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Perquisites of Social Media Applications in the South African Construction Industry

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Abstract

Different sectors of the economy have utilized the social media space and have benefited from its adoption and implementation. The recent COVID-19 pandemic that crippled the global economy also propelled the massive use of social media applications (SMAs) beyond its usual limit while forcing the birth of novel innovations in this regard. However, the construction industry (CI) still lags and continually grapples with the wave of adopting SMAs. This is largely due to the generally known nature of construction stakeholders' and professionals' resistance to change. Hence, this paper assesses the benefits of adopting and utilizing SMAs in the South African construction industry (SACI). The study employed the quantitative research approach using a structured questionnaire survey. The questionnaire survey was administered to registered construction professionals in the South African construction industry. Descriptive statistics and exploratory factor analysis were used to analyze the collected data. The findings from the study revealed 23 beneficial impacts of SMAs in the construction sector. Enhanced company marketing reach, brand awareness creation, prompt access to information, increased company visibility, and cost-effective means of advertisement as the top benefits. The study concluded that the opportunities for marketing, timely communication, awareness, information sharing, networking, and collaboration that social media applications offer have the potential to drastically reinvent the construction space. Governmental and non-governmental multi-stakeholder support and intervention are therefore recommended to ensure the numerous benefits accruable to the use of SMAs are fully maximized in the CI.

Keywords

Construction Industry, Digitalization, Fourth Industrial Revolution, Information, Social Media Applications, South Africa.

1. Introduction

The construction industry (CI) globally is known to be the main driver of the economy. The sector is characteristically complex and unique owing to the multiplicity of stakeholders and activities involved (Fernández-Solís, 2008). However, the CI may not be regarded as one of the tech-savvy sectors due to its signature traditional approach (Ndlovu & Simbanegavi, 2021). The CI has traditionally been known for its slow adoption of technology, but this is changing rapidly with the present fourth industrial revolution (4IR) era. With the advent of new technologies such as Building Information Modeling (BIM), Augmented Reality (AR), and Virtual Reality (VR) among numerous others, the industry is now moving towards a more digitized and interconnected future. This shift is being driven by the need for resilience, greater efficiency, cost savings, and sustainability in the CI.

One of the most significant changes that technology is bringing to the CI is the move towards BIM and other innovative technologies that have characterized the 4IR era. These technologies, especially BIM allow architects and other project stakeholders to collaborate in real time, ensuring that all stakeholders are working from the same set of plans and reducing the likelihood of errors and delays (Diaz, 2016). BIM can also be used to digitally simulate

construction processes and projects in geometric mode, allowing stakeholders to identify potential issues ahead of time (Zima et al., 2020). This can result in significant cost savings, rework mitigation, efficiency, client satisfaction, waste reduction, enhanced communication among project stakeholders, and improved safety on construction sites among others (Farnsworth et al., 2015). Another technology that is rapidly changing the face of the CI is VR. By creating virtual models of construction projects, the project team and other stakeholders can virtually compare the as-planned and as-built statuses of projects thereby enhancing collaboration and efficiency (Rankohi & Waugh, 2013). This can help to reduce costly mistakes and improve client satisfaction. To aid an effective management strategy to control hazards, VR can also be used to simulate construction safety programs, allowing workers to train in a safe and controlled environment before entering the actual construction site (Noghabaei et al., 2020). To ensure an amazing user experience, social media applications (SMAs) have been able to effectively and efficiently ensure the interoperability of these technologies. This has resulted in the proliferation and multifaceted functionalities of SMAs within the various sectors of the economy. Likewise, the recent experience of the covid19 necessitated and ensured the widespread adoption and utilization of these innovative applications.

Social media is also now playing a significant role in the CI, allowing clients, construction professionals, contractors, and suppliers to connect in new and innovative ways. Platforms and applications such as Facebook, LinkedIn, Twitter, and Instagram are being used to share information about projects, advertise services, and connect with potential clients. Social media are also being used to interact and build relationships with existing and new clients, improve client satisfaction, and gather feedback in form of reviews. With the significant technological transformation happening in the CI, social media apps are increasingly being used to improve efficiency, reduce costs, and enhance client satisfaction. As the CI continues to evolve, it is important to note that technology and social media will play an increasingly important role in shaping the future of the industry. Hence, this study seeks to assess the perquisites of adopting and utilizing SMAs in the South African Construction Industry (SACI).

