

A Framework for Data-Informed Content Creation

Elda Diah Safitri¹ , Fitra Putri Oganda^{2*} , Carlos Perez³ 

¹State University of Jakarta, Indonesia

²Cai Sejahtera Indonesia, Indonesia

³Ilearning Incorporation, Colombia

¹eldadiasafitri_1205619039@mhs.unj.ac.id, ²fitra.putri@raharja.info, ³carloszz11@ilearning.co

*Corresponding Author

Article Info

Article history:

Submission March 13, 2026

Revised March 13, 2026

Accepted March 14, 2026

Published March 16, 2026

Keywords:

Data-Informed Content Creation

Audience Analysis

Digital Marketing Strategy

Content Lifecycle

Data-Driven Decision Making



ABSTRACT

The rapid growth of digital platforms has transformed content creation into a data-rich activity where audience interactions generate valuable insights. Despite the availability of large volumes of data, many content creators still rely heavily on intuition and use analytics only for superficial performance monitoring. **This study** addresses the gap between data availability and its practical integration into the content creation process by proposing a structured framework for data-informed content creation. **The research reviews** existing literature on digital marketing, content strategy, and data analytics to identify key stages where data can effectively guide creative decision-making. **The proposed framework integrates** audience analysis, data-driven content planning, content production, and performance evaluation into a continuous cycle of improvement. By combining analytical insights with creative processes, the framework helps organizations develop more relevant, engaging, and strategically aligned content. **The findings highlight** that a data-informed approach not only improves engagement and efficiency but also supports better collaboration between creative and analytical teams. Ultimately, this study contributes both theoretically and practically by providing a systematic model that enables marketers and content creators to leverage data more effectively throughout the entire content lifecycle.

This is an open access article under the [CC BY 4.0](https://creativecommons.org/licenses/by/4.0/) license.



This is an open-access article under the CC-BY license (<https://creativecommons.org/licenses/by/4.0/>)

©Authors retain all copyrights

1. INTRODUCTION

The rapid expansion of digital platforms has fundamentally transformed the way organizations and individuals create and distribute content [1]. In this data-intensive environment, every digital interaction such as clicks, shares, and comments generates valuable insights into audience behavior and preferences [2]. Content creation, once guided primarily by intuition and creativity, is now increasingly influenced by the availability of large-scale user data and sophisticated analytics tools. Businesses are no longer competing solely on creative output but on their ability to interpret data effectively to design content that resonates with their audiences and aligns with strategic objectives [3]. This shift marks the rise of data-informed decision-making, where creativity and analytics converge to optimize engagement and communication effectiveness [4].

However, despite the abundance of accessible data, many content creators continue to rely on traditional, intuition-based approaches. While metrics such as engagement rates and impressions are routinely tracked, they are often used superficially, without a deeper analytical integration into the content development process [5, 6]. This results in disjointed strategies, misaligned content goals, and underutilization of the vast data resources available to digital marketers. The problem lies not in the lack of data but in the absence of a

structured framework that translates data insights into practical guidance for creative decisions. As a result, opportunities to enhance audience relevance, performance consistency, and long-term engagement are frequently missed [7, 8]. Existing literature provides considerable discussion on content marketing and digital analytics, yet few studies offer a comprehensive model that systematically incorporates data into the creative workflow. Most research tends to emphasize the measurement of content performance after publication, rather than the integration of data-driven insights during the ideation and production stages. This reveals a clear research gap in developing an actionable framework that connects data collection, analysis, and creative execution [9, 10]. Addressing this gap is crucial, as organizations increasingly seek evidence-based methods to ensure that their content strategies are both innovative and effective in achieving business outcomes [11].

Therefore, this study aims to develop a structured framework for data-informed content creation that enables marketers and creators to systematically utilize data throughout the entire content lifecycle from audience analysis and content planning to performance evaluation and refinement [12]. By identifying key data sources and analytical metrics that influence content success, the proposed framework aspires to bridge the divide between creativity and analytics. Academically, this research contributes to the growing discourse on data-driven marketing and content strategy, while practically, it provides organizations with a replicable process to enhance personalization, engagement, and strategic alignment in digital communication [13, 14].

2. LITERATURE REVIEW

2.1. Content Creation Overview

Content creation has become a cornerstone of modern digital marketing and brand communication. In today's digital ecosystem, content serves not only as a tool for information delivery but also as a strategic instrument for building brand identity, customer trust, and long-term engagement [15]. The evolution of digital platforms, blogs, social media, video-sharing sites, and streaming channels has diversified content formats and expanded their roles across various stages of the customer journey [16]. Effective content creation now requires a balance between creativity, audience relevance, and strategic intent. Recent studies emphasize that successful content strategies depend on the ability to align content with audience expectations, ensuring consistency in tone, quality, and messaging. Consequently, understanding the different types of content and their purposes within brand communication is essential for designing data-informed strategies [17, 18].

