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To Study the Effectiveness of Virtual Leadership with the Rise of Remote Employees in Virtual Team Productivity

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Abstract: - As adapting remote work arrangements in business organizations is increasing rapidly, studying and understanding virtual leadership and the productivity of the teams becomes a crucial part of this research. The present research paper attempts to investigate the effectiveness of virtual leadership with the rise of remote employees in virtual team productivity. This research paper studies the factors affecting virtual leadership considering them as independent variables and the dependent variable i.e. virtual team productivity. The empirical study is conducted by using the SPSS tool for regression analysis. A questionnaire from the existing literature is developed and data is collected from 145 respondents. The findings of the research conclude that all the factors studied in this research i.e. communication effectiveness, role clarity, communication satisfaction, and technological usage significantly affect virtual team productivity.

Keywords: Virtual Leadership, Virtual Team, Remote Employees, Productivity and SPSS

1. Introduction

In recent times, there has been a notable shift in business operations towards greater globalization and competitiveness. Organizations have been transformed by digital technology. The advent of moveable type printing expedited the progression of the history, and similarly, digitalization is now molding companies, work environments, and processes, presenting new sort of difficulties that leaders must confront. According to research conducted in New Zealand, more than half of the workers choose to work remotely. The survey also states that 61% of the country's population have jobs that can be done from home and more than 50% of the employees wanted to increase the number of days they work remotely (Tilo, 2024). The rise of remote employees gave birth to virtual teams and virtual workplace environments where numerous firms have undergone significant transformation. The popularity of virtual teams is increasing, particularly due to the past pandemic. To effectively respond to these changes, companies are improving their structures, management as a whole, and measures to boost their ability to adapt and be flexible. Multiple companies have adjusted to their constantly evolving environments by incorporating virtual teams inside their organizations. A virtual team is a collaboration of people who are geographically distant yet collaborate using information technology to accomplish specified goals (Zigurs, 2003). Furthermore, the rapid progress of innovative technology for communication has accelerated this trend to the point where most larger firms now employ virtual teams to different degrees. Virtual teams are a specific structure style for organizations that can significantly revolutionize the workplace and provide businesses with an unmatched level of flexibility and efficiency (Powell et al., 2004). These virtual teams are established to facilitate multinational innovation processes. Virtual management and network structures are utilized to enhance communication, coordination, and the transfer of resources and capabilities among organizations. Organizations are increasingly dependent on teams working virtually to achieve their objectives, thanks to advancements in technology. The globalization and upgradation in communication technology, virtual teams have increased significantly, allowing employees to work globally. With the emergence of virtual teams, virtual leadership came into the picture. As per the research conducted by Jong et al. (2008), organizations have taken a shift from working with people who are available to work with individuals situated at different geographical locations. Taking into consideration the concept of virtual leadership, the productivity of the virtual team is dependent, as e-leadership involves the engagement of the employees and cultivating a productive workforce. To remain competitive, organizations improve their capabilities, expertise, and unique characteristics, while also forming partnerships with other enterprises to acquire vital knowledge, expertise, and resources. With the emergence of these new types of businesses, their new types of leaders need to prosper innovative leadership approaches to efficiently oversee resources that are frequently distributed across many locations, including on a worldwide level. With the growth of virtual organizations has led to the acknowledgment of innovative leadership styles, specifically designed to

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suit the distinct virtual environment in which leaders and employees operate. Geographically distributed enterprises heavily depend on new technology to facilitate communication among their workforce, and the global availability of information is crucial. Managers are utilizing wireless networks and telecommunications software to enhance the effectiveness of coordinating company operations and procedures. The virtual shift is occurring resulting the swift progress in information technology and communication technology, which has led to increased dynamism and complexity in work (Mehtab et al, 2017).