2. Social Media Sphere in the Construction Industry

The exponential effect and prominence of social media applications (SMAs) are visible and felt in sectors such as marketing, fashion, entertainment, and hospitality among others(Ndlovu & Simbanegavi, 2021). The CI on the other hand is left behind and not riding on the social media wave. Among other reasons, this is largely traceable to the fact that the CI is technology disinclined and globally known as an industry that relies on manual labour and traditional construction methods, especially in developing countries. Compared to other media sources, SMAs allow users to communicate, share or exchange information more rapidly and in real time. Social media have been able to create a platform for idea sharing, relationships, mobilization, and many more. According to Ngai et al. (2015), the social component of SMAs pertains to interpersonal activities while the media aspect pertains to the internet-enabled technologies and tools that are used to conduct such activities. As defined by Kaplan and Haenlein (2010), social media is a collection of web-based applications that aid the production and dispensation of user-generated content (UGC).

It is noteworthy that SMAs can be utilized for multiple or single purposes in a variety of sectors and disciplines. The multifaced functionalities and usability of SMAs became advanced with the 4IR era and the recently experienced covid19 pandemic. This has seen the interoperability of various innovative technologies in SMAs to enhance functions and maximize user experience. SMAs are categorized into the following namely social networks, messaging applications, picture and video sharing applications, interactive and video sharing applications, discussion forums, publishing and blogging networks, bookmarking and content creation, shopping networks and applications, review networks, audio applications, and video conferencing applications (Kaplan & Haenlein 2010; Liu, 2010; Korda & Itani, 2013; Tuten & Solomon, 2017; Diaz & Mellon, 2021; Shayne, 2021; Chan & Allman-Farinelli, 2022; Minaev, 2022). Notable examples of the SMAs in these classifications are Facebook, WhatsApp, Twitter, LinkedIn, Telegram, Gmail, Instagram, YouTube, TikTok, Snapchat, Quora, Reddit, Pinterest, Amazon, Takealot, Zoom, UberEATS, Spotify, Skype, Google Meets, Microsoft Teams and a host of others.

There are several potential benefits of adopting and utilizing SMAs in the construction sphere. These SMAs can be used to further and maximize academic and educational, income generation, marketing, communications, procurement, and tendering purposes across various fields within and outside the architecture, engineering, and construction (AEC) sector. SMAs are beneficial to the CI as they increase brand awareness and recognition, improve teamwork and collaboration, enhance management and tracking of project schedules, improve communication between project stakeholders, increase project transparency, improve oversight and quality control, increase safety training and awareness, improve customer support and service, enhance customer/client feedback and engagement, increase networking opportunities for construction professionals, increase participation and engagement in industry

events, enhance accountability in project execution, enhance community outreach and engagement, improve promotion and marketing of construction projects and brands, and improve project sustainability and corporate social responsibility (CSR) practices (Leader-Chivee & Hamilton, 2008; Meske & Stieglitz, 2013; Ristova, 2014; Çalli & Clark, 2015; Cesaroni & Consoli, 2015; Singla & Gurga, 2015; Mohd Noor et al., 2021).

3. Research Methodology

This study employed the quantitative method of research to assess the perquisites of social media applications (SMAs) in the South African construction industry (SACI). A well-structured questionnaire survey was developed and administered to the respondents to achieve the objective of this study. The respondents sampled are registered construction professionals in the SACI such as architects, civil engineers, construction managers, electrical engineers, health and safety officers, mechanical/services engineers, project managers, and quantity surveyors. A total of twenty-three (23) benefits of SMAs identified through the review of literature were contained in the questionnaire survey. The questionnaire utilized a five-point Likert agreement scale to ascertain the agreement level of the respondents with the identified benefits. The completed and returned questionnaires were collated, reviewed, and cleaned to ensure their completeness and usefulness for the research study. The duo of descriptive and exploratory factor analysis was employed to analyze the retrieved data. A Cronbach alpha value of 0.908 was achieved thereby authenticating the reliability of the data collection instrument and the correctness of the collated results.

4. Results and Discussions

The analysis of the demographics of the respondents showed that 55% of the respondents are males while 45% are females. Quantity surveyors account for 45% of the population sample, construction managers and project managers account for 11.3% respectively, civil engineers account for 10%, mechanical/services engineers account for 8.8%, architects and electrical engineers account for 6.3%, and health and safety officers account for 1.3%. Most of the respondents (51.2%) possess a bachelor's degree followed by those with an advanced diploma or honours degree accounting for 26.3%. A total of 63.7% of the respondents work for private entities, 27.5% work for public/government entities, and 8.8% work for both private and public/government entities.

