The impact of using WhatsApp on the team's communication, employee performance and data confidentiality

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CHRONICLE	ABSTRACT
	This research aims to explore the ways in which the use of WhatsApp for diagonal and lateral communication can improve the achievement of tasks, to what extent it can keep data and information trustworthy and confidential, and in what ways WhatsApp improves the communication of suggestions, instructions, and complaints. The study uses a quantitative research strategy with one independent variable, which is WhatsApp usage in the workplace, and three dependent variables, which are team member communication, employee performance, and confidentiality. To test the proposed research model, the authors conduct an online questionnaire in the United Arab Emirates. Descriptive statistics are used to analyze the quantitative data collected through the questionnaires. The study shows that the use of WhatsApp for communication is positively associated with leader-member exchange (LMX) and team-member exchange (TMX). Both LMX and TMX have a positive correlation with employee performance. WhatsApp is a trusted method to transfer information between team members and between managers and employees. The study also asserts that the use of WhatsApp is an effective tool to improve productivity and performance, and it makes task completion faster. It appears that the study has a limited literature review and lacks previous research on the variables related to data confidentiality and improving team performance. In this case, the study seems to be lacking a thorough examination of prior research related to data confidentiality and its impact on team performance. WhatsApp is a widely used messaging application that offers end-to-end encryption to its users, and this encryption provides a certain level of security and privacy. WhatsApp usage has a positive impact on team performance and productivity. The study presents a concrete understanding of how vertical and horizontal relationships connect the impact of WhatsApp communication on employee performance. The study recommends the use of WhatsApp in the workplace as a safe tool to boost performance and improve productivity and satisfaction.

1. Introduction

Jan Koum and Brian Acton founded WhatsApp Inc. in 2009 in Santa Clara, California. WhatsApp started as an iPhone application, but soon became more popular and was available for Android, Windows Phone, BlackBerry, and Nokia (Plana et al., 2013). In February 2014, Facebook Inc. bought WhatsApp for $19 billion. As of September 2015, it had more than 900 million monthly active users worldwide. It is very easy to start using WhatsApp, as it is free to download and does not require complex

registration. The application automatically identifies users by their phone numbers. The contacts stored on the smartphone who are also users of WhatsApp are automatically added to the application's contact list. WhatsApp combines one-to-one, one-to-many, and group communication and offers private chats, broadcasts, and group chats. In early 2015, a desktop client and voice call feature over VoIP was added (Chowdhry, 2015). A successful company must have leaders who can communicate well with people at all levels. Communication is very important to solve professional and personal problems in the work environment. The use of various media and technologies has changed the pattern of face-to-face communication to communication through technology (Putri & Irwansyah, 2020). WhatsApp, such as WhatsApp, is used for the wide distribution of information (Wong et. al. 2021). Communicating effectively with employees is a difficult task for managers (Ayub et. al. 2014). According to research by Hargie (2016), good communication in an organization can optimize working relationships, enhance creativity, and increase employees' sense of belonging and commitment to the organization. WhatsApp is an internet-based application that has the potential to be used as a communication medium (Rahartri 2019). In Fattah's study, WhatsApp had a significant effect on students' writing skills and increased students' active participation in class (Fattah 2015). Rahartri's study shows that users prefer WhatsApp as a communication medium compared to other communication media (Rahartri 2019). Meanwhile, Trisnani's research revealed that the most commonly used communication medium by community leaders is WhatsApp (Trisnani 2017).

WhatsApp has several advantages over similar applications. Some advantages of WhatsApp are that it does not require a password, it is directly connected to a contact number on the cell phone, it is convenient and timely to send messages, it is easy to understand, it saves battery, and it saves internet data (Rahartri 2019). Many parties use WhatsApp as a medium for online communication (Draz et al., 2023). Previous studies have shown that WhatsApp can be used for two communication purposes, vertical and horizontal (Davison et al., 2014; Wong et al., 2016). Diagonal communication occurs between individuals with different hierarchical status levels (Wong et al., 2016), while lateral communication typically occurs between individuals with the same hierarchical status (Postmes et al., 2003; Wong et al., 2016). Diagonal communication includes information that helps define the team, responsibilities, and roles of subordinates on the team. Lateral communication includes task-related information that describes team events and developments, as well as informal information that promotes affiliation and cohesion among team members (Postmes et al., 2003). Therefore, it is worthwhile to investigate the underlying mechanisms through which WhatsApp use for diagonal and lateral communication contributes to employees' work performance. Communication between employees can provide the social-emotional benefits necessary for the organization to thrive (Draz et al., 2023). Moreover, in high-quality leader-member exchange (LMX) and team-member exchange (TMX) relationships, employees' economic, social, and psychological needs are more likely to be met (Zhang et al., 2012). These social exchange relationships gradually transform into a shared commitment to work beliefs and goals, which eventually improves employees' work performance (Banks et al., 2014). Therefore, the first objective of our research is to investigate the relationships between WhatsApp for communication, social exchange relationships, and work performance due to the potential importance of theory and practice (Abdelhay, et al, 2023). Theoretically, this could open a research opportunity to investigate how WhatsApp works for communication through different underlying mechanisms. In practice, a full understanding of these relationships may have the potential to help organizations fine-tune their WhatsApp usage strategies.

