

Enrichment of Virtual Teams Management through Communication

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ABSTRACT: Based on the circumstances the world is facing these days with Covid-19; most of business have moved to work from home. Working as a virtual team is the challenge of these days business life. This study is aiming to find the impact of communication methods on the performance of team members, checking whether their motivation will differ, satisfaction, loyalty, and competence by conducting a mixed method model that include a survey distributed to people working in virtual teams of international companies around the world and considering testing of the effect of different communication methods on these variables as there are email communication, calls, face to face meetings, and regular online video calls and interviews with people working remotely to support the survey findings. Advancement in communication and technology created a new way for organizations to develop their business in different departments such as software development, research, and customer support and product design through creating a team of geographically distributed experts or members that are called virtual teams. Performance of these teams depends mainly on their experience and the method of communication between team members and management, adding up that those teams can include members of different cultures that can cause a conflict in management and in getting the job done as it is supposed to be. The central hypothesis is that the type of communication have an impact on virtual teams' performance and their loyalty, competency and satisfaction. The research has found that with addition to the importance of communication in enhancing the competency, satisfaction, loyalty and trust of the team; a manager or a team leader should find a balance in the frequency of communication and find a balance between how frequent should the team be contacted and between the type or communication used in order to optimize the team performance.

Keywords: Virtual Teams, Performance, Personnel Management, Communication, Conflict, Globalization

Jel Codes: M00, M12, M16, M54, M14

1. INTRODUCTION

The term of a virtual team is highly prevalent in organizations Nowadays especially with the global expanding of business around the world; it's believed that over half of professionals in the world have worked in virtual teams or they will work (Martins *et al.* 2004). The analysis of virtual organization started with the book by David Edmond Malone (1992) and followed the article by (Byrne *et al.* 1993) concerning the new style of organizations and cooperation which can evolve supported the markets' needs, with less structure boundaries. According to (Gibson and Gibs, 2006), virtual teams are group of professionals that are geographically dispersed and they connect to each other depending heavily on communication technologies and that they became widely known due to the need for globalization and flexible work arrangements. Based on (Lipnack and Stamps, 2000)'s definition, virtual teams are to some extent small, task-oriented groups of professionals who work from a distance collaborating primarily via technology to achieve a shared purpose so, virtual team

communication is always mediated by technology. Choosing the right communication technologies and understanding how to use technology are essential for successful team interaction (Hovde, 2014).

There are many similarities between virtual and traditional teams; both are made up of small numbers of individuals, have a common goal to work toward, and need to develop work protocols and supportive relationships in order to function effectively. However, virtual teams can differ from traditional teams in their interactions of the virtual members and their need to rely heavily on Computer-Mediated Communication (CMC), such as e-mail, web conferencing tools, and groupware tools (Duarte and Snyder 2001) added to today's new video conference tools and platforms such as zoom and googlemet, etc. . In a virtual environment, there are some problems that can disrupt team communication or create a conflict in the decision-making process, such as the lack of nonverbal clues as well as technology (Palloff and Pratt 1999). When members are absent, or there are technical problems, group decisions are often based on information that is not available to all of its members. Member conflicts or problems might get slipped away if managers of virtual teams did not pay close attention to the needs of the team members.

During the Pandemic of Covid-19 that is envading the whole universe and changing the way of learning, teaching and doing business; to a whole new picture that is called "working from home" or "romote jobs"; The virtual teams has now new procedures and rules that are forcing a new business environment that can be easy and more fun to some people but very hard and challenging to others.

In this study, the impact of communication on the performance of virtual teams will be studied in a matter of motivation, loyalty, efficiency, and competency. The model of the research will be designed as a semi-structured survey that will be distributed to a sample of 350 members of virtual teams around the world. The research is aiming to find the best communication method for virtual teams managing that can reduce conflict in the team and lead to more efficiency, motivation, and competency in the group. Moreover, it will show how managers of the virtual team can build team loyalty by enhancing the communication method between team members.

One of the improvements which have been adopted in recent years is the use of "virtual groups". For many years, we have seen companies make more efficient and easy use of conferencing, teleconference, and telecommuting. Virtual teams, though, go beyond even this development. Teams that are not based in a standard location are now able to work together on projects . In reality, works at different places, different times, and even various times can collaborate. The communication technologies and the groupware and other computer developments allow people to work together on projects, track the research and commitments, interact between individuals as well as with the group and sustain a center or plan, which is collaboratively developed. (Nydegger, 2010)

1.1. Research Question and Hypotheses

Based on the literature, studies have shown that communication is a critical factor in ensuring virtual teams' effectiveness. So, the question to be answered in this study is how communication methods can affect employee's behavior such as trust and loyalty, satisfaction, competency and motivation. The developed hypotheses that will hopefully find the best communication method of virtual teams that will help managers or organizations optimize their work outcomes and meet the goals.