4.1 Descriptive Analysis: Perquisites of Social Media Applications in the Construction Industry

A total of twenty-three (23) benefits of SMAs were identified and extracted for this study after a review of relevant scholarly works. A mean item score (MIS) analysis was performed on the extracted variables based on the retrieved and collated data. Table 1 below presents the results of the analysis of the perquisites of SMAs in the South African construction industry (SACI). The table presents the results of the study on the perceived benefits of social media applications in the construction industry. The identified benefits are ranked based on their mean scores, which reflect the participants' perceived importance of each variable. The identified benefit with the highest mean score is “Enhance company marketing reach” with a score of 4.56, followed by “Brand awareness creation” with a score of 4.45, and “Access to information promptly” with a score of 4.43. This suggests that participants see social media applications as valuable tools for improving their companies' marketing efforts, increasing brand awareness, and accessing information promptly. The identified perquisites with the lowest mean scores are “Improved organisational performance” and “Aids performance evaluation” with scores of 3.96, followed by “Reduced business operating cost” with a score of 3.93, and “Improved employee performance” with a score of 3.86. Even though they are ranked lower than the top variables, the mean scores are above the average of 3.00 on a 5-point Likert scale. Hence, they are considered significant benefits of social media applications. The standard deviation score measures the amount of variation or dispersion in the data. In this case, the standard deviation represents the degree to which the mean score of each identified benefit varies across the responses from the participants in the study. Looking at the table, the standard deviation values range from 0.644 to 0.978. Perquisites with smaller standard deviation values indicate that the participants had a relatively consistent opinion on their importance, while larger standard deviation values suggest that the opinions were more diverse. For example, “Enhance company marketing reach” has a small standard deviation of 0.653, which suggests that the majority of participants agreed that it was a highly important benefit. On the other hand, “Improved employee performance” has a larger standard deviation of 0.951, indicating that participants had more diverse opinions on its importance. In general, the study suggests that social media applications have the potential to provide significant benefits to the construction industry, particularly in the areas of marketing, brand awareness, and communication. such as improving employee performance and reducing costs.

Table 1. Descriptive analysis of perquisites of social media applications in the construction industry.

Identified Perquisites	Mean Score	Standard Deviation	Ranks
Enhance company marketing reach	4.56	0.653	1
Brand awareness creation	4.45	0.654	2
Access to information promptly	4.43	0.652	3
Increased company visibility	4.41	0.669	4
Cost-effective means of advertising	4.40	0.704	5
Broaden networking connections	4.38	0.644	6
Aids effective communication	4.33	0.792	7
Job creation	4.31	0.908	8
Increased customer base	4.29	0.750	9
Aids active brand building	4.29	0.783	9
Improved customer-company engagement	4.28	0.811	11
Enable effective collaborations	4.25	0.720	12
Aids direct connection to customers	4.21	0.822	13
Increased Website Traffic	4.19	0.813	14
Free social networking avenue	4.15	0.813	15
Improved client experience	4.10	0.773	16
Aids healthy competition among service providers	4.08	0.911	17
Builds customer confidence	4.08	0.854	17
Boost sales and patronage	4.05	0.840	19
Improved organisational performance	3.96	0.920	20
Aids performance evaluation	3.96	0.947	20
Reduced business operating cost	3.93	0.978	22
Improved employee performance	3.86	0.951	23

4.2 Exploratory Factor Analysis: Perquisites of Social Media Applications in the Construction Industry

Further to the descriptive analysis carried out on the retrieved data, exploratory factor analysis was done. Table 2 shows the results of the KMO and Bartlett's Test for the data used in the study. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is used to assess the suitability of the data for factor analysis. The KMO value ranges from 0 to 1, where values closer to 1 indicate that the data is suitable for factor analysis. In this case, the KMO value is 0.745, which is considered to be moderately adequate. The Bartlett's Test of Sphericity is used to test the null hypothesis that the correlation matrix is an identity matrix, which would indicate that the variables are uncorrelated and therefore unsuitable for factor analysis. The test statistic is an approximation of chi-square, and the significance value indicates whether the null hypothesis can be rejected or not. In this case, the test statistic is approximately 1089.576, with 253 degrees of freedom, and the significance value is 0.000, which is less than the significance level of 0.05. This indicates that the variables are sufficiently correlated for factor analysis.