2.2. The Role of Data in Content Strategy

The emergence of data-driven marketing has fundamentally changed how organizations plan and execute their content strategies [19]. Data analytics enables marketers to identify audience segments, track engagement, and evaluate the effectiveness of specific content types and formats [20]. Key performance indicators (KPIs) such as engagement rate, click-through rate, time on page, and conversion rate provide quantitative measures that inform creative and strategic decisions. Data allows marketers to move beyond intuition, helping them predict what types of content are likely to perform well and how audiences will respond [21, 22]. Moreover, the integration of behavioral and psychographic data deepens audience understanding, allowing businesses to craft more targeted and impactful narratives. This alignment between analytics and creativity ensures that content development is not only imaginative but also evidence-based and goal-oriented [23]. The increasing sophistication of analytics tools, such as Google Analytics, social media insights, and AI-based data visualization platforms, further strengthens the role of data as the foundation of content strategy [24]. To operationalize data-driven content strategies, marketers rely on specific performance metrics that quantify engagement, effectiveness, and audience response. These indicators provide the empirical foundation upon which creative and strategic decisions are made. Table 1 summarizes the key performance indicators most commonly used in evaluating content success across digital platforms [25].

As shown in Table 1, these performance indicators form the quantitative core of a data-informed content strategy. They enable marketers to move beyond subjective judgment and evaluate content effectiveness using measurable outcomes [26]. Metrics such as engagement rate and average time on page reveal the depth of audience interaction, while conversion and click-through rates reflect how effectively content drives behavioral responses aligned with business goals [27, 28]. Meanwhile, indicators like bounce rate and social share of voice provide diagnostic insights, helping identify weaknesses in content relevance and brand positioning. By continuously monitoring these KPIs, organizations can transform performance data into actionable intelligence—informing iterative improvements in content planning, production, and distribution [29]. Ultimately,

Table 1. Key Performance Indicators (KPIs) for Data-Driven Content

KPI	Definition	Relevance to Content Creation	Typical Benchmark
Engagement Rate	Percentage of users who interact with content (likes, comments, shares, clicks).	Reflects how effectively content captures audience interest and interaction.	1–5% for social media; 5–10% for video content.
Bounce Rate	Percentage of visitors who leave a page without further interaction.	Indicates content relevance and user satisfaction with the experience.	Ideally below 50%.
Average Time on Page	Average amount of time a user spends viewing a content page.	Measures content quality and audience engagement depth.	Over 1 minute is generally positive.
Conversion Rate	Proportion of users completing a desired action (e.g., sign-up, purchase).	Shows how well content drives business objectives.	2–5% for general campaigns.
Click-Through Rate (CTR)	Ratio of users clicking on a link or CTA compared to total impressions.	Reflects the effectiveness of calls-to-action and message clarity.	1–3% typical for ads; higher for targeted content.
Content Reach	Total number of unique users exposed to a piece of content.	Demonstrates visibility and distribution effectiveness.	Varies by platform; higher is better.
Social Share of Voice (SSoV)	Percentage of brand mentions compared to competitors in digital spaces.	Indicates brand visibility and influence in online conversations.	Context-dependent; trend-based evaluation recommended.

these metrics ensure that creative decisions are evidence-based, audience-centered, and strategically aligned with measurable objectives [30].

2.3. Content Personalization

One of the most transformative outcomes of data utilization in marketing is content personalization. Personalization involves tailoring content to match individual preferences, behaviors, and contexts using data collected from digital interactions. Studies demonstrate that personalized content significantly improves engagement rates, customer satisfaction, and brand loyalty [31]. Advanced technologies such as machine learning and artificial intelligence have enabled dynamic content delivery where recommendations, visuals, and messages adapt in real time based on user data [32, 33]. Recommendation engines used by platforms like YouTube, Spotify, and Netflix exemplify how data-driven personalization enhances user experience and retention. In digital marketing, similar techniques allow brands to segment audiences and deliver customized messaging that aligns with specific demographics or behavioral clusters. However, achieving effective personalization also depends on maintaining ethical data practices, ensuring user consent, and balancing automation with authentic human creativity [34, 35].

2.4. Frameworks for Data-Informed Decision Making

Existing frameworks in marketing and digital strategy have explored the integration of data into decision-making, yet few provide a comprehensive, end-to-end model for content creation [36]. Traditional marketing frameworks such as the customer journey model or AIDA (Attention, Interest, Desire, Action) focus on engagement flow but often overlook how data can continuously inform and refine content design [37]. Recent approaches emphasize iterative cycles of data collection, analysis, content adaptation, and performance evaluation. For example, the Data-Driven Marketing Model (DDMM) proposes aligning business goals with analytical insights and feedback loops for ongoing optimization [38, 39]. Nonetheless, there remains a lack of structured frameworks specifically dedicated to guiding creators through each stage of content production

using empirical evidence. Developing such a model would bridge the gap between marketing analytics and creative execution, offering a more systematic process for translating insights into action [40, 41].

