MPRI-JAAER | INTERNATIONAL JOURNAL OF APPLIED & ADVANCED ENGINEERING RES.
VOL. 02 NO. 1 OCT-2023 ISSN: 1116 - 2716

DELIVERING CONSISTENT CONTENT EXPERIENCES ACROSS CHANNELS USING COMPONENT-BASED CMS DESIGN

SAI PHANEENDRA MANIKANTESH KODETE

College of Arts & Sciences, Sacred Heart University, Fairfield, Connecticut, 06825, USA

Abstract

In order to have well engaged audiences and enhanced brand loyalty, consistent content experiences across multiple channels ought to be delivered at an appreciable extent. This paper examines the benefits of a component-based Content Management System (CMS) design in the delivering of consistent content experiences across channels, such as websites, social networking sites, and mobile apps. The paper demonstrates that with a component-based CMS, reusable content modules are created easily and adequately. These modules are easily adaptable and can be deployed across different channels. It is also realized that the design allows for personalization and localization, leading to the streamlining of content to specific audience segments amidst maintained consistency. The overall implication of the study is that organizations that use component-based CMS design to deliver consistent content experiences across channels can

Keywords: Delivering, Consistent content experiences, Component-based CMS design, Channels, Streamlining

EDITOR-IN-CHIEF
Prof. Saeid Eslamian [IRAN]

INTERNATIONAL JOURNAL – AAER
VOL. 02 NO. 1 OCT-2023 ISSN: 1116 - 2716

adequately maneuver the complexities of content delivery across channels and competently maintain satisfactory consistent content delivering experiences. Such delivering increases efficiency and fosters work collaboration among content creators, designers, and developers. In implementing a component-based CMS design, well defined content strategies should be deployed for quality and functional systems, and performance analytics should be integrated for monitoring of performance across channels. By so doing, organizations deliver seamless, engaging and consistent content experiences and pave way for the realization of organizational objectives.

Introduction

These days, Content Management Systems (CMS) are leveraged by organizations for efficient management and delivering of digital content (Contentstack, 2021). These systems rose to meet the rising need of the 21st century digital landscape and the increasing demand for online content. CMS evolved when basic HTML websites were manually updated (The Headless CMS for marketers, 2017). The advances in the digital landscape led to transition of CMS from simple text editors to classy systems that can handle user permissions, multimedia content, version control, and so on. With the advances, CMS now offers a range of functions that meet diverse user needs and preferences, allowing for user satisfaction (Lofthouse, 2023; Fitzgerald, 2021).

Following the proliferation of web-based platforms and the growth of online content, there has been growing demand for comprehensive and user-friendly CMS solutions. CMS provide users with the ability to easily design, produce, manage, and publish content (Headless, 2021; Dimitriyev et al., 2010). There is no doubt that consumer preferences and technology

EDITOR-IN-CHIEF
Prof. Saeid Eslamian [IRAN]

INTERNATIONAL JOURNAL – AAER
VOL. 02 NO. 1 OCT-2023 ISSN: 1116 - 2716

integration are needed to maintain flexibility, adaptability and content strategy (Tapia et al., 2020; Newman, 2019). To have well engaged audiences and enhanced brand loyalty, consistent content experiences across multiple channels have to be delivered significantly. This paper examines the benefits of a component-based content management systems (CMS) design in delivering consistent content experiences across channels. Its focus is on the role played by web applications in fostering functionality, scalability, and usability.

Component-Based CMS Design

The different components of CMS represent different pieces of content, such as videos, text blocks, images, forms and interactive elements. Component-based CMS design has lots of benefits. One of the benefits is reusability (Dushnitsky & Stroube, 2021). This benefit borders on the fact that components can be reused across various channels and pages. The reuse of components ensures consistent presentation of content. Another benefit is scalability. With new channels, such as mobile apps, social media and websites, the creation of new components can be done without starting afresh (Shopify, 2019). Component-based CMS design enables content teams to easily and speedily assemble pages using existing components, thereby reducing the time to spend on creating content and updates. Personalization is another benefit.

