support Systems, highlighting their core concepts, application examples, and distinguishing characteristics. It shows how Artificial Intelligence (AI)-based systems can simulate human thinking and learn from data, while Data Warehouse (DW)-based systems rely on integrating and analyzing data from multiple sources to generate comprehensive insights. In contrast, Case-Based Reasoning (CBR) systems enable solving new problems by leveraging past experiences and solutions. This classification demonstrates the diversity of decision support approaches and how the appropriate system can be selected based on the nature of the problem and the organizational environment :

Type	Core Concept	Examples / Models	Key Characteristics
AI-based	Use of artificial intelligence techniques to simulate human thinking and support decision-making	- Expert Systems (ES): knowledge base + inference engine + database. - Machine Learning (ML): automatic knowledge acquisition through learning. - Intelligent Agents: autonomous and multi-agent systems.	- Based on logical or quantitative reasoning. - Ability to learn and adapt. - Suitable for complex and unstructured problems.
Data Warehouse (DW)-based	Integration and storage of data from multiple sources for analysis	- Integrated data warehouse. - OLAP tools for multidimensional analysis (slicing, dicing, drilling).	- Provides a comprehensive view of data. - Enables pattern and trend discovery. - Supports real-time and multidimensional analysis.
Case-Based Reasoning (CBR)-based	Solving new problems based on similar past cases and solutions	- Case base containing previous solutions. - Case matching and solution adaptation.	- Reuses prior knowledge and experience. - Reduces knowledge acquisition effort. - Effective for comparable problems.

Source: Prepared by the authors based on (Changlin & Yufen, 2017, p. 202)

Figure 01: Classifications of Intelligent Decision Support Systems



AI-based: Use of artificial intelligence to simulate human thinking

Data Warehouse (DW)-based: Integration and storage of data from multiple sources

Case-Based Reasoning (CBR)-based: Solving new problems by relying on previous solutions

Source: Prepared by the authors based on (Changlin & Yufen, 2017, p. 202)

The table and figure illustrate the main classifications of Intelligent Decision Support Systems (IDSS), which are categorized into three primary types: Artificial Intelligence (AI)-based systems, Data Warehouse (DW)-based systems, and Case-Based Reasoning (CBR)-based systems. The table highlights the distinctive characteristics of each category in terms of their operating mechanisms and application areas. AI-based systems are characterized by their ability to learn, adapt, and handle complex and unstructured problems, whereas DW-based systems focus on integrating and analyzing large volumes of data to identify patterns and trends that support decision-making. In contrast, CBR-based systems rely on previous experiences and solutions to address new problems with similar characteristics.

The figure further enhances understanding by providing a clear visual representation of these classifications and their interrelationships. It demonstrates the diversity of intelligent decision support approaches and emphasizes that the selection of an appropriate system depends on the nature of the decision problem, the level of complexity involved, and the organizational environment. Consequently, these systems constitute strategic tools that improve decision quality and strengthen organizational performance in the digital business environment.

Axis 02: Intelligent Decision Support Systems as a Strategic Tool in a Digital Environment and Their Role in Enhancing Decision-Making Effectiveness

Intelligent Decision Support Systems play a pivotal role in enhancing the efficiency and accuracy of decisions within digital organizations. These systems rely on big data analytics and artificial intelligence techniques to provide well-informed strategic recommendations. Consequently, they become essential strategic tools for supporting more effective decision-making in contemporary business environments.

First: The Digital Environment (Concept and Characteristics)

The digital environment refers to the technical and organizational framework that relies on the use of digital technologies for information exchange and process management. This environment is characterized by speed, continuous connectivity, the ability to analyze large volumes of data, and flexibility in adapting to rapid changes.

1. Concept of the Digital Environment: The digital environment is an integrated virtual space encompassing various forms of information and digital content available through connected networks, particularly the Internet. It is distinguished by the diversity of its sources and formats, as well as the technologies used in its construction. It is based on a digital infrastructure that includes information networks and modern IT tools and technologies (C-Point, 2025).

The digital environment includes digital content of all types, from data and documents to multimedia, alongside digital tools and platforms that enable efficient storage, retrieval, and dissemination of this information. It represents a comprehensive framework for the transition from traditional systems to modern digital ecosystems, resulting in a qualitative shift in work patterns, interactions, and knowledge production across various fields (C-Point, 2025).

In essence, the digital environment consists of digital systems and platforms that facilitate interaction and the performance of various functions electronically, built on technologies such as the Internet, computing, software, and communication systems. It reshapes the way information is accessed and shared among individuals and organizations.

