

Article

Factors Affecting Decision-Making Processes in Virtual Teams in the UAE

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Abstract: Organizational reliance on virtual teams (VTs) is increasing tremendously due to the significant benefits they offer, such as efficiently reaching objectives and increasing organizational performance. However, VTs face a lot of challenges that, if overlooked, will prevent them from yielding the required benefits. One of the major issues that hinders the effectiveness of VTs is the decision-making process. There is a lack of scientific research that attempts to understand the factors affecting decision making processes in VTs. Studies in this area have only been done in the United States and Europe. However, such research has not been conducted in the Middle East, where specific scientific solutions are still required to improve the performance of VTs. Therefore, this study is conducted in the Middle East, namely in the United Arab Emirates, to gain scientific knowledge on this region's specificity. An online questionnaire (Google forms) was used to obtain the necessary data. Hypotheses were developed to test the influence of ICT (Information and communications technologies), language, information sharing, and trust on the decision-making processes, and the effect of decision making on team performance. Structural equational model (SEM) methodology was used to test our proposed model. The results showed that factors such as trust, ICT, and information sharing have a direct effect on decision-making processes, while language has no effect on decision making, and decision-making processes have a direct effect on the performance of the VTs.

Keywords: information and communications technologies; ICT; virtual organization; virtual teams; decision making processes; performance

1. Introduction

Rapid changes in ICT have allowed organizations to change the structure of their teams from face-to-face to virtual teams. Virtual teams are defined as “small temporary groups of geographically, organizationally, and/or time-dispersed knowledge workers who coordinate their work predominantly with electronic information and communications technologies to accomplish one or more organizational tasks.” [1]. The following is an overview of the benefits that virtual teams offer to organizations. Firstly, team members are geographically dispersed and they can work on multiple projects and coordinate tasks without the need for physical presence, which results in reduced costs due to the dispensable travel costs (e.g., flights, hotels, etc.). Secondly, VTs support highly flexible working patterns. Thirdly, VTs provide companies with multiple benefits, including the opportunity to hire talent regardless of location, to enhance local knowledge and presence, to operate with 24/7 productivity, and to obtain an international perspective on business challenges and solutions. Finally, an organization can react quickly to the dynamic changes arising from clients and the business. Although VTs provide benefits to organizations, accomplishing effective performance can still be challenging. One of the important challenges that VTs face is decision making [2]. Recent studies on VT decision making

found that teams are likely to fail 8 times on average before they make an optimal decision due to the members withholding unique information and lacking trust in other team members [3]. The differences in language proficiency among the team members have motivated scholars to study the impact of language on decision making in VTs. Most studies on language differences have found a negative effect on VT decision making [4]. Based on a review of 400 organizational decisions, it was found that more than half of these decisions failed to reach their full potential due to the improper use of the ICT tools [5]. This presents a critical problem for organizations since the purpose of implementing virtual teams is to benefit from the full knowledge package of all team members and to enhance decision making. Therefore, it is very important to study these factors and their effects on VT decision making. A lack of verbal and non-verbal cues in VTs, trust between team members, language differences, handling of ICT tools, and withholding information due to the absence of physical interactions all cause issues with the decision-making process, which in turn affects team performance [3]. There is little research on decision-making processes in virtual teams and its effect on team performance [5–8] or it is done in a laboratory setting using students instead of actual teams [9–12]. Moreover, there is no literature examining the effect that factors such as language, trust, information sharing, and ICT have on decision-making process in the UAE.

This article aims to examine the effect of factors such as trust, language, information sharing, and ICT on the decision-making process in the IT Industry in the UAE, and the effect of decision-making processes on VT performance. The research question is as follows: (1) Are Language, Trust, Information Sharing, and ICT positively correlated with decision-making processes? The methodology used is literature review, survey methods, and structural equation modelling.

In the next section, we review the literature on decision making and the factors that affect it. Additionally, we present our model and follow with the methodology section. Finally, we offer our conclusion.

2. Previous Studies and Hypothesis Development

2.1. Literature Review

Authors identified several factors that affect VT decision-making processes. The following is a more detailed discussion of the key elements, i.e., ICT, trust, language, information sharing, and decision making. These factors have been chosen for their prevalence in academic research on VTs as having the biggest impact on VT decision-making processes, as summarized in Table 1.

