Short Paper

Professional Leadership Investigation in Big Data and Computer-Mediated Communication in Relation to the 11th Sustainable Development Goals (SDG) Global Blueprint

Oluwasegun Julius Aroba
Honorary Research Associate, Department of Operations and Quality Management, Faculty of Management Sciences, Durban University of Technology, 4000, Durban South Africa
Oluwaseguna@dut.ac.za, aroseglinks@yahoo.co.uk
ORCID: 0000-0002-3693-7255

Abstract

Purpose – This study aimed to explore how professionalism is impacted by big data and computer-mediated communication (CMC) in relation to level 5 leadership (L5LS).

Methodology – The method adopted here is a research design and with the use of a quantitative research design approach to carry out the analysis, the study investigated the connection between leadership influence, communication satisfaction, and job satisfaction in the context of CMC. Convenience sampling was used to gather the data, and structured questionnaires were used to protect the privacy and identity of the participants. The association between employee engagement and CMC was examined using multiple regression analysis.

Findings – The questionnaire used in this study also evaluated participants' perceptions of workplace leadership, their satisfaction with communication, and their job satisfaction with the 11th Sustainable Development Goals. The results showed a gender distribution with a slight female preponderance among the 103 participants (48 men and 55 women).

Furthermore, they indicated that computer-mediated communication (CMC) channels account for 65.4% of organizational communication. These results demonstrate the widespread adoption and utilization of information and communication technologies (ICTs) within the surveyed organizations.

Practical Implication – The substantial presence of internet-based communication channels, representing 65.4% of organizational communication, emphasizes these channels' crucial role in facilitating effective communication within these organizations. Overall, the study analyses the effects of big data and CMC on professionalism and provides insights into gender distribution among participants.

Research Limitations – Encouraging inclusive, safe, resilient, and sustainable cities and human settlements is the focus of Sustainable Development Goal (SDG) 11. Although it focuses on housing and urban challenges, its theoretical implications can be applied to several different sectors, such as professional leadership in big data. Theoretically, SDG 11 may have the following effects on Big Data-related professional leadership investigations.

Keywords – Big data, professionalism, Computer-Mediated Data (CMD), leadership, Sustainable Development Goals (SDG's)

INTRODUCTION

In the digital age, communication has become more complex and sophisticated than ever before. We live in a data-driven world, where professionals are increasingly relying on digital tools and techniques to manage and analyze substantial amounts of data to make informed decisions. With the growing significance of these technologies, it has become essential to understand the implications of their integration into professional communication.

According to Segal (2022), Big data is also known as massive, varied information sets that are expanding at an exponential rate. The "three v's" of big data are the amount of information, the rate at which it is produced and acquired, and the variety or range of the data points being covered. In the context of Big Data, professional communication is of utmost importance in computer-mediated communication (CMC). With the advent of big data analytics and computer-mediated communication (CMC) which refers to the use of digital technology to facilitate communication, manage data, and analyze information in various industries and contexts, businesses and organizations have new tools to better understand their customers, make data-driven decisions and, communicate more effectively, which in this context requires not only technical proficiency in data analysis and digital tools but also strong communication skills to convey complex information and insights to non-technical stakeholders.

The capacity to communicate effectively and efficiently using digital technologies is known as CMC competency, and it is highly influenced by a person's motivation, knowledge, abilities, and contextual factors (Chih-Ming and Ying-You, 2020). In the context of Big Data, mastery of CMC competency is crucial for one to contribute significantly to disseminating information through intermediary communication channels (Chih-Ming and Ying-You, 2020). Professional communication in the CMC comprises the capacity to interact with others using digital technologies acceptably and successfully. Professional communication with big data computer-mediated communication is an emerging trend transforming how businesses and organizations communicate with their stakeholders. This combination of technologies has the potential to revolutionize the way communication is conducted by professionals in the industry, offering new opportunities for innovation, growth, and success. Businesses that want to leave a good impression on their customers must prioritize Professional communication.

Effective professional communication is a multidisciplinary field involving various approaches and tools. some of the essential elements of professional communication include care, attention, discipline, fiduciary duty, and mentoring. Many professions, including instructional design, where mentorship is crucial to success, require effective communication as a fundamental component. There are several advantages to mentoring. According to research, effective mentoring can help people achieve higher job success, including promotions, raises, and more chances. Employee engagement, retention, and knowledge sharing are all better in organizations that value mentorship. 71% of Fortune 500 businesses now offer mentorship programs to their staff since it is so useful (Abbajay 2019).

According to Padhi, (2019), The focus on formal mentoring is a more recent trend, as businesses aim to design effective frameworks to optimize the benefits of this natural human relationship. A mentoring framework is also necessary when firms grow and become more separated geographically to facilitate relationships inside the organization. Modern design, which is getting more attention, must have discipline and attention to detail. Numerous areas have given professional communication a great deal of attention, which has sparked the creation of specialized methods and strategies for effective communication. Effective mentoring calls for mentors to modify their degree of care, advice, and support to the needs of the mentee. It is impossible to emphasize the value of mentorship in professional communication. Any mentoring relationship will succeed or fail based on the caliber of the mentoring provided.