2.5. Challenges in Data-Informed Content Creation

While the benefits of data-informed content creation are widely acknowledged, several challenges hinder its effective implementation [42]. First, data accessibility and quality remain persistent issues: fragmented datasets, missing information, and inconsistencies across platforms often lead to unreliable insights [43]. Second, integration across multiple sources such as social media analytics, content management systems (CMS), and customer relationship management (CRM) databases poses technical and organizational challenges. Third, the risk of data overload can obscure meaningful insights, leading to superficial analysis focused on vanity metrics rather than strategic indicators [44]. Another critical challenge lies in balancing creativity with analytics: while data provides structure and direction, excessive reliance on it may stifle originality and innovation. Finally, ethical and privacy considerations related to data collection and personalization demand rigorous compliance with data protection regulations such as GDPR and similar frameworks worldwide. Addressing these challenges is crucial for ensuring that data serves as an enabler rather than a constraint in the creative process.

2.6. Theoretical Framework

This study is grounded in theories of consumer behavior, decision-making, and digital marketing that emphasize the intersection between information processing and creativity. The Elaboration Likelihood Model (ELM) and Uses and Gratifications Theory (UGT), for instance, provide insights into how consumers engage with content based on motivation and relevance. Similarly, Data-Driven Decision Theory (DDDT) supports the idea that structured data interpretation enhances the precision of marketing outcomes. Together, these theoretical perspectives inform the development of a data-informed content creation framework that bridges analytical reasoning and creative strategy ensuring that content resonates both emotionally and empirically with its intended audience.

3. METHODOLOGY

3.1. Research Design

This study adopts a mixed-methods approach, combining both qualitative and quantitative techniques to develop and validate a data-informed framework for content creation. The qualitative component focuses on identifying best practices, conceptual relationships, and expert perspectives in content strategy, while the quantitative component emphasizes the analysis of audience and performance data to derive actionable insights. Together, these methods allow for a comprehensive understanding of how data can be systematically integrated into the creative process. The research design follows an exploratory–descriptive orientation: exploratory in identifying relevant variables and metrics, and descriptive in outlining the step-by-step framework for implementation.

3.2. Data Collection

Data for this study are collected from three primary sources: audience insights, content performance data, and market research information.

- **Audience Insights:** Data is gathered from analytics platforms such as Google Analytics, YouTube Studio, and social media dashboards (e.g., Instagram Insights, Facebook Analytics, X/Twitter Analytics). These data include demographic information, behavioral trends, interests, and device usage patterns. Surveys and structured interviews with target audiences are also employed to capture qualitative perspectives on content preferences and motivations for engagement.
- **Content Performance Data:** Historical data from existing digital content (e.g., blog posts, social media posts, videos) are collected to assess key performance indicators (KPIs) such as engagement rate, average view duration, bounce rate, and conversion metrics. This quantitative dataset provides empirical evidence for identifying patterns that correlate with successful content performance.
- **Market Research Data:** Competitor analysis and industry benchmarking are conducted to contextualize findings within broader digital marketing trends. This includes monitoring top-performing content in relevant industries, analyzing keyword trends through tools such as Google Trends and SEMrush, and examining emerging audience behaviors.

By combining these datasets, the study ensures triangulation, enhancing both validity and reliability in developing the proposed framework.

To synthesize these sources, Table 1 summarizes the primary data inputs used in this study, detailing their origins, types, and respective functions in the content creation process.

Table 2. Key Data Sources for Content Creation

Data Source Type	Example Tools / Platforms	Data Collected	Purpose in Content Creation
Audience Insights	Google Analytics, Meta Insights, YouTube Analytics	Demographic data (age, gender, location), behavioral data (session duration, navigation path)	Identify target audience segments and consumption patterns.
Engagement Metrics	Instagram Insights, TikTok Analytics, X (Twitter) Analytics	Likes, comments, shares, saves, views	Measure audience engagement and determine content resonance.
Performance Data	Google Search Console, CMS analytics, Conversion reports	Click-through rate (CTR), bounce rate, conversion rate	Evaluate content performance and ROI effectiveness.
Market and Competitor Data	SEMrush, Ahrefs, BuzzSumo	Keyword trends, backlink profiles, competitor performance	Identify market opportunities and content gaps.
Survey and Feedback Data	Online surveys, polls, customer feedback forms	Audience opinions, satisfaction ratings, qualitative responses	Capture direct audience sentiment and content preferences.
Social Listening Data	Brandwatch, Hootsuite, Sprout Social	Mentions, sentiment analysis, trending topics	Monitor audience conversations and identify emerging themes.

