The Influence of Big Data Analytics on Strategic Decision-Making in Public Relations Agencies- A Quantitative Study

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Abstract—**Technology has revolutionized every organization, and Public Relations agencies are no exception. Particularly, big data has facilitated these organizations by facilitating them on different levels for different purposes. Based on the role and importance of big data analytics in Public Relations (PR), this research aims to examine its impact on strategic decision-making, client satisfaction, and campaign performance metrics in the United Arab Emirates. Data gathered from 272 respondents currently working in UAE-based PR organizations is analyzed by using Partial Least Square-Structural Equation Modelling (PLS-SEM). Findings revealed that big data analytics has a positive and significant impact on PR organizations' strategic decision-making, client satisfaction, and campaign performance metrics. The survey results show that technology, particularly big data analytics, positively affects public relations (PR) practices. It is agreed that technology facilitates their work, improving strategic decision-making and understanding client needs and preferences. Big data analytics are important in optimizing campaign performance and improving client satisfaction. The absence of big data analytics inhibits PR organizations' capability to align their strategies with market trends. Thus, these findings highlight the importance of big data in PR organizations and help perform tedious, facilitating growth and performance.** *Keywords-*

Keywords— Big Data Analytics, Public Relations, United Arab Emirates, Resource Based Theory

I. INTRODUCTION

The argument over whether public relations (PR) practitioners should play a role in an organization's strategic decision-making is a perennial subject in the PR industry. Being adjusted to the external landscape, PR professionals have practical experiences that can inform how organizations manage issues and engage stakeholders. This contribution can significantly affect the organization's strategic decision-making capabilities. Specifically, strategic decision-making within Public Relations (PR) organizations involves problem-solving activities focused on success. Scholars like Mykkänen [1] highlight the significance of communication and stakeholder negotiation in decision-making processes. Khodarahmi [2] supports corporate public policymaking that considers societal interests. Organizations handle many forces in the complex social environment, each with goals and interests. Seeking legality for their activities, organizations engage in dialogue with stakeholders and are responsible for their decisions. According to Deep [3], organizations involve internal and external stakeholders, giving them a voice on different issues. Stakeholder involvement in decision-making can take various forms: recommending directions, agreeing or disagreeing, providing input, making decisions, or enforcing them. It is argued that PR organizations profit from involving PR practitioners in strategic decision-making. They use their insights and skills to handle complex external environments, address

stakeholder relationships effectively, and make informed decisions consistent with organizational objectives and societal expectations. Notably, decision-making is generally comprehended as selecting between diverse options, while the process involves phases, i.e., identification, development, and selection. Earlier, leadership normally made decisions, with employees tasked with enactment. However, in contemporary organizations, input from employees and stakeholders especially affects decision-making [4]. When employees bring diverse knowledge, ideas, skills, and capabilities, it augments the information obtainable for decision-making. *Organizational decision-making* is a social process for finding the most effective solution to a problem. Continuous communication is key throughout this process. Initially, the focus is on collecting information to determine problems and possible solutions. After that, collaboration and negotiation occur, followed by the dissemination of decisions and evaluation of results [5]. Furthermore, the rise of technology and its evolution has facilitated PR organizations on different levels. The use of Big Data in Public Relations has progressed considerably since the early 2000s, overlapping with the emergence of social media platforms. PR practitioners instantly recognized the potential of these platforms for collecting and analyzing data regarding their target demographics, cultivating more meaningful engagements [6]. Earlier, social media analytics tools monitored brand mentions, determined key influencers, and measured the overall sentiment of online conversations. This data was valuable for guiding PR strategies and decisions [7], [8], pinpointing outreach prospects, and preemptively addressing crises. In recent years, the application of Big Data in PR has progressed beyond mere monitoring and research. PR professionals use big data analytics to gain profound insights into their audiences and competitive landscapes. Such insights enable organizations to make informed decisions concerning their PR campaigns. For example, they can pinpoint optimal channels for accessing their target demographics or identify the most sensible moments to introduce new products [9], [10].

