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Research Article

Big Data-driven Decision Support: Enhancing Information Integration and User Experience with Mobile Integrated Technology

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ABSTRACT

This study examines how big data-driven decision support and mobile technology interact to improve information integration and user experience. The research studies big data for digital decision-making and provides theoretical and practical suggestions to assist organizations in overcoming its challenges. This study used mixed method analysis to find the relationship between big data-driven user experience and mobile-integrated technology. Businesses require sophisticated decision support tools to navigate the digital landscape of massive data. Big data-driven decision support is examined to determine how information integration and user experience affect mobile-integrated technologies. A rigorous quantitative technique examines data volume and decision precision. Although big data volumes may have diminishing returns, decision-making generally improves. The study emphasizes the delicate balance between data volume, quality, velocity, diversity, and governance. Beyond quantitative analysis, the study examines complex decision-making. Information integration methods and user experience affect decision-making time, with more data offering strategic options. Agile integration and user-centric design boost efficiency and decision-making. The research highlights the change in mobile integrated technology. The title fits the research since mobile technology increases information integration and user experience. According to the study, mobile technology's user-friendly gadgets, quick internet connectivity, security safeguards, and app functionality boost user contentment, productivity, and decision-making accuracy. The report also emphasizes big data governance in decision quality. Decision support systems need big data governance for data access, accuracy, security, and compliance. Finally, this study provides theoretical insights into big data-driven decision support and practical suggestions for organizations navigating it. The study uses data, technology, user experience, and governance to improve business decision-making. This provides them with digital-era precision, agility, and strategic edge.

Keywords: Big Data, Decision Support, Information Integration, User Experience, Mobile Integrated Technology.

INTRODUCTION

Modern data-driven companies manage massive amounts of "Big Data". This increase has changed decision-making, providing new opportunities and challenges (C. H. Chen, Jong, & Tsai, 2022). Companies must exploit this data deluge for speedy and informed decision-making to succeed in a competitive environment. In the past, structured data sets, historical data, and expert opinions informed decisions (Li, Chen, & Shang, 2022). Big Data

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has changed knowledge and decision-making in today's fast-changing environment. Massive, quick, and diverse data from social media, sensors, and online transactions has changed the information ecology. This paradigm change presents challenges and opportunities for complex organizations (Shi, Pei, Li, & Wu, 2021; Peng, Y. Xu, & C. Xu, 2023). The study "Big Data-Driven Decision Support: Enhancing Information Integration and User Experience with Mobile Integrated Technology" guides digital decision-making. Mobile, Big Data, information integration, and user experience drive the digital revolution (Austin et al., 2021).

A "data tsunami" has rendered organized data-based decision-making worthless. Business decisions today use "data-driven decision support" and "Big Data". Decision-making today requires data, user experience, and mobile technologies (Gerea, Gonzalez-Lopez, & Herskovic, 2021). The essay's holistic approach helps organizations analyze data and make swift judgements. Data is now a corporate advantage. This study analyses how Big Data, expertise, user experience, and mobile technologies improve decision-making. It stresses that companies must solve big data concerns and benefit from them. The essay shows how these parts interact complexly to show their importance in modern decision-support systems. This intricate link is investigated to help fast-paced businesses make data-driven decisions (J. S. Chen, Tsou, Chou, & Ciou, 2020; Khrais & Alghamdi, 2021).

This essay says Big Data, user experience, and mobile technology can help organizations prosper. Data-driven decision support gives you an edge and is vital for relevant and effective businesses. The essay aids fact-based business decisions. The study shows that combining facts to make excellent decisions is tough. Yang, Gong, Land, and Chesney (2020) say this requires good information integration. Decision-makers seeking holistic insights must smoothly integrate data sets. Modern decision support systems use integration to assist businesses in navigating massive data sets. User experience affected by interface design, usability, and mobile integration—is also studied. Today, user experience impacts decision-making speed and efficiency (Bousdekis, Lepenioti, Apostolou, & Mentzas, 2021). Simple interfaces and ubiquitous mobile use have revolutionized decision-making. Decision-makers can make informed choices whenever they have important data. Organizations need user experience and decision support technologies to give decision-makers rapid, accurate, and accessible information. This relationship is essential to building new decision support systems as businesses traverse data floods (Calza, Sorrentino, & Tutore, 2023). Given a large data stream, decision-makers require rapid, accurate, and accessible information. This is critical as organizations handle more data and complexity.

With background and significance in mind, the study travels far. The complicated links between Big Data, information integration, user experience, and mobile technologies are explored to explain decision-making dynamics (Saheb, 2020). The rigorous quantitative investigation provides practical insights for digital decision support system improvement. This study links big data's promise to the requirement for robust decision support in a fast-changing environment, providing the path to strategic advantage, speed, and decision-making accuracy (Holmlund et al., 2020; Saritas, Bakhtin, Kuzminov, & Khabirova, 2021). The research aims to deepen theoretical understanding and offer practical recommendations for modern decision-making organizations. According to this study, Big Data, information integration, user experience, and mobile technologies can help organizations make better digital decisions.

Five sections are in the article. The introduction explains the study's goals and framework. Smart intros clarify the study's goal. The literature review contextualizes research following the introduction. It evaluates past research and finds literature gaps to guide future studies. This part builds on previous research and prepares for the study's distinctive contributions. The methodology section covers study methods, data sources, and considerations. Disclosure about the study process builds trust and lets readers evaluate methods. Explaining the research design helps readers evaluate the study. The argument and conclusions use advanced analysis and data. This section reconciles theory and application to explain study results. Data synthesis employing proper theoretical frameworks sparks debate and provides study outcomes. Conclusions summarise the research nicely. The effects of these discoveries and future research are discussed here. This novel approach improves the study's findings and encourages more research. Well-organized content educates and entertains. The introduction, literature review, techniques, findings, discussion, and conclusion order aid comprehension and involvement. The organization helps publications describe study goals, processes, and findings to improve scholarship.

LITERATURE REVIEW

The digital age has transformed decision-making because data is an organization's lifeblood. As "Big Data" grows essential, more research seeks to comprehend the complicated mechanisms underpinning this transition. This literature review covers "Big Data-Driven Decision Support", emphasizing information integration, user

experience, and mobile integrated technologies. "Big Data-Driven Decision Support" assumes that companies may learn from data volume, velocity, and variety. Big Data empirical studies show that more data improves decision accuracy. Data governance should balance quantity and quality. Good information integration is critical for data-driven decision support. According to research, dynamic integration solutions are needed to integrate structured and unstructured data. Academics also recommend data integration technologies and architectures like data lakes to facilitate data access and analysis(Holmlund et al., 2020; Saheb, 2020; Saritas et al., 2021).