Numerous research has looked at how big data and CMC affect business communication. For example, their research (Shamim et al., 2019) looked at how big data value generation, staff ambidexterity, and big data management skills relate to Chinese multinational corporations. According to the study, employee ambidexterity was favorably correlated with big data management skills, which in turn were positively correlated with big data value generation at the employee level. The study also discovered that encouraging staff ambidexterity and big data value generation required efficient employee communication and teamwork. The authors argue that by investing in employee training and

development programs, encouraging a culture of creativity and collaboration, and putting in place efficient communication techniques, Chinese multinational corporations may enhance their big data management capabilities.

Despite the numerous advantages of big data and CMC, there may also be issues and difficulties when incorporating them into business communication. According to the study (Microblog, 2023) Despite the extensive benefits of using big data analytics, there are still obstacles to its application. One is data accessibility, as data volumes increase, storage and retrieval become more difficult. To enable access by data scientists and analysts of lower skill levels, big data must be properly processed and maintained. Keeping up with Data Quality; It requires a lot of time, effort, and money to maintain data quality management for big data. Numerous sources and formats are used to send large amounts of data. Most importantly data security: big data systems provide unique security issues due to their complexity. Correctly resolving security vulnerabilities within such a large Big Data ecosystem can be a challenging task.

In conclusion, professional communication has been altered by the integration of big data and CMC, enabling a quicker and more effective interchange of information. Better decision-making, enhanced productivity, and improved cooperation are all advantages of this technology. However, there are potential issues with these technologies as well, such as privacy issues and the deterioration of interpersonal communication abilities.

LITERATURE REVIEW

Stich *et al.* (2017) and Lartey and Randall, (2023) both highlight the importance of employee engagement concerning the use of Computer-Mediated communication(CMC) with both authors pointing out that the reason for using CMC is what greatly affects employee engagement. To accomplish the organization's stated goals and strategies, employee engagement includes actively applying emotional, cognitive, and behavioral efforts at work. A multiple regression statistical model was employed by Lartey and Randall, (2023). to analyze the results of an online survey they conducted of 133 remote knowledge workers in the United States. They concluded that motivation, expressiveness, and empathy all had statistically significant links to the level of engagement among remote workers.

Considering this, we consider Stich *et al*'s influential contribution, which included proposing the concept of "misfit" about the stress that professionals face as a result of utilizing CMC. In their article, Stich et al. describe person-environment fit as "the compatibility between an individual and a work environment that occurs when their characteristics are well matched"(Stich *et al.* 2017: 97). By improving this compatibility managers can expect a higher degree of employee engagement. Employee engagement suffers from a lack of compatibility, or "Misfit," as there is a misfit between how professionals intend to use media and how they use it. For example, professionals frequently disagree on whether social media improves or hurts productivity, and big data

and social media both contribute to the erosion of privacy boundaries between co-workers workers (Kelly 2019).

Because every online activity leaves a trail, the internet's rapidly growing volume of data is what has caused this concern (Smalec 2021). In her article (Smalec, 2021) points out that marketing and management specialists attempt to get useful insights from big data, therefore collecting and accurately understanding this data is crucial for market organizations in terms of management as well as communication management. They analyze and choose the user profiles of those who are most likely to purchase the offered goods before they target their marketing efforts to a particular group. Big data offers a lot of potential for managing stakeholder communication, so it's important to be aware of both the advantages and risks of using it (Aroba et al., 2020; Aroba et al., 2022a, Aroba et al.,2022b; Aroba Oluwasegun 2022; Fagbola et al. 2022; Aroba et al.,2023a; Aroba et al.,2023b; Aroba et al.,2023c; Aroba et al.,2023d; Aroba et al.,2023e).

The features of CMC that make them most useful also make them most susceptible to moral transgressions. In every field of activity, conflicts between and among professional ethics, rules of professional conduct, and personal values emerge as a result of the expanding usage of computer-related technology. The professional will always bear the final burden of duty. When using computer technology, fundamental ethical principles are the same as they are in any professional endeavor(Harvey & Carlson 2003; Peeters 2022).

The social and ethical ramifications of big data CMC systems must be evaluated as they are created. Already widely implemented, CMC systems have the potential to have significant social effects that disproportionately affect vulnerable groups(Hancock, Naaman & Levy 2020). This assertion is supported by Nam's more recent work, which claims that the design of the CMC has recently been more focused on the requirements of the businesses because of the necessity of employing information products as a gateway for gathering data that could be used for marketing purposes. For instance, digital businesses employ predictive analytics to create new business prospects and values by drawing on the vast amounts of client online activity data, the most valuable data asset in their eyes is consumer data. They occasionally make use of the resources without customers' permission (Nam 2021).

The adoption of Acceptable Use Policies (AUPs) for computing in the workplace is necessary for professionals to prevent this. According to (Payson, 2022), AUPs are made to specify the guidelines that employees must adhere to when utilizing technology provided by the firm. By lowering the danger of cyberattacks, data breaches, and compliance violations, these measures can enhance security.

According to (Bedoya, 2021) researchers must also conduct a multidimensional analysis of authority characteristics and any links they may have with professionals. To achieve this, we looked into the nature of professionalism in IT and computing about the usage of big data CMC. These studies have identified numerous knowledge gaps in the area of Professional

Communication with Big Data CMC, this literature review covers what factors policymakers should take into account when regulating CMC, and what strategies professionals can use to allay these worries(Hancock, Naaman and Levy 2020).

FRAMEWORK

Table 1 and Table 2 are the different approaches, problem solved with a unique contribution that has been used in recent articles about big data, computer-mediated communication styles, and leadership.