The central hypothesis is that "Effective communication between virtual team members have an impact on the employee's bahvior". According to (Shahid & Azhar, 2013), the engagement of employee is demonstrated by the level of commitment and tendency to work hard for the organization. In virtual teams, the method of engagement is only possible through communication. In today's world, we see 'communication' as one of the most essential and dominant functions in companies (Harris & Nelson, 2008). Fundamentally, ties emerge through communication, and the efficiency and sustainability of the business is dependent on effective interpersonal communication interactions. Furthermore, organizational competencies are formed and implemented through "deep social and communication processes" (Jones et al., 2004). Communication assists people and organizations in coordinating actions to achieve goals, and it is essential in the processes of socialization, decision-making, issue resolution, and change management. based on these studies; some sub-hypotheses will be tested through the study, which are:

- H1:** Effective communication method between virtual team members increases employees' motivation.
- H2:** Effective communication methods between virtual team members lead employees to be more loyal.
- H3:** Effective communication methods between virtual team members can increase competency of the members.
- H4:** Effective communication methods between virtual team members might lead to increase customer satisfaction.

1.2. Model and Variables

Figure 1 below shows the model of the research by indicating the dependent variable shown as employee behavior measuring (Satisfaction, loyalty, motivation, and competency) and communication between team members and managers as an independent variable measuring the importance of communication type or used tool such as (email, video conferencing, face to face meetings or phone calls), also how well the members know the communications tools used by their company and how that affect their behavior and how frequent the manager is communicating with his team members to give them support and directions.

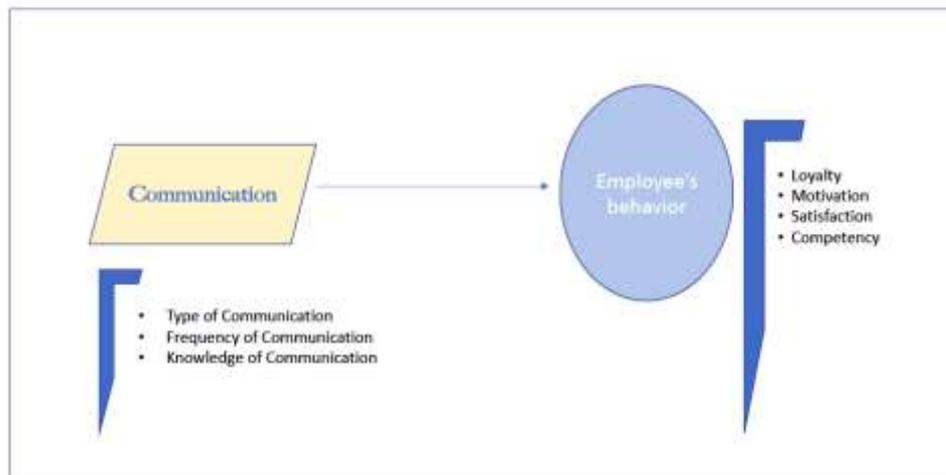


Figure 1: The proposed conceptual research model (Prepared by author, 2020)

1.3. Gap Identification

Business Owners aim hard to use IT's power to transform how they function. Organizations' overall perspective has transformed by increasing competition on the market, advancement in information and communication technology, and the globalization of the business. There is a need to establish effective policies and strategies to preserve the unity of these different people. Members in this situation can only be successful if they trust others, and share their expertise and information in good time. The performance of digital teams is seen in the literature as an essential and demanding factor. Although several publications are dealing with virtual teams and their roles, trust-related literature, information sharing, and communication as one entity are scarce in the IT sector: this topic has been dealt with by few publications in the past, but only in the United States or Europe and mainly one sector. Now that we are facing a new shape of life and business; most of business sectors and academic sector is moving to remotely working environment, which makes the study more essential to cover the most effective communication method that will enhance this experience and maybe put the first steps in the forms of this type of business environment. Most of the researched focused on confidence building levels, group development, relationships between the participant, society, disputes, sharing of knowledge in digital teams, and awards. This work has attempted to investigate conditions by which the individuals divided by time, space, and boundary shape and are further maintained. The study seeks to recognize the most efficient communications method for the virtual teams that are the most essential to managers and team leaders to maintain sustainable performance and efficiency among team members according to modern times.