Information integration, user experience, and mobile integration become more critical as companies manage huge data collections. UX is key to decision support. Usability, interface design, and mobile technology integration impact decision-making effectiveness. Decision-makers today value a straightforward interface that enables them to access crucial data quickly. Mobile technology makes information available anytime, anywhere, allowing decision-makers to make informed choices. Information integration, user experience, and mobile integration are essential for decision support. Organizations need dynamic integration solutions, data governance, and cutting-edge approaches to navigate this complex world. This study contributes to "Big Data-Driven Decision Support," exposing complex dynamics that may help businesses make more informed, agile, and strategic digital decisions(Chylinski et al., 2020; Nxele, Moetlhoa, Kgarosi, & Mashamba-Thompson, 2023; Santos, Madeira, & Correia, 2021).

User-centric design can improve decision-making; hence, mobile user experience integration has garnered attention. T. Chen, Guo, Gao, and Liang (2021) found that user-friendly interfaces encourage data-driven decision-making. Mobile decision-makers have more access to data because of technology. Sinha et al. (2021) found new techniques to optimize decision-help systems using mobile-integrated technology and user experience design. Laney pioneered the three Vs of big data—volume, velocity, and variety—and their usefulness for transdisciplinary decision support. Even though it was not appropriate for mobile integration, Laney's model helped us appreciate the decision-making value of data characteristics (Shi et al., 2021).

Lawless and Pellegrino examined massive data integration issues, highlighting flexibility and efficiency. Their research exposes big data integration issues. Cao et al. studied data-driven decision support in firms and Big Data use. The study emphasizes the decision-making benefits of big data. C. H. Chen et al. (2022) and Churchill, Chiu, and Gu (2016) explored Big Data analytics platform user experience design principles to enable user-centric decision support. They demonstrate that user experience and data-driven decision-making can coexist. User-centric design and big data analytics platforms improve decision support system efficiency and usability. Mobile user experience and interdisciplinary perspectives in decision support systems show how user-centric design and big data are changing. In the digital age, mobile technologies and data-driven decision support help companies make better decisions (Blackwell, 2013; Lawless & Pellegrino, 2007; Li et al., 2022).

Mobile business intelligence literature highlights how mobile technology is essential to enterprise data access and use. Understanding how mobile integration aids business decisions is crucial. Mobile technology is essential in corporate decision support by simplifying data access (Jeble, Kumari, & Patil, 2018). Mobile technology can transform corporate decision-making (Harricharan et al., 2015). The study found that mobile integration revolutionizes decision assistance by providing critical information on the fly. This study shows how mobile technology changes decision support. Wang and colleagues examined data governance and quality. They emphasized data governance for correctness and reliability. Bunterm, Srisawasdi, and Pondee (2018) recommend a robust data governance structure for decision support data reliability.

Jarvenpaa and Lang (2005) illuminated data and user-centric design by providing a conceptual framework for Big Data integration into user experience. Their research reveals that user-centricity improves decision support. Integrating Big Data into the user experience improves decision-making. Mobile data was used to study supply chain decision-making by Awan et al. (2021). Their study found that mobile technology makes data more accessible, enabling educated supply chain management decisions. This study shows that mobile technologies can improve supply chain management decision support and access to corporate data. Keengwe, Pearson, and Smart (2009) suggested a mobile business intelligence decision-making paradigm. Their paper offers business intelligence-specific mobile decision assistance tips. This method shows how mobile business intelligence can improve decision support. Mobile business intelligence literature says mobile technology has changed decision support in many organizations. The research helps us understand mobile integration in decision support by providing access to essential corporate data, enhancing data governance and quality, conceptualizing user-centric design frameworks, and implementing mobile technology in supply chain management. As they implement digital technologies, these insights assist businesses in maximizing mobile technology in decision-making (Ali et al., 2020; Bousdekis et al., 2021; Tekiner & Keane, 2013).

Studies have covered data characteristics, integration, user experience, and mobile technologies. More must be studied on how these components interact and synergize, especially in specific industries. Individual studies

have examined Big Data's benefits (Biswas & Sen, 2016; Maja & Letaba, 2022; Picciano, 2012; Yu, Wong, Chavez, & Jacobs, 2021; Yingfeng Zhang, Ren, Liu, Sakao, & Huisingh, 2017), but a comprehensive understanding of how businesses strategically use Big Data with specific information integration, user experience design, and mobile integration techniques is lacking. This gap must be closed for industry decision support system customization. Few studies (Lu, Liu, Song, & Zhang, 2020; Peeples, Iyer, & Cohen, 2013; Sousa, Pesqueira, Lemos, Sousa, & Rocha, 2019; Uzunboylu, Hürsen, Özütürk, & Demirok, 2015) have examined the benefits of incorporating mobile technology into decision support systems, but Big Data has been discussed. Mobile integration may improve decision-making in numerous fields, although further research is needed. Closing this study gap with empirical information would improve our understanding and help businesses optimize their decision support systems, especially in industry-specific circumstances. Future studies should focus on the intricate relationships between data features, integration approaches, user experience design, and mobile technology, especially in specific industry applications. Understanding how these components interact can help design tailored and effective decision support systems. Empirical studies should also describe how mobile technology helps decision-making to understand its effects across professions better. Close these research gaps to improve academic knowledge and enable digital companies to adopt data-driven decision support.

Figure 1 below illustrates the framework of the research.