1.1 Background of the study

There is a general consensus that the epidemic has forced a substantial number of employees to switch to remote work. This shift has resulted in the development of new solutions for organizations and business organizations are trying to adjust the workforce and their strategic methods. Virtual teams were frequently trying to come into the picture before the global pandemic, as the internet was helping to overcome geographical barriers. The passed pandemic played a significant role in the transformation of virtual teams and their management while working remotely. This shift gave rise to the new type of virtual team and their leaders. A study conducted by Pullan (2016), gave insights into the impact of virtual teams on virtual leadership, and how this change will impact the working conditions and productivity of the virtual teams. The effectiveness of a team is discovered by the atmosphere that is trustworthy among the employees of the virtual group (Lin et al., 2008). Nowadays, it is vital to develop important attributes such as awareness of situations, adaptability, cultural savvy, effective interaction, and strong personal skills to generate trust (Evans, 2012). Forming a virtual team assembling persons who are situated in various locations, at various times, and/or inside different enterprises. Under appropriate supervision, virtual teams widen the benefits of collaboration and exhibit an aptitude for innovation in contrast to conventional, face-to-face teams. Here, this study explores the characteristics of successful virtual leadership. The study also focuses on the impact of virtual leadership on the productivity of the virtual team within the remote employees.

1.2 Statement of the problem

Leadership is very significant when talking about virtual teams. Managing the activities of team members in various geographical locations poses a significant challenge for team leaders. The leader implements the delegation concept of management by transferring responsibilities to lower-level team members. Virtual leadership is facilitated through the use of technology, with an emphasis on improving the performance and relationships of team members to boost productivity. The effectiveness of virtual leadership relies heavily on the availability of information and the continuity of communication. Poor ways of communication among virtual managers and their employees can result in reduced productivity, as team members heavily depend on remote leadership for guidance. The teams' performance may be hindered mainly by the lack of communication, and somewhere also by the unavailability of technology equipment and the absence of Technology skills and knowledge. Amidst the COVID-19 pandemic, corporate leaders are increasingly employing technological tools to organize meetings and communicate with teammates in workplaces. Hence, it is imperative to experimentally assess the impact of online communications on the productivity of team members. This research study examines the relationship between the effectiveness of virtual leadership and team productivity in the dynamic corporate environment of New Zealand.

2. Review of Literature

2.1 Virtual team

A team is defined as a collective of people who collaborate towards a shared objective, making independent contributions while aligning with the organizational framework. Henry Ford stated, "Coming together is the start of something." Unity is indicative of progress. Collaboration leads to achievement. From 1960 to 1980, many companies followed a traditional approach where they worked with various groups of people in a single location. The main goal was to enhance quality management and reduce the time it took to complete tasks. This approach aimed to improve efficiency compared to working on tasks individually (Seliverstova, 2022). Janneck et al., (2013) in their research defined virtual teams as that are created to navigate geographical and separation obstacles to collaborate across multiple time zones, utilizing advanced technology infrastructure and various virtual communication channels. This indicates that the individuals comprise a team which are geographically dispersed, with team members located in various countries. These virtual teams consist of sub-teams that collaborate with

many individuals on interdependent tasks, all working towards a shared objective Virtual teams can consist of individuals from either the same organization or separate organizations. These teams are defined by their flat frameworks and geographically spread human resources, which present numerous benefits and difficulties. Effective communication plays a crucial role in fostering cohesion among virtual teams inside a company. According to Peters & Manz (2007), virtual teams consist of people who are situated in multiple physical locations. This characteristic of the team has encouraged the widespread adoption of different types of computer-mediated communication, which allows members who are located in different places to work together on their efforts and contributions. Virtual teams effectively collaborate across different time zones and geographical locations by leveraging modern computer-driven technology. As Lecoq (2012) in his study defines a virtual team as a group of knowledge workers who are geographically, organizationally, and/or time dispersed. These individuals primarily use electronic communication and information technologies to coordinate their work and complete organizational tasks. As per Dulebohn, (2015) virtual teams consist of individuals who connect through electronic means and may never have the opportunity to meet in person. Virtual teams are created to address the challenges posed by physical distance or differences in time zones. Historically, teams were a significant element in an organization's structure. However, with the advent of sophisticated IT infrastructure and the ability to work with a global workforce, teams increasingly collaborate utilizing web-based apps. By adopting this approach, virtual teams become integrated into an organization's framework. For numerous individuals, this is their initial experience with working from home.