2. LITERATURE REVIEW

Virtual group work is still in its emerging stages (Badrinara and Arnett, 2008. Prasad and Akhilesh, 2002) and a variety of research areas have not been explored because of the relative newness of the virtual teams. (Camarinha and Afsarmanesh, 2003) argue that the construction of digital networks still involves an immense engineering effort and that this new paradigm is a major obstacle. The success of engineering projects includes effective and efficient teamwork across disciplines and decentralized teams (Zhang *et al.*, 2008). The experiments, therefore, suggest that further research is needed to explore how virtual teams can improve their performance (Eltayeh *et al.*, 2008).

In a dynamic, constantly changing, complex environment, organizations are currently facing essential and unprecedented challenges (Rezgoui, 2007). All kinds of economic activity are moving towards globalization. Therefore, taken into consideration dispatching work was much more comfortable, faster, and more efficient, considering the development of electronic information and communication media over the last decades (Hertel *et al.* 2005). In response to an increasing decentralization and globalization of work processes, many organizations have responded to their dynamic environments by introducing virtual teams working together on communication technology across geographical, temporary, cultural, and organizational borders to achieve a common objective within their organizations.

The growth of virtual teams is rising. Moreover, the rapid development of new communications technologies like the Internet has sped up the trend so that virtual teams are currently used to a certain degree by a large organization (Hertel *et al.*, 2005). The technology needed to support the development of new modes of operation is supported by IT. One type, which can revolutionize the workforce and provide unparalleled versatility and reaction to companies, is remotely working teams (Powell *et al.*, 2004). Compared to the competitive world economy in today's world, however, organizations that can create virtual teams of talented people quickly respond to changing business environments. Such capabilities provide a competitive advantage to organizations. A large pool of products new, seemingly a promising source of innovation, is represented by virtual teams.

2.1. Background of Virtual Teams.

“Virtual teams as a group of people and teams collaborate in interrelated tasks driven by a common purpose and work through links enhanced by information, communication and transport technologies” (Gassmann and Von Zedtwitz, 2003b).

Another site suggests that virtual teams are decentralized work teams with geographically dispersed members that organize their work, prevailing with e-mail, video, telephone, etc. (Hertel *et al.*, 2005). Also; the following is one of the most widely accepted interpretations of the idea of a virtual team:

“we describe virtual teams as a group of people geographically, organizationally, and on time, unified in one or more organizational activities by means of information technologies.” (Powell *et al.*, 2004).

With the occurrence of worldwide connectivity through the internet, satellite, and other telecommunications advancement, organizations are expanding their teams and develop new forms of management. For example, adoption of a virtual group working remotely regardless of the institutional limit of time and space communication via different video conference platforms and tools such as zoom and googlemet or an internal video conference tool. Virtual teams can include members from different departments and functions, enhancing the coordination of the team.

Different business partners may also contribute to virtual teams such as customers, vendors, and other business partners, further increasing their diversity and their communication and coordination requirements. Although Virtual teams usually operate in multiple locations, members of these teams must execute a large number of interrelated tasks to ensure work effectivity. Usually, members of virtual teams are supervised from

distant. Instead, they function as empowered experts who know when to use their initiative and resources to create added value to customers and other stakeholders.

Virtual organizational forms have become popular, and the professional management literature consistently promotes the virtues of going virtual (Boudreau *et al.*, 1998; Davidow and William, H., 1992; Grenier and Metes 1995; Townsend *et al.*, 1998). Virtual teams are working remotely, and their primary interaction is through some combination of electronic communication systems. Such team forms provide several advantages to the business as it saves time, travel expenses, and provides access to experts. Moreover, teams can also be organized regardless of whether members are close or not. Companies are also able to outsource consultants without incurring transportation, accommodation, or downtime costs remotely. Also, Virtual teams help employers to grow and use their future labor markets to keep the best talent irrespective of their place of business and whether or not they can work with employees with disabilities. Workers can lead both personal and professional lives more comfortably. Membership in a dynamic team allows people to move from project to project. Staff can be delegated to several leasing groups.

While working groups in the US were used in the 1960s, in the Total Quality Management Movement in the 1980s, widespread use of teams and quality circles began. Several companies set up self-management or self-employed workgroups in the late 1980s and early 1990s. To cut waste, minimize cycle time, and optimize efficiency, the workers typically reserve their responsibility for decision-making and problem-solving. In the mid-1990s, an increasing number of firms such as Goodyear, Motorola, Texas Instruments and General Electric started exporting the concept of the team in order to integrate global human resources practices with their foreign affiliates in Asia, Europe and Latin America (Kirkman *et al.*, 2001). Now virtual teams have snowballed worldwide because of the improvements in communication technology and continuous globalization (Kirkman *et al.* 2002). This age is becoming increasingly popular in organizational digital group structures (Cascio, 2000; Walvoord *et al.*, 2008).