2. Characteristics of the Digital Environment: The digital environment is distinguished by a set of features that make it a comprehensive and distinct framework compared to traditional environments. It combines technology and human interaction within an interconnected virtual space. These characteristics are reflected in its ability to support connectivity, diversity, flexibility, and social and cultural influence. The following table presents the most prominent characteristics with an academic explanation:

Characteristic	Academic Description
Interactivity	The digital environment is dynamic, allowing continuous and direct interaction between users and digital content. This interaction reshapes traditional communication into a more participatory and integrated form, enhancing the effectiveness of knowledge and information exchange.
Network Connectivity	The digital environment relies on information and communication network infrastructures, particularly the Internet, enabling connections among individuals, organizations, and digital resources within a unified space, making it highly interconnected beyond geographical boundaries.
Diversity and Multiplicity	The digital environment features multiple sources and formats. It is not limited to written text but also includes images, video clips, audio recordings, and big data, providing rich diversity in content and interaction tools.
Rapid Access to Information	It provides instant access to information and services from anywhere at any time, facilitating search, learning, and decision-making processes, while reducing time and distance compared to traditional environments.
Continuity and Updatability	The digital environment is continuously evolving, both in terms of digital content and supporting technologies and infrastructure, ensuring its suitability for the rapid changes imposed by the modern technological landscape.
Adaptability and Development Potential	It is highly flexible, able to adapt to user needs, and supports the adoption of advanced digital technologies such as artificial intelligence and the Internet of Things, enhancing its potential for future development and expansion.
Technology Dependence	Fundamentally based on information and communication technologies such as cloud computing, intelligent databases, artificial intelligence, and interactive systems, making technology the core pillar of its operation and development.
Global Reach	The digital environment spans users worldwide, removing spatial and temporal barriers, creating an open, cross-border, and globally inclusive environment.
Cultural and Social Impact	Beyond technical aspects, it influences social and cultural values and behaviors by promoting new patterns of communication, work, education, and interaction among individuals and communities.
Difficulty of Delimitation	Due to its virtual nature and integration with all aspects of daily life, the digital environment's boundaries are difficult to define. It encompasses economic, social, cultural, and educational dimensions, making it complex and multi-layered.

Source: (Azzam, 2020); (Bouti, 2024)

It is clear from reviewing the characteristics of the digital environment that it is not merely a virtual space for communication or information exchange, but rather a comprehensive and complex system. It combines interactivity, diversity, and global reach on one hand, with technology dependence, continuity, and difficulty of delimitation on the other. These characteristics make the digital environment a dynamic and evolving framework that reshapes work methods, communication, and knowledge across various fields. Its capacity for continuous adaptation and development further establishes it as a fundamental element in supporting strategic decision-making, providing organizations and individuals with greater opportunities for innovation and achieving a competitive advantage amid rapid digital transformations.

Second: Effectiveness of Intelligent Decision Support Systems in the Digital Environment

Intelligent Decision Support Systems (IDSS) are a fundamental strategic tool in modern digital environments, enabling organizations to achieve competitive advantage and anticipate market changes. This strategic dimension is reflected in several aspects:

1. **Transforming Data into Strategic Knowledge:** IDSS extracts patterns from big data and converts them into actionable strategic insights, enabling management to formulate precise plans that enhance organizational competitiveness (Soori, Fooad, Dastres, & Behrooz, 2024).

2. **Supporting Complex and Multi-Dimensional Decisions:** IDSS provides simulation models and predictive scenarios that help decision-makers evaluate alternative options and manage unstructured situations, improving the quality of strategic decisions (Markus Bertl & Ross, 2022).
3. **Enhancing Flexibility and Adaptability:** DSS helps organizations respond quickly to digital changes by processing real-time data and providing dynamic decisions, thereby increasing the organization's ability to adapt to changing business environments (Kitsios & Kamariotou, 2018, p. 60).
4. **Achieving Functional Integration Within the Organization:** IDSS links various operational units (finance, marketing, operations, and human resources), providing a comprehensive view that facilitates integrated strategic decision-making.
5. **Enabling Innovation and Enhancing Competitive Advantage**: IDSS contributes to innovation by analyzing big data and customer behavior, helping propose unconventional solutions and strategies that deliver competitive advantages (Csaszar et al., 2024).
6. **Promoting Environmental Sustainability**: IDSS improves environmental operations by selecting sustainable suppliers and applying planning methods that ensure lower energy consumption and more efficient resource use (Mohamed et al., 2024).
7. **Reducing Risks and Enhancing Crisis Management Capabilities**: IDSS improves risk management through multi-factor analysis and simulation models that enable organizations to anticipate and prepare for crises more effectively. Machine learning methods in environmental impact assessment enhance accuracy and efficiency, reducing risks associated with traditional estimates and improving responses to environmental crises. IDSS based on machine learning can process complex environmental information and provide outputs that support rapid and balanced decision-making during emergencies (Obulesu, 2024, p. 652).

A conceptual model can be proposed to illustrate how intelligent and effective decisions are achieved. This model highlights how digital transformation enables IDSS to perform effectively by leveraging data, predictive analytics, and machine learning.

Figure 02: Effectiveness of Intelligent Decision Support Systems in the Digital Environment



Source: Prepared by the authors

Figure 02 illustrates the strategic role of Intelligent Decision Support Systems (IDSS) in enhancing organizational performance within the digital environment. The figure demonstrates that the effectiveness of these systems extends beyond supporting routine decision-making to encompass transforming big data into strategic knowledge, enabling organizations to make informed and proactive decisions. It also highlights the contribution of predictive analytics and simulation models in dealing with complex and multidimensional problems, thereby improving decision quality and reducing uncertainty.

Furthermore, the figure emphasizes the ability of IDSS to enhance organizational flexibility and adaptability through real-time data processing and rapid response to environmental changes. It also shows how these systems facilitate functional integration among different organizational units, support innovation, strengthen competitive advantage, and contribute to sustainability and risk management. Overall, the figure presents an integrated conceptual framework that explains how digital technologies, predictive analytics, and machine learning interact to generate intelligent, data-driven decisions that improve organizational effectiveness and long-term competitiveness in a rapidly evolving digital business environment.