Table 1. Factors affecting decision-making processes in VTs.

Factor	Authors
ICT	[8–12]
Trust	[5,13–15]
Language	[11,16–18]
Information Sharing	[8,19–21]
Decision Making	[22–26]

Decision making is defined as “the study of identifying and choosing alternatives based on the values and preferences of the decision maker. Making a decision implies that there are alternative choices to be considered, and in such a case we want not only to identify as many of these alternatives as possible but to choose the one that best fits with our goals, objectives, desires, values, and so on” [27]. Decision making in a team is an important performance component [28]. Decision making in virtual teams is complex. Since interaction remains the core of group decisions, it is important to look at the interaction patterns in group decision making in order to understand the group decision dynamics. Decisions made by virtual teams are not discrete, but generated through a series of activities and choices [2]. Virtual decision making is complex because it requires the negotiation of multiple

team members' opinions and ideas [20]. There exist several frameworks to describe decision-making processes. Early studies proposed a normative or rational model to view how decision making is accomplished in a unitary sequence. Many of these models have been based on Simon's model of decision making. Simon's model of decision making has three phases, including intelligence (information collection), design (generating all possible alternatives), and choice (choosing the suitable alternative). Another normative model was proposed by Fisher and it has the following four phases: orientation, conflict, emergence, and reinforcement. Although the phases of each model differ to complete the decision-making process, both assume that the group follows a systematic logic to reach a decision. Based on their study conducted on small groups, Poole and Roth pointed out that those models do not always capture the nature of decision-making sequences. In addition, Simon himself confirmed that decision makers do not always follow the rational path to reach a decision [2]. An alternative to the normative model is a non-phasic model, for example, the Garbage Can Model that was proposed by Cohen, March, and Oslin. This model emphasizes the fragmentation and chaotic nature of decision making in an organization. It proposes that problems, solutions, choices and participants are all thrown together in a random way, and the decision is reached when these four elements coincide together under the organizational structures [26]. In other words, the decision is reached through a non-logical search. Although sometimes decisions can be made through a non-logical search, there are cases that demand a logical process to reach a decision. Poole and Roth proposed a new phase model called the multiple sequence model. This model assumes that a group follows different development sequences to reach a decision, and these sequences depend on the factors of the decision situation. Besides the sequences mentioned, groups also follow a more complicated path in reaching a decision, which can cause some phases to repeat themselves as groups find a lacking activity or encounter a problem with previous phases and move between them. Another important thing to consider when studying the processes of decision making is the impact of the context on processes, which is demonstrated by groups following different paths under different circumstances to reach a decision [2].

In previous research, structured decision-making models have been proved to increase the effectiveness and quality of decision making [29,30]. Decision-making processes focus on the way a team shares, examines and uses information to make a decision [31]. Decisions that are made after the stages of information collection and analysis are found to be more effective. This is the key point separating teams who perform successfully from teams that are under-performing [2]. It is important to study the whole process of decision making to fully understand what causes it to be poor or successful. In this article, we concentrate on the rational decision-making model and examine its three decision-making processes that are as follows: (1) intelligence (problem understanding); (2) design (generating alternatives); (3) choice (choosing a decision among the alternatives). Based on the above, we propose the following hypothesis: H1: Rational decision-making processes will positively affect VT performance.

Trust can be the fatal agent impacting the teamwork of a virtual team. [1]. It is one of the key factors affecting the growth and success of an organization. Due to the lack of face-to-face interaction between team members, trust in virtual teams is established quite differently compared to traditional teams. This makes achieving trust in a virtual setting a challenging process [32]. Trust is defined as "the extent to which one party is willing to depend on something or somebody in a given situation with a feeling of relative security, even though negative consequences are possible". This definition has the following four aspects: (1) dependence on the trustee; (2) reliability of the trusted person; (3) positive and negative utility that results in either positive or negative outcome; (4) the risk that the trusting party accepts. Trust is the willingness to put oneself in a vulnerable position in terms of the trusted person because they are regarded as dependable [33]. Trust in virtual teams relies on the belief that each member is acting upon the agreed commitment with good intentions and they are working hard on behalf of the group [15]. Team members who have an interpersonal relation will be more likely to trust each other [34]. Trust is composed of three factors which are ability, benevolence and integrity [13,35,36]. The type of trust that is formed in virtual teams is cognitive-based trust because [1] feelings and

