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Beyond Formal Roles: A Balanced Leadership Approach to Leadership in Virtual Teams

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Abstract

Organizations are becoming more complex such that they are beginning to branch out beyond the traditional top-down structures. Regardless of the structure of an organization, leadership seems to be a constant force that drives it to achieve set goals. However, varying structures of organizations suggest that leadership is likely taking a new dimension such that it is adapting to the new structures which are not compatible with top-down leadership processes. Hence, this study examines how leadership is enacted beyond formal roles in virtual teams, a structure that is different from the traditional structure. The research was conducted qualitatively to gather in-depth information on the perception of leadership in virtual teams, structure of virtual teams, and the challenges faced in virtual teams through 16 semi-structured interviews and 2 virtual meeting observations. The analyses of these findings, through a complexity leadership theory, revealed that virtual teams face internally and externally induced challenges that result in the emergence of new situations and organizational leaders have to use their roles to enable adaptability. Therefore, this research argues for a balanced leadership approach to leadership in contemporary organizations with hierarchical leaders whose managerial leadership functions often intertwine with generating new situations to enable adaptability.

Keywords:
Organizational structure, Leadership, Virtual teams, Complexity leadership, Digital platforms

1.0. Introduction

In traditional organizational structures, leadership is often played by people at the helm of affairs, which suggests that leadership is a top-down process, and power and information are passed from up to down. Research suggests that hierarchical leadership process may need some support in virtual teams to enhance team effectiveness (Avolio, Kahai, and Dodge, 2000; Bell and Kozlowski, 2002). This implies that the traditional hierarchical leadership process may be limited in teams where work is performed virtually since everyone does not work from a central physical location where work can be directly monitored.

Globalization, digitalization, and technological advancements have made it easy for organizations to adapt to challenges. For instance, in the heat of the COVID-19 pandemic, many organizations opted for virtual work operations, which according to Garro-Abarca et al. (2021) contributed to the increase in virtualization, thereby creating new organizational structures. Furthermore, digitalization has provided organizations with new ways of carrying out their operations, causing them to gradually shift away from traditional organizational structures, that is, working from a central office that is controlled by the employer. This means that work can be done from anywhere at any time, irrespective of distance in space and time, and teams can collaborate from different locations with the help of technology. As a result, organizational work teams are moving from face-to-face to virtual settings (Guo et al., 2009).

Coordinating work from a distance, with the help of technology influences how leadership plays out. According to Yukl (2006), leadership is "the process of influencing others to understand and agree about what needs to be done and how to do it, and the process of facilitating individual and collective efforts to accomplish shared objectives". This means that leadership is about influencing individual members as well as facilitating teamwork. In other words, leadership is performed individually by each person in a group and also collectively by the group and may not be limited to a formally appointed leader.

1.1. Problematization & Purpose of the Study

Organizations are gradually being reorganized from hierarchical leadership structures to more linear structures that are compatible with dynamic challenges (McDowell, et al., 2016). These non-hierarchical structures foster innovative solutions and learnings, as such, contemporary leadership approaches focus on leadership as an interaction where leaders and followers take on flexible roles that can change, depending on the situation (Carter et al., 2015). Yukl (2006) defines leadership as "the process of facilitating individual and collective efforts to accomplish shared objectives," meaning that leadership is both an individual and collective effort.

Further explaining leadership from a holistic perspective, Padilla and Lunsford (2013) state that "leadership is a resource for group performance within the environmental conditions where the organisation operates." In other words, leadership is performed collectively by a group within an environment categorized by institutional, cultural, economic, social, and/or technological conditions. In line with this thought, Kozlowski et al. (2016) mention that "the most relevant social context for understanding leadership processes is the small group or work team," leading to our assumption that the best way to understand leadership within dynamic, interactive work structures is by studying virtual teams. Although several studies have investigated leadership within the context of close leader-follower interactions, leadership from a distance, performed through technology is a quite recent phenomenon (Avolio et al., 2014; Van Wart et al., 2019). This research will explore how leadership is enacted beyond formal roles in virtual teams, where work is enabled by advanced technologies and members are separated by time and space. It will contribute to already existing research in this area and will be relevant for collaborative teams working in virtual settings and teams adopting or transiting to virtual work settings. Hence, the purpose of this study is to understand how leadership is enacted beyond formal roles in virtual teams.

1.2. Research question

How is leadership enacted beyond formal roles in virtual teams?

1.3. Delimitation

Leadership is a broad concept that can be studied in various ways. However, this study focuses on leadership in virtual teams by exploring and analyzing how leadership is performed beyond formal roles in virtual teams. Data was gathered from both team leaders and team members of virtual teams through semi-structured interviews and observations. This study does not seek to generalize its findings to all virtual teams but rather provides insights into how leadership plays out within a specific context.

This paper is structured by starting with an introduction, followed by a literature review on the study area, then the theoretical framework that presents the complexity of leadership. Next is the methodology that outlines the process and the context of the research. This is followed by the presentation of the empirical findings based on the categories that were generated from the interview data. Afterwards, the analysis of the empirical findings with the theoretical framework and lastly, the conclusion, contribution, implications, and recommendation for future studies based on the result of this research.

2.0. Literature Review

2.1 Contemporary Leadership Approaches

Contemporary researchers employ a collectivistic or "we" approach (Yammarino et al., 2012) to defining leadership, using terms like team leadership (Day et al., 2004), network leadership (Balkundi & Kilduff, 2006), shared leadership (Carson et al., 2007; Wang et al., 2014; Singh et al., 2019), complexity leadership (Uhl-Bien et al., 2007), and collective leadership (Yammarino et al., 2012). These approaches shift the idea of leadership from an individual to a group process where communication, face-to-face interactions, and knowledge are constantly exchanged. Contemporary leadership approaches also steer away from leader-centric leadership by focusing on recognizing the roles of followers and the environmental conditions where the leadership happens (Padilla & Lunsford, 2013).

In explaining team leadership, Day et al. (2004) explains that leadership is an outcome of team processes rather than an input. This means that leadership happens when team members interact with each other to achieve a common goal. Explaining how leadership is performed by the group, Singh et al. (2019) describes shared leadership as "a dynamic, interactive influencing process among peers, with the objective of achieving personal, team, and/or organizational goals." In other words, shared leadership is not necessarily performed by the formal team leader, but by team members and among team members. Therefore, shared leadership happens when team members engage in responsibility sharing, mutual influencing, guiding, and collaborative decision-making (Hoch & Kozlowski, 2014). Depending on the situation, team members intuitively become leaders or followers (Stewart et al., 2011), and formal leaders share leadership with team members (Hoegl & Muethel, 2016). Wang et al. (2014) add that this

leadership approach is ideal for complex environments, such as virtual teams, so that the influencing process is distributed across the team members (Carson et al., 2007), and leadership is more lateral than upward or downward (Al-Ani et al., 2011). Nevertheless, it is important to note that shared leadership is not meant to contradict or serve as an opposition to the leadership of an assigned leader, but rather act as a supplement and support for influencing team members (Hoch & Kozlowski, 2014).

Other researchers also explain leadership as a complex emergent process (Pearce et al., 2008; Gerpott et al., 2018; Charlier et al., 2016). This means that leadership is not static but is the outcome of dynamic interactions between leaders and followers. In many modern teams, leadership has become less hierarchical and the roles of leaders and members more fluid (Scott et al., 2018), implying that, at a particular time, team members could be taking on leadership roles and at another time, switch to a followership role. Therefore, less hierarchical and fluid structures create a good environment for emergent leadership. According to Gerpott et al. (2018), emergent leadership is how certain individuals emerge as leaders within a leaderless group because other members perceive them to be taking leadership responsibility. However, even in groups with formal leaders, some individuals can exhibit leadership influence even without having any formal authority (Charlier et al., 2016). In other words, non-formal leaders can emerge within a team, depending on how other members perceive them to exhibit leadership behaviours.