In comparison to a traditional team, a virtual group has ties strengthened across internet communication technology over time and organizational borders. Nonetheless, several traditional teams have best practices that are analogous to digital teams (Bergiel *et al.*, 2008). Virtual teams differ markedly from traditional teams. The participants work side by side in the real, traditional squad, while in virtual teams, they are working in different areas. In the traditional teams, the tasks are coordinated easily and jointly by the team members; in contrast, work needs to be far more structured in virtual equipment. In addition to face-to-face interaction in traditional teams, virtual teams rely on electronic communication, too. These variations are summarized in Table 1 (Kratzer *et al.*, 2005). Confidence in computer-mediated interaction is particularly unique to conventional digital teams (Munkvold & Zigurs, 2007).

Table 1: Virtual and Traditional teams are usually viewed as opposites

| Fully Traditional team | Fully Virtual team |
|--|--|
| Team members are co-located | Team members are all in different locations |
| Team members communicate face-to-face. | Team members communicate through asynchronous means. |
| Team members coordinate tasks in mutual adjustments. | The team tasks is highly structured that coordination between team members are rarely necessary. |

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(Sanchez *et al.*, 2006, Rice *et al.*, 2007) found a significant increase in the effectiveness of virtual teams with the adoption of formal procedures and structured processes. In contrast to the results highlighted in their literary review (Arranz and Arroyabe, 2008), the geographical dimension does not have an impact significantly on the typology and objectives of R&D cooperation. In addition to face-to-face teams, Virtual teams have more

effectively implementing R&D decisions because they are asynchronous, give digestion time, and reduce group conformity pressure (Cummings and Teng 2003).

“Learning to make the transition from managing time to managing projects is critical and will determine the success of an organization's telework program” (Cassico, 2000).

It is more difficult to resolve conflicts in virtual teams than in face-to-face teams. Due to the limited opportunity available to virtual participants for studying the language of their bodies or hearing their speech and watching their facial expressions, multiple online group disputes can remain unknown for long periods. For virtual teams to avoid conflict, early warning systems must be developed to alert them to potential conflicts.

In comparison to what is commonplace, the efficient operation of the group requires a degree of confrontation. Conflict must be handled to be efficacious, and the fact that not all disputes are the same must be acknowledged. Conflict in teams, in general, is simply the awareness of differences, differences, inconsistent desires, or unconscious desires among some or all of the members.

Awareness of interpersonal differences is a relation conflict (or affective conflict). Conflicts between relationships may include differences in personality, hostility, and discomfort. Conflicts in relationships harm the performance of individuals in the team and also has a negative effect on the satisfaction of team members. Moreover, the chance that the team will be able to work together in the future. Team members may be diverted from the mission, work less in partnership, and deliver sub-optimal results if there is tension of relationships.

Task conflict (or cognitive conflict) is a consciousness of differences of opinion on the task of the team. Task conflicts may contain discrepancies regarding the task. Moderate task conflict levels have proved to contribute to team performance on various decision-making and teamwork tasks in contrast to relationship conflicts. The differences of opinion about the work that has been doing benefit teams with complex cognitive tasks (Jehn and Mannix, 2001). Task conflict improves the quality of decisions as teams depress old patterns of interaction and embrace new perspectives. The synthesis emerging from task conflict generally outweighs individual prospects, in addition to its sufficient resolution, the presence of task conflicts should, therefore, improve the performance of the team.

2.2. Communication in Virtual Teams

Many digital team studies stress the quality of interaction for team specifications to be complied with in order to perform tasks effectively (DeSanctis, 1997). Effective teams must find ways of fulfilling their tasks and meeting other social results, such as satisfaction, organizational commitment, identity, cultural understanding, and confidence. Since functional, geographical, and cultural borders are generally virtual; however, the volume of communication within teams can increase on a broader range of media. According to (Lau, *et al.*, 2000), to ensure productivity in virtual teams, excellent communication is the key. Communications have two overlapping dimensions—social and task. Although the social aspect provides the basis and willingness for members of the team to interact over time, the task aspect concentrates on how project data, tasks, and results are managed through communication.

Technology draws a significant role in influencing the interaction style of virtual teams. The availability, synchronicity, and resources of the medium, as well as team members' technical experience, typically dictate the use and frequency of some types of technology. In reality, effective digital teams often use various technologies to boost their communication's breadth and depth. Video-conferencing that requires the involvement of remote team members at the same time can improve social relations through naming and allows for better project collaboration through digital interactions “face-to-face”. Videoconferencing could, however, also lead to a complete breakdown in digital teams that lack swift confidence and social connections by exposing and stressing the poor conditions of these teams.