2. Literature review

2.1 Theory of Virtuality

Shan et al. (2022) suggest that improving technological capabilities could help develop effective interaction in a virtual environment (Davis et al. 2009). WhatsApp functions as a social network and has been used to build and maintain social relationships (Davison et al., 2014). When we apply the theory of virtuality to the context of WhatsApp, we assume that employees using WhatsApp in different ways may lead to different outcomes in social exchange relationships. However, virtuality theory does not predict the consequences of these social exchange relationships, which may limit our understanding of how individuals' social exchange relationships affect their performance variance. Therefore, we use the perspectives of LMX and TMX when studying the performance variance of individuals in a social exchange relationship (Abdelhay et al., 2023).

2.2 Exchanges between leaders and team members

In recent years, more and more attention has been paid to the social exchange relationships embedded in a work team. Previous researchers assumed that a networked social system operating in organizations consists of social exchange relationships among managers, subordinates, and employees. In organizations, there are two key social exchange relationships, namely the one between individuals and leaders and the one between individuals and other team members (Liao et al., 2010). The first relationship is referred to as LMX and the second relationship is referred to as TMX (Marstand et al., 2017).

2.2.1 Leader-member exchange

LMX, which is derived from social exchange theory and role theory, refers to the relationship between an individual and his or her leader (Wayne et al., 1997). The quality of this dyadic relationship influences the attitudes and behaviors of the leader and the individual (Chen et al., 2018). According to LMX theory, "effective leadership processes occur when leaders and

followers are able to develop mature leadership relationships (partnerships) and thus access the many benefits that these relationships bring" (Graen & Uhl-Bien, 1995, p. 225). LMX theory states that the quality of the relationship between leaders and subordinates can be divided into two categories, "in-group" and "out-group" (Wayne et al., 1997). The term "in-group" connotes a higher quality of LMX based on mutual trust, respect, and affection, while "out-group" connotes a lower quality of LMX characterized by directives, formal rules, and authority (Graen & Scandura, 1987). In-group employees tend to contribute more than the literal job description, while out-group employees only perform routine tasks required by managers (Graen & Scandura, 1987; Tsay et al., 2014). Thus, in-group employees develop congruent values with leaders (Abu-AlSondos et al., 2023). Regarding the role of LMX in the organizational process, previous studies have shown that high-quality LMX relationships can lead to positive outcomes, including job performance, employee commitment to the work unit, and employee satisfaction (Goh & Wasko, 2012; Murphy et al., 2003). Undesirable outcomes such as role conflict and ambiguity, turnover intentions, and workplace problems can also be mitigated by high-quality LMX relationships (Graen & Uhl-Bien, 1995; Goh & Wasko, 2012). In addition, researchers have identified various types of equity, active personality between leader and subordinate and benevolent leadership as antecedents of LMX (Tsay et al., 2014; Zhang et al., 2012).

2.2.2 Team-member exchange

TMX, as a theoretical extension of LMX, refers to the quality of the relationship between an individual and team members (Seers, 1989; Tsay et al., 2014). Specifically, TMX reflects an individual's willingness to share ideas and feedback and to help other team members in return for recognition, support, and information from other members (Seers, 1989; Seers et al., 1995). In this sense, TMX represents the reciprocal relationships between an individual and other team members (Seers, 1989). According to Seers (1989) and Seers et al. (1995), TMX is related to but distinct from other variables such as LMX, satisfaction with coworkers, and perceptions of cohesion. LMX focuses on diagonal relationships between managers and subordinates (Banks et al., 2014). TMX, on the other hand, focuses on lateral relationships between team members (Banks et al., 2014). Employee satisfaction emphasizes an individual's attitudes and affective reactions to other members in the workplace, whereas TMX emphasizes perceptions of the reciprocal relationships among team members (Seers, 1989). Cohesion encompasses perceptions of the team rather than perceptions of roles within the team, as is the case with TMX (Abdelhay et al, 2023).

2.2.3 Confidential Communication

With the presence of technology in mobile devices such as smartphones and tablets, workers are willing to use technology that can help them better perform their jobs. According to Newman et al. (2018), about 54% of Malaysians use WhatsApp for reading messages and communication purposes, compared to 12% who use Facebook for the same purpose. In addition to WhatsApp's user-friendly features, employees believe that WhatsApp helps them get their work done much faster by getting feedback and responses from their colleagues, management, or even their customers. For example, several studies have been conducted on the impact of technology on work performance. Studies by Chung, Lee, and Choi (2015) and Di Pietro, Pantano, and Di Virgilio (2014) found that TAM improves service efficiency, and productivity, and increases business performance, which directly affects employee performance. According to Tharwat (2021) the reasons for preferring these different sources varied, and they were represented in the speed in conveying, explaining, presenting the complete facts, and then being accurate in presenting the data.

2.2.4 Awareness, Compliance, and Complaint Resolution

The organization can use WhatsApp to effectively improve customer engagement by allowing employees to respond to customer inquiries in real-time. In the public sector, this mobile messaging application can be an important aspect of public engagement due to its nature of allowing government agencies to interact with the public. WhatsApp began as an alternative to SMS and has now overtaken it as the platform for conversation and information sharing among many smartphone users. The WhatsApp application has features that enable person-to-person communication and group-based interaction. WhatsApp is an application that allows users to exchange real-time messages with individuals or groups via mobile devices. The reason for the wide adoption of WhatsApp is that the application can be used on multiple platforms and reduces the cost and convenience of mobile data plans (Wong et al., 2019).

2.2.5 Task Achievement - Organizational Performance

Convenience and other advantages such as timesaving, fast, and low cost are some of the reasons why people are willing to use the WhatsApp application as a substitute medium for communication (Wong et al., 2019). As long as the mobile application can meet users' needs, the tendency to use it is very high. In the corporate or business world, the use of WhatsApp has replaced electronic mail as a means of communication due to its efficiency, which indirectly affects the work performance of employees (Abdelhay, et al, 2023). WhatsApp can be useful for a small or large company to develop and implement active business activities and social engagement with the public (Moreno-Munoz et al., 2016; Modak & Mupepi, 2017).