emotions are difficult to share between team members via ICT, but would impact affective-based trust; [2] Trust decisions are built on the ability, benevolence and integrity of team members [37]. The lack of non-verbal cues and the geographical distance are some of the reasons for distrust in virtual teams. Trust between team members will generate optimal decision making [14]. Research found a positive effect of trust on VT decision-making processes [38,39]. Decision makers trust the opinions coming from trusted members [40]. Trust plays a key role in online decision making and in sustaining relationships between virtual team members [13]. Trust affects the decision-making processes of virtual teams by motivating people to ask for help, seek assistance and carry out other activities with less worry and anxiety of being mocked or judged [41]. Based on the above, we can see that trust is a key factor in VT members achieving successful decision making. We can propose the following hypothesis: H2: Trust between VT members will positively affect VT decision-making processes.

Language has been labelled as the neglected factor in the research of many scholars [11]. In recent years, there has been an increased interest in studying language and its effect on team decision-making processes. Differences in language proficiency have been shown to hamper the communication between team members. Language differences have a negative effect on group decision making and lower group trust [42]. Multinational corporations (MNCs) are multilingual communities that source their employees from different cultures. Recently, research has been paying attention to language differences as one of the most important factors affecting the interpretation of information when making a decision. Language differences can lead to communication problems between VT members, which in turn can hinder the decision-making process and lead to conflict. The difference in languages is a major source of frustration and dissatisfaction between VT members, which negatively affects decision-making processes [11].

Sharing a common language in the team significantly influences team cohesiveness and decision-making processes. Language commonality is the degree to which individuals in VTs share the comprehension of the English language, for example, their speaking and writing skills, use of grammatical structure, etc. [17]. The differences in the language proficiency among the members of a virtual team can cause disruption to the communication process, which will affect the decision-making processes. Language differences not only impair the understanding between team members, but also introduce social categorization. Members with a low proficiency in a language may feel anxious and uncertain within the virtual team, which will affect the decision-making processes in the VT [42]. Team members who communicate in other than their native language may find it difficult to communicate clearly, which can cause misunderstandings that may directly affect decision-making processes. Native speakers will be aware of the plurality of meaning, whereas people communicating in their second language may miss out on the nuances [11]. Members who are less proficient in a language may feel insecure and dominated by the proficient members of the group in terms of language use. This may lead to individuals avoiding communication and thus withholding ideas and unique information, which affects decision making. Choosing the correct media will help these team members to avoid such frustrations and will encourage them to share their ideas. For example, studies have shown that people who do not share the native language of the group prefer to use lean media, such as email, over rich media [42]. The following hypothesis is proposed for testing: H3: Differences in language commonality will negatively affect decision making in VTs.

Information sharing has been shown to be a key component in team performance and it plays a key role in the success of a global virtual team (GVT). Most teams fail to reach favourable decisions because team members tend to limit the discussion to relevant and common aspects while neglecting unique information. The question of information sharing should be constructively discussed and integrated to achieve a vigilant decision-making process [34]. Organizations use teams for decision making because members possess different information, knowledge and skills. The completeness of information shared in a team mainly depends on the members' ability to share information efficiently and clearly. Research has argued that teams perform poorly in decision-making tasks because they neglect to discuss important or unique information during the exchange and prefer the information that

is already available to the members. [21]. Information exchange is necessary for VTs to be able to solve complex problems and make decisions [43]. The more relevant information is gathered and analysed, the more effective the decision making. Successful VTs tend to analyse the gathered information meticulously before reaching a decision [2]. Proper information sharing within the VT and mutual understanding of what information is relevant to the decision will result in effective decision making. Proper information sharing faces multiple obstacles, including a lack of team identity and trust between team members. Information sharing between team members will result in effective decision making because proper information sharing will help the group in the following ways: understanding the problematic situation, helping team members to establish the decision criteria, and evaluating pros and cons of the prospective decision [21].