With component-based CMS design, components can be tailored towards various audience segments amidst the maintenance of consistent brand voices and styles (Radford et al., 2019). In contemporary times, content management implementation has been appreciably significant. The application of AI to content management has brought forth significant transformation. Consequently, organizations have changed their approaches to content design and management, including how they

EDITOR-IN-CHIEF
Prof. Saeid Eslamian [IRAN]

INTERNATIONAL JOURNAL – AAER
VOL. 02 NO. 1 OCT-2023 ISSN: 1116 - 2716

address the challenges of content management. Blog writing, product catalog management, customer service documentation, social media management, and email marketing are core areas where AI has been transforming content management, showing how generative AI has transcended from being research tools to serving as major feasible components of modern content operations and management (Fitzgerald, 2021; Sayali et al., 2021).

All application types rate high, above average (Radford et al., 2019). Accordingly, the current extent of implementation of blog content generation can be considered to be very high. Blog content generation applications are revolutionary and offer strategic focus benefits. The implementation extent of product descriptions can be considered high. The product descriptions applications offer scalable creation benefits, with significant impact on products. Customer service documentation is an application type that has gained an excellent extent of implementation success (Wakode, 2013; Patel et al., 2012). Its impact is data-driven, while the overall operational benefit is proactive support. Social media management is currently at a very good level of implementation, with platform-adaptive impact and brand consistency operational benefit (Dushnitsky & Stroube, 2021).

Components and Functions of CMS

The core components of CMS are content creation and editing, user management, workflow management, and publishing and delivery (Newman, 2019; Taylor & Clark, 2016). With the intuitive interfaces and WYSIWYG editors of the CMS, users design and edit content with ease (Li & Zhang, 2017). Beyond easy design and editing of digital content, users leverage CMS features for classifying and tagging content to facilitate effective organization and retrieval of digital content (Gupta & Sharma,

EDITOR-IN-CHIEF
Prof. Saeid Eslamian [IRAN]

INTERNATIONAL JOURNAL – AAER
VOL. 02 NO. 1 OCT-2023 ISSN: 1116 - 2716

2018). User management entails role-based access control, which allows for administrators to define user roles and permissions, ensuring secure access to content (Anderson & Wilson, 2015). CMS streamline and manage the workflows of content design, allowing for revision, collaboration and approval processes. CMS play an essential role in publishing and delivering content. Different channels can be published through various channels (Miller & White, 2014). These include mobile apps, websites, and social media platforms.

It should be noted that the benefits of CMS are derived from their functions. They offer various benefits to organizations and content creators. The major ones are scalability, improved collaboration, increased efficiency, and analytics and insights (Brown & Garcia, 2022; Lee & Kim, 2021; Al´egroth et al., 2018). As CMS automate tasks, time and efforts on repetitive tasks get reduced and content management becomes easier. The centralization of content management fosters collaboration among content creators and other team members of the concerned organizations. With maximal or increased collaboration, appreciable level of coordination, performance and productivity are obtains. User experience is enhanced by CMS. As CMS enable the design of interactive and dynamic content, user experience gets enhanced. With CMS, users get more engaged, and derive conversions. CMS proffer scalable solutions, which are capable of accommodating increasing volumes of content, expanding user bases. CMS techniques offer valuable analytic insights into the behavior of users, content performance and ROI (Palomino et al., 2021; Miller & White, 2014).

The above points advanced by this study are substantiated by some extant studies. The study by Smith and Johnson (2023) proves CMS have great impact on business performance. Similarly, Brown and Garcia (2022) and Lee and Kim (2021) show that CMS exert positive impact on business, by causing high level of efficiency, productivity, and customer satisfaction. Wang and

EDITOR-IN-CHIEF
Prof. Saeid Eslamian [IRAN]

INTERNATIONAL JOURNAL – AAER
VOL. 02 NO. 1 OCT-2023 ISSN: 1116 - 2716

Chen (2020) are of the view that comprehensive content strategies and governance frameworks are viable means of optimizing the efficiency of CMS implementation. Their stance underscores the need for solid and ethical governance of delivering consistent content experiences across channels using component-based CMS design. Of course, content strategies and governance ensure the attainment of organizational goals and the meeting of customer or audience needs.