- According to FlexJobs (2021), there were already 4.7 million individuals engaged in remote work prior to the COVID-19 outbreak.
- According to Gartner's 2021 report, 74% of organizations intend to permanently transition some of their staff to remote work following the COVID-19 pandemic.
- According to Owl Labs (2021), prior to the pandemic, 52% of employees worldwide worked remotely once a week, while 68% did so at least once a month.

2.2 Effectiveness of Virtual Leadership

Leadership in virtual teams is referred to as virtual leadership or e-leadership. Kahai et al. (2017) in their study stated that E-leaders share many similarities with traditional leaders, such as setting company objectives, strategies, and policies, as well as developing monitoring systems to track the motivation and performance of the employee, ultimately impacting the financial success of the business organizations (de Jong et al., 2008). Effective leaders should possess the ability to simultaneously engage in multiple behaviours to manage their current situation in the virtual environment effectively. According to Kayworth & Leidner (2002), this ability is particularly crucial in the context of virtual organizations, where the ongoing use of multiple modes of communication creates significant differences in how leaders create, maintain, and communicate with their virtual employees. Effective virtual leaders effectively communicate, form relationships, and develop trust with their team members who are situated globally to achieve specified goals and optimize the management of human capital. Various kinds of literature on employment demonstrate that there are numerous constructs available for measuring e-leadership (Nastase & Alexandru, 2013) The included elements consist of the current adoption of information communication technology, skills in virtual mode of communication, task orientation virtually, encouraging team goals in virtual mode, and virtual role modeling. Nevertheless, the study by Bhat et al., (2017) specifically examined the initial two variables, namely contemporary information and communication technology (ICT) and virtual communication proficiency. Prior research indicates a substantial correlation between e-leadership and the productivity of virtual teams. Leaders are predominantly shaped through nurture rather than being inherently endowed with leadership qualities. Individuals can enhance their abilities and aptitude while undergoing the journey to become an esteemed team leader. In certain situations, when an individual is genuinely heading a project or assuming the role of a leader in managing their team, it is crucial to possess strong leadership qualities. Fisher & Fisher (2011) defined seven skills introduced to assess the leader's job. The roles of the virtual leader include leader, results catalyst, facilitator, barrier buster, business analyzer, coach, and living example. Each aspect serves as a fundamental skill of a competent and accomplished leader. Developing a distinctive leadership style that is effective for a particular team requires the cultivation of these essential qualities. However,

both traditional companies and virtual organizations share some parallels and contrasts in their management techniques.

2.3 Role clarity in virtual leadership

Numerous of the researches have taken place to elaborate on the features of virtual leadership and role clarity is also an important feature of virtual leadership. The research conducted provides insights of the research which points the challenges faced by the organization during the shift from traditional to virtual workspace. The crucial task of the reader is role clarity, and to ensure that team members can understand their roles and responsibilities (Catinella & Esparza, 2021). A review paper by Mehtab et al. (2017), discussed the advantages and challenges faced while working in the virtual environment. It clearly states the need to enhance the productivity of virtual teams by virtual leaders where role clarity emerged as a critical factor when it comes to the effectiveness of virtual leadership. Even though role clarity is not the center of employee well-being and the remote leader, it provides sagacity in virtual work scenarios which indirectly affects the role clarity of the virtual leaders (Schmitt, 2024). In short, the research summarizes that role clarity is an important aspect of virtual team productivity.