Virtual teams differ from face-to-face teams in the way they communicate. VTs use ICT to communicate with each other. VTs face a challenge of bringing multiple perspectives from team members together, which can result in a weak exchange of information. Although VTs exchange more information than FTF teams, VTs still make poor decisions. This is because members in VTs ignore the unique or important information that they receive from other members, which results in poor decisions and exacerbates weak performance in the team [20]. Sharing too much information cause overlaps of information, which diverts members from discussing unique information that would be valuable for decision making [44]. Based on the above literature, we can see that information sharing is critical in decision-making processes as withholding or ineffectively sharing unique information will affect the decision-making processes and result in poor decisions. Consequently, we propose the following Hypothesis: H4: Adequate information sharing will have a positive effect on decision making in VTs.

Information and communications technology (ICT) has caused a change in the structure of organizations [45]. Face-to-face (FTF) is no longer the primary or preferred mode of communication due to its cost and efficiency that pose a significance barrier [12]. ICT creates not only opportunities for organizations, but also challenges [46]. Advancements in ICT and the organization's need for access to global expertise have led organizations to using virtual teams. It is very important to understand the factors that affect VT performance [9]. Organizations are increasingly relying on ICT to enable communication between team members. This creates communication problems among VT members that affect VT performance and decision making [10]. ICT affects various virtual team processes and most importantly it impacts the process of decision making [20]. ICT benefits group decision-making processes in virtual teams by enhancing cooperation and collaboration amongst the team members [8]. ICT helps team members to cross both physical and social boundaries. However, these tools bring challenges to group decision-making processes. Compared to face-to face meetings, the use of ICT tools leads to delay in discussion and a lack of verbal cues, which results in unconventional or poor decisions [11]. ICT has changed the way teams share, collect and exchange information [31]. Computer-mediated group decision making generates more favourable decisions because it allows for the participation of all team members by creating an environment in which they feel free to express their ideas and opinions [2]. Decision-making systems act as facilitators for virtual team members in the process of making a decision [47].

Computer-mediated technologies have a positive effect on group decision making, since all participants can express their opinion without the fear of being interrupted or mocked. It also facilitates the information sharing between members and allows them to share their unique information which helps the decision-making process. Researchers have also found that asynchronous technology enables a more effective decision making due the following reasons: it provides flexibility in terms of time and distance, increases member and creates additional time for archiving and reflection for all discussion participants [2]. Some employees prefer using email as a way to communicate their ideas without being constantly interrupted or for documentation purposes [48]. Collaborative technology combined with groupware can facilitate the decision making in virtual teams [49]. VTs can overcome the geographic distance and work synchronously by heavily relying on ICT to communicate [50]. ICT tools must be chosen correctly in order to have effective and efficient communication between team members.

The tools should satisfy the demands of a task that is being performed by the VT members. However, when it comes to decision making, media and task matching is very difficult.

Media choice is very important for establishing effective communication in a global virtual team. Theories on media selection should be based on task demand rather than the people and their relationships. Researchers have found a positive relationship between media choice and high performing teams [51–53]. Media richness theory (MRT) and Social presence theory (SPT) consider the communication medium effective if it can carry out and fulfil the purpose of transferring a message or information. SPT argues that the greater the bandwidth, the greater the social presence, which offers an effective way of delivering a message. MRT assumes that media will vary based on its capacity to deliver immediate feedback, the degree of personalization and the language variety. Hence, face-to-face is considered to be the richest medium since it provides verbal and non-verbal cues during communication. On the other hand, email is considered at the lowest level of media richness because any type of cues are missing in the communication [48]. Media richness theory has shown that, for an organization to be successful, it must be able to process information in an appropriately rich format to reduce uncertainty and clarify ambiguity. Limiting ICT use in virtual teams will limit the quality and quantity of information shared between team members [5]. We can see from the above literature that ICT has a direct effect on VT decision-making processes, especially when selecting the appropriate media for communicating in the process of decision making. Based on the above, it is important to choose appropriate media for communication between team members in order for them to make a decision. Consequently, we can propose the following hypothesis: H5: ICT choice will have a positive effect on VT decision making.

To summarize, expert scholars in the field of VTs have suggested that the following factors have a significant impact on VT decision making: trust, language, information sharing, and ICT. After having identified these factors and having formulated our hypotheses, we are empirically testing the significance of these hypotheses by performing correlational studies discussed in the next section.