3. Methods

The researcher preferred questionnaires because they are cheap to administer, respondents can fill them out conveniently, and data can be collected from many respondents in a very short time. The collected data were first coded and then cleaned in IBM SPSS v29. Tests for assumptions were then conducted prior to the final analysis addressing the objectives of the study. This study consists of four subsections. The first section addresses the adequacy of the sample, while the second section contains the demographic statistics. The third section presents the results of the exploratory factor analysis and construct validity using confirmatory factor analysis. The last section presents the overall inferential analysis using structural equation modeling. The researcher preferred principal component analysis with varimax rotation for factor analysis because it is a variable reduction technique used when variables are assumed to be highly correlated (Field, 2007). In selecting the principal components, the Kaiser criteria were used based on their variance contributions (eigenvalues > =1) to performance management practices, participative decision-making, and employee performance. The variables (items) corresponding to the principal components were selected based on their relationship to their principal components (factor loadings greater than 0.5).

4. Results

The results of the use of WhatsApp for effective vertical and horizontal communication levels in the workplace are presented in this section. Based on the above methodology, a total of 310 respondents took part in this study.

4.1 Sample Adequacy

Prior to the analysis, data cleaning was first carried out. The first cleaning task involved the assessment of the missingness of the data. The results show that out of the 17 variables, only one variable had missing data and this was the gender of the respondents which had 5 missing observations (1.613%), while the rest of the variables did not have any missing data. These five were Missing Completely at Random and therefore, only complete case analysis was done for instances where the gender variable was used. For this study, however, gender was not used as a moderator, and therefore, the missingness of the data did not affect the study (Raghunathan, 2015). To determine the adequacy of the sample, two approaches were used. First, the 10-times rule recommended by Hair *et al.* (2021) was used. According to this rule, the sample size must be at least 10 times the total number of the latent variables in the study. For this study, there were fifteen latent variables and two demographic variables. Therefore, the minimum expected sample size for this study was 10*15, that is, 150. Secondly, given the fact that the study involved the use of Exploratory Factor Analysis, the Kaizer-Mayor-Olkin (KMO) test for sampling adequacy was carried out. The results are presented in Table 1.

Table 1
KMO Test for Sample Adequacy

KMO.		.863
Bartlett's Test	Chi-Square	5344.045
	df	105
	Sig.	.000

Source: Preparation of the researcher, based on field study data, 2023.

The minimum acceptable KMO is 0.50, but from the above results, the KMO was 0.863, and being above 0.50, this meant that the sample size used for this study was adequate.

4.2 Demographic Statistics

There were only two demographic attributes considered, that is, gender and occupation. The distribution of the two demographic variables is summarized below.

Table 2
Demographic Statistics

	N	%	Cumulative
Male	158	51.8	51.8
Female	147	48.2	100.0
Employee/ Teaching Staff	199	64.2	64.2
Supervisor	48	15.5	79.7
Manager	63	20.3	100.0

Source: Preparation of the researcher, based on field study data, 2023.

The results show that most of the respondents were males (51.8%), while females were 48.2%. There is a marginal difference between the two and this shows that there was no possibility for bias. Secondly, with respect to occupation, the majority were employees or teaching staff (64.2%), then supervisors (15.5%) then managers (20.3%). These distributions are reflective of the population, and hence, there was minimal to no possibility of sampling bias that could affect the credibility of the findings.

4.3 Exploratory Factor Analysis

For this study, 15 measurement items were considered as collated from several extant studies on the importance of the use of WhatsApp in organizations. In this respect, it was imperative to extract factors from these items first as the original items had been adopted for use in a different context and sample (Hair *et al.* 2021). To achieve this, Exploratory Factor Analysis was conducted using the Principal Axis Factoring extraction method and the orthogonal Varimax rotation along with Kaizer normalization. The total variance explained is presented In Table 2.

Table 2
Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums			Rotation Sums		
	Total	% var	Cumulative	Total	% var	Cumulative	Total	% var	Cumulative
1	6.481	43.206	43.206	6.226	41.506	41.506	2.957	19.712	19.712
2	2.111	14.073	57.279	1.924	12.827	54.334	2.239	14.929	34.641
3	1.535	10.232	67.512	1.272	8.477	62.811	2.224	14.824	49.465
4	1.248	8.320	75.832	1.016	6.774	69.584	2.099	13.996	63.460
5	1.049	6.995	82.827	.786	5.240	74.824	1.705	11.364	74.824
6	.374	2.495	85.322						
7	.352	2.347	87.668						
8	.342	2.277	89.946						
9	.313	2.090	92.035						
10	.293	1.952	93.988						
11	.221	1.472	95.460						
12	.208	1.390	96.850						
13	.191	1.271	98.120						
14	.153	1.017	99.137						
15	.129	.863	100.000						

Extraction Method: Principal Axis Factoring.

There were five factors whose eigenvalues were above the minimum accepted 1.0. Factor 1 had an eigenvalue of $\lambda = 6.841$ and explained 19.481% of the variance. Factor 2 had an eigenvalue of $\lambda = 2.111$ and explained 14.073% of the variance. Factor 3 had an eigenvalue of $\lambda = 1.535$ and explained 14.824% of the variance. Factor 4 had an eigenvalue of $\lambda = 1.248$ and explained 13.996% of the variance, while lastly, Factor 5 had an eigenvalue of $\lambda = 1.049$ and explained 11.364% of the variance. The cumulative variance that was explained by all five factors was 78.824%, and this was greater than the minimum prescribed 50% (Hair *et al.,* 2021). Therefore, all five extracted factors were valid. To identify the composition of these factors, the rotated factor matrix was considered and the results are presented in Table 3 below.