Time and space issues can be critical for virtual teams because they influence team members' pattern of interactions. Differences in time zone and physical distance between members of the digital team can affect how they interact. In terms of time and space, the other members of the team are physically separate; further work is usually needed to organize their interaction and coordination efforts. Where virtual project teams

consist of participants of different organizations in different space locations, regional objectives may or may not be entirely consistent with the overall objective of the project. The higher the geographical distance between the groups, the more likely there will be cultural differences between the participants (e.g., gender, ethnicity, political, and social systems). The efficiency of virtual team communication, therefore, depends on the awareness and sensitivity of the team members to such differences in time, space, and culture.

Patterns of interaction are essential for virtual teams, as they influence the creation over time of social relationships and work between team members. In the course of their project, digital teams typically go through the phases of unidirectional, bi-management, and collaborative interaction. Initially, team members could begin to communicate in one direction, where one side could start watching communications, feel uncomfortable in interacting with the others, or indicate their presence on specific communication channels. As the project progresses, group members are allowed to reach the bi-directional stage of interaction where they “speak” (local and remote) to share tasks or socially relevant data. Although remote members share information, they do not usually give substantive answers to the questions of one another or consider the circumstances and interests of the other in this case. Over time, individual virtual teams can communicate together substantially by “conversing” and showing respect for each other and taking into account the circumstances of each other. Performance from one point to the next depends on how well the team members communicate with each other at both the mission and the social level. For example, in their interaction with very little substance, teams that remain in the bi-directional stage appear to be erratic and inordinate.

In comparison, there are high levels of personal experiences and strong social relations with those engaged in reciprocal contact. At this stage, the information and ideas shared are probably substantial in content. Team members usually try to establish a social relationship by using such symbolic signs of humor, friendly gestures, and story sharing.

The communication demands of teams in the workplace can be met by a number of technology methods. There are a number of technologies that are used by virtual teams, such as group conferencing platforms, shared workspaces, or online meeting tools (Bouwman et al., 2008; Hovde, 2014). Numerous, often geographically separated individuals can interact concurrently using modern conferencing platforms, which also support multiple communication tasks such as information exchange, negotiation, issue solving, and collaborative decision-making. Team members may also exchange information, such as reports, photos, or web presentations via the platforms in most cases. Teamwork communication may take many shapes using group conferencing solutions. However, the impact of technology is not simply enabling, but may also be constraining, depending on how its users perceive it. According to (Fuller *et al.*, 2016), team members with high communication technology anxiety tend to engage less, send fewer task-oriented communications, and introduce fewer new subjects.

Aspirations and past user interface also impact how effective the technology is evaluated (Treem & Co., 2015) and how attitudes about technology are handled throughout its application (Treem & Co., Crider and Ganesh, 2004). Consequently, it's important to understand not just what virtual team members make of communication technologies, but also how those concepts express themselves throughout team interaction.

3. DATA AND METHODOLOGY

The research model was investigated by collecting data from previous research studies on virtual teams followed by a survey that was distributed on employees working in virtual teams in different companies in different sectors. Survey Monkey was used to efficiently distribute surveys and provide easiness in collecting and analyzing data. The method of data collection tested different dependent variables like motivation, competency, loyalty, and satisfaction depending on the communication variable, giving managers of these teams a better insight on the best communication method that will improve the quality and performance of these teams. Also, it will reflect the importance of communication between VT members. To ensure the results that were obtained by the survey; an interview was conducted with several members of virtual teams ask them about their most communication tool or method they prefer and how do they evaluate their experience working in remotely and what are their suggestions for improving the communication quality in their teams. The measurement construct was based on previous researches and variables that were developed by (Liu, *et al.*, 2008) and another research on Individual Virtual Competence and Its Influence on Work Outcomes by

(Wang & Haggerty ., 2011). The questions started with demographics questions such as age, gender, type or contract, years of experience and position and company size which can give a better insight about the results of the research. The second part of the survey was designed as scale of 5 measures questions to investigate communication, trust and loyalty, motivation and self-efficacy. Questions were designed based on previous study model of developing effective virtual teams by (Lin, *etal.* 2008) and another study on individual virtual competence and its influence on performance by (Wang, Y. and Haggerty, N. 2001).

3.1. Operational definition

Based on the conceptual definition of the hypotheses, the operational definition for each definition will be based on collecting data from previous literature and companies that have virtual teams about the communication methods that are being used to communicate between team members. Moreover, investigate the latest technologies regarding communication methods of virtual teams that can be added to the research. A survey based on the information from previous studies was formed to investigate the importance of communication method and frequency in optimizing the quality and performance of virtual teams in order to help managers of these teams to develop the best strategy in communicating and leading those teams to maximize performance along with satisfying the team members creating the best possible environment and was followed by conducting an interview to ensure better results.