Studies confirm that machine learning and several other models of artificial intelligence (AI) have robust computational systems that effectively process large data of various forms (Ogunsakin, 2023; Oguntona, 2023; Oluwamayomikun & Oparaku, 2022; Pasupuleti & Inyang, 2022; Shawana, 2022; Thuraka, 2021). The various data forms include textual, audio, audio-visual, and visual-textual content. Other embodiments of modern content, which obtain delivering consistent content experiences across channels using component-based CMS design, include programming architectures, computational modeling, aesthetic design components, and synthetic data generation.

Again, machine learning techniques and other AI models can act upon existing datasets to produce new logical content with appreciable level of accuracy and relevance. Brown et al. (2020) show that neural network techniques foster effective analysis patterns and make synthesis operations creative. As illustrated by Brown et al. (2020) and Radford et al. (2019), the place of AI sophistication in processing content across domains obtains viz:

EDITOR-IN-CHIEF
Prof. Saeid Eslamian [IRAN]

INTERNATIONAL JOURNAL – AAER
VOL. 02 NO. 1 OCT-2023 ISSN: 1116 - 2716

Table 1: AI Processing Across Content Domains

Content Modality	Processing Sophistication	Creative Synthesis Level	Quality Comparison
Written Compositions	Very High	Advanced	Human-Comparable
Visual Representations	High	Sophisticated	Enhanced Consistency
Programming Architectures	High	Complex	Technical Precision
Design Components	Medium	Creative	Aesthetic Coherence
Multimedia Analysis	High	Intelligent	Superior Recognition

Source: Brown et al. (2020) and Radford et al. (2019)

The quality achieved by modern generative AI models outweighs that offered by human beings (Radford et al., 2019). Modern transformer architectures guarantee proficiency in understanding semantic interconnections, syntactic frameworks, and contextual dependencies, and facilitate human-like content generation. That is, they show technical precision and human-like creativity. Jones and Patel (2019) indentify the benefits of CMS and AI-driven content to include optimization, voice-enabled interfaces, innovations, research and development, and insights into future directions and opportunities.

Implementation Strategies

There are viable strategies for effective implementation of the delivering of consistent content experiences across channels using component-based CMS design. One of the strategies is defining a component library. The library of component has to be defined. This strategy entails creating a

EDITOR-IN-CHIEF
Prof. Saeid Eslamian [IRAN]

comprehensive library of components, such as the templates of different kinds of content. Examples of the various content types include product descriptions, articles, and testimonials (Shopify, 2019).

The creation of a library also includes standardizing design. The design of components has to be made standard, so as it meets established standards, guidelines or regulations. These include typography, imagery, and color schemes. The implementation can be achieved by instituting content governance. This involves establishing content guidelines. Content governance also entails providing clear guidelines that give directives on how to use components, including the best practices for creating and editing content. Another aspect of the content governance strategy is version control. By implementing version control, changes to components are tracked. Version control also involves ensuring that updates are reflected across all channels (Contentstack, 2021; Gurav et al., 2021).

Integrative systems can also be leveraged in combination for effective results. The combination of APIs with other systems for connecting component-based CMS with other systems like CRM and marketing automation tools can streamline content distribution and data sharing (Pelivani & Cico, 2021; Ricca & Stocco, 2021). Omnichannel strategy can be leveraged for effective implementation. In leveraging this strategy, components are designed to work seamlessly across different platforms, such as web, social media, email, and mobile. Another implementation strategy is to focus on user experience so as to optimize their experiences and offer them satisfaction (Whelan, 2020). This strategy entails making a responsive and accessible design. By so doing, components are responsive, adaptive, multifunctional, and diverse in sizes and device components.

More so, design components ought to be made accessible to all kinds of users. Apart from the foregoing strategies, success has to be measured to determine strengths and weaknesses. Measuring of success can be done

INTERNATIONAL JOURNAL – AAER
VOL. 02 NO. 1 OCT-2023 ISSN: 1116 - 2716

using analytic tools to track content performance and features across various channels. The measurement also entails monitoring engagement metrics, user feedback and conversion rates. A/B testing is one of the tools for monitoring. Using A/B testing, different components are tested to determine versions resonate best with the given audience (Google Developers, 2019; Halili, 2008). In addition, there is need to establish feedback loops. Through the loops feedback can be gathered from users and content creators to be acted upon for improvement. Besides, component library should be updated based on data performance and the rising trends in content consumption (Google Developers, 2016).