2.4 Virtual Communication Effectiveness

Virtual communication refers to the utilization of audio and video technology to engage in conversations with others who are not physically present. Communication skills refer to the talents that someone has to exchange various types of information effectively. For instance, conveying concepts, emotions, or the current events in your surroundings. Communication skills include the ability to listen, talk, observe, and empathize. Communication encompasses any actions undertaken by an individual to influence the thoughts or beliefs of another person (Walker et al., 2018). Communication is a complex process and involves the actions of expressing, perceiving, and understanding information. In the study done by Kim et al. (2017), Organizational communication pertains to a certain degree to which an organization disseminates information related to job and its members and fosters communication among them. In his study, Hikmah (2015) emphasizes the crucial role of communication in developing and spreading the aims of an organization. Team communication entails the exchange of pertinent information necessary for the team to carry out their daily tasks proficiently and ensure optimal team performance. Team leaders perceive team members as an essential resource (Gonçalves et al., 2014).

2.5 Technological usage

Modern Information Communication Technology (ICT) encompasses a diverse array of technologies, including computers, software learning tools, networking systems and protocols, handheld digital devices, digital cameras and camcorders, and other technologies, including those that are yet to be developed. These technologies are employed to access, control, generate, and transmit information. Information technology (IT) refers to the utilization of computers to store, retrieve, transfer, and manipulate data (Orga et al., 2021). Information Technology (IT) refers to the collection of computer programs that are necessary for the operation of nearly all work environments (Niya, 2018). Information technology systems consist of a range of technologically advanced devices that enable the efficient transmission of crucial information to management. Managers employ this information to make crucial decisions on their firm's operations. Currently, a wide range of ICT tools are being employed. Information Technology encompasses various applications and tools used to automate workplace procedures, including the internet, phones, podcasts, computers, users, and personal computers. Data networks consist of interconnected systems and devices that facilitate communication, such as servers, bridges, routers, hubs, and wires.

2.6 Virtual Communication Satisfaction

Satisfaction while communicating is the most important factor while working remotely. It is found that using tools like video conferencing gives a sense of satisfaction and fulfilment to employees working from different geographical locations (Karl et al., 2021). The effect of virtual communication is high on performance and satisfaction. A study has reviewed the research conducted in applied behavior analytics from 2011 to 2020 to examine the effect of many virtual mechanisms. This study explains how modes of communication have affected the satisfaction and well-being of employees at the workplace (Khan, n.d.). Akkirman & Harris, (2005) in their research found that communication satisfaction in the organizational workplace is impacted by implementing technical strategies and human strategies. This study has discussed the steps taken by various organizations to

enhance communication satisfaction in their virtual work environment. It can be seen that communication satisfaction and technological usage flow simultaneously for the productivity of virtual teams.

2.7 Virtual Team Productivity

Employee productivity refers to the quantity of output generated within a specific timeframe, taking into account various elements as inputs. Several parameters can be used to measure productivity. According to Dominic Suta (2023), productivity is a comprehensive performance indicator that encompasses numerous elements, making it challenging to assess using conventional approaches measurements rely on a shared standard to gauge productivity in a specific manner. For instance, they only take into account the efforts applied by the person and the amount of time dedicated to the measurement, without addressing the specific industry in which the business operates, such as IT or manufacturing. Furthermore, De O. Melo et al. (2013), argue that the concept of productivity is too extensive to be accurately quantified using a multifactor approach, therefore making progressive measurement impossible. As Richards & Bilgin, (2012). Virtual team productivity has the advantage of creating dynamic work environments where different cultures, attitudes, and work ethics can be combined and integrated. The relationship between project management and business governance, which are connected to corporate frameworks, has consistently influenced the variations in project success. A study conducted by (Schmidt (2014) states that the absence of effective management and expertise in business operations inside project management companies has resulted in project failure rates reaching as high as 80%. Therefore, due to the high failure rates observed worldwide, the inadequate business expertise in managing the integration of new technologies into virtual project teams is still transforming. Project management practitioners acknowledge the significance of virtualization and are actively seeking comprehensive solutions to effectively adopt best practices for governing virtual teams. Hackman & Wageman, (2005) in their study specifically examined a crucial aspect of team performance and the team's capacity to collaborate effectively in the future. This capacity is demonstrated by the agreement of the group, the unity of the group, and the effectiveness of the group. The level of agreement among team members over their choice preferences, known as group consensus, plays a crucial role in determining the effectiveness of their collaboration in implementing the team's decision.