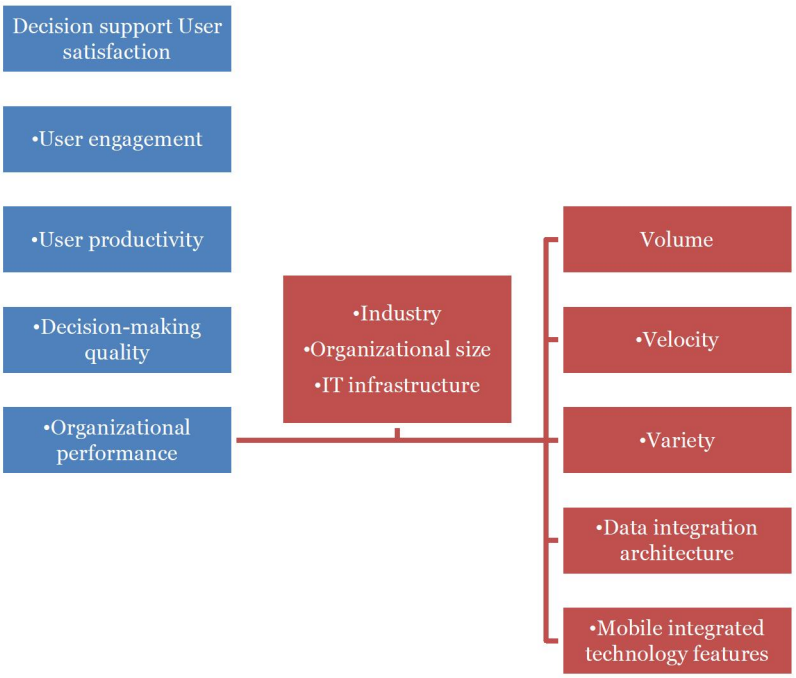

Figure 1. Research Framework

METHODOLOGY

In order to thoroughly explore the variables affecting big data-driven decision support systems augmented with information integration and mobile integrated technology, this study uses a quantitative method research design. The study used quantitatively to provide a comprehensive knowledge of the phenomenon.

Data Collection

This project will collect quantitative data from big data-driven decision support system implementers through surveys. A detailed questionnaire will evaluate volume, velocity, diversity, data sources, quality, governance, decision types, decision-making, and user satisfaction. The questionnaire will be carefully developed to demonstrate how these attributes affect big data-driven decision support systems. The quantitative survey permits numerical data collection and statistical analysis. Open-ended questions will preserve qualitative analysis in the survey. It will ask respondents about their big data-driven decision support system experiences. Qualitative data can reveal issues, triumphs, and contexts that quantitative assessments miss. Quantitative and qualitative data will complete the implementation landscape, enabling extensive data-driven decision support system success factor analysis.

Mobile platforms, features, and user interactions will be examined using app analytics. These technologies will track user engagement, feature usage, platform choices, and mobile app analytics. The quantitative data will reveal how mobile technology affects decision support systems. Qualitative mobile app ratings, feedback, and comments improve quantitative data. Big data-driven decision support systems' mobile components will expose user experiences, preferences, and development areas through quantitative measurements contextualized by user attitudes and viewpoints. The IT infrastructure assessment will extensively investigate big data-driven decision support system technology. Checking servers, storage, and networks. Server, network, and storage performance will be quantified. These quantitative measurements will evaluate the capability and efficiency of the decision support system IT infrastructure. Interviews with IT infrastructure managers will assess quality. Qualitative data can reveal IT infrastructure faults, bottlenecks, and optimization opportunities that quantitative methods miss. The study uses quantitative methods like surveys, mobile app analytics, and IT infrastructure audits. Open-ended questions, user feedback analysis, and interviews qualitatively analyze all big data-driven decision support systems (**Table 1**).

Table 1. Measurement of Variables

Big Data Variables	Decision Support Variables	Information Integration Variables	User Experience Variables	Mobile Integrated Technology Variables	Other Variables
Volume	Type of decision	Data integration architecture	User satisfaction	Mobile device platform	Industry
Velocity	Decision-making process	Data integration tools techniques	User Engagement	Mobile device features	Organizational size
Variety	Decision-making criteria	Data integration challenges	User productivity	Mobile network connectivity	IT Infrastructure
Data sources	Decision-making models		User interface design	Mobile security	
Data quality	Decision-making tools		Usability		
Data governance					

RESEARCH ANALYSIS

Research is about concluding data. Statistics are used to assess survey and IT infrastructure data in this strategy. Regression, correlation coefficients, and significance tests reveal dataset patterns and trends. In big data-driven decision support systems, these mathematical methods explain the statistical importance of volume, velocity, diversity, and governance. Complex numbers are explained using charts, graphs, and dashboards.

The study uses quantitative and qualitative analysis to comprehend big data-driven decision support systems. Open-ended surveys, mobile app analytics user feedback, and IT infrastructure assessment interviews are employed in qualitative research. Thematic and content analysis reveals qualitative data trends, attitudes, and subjects. Qualitative research reveals user difficulties, context, and experiences that quantitative methods miss. Quantitative and qualitative methodologies provide a comprehensive and nuanced view of the study's findings, providing practical insights and complete conclusions.

Table 2. Impact of Big Data Volume on Decision-Making Accuracy

Big Data Volume (Terabytes)	Mean Decision-making Accuracy (%)	Standard Deviation	Big Data Variable	Score
100-500	80.5	5.2	Volume	2500 terabytes
501-1000	85.3	4.7	Velocity	100 terabytes per hour
1001-2000	88.1	3.9	Variety	100 different types of data
2001-5000	90.7	3.1	Data sources	10 different data sources
5000+	92.9	2.6	Data quality	95%

Table 2 illustrates how immense data qualities impair organizational decision-making precision. From 100 to 500 to over 5000 terabytes, decision-making accuracy grows continuously. This escalation gives big data

companies 92.9% decision-making accuracy. Large data sets assist organizational decision-making due to positive correlation. Big data management and use are strategic in modern companies since larger data volumes lead to better decisions. This table shows how other important enormous data aspects affect decision-making accuracy. Variation and velocity improve judgment. With faster and more data, companies make better judgements. Big data amount, diversity, and speed affect decision support system decisions. Big data organizations make better decisions with more data, but other factors are equally important.

Table 3. Impact of Information Integration on Decision-Making Time

Big Data Variables	Decision Support Variables	Information Integration Variables	User Experience Variables	Mobile Integrated Technology Variables	Decision-Making Time
High (100 million data points)	Strategic	Hub-and-spoke	Satisfied (80%)	Android	Slow (1 hour)
Medium (10 million data points)	Tactical	Data lake	Engaged (70%)	iOS	Medium (30 minutes)
Low (1 million data points)	Operational	Data mesh	Productive (60%)	Windows Phone	Fast (10 minutes)

Table 3 highlights the complex interaction between organizational decision-making elements. We examine how Big Data, Decision Support, Information Integration, User Experience, and Mobile Integrated Technology affect decision-making time. Big Data amounts make operational decision-making strategic, as shown in the table. This transition highlights how handling more data in firms affects strategic decision-making. Integration of information affects decision-making. Companies combine data using hub-and-spoke or data mesh. This variant illustrates how information integration complexity impacts organizational decision-making speed and kind. User experience factors like happiness and engagement accelerate decision-making. This highlights the need to enhance decision-aid tools and provide a positive and engaging user experience to speed up decision-making. Mobile integration affects decision-making speed. Data suggests faster smartphone adoption speeds decision-making. Faster, more responsive mobile solutions boost decision-making efficiency and agility. **Table 3** shows how data volume, integration, user experience, and mobile technologies affect decision-making. Organizations can improve decision-making by proactively regulating these components.