As illustrated in Table 2, the integration of multiple data sources allows for a multidimensional analysis of audience behavior and content effectiveness. Quantitative data derived from engagement and performance metrics provide measurable evidence of user interaction, while qualitative insights gathered from surveys and social listening reveal contextual motivations behind audience preferences. The triangulation of these data types ensures methodological robustness, enabling the study to construct a framework that captures both behavioral patterns and emotional drivers of digital engagement.

3.3. Data Analysis

The data analysis phase aims to extract meaningful patterns and actionable insights from the collected datasets to inform the development of the data-informed content creation framework. A combination of quantitative and qualitative analytical techniques is employed to ensure a holistic understanding of audience behavior, content performance, and market dynamics.

- **Segmentation Analysis:** Audience data are analyzed using clustering techniques (e.g., K-Means, Hierarchical Clustering) to segment users based on demographic and behavioral attributes. These clusters help identify distinct audience groups with unique content consumption preferences, allowing for more targeted and personalized content strategies. Visualization tools such as Tableau or Python’s Seaborn are used to illustrate audience clusters and behavioral differences.
- **Correlation Analysis:** Quantitative techniques are applied to determine relationships between content variables and performance outcomes. Correlation analysis identifies which factors such as content type, publishing time, or format have the strongest influence on engagement metrics (e.g., click-through rate, view duration, or conversion). Regression models are then used to predict the expected performance of future content pieces based on these key variables.
- **Content Mapping:** Using both statistical results and qualitative interpretations, a content mapping process is conducted. This step aligns audience segments with specific content categories, keywords, and creative

formats that have proven effective. Machine learning-assisted tools like Natural Language Processing (NLP) are also utilized to detect recurring themes or topics in high-performing content. This enables a deeper understanding of audience interests and emotional triggers that drive engagement.

- **Triangulation and Validation:** To enhance the reliability of findings, triangulation is applied by cross-verifying insights from audience analytics, content performance data, and market benchmarks. Consistent patterns observed across multiple data sources are used as the foundation for building the proposed framework. This iterative validation process ensures that the framework is not only data-driven but also practically applicable in diverse digital marketing contexts.

Overall, this analytical approach transforms raw data into structured knowledge, forming the empirical backbone of the Data-Informed Content Creation Framework. It bridges the gap between analytics and creativity, ensuring that every content decision is both evidence-based and strategically aligned with audience behavior and organizational objectives.

3.4. Developing the Framework

To build a robust model for data-informed content creation, this study refers to the fundamental concept of the content marketing lifecycle, which emphasizes the iterative nature of content development from research to analysis. As illustrated in Figure 1, the process involves five interrelated stages: research, ideation and planning, creation and optimization, distribution, and analysis. This model underscores the importance of continuous feedback loops in refining content effectiveness over time.

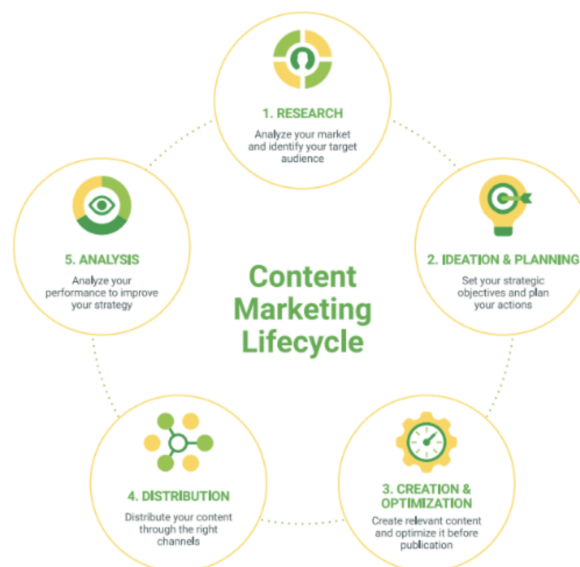


Figure 1. Content Marketing Lifecycle

The content marketing lifecycle illustrated above provides the foundational logic for designing a data-informed content creation framework. It demonstrates how content development operates as an iterative process, where each stage research, ideation, creation, distribution, and analysis feeds into the next through a feedback loop. However, while the traditional lifecycle emphasizes the sequence of creative and strategic steps, it often lacks a systematic integration of data analytics within each phase. Therefore, this study extends the model by embedding data driven mechanisms across all stages, ensuring that content decisions are informed by empirical insights rather than intuition alone. This adaptation transforms the conventional lifecycle into a dynamic system of continuous learning and optimization. Building upon this foundation, the present study proposes a more comprehensive, data driven framework that explicitly integrates data analytics into every stage of the content lifecycle. Based on the analytical findings, a step-by-step framework for data informed content creation is constructed. The framework outlines a continuous cycle of content planning, creation, distribution, and evaluation, underpinned by data feedback loops. The proposed stages include:

- **Insight Synthesis:** Translate raw data into actionable insights about audience preferences and trends.