Third: Smart Technologies Contributed by Decision Support Systems to Enhance Decision-Making in Organizations within the Digital Environment.

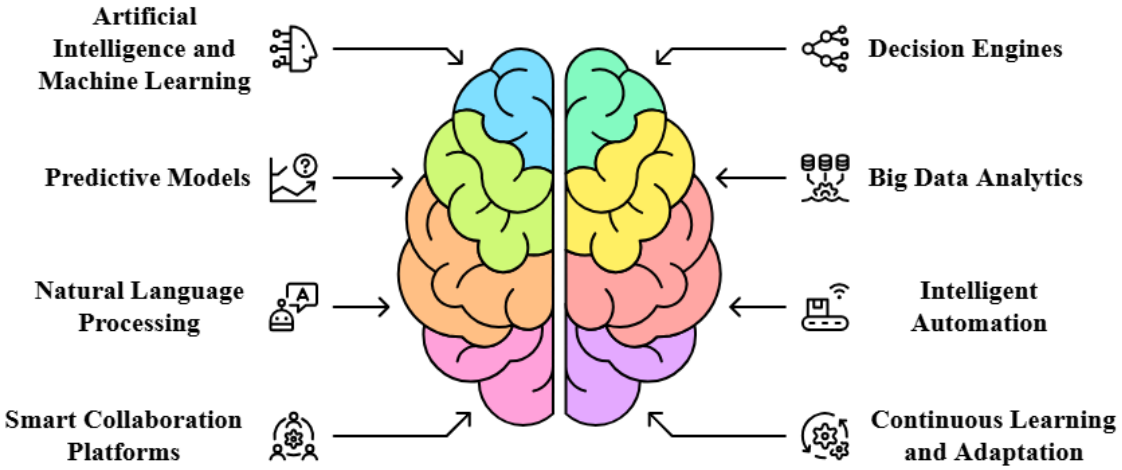
In the context of rapid digital transformation and increasing complexity of business environments, organizations are required to adopt smart technologies capable of supporting decision-makers at all levels. Intelligent Decision Support Systems (IDSS) are key tools that rely on advanced technologies such as artificial intelligence, big data analytics, and intelligent automation. These technologies enhance decision quality by improving accuracy, speed, and adaptability to continuous changes. The following table highlights the main technologies and their role in increasing the efficiency and effectiveness of decision-making within organizations:

Smart Technology	How It Contributes to Decision Support
Artificial Intelligence and Machine Learning	Enables the analysis of massive amounts of data quickly and accurately, extracting hidden patterns and predicting future outcomes. This enhances strategic decisions by providing potential scenarios and in-depth analyses that help reduce risks and maximize opportunities.
Decision Engines	Provide immediate, data-driven intelligent recommendations, allowing organizations to respond quickly to sudden changes in markets or internal environments. They accelerate decision-making processes and improve accuracy in operational and tactical decisions.
Predictive Models	Allow proactive forecasting of future risks and opportunities, enabling organizations to develop effective strategic plans to address challenges and seize opportunities, thus enhancing competitive capability in a changing environment.
Big Data Analytics	Facilitates the processing and analysis of large, diverse datasets from multiple sources (internal and external), transforming them into actionable insights. Helps decision-makers build accurate decisions based on objective and comprehensive data.
Natural Language Processing (NLP)	Enables understanding of human texts and conversations, extracting valuable information from customer reports, user reviews, and textual documents. Supports decisions related to customer service, product development, and policy formulation.
Intelligent Automation	Reduces the burden of routine tasks through robots and automated systems, giving employees more time to focus on complex strategic decisions with added value.
Smart Collaboration Platforms	Provide an interactive collaborative environment for decision-makers using AI-powered tools. Enhance the quality of group decisions by integrating multiple perspectives and achieving strategic alignment across different departments.

Continuous Learning and Adaptation	Provides ongoing capability to update analytical models with new data or changes in the digital environment, ensuring decision accuracy and relevance under changing conditions, supporting organizational agility.

Source: (RMG, 2025), (Sima R., Ghosh, & Shamsi, 2025)

Figure 03: Smart Technologies Contributed by Decision Support Systems



Source: Prepared by the authors based on (RMG, 2025), (Sima R., Ghosh, & Shamsi, 2025)

It is evident that the smart technologies adopted by Decision Support Systems are not merely technical tools, but strategic components that create a qualitative transformation in organizational decision-making. They increase accuracy and objectivity through the analysis of massive datasets, accelerate responsiveness and flexibility to environmental changes, and improve the quality of strategic and group decisions through smart collaboration platforms and continuous learning. Investing in these technologies is not only a technological choice but also a strategic approach that ensures organizations enhance their competitive capability and sustain performance in a dynamic digital environment.