2.2 The Concept of Leadership in Virtual Settings

Zigurs (2003) defines virtual teams are a collection of individuals who are dispersed from each other geographically or organizationally but connect and accomplish assigned tasks through information technology. Research has shown how technology influences leadership in virtual teams (Olson & Olson, 2000; Kerfoot, 2010). According to Kerfoot (2010), virtual leadership is the management of distributed work among a virtual team through electronic media, and Olson and Olson (2000) add that electronic media like telephone, videoconferencing, instant messaging, and file application sharing are often enabled by information communication technology (ICT) to function. Therefore, advanced information technology is important for leadership in virtual settings because team members are physically separated. Although virtual teams are physically separated, they collaborate, coordinate tasks, and communicate through information technology. As they interact and perform tasks together through technology-enabled electronic media, leadership is produced. This implies that leadership in virtual settings is the diverse interactions between virtual teams and technology to collaborate, communicate, and coordinate tasks. In other words, technology provides an environment for virtual teams to delegate tasks, supervise work, collaborate, and communicate with each other in different ways. Therefore, technology influences and transforms leadership in virtual settings and leadership is produced as virtual teams interact with technology.

According to Yukl (2006), leadership is a process of influencing others by facilitating individual and collective efforts to understand and agree on what needs to be done and how to do it in order to accomplish a common objective. Avolio and Kahai (2003) further explain that e-leadership happens in a virtual setting that promotes collaboration and digital interactions via

emails or other electronic media. Therefore, e-leadership is a form of leadership in virtual settings where virtual teams collaborate and interact through technology. Avolio et al. (2000) also use the term e-leadership to explain how advanced information technology (AIT) is used to influence social behaviour in groups, thereby creating a change in feelings, attitudes, thinking, performance, and behaviour. This implies that technology can be used in virtual settings to influence team members in a positive or negative way. For instance, technology helps to close the gap of geographical distance (Kerfoot, 2010) and little or no significant human interactions (Avolio & Kahai, 2003), foster and coordinate performance (Peters & Manz, 2007), promote self-management, influence attitudes, and behaviours (Avolio et al., 2014). However, technology also creates challenges for virtual teams, like lack of physical and social interactions, loss of face-to-face synergies, mistrust, communication breakdown (Cascio, 2000), and using complex applications to get work done (Badrinarayanan & Arnett, 2008). This means that leadership in virtual settings involves using technology to manage boundaries and the peculiar challenges associated with virtual team structures.

2.3. ICT in Virtual Teams

Virtual teams use various technologies and tools to interact and carry out work routines. Some of the research on virtual teams (Messenger & Gschwind, 2016; Neufeld et al., 2010; Cortelazzo et al., 2019) explain the type of technologies virtual teams use and how they use them. According to Messenger and Gschwind (2016), smartphones and tablet computers have been used to revolutionize work routines through videoconferencing and web-based collaboration tools. In other words, virtual teams use digital tools to communicate, collaborate, and coordinate tasks. Therefore, ICT is important in virtual settings for sharing ideas and exchanging information. The research by Neufeld et al. (2010) agrees with this by explaining that leadership in virtual settings is performed through communication. This implies that leadership in virtual teams involves creating a communication channel that encourages team members to participate in decision-making, idea sharing, and information exchange. Doing this will encourage collaboration and responsibility, which will also create a positive environment for leadership (Cortelazzo et al., 2019). This means that ICT creates an enabling environment for leadership in virtual teams.

Likewise, other research (Avolio & Kahai, 2003; Henttonen & Blomqvist, 2005; Coppola et al., 2004) highlight how ICT fosters teamwork in virtual teams. Avolio and Kahai (2003) explain that emails can be used to reinforce team behaviour, while Henttonen and Blomqvist (2005) and Coppola et al., (2004) mention that ICT can be used to promote positive communication behaviour, open communication, feedback, early communication, and a positive tone. This means that ICT can be used in virtual teams to motivate actions that lead to collaboration and improved trust.

2.4. Theoretical framework

According to Curseu (2006), virtual teams are complex socio-technical entities whose effectiveness is dependent on a set of nonlinear and bidirectional causal relations among

various dynamic levels, which Uhl-Bien et al. (2007) describe as complex adaptive systems (CAS). In complex adaptive systems, these relationships are not defined based on hierarchy but based on the interactions among heterogeneous agents across agent networks (Uhl-Bien et al., 2006). In other words, the complex systems perspective defines leadership as an emergent event and an outcome of dynamic interactions. The theory also describes leadership as how formal leaders use their authority to foster innovation, generate new ideas, and induce adaptability. Baltaci and Balci (2017) explain that complexity leadership provides an approach for organizations to survive the volatile, uncertain, complex, and ambiguous environment of information technology, and Uhl-Bien et al. (2006) argue that the complexity leadership theory (CLT) provides a framework for understanding the dynamic interactions that happen in contemporary work structures. Hence, this framework will be used to analyze how leadership is performed beyond formal roles in virtual teams.

The CLT framework is based on three forms of leadership, which Uhl-Bien et al., (2007) categorize as: (1) administrative leadership (2) adaptive leadership, and (3) enabling leadership. However, for the purpose of this research, they have been reframed as: (1) top-down leadership approach (2) leadership as outcomes approach, and (3) balanced leadership approach.

2.4.1 Top-down leadership approach

According to Uhl-Bien et al. (2007), this form of leadership is categorized as administrative leadership because it is based on formal functions that serve to coordinate and structure organizational activities. Therefore, it is performed by individuals who engage in formal managerial roles such as planning, coordination, task structuring, building vision, and allocating resources. For the purpose of this research, this form of leadership has been reframed as top-down leadership approach because it suggests that leadership flows from the top and focuses on alignment and control. This is in line with the argument of Uhl-Bien et al. (2007) that administrative leadership is based on bureaucracy and hierarchy.

2.4.2. Leadership as outcomes approach

Uhl-Bien et al. (2007) categorized this form of leadership as adaptive leadership, which is explained as an outcome of informal adaptive dynamics. For the purpose of this research, adaptive leadership has been reframed as leadership as outcomes approach because this form of leadership is not limited to a formal role but originates from the interactions and interdependencies of people, ideas, technology, etc. As such, leadership emerges from informal adaptive dynamics, and anyone can participate as a leader or follower at any time and for different purposes. Therefore, this approach differentiates leaders from leadership, since leadership is an outcome of dynamic interactive processes and leaders are the people who facilitate the outcome. Leadership as outcomes of dynamic interactions means that leadership happens when heterogeneous agents (Uhl-Bien et al., 2007) interact, integrate, create alliances, collaborate and cooperate. As agents interact, new ideas, new challenges, new leaders, new processes, and new solutions emerge, and heterogenous agents learn how to adapt to these new situations. Therefore, this approach is characterized by network dynamics and emergence (Uhl-Bien et al., 2007). Network dynamics implies that leadership is not an outcome of individual

interactions but a network of interdependent agents, while emergence is the new situation that is created from the interactions and interdependencies in the existing complex network without the direct control of formal leaders. This implies that network dynamics and emergence together produce leadership outcomes, so leadership outcomes are new situations that emerge from dynamic interactions and interdependencies.

2.4.3. Balanced leadership approach

According to Uhl-Bien et al. (2007), this form of leadership is categorized as enabling leadership because it balances the other two forms of leadership by catalyzing the conditions for leadership outcomes. For the purpose of this study, enabling leadership has been reframed as balanced leadership approach to further support the claim that leadership is based on how formal leaders can use hierarchical positions to strike a balance between top-down leadership and interactions that produce leadership outcomes. Uhl-Bien and Arena (2018) suggest that formal leaders can induce conditions that enable leadership outcomes by fostering adaptive space, that is, facilitating interaction, interdependency, and adaptive tension (Uhl-Bien et al., 2007). Therefore, this approach recognizes that tension can spark creativity, so it promotes productive task conflicts and encourages adaptive problem-solving through productive discussions and interactions (Uhl-Bien et al., 2007). Formal leaders can also exert external tensions that support creativity by inducing managerial pressures, challenges, resource distribution, demanding results, and dropping "seeds of emergence" (Marion & Uhl-Bien, 2001). As such, formal leaders can create a balanced leadership approach by generating internal or external situations that enable leadership outcomes without exerting control. Uhl-Bien and Arena (2017) elaborate that enabling leadership involves managing the entanglement between administrative leadership and emergent leadership. This implies that a balanced leadership approach is essential for formal leaders whose top-down leadership functions are often intertwined with inducing situations that create leadership outcomes so that they will not resist these dilemmas but align with them.