3.2. Data Collection Method

For any study, the analysis will be unreliable, and the investigator cannot draw any observations or conclusions without determining an exact method of data collection. Based on this fact, the research methods and techniques that will be used is the quantitative research method by building a structured survey. Questions are in the form of a focused, structured interview that can reduce time and obtain better results along with a quantitative structured online survey for managers and staff working in virtual teams in organizations that are located in different countries around the world and especially in Turkey, Jordan and United Arab Emirates.

The questions are short, clear, structured, direct, and focused on obtaining the best quantitative data that can be compared to data collected from each country and reach the best answer to the research solution. It can minimize costs and improve the quality and accuracy of collected data, as information will not be duplicated or missed.

The research methods cannot be used without selecting the correct sample, because a population cannot be tested or all managers in the three countries can be found, thus selecting a sample representing the whole group of managers and team members. The sampling process consists of simulated team managers and team members. The study covers businesses around Jordan, United Arab Emirates and Turkey.

3.3. Reliability and Validity of Variables

Reliability measures coherence or the measuring variables of the study, while reliability applies to the precision of the calculation of the variables. Various reliability checks assess the accuracy of the testing variables. Based on previous studies and also the emerging behaviors of research people, the work is based on the concept of quality. For stable variables that are legitimate, the level of ability to reliably obtain results is the primary determinant of validity, although only a few tests test the validity and consistency of variables. It can demonstrate that experimental parameters are adequately correct based on validation checks. Although the quality of data is not too high, the accuracy of the face and information is reasonable enough to guarantee the consistency and reliability of the variables. The study also has standards and a high level of credibility because it can open the eyes to many research questions and potential predictions about the management of virtual teams and how can these teams optimize their performance to obtain organizational goals. Concerning these two definitions, the variables tested in this research are seemingly directly correlated with the question and can genuinely help answer the research question and explain the whole thing accurately. Moreover, the study will explain the behavior of the virtual team members according to the communication method used by the management.

For the validity of the research measurement variables, A component factor analysis has been done using the Kaiser-Olkin-Mayer (KMO) Test for Sampling Adequacy. The minimum level required for any given scale to pass this test is 0.5. The results in the following tables show the values of KMO which indicate good adquete for the research and the analysis can be run. According to (Hutcheson & Sofroniou, 1999), (Kaiser, 1974) has recommended a bare minimum of 0.5. based on this; a value of KMO equal to or greater than 0.5 will be considered acceptable.

KMO for Loyalty Factor

| KMO and Bartlett's Test | | |
|--|--------------------|---------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .666 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 128.946 |
| | df | 6 |
| | Sig. | .000 |

KMO for motivation Factor

| KMO and Bartlett's Test | | |
|--|--------------------|---------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .568 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 128.808 |
| | df | 6 |
| | Sig. | .000 |

KMO for satisfaction Factor

| KMO and Bartlett's Test | | |
|--|--------------------|---------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .653 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 139.997 |
| | df | 10 |
| | Sig. | .000 |

KMO for Competency Factor

| KMO and Bartlett's Test | | |
|--|--------------------|-------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .500 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 9.369 |
| | df | 1 |
| | Sig. | .002 |

KMO for Communication Factor

| KMO and Bartlett's Test | | |
|--|--------------------|---------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .821 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 545.287 |
| | df | 36 |
| | Sig. | .000 |

Having proved that the research can be carried out, the factor analysis has been done for each scale starting with the loyalty scale that has 6 measurement scales which showed that there are two factors of total variation, the first factor accounts for %36.281of the variance the second one is %57.351. The factor loading analysis shows that the variables of relationship building Q2, and Q3 should be omitted to give better results. The second factor analysis was run for motivation factor that has 4 measurement scales which showed that there are two factors of total variation, the first factor accounts for %46.385 of the variance and the second one is %27.108. however, to obtain better results in the analysis questions 1 and 2 were omitted.

For Satisfaction factor, there were 6 measurement scales that showed two factors of total variation, the first accounts for %40.906 of the total variance and the second is %22.190. according to the results the questions 4 and 5 were removed.

Another Factor was the competency factor which has only 2 measurement scales with %60.606 of total variation. For frequency of communication the measurement scales are 9 which showed that there are two factors of total variance, the first one accounts for %40.106 of total variance while the second one accounts for %12.633 of variance with omitting questions 1 ,2,3,and 4.

Now for the last factor of communication knowledge there are 4 measurement scales which showed two factors of variations, the first with %37.314 of total variation and the second one accounts for %32.787 of total variance. Better reliability with omitting questions one and 2.