Table 1. Methods and unique contribution of computer-mediated level 5 leadership (L5LS)

Author	Year	Method	Problem Solved	Unique contribution
Abbajay, M	2019	Hybrid Approach	Importance of successful mentoring for both individual and corporate success.	More success in the workplace, including raises, promotions, and new chances.
Padhi, P	2019	Structured mentoring	To optimize the advantages of the mentor-mentee connection, firms must arrange their mentoring programs.	Organizational connectedness, networking, employee engagement, talent development, and knowledge transfer.
microblog	2023	Big data analytics	Businesses utilize data analysis tools to analyze vast amounts of data to make better business decisions.	The advantage of the power of big data is to make wise decisions, increase operational effectiveness, better understand consumers, forecast future events, and gain a competitive edge.
Segal, T	2022	Hybrid Approach	Management and use of big data, in particular the classification and analysis of unstructured data, including data from social media, to learn more about client requirements.	Various data obtained can be used to gain insightful information about client requirements.
Chih-Ming, C., Ying-You, L	2020	Web-based collaborative problem-based learning (WCPBL)	Creation of computer-mediated communication (CMC) competence forecasting model (CMCCFM) based on five well-known machine learning schemes: the linear regression algorithm, the M5P algorithm, the sequence minimum optimization regression algorithm, the convolutional neural network algorithm, and the multi-layer perceptron algorithm.	The creation of the CMCCFM must consider the learning scenarios and learner characteristics, such as the conversation characteristic and level of familiarity with problem-solving.

Table 2. Approaches on big data, computer-mediated in relation to level 5 leadership (L5LS)

Author	Year	Method	Problem Solved	Unique contribution
Shamim, S., Zeng, J., Choksy, U., Shariq, S	2019	Partial least square	Relationship between employee exploration and exploitation activities and big data management capabilities.	Conceptualizing big data management as the capacity to make use of external knowledge (produced by worldwide users) in a resource-constrained setting.
Lartey, F M., & Randall, P M	2023	Multiple regression statistical	How motivation, expressiveness, and empathy influenced distant workers' involvement.	Managers can see which remote employees need the greatest help.
Peeters, W	2022	Application programming interface (API)	What interactional norms, protocols, and conventions that regulate computer-mediated communication (CMC) might be first identified by educators and researchers.	Researchers and educators can better map and analyze processes like socialization by taking into consideration how the dynamics of online contact and collaboration change over time.
Payson, H	2022	Hybrid Approach	Assuring the ethical and responsible use of technology at work in a hybrid workplace.	Improved productivity, Enhanced security, Risk mitigation, Compliance and legal requirements, and Employee empowerment.
Stich, J.-F., Tarafdar, M., Cooper, C. L., Stacey, P	2019	Multi-method	How a person's actual and desired use of communication tools affects his or her level of work stress.	Influence the desired and actual use of communication in the workplace.
Smalec, A	2021	Systematic Approach	Describe the idea of big data and how it may be used to control environmental marketing communication.	Assist in dealing with the difficulties and dangers brought on by modern multidirectional communication in a hypermedia environment.
Nam, J	2021	Experimental study	Computer-mediated communication's positive attributes in corporate planning, where teamwork depends on effective communication.	Assist in the development of CMC technology design that is more customer-focused and suitable for group projects like business planning.
Harvey, V. S., Carlson, J. F	2019	Professional expertise	When employing computer-related technology in their work, school psychologists must take ethical implications and considerations into account.	Psychologists can ensure appropriate use of technology and make knowledgeable decisions.
Luo, Z., Walden, J	2019	Literature review	The effects of computer-mediated communication (CMC) technology on interpersonal communication, particularly concerning how context is conveyed in messages, how intimacy is felt, and how interpersonal communication exchanges change over time.	Assist frontline workers and managers in starting to think about how CMC can be a tool and influence in our professional lives.

Table 2. Approaches on big data, computer-mediated in relation to level 5 leadership (L5LS)
(cont.)

Author	Year	Method	Problem Solved	Unique contribution
Hancock, J. T., Naaman, M., Levy, K	2020	Research synthesis	Discuss the effects of AI-MC on human communication and the need to reconsider and maybe build upon current ideas, conceptual frameworks, and research findings in Computer-Mediated Communication (CMC).	Provides a framework for future research efforts to study the implications and promise of AI-MC, as well as a more thorough knowledge of AI-MC and its effect on human communication. This will help to ensure that the integration of AI into human communication is done so intelligently and ethically.
Bedoya, E	2021	Cronbach's alpha coefficient, SPSS, correlation analysis	How the relationship between communication fulfillment and job fulfillment in CMC environments is influenced by transactional, transformational, and level 5 leadership approaches.	Contributions from academics and managers are provided for literature, study, assessment, decision-making, and policy formulation that aid in understanding and improving leadership practices, work satisfaction, and communication satisfaction in CMC situations.

METHODOLOGY

This section delves into research quantitative design. The quantitative research design procedures employed in the social sciences, natural sciences, and many other domains for gathering and analyzing numerical data are known as quantitative research strategies and approaches (Fischer et al., 2023; Aroba 2022). These methods are distinguished by their focus on statistical analysis and objective, measurable measurements. The participants, data collection procedures, and data analysis techniques were used in the study.

Research Design

A quantitative research design is used in this study to evaluate the relationship between leadership influence, communication satisfaction, and work satisfaction in computer-mediated communication. To gather information at a single point in time, a cross-sectional design is used (Aroba 2022).