- Audience Analysis: Identify and segment target audiences based on demographic and behavioral data.
- Content Ideation: Generate content concepts grounded in these insights.
- Content Production: Develop creative outputs that align with data-derived strategies.
- Performance Tracking: Monitor engagement metrics and evaluate outcomes against predefined objectives.
- Optimization: Refine future content strategies using performance feedback and evolving data patterns.
- This cyclical structure ensures that content creation remains adaptive and continuously optimized in response to dynamic audience behavior and market trends.

3.5. Validation

The proposed framework will be validated through case studies and real-world applications. Selected organizations or brands will apply the framework to their digital marketing processes over a defined period. Metrics before and after implementation will be compared to evaluate improvements in engagement, conversion, and audience satisfaction. Additionally, expert evaluations from marketing analysts and content strategists will provide qualitative validation of the framework's practicality and effectiveness. 3.6 Tools and Software The research utilizes a range of analytical and visualization tools to manage and interpret data effectively:

- Python (Pandas, Scikit-learn): for statistical and clustering analysis.
- R Programming: for correlation and regression analysis.
- Google Analytics and Social Media Insights: for audience and performance metrics.
- Content Management Systems (CMS): such as WordPress and HubSpot for content tracking.
- Data Visualization Tools: including Tableau and Power BI for reporting and dashboard development.

These tools collectively enable an integrated analytical environment that supports the technical and interpretive requirements of the study.

4. RESULT AND DISCUSSION

4.1 Insights from Analytical Findings The results indicate that integrating data analytics into the content creation process enables organizations to better align their creative output with audience needs and preferences. Audience segmentation emerged as a critical component, revealing that different demographic and behavioral groups respond distinctly to content formats, tone, and delivery channels. Engagement metrics such as click-through rate, dwell time, and conversion rate serve as measurable reflections of content resonance and effectiveness.

Furthermore, the iterative nature of data-informed content creation where performance data continuously refine content strategies ensures that content evolves alongside audience behavior. These insights validate the proposed framework's cyclical structure, confirming that sustainable engagement relies on ongoing adaptation rather than static planning.

4.1. Implications for Content Strategy

The integration of audience analytics, content performance data, and market intelligence transforms how organizations conceptualize and execute content strategies. Rather than relying on intuition or isolated creative decisions, marketers can now use empirical evidence to predict audience reactions and optimize message delivery. The findings highlight that data not only improves targeting precision but also informs the creative process itself. For instance, keyword analytics and sentiment analysis reveal which narratives or visual elements generate stronger emotional engagement. This synergy between analytics and creativity fosters a data-informed culture where storytelling remains authentic but strategically aligned with measurable objectives.

4.2. Comparison with Traditional Content Creation

When compared with traditional, intuition-based approaches, the data-informed framework demonstrates greater strategic alignment, adaptability, and performance accountability. Traditional methods often emphasize creativity and originality but lack systematic validation through metrics. Consequently, content may fail to resonate or achieve desired engagement outcomes. In contrast, data-informed creation combines quantitative insight with creative intuition, resulting in a more balanced and evidence-driven approach. Table 3 provides a comparative overview of the two approaches, highlighting their respective strengths and weaknesses.

4.3. Strategic and Practical Implications

From a strategic perspective, organizations adopting data informed frameworks gain significant competitive advantages. The continuous monitoring of performance metrics enables real time adjustments, improving efficiency and return on investment (ROI). The approach also enhances cross-functional collaboration between creative, analytical, and strategic teams ensuring that content production is not only imaginative but also business-oriented.

Practically, data informed content strategies support agile decision making and personalization. Predictive analytics tools, sentiment monitoring, and AI-driven recommendation systems can forecast emerging audience interests, allowing brands to deliver relevant content before competitors do. Moreover, the ability to measure every stage of content performance supports transparent evaluation and resource optimization.

4.4. Limitations and Future Considerations

Despite its advantages, the data-informed approach presents several challenges. Data fragmentation across multiple platforms can complicate integration and analysis. Additionally, maintaining data accuracy and relevance is an ongoing concern, as algorithms and audience behaviors evolve rapidly.

Another limitation lies in the creative-data balance an overreliance on analytics may constrain creativity and lead to content uniformity. Thus, future research should explore hybrid models that integrate AI-based personalization with human-centered creativity to maintain originality while optimizing performance. Lastly, further validation of the proposed framework could be conducted across industries and content types to assess its scalability and adaptability in diverse digital environments.