In general, complexity leadership theory draws from the concept of complex adaptive systems (CAS) to suggest that leadership is not only a position but also "an emergent, interactive dynamic" (Uhl-Bien et al., 2007). This implies that leadership is not the function of an individual but emerges from the dynamic interactions in complex networks. However, CLT suggests that, instead of exerting control, formal leaders can use their positions to encourage conditions that produce new learning, innovation, and adaptability (Uhl-Bien et al., 2007). The complexity leadership theory has been used as a framework to clarify how agile coaches practise enabling leadership (Bäcklander, 2019), to investigate how complex leadership in healthcare has been defined, theorised, and conceptualised, and to explore how complex leadership has been applied in healthcare settings (Belrhiti et al., 2018). In this research, CLT will be used to provide insight into how leadership is enacted beyond formal roles in virtual teams.

3.0. Methodology

3.1. Research design

This study has been conducted qualitatively and is aimed to answer the 'how' question, which according to Silverman (2015), is best answered qualitatively by exploring how a phenomenon is perceived in a social setting. Qualitative research, which is multi-method in focus (Denzin & Lincoln, 2005), gave us the chance as researchers to be personally involved in the process of data collection, allowing us to gather in-depth information about the case study. The qualitative approach has helped to explore the study area for deeper understanding (Flyvbjerg, 2006), and has provided great insights (Silverman, 2013) into how leadership is enacted beyond formal roles in virtual teams. This research is based on a single case study, even though there is a common misconception that results generated from case studies may not be generalizable. However, we strongly argue that case studies can help to provide in-depth knowledge on a phenomenon (Flyvbjerg, 2006) which can be related to other cases.

Furthermore, the setting/context of this study is virtual teams, which are teams that are separated by time and distance using technological tools to coordinate, communicate and collaborate to achieve a common objective. Some of these teams consist of experts that work together to proffer solutions to their clients' needs. These solutions are usually intangible and could be in the form of creativity, skills, or innovative ideas. Some examples of virtual teams include but are not limited to non-governmental organizations (NGOs), consulting teams, talent acquisition teams, project management teams, DEI teams, marketing and communications teams, etc. The researchers focused on teams that fit this description regardless of their size, and participants were mainly from consulting, educational coaching, content marketing, and project management teams. Respondents were intentionally selected based on their connection to the purpose of the study and question the research seeks to answer (Silverman, 2015). Hence, the target population for this study were team leaders and team members in virtual teams. Considering the large population that will fit into this category and the limited time available for this research, a representative sample was selected.

3.2. Data collection strategy

Drawing on Silverman's (2019) claim that the interview method is a suitable and efficient method of data collection in a qualitative study, interviews were conducted to gather first-hand data from respondents for the purpose of this study. Semi-structured interviews were used to guide the discussion, allowing the respondents to give extensive information, and not limiting respondents to specific answers. A few open-ended questions were prepared ahead of the interview to serve as a guide but were flexible enough to give room for follow-up questions and clarifications where needed. The interviews were focused on how leadership takes place in virtual teams beyond formal roles while exploring and identifying every action and element that contributes to leadership. All interviews were conducted for about 30 to 60 minutes virtually via Zoom. A study carried out by Archibald et al. (2019) has verified the convenience and interactivity that Zoom technology provides and suggested that Zoom could be used as an efficient and effective platform for gathering qualitative data. The interviews were recorded to

enable researchers double back and confirm the information as much as they want without any bias.

Data was collected mainly from primary sources. For primary data, the researchers interviewed 16 respondents who work in different virtual teams across nine different organizations. The organizations include two publishing companies, three consulting firms, one vehicle manufacturing company, one real estate company, and two educational institutions. The researchers have decided to take on a team-focused approach rather than an organization-focused approach for this study, hence information was gathered from four virtual teams across these different organizations. These teams include 3 consulting teams, 2 publishing teams, 2 project management teams, and 2 educational coaching teams.

The consulting team consists of a group of experts who operate virtually and provide both individuals and organizations with a range of services that include giving advice in the areas of integration, diversity, and inclusion process; designing equality initiatives, discovering new innovative solutions to attract and retain diversity within organizations, promoting national inclusion campaigns in communities, provision of programs for international talents, provision of software development services for international employees, managing international employees relocation, helping companies reduce uncertainty and workload, guidance on complex processes. Members of this team are positioned in different geographical areas, while a number of them are within the same location, majority are geographically dispersed. There were 4 respondents from the consulting team: 3 team leaders and 1 team member.

There were also 4 respondents from the publishing team. This team is made up of professionals that work collectively to provide writing services as well as digital and content marketing services. These services involve editing, proofreading, transcribing, content writing, ghost-writing, and printing. Hence, members have roles such as writers, designers, editors, printers, and illustrators. Based on their roles within the team, members are further divided into sub-teams.

In the project management team, 5 members were interviewed. The project management team is made up of individuals with different skill sets. This team consists of project managers, project owners, technical leads, and business analysts. Their services include planning, organizing, executing, and controlling different types of projects, ranging from construction to car manufacturing.

From the educational coaching team, 3 members were interviewed. Two of them are team leaders, while the third individual is a team member who is being coached. The team consists of educational coaches and student who engage in tutoring and learning through learning management system platforms.

Team(s)	Interviewees	Number of Leaders	Number of Members
Consulting Team	Consulting leader 1		

	Consulting leader 2	3	1
	Consulting leader 3		
	Consulting member		
Educational Coaching team	Educational leader 1	2	1
	Educational leader 2		
	Educational member		
Project Management Team	Project leader 1	3	2
	Project leader 2		
	Project leader 3		
	Project member 1		
	Project member 2		
Publishing Team	Publishing leader 1	2	2
	Publishing leader 2		
	Publishing member 1		
	Publishing member 2		

Table 1. List of respondents

The selection of respondents from these different virtual teams across different organizations has helped the study to capture a wide range of perspectives and experiences that can help to ensure that the findings are rich and generalizable.

Furthermore, two of the consulting teams were observed through participation in their virtual team meetings, paying attention to how the meetings were organized, communication styles of team members, actions, and non-verbal cues performed during the meetings. During these observations, notes were taken to make meaning through active reflection in the data collection process. The field notes served as a supplementary form of data collection for this study as well as the documentation of each observation. The observation method provided a practical experience of the case study for the researchers and provided support for the information that had been gathered from the interviews, thereby helping in our investigation. Neyland (2008) encouraged this by arguing that it is important to carry out observations and get involved with the social settings where the actions are being carried out. Both observations have been labelled virtual meeting Observation 1 and virtual meeting Observation 2 to help readers distinguish between the findings that were gathered in both interviews.

3.3. Analytical strategy

The data gathered was analyzed as soon as the interviews were conducted and lasted through the entire data collection period. This allowed the researchers to recognize different patterns of information that were relevant for the study and to also identify areas that could use more exploration in upcoming interviews. It was done in different phases that was preceded by the transcription of recorded interviews. After which the analysis took a thematic process to improve the credibility of researchers' findings. The transcripts were carefully studied to become familiar with the data gathered. Followed by an initial coding process, that entailed a line-by-line reading of the transcripts and researchers assigned codes to each line. During this initial coding, various processes and elements that contributed to leadership were identified and

these led the researchers to what Gioia et al. (2012) refers to as first order category codes. These codes were further used to identify, retrieve, and categorize similar data for examination across the data set that are associated with the assigned codes (Castleberry & Nolen, 2018). At the end of the initial coding, all the codes that had been generated were assembled into different themes based on the similarities in their meanings/features. These new themes can be referred to as the second order themes and were reviewed to verify their relevance for the purpose of the study. The themes were then defined and put into categories through second order aggregate of dimensions. These categories were then used headings which were used to describe our empirical findings.