Sample Selection and Data Collection

They employed convenience sampling to choose participants from various organizations operating in computer-mediated communication situations. We utilized a structured questionnaire with established measures to collect data. Items in the questionnaire assess job satisfaction and leadership. The questionnaire was filled out by

the participants based on their thoughts and experiences. To promote honest responses, the data collection process assures confidentiality and anonymity.

Variable measurements

Communication Satisfaction: The questionnaire assesses participants' satisfaction with their workplace's communication processes and channels.

Job Satisfaction: Participants' overall job satisfaction is measured using items relating to various aspects of their work experience.

Leadership: Items in the questionnaire examine participants' perceptions of leadership behaviors and styles in their workplace.

Data Analysis

The descriptive statistics (mean, standard deviation) to characterize the sample and variable characteristics. Correlation analysis was used to investigate the connections between communication fulfillment, job fulfillment, and leadership. Multiple regression analysis was used to investigate the impact of leadership on the connection between communication fulfillment and work fulfillment. Statistical software was used to analyze the data and compute the required statistical measures.

Ethical considerations

By assuring participant confidentiality, voluntary participation, and informed consent, the study report adheres to ethical principles. The study protects participants' privacy and anonymity by anonymizing data throughout analysis and publication.

Theoretical Implications

Leaders may be motivated to investigate how Big Data might enhance accessibility to urban services like public transportation, healthcare, and education by focusing on inclusivity in SDG 11. By identifying underserved populations, streamlining service delivery, and addressing disparities in metropolitan areas, leaders may leverage big data to guarantee that everyone has access to basic services. Sustainability of the Environment and Green Urbanism: The significance of environmentally sustainable cities is emphasized in SDG 11. Big Data leaders can investigate how data analytics can help with resource conservation and green urban design. Using big data, decision-makers can optimize energy use, keep an eye on and lessen environmental effects, and support environmentally friendly urban transportation options.

ANALYSIS: PARTICIPATION IN THE COMMUNITY AND DATA TRANSPARENCY

The data was collected through a structured questionnaire, as structured data information that the company currently manages in databases and spreadsheets; is typically numerical (SEGAL 2022). Convenience sampling was used, which entails choosing participants who are available and accessible. This method may induce bias and limit the findings' generalizability to a larger group. However, given the study's emphasis on computer-mediated communication and the specific businesses involved, convenience sampling may be suitable. It enables data collecting to be practicable and feasible within the specified setting.

The structured questionnaire ensured that each participant's personal information was not collected as the entire data collection process ensures confidentiality. Therefore, before any analysis, the data set was thoroughly anonymized (Peeters 2022). It also ensures standardized data collection, allowing for comparability and consistency between participants. This method is critical for reducing social desirability bias and creating a safe setting in which participants can communicate their views and experiences.

Descriptive statistics highlight the key elements of the data, offering an overview of the replies of the participants as well as the distribution of various variables such as communication satisfaction, work satisfaction, and leadership impressions.

Lartey and Randall (2023), utilized multiple regression analysis to evaluate the relationship between employee engagement and computer-mediated communication variables in their study. The same was done for this study, it aimed to see if leadership actions and styles had a substantial impact on the link between communication fulfillment and work fulfillment in the context of computer-mediated communication. The connection between communication fulfillment, work fulfillment, and leadership was investigated using correlation analysis. The study can analyze whether there are links among communication fulfillment, job satisfaction, and leadership in the setting of computer-mediated communication by investigating the relationship between these constructs.

This study's methodology exemplifies a well-designed strategy to investigate the connection between leadership impact, communication contentment, and work contentment in computer-mediated communication. The qualitative study design, convenience sample, structured questionnaire, data analysis procedures, and ethical considerations all contribute to the study's findings' rigor and reliability.

These are the results of the above-mentioned study. From the sample studied (n=103) 48 of them were male and 55 of them were female. Lartey and Randall (2023) used the following acronyms to describe the corresponding experience in the study, Job

Satisfaction (JS), Communication Satisfaction (CS), Transactional Leadership (TRN), Transformational Leadership (TRF), Level 5 Leadership (L5LS).

The following tables (Table 3 and Table 4) depict the effect of different leadership styles on the connection between Communication Satisfaction (CS) and Job Satisfaction (JS). According to Pearson's moderation H, job fulfillment and communication fulfillment are strongly correlated. All variables returned strong values ($p < 0.01$).

Table 3. Pearson's correlation coefficient moderation H

Variable	1	2	3	4	5
1. JS	-	-	-	-	-
2. CS	,721**	-	-	-	-
3. TRN	.391**	.596**	-	-	-
4. TRF	.537**	.690**	.796**	-	-
5. L5LS	.521**	.725**	.672**	.794**	-

**. Correlation is significant at the 0.01 level (2-tailed).

From Table 4, The findings showed that the coefficient in this instance was not significant. Because transactional leadership did not control the relationship between job happiness and communication satisfaction, the hypothesis was refuted.

Table 4. Model H2

Variable	coeff	se	t	p	LLCI	ULCI
constant	150.3129	2.0943	71.7713	.0000	146.1573	154.4685
CS	17.8400	2.1866	8.1590	.0000	13.5014	22.1786
TRN	-2.4581	3.2581	-.7545	.4524	-8.9229	4.0067
Int_1	1.9103	2.3057	.8285	.4094	-2.6647	6.4854

Product terms key: Int_1:   CS   x   TRN

From Table 5, The findings showed that the coefficient in this instance was not significant. Because transformative leadership did not control the relationship between job happiness and communication satisfaction, the hypothesis was rejected.