5. CONCLUSION

This study proposes a structured framework for data-informed content creation that integrates data analysis into every stage of the content development process, from audience understanding and planning to evaluation and optimization. The findings demonstrate that combining analytical insights with creative intuition enables organizations to produce content that is more relevant, targeted, and strategically aligned with audience needs and business objectives. Compared to traditional intuition-based approaches, data-informed strategies support more consistent performance measurement, faster decision-making, and improved engagement outcomes. However, the implementation of this approach also presents challenges, including data integration issues and the risk of overreliance on analytics that may limit creativity. Therefore, a balanced approach that combines data insights with human creativity is essential. Future research should further test the proposed framework across different industries and digital platforms to evaluate its scalability and effectiveness. Overall, adopting a data-informed framework can help organizations optimize their content strategies and remain competitive in an increasingly data-driven digital environment.

6. DECLARATIONS

6.1. About Authors

Elda Diah Safitri (ED)  <https://orcid.org/0000-0002-2746-5364>

Fitra Putri Oganda (FP)  <https://orcid.org/0000-0002-4590-0657>

Carlos Perez (CP)  <https://orcid.org/0009-0006-5344-6833>

6.2. Author Contributions

Conceptualization: ED; Methodology: CP; Software: FP; Validation: CP and FP; Formal Analysis: ED and CP; Investigation: ED; Resources: FP; Data Curation: CP; Writing Original Draft Preparation: FP and

ED; Writing Review and Editing: FP and CP; Visualization: ED; All authors, ED, FP, and CP, have read and agreed to the published version of the manuscript.

6.3. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

6.4. Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

6.5. Declaration of Conflicting Interest

The authors declare that they have no conflicts of interest, known competing financial interests, or personal relationships that could have influenced the work reported in this paper.

REFERENCES

- [1] R. Jiao, "From 'data-driven' to 'data-informed' design—grounding ai for design in knowledge, context and decisions," *Journal of Engineering Design*, pp. 1–23, 2026.
- [2] N. Septiani, A. S. Bist, C. S. Bangun, and E. Dolan, "Digital business student development for entrepreneurs with software," *Startupreneur Business Digital (SABDA Journal)*, vol. 1, no. 1, pp. 34–44, 2022.
- [3] E. Brazauskienė, "Educational decision-making in digital education: A conceptual review of data-driven, data-based, and data-informed approaches," *Revista de Pedagogie Digitala*, vol. 4, no. 1, pp. 63–72, 2025.
- [4] B. K. Bintaro, P. Sokibi, I. Amsyar, and Y. P. A. Sanjaya, "Utilizing digital marketing as a business strategy: Utilizing digital marketing as a business strategy," *Startupreneur Business Digital (SABDA Journal)*, vol. 1, no. 1, pp. 63–71, 2022.
- [5] I.-A. Chounta, A. Ortega-Arranz, S. Daskalaki, Y. Dimitriadis, and N. Avouris, "Toward a data-informed framework for the assessment of digital readiness of higher education institutions," *International Journal of Educational Technology in Higher Education*, vol. 21, no. 1, p. 59, 2024.
- [6] D. Mohammed, A. G. Prawiyog, and E. R. Dewi, "Environmental management/marketing research: Bibliographic analysis," *Startupreneur Business Digital (SABDA Journal)*, vol. 1, no. 2, pp. 191–197, 2022.
- [7] J. de Jong, F. Fernandez-Monge, Q. Mayne, and N. Vachon, "The data-informed city: a conceptual framework for advancing research and practice," *Information Polity*, vol. 30, no. 3, pp. 201–217, 2025.
- [8] D. S. Wuisan and T. Handra, "Maximizing online marketing strategy with digital advertising," *Startupreneur Business Digital (SABDA Journal)*, vol. 2, no. 1, pp. 22–30, 2023.
- [9] Y.-C. Chang and H. M. Menzies, "Data-informed decision-making in higher education: Lessons from a teacher education program," *Research and Practice in Assessment*, vol. 17, no. 1, p. 59, 2022.
- [10] D. Immaniar, A. A. Aryani, S. Z. Ula, M. R. Firmansyah, and Y. Rahman, "Challenges smart grid in blockchain applications," *Blockchain Frontier Technology*, vol. 2, no. 2, pp. 1–9, 2023.
- [11] L. Skoury, S. Treml, N. Opgenorth, F. Amtsberg, H. J. Wagner, A. Menges, and T. Wortmann, "Towards data-informed co-design in digital fabrication," *Automation in Construction*, vol. 158, p. 105229, 2024.
- [12] M. A. W. Saputra, D. Ochtaffia, D. Apriani, S. C. Yusfi, and M. Gori, "Blockchain applications in education affecting challenges and problems in digital," *Blockchain Frontier Technology*, vol. 2, no. 2, pp. 15–23, 2023.
- [13] M. Abac, "Decision making in the innovation process: Data-driven vs. data-informed," *Journal of Innovation in Polytechnic Education*, vol. 6, no. 1, pp. 24–28, 2024.
- [14] M. S. Aprizal, M. Y. Fadilla, M. R. A. Adha *et al.*, "Ensuring security using blockchain technology," *Blockchain Frontier Technology*, vol. 2, no. 2, pp. 54–57, 2023.
- [15] J. Chalermdit, N. Wittayakhom, N. Chumuang, T. Ganokratanaa, T. Phetcharat, and M. Ketcham, "The augmentation of interest in a community application for pethub via data-informed content recommendations tailored," in *Proceedings of the International Workshop on Artificial Intelligence for Signal, Image Processing and Multimedia*, 2024, pp. 1–5.
- [16] B. Bhima, A. R. A. Zahra, T. Nurtino, and M. Z. Firli, "Enhancing organizational efficiency through the integration of artificial intelligence in management information systems," *APTISI Transactions on Management*, vol. 7, no. 3, pp. 282–289, 2023.