Table 3
Rotated Factor Matrix and Descriptive Statistics

	Factors				
	1	2	3	4	5
Consulting in accomplishing files shared at work	**.886**	.215	.209	.217	-.035
Developing business relationships	**.777**	.177	.191	.171	-.040
Exchanging views between subordinates	**.761**	.186	.132	.165	-.023
Exchanging information among subordinates	**.735**	.156	.219	.187	-.027
For inquiries and requests by managers from subordinates	.233	**.875**	.153	.203	.079
Sending information from managers to superiors	.168	**.753**	.145	.202	.103
Responding to requests from superiors	.232	**.732**	.114	.185	.112
Submitting periodic reports on work	.171	.118	**.813**	.216	.064
Substitute for face-to-face meetings of the committees	.245	.191	**.796**	.254	.053
WhatsApp keeps the data confidentiality	.231	.112	**.733**	.177	.066
Circulating regulations and instructions	.246	.244	.254	**.802**	.052
For demands, suggestions and complaints of subordinates	.201	.203	.287	**.746**	.060
Popularizing business development methods	.250	.212	.180	**.706**	.045
Collaborating on teamwork and teamwork tasks	-.040	.084	.066	.053	**.910**
Saving time needed to carry out business	-.055	.137	.068	.051	**.907**

Extraction Method: Principal Axis Factoring.

Factor 1: Team Members Communication - Horizontal Communication

The first factor comprised four measurement items and these were: consulting in accomplishing files shared at work, developing business relationships, exchanging views between subordinates, as well as exchanging information among subordinates. These correspond to horizontal communication in organizations, particularly, among subordinates or team members. Therefore, this can best be classified and labeled as facilitating horizontal communication among subordinates in the organization.

Factor 2: Leader-Subordinate Communication - Vertical Communication

There were three items in the second factor, and these were for inquiries and requests by managers from subordinates, sending information from managers to superiors as well as responding to requests from superiors. These items relate to the communication between subordinates and superiors. Therefore, this factor can best be labeled as facilitating vertical communication between superiors and subordinates.

Factor 3: Confidential Communication

There were also three measurement items that have been extracted and these were that WhatsApp was being used to submit periodic reports on work, as a substitute for face-to-face meetings of the committees as well as that WhatsApp keeps the data confidential. Given that there is the issue of the transmission of confidential reports, the use of WhatsApp to replace face-to-face meetings, and the fact that data confidentiality is guaranteed, the best label for the construct is facilitating confidential communication.

Factor 4: Awareness, Compliance, and Complaint Resolution

The fourth factor had three items extracted, and these were circulating regulations and instructions; for demands, suggestions, and complaints of subordinates as well as popularizing business development methods. These three items generally relate to the use of WhatsApp to facilitate awareness of company policies and regulations as well as to facilitate compliance that eventually creates a coherent organizational culture. Thus, this factor can be labeled as facilitating awareness, compliance, and dispute resolution.

Factor 5: Task Achievement - Organizational Performance

There were only two items that were extracted, and these were that WhatsApp enables collaboration on teamwork and teamwork tasks, as well as saving time needed to carry out business. These two generally refer to the improvement of task achievements, which is a perfect measurement of performance. Therefore, these two generally measure organizational performance.

Confirmatory Factor Analysis

To validate the above-extracted constructs, convergent validity, and discriminant validity were computed, along with the reliability analysis. For the reliability testing, composite reliability was used while the convergent validity was tested using the Average Variance Extracted (AVE), and the discriminant validity was tested using the Heterotrait-Monotrait ratio (HTMT) of correlations (Hair et al., 2021). The five extracted factors were tested for validity and reliability, that is, Facilitating Team Members' Communication/Horizontal Communication (HC), Facilitating Leader-Subordinate Communication/Vertical Communication (VC), Facilitating Confidential Communication (CONF), Facilitating Awareness, Compliance, and Complaint Resolution (ACC) as well as Facilitating Organizational Performance (OP). Table 4 presents these results.

Table 4
Construct Reliability and Validity

	CR	AVE	MSV	MaxR(H)	HTMT HC	VC	CONF	ACC	OP
HC	0.916	0.732	0.313	0.951	**0.855**				
VC	0.892	0.734	0.308	0.918	0.514***	**0.857**			
CONF	0.887	0.725	0.369	0.900	0.526***	0.439***	**0.851**		
ACC	0.889	0.728	0.369	0.902	0.560***	0.555***	0.608***	**0.853**	
OP	0.924	0.859	0.052	1.004	-0.029	0.228***	0.144**	0.139**	**0.927**

Source: Preparation of the researcher, based on field study data, 2023.