Through measuring the value of Cronbach alpha, the reliability of elements was evaluated. The internal consistency of objects is calculated by Cronbach alpha. To test the validity of the measures used in the analysis, the alpha coefficient were independently calculated for the purpose of this investigation. Table 2 displays the findings of a reliability analysis. It is called reliable if the alpha-coefficient is greater than 0.5. All the alpha coefficients vary between 0,587 and 0,867 suggesting that the objects within each dimension and scale have a strong consistency.

| No. | Name of the scale | Cronbach Alpha |
|-----|----------------------------|----------------|
| 1. | loyalty | 0.867 |
| 2. | Satisfaction | 0.666 |
| 3. | Motivation | 0.748 |
| 4. | competency | 0.338 |
| 5. | communication | 0.587 |
| 6. | Frequency of communication | 0.845 |

Further testing of hypotheses, correlations, and regression tests have been applied using SPSS 26. Preceded by applying a test to prove normality and asymmetric distribution of the variables, the Skewness and Kurtosis Test was applied, and according to (George & Mallery,2010), the values for asymmetry and kurtosis between -2 and +2 are considered acceptable in order to prove normal univariate distribution. The Skewness and Kurtosis results prove normality in the distribution, as shown in table 3

| | N | Minimum | Maximum | Mean | Std. Deviation | Skewness | | Kurtosis | |
|--------------------|-----------|-----------|-----------|-----------|----------------|-----------|------------|-----------|------------|
| | Statistic | Statistic | Statistic | Statistic | Statistic | Statistic | Std. Error | Statistic | Std. Error |
| FrequencyComm | 205 | 1.00 | 4.40 | 2.2166 | .66621 | .580 | .170 | .330 | .338 |
| competency | 207 | 1.00 | 4.00 | 2.3309 | .73762 | .334 | .169 | -.396 | .337 |
| Motivation | 206 | 1.00 | 5.00 | 3.3107 | 1.06408 | -.225 | .169 | -.772 | .337 |
| CommType | 206 | 1.00 | 5.00 | 2.9248 | 1.36611 | .232 | .169 | -1.188 | .337 |
| Satisfaction | 207 | 1.00 | 4.67 | 2.2496 | .71768 | .769 | .169 | .842 | .337 |
| CommKnowledge | 206 | 1.00 | 4.00 | 1.9684 | .63839 | .389 | .169 | .306 | .337 |
| loyalty | 207 | 1.00 | 4.50 | 1.9046 | .55050 | .990 | .169 | 2.478 | .337 |
| Valid N (listwise) | 204 | | | | | | | | |

Table 3

4. TEST RESULTS

Regression analysis have been conducted between communication and each behavior to see the impact of communication on motivation , competency, satisfaction and loyalty. Based on the figures below, the first regression model of communication and loyalty %56 of correlation and %31 of total variance can be explained

by dependent variable. it shows that loyalty will decrease with every increase in communication tool the by 0.09 . interestingly; there the research survey has shown a negative relation between loyalty and the increase of communication tools or types and with each %27 increase in communication frequency the loyalty will increase so the relation is positive and with %27.8 increase in knowledge the member have in communication tools and platforms the loyalty shows an increase However, the regression analysis between communication factor and satisfaction factor showed that with every increase in communication knowledge by %31, the satisfaction will increase and with %32 increase in communication frequency the satisfaction increases but the same results that happened with loyalty it shows with more communication tools and platforms the satisfaction will decrease by %31.

Applying regression analysis for motivation factor and communication the figures shows that there %38 of correlation and %21.7 of total variance of the motivation can be explained by communication factor. According to the ANOVA table, the regression equation fits the model with significance of 0.000 which is less than 0.05. The coefficients tables indicates that when the communication knowledge decreases by %37 the motivation increases and with less frequent communication by %27 the motivation gets increase. However, when the communication tools or platforms increases by %15 the motivation increases. For the last factor of competency; the analysis shows that there are %31 of correlation with %10 of total variance that can be explained by dependent variable. The ANOVA table shows that regression equation fits the model with significance 0.000 less than 0.05. The coefficients table shows that there will be an increase in competency and effectiveness with each %19 of communication knowledge increase, almost %5 of communication tools or platforms used and with every %24 of increase in communication frequency.