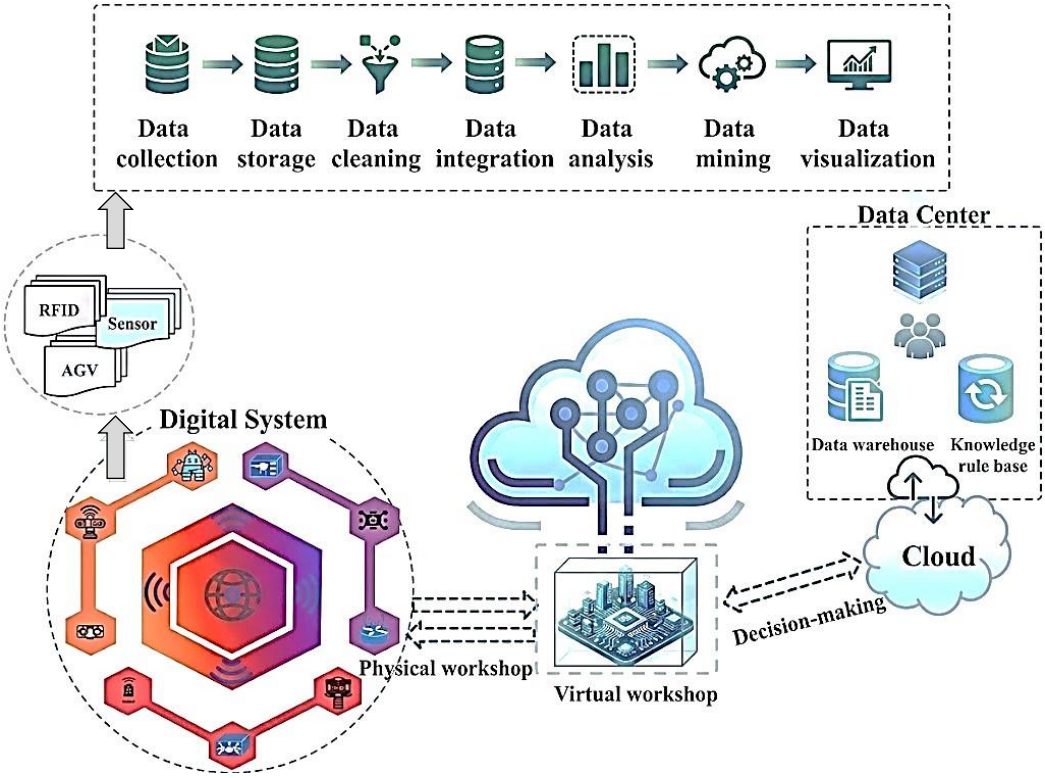
Fourth: An Integrated Framework for Data-Driven Intelligent Decision-Making

The utilization of big data and artificial intelligence technologies forms a fundamental pillar for building intelligent decision support systems within the digital environment. With the growing reliance on digital platforms, it has become essential to develop integrated mechanisms that allow the collection of data from diverse sources within the digital ecosystem, processing it, and transforming it into actionable knowledge.

These mechanisms follow an interconnected sequence starting from data collection, storage, and cleaning, through integration, analysis, and data mining, and culminating in the visual representation of results. Data centers and cloud computing serve as key components for handling these massive volumes of information and converting them into more effective strategic and operational decisions.

Thus, the following conceptual framework provides a comprehensive representation of how intelligent decision-making systems operate in an interconnected digital environment. The figure below illustrates the core stages of this framework:

Figure 04: Theoretical Foundation for Analyzing Intelligent Decision-Making in Data-Driven Industry Technologies



Source : (Soori, Fooad, Dastres, & Behrooz , 2024, p. 9)

The figure represents an integrated framework for data-driven intelligent decision-making within the digital environment, with the stages outlined as follows:

1. Data Processing Stages (at the top):

- **Data Collection:** Gathering data from diverse digital sources such as online platforms, social media networks, websites, and digital transactions.
- **Data Storage:** Storing raw data in digital databases or large-scale data warehouses.
- **Data Cleaning:** Enhancing data quality by removing errors, duplicates, and incomplete entries.
- **Data Integration:** Combining data from different sources (internal and external) to create a unified, information-rich database.
- **Data Analysis:** Applying statistical analysis tools, artificial intelligence, and machine learning techniques to extract patterns and relationships.
- **Data Mining:** Discovering hidden patterns and generating new knowledge from vast amounts of digital data.
- **Data Visualization:** Presenting outputs in visual formats (charts, dashboards) to facilitate decision-makers' understanding of results.

2. Digital Environment: Acts as a virtual space that connects users and diverse digital sources, where digital interactions and transactions are transformed into analyzable data for decision-making purposes.

3. Data Center:

- Contains a **Data Warehouse** for storing massive volumes of data.
- Houses a **Knowledge Rule Base** to support analysis and predictive insights.
- Linked to **Cloud Computing**, providing advanced and flexible analytics capabilities for processing big data.

4. Decision-Making: By integrating and analyzing data in data centers and the cloud, raw data is transformed into actionable knowledge that helps organizational decision-makers improve performance, enhance efficiency, and develop precise strategies aligned with the digital environment's requirements.

The figure illustrates a complete cycle starting from collecting digital data from various sources, passing through processing, analysis, and visualization stages, and culminating in knowledge-supported intelligent decisions. This process enhances organizational effectiveness and strengthens adaptability to the dynamic nature of the digital environment.

Axis 03: Case Study of Alibaba.

This study examines Alibaba as a practical model to understand how intelligent decision support systems (IDSS) are applied in a complex digital environment. It also aims to highlight the impact of these systems on improving strategic and operational performance and enhancing the company's competitive capabilities.