- [17] E. Gefenas, J. Lekstutiene, V. Lukaseviciene, M. Hartlev, M. Mourby, and K. Cathaoir, "Controversies between regulations of research ethics and protection of personal data: informed consent at a cross-road," *Medicine, Health Care and Philosophy*, vol. 25, no. 1, pp. 23–30, 2022.
- [18] A. Lansonja and M. Austin, "The role of information management in enhancing organizational resilience," *APTISI Transactions on Management*, vol. 8, no. 1, pp. 32–39, 2024.
- [19] J. D. Lomas, N. Patek, and J. Forlizzi, "Designing data-informed intelligent systems to create positive impact," in *Proceedings of Relating Systems Thinking and Design (RSD10) 2021 Symposium*, 2022.
- [20] E. A. Beldiq, B. Callula, N. A. Yusuf, and A. R. A. Zahra, "Unlocking organizational potential: Assessing the impact of technology through smartpls in advancing management excellence," *APTISI Transactions on Management*, vol. 8, no. 1, pp. 40–48, 2024.
- [21] L. Ahva, M. Salonen, L. Ovaska, and K. Talvitie-Lamberg, "The managerial and future-oriented role of audience data in data-informed news organisations," *Journalism*, vol. 27, no. 1, pp. 3–21, 2026.
- [22] R. G. Munthe, Q. Aini, N. Lutfiani, I. Van Persie, and A. Ramadhan, "Transforming scientific publication management in the era of disruption: Smartpls approach in innovation and efficiency analysis," *APTISI Transactions on Management*, vol. 8, no. 2, pp. 123–130, 2024.
- [23] I. Karsten and A. van Zyl, "Design-based research (dbr) as an effective tool to create context-sensitive and data-informed student success initiatives," *Journal of student affairs in Africa*, vol. 10, no. 1, pp. 15–31, 2022.
- [24] A. Kadim, I. Yusnita, A. Sutarman, R. Lesmana, and F. A. Ramahdan, "Assessing the impact of corporate governance and strategic leadership on economic growth and market stability," *IAIC Transactions on Sustainable Digital Innovation (ITSDI)*, vol. 6, no. 2, pp. 177–187, 2025.
- [25] A. G. Di Stefano, M. Ruta, and G. Masera, "Advanced digital tools for data-informed and performance-driven design: a review of building energy consumption forecasting models based on machine learning," *Applied Sciences*, vol. 13, no. 24, p. 12981, 2023.
- [26] J. Lee and J. Lee, "Generative ai chatbot for teachers' data-informed decision-making," *Educational Technology & Society*, vol. 28, no. 3, pp. 298–317, 2025.
- [27] Y. Ismiyanti, S. D. W. Prajanti, C. B. Utomo, E. Handoyo, E. Banowati, I. Kusmaryono, and M. N. Huda, "Technopreneurship enhancing student msme's competitive edge via digital marketing," *Aptisi Transactions on Technopreneurship (ATT)*, vol. 8, no. 1, pp. 24–36, 2026.
- [28] L. Seiling, R. Gsenger, F. Mulugeta, M. Henningsen, L. Mischau, and M. Schirmbeck, "Beware: Processing of personal data—inform consent through risk communication," *IEEE Transactions on Professional Communication*, vol. 67, no. 1, pp. 4–25, 2024.
- [29] S. Li, Z. Zhou, Z. Tie, B. Wang, M. Ye, L. Du, R. Cui, W. Liu, C. Wan, Q. Liu *et al.*, "Data-informed discovery of hydrolytic nanozymes," *Nature Communications*, vol. 13, no. 1, p. 827, 2022.
- [30] A. F. Eriyawan and C. A. Utama, "The effect of greenwashing on firm performance with multiple directorships as moderating variable," *Aptisi Transactions on Technopreneurship (ATT)*, vol. 8, no. 1, pp. 74–84, 2026.
- [31] J. Van Godwin, S. Long, B. Bowen, H. Reed, N. Page, M. Svobodova, M. Boffey, F. Rice, Y. Shenderovich, R. Bevan-Jones *et al.*, "Piloting a data dashboard to support data-informed health promotion in secondary schools: qualitative analysis of stakeholder interviews," *BMC Public Health*, 2026.
- [32] B. Wang, Z. Cai, M. M. Karim, C. Liu, and Y. Wang, "Traffic performance gpt (tp-gpt): Real-time data informed intelligent chatbot for transportation surveillance and management," in *2024 IEEE 27th International Conference on Intelligent Transportation Systems (ITSC)*. IEEE, 2024, pp. 460–467.
- [33] T. A. Prasetyo, A. Antonius, and S. Sumirin, "Experimental evaluation of modified t-stub connections for seismic applications," *Aptisi Transactions on Technopreneurship (ATT)*, vol. 8, no. 1, pp. 125–137, 2026.
- [34] E. Susetyono, D. S. Priyarsono, A. Sukmawati, and P. Nurhayati, "A structural model of risk governance and maturity in ultra microfinance soes," *International Journal of Cyber and IT Service Management (IJCITSM)*, vol. 5, no. 2, pp. 156–170, 2025.
- [35] A. Strauss, K. Bergmeister, P. Daro, G. Mancini, F. Sattler, and A. Bigaj-van Vliet, "Monitoring and data-informed approaches for the assessment of existing structures," *Structural Concrete*, vol. 24, no. 4, pp. 4433–4445, 2023.
- [36] S. A. Sibagariang, N. Septiani, and A. Rodriguez, "Enhancing educational management through social media and e-commerce-driven branding," *International Journal of Cyber and IT Service Management (IJCITSM)*, vol. 5, no. 2, pp. 235–245, 2025.