The recommended minimum acceptable Composite Reliability is 0.70 (Taber, 2018). The results above show that the highest composite reliability was for organizational performance ($\alpha = 0.924$), while the second highest was horizontal communication ($\alpha = 0.916$) followed by vertical communication ($\alpha = 0.892$). On the other hand, the least composite reliability was for facilitating confidential communication ($\alpha = 0.887$), and the second least was awareness, compliance, and complaint resolution (α

= 0.889). Since none of these coefficients was less than the minimum accepted 0.70, this confirms that the constructs that were used for this study were reliable and internally consistent. The Average Variance Explained (AVE) tested the convergent validity of the constructs. The minimum accepted AVE is 0.60 (Haie et al., 2022). The results above show that the least AVE statistic was 0.725 for confidential communication, while the second least was 0.728 for awareness, compliance, and complaint resolution, and the third least was 0.732 for horizontal communication. On the other end, the highest AVE was for the organizational performance construct (0.767), while the second highest was for organizational performance (0.859), followed by vertical communication (0.734). Because all the AVEs were greater than 0.60, therefore, it follows that the convergent validity was not violated. Lastly, the HTMT test was conducted to determine the discriminant validity of the constructs. The maximum acceptable threshold is 0.85. From the findings above, the highest HTMT was 0.608 between facilitating confidential communication and facilitating awareness, compliance, and complaint resolution. Since none of the HTMT ratios was greater than the maximum threshold of 0.85, discriminant validity was not violated. Overall, the findings above do confirm that the data used for this study was reliable and valid. The validation of the foregoing five factors, therefore, confirms that WhatsApp improves task achievements, that WhatsApp is confidential and trusted for data transfer, that WhatsApp improves team member communication, that WhatsApp improves leader-subordinate communication, and that WhatsApp improves organization performance in general.

4.4 Hypothesis Testing

This study was aimed at testing whether WhatsApp improves tasks achievements, whether WhatsApp is confidential and trusted for data transfer, whether the use of WhatsApp improves team member's communication, whether the use of WhatsApp improves leader-subordinate communication, and whether suggestions, instructions, and complaints are highly communicated when WhatsApp is used. All the conceptualized constructs were validated using Exploratory Factor Analysis. This section goes further to validate the hypotheses, by first presenting the descriptive summaries and then the inferential analysis will be presented. The 15 items for the five constructs were all measured on a 5-point Likert scale, with 1 being Strongly Disagree and 5 representing Strongly Agree. Therefore, the mid-point was 3.0 with mean ratings above 3.0 representing generally positive responses, while mean ratings less than 3.0 represented generally negative responses. The descriptive statistics for these 15 items are presented in Table 5.

Table 5
Descriptive Statistics

	Descriptives	
	M	**SD**
Team Members Communication		
Consulting in accomplishing files shared at work	3.96	.687
Developing business relationships	4.17	.803
Exchanging views between subordinates	4.60	.801
Exchanging information among subordinates	4.25	.809
Overall	**4.25**	**.746**
Leader-Subordinate Communication		
For inquiries and requests by managers from subordinates	3.87	.711
Sending information from managers to superiors	4.16	.819
Responding to requests from superiors	4.46	.833
Overall	**4.16**	**.782**
Confidential Communication		
Submitting periodic reports on work	3.71	.717
Substitute for face-to-face meetings of the committees	3.93	.814
WhatsApp keeps the data confidentiality	3.79	.739
Overall	**3.81**	**.744**
Awareness, Compliance and Complaint Resolution		
Circulating regulations and instructions	3.75	.702
For demands, suggestions and complaints of subordinates	3.89	.761
Popularizing business development methods	4.18	.810
Overall	**3.94**	**.761**
Task Achievement		
Collaborating on teamwork and teamwork tasks	3.61	.745
Saving time needed to carry out business	3.55	.719
Overall	**3.58**	**.738**

With respect to Team Member's Communication, all four items had mean ratings that were greater than 3.0. The highest mean rating was for the item *WhatsApp helps in exchanging views between subordinates* (M = 4.60; SD = 0.801) followed by the item *WhatsApp helps in exchanging information among subordinates* (M = 4.25; SD = 0.809). On the other hand, the least rated item was that *Whatsapp helps to consult in accomplishing files shared at work* (M = M = 3.96; SD = 0.687), while the second least rated item was that *WhatsApp helps to Develop business relationships* (M = 4.17; SD = 0.803). The aggregate

mean rating for the construct was M = 4.25 (SD = 0.746), and being greater than 3.0 this confirms that there was consensus that WhatsApp improved the communication by team members, or rather, horizontal communication.

For Leader-Subordinate Communication, again, all three items had mean ratings above 3.0. The highest item was for the *use of WhatsApp to respond to requests from superiors* (M = 4.46; SD = 0.833), followed by the *use of WhatsApp to send information from managers to superiors* (M = 4.16; SD = 0.819), while the least rated mean was for the *use of WhatsApp for inquiries and requests by managers from subordinates* (M = 3.87; SD = 0.711). The overall mean rating for the construct was M = 4.16 (SD = 0.782) and being greater than 3.0, this confirms that overall; there was consensus among the respondents that WhatsApp was useful to facilitate vertical communication.

For the use of WhatsApp to facilitate Confidential Communication, there were three items, all of which were positively rated. The highest rated mean was for the item that WhatsApp was being used to *substitute for face-to-face meetings of committees* (M = 3.93; SD = 0.814), while the second highest was the use of WhatsApp to keep data confidentiality (M = 3.79; SD = 0.739). The least rating, however, was for the item that WhatsApp was being used *to submit periodic reports on work* (M = 3.71; SD = 0.717). The overall mean rating for the construct was M = 3.81 (SD = 0.744) and therefore, it can be concluded that the respondents did concur that WhatsApp was very useful in facilitating confidential communication as conceptualized.