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|-------|-------------------|----------|-------------------|----------------------------|---------------|
| 1 | .565 ^a | .319 | .309 | .43068 | 2.108 |

a. Predictors: (Constant), FrequencyComm, CommType, CommKnowledge
b. Dependent Variable: loyalty

Figure 2

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|-------|---------------|-----------------------------|------------|---------------------------|-------|------|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | .756 | .143 | | 5.287 | .000 |
| | CommKnowledge | .278 | .050 | .342 | 5.577 | .000 |
| | CommType | -.009 | .022 | -.023 | -.402 | .688 |
| | FrequencyComm | .278 | .048 | .357 | 5.840 | .000 |

a. Dependent Variable: loyalty

Figure 3

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|-------|-------------------|----------|-------------------|----------------------------|---------------|
| 1 | .465 ^a | .217 | .205 | .63914 | 1.829 |

a. Predictors: (Constant), FrequencyComm, CommType, CommKnowledge
b. Dependent Variable: Satisfaction

Figure 4

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|-------|---------------|-----------------------------|------------|---------------------------|-------|------|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.027 | .212 | | 4.838 | .000 |
| | CommKnowledge | .310 | .074 | .275 | 4.185 | .000 |
| | CommType | -.031 | .033 | -.060 | -.952 | .342 |
| | FrequencyComm | .316 | .071 | .293 | 4.470 | .000 |

a. Dependent Variable: Satisfaction

Figure 5

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|-------|-------------------|----------|-------------------|----------------------------|---------------|
| 1 | .388 ^a | .150 | .138 | .98001 | 1.873 |

a. Predictors: (Constant), FrequencyComm, CommType, CommKnowledge
b. Dependent Variable: Motivation

Figure 6

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|-------|---------------|-----------------------------|------------|---------------------------|--------|------|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 4.226 | .326 | | 12.983 | .000 |
| | CommKnowledge | -.378 | .113 | -.228 | -3.327 | .001 |
| | CommType | .151 | .050 | .196 | 2.997 | .003 |
| | FrequencyComm | -.272 | .108 | -.172 | -2.512 | .013 |

a. Dependent Variable: Motivation

Figure 7

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|-------|-------------------|----------|-------------------|----------------------------|---------------|
| 1 | .317 ^a | .100 | .087 | .70612 | 2.350 |

a. Predictors: (Constant), FrequencyComm, CommType, CommKnowledge
b. Dependent Variable: competency

Figure 8

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|-------|---------------|-----------------------------|------------|---------------------------|-------|------|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.288 | .235 | | 5.493 | .000 |
| | CommKnowledge | .191 | .082 | .164 | 2.335 | .021 |
| | CommType | .047 | .036 | .087 | 1.292 | .198 |
| | FrequencyComm | .241 | .078 | .217 | 3.086 | .002 |

a. Dependent Variable: competency

Figure 9

According to the Durbin-Watson values the loyalty and competency model shows negative autocorrelation with a value greater than 2. And positive autocorrelation in satisfaction and motivation model.

Further analysis to the interview questions showed that most of the people who are working from home prefer emails in communication rather than different communication tools as it gives them more freedom of movements and for them it acts like a formal documentation of all the job requirement and improvements. Also, most of the people felt less motivated and satisfied working from home especially during Covid-20 pandemic so actually their replies couldn't be considered so efficient as it might be related to the overall psychological atmosphere and the consequences of quarantine.

5. CONCLUSIONS

From both the survey and interview's findings built on the literature review it can be stated that Communication plays an important role in enhancing the performance of virtual teams and the type of communication used between team members and management can increase the motivation, feeling of trust and involvement between the team members. for optimal Performance; manager of a virtual team needs to find the best way of communication method that make his team feel closer and in touch with all the team in any time. Creating a virtual environment where communication between team members and management is easy can definitely increase the performance and productivity of the team. To be successful in this area it is not sufficient to be outstanding in technical competences. Soft skills like communication, teamwork and leadership are just as important. Based on the results; managers should find a great balance of communication tools and how frequent they communicate with each other making all information clear and easy to understand and use sound to be the last part of puzzle.

The perfect balance creates the best structure and virtual environment that will enhance motivation, satisfaction, loyalty and competency of the members.

Even though the research was confined to only find the importance of communication to virtual team but results have showed the importance of language and culture also as they can be studied in future and could be addressed more closely to develop an ideal environment for managing virtual teams in the best possible way.

5.1. Limitations and Future Recommendations

For future recommendations; a Shorter survey can be designed to reach out more virtual teams' members. Also, further study can be implemented to test the effect of culture and language on the performance of Virtual teams along with the importance of communication type. Moreover, the time difference between countries could affect the communication between virtual teams and could be also tested in future. Also, Different countries can be tested and results can be compared with the findings of this research.

One of the limitations of the research was difficulty in reaching out people in virtual teams. Another Limitation was the length of the survey that kept a lot of participants from completing the survey and the cost for reaching more countries and the inability to perform experimental test of the effect of communications type on the performance of virtual teams due to it's high cost and the difficulty to get access and acceptance from such organizations to perform such experiments so if applicable in future, Experimental study of the effect of these variables on the performance of these teams would give a great results especially if the researcher was working in a company that has virtual teams

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