Table 5. Model H3

Variable	coeff	se	t	p	LLCI	ULCI
constant	150.9317	2.1870	69.0133	.0000	146.5922	155.2711
CS	15.2023	2.2876	6.6454	.0000	10.6631	19.7415
TRF	2.9159	3.6287	.8036	.4236	-4.2841	10.1160
Int_1	.5077	2.2500	.2256	.8220	-3.9568	4.9721

Product terms key: Int_1:   CS   x   TRF

The findings from Table 6 and Table 7 indicate the moderator term's addition caused a significant shift in r2 (r2=023, p 0.05), as well as a significant association between the interaction term and the dependent variable (JS) (b=1.645, t=2.249, 95% CI [.1935,

3.0962], p.05). This suggests that level 5 leadership had a modifying effect on the connection between work satisfaction and communication satisfaction.

Table 6. Model H4

	coeff	se	t	p	LLCI	ULCI
constant	148.7497	2.0702	71.8530	.0000	144.6419	152.8574
CS	17.7114	2.3063	7.6794	.4107	13.1351	22.2877
L5LS	.7669	1.4682	.5223	.6026	-2.1464	3.6802
Int_1	1.6449	.7315	2.2488	.0267	.1935	3.0962

Product terms key: Int_1:   CS   x   L5LS

Source: Author

Test(s) of highest order unconditional interaction(s):

Table 7. Moderator

	R²-chng	F	df1	df2	p
X*W	.0233	5.0570	1.0000	99.0000	.0267

Focal predict: CS   (X)   Mod var: L5LS   (W)

Graph 1 (Figure 1) shows the relationship between JS and CS which shows a directly proportional trend. All in all, the results supported the hypothesis.
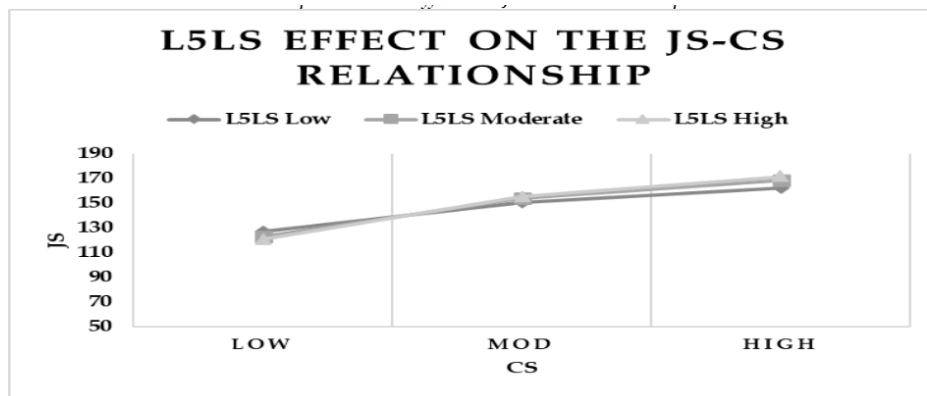

Figure 1. L5LS Effect on JS-CS relationship

RESULT

Sociodemographic data

The questionnaires were chosen based on two criteria: a precise theoretical framework pertinent to the study's objectives and reliable reliability standards. All questionnaires were evaluated during the present investigation, along with reliability checks from earlier research; hence, 5 questionnaires were used. (Bedoya,2021).

In terms of participant demographics, out of the 103 individuals who completed the questionnaires, 48 (46.6%) identified as male, while 55 (53.4%) identified as female. The participants' job tenure ranged from 1 to 38 years, with an average of 6.83 years and a standard deviation of 7.0. Similarly, the time in charge of the same position ranged from

1 to 38 years, with an average of 4.90 years and a standard deviation of 5.99. When examining the participants' level of command within the organization, 51 (49.5%) belonged to the middle level, 14 (13.6%) were at the top level, 11 (10.7%) were at the low level, and 27 (26.2%) did not have a specific level of command assigned to them.

Regarding the use of Internet technologies in the participants' work activities, respondents reported spending an average of 5.4 hours per day using the Internet for work-related tasks. Additionally, they stated that 65.4% of organizational communication took place through computer-mediated communication (CMC) channels. These findings indicate that information and communication technologies (ICTs) are extensively utilized within the organizations surveyed. The predominance of internet-based communication channels, accounting for 65.4% of organizational communication, highlights the significance of these channels in facilitating communication within these organizations.

This study hypothesized that in CMC situations, job happiness has a favorable and significant link with communication satisfaction. The results of the analysis of Table 8 show a strong and statistically significant connection (r =.725, p 0.01) between communication satisfaction, which we believe drives job satisfaction, and job satisfaction, which is the variable we are trying to predict. This suggests that higher levels of communication satisfaction and higher levels of job satisfaction are strongly related.

Table 8. Pearson's correlation coefficient

Variable	Pearson Correlation r	
JS	-	-
CS	.725**	-

In Table 9, both the constant coefficient (b=68.121, t=8.368) and the coefficient related to communication satisfaction (b=16.178, t=10.461) are statistically significant at a very high level (p < .001). The communication satisfaction coefficient indicates a positive association between job satisfaction and communication satisfaction. In other words, when communication satisfaction rises by one unit, work satisfaction rises by approximately 16.178 units. This finding demonstrates that higher job satisfaction relates to improved communication satisfaction.