For example, the category "virtual team structures" was gotten from the themes and codes shown in *Diagram 1* below:
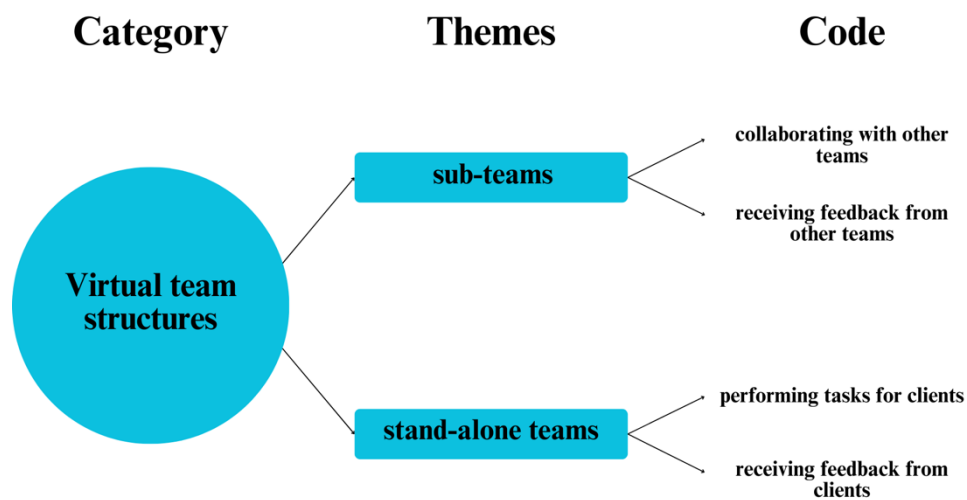
Diagram 1

Additionally, information gathered that has been presented under different categories, describing the complexity of leadership and dynamic interactions taking place in virtual teams was analysed through the lens of complexity leadership theory and associated concepts. The categories that were used to structure the empirical findings were analysed under new headings in relation to theory and concepts.

3.4. Limitations of the study

The main limitation of this study was a lack of access to virtual teams in one organization. The researchers would have preferred to do an in-depth study of different teams in one service-based organization and compare how leadership is organized in each team. However, most of our requests for an interview were turned down due to privacy issues, lack of time, or lack of understanding of the phenomena. Furthermore, the researchers would have preferred to observe more virtual team meetings to gather more data for our findings, and perhaps, interview more participants from the same team for a deeper analysis of how leadership plays out in the team. The researchers would have also preferred to have a balanced perspective of both leaders and followers from the same team.

3.5. Ethical Reflection

This research has been conducted with the full consent of all participants, with consideration of participants' reputations, and without any coercion. Before the commencement of the interview, researchers assured all participants that they will be kept anonymous thereby respecting their privacy. The researchers also ensured that each participant is aware of the purpose and scope of the study, providing them with every necessary information before interviews. For further privacy and confidentiality measures, researchers took additional steps to ask participants if they had disclosed any information they would want to withdraw at the end of every interview.

4.0. Empirical Findings

4.1 Leadership Perceptions

The data collected suggests that leadership in virtual teams is perceived in various ways as positions of authority, traits, and relationships.

4.1.1 Leadership as authority

Leadership in virtual teams is perceived as the responsibilities that assigned leaders perform towards the team. Respondents described some of the roles that these assigned leaders perform as coordinating and managing team activities, guiding, and ensuring that team goals are achieved. One of the team leaders explained:

> "I'm leading the development group, so I get to plan everything about the project and report to the stakeholders. I make sure that my team members are actually working, checking up on them like what the leader would do, and making sure that the project is moving." (Project manager 2)

According to this explanation, a team leader manages, supervises and coordinates team activities, therefore, a team leader is an assigned leader. Leadership in virtual teams is performed by team leaders as they coordinate, supervise, and guide team members. It was also mentioned that team leaders are in charge of setting team objectives, assigning tasks, and coordinating work processes. By performing these functions, they manage the team activities and work processes. This implies that team leaders are perceived to be leaders because they are assigned leaders who coordinate and manage virtual team operations.

The data also suggested that admins are assigned leadership roles by digital platforms because they can restrict or allow access to the group, manage information sharing, and task distribution. During Observation 1 (March 13, 2023), it was noted that the participant with the tag "host" on their window was responsible for allowing participants into the virtual meeting from the waiting room. Also, during one of the sessions, the "host" made another participant a co-host so that they could assign the team to breakout sessions. Information gathered from the data shows that virtual hosts are also in charge of sending out virtual invitations, can mute and unmute participants' audio, and take control of screen sharing. As such, those virtual hosts can be categorized as admins since they control access on digital platforms. Some respondents also mentioned that team leaders also double as admins on digital platforms. In line with this, one of the team leaders said:

> "I send out the majority of the meetings that I have with any team member. I send out all of the invites because I essentially have control over everything." (Consulting leader 2)

This means that admins decide who participates in team activities and how they participate they send out meeting invitations to team members. Therefore, admins are assigned leaders because they control access by allowing or restricting access to the group. It was mentioned that admins are responsible for adding and removing team members from digital platforms. Therefore, leadership is how admins control participants' access to digital platforms. The data also suggests that admins control the information that is shared on digital platforms. One of the respondents highlighted:

> "During the election period, there was tension, and we were asked not to post anything political on the WhatsApp platform. Basically, we don't post any unnecessary messages or unnecessary broadcasts outside work stuff." (Publishing member 2)

This implies that admins manage communication on digital platforms by controlling the information that is being shared. It was stated that admins can also delete information added by other participants on digital platforms and can add or remove access to shared documents. As such, they control how participants share information and what type of information is being shared. Therefore, leadership in virtual teams is perceived to be how admins manage information and communication on digital platforms. In addition, it was stated that digital platforms make it possible for virtual teams to easily identify who is in charge. One respondent said,

> "In the learning management system, there's a little icon next to the instructor's name. The visual interface does not let people forget what your role is." (Educational leader 1)

This means that participants can easily recognize who controls access and manages information and communication on digital platforms. As such, they know who to turn to for support when they need it. Since the data highlighted that leadership is providing guidance and direction for the team, it implies that admins on digital platforms perform these leadership functions when they provide support by pointing team members in the right direction. Therefore, leadership is perceived as how admins guide virtual teams by providing support.

It was also gathered that team leaders coordinate virtual teams via digital platforms by setting goals and ensuring that the goals are met. As one of the respondents mentioned,

> "When I'm planning the sprint on the Asana board, I will look at it using something called story points. I'll ask my team how many hours they think it will take them to complete the task and they tell me how many hours it will take them to complete it. Now, I will look at how many hours the company is giving us in a week and assign it to them. I won't give them any work that will be more than that. If the company is giving us five hours to work in a week, any task they are doing should be within four hours." (Project leader 2)

This means that team leaders coordinate team activities by setting objectives, delegating, and supervising tasks until they are executed. In addition, they decide who takes up a particular task, how tasks should be done, and when tasks should be completed. During one of the observations (virtual meeting observation 2, March 30, 2023), a participant who introduced themselves as the team leader shared their screen, displaying a document that contained a list of tasks that had been delegated to each team member. The progress of these tasks was discussed

by team members by giving reports on the status of each task and expressing how they intend to move forward. Tasks that were completed were ticked off by the team leader. This implies that team leaders are responsible for ensuring that team members are carrying out their tasks as they should, and meeting set deadlines. Therefore, leadership in virtual teams is perceived to be how team leaders delegate and supervise tasks to ensure that virtual teams achieve set goals.

4.1.2. Leadership as traits

From the data collected, leadership in virtual teams is perceived as traits exhibited by a leader. One of the respondents explained,

> "Some persons lead by virtue of what they do or say in the team, which makes others to follow them and to do things together." (Project member 1)

According to this statement, leaders act or speak in certain ways to command leadership. This means that a leader is anyone who possesses or exhibits leadership traits. Respondents identified leadership traits as accountability, authenticity, and influence.