This research investigates the influence of big data analytics on strategic decision-making within public relations (PR) organizations in the UAE. It specifically examines its effects on the effectiveness of strategic decision-making, client satisfaction levels, and PR campaign performance metrics. The significance of this research lies in understanding how PR firms can use big data analytics to improve their decision-making processes, improve client satisfaction, and upgrade the performance of their PR campaigns. Eventually, this research will contribute to the existing literature in PR and technology, especially big data analytics. This paper is structured into four main sections. The first section, Introduction, provides an overview of the research topic, emphasizing the importance of strategic decision-making in public relations (PR) organizations, the role of PR practitioners, and the impact of big data analytics on this process. The second section, Literature Review, delves into relevant academic theories and past studies related to PR decision-making, stakeholder engagement, and the integration of big data analytics, drawing on contributions from scholars such as Mykkänen, Khodarahmi, and Deep. The third section, Methodology, outlines the research design, data collection techniques, and analytical methods employed to assess the influence of big data on strategic decision-making within PR organizations in the UAE. Finally, the Analysis and Results section presents the findings of the research, discussing the effects of big data analytics on strategic decision-making effectiveness, client satisfaction levels, and PR campaign performance, followed by a discussion of the results in the context of existing literature.

I. REVIEW OF LITERATURE

A. *Resource-based Theory*

This research is supported by Resource-based Theory. Notably, Resource-Based Theory (RBT) stemmed from Penrose's work in 2009, when she presented a framework focusing on how organizations can efficiently handle their resources, seek diversification strategies, and capitalize on productive prospects [11]. Penrose's seminal work conceptualized a firm as a combined collection of resources, seeking to understand how firms can effectively follow their goals and strategic initiatives [12]. Big data has become a focal point during the last few years in order to inform organizational decision-making. Many organizations invest in big data analytics (BDA) to gain practical insights and competitive advantage [13]. As the volume, speed, and data type continue to extend rapidly, there has been notable advancement in approaches and technologies for data storage, analysis, and visualization. Considering these advancements, today, Public relations (PR) organizations focus on fully embracing these technological inventions and the resulting shifts in industry dynamics.

Consequently, this research assumes that Emirati organizations acquire a competitive advantage using big data analytics for strategic communication and decision-making, particularly in the United Arab Emirates (UAE). In this regard, the effectiveness of strategic decision-making depends on the firm's capability to use its internal resources efficiently. These resources include discernible assets like technology and infrastructure and intangible assets like brand reputation, expertise, and stakeholder relationships [14]. For PR organizations, strategic decision-making involves campaign design, planning, message creation, and crisis management. RBT highlights the significance of recognizing and using resources to create sustainable competitive advantages, enabling PR firms to attain their goals during competitive pressures and evolving industry landscapes [15]. Hence, focusing on the theoretical argumentation and study problem, this research focuses on the conceptual framework provided in Figure 1.

B. *Big data analytics in strategic decision-making*

Using big data analytics offers organizations a significant edge in decision-making by providing insights into their functions, customers, and operating dynamics. Through constant analysis of extensive datasets, organizations can

identify appearing trends, customer preferences, and competitive perils, enabling them to modify their strategies [16] proactively. Here, Li and colleagues [17] cited an example of retailers utilizing big data analytics to investigate consumer purchasing patterns and design their product offerings, pricing strategies, and marketing campaigns. Also, retail chains use big data analytics to examine consumer behaviour across different demographics and regions, acquiring practical insights into client preferences. By aligning their offers and marketing efforts with the needs of their target demographics, organizations can improve sales and customer satisfaction. In today's competitive business landscape, the ability to anticipate and adapt to evolving market conditions is important. To steer this complexity, organizations are increasingly integrating diverse data sources, both internal and external, into their decision-making processes [18]. Thus, it is hypothesized that.

H1. Big data analytics has a positive impact on strategic decision-making among Public Relations organizations in the United Arab Emirates.