Table 2. KMO and Bartlett's Test for perquisites of social media applications in the construction industry.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.745
Bartlett's Test of Sphericity	Approx. Chi-Square	1089.576
	df	253
	Sig.	0.000

The variance of the components was extracted, and it was discovered that the first component explains the most variance (34.286%) followed by the second component (11.724%), the third component (9.445%), the fourth component (6.101%), the fifth component (5.226%), and the sixth component (4.585%). Together, these six

components explain 71.366% of the variance. The remaining components each explain a smaller percentage of the variance. Hence, the six components were extracted as evident from the Scree plot shown in Figure 1.

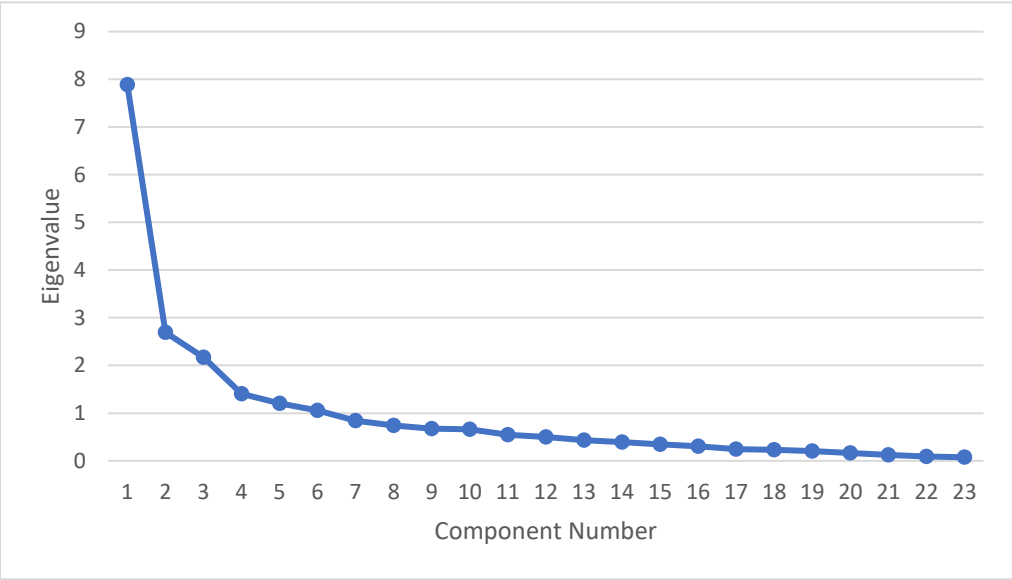

Fig. 1. Scree plot for perquisites of social media applications in the construction industry.

The pattern matrix in Table 3 shows the relationship between the 23 perquisites of social media applications in the construction industry and the six identified components through the principal component analysis. The values in the matrix represent the loadings or correlations between each benefit and the components. The higher the loading value, the stronger the relationship between the benefit and the component. The component clusters are explained as follows. *Marketing and customer engagement*: This component includes perquisites such as an increased customer base, aids direct connection to customers, improved client experience, builds customer confidence, aids active brand building, free social networking avenue, and aids healthy competition among service providers. This component is related to the use of social media applications as a tool for marketing, promoting the brand, and engaging with customers to build trust and loyalty. *Cost-effectiveness*: This component comprises perquisites such as brand awareness creation, enhance company marketing reach, cost-effective means of advertising, and increased website traffic. This component relates to the use of social media applications as a cost-effective alternative to traditional advertising and marketing channels. *Collaboration and access to information*: This component includes perquisites such as enabling effective collaborations and access to information promptly. This component relates to the use of social media applications as a tool to enhance communication and collaboration among stakeholders in the construction industry. *Effective communication*: This component includes only one benefit; aids effective communication. This component relates to the use of social media applications as a tool to enhance communication among stakeholders in the construction industry. *Organisational performance*: This component includes perquisites such as improved employee performance, improved organisational performance, and job creation. This component relates to the use of social media applications as a tool to enhance the performance of employees and the organization as a whole. *Business growth*: This component comprises perquisites such as increased website traffic, boost sales and patronage, and reduced business operating costs. This component relates to the use of social media applications as a tool to increase business growth and reduce operational costs.

In summary, the use of social media applications in the CI has several perquisites, and these perquisites can be clustered into six components, namely marketing and customer engagement, cost-effectiveness, collaboration and access to information, effective communication, organisational performance, and business growth. These components can guide the construction industry in leveraging social media applications to achieve their organisational objectives.

Table 3. Pattern Matrix for perquisites of social media applications in the construction industry.