> "I think leadership is holding yourself accountable to the same standards you expect of others, having a passion in that area, and motivating other people." (Consulting leader 2)

This implies that leaders use these leadership traits to influence others in a certain way. Respondents also mentioned that virtual teams look up to team members who demonstrate skillfulness, experience, knowledge, maturity, taking initiative, and a good track record. A respondent stated,

> "There are persons that play leadership roles because they are more experienced, provide guidance, know more about the team, or have proven that they can lead in some way. In such cases, the tendency is that the team members will look up to them. Those persons are perceived not labelled, because they don't have the title of leadership, but they are perceived as leaders by virtue of how they interact or what they do." (Project member 1)

According to this explanation, team members who demonstrate these traits are identified as leaders, even though they do not have leadership titles. As such, other team members gravitate towards these identified leaders for guidance, mentorship, and coaching. An instance was given where other team members often approached a team member to help resolve conflicts because he demonstrated a high level of maturity. Another respondent talked about how other team members were usually directed to a tech savvy team member for help on how to use some digital tools. In other words, if a team member exhibits leadership traits, they become an identified leader and other team members will go to them to help solve problems. Therefore, leadership in virtual teams is perceived as how identified leaders use leadership traits to influence team members.

4.1.3. Leadership as relationships

Leadership in virtual teams is perceived as a relationship. When describing leadership, respondents used analogies like the relationship between a spider and web, parents and kids, a shepherd and flock among others. According to one of the respondents,

"I guess leadership is sort of like parenting, so we have to build a strong parental relationship and we have to set good examples and be good role models for the kids." (Consulting leader 3)

This implies that leadership is a relationship where one person sets the standard and the other tags along. As gathered from the data, a leader acts as a model and the follower mirrors their example, implying that the person who sets the pace is a leader and the other who emulates is the follower. Therefore, leadership is a relationship between a leader and a follower. Respondents also mentioned that leaders persuade followers through idea sharing and communication, and followers can either agree or disagree with the ideas. This means that leadership is not unilateral but bilateral, so it requires open communication to achieve mutual agreement between leaders and followers. In virtual teams, communication between leaders and followers is done via digital platforms like Zoom, WhatsApp, Microsoft Teams, and Slack. One of the respondents explained how their team uses one of the digital platforms.

"You can have text chats, audio conversations, do presentations on Teams, and share your screen with your colleagues. We can actually give our colleagues control over our desktop. So, it's perhaps even more convenient than if you are physically with the person. You can give a smile if you like something, and you don't want to text and we can also share files through Teams, and of course, you can record." (Educational member)

This implies that communication and information sharing in virtual teams is done through chats, teleconferencing, and videoconferencing. Some teams also communicate through emails and phone calls. Via digital platforms, leaders share information and communicate with followers, and followers can show agreement or disagreement through verbal or non-verbal communication. Respondents noted that a smiley face, applause or thumbs up implies agreement, while a sad face or thumbs down implies disagreement. It was also gathered that virtual teams use other non-verbal methods like emojis, stickers, or GIFs to communicate. An instance of this was seen during Observation 1 (March 13, 2023) where team members used emojis like a heart face, applause, and thumbs up to react to an idea proposed by a participant. This means that without feedback or reaction, a consensus cannot be reached, so leadership happens through communication and feedback. Therefore, leadership in virtual teams is perceived as a relationship between leaders and followers, where leaders persuade followers through communication and receive positive or negative feedback.

4.2. Virtual team structures

The data revealed that virtual teams operate within diverse structures. Some teams are structured in a way that they work independently and are still part of a larger group, just like this respondent explained:

"We have several different channels on Slack; a social media channel, which is for the social media team. We have our own general channel where we post messages to everybody within the larger team, we have a channel for the inclusion campaign, and we also have a channel for the HR team. If I need to reach out to people in two different teams, I might start a conversation that incorporates both of them, so we interact in that way, and then people interact depending on which section they belong to." (Consulting leader 1)

According to this description, some virtual teams that are structured as part of a larger team interact with people and teams within the larger group. Respondents also mentioned that sometimes their tasks are dependent on other teams within the larger group. This implies that virtual teams collaborate with other teams, therefore the people and teams in the larger group are external members of the team. In addition, as virtual teams rely on external members for feedback to complete their tasks, it often leads to delays. One of the respondents said,

> "One of the biggest challenges is that sometimes there are some things that you want to get resolved immediately or a decision you need to take, and you don't have all the information. You're trying to reach someone with the rest of the information, but they are away, they are not online. So, you suddenly postpone making that decision." (Project leader 1)

According to this explanation, when there is a delay in receiving information from external members, virtual teams are unable to complete tasks. Therefore, virtual teams depend on external members to execute tasks and a delay in getting information poses a challenge and slows down their pace. This means that some virtual teams are structured as chains of interactions between team members and external team members.

It was also gathered that some virtual teams are structured in a way that they interact within the and with people outside the group, just like one of the respondents mentioned,

> "So I work with our developers, but I also have to work with the people outside; our lawyer and our customers as well." (Consulting leader 3)

According to the description, some virtual teams work with external stakeholders who perform services for them or patronize them. Respondents also mentioned that these external stakeholders often impact how work is performed and the decisions that are made within the team. One of the respondents explained,

> "What happens is that I do my part and send it to the team lead before we send it to the printer or to our client. And there are some cases where I sent it to the team lead, and she just sends it to the client without having a second look at it. And if there are complaints, they send it back to her and she sends it back to me to work on it again. I do a second editing or look through it again and correct the places where they were complaining about before sending it back to the team lead. Then, she takes her time to go through it again because we don't want the client to make any complaints." (Publishing member 1)

This implies that external stakeholders influence virtual teams to act in a certain way, which affects how they perform tasks and make decisions. As such, virtual teams take actions based on the feedback they get from external stakeholders. Therefore, some virtual teams are structured as channels of communication between external stakeholders and team members.

4.3. Challenges of virtual teams

The data showed that virtual teams face many challenges. One of which is time zone differences as this respondent explained,

> "We do meetings in PST time, but you can work in your time zone. When it comes to meetings, it has to be between 8:00 AM to 11:00 AM PST. So everybody is comfortable with that." (Project leader 2)

According to the explanation, virtual teams consider the time zones of all team members as they work together. Although virtual teams work in their time zone, they also collaborate with

other team members outside their time zone. This means that virtual teams do not work from a physical location but across countries and continents in different time zones. Since they often perform tasks together, they usually set a time that is most convenient for all team members. However, other challenges may arise as they collaborate just as this respondent elaborated:

> "A team member had to do a work and then someone else asked about it during our working hours. Since she is six hours ahead, during that time, she probably could have closed or be on her way home. When someone else tried to answer for the work she was doing and the progress of the work, she responded by saying that she should be the one talking about her work because she felt it was a way to indicate that she was the one that did the work. But that was because of the way she looks at things and the work environment or the social context she's coming from and that is understood when you have people in geographically remote or different locations." (Project member 1)

According to the respondent, some misunderstandings in virtual teams arise due to external factors that influence the behaviour of team members. This means that there are multiple layers that make up team members' personalities. Some respondents added that misunderstandings in virtual teams sometimes happen due to differences in language, culture, values, and beliefs among other factors. This implies that virtual teams interact with different layers of personalities as they collaborate on tasks, as such, some challenges in virtual teams are based on social context. However, virtual teams may not understand these multiple layers due to limited social interactions as this respondent explained:

> "You don't see all the nuances that make them. In person it's easier to see the good parts of people, or even the things that annoy you about somebody is much easier to counteract because you see the other aspects of their personality, which you don't necessarily see when you don't take those coffee breaks together, when you just have idle chats with each other. It's difficult to see a full person, but if you're just virtual, it's more difficult." (Consulting leader 3)

According to this explanation, virtual teams lack non-formal interactions due to physical separation. Therefore, they cannot hang out, socialize, or engage in other activities outside work. This implies that interactions on digital platforms restrict how team members can interact with each other. Respondents explained that the personalities, gestures, and body language of team members are only visible to the extent that they show them on the phone or computer screen. Therefore, the state of mind, mood, and well-being of team members cannot be known. As such, social interactions are limited and difficult to have. In addition, some team members completely turn off their cameras, which gives little or no chance for making emotional connections. Therefore, some challenges in virtual teams are caused by lack of physical interactions. However, some respondents mentioned that the team devised some ways to overcome this challenge, organizing virtual fikas, occasional face-to-face meetings, virtual hangouts, and virtual team bonding sessions.