### C. *Big data analytics and client satisfaction*

Strategic communication in marketing is a decisive approach for communicators to engage deeply with customers, maintain existing relationships, develop new connections, and improve the overall client experience. This strategy increases client satisfaction, cultivates brand loyalty, improves spending readiness, and augments marketing effectiveness [19]. In this regard, big data is critical in shaping the client experience by providing insights into consumer behaviour, preferences, and distress points. This knowledge allows organizations to design their efforts more specifically, refine their products and services, and promote overall satisfaction. Big data allows organizations to conduct comprehensive client analyses on a larger scale, increasing productivity and efficiency [20]. For example, Viacom, the parent company of renowned brands like Comedy Central, Nickelodeon, and MTV, has enforced a real-time big data analytics platform using Apache Spark and Databricks. This platform enables Viacom to evaluate real-time video feed quality and dynamically assign resources as needed. Big data is characterized by volume, velocity, and variety, with further dimensions, i.e., veracity and value [21]. Using unstructured data, organizations can use predictive analytics to determine customer behavioural patterns, revealing valuable insights— called "golden data"—that drive the organization's decisions and improve client experiences. Based on the cited literature, it is hypothesized that.

H2. Big data analytics has a positive impact on client satisfaction among Public Relations organizations in the UAE.

D. *Big data analytics and campaign performance metrics*

According to Koohang and colleagues [22], big data technology has transformed business intelligence, fundamentally changing how organizations analyze data to acquire insights and drive decision-making processes. While the concept of big data extends beyond distinct industries like commerce or marketing, the rapid growth of online

companies has further propelled its prominence. This sector inherently yields extensive volumes of data, necessitating sophisticated analytics to extract meaningful performance metrics. Considering the performance measurement, big data
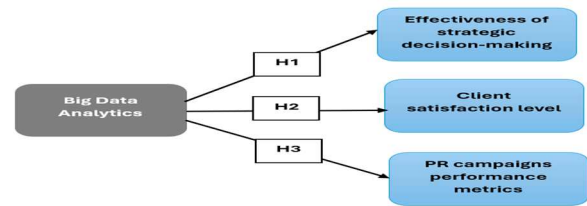
analytics plays a key role in extracting practical insights from extensive datasets [23]. Organizations can discover patterns, correlations, and information critical for evaluating performance metrics effectively by applying algorithms to analyze data sets. This includes identifying consequential relations between variables within large datasets and encountering previously hidden patterns and insights. Decision-makers increasingly depend on historical data to acquire a competitive advantage, emphasizing the significant effect of analytics on research and technology. As organizations seek to optimize their performance measurement strategies, big data analytics appears as a crucial tool for extracting actionable insights and driving

informed decision-making processes [24]. Hence, it is proposed that.

H3. Big data analytics has a positive impact on campaign performance metrics among Public Relations organizations in the UAE.

II. RESEARCH METHODS

A. *Study Design and Data Gathering Tool*

This research involves quantitative design [25]. The data is gathered by using an online survey shared with the respondents using Ipsos, one of the leading market research services in the UAE, offering data gathering and sampling services. The relevant service confirmed respondents through emails and mobile numbers to ensure their participation. Since the PR organizations and agencies actively communicate and run their campaigns on new media venues, online surveys selecting employees of these organizations are considered suitable to examine the influence of big data dynamics on strategic decision-making in these Emirati entities. Furthermore, data is gathered by using structured, closed-ended survey questionnaires designed on a five-point Likert scale [26]. The measurement items are adopted from the existing literature to ensure the use of instruments whose validity and reliability are already established. Table 1 represents the sources of questionnaire items used in the current study.

	Sources of questionnaire items

Tab 1	Source(s)	Number of Items
Big data analytics	[12], [18]	1. Our organization effectively uses big data analytics to inform PR strategies. 2. The use of big data analytics enhances our understanding of target audiences. 3. Big data analytics has improved our ability to predict PR campaign outcomes. 4. Our PR team depends on big data analytics to make more informed decisions.
Strategic decision-making	[6]	1. Big data analytics plays a critical role in our strategic decision-making process. 2. Our organization makes data-driven decisions that align with its long-term objectives. 3. Stakeholder input is consistently considered in our strategic decision-making. 4. Our strategic decisions are based on a comprehensive analysis of available data.
Client satisfaction	[8]	1. Our clients are satisfied with the results of the PR campaigns conducted using big data analytics. 2. The use of big data has improved client confidence in our decision-making process. 3. Our PR campaigns meet client expectations effectively due to data insights. 4. Clients voice greater satisfaction with our services when big data informs campaign decisions.
Campaign performance metrics	[24]	1. Big data analytics helps us accurately measure the performance of our PR campaigns. 2. Our PR campaigns achieve better results when informed by significant data insights. 3. We regularly track and evaluate campaign performance metrics using data-driven tools. 4. Big data analytics allows us to pinpoint areas for improvement in our PR campaigns.