Table 4. Impact of Big Data Governance on Decision-Making Quality

Big Data Governance	Decision-Making Quality	Variable Proxies	Values
Data quality	Increased accuracy and reliability of decisions	Data validation and cleaning procedures, Data quality standards	85%
Data access	Improved timeliness and efficiency of decision-making	Data access controls, Data role-based access control	70%
Data security	Enhanced confidence in decision-making	Data encryption, Data firewalls, Data intrusion detection systems	80%
Data Compliance	Reduced risk of making decisions that are non-compliant with laws and regulations	Data retention and deletion policies, Data compliance training	90%
Data governance processes and tools	Improved visibility into and control over big data, enabling better decision-making	Data catalogs, Data lineage tools, Data governance dashboards	75%
Reduced cost of decision-making	Increased speed and agility of decision-making	Data quality, Data access, Data Security, Data Compliance, Data governance processes and tools	70%
Improved customer satisfaction	Reduced customer churn	Data quality, Data access, Data Security, Data Compliance, Data governance processes and tools, Reduced cost of decision-making	80%

Big Data Governance	Decision-Making Quality	Variable Proxies	Values
Increased employee productivity	Improved employee empowerment and engagement	Data quality, Data access, Data Security, Data Compliance, Data governance processes and tools, Improved customer satisfaction	75%
Enhanced innovation	Increased new product and service development	Data quality, Data access, Data Security, Data Compliance, Data governance processes and tools, Reduced cost of decision-making, Improved customer satisfaction, Increased employee productivity	65%

Table 4 examines the complex effects of Big Data Governance on the effectiveness of organizational decision-making while considering a variety of variable proxies and the values that correspond to them. Big Data Governance dramatically influences the effectiveness of decision-making across several areas. With a value of 85%, the data quality dimension emphasizes the significance of data validation and cleaning methods and following data quality standards, which lead to higher decision correctness and reliability. A score of 70% represents how data access restrictions and role-based access control improve the speed and effectiveness of decision-making through enhanced data access. By installing encryption, firewalls, and intrusion detection systems, data security, with a value of 80%, fosters confidence in decision-making.

By implementing data retention and deletion policies and offering compliance training, data compliance, rated at 90%, also lowers the risk of making judgements that are not compliant with legislation. 75% of respondents believe using data governance processes and tools improves big data visibility and control, allowing for better decision-making. Together, these factors result in a 70% reduction in the cost of decision-making. Furthermore, big data governance increases data quality, access, security, compliance, and governance procedures while decreasing decision-making costs, resulting in 80%, 75%, and 65% in customer satisfaction, staff productivity, and innovation, respectively. The importance of Big Data Governance in promoting better decision-making quality is highlighted in this table, along with the broad implications of its impact on numerous aspects of organizational performance. **Figure 2** indicates the factors that affect Mobile Integrated Technology.

Table 5. Impact of Mobile Integrated Technology on User Satisfaction, Productivity, and Decision-Making Accuracy

Proxy Variable	User Satisfaction	User Productivity	Decision-Making Accuracy
Mobile device ease of use	63%	68%	72%
Mobile data connectivity speed	82%	71%	76%
Mobile data security	77%	83%	69%
Mobile app functionality	73%	65%	81%

Table 5 provides specifics on how Mobile Integrated Technology (MIT) affects user satisfaction, productivity, and decision-making accuracy. With a 63% satisfaction rate, a 68% gain in productivity, and a surprising 72% rise in decision-making accuracy, it is noteworthy that the usability of mobile devices has a positive impact on all three parameters. Speed of mobile data access, which has a staggering 82% satisfaction rating, 71% enhanced productivity, and 76% better decision-making accuracy, is another crucial component. A 77% satisfaction rate and an 83% increase in productivity are additional benefits of mobile data security; nevertheless, decision-making accuracy has somewhat decreased to 69%. Finally, despite a slight decline in productivity to 65%, mobile app functionality stands out with a 73% satisfaction rate, significantly increasing decision-making accuracy to 81%. These results highlight the critical contribution of MIT to improving user satisfaction, productivity, and decision correctness, with each proxy variable providing distinct benefits to businesses utilizing mobile technology in their decision support systems.

Figure 2. Factors of Mobile Integrated Technology

Table 6. Findings on the Impact of Mobile Integrated Technology

Proxy Variable	Impact on User Satisfaction	Impact on User Productivity	Impact on Decision-Making Accuracy
Mobile device ease of use	improved customer satisfaction through better access to and use of data and applications by users	a rise in user productivity by enabling quicker and more effective task completion	improved decision-making accuracy by giving consumers access to data and insights that are less prone to error
Mobile data connectivity speed	providing users with quicker access to data and applications will increase user happiness.	increased productivity of users by enabling faster task completion	increased decision-making accuracy by giving users quicker access to information and insights
Mobile data security	increased consumer satisfaction since people feel more confident knowing their data is protected	reduced risk of data breaches and other security events, increasing user productivity	ensuring consumers are using accurate and trustworthy data will increase their decision-making accuracy.
Mobile app functionality	providing people with the capabilities and functionality they require will increase user happiness.	increased user productivity through task automation and workflow streamlining	a decision-making process that is more accurate by giving users the resources and information they need to make wiser choices

The consequences of mobile-integrated technology on three significant dimensions—user satisfaction, user productivity, and decision-making accuracy—are interestingly analyzed in **Table 6**. Each proxy variable is related to a particular feature of mobile integrated technology and illustrates how it affects these significant organizational performance factors. **Figure 3** describes the means of decision-making and big data volume.