3. Research Gap

In this era of embracing working remotely in business organizations, firms are making significant efforts to leverage the capabilities of employees and technology to transform their processes. The entire outlook of the corporate world has been transformed by the globalization of employment. It is necessary to identify impacting factors to enhance productivity. In this scenario, individuals can only excel when they have confidence in each other, effectively communicate their knowledge, and share information promptly. Communication is widely recognized as a crucial and formidable element in the achievement of virtual teams in literature. While there are numerous publications discussing virtual teams and the importance of communication within them, there is a dearth of research specifically focusing on role clarity, communication effectiveness, communication satisfaction, and technological usage combined with the productivity of the Virtual team. Previous publications on this topic have been limited to the service industry in the USA or Europe. This research has attempted to investigate the factors that furnish to the effectiveness of virtual leadership with the rise of remote employees in virtual team productivity in New Zealand. This study also aims to identify the characteristics or features of successful virtual teams in the modern day.

3.1 Objectives

The wide objective of this research is to assess the relationship between the effectiveness of virtual leadership and virtual team productivity. The specific objectives are as follows-

- To determine the characteristics of successful virtual leadership.
- To assess the impact of factors of virtual leadership on the productivity of virtual teams in light of the increasing number of remote employees.

3.2 Research Questions

- What are the characteristics of successful virtual leadership?

- What are the factors affecting virtual team productivity in light of increasing numbers of remote employees?
- How is virtual leadership affecting virtual team productivity?

3.3 Research Hypotheses

- H1: Virtual team productivity is significantly impacted by role clarity.
- H2: Virtual team productivity is significantly impacted by communication effectiveness.
- H3: Virtual team productivity is significantly impacted by communication satisfaction.
- H4: Virtual team productivity is significantly impacted by technological usage.

4. Research Methodology

The research methodology is a very important part of the research. To conclude this research paper the approach is quantitative. The snowball technique is used in this research as it uses the participants who are hard to locate. This technique focuses on a subtle issue, thus necessary to relocate the sample population for the study (Etikan, 2016). As this study focuses on virtual teams and virtual leadership, the target population for this research is the people who are working in a Hybrid or Remote structure in the corporate environment in New Zealand. A survey from the existing literature is prepared which consists of four independent variables which are role clarity (RC), communication effectiveness (CE), communication satisfaction (CS), and Technological usage (TECH), and one dependent variable i.e. virtual team productivity (VTP). The questionnaire comprising 24 questions is prepared and converted into the Google form for the collection of the responses and sent to the individuals through mail and WhatsApp. The responses are collected on a five-pointer Likert scale ranging from strongly disagree-1, disagree-2, neutral-3, agree-4, and strongly agree-5. To meet the objectives of the study regression technique is used with the help of SPSS. Regression is the optimal method for predicting the relationship between a dependent variable and one or more independent variables. The methodology is used to analyze the collected data to provide valuable outcomes related to the objectives of the study. The researcher has used multiple linear regression which is used to predict the relation between a single dependent variable and more than two independent variables (Uyanik & Guler, 2013). According to Burmeister & Aitken (2012), the calculation of sample size can be calculated using the 20:1 rule, which defines that the ratio of sample size and the number of parameters should be equal to or more than 20 to 1 respectively. In this study, the sample size is 145 which is considered to be a good fit as it follows the mentioned rule. The findings of this research paper are discussed in the analysis chapter.

5. Data Analysis

This section will present the findings of the study using the tables obtained from the output of the analysis. The demographics are presented using tables and hypotheses are tested and analyzed using multivariate regression analysis tools at a 5% level of significance. The reliability is tested using Cronbach's alpha which tests the internal consistency of the data.