-
- [37] E. Sherrard-Smith, P. Winskill, A. Hamlet, C. Ngufor, R. N'Guessan, M. W. Guelbeogo, A. Sanou, R. K. Nash, A. Hill, E. L. Russell *et al.*, "Optimising the deployment of vector control tools against malaria: a data-informed modelling study," *The Lancet Planetary Health*, vol. 6, no. 2, pp. e100–e109, 2022.
- [38] M. Korvink, M. Biondolillo, J. W. Van Dijk, A. Banerjee, C. Simenz, and D. Nelson, "Detection of potential causal pathways among social determinants of health: A data-informed framework," *Social Science & Medicine*, vol. 373, p. 118025, 2025.
- [39] T. Huang, J. Fredericks, and S. Maalsen, "Interior media architecture: using social media as a tool for data informed design solutions," in *Proceedings of the 6th Media Architecture Biennale Conference*, 2023, pp. 28–37.
- [40] W. Lutz, A.-K. Deisenhofer, B. Weinmann-Lutz, and M. Barkham, "Data-informed clinical training and practice." 2023.
- [41] P. Kohler, K. Agot, I. N. Njuguna, J. Dyer, J. Badia, W. Jiang, K. Beima-Sofie, N. Chhun, I. Inwani, S. K. Shah *et al.*, "Data-informed stepped care to improve youth engagement in hiv care in kenya: a protocol for a cluster randomised trial of a health service intervention," *BMJ open*, vol. 12, no. 10, p. e062134, 2022.
- [42] B. N. Phillips, A. R. Fleming, S. M. Kwiatek, T. Riesen, C. K. Emery, A. Langone, L. Gripentrog, M. Garside, J. Cardis, A. Snyder *et al.*, "Data-informed collaboration in transition services: A model for improving outcomes," *Journal of Vocational Rehabilitation*, vol. 63, no. 2, pp. 160–170, 2025.
- [43] T. Kano, I. Horikoshi, K. Koike, and H. Ogata, "Yinsight: Supporting data-informed competency assessment with customizable indicators in a self-regulated learning context," *Research and Practice in Technology Enhanced Learning*, vol. 21, pp. 044–044, 2026.
- [44] S. O. Alfred and M. Amiri, "A data-informed knowledge discovery framework to predict fatigue properties of additively manufactured ti–6al–4v, in718 and als10mg alloys using fatigue databases," *Progress in Additive Manufacturing*, vol. 10, no. 9, pp. 6183–6210, 2025.
-