> "The virtual fikas are more like we fix a time where someone brings cake, a cup of coffee or tea, whatever they want, and we turn on the cameras and have brief informal chats." (Project leader 1)

This implies that virtual teams solve the challenge of lack of physical separation through informal interactions. In addition, digital tools also pose a challenge for virtual teams just like this respondent mentioned:

> "Sometimes the communication or the sound is really bad so we need to make the person repeat. I got cut off during a team meeting and we had to plan another meeting with a new link. So sometimes

it's hard to perceive the information on the spot, on the first shot. We need to repeat it to make sure everyone has understood clearly what was said. The sound can be bad, it could be lagging, and it could be annoying." (Consulting member)

This means that digital tools can cause misunderstandings in virtual teams, which could lead to stress and frustration. Also, a malfunction in digital tools can cause delays in communication, miscommunication, and lost communication. According to the respondents, a breakdown in digital tools causes delays that makes them unable to connect with team members, share information, or complete tasks. However, some respondents mentioned that when these technical challenges occur, they try to solve them by rebooting their computers or leaving the virtual meeting and trying to join again. Therefore, challenges in virtual teams are caused by technical failures.

4.4. Summary of the empirical findings

Virtual teams have different perceptions of leadership however leadership is commonly perceived as authority, traits and relationships. Firstly, the perception of leadership as authority is based on how assigned leaders manage information, guide, coordinate and supervise tasks to ensure that virtual teams achieve set goals. Secondly, the perception of leadership as traits is based on how identified leaders use leadership traits to influence team members. Thirdly, leadership perception as relationships is based on the interaction between leaders and followers; how leaders persuade followers and how followers give feedback by agreeing or disagreeing.

Virtual teams have different structures through which they communicate, collaborate and coordinate work. While some teams are structured as sub-teams of larger teams, involving chains of interactions between team members and external teams within the larger group, others are structured as channels of communication between external stakeholders and team members. In addition, virtual teams are faced with different challenges based on time zone differences, social context, limited physical interactions, and technical failures.

5.0. Discussion

5.1. Managerial functions as leadership

Going by the respondents' perception of leadership as authority, assigned leaders are at the helm of affairs and are responsible for leadership. These assigned leaders were categorized as team leaders who delegate and supervise tasks and admins who provide guidance and control access to digital platforms. As these assigned leaders perform these functions they exert authority, which is typical of top-down leadership. However, the functions of these bureaucratic leaders also include managerial and administrative responsibilities (Uhl-Bien et al., 2007). The findings have shown that admins guide virtual teams by providing support, managing communication and information sharing, and controlling access to digital platforms. Team leaders also supervise and coordinate tasks by setting team objectives, delegating tasks, and ensuring that the tasks are completed on due dates. These managerial functions are executed through the top-down leadership approach, which Uhl-Bien et al. (2007) categorizes

as administrative leadership, indicating that admins and team leaders only focus on control and alignment within the group. The complexity leadership theory provides support for this argument as it identifies the top-down leadership approach as a form of leadership that is based on bureaucracy and hierarchy and happens by carrying out managerial functions like planning, coordination, task structuring, building vision, and allocating resources (Uhl-Bien et al., 2007). In virtual teams, managerial and administrative leadership functions are carried out through digital platforms. Previous research shows that virtual leadership is the management of distributed work among a virtual team through electronic media (Kerfoot, 2010). Therefore, the top-down leadership approach ignores the role of technology used to manage boundaries and the peculiar challenges associated with virtual team structures (Kerfoot, 2010); Avolio & Kahai, 2003; Peters & Manz, 2007; Avolio et al., 2014). Perceiving managerial functions as leadership is completely leader-centric because it does not separate leadership from the leader (Uhl-Bien et al., 2007), nor does it take the followers and environmental context into account (Padilla & Lunsford, 2013). Rather, it depicts assigned leaders as leadership objects who enforce leadership, while team members are leadership subjects who are not capable of carrying out managerial functions but only do as they are told and follow orders from above. In addition, using the top-down leadership approach assumes that leadership in virtual teams is the sole responsibility of assigned leaders, making leadership fixed and not fluid (Scott et al., 2018) or shared (Singh et al., 2019), so the leadership process is not distributed across the team (Carson et al., 2007). Therefore, using the top-down leadership approach to support the perception of managerial functions as leadership does not consider that leadership is more lateral than upward or downward (Al-Ani et al., 2011), therefore it does not create a good environment for emergent leadership (Gerpott et al., 2018; Charlier et al., 2016).

5.2. Challenges as leadership outcomes

Information gathered from the data shows that virtual teams are faced with different challenges like time zone differences, social context, lack of physical interaction, and technical failures. Respondents noted that these challenges often result in misunderstandings, delayed feedback, breakdown in communication, frustrations, and stress. Previous study also shows that technology creates challenges for virtual teams, like lack of physical and social interactions, loss of face-to-face synergies, mistrust, communication breakdown (Cascio, 2000), and using complex applications to get work done (Badrinarayanan & Arnett, 2008). These challenges are sparked as team members interact, coordinate tasks, and collaborate via digital platforms. According to Uhl-Bien et al. (2007), leadership are outcomes of dynamic interactions between heterogeneous agents as they interact, integrate, collaborate and cooperate. This implies that leadership happens as new challenges emerge from the interactions of people, ideas, and technology and they learn how to adapt to these new situations. The leadership as outcome approach supports this assumption because it is characterized by network dynamics and emergence (Uhl-Bien et al., 2007). Network dynamics implies that leadership is not an outcome of individual interactions but a network of interdependent agents, while emergence is the new situation that is created from the interactions and interdependencies in the existing complex network without the direct control of formal leaders. As such, network dynamics and emergence together produce leadership outcomes, so leadership outcomes are new situations

that emerge from dynamic interactions and interdependencies. This means that challenges of virtual teams are an outcome of leadership processes, therefore leadership happens as virtual teams adjust to these challenges. For example, some respondents highlighted that they try to solve technical challenges by rebooting their computers and others mentioned that the team organizes virtual hangouts to solve the problem of lack of physical interactions. According to previous research, technology helps to close the gap of geographical distance (Kerfoot, 2010) and little or no significant human interactions (Avolio & Kahai, 2003). Therefore, leadership in virtual settings involves using technology to manage boundaries and the peculiar challenges associated with virtual team structures. This means that leadership happens as virtual teams find solutions by reorganizing and adapting to challenges. The leadership as outcomes approach supports this claim because this form of leadership originates from the informal adaptive dynamics of people, ideas, technology, etc. As such, it provides support for challenges as outcomes because it recognizes that leadership is not a position but an emergent interactive dynamic (Uhl-Bien et al., 2007), implying that leadership is not hierarchical (Carson et al., 2007) but more lateral than upward or downward (Al-Ani et al., 2011). However, using this framework to explain leadership as outcomes does not recognize the roles of formal leaders in engineering situations that produce new learning, innovation, and adaptability (Uhl-Bien et al., 2007). This implies that formal leaders do not play any part in the leadership process, so virtual teams are left to figure out how to adapt to challenges on their own without any form of guidance.