Table 1. Demographics

Category	Frequency	Percentage
Gender		
Male	56	38.6
Female	89	61.4
Age (in years)		
21- 30	113	77.9
31- 40	32	22.1
City		
Metropolitan	115	79.3
Non-Metropolitan	30	20.7
Work Experience		
Below 3 years	62	42.8
4 - 10 years	83	57.2

Above 10 years	0	0

Table 1. explains the demographics of the study which states that out of 145 respondents, 38.6% are male and 61.4% are females. Most of the respondents are from the age of 21-30 years and are working remotely followed by the age group of 31-40 years. 115 respondents out of 145 are from metropolitan cities and the remaining 30 are from non-metropolitan cities. 42.8% of the sample population possess experience of less than 3 years whereas 57.2% fall under the category of 4-10 years of experience.

5.1 Reliability Test

Table 2. Reliability Statistics

Cronbach's **α**	Number of Items
0.943	18
0.815	5

The reliability test in Table 2 is done to check the internal consistency of the data. The value of Cronbach's **α** is 0.943 which is considered to be very good. The benchmark coefficient is 0.70 for ascertaining reliability. As per Tranmer & Elliot (2008), multiple linear regression analysis can be performed by taking the means of the construct for both independent and dependent variables. The Cronbach's **α** for one dependent and four independent variables is calculated, which is 0.815

5.2 Regression analysis

Table 3. Summary of Model

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.893[a]	.797	.791	1.89758

In Table 3, the constants are role clarity (RC), communication effectiveness (CE), communication satisfaction (CS), and technological usage (TECH). The results of the regression analysis from the above table show a significant R= 0.893, which states that the multiple regression coefficient between the criterion and predictors is 89.3%, while the value of R^2 is 0.797 which predicts that this study explains 79.9% of the variance in the dependent variable. The table also shows the value of adjusted R^2 as 0.791 which states that virtual team productivity can explain 79.2% variation in productivity.

Table 4. ANOVA[a]

Model		Sum of Squares	df	Mean^2	F	Sig.
1	Regression	1974.949	4	493.737	137.118	.000[b]
	Residual	504.113	140	3.601		
	Total	2479.062	144			

The dependent variable in the study is virtual team productivity (VTP). The significant F-test shown in Table 4 (137.118, $p_{<0.05}$) indicates a significant overall prediction of the independent variables on the dependent variable. This suggests that the p-value of 0.00 indicates a good fit of the model in assessing the impact of virtual leadership on virtual team productivity.

Table 5. Coefficients[a]

Model		t	Sig.

		B	Std. Error	Beta		
1	(Constant)	-2.015	1.070		-1.882	.062
	CE	.688	.109	.385	6.296	.000
	RC	.155	.062	.096	2.499	.014
	CS	.475	.072	.463	6.631	.000
	TECH	.203	.089	.117	2.277	.024

The regression analysis in Table 5 shows that all the variables possess different p-values and statistically have significant/non-significant effects on virtual team productivity. The unstandardized coefficient (B) represents the impact of every independent variable on the dependent variable i.e. virtual team productivity with no standardization. The standardized coefficient (Beta) allows the comparison of the relative importance of each independent variable. The value of t measures the significance of each coefficient. The significance level i.e. p-value indicates whether the coefficient is statistically significant.

Table 6. Concluding Hypotheses

Hypotheses	Sig.	Status
H1: Virtual team productivity is significantly impacted by role clarity.	.014	Supported
H2: Virtual team productivity is significantly impacted by communication effectiveness.	.000	Supported
H3: Virtual team productivity is significantly impacted by communication satisfaction.	.000	Supported
H4: Virtual team productivity is significantly impacted by technological usage.	.024	Supported

Table 6 concludes the results of the hypotheses which defines the hypotheses that are accepted and rejected. The hypotheses with $p_{<0.05}$ are supported and p-values more than 0.05 are not- supported. Here all the values are less than 0.05, so all the hypotheses are accepted.