The fourth construct looked into the issue of Awareness, Compliance, and Complaint Resolution, and for this construct, all three items had mean ratings above the midpoint of 3.0. The highest mean rating was for the item that WhatsApp was used to *popularize business development methods* (M = 4.18; SD = 0.810), while the second highest rate was for the item that WhatsApp was used to make *demands, suggestions and complaints of subordinates* (M = 3.89; SD = 0.761), and the least rated was for the item that WhatsApp was being used for *circulating regulations and instructions* (M = 3.75; SD = 0.702). Overall, the aggregate mean rating was M = 3.94 (SD = 0.761) and since this was greater than the midpoint 3 of .0, this confirms that the responses were all affirmative.

Lastly, the fifth construct looked into the use of WhatsApp to facilitate task achievements, from the findings, the highest mean rating was for the item that WhatsApp was being used to *collaborate on teamwork and teamwork tasks* (M = 3.91; SD = 0.745), while the second was for the item that WhatsApp was being used to *save the time that was needed to carry out business* (M = 3.55; SD = 0.719). The overall mean rating was, therefore, M = 3.73 (SD = 0.738), and because this was greater than the mid-point, these findings do confirm that indeed, WhatsApp was very effective in facilitating task achievements.

To confirm the above descriptive findings inferentially, five hypotheses were tested:

H₁: *WhatsApp improves team member communication.*

H₂: *WhatsApp improves leader-subordinate communication.*

H₃: *WhatsApp is confidential and trusted for data transfer.*

H₄: *WhatsApp improves Communication of Suggestions, Instructions, and Complaints.*

H5: *WhatsApp improves the achievements of the task.*

To test these hypotheses, the MANOVA was carried out to determine whether the extent of use of WhatsApp did influence each of the users. The results from the analysis are presented in Table 6 below.

Table 6
MANOVA Test

Dependent Variable	SS	df	MS	F	p	Partial Eta^2
Team Members Communication	87.183	1	87.183	289.443	.000	.368
Leader-Subordinate Communication	66.155	1	66.155	176.533	.000	.262
Confidential Communication	120.172	1	120.172	531.418	.000	.516
Communication of Suggestions, Instructions and Complaints	103.238	1	103.238	395.022	.000	.442
Task Achievement	4.682	1	4.682	9.630	.002	.019

a. R Squared = .368 (Adjusted R Squared = .366)
b. R Squared = .262 (Adjusted R Squared = .260)
c. R Squared = .516 (Adjusted R Squared = .515)
d. R Squared = .442 (Adjusted R Squared = .441)
e. R Squared = .019 (Adjusted R Squared = .017)

For the use of WhatsApp to facilitate Team Member's Communication, $F(1, 308) = 289.443$, p<0.05. For the use of WhatsApp to facilitate Leader-Subordinate Communication, $F(1, 308) = 176.533$, p<0.05. For the use of WhatsApp for Confidential

Communication, F(1, 308) = 531.418, p<0.05. For the use of WhatsApp to facilitate Communication of Suggestions, Instructions, and Complaints, F(1, 308) = 395.022, p<0.05. Lastly, for the use of WhatsApp to facilitate Team Member's Communication, F(1, 308) = 9.630, p<0.05. Since all the p-values were less than 0.05, this confirms that all the hypotheses tested were statistically significant implying that the use of WhatsApp in the companies was confirmed to be very effective and to yield positive effects.

5. Discussion

For the first and second hypotheses, the overall mean for the construct was M = 4.25 (SD = 0.746), and being greater than 3.0, this confirms that there was consensus that WhatsApp improves communication between team members or improves horizontal communication, and for the second hypothesis, the overall mean for the construct was M = 4.16 (SD = 0.782), and being greater than 3.0, this confirms that there was an overall consensus among respondents that WhatsApp was useful in facilitating vertical communication. These results are consistent with other studies. Employees can ask their colleagues for help and share information to complete their tasks. Therefore, communication in an organization could be improved, which contributes to better performance at work. Jamil et al. (2018) suggested the use of WhatsApp in organizations such as hospitals where employees can share information easily, quickly, and in real-time. The result showed that the organization can improve the performance of employees because it is a fast method to share information and can reach people easily.

Third hypothesis: the overall mean for the construct was M = 3.81 (SD = 0.744). It can be concluded that the respondents believe that WhatsApp is very useful in facilitating confidential communication as defined by the concept. Although there were no studies that directly discussed that WhatsApp is a trustworthy communication tool for sharing data, we started to implement an updated privacy policy in January 2021: No one can see users' personal messages or hear their calls, including Meta: Neither WhatsApp nor Meta can read your messages or hear your calls with your friends, family and colleagues on WhatsApp. Whatever you share stays between you. That is because your personal messages are protected by end-to-end encryption. We will never soften that security, and we clearly mark every chat so you know we are committed to it. According to Rice et al. (2017), the number of WhatsApp users increases over time

Fourth hypothesis: the overall mean was M = 3.94 (SD = 0.761), and since this was above the mean three of 0.0, this confirms that the responses were all positive. WhatsApp can be useful for a small or large company to develop and implement active business activities and social engagement with the public (Moreno-Munoz et al., 2016; Modak & Mupepi, 2017). The company can use WhatsApp to effectively improve customer engagement, as employees can respond to customers' requests in real-time.

Fifth theory, the in general cruel rating was, hence, M = 3.73 (SD = 0.738), as a result, this was more prominent than the midpoint, these discoveries do affirm that without a doubt, WhatsApp was exceptionally successful in encouraging errand accomplishments, this concurs with past considers which allude to that laborers are willing to utilize the innovation which can help them to perform their errands superior. Agreeing to Newman et al. (2018), around 54% of Malaysians utilized WhatsApp when perusing news and for communication purposes as compared to 12% who utilized Facebook for the same reason. Other than the user-friendly highlights of WhatsApp, representatives feel WhatsApp makes a difference for them to perform their work much speedier in terms of getting criticism and reactions from their colleagues, best administration, or indeed their clients. For occurrence, a few things about have been conducted on the effect of innovation on errand execution. Ponders conducted by Chung, Lee, and Choi (2015) and DiPietro, Pantano, and Di Virgilio (2014) recognized that TAM upgraded benefit productivity, progressed efficiency, and expanded the firms' execution which had a coordinated effect on the employees' execution.