B. Study Population and Sampling

The population of current research involve employees of PR organizations working in the United Arab Emirates (UAE). According to recent data, currently, more than one hundred PR agencies are working in the UAE. However, as there is no data available regarding the precise number of employees currently working in these organizations, the researchers employed a free sampling approach, as also used by Farhi and colleagues [27], where the researchers provided an online survey for a certain period and the respondents filled them accordingly. Consequently, the data gathering took place from Feb. 16, 2024, till May 10, 2024. A total of 303 responses were collected. Once all the responses were collected, the researchers read and re-read them to ensure that all the responses were accurate. At this stage, 31 responses were deemed unsuitable and were carefully removed. Thus, a total of 272 responses were finalized for data analysis purposes, indicating a response rate of 89.7%, which is higher than the threshold of 60% [28], ensuring the generalizability of the results.

C. Respondents' Demographics

Residents' demographics are calculated using descriptive statistics, including frequencies and percentages. Table 2 represents the demographics of relevant data, including that most of the respondents (66.9%) were males and 33.1% were females. Concerning the qualification, 47.8% of respondents have a bachelor's, 36.8% have a master's, 11.4% have a doctorate, and 4.0% have marked "others" as their qualification level. Finally, 41.2% of respondents are 36 to 45 years old, 39.3% of them are below 26 to 35 years, 14.3% are below 25 years, and 5.1% are 46 years old or above.

Tab 2	Respondents' Demographics		
	Constructs	Number	%
Gender	Male	182	66.9
	Female	90	33.1
Qualification	Bachelor	130	47.8
	Masters	100	36.8
	Doctorate	31	11.4
	Other	11	4.0
Age	Below 25 years	39	14.3
	26-35 years	107	39.3
	36-45 years	112	41.2
	46 years or above	14	5.1

III. ANALYSIS AND RESULTS

First, the validity and reliability of the measurement tool are assessed using convergent validity analysis. Table 3 presents the results of convergent validity analysis. When assessing Big Data Analytics, most items displayed strong factor loadings, suggesting a substantial relationship with the underlying concept. The Average Variance Extracted (AVE) for Big Data Analytics was calculated at 0.603, exceeding the recommended threshold of 0.5 and exhibiting satisfactory convergent validity. Internal consistency reliability was confirmed with a Cronbach's alpha coefficient of 0.771 and a Composite Reliability (CR) of 0.819, meeting or surpassing the minimum criteria. Further, Strategic Decision-Making showed strong relationships between observed variables and the latent construct, with DM3 and DM4 having lower factor loads. However, with an AVE of 0.612, Cronbach's alpha coefficient of 0.731, and a Composite Reliability of 0.749, all surpassing the acceptable thresholds indicate that internal consistency does exist. Client satisfaction displays moderate relationships with loading values of CST1 and CST4 below 0.5. However, the AVE is 0.617, surpassing the recommended threshold. The Composite Reliability for this construct is 0.713, with a Cronbach's alpha coefficient of 0.753. Lastly, Campaign performance metrics showed moderate relationships with factor loadings of CPM2 and CPM4 below the threshold of 0.5, an AVE of 0.715, surpassing the recommended threshold. The Cronbach's alpha coefficient for Crisis Management was 0.721, with a Composite Reliability of 0.799, both meeting the minimum criteria.