	Component					
	1	2	3	4	5	6
Increased customer base	0.810					
Aids direct connection to customers	0.735					
Improved client experience	0.702					
Builds customer confidence	0.661					
Aids active brand building	0.605					
Free social networking avenue	0.521					
Aids healthy competition among service providers	0.451					
Aids performance evaluation	0.403					
Brand awareness creation		0.818				
Enhance company marketing reach		0.718				
Cost-effective means of advertising		0.694				
Enable effective collaborations			0.902			
Access to information promptly			0.744			
Broaden networking connections			0.581			
Improved customer-company engagement			0.453			
Increased company visibility			0.414			
Aids effective communication				0.869		
Improved employee performance					-0.858	
Improved organisational performance					-0.808	
Job creation					-0.643	
Increased Website Traffic						0.873
Boost sales and patronage						0.655
Reduced business operating cost						0.358

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 17 iterations.

The first component cluster, marketing, and customer engagement highlight the importance of social media applications in marketing, promoting the brand, and engaging with customers to build trust and loyalty in the construction industry. According to Johansson and Hiltula (2021), companies that utilize social media platforms effectively can gain a competitive advantage by improving their marketing efforts, building their brand image, and providing a better customer experience. The cost-effectiveness component of the pattern matrix highlights the benefits of using social media applications for marketing and advertising purposes. According to Appel et al. (2020), the use of social media applications for advertising and marketing purposes can help companies to reach a wider audience, target potential customers more effectively, and track the effectiveness of their marketing efforts more accurately. The collaboration and access to the information component cluster underscore the importance of social media applications as a tool to enhance communication and collaboration among stakeholders in the construction industry. According to Khan et al. (2022), by enabling effective collaboration and providing access to relevant information, social media applications can help stakeholders make informed decisions, improve project outcomes, and drive industry innovation. The component of effective communication highlights the importance of communication in the CI and the potential benefits of social media applications in enhancing communication among stakeholders. According to Argyris and Monu (2015), social media applications can provide a platform for real-time communication, allowing stakeholders to exchange information promptly. The Organisational Performance component cluster emphasizes the importance of using social media applications to improve employee performance, organizational performance, and job creation in the construction industry. According to Marolt et al., (2022), by leveraging the benefits of social media applications, construction companies can improve their competitive position and achieve long-term growth and success. The sixth

component cluster highlights the potential benefits of using social media applications for business growth and cost savings. According to Okanga and Groenewald (2017), by leveraging these social media tools effectively, businesses in the CI can increase their online presence, attract more customers, and improve their bottom line.

5. Conclusions and Recommendations

Technology and social media are rapidly transforming the construction industry (CI), with Building Information Modeling (BIM), Augmented Reality (AR), Virtual Reality (VR), and social media applications being at the forefront of these changes. With social media, clients, construction professionals, contractors, and suppliers can connect in new and innovative ways, enhancing communication, and feedback, and building relationships. In line with these perceived benefits, this study provides valuable insights into the benefits of SMAs in the South African construction industry (SACI). The research employed a well-structured questionnaire survey to collect data from registered construction professionals in the study area. From the analysis, the benefits of SMAs were ranked based on their mean scores, with the highest mean score being "Enhance company marketing reach," followed by "Brand awareness creation" and "Access to information promptly." However, even the perquisites ranked lowest by participants, such as "Improved organisational performance" and "Aids performance evaluation," still had mean scores above the average 3.00 on a 5-point Likert scale, indicating their importance.

The study's findings suggest that the SACI should consider utilizing SMAs as valuable tools for improving their companies' marketing efforts, increasing brand awareness, and accessing the information on time. The industry should also consider the use of SMAs in areas such as improving employee performance and reducing costs. Therefore, the SACI should incorporate SMAs in their strategies for competitive advantage, especially in today's digital age. Based on the results of the exploratory factor analysis, the study suggests that SMAs can be categorized into six broad factors: marketing and customer engagement, cost-effectiveness, collaboration and access to information, effective communication, organisational performance, and business growth. Thus, the SACI should consider the potential of SMAs in these categories and tailor their strategies to utilize applications in each category to enhance their overall performance. From the findings of the study, it is recommended that future research should focus on investigating the challenges of implementing SMAs in the SACI. This research can aid in developing a better understanding of how the industry can overcome the challenges and better utilize SMAs for enhanced performance. Additionally, research should focus on exploring the potential of other emerging technologies, such as artificial intelligence, blockchain, and the internet of things in the SACI.

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