6. Conclusion

This study confirms the significance of WhatsApp utilization in the workplace, it refers to using WhatsApp will improve the communication within the same teams that WhatsApp allows team members to create group chats where they can discuss ideas, share files, and collaborate on projects. Group members can easily communicate with each other, ensuring effective teamwork, WhatsApp is a widely used messaging application that offers end-to-end encryption for its users, which means that the content of your messages is encrypted and can only be accessed by the sender and the recipient. This encryption provides a certain level of security and privacy, making it difficult for third parties to intercept and read your messages. Backup and cloud storage: WhatsApp provides an option to back up your chats to cloud storage services such as Google Drive or iCloud. These backups are not encrypted end-to-end, and the security of your chat history relies on the security measures provided by the cloud storage service. Companies can create dedicated WhatsApp groups for specific teams, departments, or projects. This allows employees, supervisors, and customers to easily share suggestions, instructions, and complaints related to their work within a focused environment. WhatsApp provides real-time messaging, allowing team members to quickly communicate with each other. It facilitates immediate responses and reduces delays in information exchange, enabling faster decision-making and problem-solving, consequently, this will increase task attainment.

References

Abdelhay, S. (2023). How Artificial Intelligence can affect the process of recruitment and improve the quality of new hired employees. Journal of Jilin University. *Resmilitaris, 13*(3), 2517-2533.

Abdelhay, S., Al Talay, M. S. R., Abdelhay, D. A., & El-Bannany, M. (2023). Relation between Employee Productivity, Job Satisfaction, and Ethical Leadership in the Context of Work-Life Conflicts. *Resmilitaris, 13*(3), 2534-2546.

Abu-AlSondos, I., Alkhwaldi, A., Salhab, H., Shehadeh, M., & Ali, B. (2023). Customer attitudes towards online shopping: A systematic review of the influencing factors. *International Journal of Data and Network Science*, *7*(1), 513-524.

Ayub, S. H., Abd Manaf, N., & Hamzah, M. R. (2014). Leadership: Communicating strategically in the 21st century. *Procedia-Social and Behavioral Sciences*, *155*, 502-506.

Banks, G. C., Batchelor, J. H., Seers, A., O'Boyle Jr, E. H., Pollack, J. M., & Gower, K. (2014). What does team–member exchange bring to the party? A meta-analytic review of team and leader social exchange. *Journal of Organizational Behavior*, *35*(2), 273-295.

Chen, X. P., He, W., & Weng, L. C. (2018). What is wrong with treating followers differently? The basis of leader–member exchange differentiation matters. *Journal of Management*, *44*(3), 946-971.

Chowdhry, A. (2015). WhatsApp Android App Now Has Free Voice Calling For Everyone. [Online]. Available: http://www.forbes.com/sites/ amitchowdhry/2015/03/31/whatsapp-calls-android/

Chung, S., Lee, K. Y., & Choi, J. (2015). Exploring digital creativity in the workspace: The role of enterprise mobile applications on perceived job performance and creativity. *Computers in Human Behavior*, *42*, 93-109.

Davis, A., Murphy, J., Owens, D., Khazanchi, D., & Zigurs, I. (2009). Avatars, people, and virtual worlds: Foundations for research in metaverses. *Journal of the Association for Information Systems*, *10*(2), 90-117.

Davison, R. M., Ou, C. X., Martinsons, M. G., Zhao, A. Y., & Du, R. (2014). The communicative ecology of Web 2.0 at work: Social networking in the workspace. *Journal of the Association for Information Science and Technology*, *65*(10), 2035-2047.

Di Pietro, L., Pantano, E., & Di Virgilio, F. (2014). Frontline employees ' attitudes towards self-service technologies: Threats or opportunity for job performance? *Journal of Retailing and Consumer Services, 21*(5), 844-850.

Draz, A. M. M. A. (2023). Social Media Sites and their Role in Educating the Public in the Emirate of Umm Al Quwain on the Strategies of the Blue Economy and Mechanisms of its Activation. *Resmilitaris*, *13*(2), 5350-5368.

Draz, D. A. M. M. A., & Mohamed, D. E. A. S. (2022). The Role Of The Social Media In Raising The Awairness Of Umm Al-Quwain University's Students About The Importance Of Participating In Expo 2020-Dubai. *Journal of Positive School Psychology*, *6*(9), 739-758.

Fattah, S. F. E. S. A. (2015). The Effectiveness of Using WhatsApp Messenger as One of Mobile Learning Techniques to Develop Students' Writing Skills. *Journal of Education and practice*, *6*(32), 115-127.

Goh, S., & Wasko, M. (2012). The effects of leader-member exchange on member performance in virtual world teams. *Journal of the Association for Information Systems*, *13*(10), 1.

Graen, G. B., & Scandura, T. A. (1987). Toward a psychology of dyadic organizing. *Research in organizational behavior*.

Graen, G. B., & Uhl-Bien, M. (1995). Relationship-based approach to leadership: Development of leader-member exchange (LMX) theory of leadership over 25 years: Applying a multi-level multi-domain perspective. *The leadership quarterly*, *6*(2), 219-247.

Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., Ray, S., ... & Ray, S. (2021). An introduction to structural equation modeling. *Partial least squares structural equation modeling (PLS-SEM) using R: a workbook*, 1-29.

Hargie, O. (2016). The importance of communication for organisational effectiveness. *Psicologia do Trabalho e das Organizações*, 15-32.

Jamil, M. M., Talib, N., Azam, N. H. N., Nazeri, N. M., Yusof, M. A. M., & Abidin, N. E. (2018, July). WhatsApp Acceptance and Behavioral Intention to Use among Non-Nursing Staff in Selected Hospitals at Melaka. In *First Padang International Conference on Economics Education, Economics, Business and Management, Accounting and Entrepreneurship (PICEEBA 2018)* (pp. 366-373). Atlantis Press.

Liao, H., Liu, D., & Loi, R. (2010). Looking at both sides of the social exchange coin: A social cognitive perspective on the joint effects of relationship quality and differentiation on creativity. *Academy of Management Journal*, *53*(5), 1090-1109.

Mander, J. (2014). WhatsApp Usage Highest in LatAm and MENA. [Online]. Available: https://www.globalwebindex.net/blog/whatsapplatam-mena

Marstand, A. F., Martin, R., & Epitropaki, O. (2017). Complementary person-supervisor fit: An investigation of supplies-values (SV) fit, leader-member exchange (LMX) and work outcomes. *The leadership quarterly*, *28*(3), 418-437.

Modak, A., & Mupepi, M. G. (2017). Dancing with WhatsApp: Small businesses pirouetting with social media. In *Conference Proceedings by Track* (Vol. 51).

Moreno-Munoz, A., Bellido-Outeirino, F. J., Siano, P., & Gomez-Nieto, M. A. (2016). Mobile social media for smart grids customer engagement: Emerging trends and challenges. *Renewable and Sustainable Energy Reviews*, *53*, 1611-1616.

Murphy, S. M., Wayne, S. J., Liden, R. C., & Erdogan, B. (2003). Understanding social loafing: The role of justice perceptions and exchange relationships. *Human relations*, *56*(1), 61-84.

Newman, N., Fletcher, R., Kalogeropoulos, A., Levy, D. A. L., & Nielsen, R. K. (2018). Reuters Institute Digital News Reports 2018.

Plana, M. G. C., Escofet, M. I. G., Figueras, I. T., Gimeno, A., Appel, C., & Hopkins, J. (2013). Improving learners' reading skills through instant short messages: A sample study using WhatsApp. *WorldCALL: Sustainability and computer-assisted language learning*, 266-281.

Postmes, T., Haslam, S. A., & Swaab, R. I. (2005). Social influence in small groups: An interactive model of social identity formation. *European review of social psychology*, *16*(1), 1-42.

Putri, A. V., & Irwansyah, I. (2020). Communication patterns and media technology role in organization and society during pandemic. *The Journal of Society and Media*, *4*(2), 228-261.

Rahartri, L. I. P. I. (2019). "WHATSAPP" MEDIA KOMUNIKASI EFEKTIF MASA KINI (STUDI KASUS PADA LAYANAN JASA INFORMASI ILMIAH DI KAWASAN PUSPIPTEK. *VISI PUSTAKA: Buletin Jaringan Informasi Antar Perpustakaan*, *21*(2), 147-156.

Rice, R. E., Evans, S. K., Pearce, K. E., Sivunen, A., Vitak, J., & Treem, J. W. (2017). Organizational media affordances: Operationalization and associations with media use. *Journal of Communication*, *67*(1), 106-130.

Seers, A. (1989). Team-member exchange quality: A new construct for role-making research. *Organizational behavior and human decision processes*, *43*(1), 118-135.

Seers, A., Petty, M. M., & Cashman, J. F. (1995). Team-member exchange under team and traditional management: A naturally occurring quasi-experiment. *Group & Organization Management*, *20*(1), 18-38.

Shan, R., Xiao, X., Dong, G., Zhang, Z., Wen, Q., & Ali, B. (2022). The influence of accounting computer information processing technology on enterprise internal control under panel data simultaneous equation. *Applied Mathematics and Nonlinear Sciences*, *8*(1), 1685-1694.

Tharwat, W. A. K. (2021). The Public's Dependency on Social Media during Crises with The Application to The Covid-19 Pandemic. *Turkish Online Journal of Qualitative Inquiry*, *12*(10).

Trisnani, T. (2017). Pemanfaatan Whatsapp Sebagai Media Komunikasi dan Kepuasan Dalam Penyampaian Pesan Dikalangan Tokoh Masyarakat. *Jurnal Komunika: Jurnal Komunikasi, Media dan Informatika*, *6*(3), 1-12.

Tsay, J., Dabbish, L., & Herbsleb, J. (2014, May). Influence of social and technical factors for evaluating contribution in GitHub. In *Proceedings of the 36th international conference on Software engineering* (pp. 356-366).

Wayne, S. J., Shore, L. M., & Liden, R. C. (1997). Perceived organizational support and leader-member exchange: A social exchange perspective. *Academy of Management journal*, *40*(1), 82-111.

Wong, A., Ho, S., Olusanya, O., Antonini, M. V., & Lyness, D. (2021). The use of social media and online communications in times of pandemic COVID-19. *Journal of the Intensive Care Society*, *22*(3), 255-260.

Zhang, Z., Wang, M. O., & Shi, J. (2012). Leader-follower congruence in proactive personality and work outcomes: The mediating role of leader-member exchange. *Academy of management journal*, *55*(1), 111-130.

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