Table 3	Convergent Validity Analysis				
	Items	Loads	AVE	CR	CA
Big data analytics	BDA1	0.660	0.603	0.771	0.819
	BDA2	0.579			
	BDA3	0.602			
	BDA4	0.750			
Strategic decision-making	DM1	0.428	0.612	0.731	0.749
	DM2	0.235			
	DM3	0.906			
	DM4	0.675			
Client satisfaction	CST1	0.236	0.617	0.713	0.753
	CST2	0.533			
	CST3	0.740			
	CST4	0.068			
Campaign performance metrics	CPM1	0.773	0.560	0.721	0.799
	CPM2	0.081			
	CPM3	0.854			
	CPM4	0.590			

The goodness-of-fit statistics in Table 4 compare the fit of the observed model to a saturated model, representing a perfect fit [29]. The SRMR values for both models are relatively low, meaning neither model fits the data well about the average discrepancy between observed and predicted correlations, indicating a good fit. Also, the d_ULS and d_G values are higher for the estimated model than the saturated model, indicating a small discrepancy between the observed and estimated covariance matrices and, hence, a better fit. The chi-square test results show significant values for both models, indicating that the model fits the data well. Similarly, the NFI values for both models are high, with the estimated model performing slightly better, suggesting a better fit than the saturated model. Overall, these statistics indicate a good fit for the study model.

| Tab 4	Goodness of fit	
	Saturated Model	Estimated Model
SRMR	0.049	0.069
d_ULS	0.999	1.28
d_G	0.672	0.741
Chi-Square	971.445	1056.955
NFI	0.906	0.953

Figure 2- Final Measurement Model of Study

Further, the discriminant validity of the constructs is tested using the Fornel-Larcker criterion and the Heterotrait-monotrait ratio scale suggested by [15], [30]. First, correlation values in Table 5a show that the calculation correlations are distinctive, indicating no correlation between each other. Further, Table 5b shows the results of the Heterotrait-
Monotrait ratio, implying that all the HTMT are relatively less than the threshold value of 0.5, suggesting that discriminant validity exists in the measurement model.

Table 5b	Discriminant Validity Analysis	
	HTMT	Threshold Value
Campaign Performance Metrics <-> Big Data Analytics	0.389	0.850
Client Satisfaction <-> Big Data Analytics	0.355	
Client Satisfaction <-> Campaign Performance Metrics	0.025	
Decision-Making <-> Big Data Analytics	0.352	
Decision-Making <-> Campaign Performance Metrics	0.412	
Decision-Making <-> Client Satisfaction	0.584	

Table 5a	Big Data Analytics	Campaign Performance Metrics	Client Satisfaction	Decision-Making
Big Data Analytics	0.077			
Campaign Performance Metrics	0.419	0.749		
Client Satisfaction	0.445	0.603	0586	
Decision-Making	0.341	0.447	0.366	0.083

Further, the predictive power of the independent variable is tested using coefficients of Determination R^2. For Campaign Performance Metrics, the R^2 value is 0.475, indicating that the model's predictors explain 47.5% of the variance, suggesting a moderate power. The R^2 value for client satisfaction is 0.498, suggesting that the predictors explain 49.8% of the variance in Client Satisfaction (moderate level). Finally, decision-making has an R^2 value of 0.708, which explains 70.8% of the variance in decision-making. This higher R^2 value implies a strong level of explanation. Table 6 represents the results of coefficients of Determination R^2.
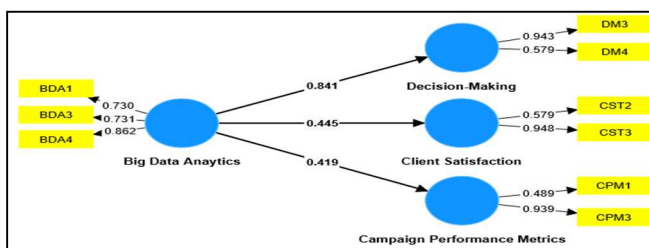
Tab 6 Variables	Coefficients of Determination R^2	
	R^2	Variables

Campaign Performance Metrics	0.475	Moderate
Client Satisfaction	0.498	Moderate
Decision-Making	0.708	**Strong**

Finally, path analysis is conducted to assess the study hypotheses proposing positive impacts of big data analytics on strategic decision-making, client satisfaction, and campaign performance metrics. Table 7 represents the results of path analysis including path values, t-values, significance values, means and standard deviations. First, regarding the H1 of the study, the path from Big Data Analytics to Strategic Decision-Making (DM) has a β coefficient of 0.841, showing a strong positive relationship. The high t-value of 6.102 and the low p-value of 0.000 indicate that this relationship is statistically significant. Besides, the path from Big Data Analytics to Client Satisfaction (CSA) has a β coefficient of 0.445, indicating a positive relationship, though weaker than the previous path. The high t-value of 10.807 and the low p-value of 0.000 suggest that the H2 of the study is also statistically significant. Finally, concerning the H3 of the study, the path from Big Data Analytics to Campaign Performance Metrics (CPM) has a β coefficient of 0.419, indicating a positive relationship. The high t-value of 12.947 and the low p-value of 0.000 indicate that this relationship is statistically significant.