Table 9. Coefficients H1

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
1 (Constant)	68.121	8.141		8.368	.000
CS	16.178	1.546	.721	10.461	.000

Furthermore, from Table 10 the study studied how leadership styles affected the connection between job fulfillment and fulfillment with communication. The study discovered that level 5 leadership (L5LS) had a significant impact across all value categories (low, moderate, and high). However, when the value was high, the influence of L5LS was found to be considerably larger than when it was low or moderate.

Table 10. Pearson's correlation coefficient moderation H

Variable	1	2	3	4	5
1. JS	-	-	-	-	-
2. CS	,721**	-	-	-	-
3. TRN	.391**	.596**	-	-	-
4. TRF	.537**	.690**	.796**	-	-
5. L5LS	.521**	.725**	.672**	.794**	-

The conditional effect of L5LS was assessed at b = 20.652, with a 95% confidence interval (CI) spanning from [14.785, 26.518] when the value was high. The associated t-value was 6.985, and the p-value was less than 0.001, suggesting that the result was very significant. When the value was low, the conditional effect of L5LS was measured at b = 14.283, with a 95% confidence interval of [9.5673, 18.9978]. The corresponding t-value was 6.010, and the p-value was less than 0.001, indicating that the result was significant.

Similarly, the conditional effect of L5LS was evaluated at b = 18.618, with a 95% CI ranging from [13.754, 23.483] when the value was moderate. The associated t-value was 7.595, and the p-value remained less than 0.001, suggesting that the result was significant. These findings show that level 5 leadership has a considerable influence across all values, but it is especially obvious when the value is high. The findings emphasize the significance and effectiveness of level 5 leadership, particularly in situations with high values.

Table 11. Test of highest-order unconditional interactions

	coeff	se	t	p	LLCI	ULCI
constant	148.7497	2.0702	71.8530	.0000	144.6419	152.8574
CS	17.7114	2.3063	7.6794	.4107	13.1351	22.2877
L5LS	.7669	1.4682	.5223	.6026	-2.1464	3.6802
Int_1	1.6449	.7315	2.2488	.0267	.1935	3.0962

The analysis revealed that the interaction between the independent variable (communication fulfillment) and the moderator variable (level 5 leadership) had a significant connection with the dependent variable (job satisfaction). The coefficient for the interaction term was 1.645, with a t-value of 2.249 and a 95% confidence interval ranging from 0.1935 to 3.0962. The p-value was less than 0.05, indicating statistical significance.

Table 12. Test(s) of highest order unconditional interactions: Moderator

	R2-chng	F	df1	df2	p
X*W	.0233	5.0570	1.0000	99.0000	.0267

Furthermore, when the moderator term (level 5 leadership) was added to the model, there was a significant increase in the adjusted R-squared value (r2=0.23, p<0.05; Table 12). This suggests that the presence of level 5 leadership as a moderator influenced the relationship between job satisfaction and communication satisfaction. In simpler terms, the impact of communication satisfaction on job satisfaction was influenced by the level of level 5 leadership in the organization.

The plot below shows the significant influence of level 5 leadership on the relationship between job satisfaction and communication satisfaction (Figure 2). From Figure 2 above the study found that level 5 leadership (L5LS) had a significant influence across all levels of values (low, moderate, and high). However, the impact of L5LS was found to be even stronger when the value was high compared to when it was low or moderate. Specifically, when the value was high, the conditional effect of L5LS was measured at b = 20.652, with a 95% confidence interval (CI) ranging from [14.785, 26.518]. The corresponding t-value was 6.985, and the p-value was less than .001, indicating a highly significant result.
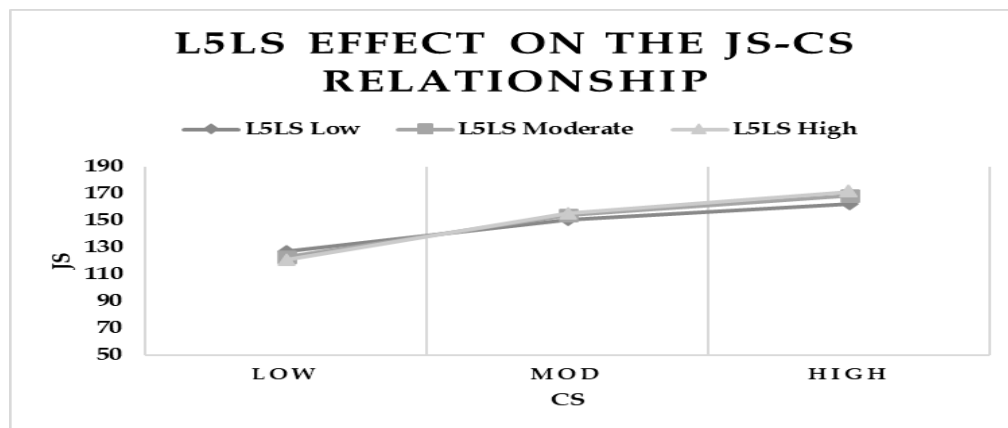

Figure 2. Effect on JS-CS Relationship

In contrast, when the value was low, the conditional effect of L5LS was measured at b = 14.283, with a 95% CI ranging from [9.5673, 18.9978]. The associated t-value was 6.010, and the p-value remained less than .001, indicating a significant result. Similarly, when the value was moderate, the conditional effect of L5LS was measured at b = 18.618, with a 95% CI ranging from [13.754, 23.483]. The corresponding t-value was 7.595, and the p-value remained less than .001, indicating a significant result. The results demonstrate that the influence of level 5 leadership is significant across all values, but it is particularly pronounced when the value is high. The findings highlight the importance and effectiveness of level 5 leadership, especially in situations where high values are involved.