5.3. Leadership as shared relationships

The findings reveal that leadership in virtual teams is perceived as a relationship. Some respondents used relationship analogies like parenting, and shepherding to suggest that leadership is a relationship between leaders and followers, where leaders persuade followers through communication and receive positive or negative feedback. The research by Neufeld et al. (2010) agrees with this by explaining that leadership in virtual settings is performed through communication. Respondents mentioned that communication and information sharing in virtual teams is done through chats, teleconferencing, and videoconferencing. emails and phone calls. Previous research (Zigurs, 2003; Kerfoot, 2010), also shows that leadership is the diverse interactions between virtual teams and technology via electronic media like telephone, videoconferencing, instant messaging, and file application sharing (Olson and Olson, 2000). However, Avolio et al. (2000) explain that advanced information technology (AIT) is used to influence social behaviour in virtual groups, thereby influencing team members to act in a positive or negative way. The data gathered reveals that leadership is perceived as relationships because leaders share information and communicate with followers via digital platforms, and followers can show agreement or disagreement through verbal or non-verbal communication. This supports the CLT claim that leaders control the outcomes of leadership, therefore leadership is produced as leaders share ideas and followers give feedback. The leadership as outcomes approach also provides a framework for these dynamic interactions because this form of leadership happens when leaders, followers, ideas, and technology interact, create alliances, collaborate, and cooperate (Uhl-Bien et al., 2007). The approach also recognizes that followers can become leaders and leaders can become followers depending on the situation (Stewart et

al., 2011), making leadership more fluid and lateral (Al-Ani et al., 2011) and a shared function of the team (Hoch & Kozlowski, 2014). Therefore, using the leadership as outcomes approach as a framework for the perception of leadership as shared relationships acknowledges that leadership happens through mutual influencing, so it does not consider the positional roles of leaders based on authority and alignment which is characteristic of the top-down leadership approach. This implies that this form of leadership happens within shared relationships where leaders and followers influence each other simultaneously, thereby acknowledging that leadership is not bureaucratic or hierarchical and completely ignoring the organizational structure that the top-down leadership approach provides (Uhl-Bien et al., 2007).

5.4. Leadership emerging from identified leaders

The findings reveal that leadership in virtual teams is perceived as how identified leaders use their leadership traits to influence team members. Identified leaders are team members who demonstrate these leadership traits that make other team members gravitate towards them for guidance, mentorship, and coaching. Therefore, identified leaders are perceived to be leaders who can provide solutions to the team, even though they do not have leadership titles. This is supported by the leadership as outcomes approach because the framework is not limited to a formal role but originates from the interactions and interdependencies of people, ideas, and technology. Uhl-Bien et al. (2007) explains that this form of leadership is an outcome of informal adaptive dynamics, therefore it is not engineered by formal leaders. This implies that identified leaders are leadership outcomes because they are new situations that emerge from dynamic interactions and interdependencies. According to previous studies, emergent leadership is how certain individuals emerge as leaders because other members perceive them to be taking leadership responsibility (Gerpott et al., 2018) and how some individuals can exhibit leadership influence without having any formal authority (Charlier et al., 2016). This means that identified leaders are emergent leaders, who can take on leadership roles at one time, and at another time, switch to a followership role. Similarly, the leadership as outcomes approach is not limited to formal roles but emerges from informal adaptive dynamics, so anyone can participate as a leader or follower at any time and for different purposes. According to Hoch & Kozlowski (2014), shared leadership happens when team members engage in responsibility sharing, mutual influencing, guiding, and collaborative decision-making. In other words, shared leadership is not necessarily performed by the formal team leader, but by team members and among team members. Therefore, perceiving leadership as emerging from identified leaders, recognizes that formal leaders can share leadership with team members (Hoegl & Muethel, 2016) and team members can intuitively become leaders or followers depending on the situation (Stewart et al., 2011). This implies leadership emerging from identified leaders encourages shared leadership as identified leaders influence team members to solve problems, and the influencing process is distributed across the team (Carson et al., 2007), making leadership more lateral than upward or downward (Al-Ani et al., 2011). The leadership as outcomes approach supports shared leadership because it is not limited to a formal role but originates from informal adaptive dynamics, where anyone can participate as a leader or follower at any time and for different purposes. As such, it provides support for perceiving leadership as emerging from identified leaders because it recognizes the function of leaders as

those who facilitate leadership outcomes, and not those who occupy leadership positions. The framework also acknowledges that team members can participate in leadership (Hoch & Kozlowski, 2014) and do not need to be assigned managerial roles before they can be trusted to proffer solutions to problems. Although this approach to leadership is fluid and less hierarchical (Carson et al., 2007), using the leadership as outcomes approach as a framework for the perception of leadership emerging from identified leaders does not take into consideration the managerial roles of formal leaders like the top-down leadership approach, leaving the roles of planning, coordination, task structuring, building vision, and allocating resources to identified leaders who may or may not emerge from the team.

5.5. Leadership as dynamic interactions

The findings reveal that the different team structures adopted in virtual teams are evidence of their complexity. The structures display the dynamic relationships going on between team members, internal stakeholders as well as external stakeholders. However, the major instruments of their interactions are digital platforms which they use to communicate, collaborate, exchange information, and get work done. Some of the platforms for example Slack, functions in such a way that larger teams are further broken down into sub-teams. That is, several smaller interactions between sub-team members exist in a larger body of interactions. Furthermore, one of the bases of the interaction between the sub-teams and the larger teams is their interdependencies. The smaller teams often depend on one another to get on with certain tasks, although they function differently, they have been tied together by the larger group to interact with each other either for resources or information to contribute towards a common goal. All of these result in a giant box of interactions that are interconnected. As such, they are all capable of influencing each other's next actions and like Carson et al., (2007) claimed, the influence is distributed across the team members. There are interactions going on within the teams, between members of the same sub-team and there are interactions going on from the team to members of different sub-teams, all through technological platforms that help them function as the situation demands. It is not just one straight form of interaction. In fact, the finding has revealed that for some teams, the interactions do not end with just team members. The dependency of some teams on external stakeholders shows another form of ongoing interaction. Without the exchange of certain resources or information between the team and these external stakeholders, the team cannot fulfil its mission. This goes to show that team members within virtual teams depend on each other, and these interdependencies help with the decisions that push the team several steps towards achieving their overall objectives. It also implies that leadership is a collective action that is taking place through these various interactions that we have described as dynamic, in virtual teams. It is the outcome of the entire process that goes on in the team just as Day et al., (2004) argued. The leadership as outcomes approach provides a framework to support this claim because the relationships going on are based on the interdependencies and interactions (Uhl-Bien- et al., 2006) that take place through digital platforms that the team uses to communicate and collaborate. However, this approach does not consider the role of hierarchical leaders or authority. Therefore, implying that leadership emerges from the dynamic interactions that give any member of the team the ability to participate as a leader or follower at any time for different purposes (Stewart et al., 2011; Uhl-Bien et al., 2006).

5.6. Assigned leaders as leadership enablers

The data suggests that assigned leaders are those who perform functions like coordinating and managing team activities, guiding, and ensuring that team goals are achieved. In virtual teams, these roles are often performed by team leaders and digital platform admins as they supervise, assign and coordinate tasks, and control access on digital platforms. This implies that assigned leaders perform managerial functions that produce leadership. The top-down leadership approach supports this assumption because it is based on how formal leaders provide administrative functions to coordinate and structure organizational activities (Uhl-Bien et al., 2007). Therefore, leadership is performed by individuals who engage in formal managerial roles and is focused on control and alignment. The top-down leadership approach alone cannot be used to support the assumption of assigned leaders as leadership enablers because is leader-centric and does not take into account the followers and context where leadership happens (Padilla & Lunsford, 2013) and the dynamic interactions that produce leadership (Uhl-Bien et al., 2007). According to Messenger and Gschwind (2016), virtual teams use digital tools to communicate, collaborate, and coordinate tasks. Kerfoot (2010) also explains virtual leadership is the management of distributed work among a virtual team through electronic media. This implies that leadership in virtual settings is the diverse interactions between virtual teams and technology to collaborate, communicate, and coordinate tasks. In other words, technology provides an environment for virtual teams to delegate tasks, supervise work, collaborate, and communicate in different ways. Therefore, technology influences and transforms leadership in virtual settings and leadership is produced as assigned leaders interact with technology to manage virtual teams via digital platforms. However, as these interactions happen, challenges erupt, some of which respondents identified as technical breakdown, limited physical interactions, and differences in time zones. Uhl-Bien et al. (2007) suggests that leadership is an outcome of dynamic interactions between people, technology, and ideas as they interact and collaborate. As these interactions happen, new challenges and new processes emerge. This implies that challenges in virtual teams are sparked by interactions between people and technology in virtual teams are outcomes of leadership. The leadership as outcomes approach supports this claim as this form of leadership originates from the informal adaptive dynamics that emerges from the interactions of people, ideas, and technology. However, this approach alone cannot support the argument of leadership as assigned leaders because it does not recognize the roles of formal leaders in engineering adaptive tensions. Uhl-Bien et al. (2007) describes adaptive tensions as challenges that generate new situations for adjustments. Similarly, respondents explained how they adjust to the challenges that arise from virtual team structures by reorganizing collaborative tasks towards the time that is most suitable for all team members, rebooting their computers, planning occasional face-to-face meetings, etc. According to Uhl-Bien et al. (2007), adaptive tensions can be induced by formal leaders by inducing managerial pressures, challenges, resource distribution, and demanding results. Marion and Uhl-Bien (2001) also suggests that adaptive tensions can be induced by dropping "seeds of emergence". Avolio et al. (2000) also explain how advanced information technology (AIT) is used to influence social behaviour in groups, thereby influencing virtual teams to act in specific ways. This implies that leadership in virtual settings is how formal leaders use technology to influence virtual teams to find solutions for managing the peculiar challenges