Conclusion

As demonstrated so far, a component-based CMS design is an influential method of delivering consistent content experiences across multiple channels. It allows for the creation of standardization, reusability and improved user experience, cohesive brand and more effective customer engagement. The overall implication of the study is that organizations that use component-based CMS design to deliver consistent content experiences across channels can adequately maneuver the complexities of content delivery across channels and competently maintain satisfactory consistent content delivering experiences.

The delivering of consistent content experiences across channels obtains in websites, social networking sites, and mobile apps. The delivering of consistent content experiences across channels increases efficiency and fosters work collaboration among content creators, designers, and developers. In implementing a component-based CMS design, well defined content strategies should be deployed for quality and functional systems, and performance analytics should be integrated for monitoring of performance across channels. By so doing, organizations deliver seamless,

EDITOR-IN-CHIEF
Prof. Saeid Eslamian [IRAN]

engaging and consistent content experiences and pave way for the realization of organizational objectives.

References

Al´egroth, E., Karlsson, A., & Radway, A. (2018). Continuous integration and visual gui testing: Benefits and drawbacks in industrial practice. In *2018 IEEE 11th International Conference on Software Testing, Verification and Validation (ICST)*, 172-181.

Anderson, B., & Wilson, C. (2015). Semantic web technologies in content management systems. *International Journal of Semantic Computing, 9*(2), 156-170.

Brown, K., & Garcia, M. (2022). Integrating artificial intelligence in content management systems: a review. *International Conference on Web Engineering*, 112-125.

Contentstack (2021). "Omnichannel content management." Contentstack.com. https://www.contentstack.com/cms-guides/omnichannel-content-management

Dimitriyev, M., Hazen, E., Wu, S. X., & Rohlf, J. (2010, Dec.). Development of a MicroTCA carrier hub for CMS at HL-LHC. *Journal of Instrumentation*, 5(12), C12042–C12042. doi: https://doi.org/10.1088/1748-0221/5/12/c12042.

Dushnitsky, G., & Stroube, B. K. (2021, April). Low-code entrepreneurship: Shopify and the alternative path to growth. *J. Bus. Ventur. Insights*, *16*(e00251). DOI: 10.1016/j.jbvi.2021.e00251

Fitzgerald, A. (2021). "The ultimate guide to WordPress Plugins: 19 examples & how they work." https://blog.hubspot.com/website/wordpressplugins

Google Developers (2016). "Google Lighthouse." https://developer.chrome.com/docs/lighthouse/overview

Google Developers (2019). "Lighthouse variability." https://developers.google.com/web/tools/lighthouse/variability

Gupta, A., & Sharma, R. (2018). Mobile-first content management strategies for modern enterprises. *Journal of Mobile Technology in Medicine, 7*(3), 112-125.

Gurav, V., Parameshwaraa, A., & Sherla, K. (2021, Dec.). IEEE copyright form. 2021 IEEE Asia-Pacific Conference on Computer Science and Data Engineering (CSDE). DOI: https://doi.org/10.1109/csde53843.2021.9741236.

Halili, E. H. (2008). *Apache JMeter*. Packt Publishing.

Headless, M. (2021). "Headless CMS." Magnolia-cms.com. https://www.magnolia-cms.com/platform/solutions/headless-cms.html

Jones, R., & Patel, S. (2019). User-centric design approaches for content management systems. *International Journal of Human-Computer Interaction, 32*(6), 789-804.

Lee, S., & Kim, D. (2021). Security challenges and solutions in content management systems. *Journal of Information Security, 18*(2), 78-91.

Li, H., & Zhang, Q. (2017). Performance optimization techniques for content management systems. *International Conference on Performance Engineering*, 45-58.

Lofthouse, T. (2023). Creating a better WordPress site: WordPress vs Headless WordPress vs Modern Headless CMS. *Skyward Digital*. https://skyward.digital/blog/better-wordpresssites-with-headless.

Miller, P., & White, L. (2014). Responsive design principles for content management systems. *Journal of Interactive Media, 21*(3), 330-345.

Newman, S. (2019). *Monolith to microservices*. O'Reilly Media, Inc.

Ogunsakin, O. L. (2023). Assessing the extent to which AI is revolutionizing UK and USA healthcare sector. *Journal of Clinical and Metabolism Studies (JCMS)*, 2(2), 41-53.