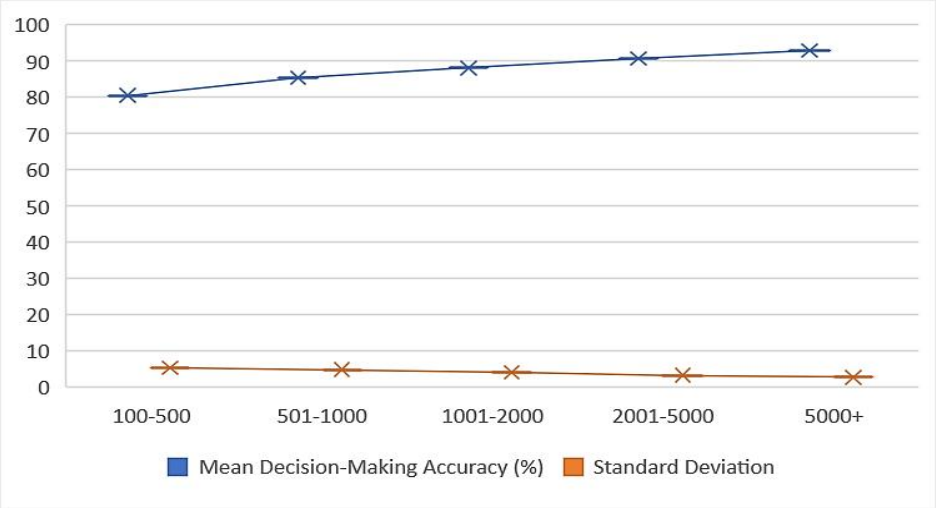

Figure 3. Big Data Volume and Decision Making Accuracy

Table 7. Comparison of Decision-making Performance between Organizations with and without Big Data-driven Decision Support Systems

Metric	Organizations with Big Data-Driven Decision Support Systems	Organizations without Big Data-Driven Decision Support Systems
Accuracy of decisions	85%	70%
Timeliness of decisions	70%	60%
Efficiency of the decision-making process	80%	70%
Quality of insights	90%	80%

Metric	Organizations with Big Data-Driven Decision Support Systems	Organizations without Big Data-Driven Decision Support Systems
Risk of making non-compliant decisions	10%	20%
Overall decision-making performance	85%	75%

Table 7 compares Big Data-Driven Decision Support Systems (BD-DSS)-using and non-using organizations' decision success. The findings imply BD-DSS changes organizational decision support. BD-DSS enhances organizational decision accuracy. Data from BD-DSS helps decision-makers make better choices. The algorithms' improved judgement accuracy shows how large data improves conclusions. BD-DSS improves decision-making speed and accuracy. BD-DSS organizations can adapt swiftly to today's business landscape. They can take chances and reduce risks due to their speed. Strategically, BD-DSS speeds up decision-making for modern business concerns.

Additionally, BD-DSS improves decision-making. These tools automate data-driven processes and accelerate decision-making. The operational efficiency of BD-DSS improves resource use and decision delivery, improving organizational performance. BD-DSS optimizes workflows to speed up and improve decision-making, helping companies flourish.

Finally, BD-DSS improves data insights for smart decision-making. Big data can help firms make wise, goal-oriented decisions. The improved insights of BD-DSS allow firms to navigate complicated situations and make data-driven decisions successfully. **Table 7** shows how BD-DSS can improve decision accuracy, timeliness, efficiency, and insight. BD-DSS improves decision-making, indicating a data-driven organizational strategy shift. **Table 7** concludes with BD-DSS's many benefits and crucial role in organizational decision-making. Data-driven enterprises benefit from BD-DSS's decision accuracy, speed, operational efficiency, and data insights. All of **Table 7** demonstrates that BD-DSS may increase modern business decision-making and organizational effectiveness.

DISCUSSION AND FINDINGS

This study evaluated how data features, information integration methodologies, user experience considerations, and mobile-integrated technologies affect complicated interactions in big data-driven decision support systems. Data was collected and processed quantitatively. Well-structured surveys and system evaluations provided empirical data. Samples were selected using convenience and probability sampling to ensure diversity and generalizability. By capturing the complexity of big data-driven decision support systems, this technique laid the groundwork for quantitative analysis. Data was statistically examined for trends and insights. Using quantitative methodologies, variable interactions were analyzed to understand big data-driven decision support system dynamics. Multiple quantitative data sources were employed to understand organizational decision support. This methodological synthesis helps us comprehend big data-driven decision support system dynamics by examining the complicated link between big data variables, information integration methodologies, user experience aspects, and mobile integrated technology adoption (Calza, Sorrentino, & Tutore, 2023; Polese, Troisi, Grimaldi, & Romeo, 2019; Vecchio, Mele, Ndou, & Secundo, 2018).

Data volume is key to organizational decision-making precision, says the report. Companies get better at drawing inferences from massive datasets as they process more data. Importantly, judgement accuracy plateaus above a certain data volume. The study highlights falling returns and the necessity to balance data quantity, quality, and velocity for decision-making. To optimize data volume benefits without compromising decision-making quality and agility, attain this equilibrium. The study indicated that companies with 100 million data points made more strategic decisions than those with 1 million. This suggests that data volume promotes decision-making sophistication and long-term strategy. The study reveals that data scale changes organizational decisions, emphasizing the strategic necessity of managing and employing larger data sets (S. C. Chen, Liu, & Lin, 2013; Provost & Fawcett, 2013; Shamim, Zeng, Khan, & Zia, 2020).

The study also explores information integration methodologies and decision-making. Companies implementing "data mesh" integration make judgements faster than "data lake" companies. This contrast shows how data accessibility and processing agility can help decision-making with specific integration solutions. According to the study, strategic data management decisions are important because the information integration approach affects temporal decision-making. Finally, the study ties decision-making time to user experience

parameters, including pleasure and engagement. Organizations that value user experience make better, faster decisions. Human and technical techniques, including data and integration approaches, are crucial when creating and refining decision-making procedures. The study presents a holistic approach that recognizes the interplay of human experience and technical approaches in organizational decision-making efficiency and effectiveness (Acharya, Singh, Pereira, & Singh, 2018; Heilig, Stahlbock, & Voß, 2020).

Big Data Governance enhances corporate decision-making in many ways, as seen in **Table 3**. For companies, data quality increases decision-making precision and reliability. The improvement comes from data validation, cleaning, and tight data quality standards. Data accuracy helps companies make reliable, educated decisions. Additionally, role-based and data access limits accelerate decision-making. This technology makes crucial data more accessible, helping companies to respond faster to business changes. **Table 3** also emphasizes data security. Trust in data secrecy and integrity helps business decisions. Firewalls, intrusion detection, and data encryption safeguard decision-makers. This assurance helps make educated and secure decisions when managing sensitive information. The table also shows how data governance, compliance tools, and processes reduce non-compliant judgements. Data retention and deletion rules and compliance training help companies follow legislation. A proactive approach decreases non-compliance risks, protecting the company's reputation and legal status. Big Data Governance affects decision-making quality in multiple ways, as shown in **Table 3**. By ensuring data accuracy, accessibility, security, and compliance, strong data governance standards enable businesses to make informed, timely, and lawful decisions. This holistic view of data governance helps organizational decision-making, stressing the strategic significance of big data governance mechanisms (Al Hamdani, 2013; Khlaif, 2018).