Tab 7	Hypotheses Testing and Path Analysis				
	β	t	M	SD	P
BDA→ DM	0.841	6.102	3.76	0.676	0.000
BDA → CST	0.445	10.807	3.93	0.698	0.000
BDA → CPM	0.419	12.947	4.016	0.569	0.000

Note: BDA is Big Data Analytics, DM is Strategic Decision-Making, CSA is Client Satisfaction, and CPM is Campaign Performance Metrics

IV. DISCUSSION AND CONCLUSION

This research examined the impact of Big Data Analytics on Strategic Decision-Making, Client Satisfaction, and Campaign Performance Metrics in the UAE-based Public Relations (PR) organizations. Notably, Public relations play a critical role within an organization by acting as the communication bridge between the organization and the public. Through a strategic communication process, public relations seek to promote a mutually beneficial relationship between the organization and its audience. They often use word-of-mouth campaigns and transform the organization's messages into press releases for distribution to the media. The effectiveness of their communication, both in terms of the message's content and presentation, can significantly benefit the organization or entity they represent [31]. Altogether, findings acquired from the survey-based data showed a significant and positive impact of technology on PR practices. Respondents indicated a stronger agreement regarding the role and influence of technology in facilitating them. This research is supported by resource-based theory, which enabled different aspects of strategic decision-making in PR organizations. As noted by Mishra and colleagues [32], RBT encourages these organizations to assess their internal resources relative to competitors, identifying unique strengths and areas needing improvement. RBT supports investing in rare, practical, and not easily replicable resources, thus enhancing its competitive advantage. This perspective also applies to using big data analytics strategically. By incorporating RBT principles, PR organizations use big data analytics to comprehend audience preferences, monitor industry trends, and evaluate campaign effectiveness. The findings from current research also remained consistent with the idea regarding big data in revolutionizing PR organizations. According to the study respondents, big data analytics significantly enhance the strategic decision-making process in PR organizations and improve their ability to comprehend client needs and preferences. A wider agreement is also seen regarding big data analytics' critical role in optimizing campaign performance metrics in PR initiatives. Also, integrating big data analytics in PR operations leads to more informed and effective strategic decisions. As Wiencierz and Röttger [6] also argued that big data is transforming the field of public relations. This suggests that communicators can now use big data to gain in-depth insights into their stakeholders and competitors, enhancing their performance and decision-making process. This transformation shows a substantial advancement in planning, implementing, and evaluating public relations strategies through big data, which constitutes a revolution or simply a significant progression and remains a topic of greater significance. It is also found that the use of big data analytics in PR strategies positively influences client satisfaction levels. Respondents further revealed that big data analytics provide valuable insights that contribute to the success of PR campaigns. Finally, the respondents highlighted the importance of big data analytics in their organizations, indicating that the absence of big data analytics restricts PR organizations' ability to make strategic decisions aligned with market trends. Thus, incorporating big data analytics into PR practices is essential for staying competitive. For Turner and Atkinson [33], big data is influential for decision-making, and the same case is with PR organizations today, thus supporting the current research implying the importance of big data analytics in facilitating the function of PR organizations in the UAE like other organizations. These findings also show the importance of technology in upgrading organizational performance and helping to perform mundane tasks that can otherwise take a prolonged time to perform [34] [35]. Finally, this study has two primary limitations that affect its scope. First, it focuses only on PR practitioners from the United Arab Emirates [36], raising concerns about the generalizability of results to other geographical areas [37]. Second, the researchers opted for a single data gathering and analysis method, which also limits its scope. Therefore, further research is warranted to explore the use and role of big data analytics on decision-making in PR organizations, particularly in the Middle East, to highlight its importance and provide insights into its significance as a prevalent technology.

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