associated with virtual team structures. Since the top-down leadership approach only considers the role of formal leaders in managing and controlling leadership processes and the leadership as outcomes approach does not consider the role of formal leaders in engineering leadership outcomes, a balanced leadership approach is required. According to Uhl-Bien et al. (2007), enabling leadership catalyzes the conditions for leadership outcomes by balancing administrative leadership and adaptive leadership. For the purpose of this study, this framework has been reframed as balanced leadership approach. The balanced leadership approach is how formal leaders use hierarchical positions to strike a balance between top-down leadership approach and leadership as outcomes approach. Therefore, this approach recognizes that tension can spark creativity, so it promotes productive task conflicts and encourages adaptive problem-solving through productive discussions and interactions (Uhl-Bien et al., 2007). Without exerting control, formal leaders can use their positions to create a balanced leadership approach by generating internal or external situations that enable leadership outcomes. This means that assigned leaders can use their positions in virtual teams to generate new situations that help the team adapt to challenges, as such, everyone participates in leadership. The balanced approach can be used as a framework for assigned leaders as leadership enablers because it recognizes the role of formal leaders as people who use their positions to control leadership outcomes by enabling adaptive tension (Uhl-Bien et al., 2007), thereby acting as a supplement and support for influencing virtual teams (Hoch & Kozlowski, 2014). This framework also supports shared leadership (Hoegl & Muethel, 2016) and collective leadership (Yammarino et al., 2012), making leadership distributed across the team (Carson et al., 2007).

6.0. Conclusion

In summary, this study explores how leadership is enacted beyond formal roles in virtual teams that are geographically and time dispersed and use information and communication technology to coordinate and accomplish tasks. Taking a collective approach, the study explored how organizational structures are changing to support more contemporary leadership approaches than traditional top-down approaches. We support our argument by reviewing previous studies on contemporary leadership approaches and how they proffer collective leadership approaches to the emerging complex work structures, like virtual teams. Hence, this study sets out to answer the research question: *How is leadership enacted beyond formal roles in virtual teams?*

Leadership has been examined through the lens of *complexity leadership theory* based on three leadership approaches reframed from the forms of leadership suggested by Uhl-Bien et al. (2007). Using the top-down leadership approach, it was suggested that the perception of leadership in virtual work context can be quite leader-centric as team members ascribe leadership roles to assigned leaders based on the managerial functions they perform. Using the leadership as outcomes approach, it was suggested that the challenges of virtual teams are leadership outcomes because leadership is not a position but an emergent interactive dynamic, although the approach does not provide a framework for the roles of formal leaders in engineering situations that produce adaptive tensions. It was also suggested that the leadership as outcomes approach is a framework that supports the perception of leadership as shared relationships by suggesting that leadership in virtual teams happens within shared relationships

of mutual influence between leaders and followers to create alliances, however the approach does not provide support for the organizational structure that hierarchical leadership provides. Using the leadership as outcomes approach as a framework for perceiving leadership as emerging from identified leaders, it was suggested that leadership is not a function of formal leaders but a function of individuals who facilitate leadership outcomes in virtual teams, thereby allowing team members to participate in leadership and problem-solving, but the approach does not provide support for the managerial roles of formal leaders. The leadership as outcomes approach was also used to provide support for the assumption of leadership as dynamic interactions because leadership happens within interdependencies of teams that are part of the larger group as well as team members and stakeholders, but the approach does not consider the functions of formal leaders. Finally, the balanced approach was used as a framework to argue for the assumption of assigned leaders as leadership enablers because the approach provides support for the role of formal leaders as individuals who use their positions to control leadership outcomes by enabling adaptive tension thereby acting as a supplement for influencing virtual teams. Therefore, this research argues for a balanced leadership approach to leadership in virtual teams as this form of leadership supports shared leadership (Hoegl & Muethel, 2016) and collective leadership (Yammarino et al., 2012), thereby making leadership distributed a distributed process. So, *how is leadership enacted beyond formal roles in virtual teams?*

Firstly, leadership is enacted beyond formal roles in virtual teams by identified leaders who emerge in the face of challenges as other team members look up to them to solve problems caused by the dynamic structures of virtual teams based on the leadership traits they have shown. Secondly, leadership is enacted beyond formal roles in virtual teams as shared relationships between leaders and followers through mutual influence, communication, and idea sharing with the aim of creating alliances. Thirdly, leadership is enacted beyond formal roles in virtual teams as dynamic interactions between team members, external stakeholders, and external teams, depending on the structure of the team. Fourthly, leadership is enacted beyond formal roles in virtual teams as dynamic interactions because leadership happens within interdependencies of teams that are part of the larger group as well as team members and stakeholders. Finally, leadership is enacted beyond formal roles in virtual teams by assigned leaders as they use their positions to enable adaptability to leadership outcomes.

In conclusion, this study argues for a balanced leadership approach to leadership in contemporary organizations with complex structures characterized by dynamic interdependencies and interrelationships that are not compatible with top-down leadership processes. The researchers propose this approach because it is essential for hierarchical leaders whose managerial leadership functions often intertwine with inducing new situations to enable adaptability so that they will not resist these dilemmas when they arise.

6.1. Contributions & Implications
This study contributes to the complexity leadership theory by reframing the leadership framework of Uhl-Bien et al. (2007) for understanding the dynamic leadership interactions that happen within organizations with contemporary work structures. The new framework has been

used to analyze how leadership is performed beyond formal roles in virtual teams, therefore, it can also be adapted to organizations with similar work structures. In addition, the researchers have used the reframed approach, based on the complexity leadership theory, to study dynamic interactions and interdependencies within subsets of organizations and smaller subsets within these subsets, thereby contributing a new perspective to the complexity leadership theory which has previously been used as a framework to study leadership in larger organizational structures.

This study also contributes to the knowledge of leadership, specifically leadership in complex adaptive systems (CAS) that are rooted in contemporary organizational structures. By exploring how leadership is enacted beyond formal roles in virtual teams, which are typical examples of these complex adaptive systems, the researchers have been able to identify and provide evidence to support theory on how a collective approach to leadership can be explored in complex organizational structures. The study also provides support for existing research by studying leadership within dynamic structures that are subsets of organizations, which future researchers can build on.

Furthermore, this study contributes to the field of management by serving as a model for organizations with similar complex structures not to neglect the contribution of their complexity towards effective leadership. That is, instead of having the perception that only formal leaders are capable of leadership, team members will understand how they contribute to leadership within their specific contexts, even though they do not have leadership titles. These organizations will also acknowledge the context within which they work and the challenges that come with them as opportunities to improvise, adapt, and produce new forms of leadership. This study will help formal leaders to become aware of how to use their leadership positions not only for managerial functions but as enablers of adaptability. Also, formal organizational leaders will understand how to identify emerging leaders, share leader leadership with identified leaders, and distribute leadership across the organization.

6.2. Future studies

The insights that this study has provided on how leadership is enacted beyond formal roles can serve as a basis for future research to draw on and add to already existing research.

Our study has been conducted over a short period, and while research in this area is still quite limited, the subject matter can benefit from further research which would help provide more insight into leadership in complex organizational environments. For future research, we recommend a longitudinal and in-depth study to examine other areas that this research was unable to cover. Also, since virtual work settings are dynamic and constantly evolving, future studies can examine the other factors that influence leadership in the virtual work context, which may have new implications for organizations.

7.0. References

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