First: Introduction to Alibaba :

Alibaba Group is a Chinese multinational technology company founded in 1999 by a team of 18 people led by Jack Ma, a former English teacher from Hangzhou, China. The company was established to empower small and medium-sized enterprises (SMEs) to leverage innovation and technology, facilitating business operations and enabling more effective competition in local and global markets (WIKI, 2011).

Alibaba is one of the largest e-commerce companies in the world, offering diverse services in business-to-business (B2B), business-to-consumer (B2C), and consumer-to-consumer (C2C) commerce. Its ecosystem includes a wide range of platforms such as Taobao, Tmall, AliExpress, and Lazada (Anaf Abdulkarem, 2024). In addition to e-commerce, Alibaba operates in other sectors such as cloud computing through Alibaba Cloud, smart logistics via the Cainiao network, and digital and entertainment services. The company also invests in advanced technologies such as artificial intelligence to optimize operations and enhance customer experience (AMINA, 2024).

Alibaba has a strong global presence, operating in over 200 countries and regions, and is one of the most valuable and influential companies in the e-commerce and internet sectors worldwide, with a clear focus on digital transformation and sustainable development. Its core mission is to facilitate business operations anywhere and empower merchants and brands to improve efficiency and engage with customers through advanced technologies and extensive digital networks, serving a diverse range of external clients including end consumers who purchase products for personal use through platforms such as Tmall and AliExpress, merchants and sellers who rely on Alibaba's marketplaces to market and sell their products locally and internationally, business organizations and companies that conduct cross-border transactions through Alibaba.com by connecting suppliers, manufacturers, and buyers across global markets, as well as Alibaba Cloud users consisting of enterprises, startups, and developers who depend on cloud computing, data storage, artificial intelligence, and digital infrastructure services to support their operations and enhance digital transformation..

Second : Strategy for Implementing Intelligent Systems at Alibaba :

For Alibaba, intelligent systems are not just another technical field; they are the key driver of future competitiveness and long-term growth. CEO Eddie Wu has emphasized that intelligent systems represent a "unique opportunity," with the company's long-term vision focusing on developing Artificial General Intelligence (AGI)—general-purpose intelligent systems capable of surpassing human intelligence in multiple domains. This vision underscores Alibaba's ambition not only to achieve incremental improvements but to drive a transformative impact on business and society through these systems (Wolfenstein, 2025) :

1. Strategic Pillars for Implementation

Figure 05: Alibaba's Strategic Pillars



Source: Prepared by the authors

a. Expanding Infrastructure as a Foundation

- **Cloud and Intelligent Systems Infrastructure:** Alibaba is accelerating the construction of data centers and upgrading facilities with specialized chips for intelligent systems and high-performance computing (HPC). This expansion is essential for training and deploying complex intelligent system models on a large scale.
- **Global Expansion:** To strengthen its international presence, Alibaba has launched new cloud regions and data centers in strategic markets such as Mexico, Malaysia, the Philippines, Thailand, and South Korea, enhancing its global reach for Intelligent Systems and Cloud services.

b. Technological Development as a Driver of Innovation

- **Focus on AGI:** Alibaba places the development of Artificial General Intelligence (AGI) at the heart of its long-term strategy, investing in research and development to tackle core challenges such as improving algorithms, innovating new architectures, and exploring advanced machine learning approaches.
- **Enhancing Intelligent Systems and Cloud Capabilities:** The company continuously improves areas like Computer Vision, Natural Language Processing (NLP), and Deep Learning, while expanding Alibaba Cloud services to provide cutting-edge intelligent system technologies.

c. Business Integration as a Value Generator

- **E-Commerce and Enterprise Solutions:** Intelligent systems are integrated into platforms like Alibaba.com, Taobao, Alipay, Tmall Genius, and Alibaba Cloud Enterprise solutions to optimize operations, enhance user experience, and develop innovative business models.
- **Operational Efficiency and User Experience:** Intelligent systems are used to improve logistics, personalize customer service, detect and prevent fraud, and provide product recommendations, thereby boosting customer satisfaction and sustainable company growth.

d. Partnerships and Talent Development as an Ecosystem Enabler

- **Strategic Partnerships:** Alibaba collaborates with universities, research institutes, startups, and tech companies to develop intelligent system applications and leverage external innovation.
- **Intelligent Systems Talent Development:** The company invests in scholarships, hackathons, research funding, and advanced training programs to ensure global talent availability and cultivate the next generation of experts in intelligent systems.

e. Diversifying the Product Portfolio

- **Products and Solutions:** Alibaba expands its portfolio to include platforms, developer tools, APIs, and enterprise services, enabling organizations and developers to integrate intelligent systems into their applications seamlessly.
- **Expanding Generative Intelligent Systems:** Alibaba invests in scaling generative intelligent systems (text, images, audio, video) and plans to offer them in new global markets, supporting innovation in marketing, content creation, design, and entertainment.

2. Strategic Implications :

Alibaba's Intelligent Systems and Cloud Computing strategy is not limited to internal innovation but serves as a geo-economic tool to strengthen its global market position. Through massive investments in infrastructure, technological development, business integration, partnerships, and talent cultivation, the company aims to:

- Establish itself as a leading force in the global Intelligent Systems and Cloud Computing markets.
- Provide innovative , intelligent system-based solutions for enterprises and developers.
- Play a pivotal role in transforming the digital economy and global society.