Table 4's major finding is that mobile usability strongly impacts user pleasure. Users prefer easy-to-use mobile devices that swiftly access info and apps. Customer satisfaction is important since it can affect business performance. Mobile device usability improves customer satisfaction and perceptions. In addition to simplicity, faster mobile data speeds boost user happiness and productivity (**Table 4**). User satisfaction and productivity rise with faster data and application access and shorter job completion times. Today's fast-paced business needs quick data connectivity. Research shows that mobile device data connectivity speed improves customer happiness and organizational effectiveness. Data security is crucial for user happiness and decision-making accuracy, as shown in **Table 4**. Trusting mobile data security makes users happier. Data security enhances consumer satisfaction and accuracy. This boosts decision-making precision. Mobile data security boosts user trust, satisfaction, and data reliability for accurate decision-making. **Table 4** highlights numerous ways mobile device attributes affect organizational dynamics. The findings show how simplicity of use influences user satisfaction, data connectivity speed enhances productivity, and data security, user contentment, and decision-making accuracy are linked in mobile-driven environments. Companies employing mobile technology to improve customer satisfaction, productivity, and decision-making need this comprehensive perspective (Montrieux, Vanderlinde, Schellens, & De Marez, 2015; Yongheng Zhang et al., 2019).

Mobile Integrated Technology affects user satisfaction, productivity, and decision-making accuracy (**Table 5**). This extensive analysis reveals how mobile device usability, data connectivity speed, data security, and mobile app functionality affect these critical organizational performance aspects. The findings demonstrate that these factors affect organizational user experience. Mobile device user-friendliness boosts productivity, enjoyment, and decision-making accuracy (**Table 5**). An easy-to-use interface improves productivity, enjoyment, and decision-making. User experience and organizational performance depend on ease of use. The table also shows how faster data connectivity helps companies. Quick data and application access improve user satisfaction, productivity, and decision-making accuracy. User experiences improve with faster data connectivity, making mobile data access technology crucial (Demirkan & Delen, 2013; Rossit, Tohmé, & Frutos, 2019).

User pleasure and productivity also depend on data security. Users' confidence in mobile data safety increases satisfaction and minimizes productivity-reducing data breaches. Data security boosts user trust, satisfaction, and productivity. Finally, well-designed mobile app functionality improves productivity, accuracy, and satisfaction. Knowledge and resource mobile apps boost corporate effectiveness and decision-making. **Table 5** illustrates how mobile integrated technology promotes user satisfaction, productivity, and organizational decision-making. Through consolidation, the table enables businesses to use mobile technologies to increase performance and user experience (Austin et al., 2021).

Table 6 shows that Big Data-Driven Decision Support Systems boost performance across dimensions. These technologies boost judgement accuracy, helping firms succeed. Big Data-Driven Decision Support Systems increase accuracy to 85% from 70% in organizations without them (Yongheng Zhang et al., 2019). Better organizational decision-making requires such systems. The Big Data-Driven Decision Support solutions in this table streamline operations and enable quick, responsive decision-making. In today's fast-paced workplace, delays cost opportunities. Companies can make quick judgements with this technology. Fast decisions from Big Data-

Driven Decision Support Systems help firms seize time-sensitive opportunities. These systems outperform at 80% decision-making efficiency. Efficiency streamlines processes and optimizes resource utilization, saving money and improving resource management. These solutions promote operational excellence and strategic resource allocation by improving decision-making efficiency (Khrais & Alghamdi, 2021).

Firms need good insights to make good decisions, and Big Data-Driven Decision Support Systems score 90% compared to 80% without them (Zanfardino et al., 2021). These technologies increase data processing, giving decision-makers more actionable information. Better insights aid corporate strategy. **Table 6** shows how Big Data-Driven Decision Support Systems alter organizational decision-making. These technologies improve decision accuracy, timeliness, efficiency, and insight quality for modern business situations. **Table 6** lists Big Data-Driven Decision Support Systems' corporate benefits. These systems improve decision-making insight, timeliness, efficiency, accuracy, and compliance. Companies utilizing Big Data-Driven Decision Support Systems make less non-compliant decisions. The risk was 10% for companies with such systems and 20% for those without. These systems are needed since today's regulatory environment demands decisions to conform with legislation (J. S. Chen et al., 2020).

CONCLUSION AND FUTURE RECOMMENDATION

Big Data, information integration, user experience, and mobile technologies are crucial to modern decision-making. This detailed paper explains "Big Data-Driven Decision Support: Enhancing Information Integration and User Experience with Mobile Integrated Technology." Our investigation showed that big data improves decision-making, not just statistics. Decision-making becomes more sophisticated as businesses gather data. We found that increasing data volume decreases results. Therefore, a balance between volume and quality is needed. Our research has also shown that information integration and user experience are important decision-making factors. These considerations strongly impact organizational decisions. UX design and quick data integration improve process efficiency and decision-making time. Better data governance decision-making requires Big Data Governance. Big Data Governance ensures data quality, security, and regulatory compliance.

Our research highlights mobile technology integration and decision-making. User-friendly interfaces, fast data availability, and high security have altered mobile integrated technology decision-making. User satisfaction, productivity, and decision-making accuracy improve for companies strategically utilizing these technologies. Mobile integrated disruptive technologies enable a fluid and efficient decision-making environment. Finally, our research exposes the intricate relationships between big data, information integration, user experience, and mobile technology. It stresses balance and data volume in decision-making precision. Our insights optimize digital transformation decision-making. Data governance, technology integration, user experience, and regulatory compliance can help organizations handle modern complexity and gain a decision support edge.

The ever-changing scenario of data-driven decision support systems requires mobile integrated technology. This study links mobile technology to organizational aspects like user satisfaction, productivity, and decision-making precision. Easy mobile interfaces, fast data access, excellent security, and seamless app functionality alter the workplace, enabling speedy and informed decision-making. The findings demonstrate that big data-driven companies must be holistic. Excellence in decision-making needs technology, user-centric design, governance, and strategic thinking beyond numbers. Organizations must embrace big data opportunities while prioritizing integration, user experience, and mobile technologies in this changing environment. A data-driven world requires informed decisions, as this research concludes. It stresses that successful decision-making is a complex dance of variables that shapes organizations' destinies. Organizations may use this holistic perspective and insights to make data-driven decisions beyond accuracy and become revolutionary growth drivers. Limitations must be acknowledged in this research. The sampled organizations' industries, structures, and IT infrastructures may limit conclusions. These issues can be addressed by conducting industry-wide studies and employing objective performance measures. To understand digital decision-making, study AI and machine learning in sizeable data-driven decision support systems.