CONCLUSION

This article examined the impact of leadership on the 11th sustainable cities and communities' connection between job and communication fulfillment in a computer-mediated communication (CMC) environment. The study reveals a gender distribution among participants, with slightly more females than males. Job tenure and time in charge of the same position varied, indicating a diverse range of experience levels. The distribution of participants across different levels of command within the organization was also varied. The results emphasize the substantial use of Internet technologies in participants' work activities, with a significant portion of organizational communication occurring through computer-mediated communication channels. This suggests the prominent role of internet-based channels in facilitating communication within these organizations.

The research results show some important findings. First, there is a positive correlation between fulfillment of both the job and communication in the CMC environment. This suggests that organizations need to improve their use of social media tools to ensure effective corporate communications. Second, the study highlights that level 5 leadership, characterized by professional will and humility, is the only leadership style that significantly impacts the relationship between communication satisfaction and job satisfaction. Small business managers are encouraged to identify Level 5 leaders within their organization and involve them in designing communication processes and supporting employees. According to Pearson's correlation coefficient moderation analysis, as shown in Table 3, strong values were found across all variables. The coefficients in Tables 4 and 5 were discovered, nevertheless. The coefficients in Tables 3 and 4 were found to be insignificant, regardless. In terms of incorporating Internet technologies into their work, participants revealed that they spend an average of 5.4 hours per day utilizing the Internet for work-related purposes.

Overall, this research highlights the growing importance of the relationship between CMC and organizational communication. CEOs and communications professionals should think about their communications strategy and provide training to all employees on how to use and deploy social networking tools. This expands the scope

of organizational communication and provides better guidance and feedback within the organization.

RECOMMENDATION

The theoretical Implication is to promote sustainable urban planning and development, Big Data experts may investigate urban data analytics. To maximize resource allocation, infrastructure, and services for sustainable cities, this entails studying large datasets from urban environments. By using big data, leaders may find patterns, trends, and opportunities for urban sustainability to be improved, which will assist decision-makers in government and urban planning. SDG 11: Resilience and Disaster Management highlights the significance of urban resilience. Experts in the field of big data can investigate how data-driven insights can improve metropolitan regions' readiness, response, and recovery from disaster. Using big data analytics, decision-makers may create models that anticipate natural disasters, evaluate risk, and allocate resources most effectively in times of need. By understanding the impact of leadership on the connection between job and communication fulfillment in CMC environments, organizations can improve communication practices and take proactive steps to increase employee satisfaction.

DECLARATIONS

The author declares no conflict of interest or financial or personal relationships that may have inappropriately influenced him in writing this article.

Conflict of Interest

The researcher declares no conflict of interest in this study.

Informed Consent

Not applicable

Ethics Approval

The article followed all ethical standards for research with direct contact with human or animal subjects.

REFERENCES

Abbajay, M., (2019). *Forbes.* Retrieved from https://www.forbes.com/sites/maryabbajay/2019/01/20/mentoring-matters-three-essential-element-of-success/?sh=4049e4d945a9.

Anwana, E. O., & Aroba, O. J. (2022). African women entrepreneurs and COVID-19: Towards achieving the African Union Agenda 2063. *HTS Teologiese Studies/Theological Studies*, 78(2).

Aroba, O.J., Naicker, N., Adeliyi, T., & Ogunsakin, R.E., (2020). Meta-analysis of heuristic approaches for optimizing node localization and energy efficiency in wireless sensor networks. *International Journal of Engineering and Advanced Technology (IJEAT)*, 10(1), 73-87.

Aroba, O.J., (2022). *Improving node localization and energy efficiency for wireless sensor networks using hyper-heuristic optimization algorithms* (Doctoral dissertation). Durban University of Technology, Durban, South Africa. Retrieved from https://openscholar.dut.ac.za/bitstream/10321/4319/3/Aroba_OJ_2022.pdf

Aroba, O.J., Naicker, N., & Adeliyi, T.T., (2023a). Node Localization in Wireless Sensor Networks using a Hyper-Heuristic DEEC-Gaussian Gradient Distance Algorithm. *Scientific African*, p.e01560.

Aroba, O.J., Xulu, T., Msani, N.N., Mohlakoana, T.T., Ndlovu, E. E., & Mthethwa, S.M., (2023b), March. The Adoption of an Intelligent Waste Collection System in a Smart City. In *2023 Conference on Information Communications Technology and Society (ICTAS)* (pp. 1-6). IEEE.

Aroba, O. J., & Mnguni, S.B., (2023c). An Enterprise Resource Planning (ERP) SAP Implementation Case Study in South Africa Small Medium Enterprise Sectors. In *Digital Technologies and Applications: Proceedings of ICDTA'23, Fez, Morocco, Volume 1* (pp. 348-354). Cham: Springer Nature Switzerland.

Aroba, O.J., Mabuza, P., Mabaso, A. & Sibisi, P., (2023d). Adoption of Smart Traffic System to Reduce Traffic Congestion in a Smart City. In *Digital Technologies and Applications: Proceedings of ICDTA'23, Fez, Morocco, Volume 1* (pp. 822-832). Cham: Springer Nature Switzerland.