Alibaba's implementation strategy demonstrates a comprehensive and ambitious approach in intelligent systems. By committing to AGI development, global infrastructure expansion, and building an ecosystem of partnerships and talent, the company positions itself as a global leader in Intelligent Systems and Cloud Computing, placing itself at the heart of the global technology race while contributing to institutional growth and worldwide digital transformation.

Third: Alibaba's Strategic Investment in Intelligent Systems and Technologies

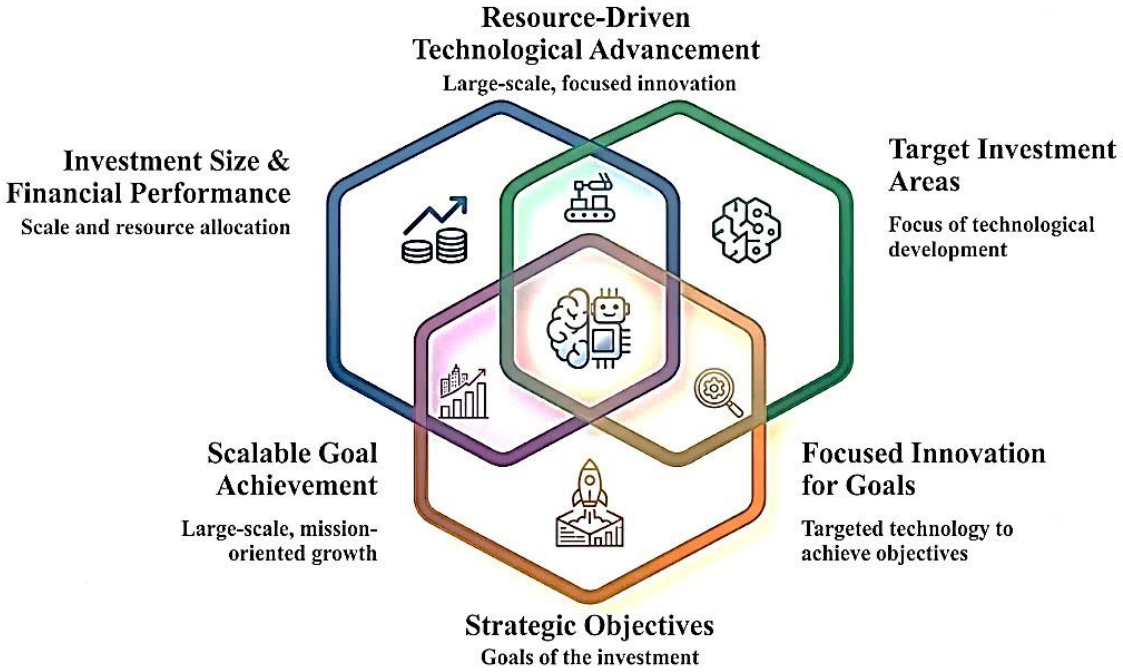
Alibaba's massive investment in Artificial Intelligence (AI) and Cloud Computing occurs within the context of the strategic competition between China and the United States for dominance in the global digital economy. While American companies aim to consolidate their leadership in AI and cloud computing, Alibaba positions itself as a leading Chinese model, investing unprecedentedly to enhance its technological capabilities. This approach seeks to anchor China at the heart of the geo-economic race and reshape the global innovation map :

Axis	Analytical Details
Investment Size	The company has launched a massive investment plan exceeding ¥380 billion RMB (approximately $53 billion USD) over the next three years. This commitment ranks among the largest in the history of private Chinese companies, surpassing its total prior investments in this field over the past decade, reflecting its ambition to become a global leader in AI and Cloud Computing.
Target Investment Areas	• Development of AI across industrial and commercial applications.• Investment in Cloud Computing infrastructure as the backbone for running AI applications.• Enhancing the operational environment for Large Language Models (LLMs) and advanced intelligent technologies.• Moving toward the development of Artificial General Intelligence (AGI) capable of rational reasoning and solving complex tasks.
Strategic Objectives of Investment	• Strengthen cloud computing capabilities and transform them into a competitive global platform.• Enhance AI and Machine Learning efficiency to support business and marketing operations.• Launch new AI-driven products

	and services and improve existing services through intelligent integration.• Accelerate the transition toward a fundamental transformation in business models and the digital economy.
Financial Performance and Capital Expenditure	• In 2024, the company's capital expenditure reached ¥72.5 billion RMB ($10 billion USD), compared to ¥24 billion RMB ($3.3 billion USD) in 2023, reflecting the accelerating pace of investments aimed at developing cloud infrastructure and advanced AI technologies.• The company reported an 8% increase in revenues, reaching ¥280.2 billion RMB ($38.6 billion USD), with profits rising to ¥48.9 billion RMB, surpassing analysts' expectations.• Alibaba's U.S.-listed shares rose by 70% over the year, driven by strong AI developments and strategic collaboration with Apple.
Strategic Implications of this Investment	• Enhance the company's competitiveness locally and globally within the Global AI Market.• Solidify China's position in the global technology dominance race against American companies such as OpenAI, Google, Microsoft, and Meta.• Contribute to reshaping the global economic map through widespread AI applications.• Cloud computing unit revenues increased by 18% in Q1 2025, reflecting the early success of the strategy.
Global Context of the Investment	This investment comes at a time when the world is witnessing an intense race among major economic powers. U.S. corporate capital expenditures (Amazon, Microsoft, Google, Meta) are expected to exceed $320 billion in 2025, with Amazon leading the race by spending over $100 billion to expand AWS services and AI infrastructure.