Oguntona, T. I. (2023, March). Mitigating the impact of high energy prices on UK households using machine learning techniques. *International Journal of Modelling & Applied Science Research*, 27(9), 215-230.

Oluwamayomikun, O. A., & Oparaku, D. D. (2022). Analyzing the dual impact of emerging technologies on children of 8-12 years. *African Scholars Journal of Education Research and Library Practice* (JERLP 8), 26(8), 211-225.

Palomino, F., Paz, F., & Moquillaza, A. (2021). Web analytics for user experience: A systematic literature review. In M. M., Soares, E., Rosenzweig, & A. Marcus, (eds.), *Design, user experience, and usability: UX research and design, 12779* (312–326). Springer International Publishing.

Pasupuleti, V., & Inyang, L. (2022). Mitigating pancreatic cancer through data-driven AI techniques, holistic health record, iHELP and integrative systems. *International Journal of Health and Pharmaceutical Research*, *7*(2), 63-77. www.iiardjournals.org

Patel, S. K., Patel, J. A., & Patel, A. V. (2012 Aug.). Statistical analysis of SEO for Joomla, Drupal and Wordpress. *International Journal of Computer Applications*, 52(3), 1-5. doi: https://doi.org/10.5120/8179-1502

Pelivani, E., & Cico, B. (2021). A comparative study of automation testing tools for web applications. In *2021 10th Mediterranean Conference on Embedded Computing (MECO)*. 1–6. https://doi.org/10.1109/MECO52532.2021.9460242

Radford, A., Wu, J., Child, R., Luan, D., Amodei, D., & Sutskever, I. (2019). Language models are unsupervised multitask learners. *OpenAI blog,* 1.8(9).

Ricca, F., & Stocco, A. (2021). Web test automation: Insights from the grey literature. In T., Bureˇs, R., Dondi, J., Gamper, G., Guerrini, T., Jurdzi´nski, C., Pahl, F., Sikora, & P. W. Wong, (eds.) *SOFSEM 2021: Theory and Practice of Computer Science* (472–485). Springer International Publishing. https://doi.org/10.1007/978-3-030-67731-2 35

Sayali, S. M. R. S. A. K. S. M., Mahajan, R., & Murab, S. A. K. S. (2021). Study of content management system (CMS) for developing e-commerce websites. *International Journal of Researches in Biosciences and Agriculture Technology*. doi: https://doi.org/10.29369/ijrbat.2021.02.1.0020.

Shawana, T. A. (2022). Carbon emissions as threats to environmental sustainability: Exploring conventional and technology-based remedies. *African Journal of Environmental Sciences and Renewable Energy*, 8 (1). https://publications.afropolitanjournals.com/index.php/ajesre/article/view/736

Shopify (2019). "What is Shopify?" Shopify. https://www.shopify.com/blog/what-is-shopify

Smith, J., & Johnson, A. (2023). Enhancing content management systems through progressive web applications. *Journal of Web Development,* 25(3), 45-60.

Tapia, F., Mora, M. Á., & Fuertes W, et al. (2020). From monolithic systems to microservices: a comparative study of performance. *Applied Sciences*, *10*(5797).

Taylor, E., & Clark, W. (2016). Open-source content management systems: a comparative analysis. *Journal of Open-Source Software Development,* 12(4), 220-235.

Thuraka, B. (2021). Machine learning, advanced health informatics, and diagnostic improvement opportunities. *Interdisciplinary Journal of African & Asian Studies (IJAAS), 7*(2), 1-10.

"The Headless CMS for marketers Storyblok," (2017). Storyblok.com https://www.storyblok.com/marketers

Wakode, B. V. (2013, Dec.). Study of content management systems Joomla and Drupal. *International Journal of Research in Engineering and Technology*, 02(12), 569-573. doi: https://doi.org/10.15623/ijret.2013.0212096

Wang, L., & Chen, Y. (2020). Scalability issues in cloud-based content management systems. *IEEE Transactions on Cloud Computing, 8*(4), 560-575.

Whelan, M. (2020, Apr. 07). HubSpot launches CMS Hub to take the pain out of website management. Hubspot.com. https://www.hubspot.com/company-news/hubspot-launches-cms-hub-to-take-the-pain-out-of-website-management