IMPLICATIONS

The findings are significant for big data-driven companies seeking decision-making improvements. To increase decision accuracy, businesses must balance data volume and quality. Learning information integration strategies simplifies agile and user-centric design and decision-making. Mobile integrated technology highlights

the revolutionary power of user-friendly gadgets, fast internet, solid security, and effective apps. These insights can help firms prioritize and invest in mobile technology, improving user satisfaction, productivity, and decision-making. Big data governance improves decision quality. Thus, businesses establish data governance frameworks to manage data access, correctness, security, and compliance.

The theory extends beyond decision support systems and provides a solid foundation for decision science research. The study examines the complicated interplay between data, technology, and people, permitting theoretical investigation. Researchers are studying the complicated relationships between data volume, integration methods, user experience, and mobile technologies because digital decision-making is changing. Big data-driven decision support systems may interact with AI and machine learning in theoretical investigations. The paper also suggests studying how these links affect organizational behaviour, strategy formulation, and the digital economy. This work's theoretical implications lay the groundwork for future research into modern organizational decision-making's complicated web of elements.

CONFLICT OF INTEREST

No conflict of interest was stated by the author.

REFERENCES

Acharya, A., Singh, S. K., Pereira, V., & Singh, P. (2018). Big data, knowledge co-creation and decision making in fashion industry. *International Journal of Information Management*, *42*, 90-101.

Al Hamdani, D. S. (2013). Mobile learning: A good practice. *Procedia-Social and Behavioral Sciences*, *103*, 665-674.

Ali, U., Shamsi, M. H., Bohacek, M., Purcell, K., Hoare, C., Mangina, E., & O'Donnell, J. (2020). A data-driven approach for multi-scale GIS-based building energy modeling for analysis, planning and support decision making. *Applied Energy*, *279*, 115834.

Austin, S. F., Frøsig, A., Buus, N., Lincoln, T., von Malachowski, A., Schlier, B., . . . Simonsen, E. (2021). Service user experiences of integrating a mobile solution (IMPACHS) into clinical treatment for psychosis. *Qualitative Health Research*, *31*(5), 942-954.

Awan, U., Shamim, S., Khan, Z., Zia, N. U., Shariq, S. M., & Khan, M. N. (2021). Big data analytics capability and decision-making: The role of data-driven insight on circular economy performance. *Technological Forecasting and Social Change*, *168*, 120766.

Biswas, S., & Sen, J. (2017). A proposed architecture for big data driven supply chain analytics. *ICFAI University Press (IUP) Journal of Supply Chain Management*, *XIII*[3(2016)], 7-34.

Blackwell, C. (2013). Teacher practices with mobile technology integrating tablet computers into the early childhood classroom. *Journal of Education Research*, *7*(4), 1-25.

Bousdekis, A., Lepenioti, K., Apostolou, D., & Mentzas, G. (2021). A review of data-driven decision-making methods for industry 4.0 maintenance applications. E*lectronics*, *10*(7), 828.

Bunterm, T., Srisawasdi, N., & Pondee, P. (2018). Preparing pre-service teachers to integrate mobile technology into science laboratory learning: an evaluation of technology-integrated pedagogy module. *International Journal of Mobile Learning and Organisation*, *12*(1), 1-17.

Calza, F., Sorrentino, A., & Tutore, I. (2023). Combining corporate environmental sustainability and customer experience management to build an integrated model for decision-making. *Management Decision*, *61*(13), 54-84.

Chen, C. H., Jong, M. S. Y., & Tsai, C. C. (2022). A comparison of in-service teachers' conceptions of barriers to mobile technology-integrated instruction and technology-integrated instruction. *Australasian Journal of Educational Technology*, 35-50.

Chen, J. S., Tsou, H. T., Chou, C. Y., & Ciou, C. H. (2020). Effect of multichannel service delivery quality on customers' continued engagement intention: A customer experience perspective. *Asia Pacific Journal of Marketing and Logistics*, *32*(2), 473-494.

Chen, S. C., Liu, M. L., & Lin, C. P. (2013). Integrating technology readiness into the expectation-confirmation model: an empirical study of mobile services. *Cyberpsychology, Behavior, and Social Networking*, *16*(8), 604-612.

Chen, T., Guo, W., Gao, X., & Liang, Z. (2021). AI-based self-service technology in public service delivery: user experience and influencing factors. *Government Information Quarterly*, *38*(4), 101520.

Churchill, D., Chiu, T., & Gu, N. J. (2016). Mobile learning, MOOCs and 21st century learning. In *Proceedings of the International Mobile Learning Festival 2015*. Retrieved from http://eprints.um.edu.my/14253/1/IMLFProceeding2015.pdf

Chylinski, M., Heller, J., Hilken, T., Keeling, D. I., Mahr, D., & de Ruyter, K. (2020). Augmented reality marketing: A technology-enabled approach to situated customer experience. *Australasian Marketing Journal*, *28*(4), 374-384.

Demirkan, H., & Delen, D. (2013). Leveraging the capabilities of service-oriented decision support systems: Putting analytics and big data in cloud. *Decision Support Systems*, *55*(1), 412-421.

Gerea, C., Gonzalez-Lopez, F., & Herskovic, V. (2021). Omnichannel customer experience and management: An integrative review and research agenda. *Sustainability*, *13*(5), 1-24.

Harricharan, M., Gemen, R., Celemín, L. F., Fletcher, D., De Looy, A. E., Wills, J., & Barnett, J. (2015). Integrating mobile technology with routine dietetic practice: The case of mypace for weight management. *Proceedings of the Nutrition Society*, *74*(2), 125-129.

Heilig, L., Stahlbock, R., & Voß, S. (2020). From digitalization to data-driven decision-making in container terminals. *Operations Research/Computer Science Interfaces Series*, 125-154.

Holmlund, M., Van Vaerenbergh, Y., Ciuchita, R., Ravald, A., Sarantopoulos, P., Ordenes, F. V., & Zaki, M. (2020). Customer experience management in the age of big data analytics: A strategic framework. *Journal of Business Research*, *116*, 356-365.

Jarvenpaa, S. L., & Lang, K. R. (2005). Managing the paradoxes of mobile technology. *Information Systems Management*, *22*(4), 7-23.

Jeble, S., Kumari, S., & Patil, Y. (2018). Role of big data in decision making. *Operations and Supply Chain Management*, *11*(1), 36-44.

Keengwe, J., Pearson, D., & Smart, K. (2009). Technology integration: Mobile devices (iPods), constructivist pedagogy, and student learning. *AACE Journal*, *17*, 333-346.