Source: (Wolfenstein, 2025), (Hano, 2025), (Bloomberg, 2025)

Figure 06: Alibaba's Strategic Investment in Intelligent Systems and Technologies



Source: Prepared by the authors

Alibaba's investment in AI and Cloud Computing represents a pivotal strategic move aimed at consolidating the company's position at the center of the global digital transformation and enhancing its competitiveness against American tech giants. By focusing on AGI and advanced cloud infrastructure, the company reinforces its long-term vision to drive a transformative shift in the global digital economy.

Fourth : Intelligent Systems and Technologies Supporting Decision-Making at Alibaba

Intelligent Decision Support Systems (DSS) represent a fundamental pillar in the contemporary digital business environment, integrating AI and Big Data analytics to generate actionable knowledge for decision-makers. In this context, Alibaba has developed an integrated model for employing these systems, enhancing operational efficiency and rapid responsiveness to market fluctuations. The following table highlights the key technologies the

company relies on and their role in improving the quality and effectiveness of strategic and operational decisions:

Technology	Description
Intelligent Agent "Axio" and Agent Mode on Accio Platform	An integrated AI agent that saves time and effort for merchants by automating procurement processes. It uses a database of over one billion products and 50 million supplier files, handling around 70% of traditional tasks such as product innovation, prototyping, and compliance checks. Users interact in natural language to describe needs, and the system automatically collects quotes, compares alternatives, and negotiates with the most suitable suppliers, supporting multiple languages and considering cultural and business differences. This enhances negotiation transparency and accuracy in the digital environment.
AI-Powered Recommendation Algorithms	Leveraging deep learning and natural language processing to analyze customer behavior and preferences, allowing personalized shopping experiences and precise product recommendations. These algorithms are also used for targeted marketing campaigns (featured ads, keywords, and commerce manager), strengthening customer loyalty and increasing sales through data-driven marketing decisions.
Intelligent Chatbots	Engage with customers through natural, fast interfaces, managing over 60% of customer inquiries with the ability to understand sentiment and prioritize requests before escalation to human agents. They improve customer experience, accelerate responses, reduce operational costs, and support real-time decision-making in customer service.
Advanced Language Model "Qwen AI"	A sophisticated language model capable of interpreting text, images, and audio. Enhances decision support systems by enabling multimodal understanding, allowing deeper reading of complex digital data. Improves user interaction quality and ensures more comprehensive and accurate decisions in global digital environments.
AI-Powered Predictive Analytics	Enables forecasting of demand, market changes, and consumer behavior. Supports proactive resource planning, optimized inventory management, and efficient marketing campaign programming. Predictive practices reduce operational risks and provide a competitive advantage in dynamic markets.
Big Data Analytics	Processes massive datasets from diverse sources, including shopping activity, customer behavior, payments, and supply chain operations. Provides strategic support in evaluating campaigns, identifying market trends, and formulating accurate decisions based on insights generated from Big Data.
Intelligent Negotiation Tools	AI-powered tools that assist in managing business negotiations, such as automating price and payment term negotiations and optimizing procurement contracts through advanced analytical models. These tools enhance decision-makers' ability to draft fairer and more effective agreements.
Trade Assurance Service	A digital system that increases trust in the commercial environment by safeguarding payments and ensuring contract fulfillment. Acts as a strategic tool reducing transaction risks and supporting secure global purchasing and selling decisions.
Smart Warehouse Automation	Employs advanced robots managing millions of shipments daily with high efficiency, reducing human errors, accelerating operations, and ensuring supply chain sustainability. Supports operational management decisions in logistics effectively and sustainably.

Sources: (Ben Berdi & Azizi, 2024), (Yaqout, 2025), (Konrad, 2025)

The table illustrates that Alibaba's deployment of AI-driven intelligent DSS extends beyond operational efficiency to form a strategic element in building sustainable competitive advantage within the digital environment. These systems have enabled the company to accelerate responses to changes, reduce costs, and enhance customer experience, positioning Alibaba as a global leader in integrating AI into decision-making strategies.

Fifth – Impact of AI Tools and Technologies on Improving Sales and Marketing Decisions at Alibaba

AI tools and technologies play a pivotal role in shaping Alibaba's sales and marketing strategies, enhancing operational efficiency and creating added value at both strategic and commercial levels, through the following dimensions:

Tool	How It Works	Impact on Sales and Marketing
Accurate Demand Forecasting	Analyzes massive databases including historical sales, market trends, and seasonal/environmental factors to produce precise future demand predictions.	Optimizes inventory management, reduces storage costs, prevents shortages or surpluses, and increases customer satisfaction.
Personalized Recommendations	Uses deep learning algorithms to analyze customer behavior and preferences, providing instant, customized recommendations.	Increases purchase likelihood, enhances cross-selling, and raises the average order value.
Intelligent Chatbots	Provides instant interaction with customers using NLP and sentiment analysis to understand inquiries and deliver accurate solutions.	Improves customer experience, accelerates response time, and increases conversion rates from visitor to buyer.
Automated Content Marketing	Generates automated marketing campaigns, including dynamic ads and real-time customer targeting.	Enhances the effectiveness of digital marketing campaigns and increases ROI.
Real-Time Analytics	Monitors campaign performance and sales in real-time with immediate adjustment capabilities.	Improves marketing outcomes, supports rapid decision-making, and enhances strategic agility.
Fraud Detection and Risk Management	Monitors abnormal activities and detects early fraud attempts using intelligent technologies.	Strengthens e-commerce transaction security, protects brand reputation, and increases customer trust.
Logistics Optimization	Analyzes transportation and shipping data to optimize order distribution using smart technologies.	Reduces operational costs, improves delivery speed and accuracy, and increases supply chain efficiency.
Virtual and Augmented Reality (VR/AR)	Provides immersive shopping environments allowing customers to virtually try products before purchase.	Enhances customer confidence in products, reduces return rates, and increases likelihood of purchase.

Source: (Wolfenstein, 2025)

By leveraging these advanced tools, Alibaba has increased the efficiency of its sales and marketing operations, strengthened customer loyalty, and achieved stronger financial performance. This demonstrates that AI-supported decision-making has become a strategic cornerstone for leading digital companies in the global business environment.

Sixth : Lessons Learned from Alibaba's Experience

From Alibaba's experience in employing intelligent systems for decision support, several key insights can be drawn:

1- Integration of intelligent systems with corporate strategy – Alibaba treats intelligent systems not just as auxiliary tools but as a fundamental pillar supporting its expansion and innovation strategies.

2- Achieving high operational efficiency – Intelligent systems improved inventory management, logistics, and targeted marketing, reducing costs and accelerating responsiveness to customer needs.

3- Enhancing global competitiveness – Alibaba's reliance on AI and predictive analytics strengthened its position as a major competitor to leading U.S. companies such as Amazon, Google, and Microsoft.

4- Customer-centric focus – Through personalized recommendations, interactive chatbots, and VR/AR experiences, the company increased customer satisfaction and loyalty.

5- Risk management and trust enhancement – Intelligent fraud detection and trade assurance systems created a safer environment for e-commerce transactions.

6- Innovation as a driving force – Investment in Artificial General Intelligence (AGI) and expansion in Cloud Computing reflect Alibaba's commitment to fundamentally transform global business models.

Conclusion

In light of the rapid digital transformation, intelligent decision support systems have become a strategic tool for organizations aiming to enhance the quality and effectiveness of their decisions. Alibaba's experience demonstrates that employing these systems—through artificial intelligence, machine learning, and big data analytics—strengthens the ability to make fast and accurate decisions while improving operational and marketing efficiency. Intelligent systems also provide high flexibility to adapt to continuous changes in the digital environment and facilitate collaboration among individuals and teams, highlighting their importance in achieving sustainable competitive advantage. Therefore, adopting these systems is a strategic necessity for any organization aspiring to succeed in modern digital markets.

1. Hypothesis Validation

Hypothesis: The use of intelligent decision support systems enhances the effectiveness and accuracy of strategic decisions in a digital environment, as illustrated by Alibaba's experience.

Alibaba's *experience confirms this hypothesis. The company demonstrated that intelligent decision support systems improve the effectiveness and accuracy of strategic decisions. These systems enhanced demand forecasting, personalized marketing offers, inventory management, and accelerated decision-making based on precise data and advanced analytics. AI and machine learning technologies enabled the company to respond rapidly to market changes and make more informed, strategic decisions, highlighting the critical role of intelligent systems in boosting organizational performance in a sophisticated digital environment.*

2. Study Findings

- ✓ Intelligent decision support systems proved effective in improving the accuracy of strategic decisions in digital companies, enhancing their competitive capacity.
- ✓ These systems improved inventory management, reduced operational costs, and increased responsiveness to market demands.
- ✓ Companies leveraged AI technologies to foster innovation and deliver new solutions and services that meet customer needs.
- ✓ The results show that adopting intelligent decision support systems allows organizations to achieve sustainable competitive advantage over the long term.
- ✓ These systems transformed vast amounts of data into strategic, actionable insights for decision-making.
- ✓ Personalized recommendations and offers positively impacted customer satisfaction and loyalty.
- ✓ Decision support systems improved risk management through accurate and proactive analyses.
- ✓ These systems enabled rapid adaptation to market changes, enhancing organizational agility and operational sustainability.

3. Study Recommendations

- ✓ Expand the use of intelligent systems: Extend intelligent decision support systems across all departments to enhance organizational performance.
- ✓ Invest in technology: Invest in AI and machine learning technologies to strengthen competitive capabilities.

- ✓ Develop employee skills: Train staff to use intelligent systems effectively to maximize benefits.
- ✓ Conduct continuous data analysis: Regularly monitor and analyze data to ensure organizational adaptability to market changes.
- ✓ Develop personalized marketing strategies: Leverage customer analytics to design more effective marketing campaigns.
- ✓ Enhance team collaboration: Promote collaboration among teams to improve decision quality and execution accuracy.
- ✓ Regular performance evaluation: Periodically review the performance of decision support systems to maintain their effectiveness and achieve organizational goals.
- ✓ Adopt best practices: Learn from leading companies like Alibaba to implement successful strategies in leveraging intelligent systems.

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