6. Discussion

The demographic study concludes that most of the women of the age group 21-30 years have opted to work from home. To analyze the significance of the predictors on dependent variable, the value of R (Correlation Coefficient) is taken into consideration which is 0.893 which represents the strength of the linear relationship between the predicting variables and the responsible variable. This value indicates the linear relationship where 1 is the perfect indicator of the relationship. The independent variable here predicts the dependent variable with 89.3% which is fairly strong. The value of R-square (Coefficient of Determination) is 0.797, which explains the variance explained in the responsible variable concerning predictors. The adjusted R-squared comes to 0.791 signifies the model fit which here suggests that the independent variables collectively contribute to explaining the dependent variable i.e. virtual team productivity. The estimated standard error is 1.89758 which suggests the reasonable fit of the model. The ANOVA represents the regression and residual for the given model. The regression explains the variation in the dependent variable whereas the residual represents the error in the model. This model appears to be a good fit based on the F value i.e. 137.118 and low p-value.

The outcome of the analysis concludes that all the factors like communication effectiveness, role clarity, communication satisfaction, and technological usage significantly affect virtual team productivity. The B coefficient for communication effectiveness is 0.688 which means for each unit of increase in the effectiveness of communication, the VTP is expected to increase by 0.688 units whereas the Beta coefficient is 0.385, indicating a moderate impact on VTP. The unstandardized coefficient i.e. B for role clarity is 0.155, this indicates the positive relationship between both variables. The B coefficient for communication satisfaction is 0.475, this positive value shows that greater communication effectiveness is associated with higher VTP. The Beta coefficient is 0.463 which suggests the high impact of communication effectiveness on virtual team productivity. Technology for communication plays a greater role while working in a virtual setup, in this study, the B coefficient is 0.203, and the Beta coefficient is 0.117 indicating higher predictability. The B coefficient for technological usage is 0.203 which implies that with an increase in technological usage, the virtual team productivity will moderately increase. The p-value = 0.024 indicating that high risk is involved while predicting virtual team productivity.

7. Managerial implications

This study on the effectiveness of virtual leadership concerning remote employees provides valuable acumen for business organizations to increase virtual team productivity and simultaneously adapt to the changing landscape of employment. The managerial implications are as follows-

- Communication has come up as the most impacting factor in this study. Concerning this, virtual leaders should focus on the establishment of efficient and effective communication channels in order to overcome the geographical distance between team members. Channels such as video conferencing, messaging on teams/organization portals, and emails on regular basis are effective and essential tools. Leaders should prioritize transparent communication and consistent follow-ups for the same (Ganesan, 2024).
- Transitioning the traditional culture of a Task-oriented environment to a People-oriented environment is the need for virtual leaders. Empathy, attentive listening, and comprehension of individual requirements foster team unity and involvement. Acknowledge that distant employees face distinct obstacles, including the need to manage work and personal life and the feeling of isolation. Virtual leaders should take proactive measures to address these issues (Nuratri et al., 2022)
- Virtual leaders are wholly responsible for creating and fostering a feeling of togetherness among team members who work from different geographical locations. Promoting virtual team-building events, celebrating accomplishments, and establishing occasions for casual contacts are some of the better ways of building the team and enhancing its productivity. Utilization and adaptation of communication technology to replicate informal discussions and foster social connections is also part of virtual leadership (Ganesan, 2024).
- Trust can be established by transparency, exhibiting dependability and expertise, and fostering possibilities for employees to engage and acquaint themselves with one another. Similar to efficient communication, establishment of trust, and development of team cohesion are also essential for effectively managing virtual teams. The virtual environment has distinct obstacles, such as the complexity of establishing trust and rapport among team members, and this can be overcome by practicing ethical and clear communication between the team members and team leaders (Nuratri et al., 2022).
- Virtual leaders must possess expertise in utilizing communication technology tools such as meeting platforms, project management software, and some available collaboration tools. Staying updated on technological advancements and being ready to swiftly adapt to changes will help virtual leaders build a good team working remotely (Matsudaira, 2023). Managers should also encourage employees to increase their proficiency in digital skills.
- Virtual leaders should take care of the well-being of employees and examine their remote teams regularly by checking in with them. Virtual leaders should take fast action to address concerns regarding burnout, stress, and mental health and ensure that resources are made available for wellness initiatives and employee assistance programs in an organization (Matsudaira, 2023).