Aroba, O.J., Chinsamy, K.K., Makwakwa, T.G. (2023e). An ERP Implementation Case Study in the South African Retail Sector. In: Abraham, A., Hong, TP., Kotecha, K., Ma, K., Manghirmalani Mishra, P., Gandhi, N. (eds) Hybrid Intelligent Systems. HIS 2022. Lecture Notes in Networks and Systems, vol 647. Springer, Cham. https://doi.org/10.1007/978-3-031-27409-1_87

Bedoya, E. (2021). Leadership influence on the relationship between communication satisfaction and job satisfaction in computer-mediated communication environments. *Journal of Business and Retail Management Research, 15*(2), 21-34.

Chih-Ming, C., Ying-You, L. (2020). Developing a computer-mediated communication competence forecasting model based on learning behavior features. *Computers and Education: Artificial Intelligence, 1,* 100004.

Fagbola, T.M., Fagbola, F.I., Aroba, O.J., Doshi, R., Hiran, K.K., & Thakur, S.C., (2022). Smart Face Masks for Covid-19 Pandemic Management: A Concise Review of Emerging Architectures, Challenges and Future Research Directions. *IEEE Sensors Journal.*

Fischer, H. E., Boone, W. J., & Neumann, K. (2023). Quantitative research designs and approaches. In *Handbook of research on science education* (pp. 28-59). Routledge.

Hancock, J. T., Naaman, M. and Levy, K. (2020). AI-Mediated Communication: Definition, Research Agenda, and Ethical Considerations. *Journal of Computer-Mediated Communication*, 25(1), 89-100.

Harvey, V. S. & Carlson, J. F. (2003). Ethical and Professional Issues with Computer-Related Technology. School *Psychology Review*, 32 (1), 92-107.

Lartey, FM & Randall, PM. (2023). The Relationship between Remote Employee Engagement and Computer-Mediated Communication Indicators. The Relationship between Remote Employee Engagement and Computer-Mediated Communication Indicators. *Current Topics on Business, Economics, and Finance, 1,* 132–144. doi: https://doi.org/10.9734/bpi/ctbef/v1/18461d.

Luo, Z. & Walden, J. (2019). Social media. *Computer-Mediated Communication for* Business: *Theory to Practice*. Newcastle upon Tyne: Cambridge Scholars Publishing, 7-8 Retrieved from https://www.cambridgescholars.com/resources/pdfs/978-1-5275-3805-4-sample.pdf

Microblog, (2023). *TheCeoViews*. Retrieved from https://theceoviews.com/big-data-analytics-uses-benefits-and-challenges

Nam, J. (2021). Understanding of the Quality of Computer-Mediated Communication Technology in the Context of Business Planning. *Informing Science: The International Journal of an Emerging Transdiscipline*, 24, 111-127.

Padhi, P., (2019). *Training Industry*. Retrieved from https://trainingindustry.com/articles/strategy-alignment-and-planning/7-ways-to-structure-mentoring-programs-to-improve-their-reach/

Payson, H. (2022). *Do We Need Employee Acceptable Use Policies for Workplace Technology?*. Retrieved from https://www.iofficecorp.com/blog/acceptable-use-policies-workplace-technologies

Peeters, W. (2022). New perspectives on computer-mediated communication research: A social network analysis approach. *New perspectives on computer-mediated communication research: A social network analysis approach*, Retrieved from https://www.researchgate.net/publication/359042201_New_perspectives_on_computer-mediated_communication_research_A_social_network_analysis_approach

Segal, T., (2022). *Investopedia*. Retrieved from https://www.investopedia.com/terms/b/big-data.asp.

Shamim, S., Zeng, J., Choksy, U., Shariq, S. (2019). Connecting big data management capabilities with employee ambidexterity in Chinese multinational enterprises through the mediation of big data value creation at the employee level. *International Business Review, 29,* 101604.

Smalec, A. (2021). Smalec, A. (2021). Big Data as a tool helpful in communication management. *Procedia Computer Science, 192,* 5156-5165.

Stich, J.-F., Tarafdar, M., Cooper, C. L. and Stacey, P. (2017). Workplace stress from actual and desired computer-mediated communication use: a multi-method study. *New Technology, Work and Employment,* 32(1), 84-100.

Author's Biography

Oluwasegun. J. Aroba, 🆔 Ⓖ SC Ⓟ a Durban University of Technology lecturer, Department of Information Systems. Honorable Research Associate in the Department of Operations and Quality Management. He has a Ph.D. in Information Technology. A graduate of Information Technology University from the prestigious Coventry University United Kingdom, BSc. Computer Science and Technology (Upper-Class Division) Crawford University whose research inclination focus area are into Wireless Sensor Networks, Hyper-Heuristic, Hybrid-Heuristic, Meta-Analysis, Project Management, Data Science, Machine Learning, SAP Specialist with over decade years of experience in the higher education sector, healthcare industries, government parastatals, a consultant across the globe, a graduate member of IEEE, IITPSA South Africa, Member of IET UK. He has Chaired and Co-Chaired International and National Conferences. He is a global mentor to SMEs and European African, Sisonke NdabaX, and a seasoned guest speaker. He has a vast collaboration network across Spain, France, Morocco, the USA, the UK, South Africa, and Sweden. oluwaseguna@dut.ac.za