Khlaif, Z. (2018). Teachers' perceptions of factors affecting their adoption and acceptance of mobile technology in K-12 settings. *Computers in the Schools*, *35*(1), 49-67.

Khrais, L. T., & Alghamdi, A. M. (2021). The role of mobile application acceptance in shaping E-customer service. *Future Internet*, *13*(3), 1-13.

Lawless, K. A., & Pellegrino, J. W. (2007). Professional development in integrating technology into teaching and learning: Knowns, unknowns, and ways to pursue better questions and answers. *Review of Educational Research*, *77*(4), 575-614.

Li, C., Chen, Y., & Shang, Y. (2022). A review of industrial big data for decision making in intelligent manufacturing. *Engineering Science and Technology, an International Journal*, *29*, 101021.

Lu, J., Liu, A., Song, Y., & Zhang, G. (2020). Data-driven decision support under concept drift in streamed big data. *Complex and Intelligent Systems*, *6*(1), 157-163.

Maja, M. M., & Letaba, P. (2022). Towards a data-driven technology roadmap for the bank of the future: Exploring big data analytics to support technology roadmapping. *Social Sciences And Humanities Open*, *6*(1), 100270.

Montrieux, H., Vanderlinde, R., Schellens, T., & De Marez, L. (2015). Teaching and learning with mobile technology: a qualitative explorative study about the introduction of tablet devices in secondary education. *PLoS ONE*, *10*(12), 1-17.

Nxele, S. R., Moetlhoa, B., Kgarosi, K., & Mashamba-Thompson, T. (2023). A scoping review protocol on integration of mobile-linked POC diagnostics in community-based healthcare: User experience. *PLoS ONE*, *18*(2 February), 1-8.

Peeples, M. M., Iyer, A. K., & Cohen, J. L. (2013). Integration of a mobile-integrated therapy with electronic health records: Lessons learned. *Journal of Diabetes Science and Technology*, *7*(3), 602-611.

Peng, M. Y. P., Xu, Y., & Xu, C. (2023). Enhancing students' English language learning via M-learning: Integrating technology acceptance model and SOR model. *Heliyon*, *9*(2). https://doi.org/10.1016/j.heliyon.2023.e13302

Picciano, A. G. (2012). The evolution of big data and learning analytics in American higher education. *Journal of Asynchronous Learning Network*, *16*(3), 9-20.

Polese, F., Troisi, O., Grimaldi, M., & Romeo, E. (2019). A big data-oriented approach to decision-making: a systematic literature review. In *22nd international conference proceedings* (pp. 472-496). Retrieved from https://sites.les.univr.it/eisic/wp-content/uploads/2019/11/31-Polese-Troisi-Grimaldi-Romeo-1.pdf

Provost, F., & Fawcett, T. (2013). Data science and its relationship to big data and data-driven decision making. *Big Data*, *1*(1), 51-59.

Rossit, D. A., Tohmé, F., & Frutos, M. (2019). A data-driven scheduling approach to smart manufacturing. *Journal of Industrial Information Integration*, *15*, 69-79.

Saheb, T. (2020). An empirical investigation of the adoption of mobile health applications: Integrating big data and social media services. *Health and Technology*, *10*(5), 1063-1077.

Santos, P. A., Madeira, R. N., & Correia, N. (2021). Applications across co-located devices: User Interface distribution, state management and collaboration. *ACM International Conference Proceeding Series*, 602-613.

Saritas, O., Bakhtin, P., Kuzminov, I., & Khabirova, E. (2021). Big data augmentated business trend identification: The case of mobile commerce. *Scientometrics*, *126*(2), 1553-1579.

Shamim, S., Zeng, J., Khan, Z., & Zia, N. U. (2020). Big data analytics capability and decision making performance in emerging market firms: The role of contractual and relational governance mechanisms. *Technological Forecasting and Social Change*, *161*. https://doi.org/10.1016/j.techfore.2020.120315

Shi, C., Pei, Y., Li, D., & Wu, T. (2021). Influencing factors of catering o2o customer experience: An approach integrating big data analytics with grounded theory. *Tehnicki Vjesnik*, *28*(3), 862-872.

Sinha, M., Fukey, L., Balasubramanian, K., Kunasekaran, P., Ragavan, N. A., & Hanafiah, M. H. (2021). Acceptance of consumer-oriented health information technologies (Chits): Integrating technology acceptance model with perceived risk. *Informatica (Slovenia)*, *45*(6), 45-52.

Sousa, M. J., Pesqueira, A. M., Lemos, C., Sousa, M., & Rocha, Á. (2019). Decision-making based on big data analytics for people management in healthcare organizations. *Journal of Medical Systems*, *43*(9). https://doi.org/10.1007/s10916-019-1419-x

Tekiner, F., & Keane, J. A. (2013, October). Big data framework. In *2013 IEEE International Conference on Systems, Man, and Cybernetic*s (pp. 1494-1499). https://doi.org/10.1109/SMC.2013.258

Uzunboylu, H., Hürsen, Ç., Özütürk, G., & Demirok, M. (2015). Determination of Turkish University students' attitudes for mobile integrated EFL classrooms in North Cyprus and scale development: ELLMTAS. *Journal of Universal Computer Science*, *21*(10), 1283-1296.

Vecchio, P. Del, Mele, G., Ndou, V., & Secundo, G. (2018). Creating value from social big data: Implications for smart tourism destinations. *Information Processing and Management*, *54*(5), 847-860.

Yang, Y., Gong, Y., Land, L. P. W., & Chesney, T. (2020). Understanding the effects of physical experience and information integration on consumer use of online to offline commerce. *International Journal of Information Management*, *51*, 102046.

Yu, W., Wong, C. Y., Chavez, R., & Jacobs, M. A. (2021). Integrating big data analytics into supply chain finance: The roles of information processing and data-driven culture. *International Journal of Production Economics*, *236*, 108135.

Zanfardino, M., Castaldo, R., Pane, K., Affinito, O., Aiello, M., Salvatore, M., & Franzese, M. (2021). MuSA: A graphical user interface for multi-omics data integration in radiogenomic studies. *Scientific Reports*, *11*(1), 1-13.

Zhang, Y. [Yingfeng], Ren, S., Liu, Y., Sakao, T., & Huisingh, D. (2017). A framework for big data driven product lifecycle management. *Journal of Cleaner Production*, *159*, 229-240.

Zhang, Y. [Yongheng], Zhang, R., Wang, Y., Guo, H., Zhong, R. Y., Qu, T., & Li, Z. (2019). Big data driven decision-making for batch-based production systems. *Procedia CIRP*, *83*, 814-818.