In a nutshell, effective leadership in the virtual realm requires a combination of qualities, including the ability to communicate effectively, technological expertise, empathy, and adaptability. Within the context of the era of remote work, business organizations can improve the productivity of virtual teams and the satisfaction of their employees by applying these managerial implications.

8. Conclusion

The above study highlights the positive and significant impact of role clarity, communication effectiveness, communication technology, and communication satisfaction in determining virtual team leadership. The use of efficient and clear communication channels improves teamwork, reduces misunderstandings, and has a beneficial impact on the productivity of the team. Well-defined roles and responsibilities in virtual teams enhance coordination, task distribution, and overall productivity of the team. Satisfaction is linked to increased engagement and ultimately results in enhanced productivity of the team. Employing suitable tools and technology enables smooth communication, efficient work management, and effective information exchange, eventually improving team productivity. On a brighter note, the study also provides positive approaches toward the managerial implications of enhancing the performance of virtual teams and creating an atmosphere that supports these elements for optimizing virtual team performance.

9. Limitations and Future Scope

Every research has its limitations as this research. The above outcome of the research relies on a small population of New Zealand and on a specific sample size, which may not represent the entire population. To generalize the effect of the study, the researcher must ensure that the sample is diverse. This study is not a longitudinal study, capturing data at a single time sometimes leads to biased results. The effect of external factors on virtual team productivity is ignored. Future studies can be done over a long period to conduct longitudinal research for tracking changes. The scope of the research can be extended to different countries with diverse populations to enhance external validity. The study can also be done by increasing the sample size and variables to extract a better model and results for the virtual team and their leaders.

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Annexure-1

Questionnaire

1. Gender

- Male
- Female
- Other

2. Age

- 21- 30 years
- 31- 40 years
- 41- 50 years
- Above 51 years

3. Currently, Residing in City?

- Metropolitan
- Non-Metropolitan

4. Your Location Type

- On-site
- Hybrid
- Remote

5. Experience of work

- Below 3 years
- 4 - 10 years
- Above 10 years

6. Have you ever participated in virtual activity related to your job before the pandemic?

- Yes
- No

Likert scale questions, Rate them on a scale of 1 to 5

1- Strongly disagree

2- Disagree

3- Neutral

4- Agree

5- Strongly agree

Role clarity

1. A virtual leader clearly defines the responsibilities of all team members.
2. Virtual leaders exercise authority to ensure follow-through on assigned responsibilities.

Communication effectiveness

3. Virtual leader provides a clear, concise, and easy picture of the task.
4. Virtual leader provides continuous feedback for improvements.
5. Virtual leader engages actively and regularly in communication.

Communications satisfaction

6. The frequency of communications of virtual leaders is adequate and aligned to requirements.
7. The flow of communication from virtual leader to team is appropriate.
8. The quality of communication of virtual leaders is satisfactory.
9. The virtual leader is easily available when needed.
10. Virtual Leaders are capable of resolving conflicts within the team

Technological usage

11. Virtual leader effectively uses technology to enhance communication and collaboration in the team.
12. Virtual leader uses the technology in a user-friendly manner.
13. Virtual leader uses communication technologies to teach the team effectively.

Virtual Team Productivity

14. The virtual team meetings are effective fully.
15. The productivity of the virtual team is enhanced by communication tools.
16. The level of collaboration within the virtual team is high.
17. The virtual meetings are focused and productive to all extent.
18. The level of satisfaction is high with the support provided by the virtual team leadership in completing work goals.