2.2. Research Model

In this section, we test our MODEL, presented in Figure 1, using an empirical procedure. The aim is to test the theoretical model against real-life situations.

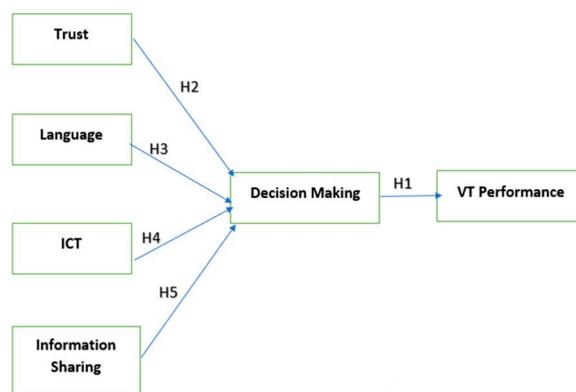


Figure 1. Factors Affecting VT Decision Making and Performance.

Hypothesis 1 (H1). *Rational decision-making model will positively affect VT performance.*

Hypothesis 2 (H2). *Trust between VT members will positively affect VT decision-making processes.*

Hypothesis 3 (H3). *Differences in language commonality will negatively affect decision making in VTs.*

Hypothesis 4 (H4). *Adequate information sharing will have a positive effect on decision making in VTs.*

Hypothesis 5 (H5). *Appropriate media choice will have a positive effect on team decision making.*

In order to answer these research questions, we conducted an empirical research to study the impact of trust, ICT, language, and information sharing on VT decision making, since these factors are the most cited and highlighted by the expert authors in the field of VTs.

The data sample was selected to include participants who are members of virtual teams in the IT industry in the United Arab Emirates (UAE). The target organizations are three IT service companies that provide consultancy services in enterprise resource planning (ERP), business intelligence (BI) and expert knowledge in information and communications technology (ICT). The three companies have multiple branches worldwide and their teams communicate using ICT. The data collected are from the UAE. We prepared a research instrument (a questionnaire) comprising of 36 questions by analyzing the available literature. Six questions are related to the participant's demographic details; five questions relate to each factor. The questions in the questionnaire were compiled from the review of articles written by experts in the ICT field. The questions were chosen using tested hypotheses. ICT questions were obtained from [2,9] and the sample questioner is "ICT overcome geographic distance during alternative selection in decision-making processes". Language questions were obtained from [42], and the sample questioner is "Difference in language affects information gathering during decision-making processes". Information sharing questions were obtained [44] and sample questioner is "We usually receive all important information on time". Trust questions were obtained from [32], and the sample questions is "Team members will perform actions that are important to the team". The method used to collect the data is an online survey (Google Forms). An email was sent to the participants with a link to the questionnaire. No incentive was offered to answer the questions. Three follow-up emails were sent to the participants to complete the questionnaire. The Likert response scale from 1 to 5 (where 1 means strongly disagree and 5-strongly agree) was chosen for the survey. The criteria applied to acquire the data sample were the following: members are working in virtual teams, they have a bachelor's degree in computer science or computer engineering and they are currently working in the IT industry in the United Arab Emirates (UAE). The survey was sent to 723 employees. We received 387 responses, which exceeded the minimum sample number of 200, considering the number of observed and latent variables in the model, the anticipated effect size and the desired probability and statistical power levels recommended by [54]. Therefore, 387 is deemed an acceptable sample for using structural equational model (SEM). To process the data collected from the questions, Amos and SPSS softwares were used. Then we applied the structural equational modelling (SEM) to perform correlational studies. We used structural equational model (SEM) for the following reasons: firstly, SEM includes confirmatory factor analysis (CFA), path analysis (PA) and partial least squares path modelling; secondly, it is used for assessing unobservable latent constructs. Models were run on AMOS 23.0 and SPSS 23.

Cronbach Alpha method was used to assess the reliability of the questions used for measurement. To be acceptable, values should be above 0.7 to reflect acceptable reliability. The variables we considered all exceed the 0.7 value. Confirmatory factor analysis (CFA) was used to determine the dimensional structure of the scale, based on eigenvalues greater than 1. A maximum likelihood method was used, since it is the best method to determine the parameters of distribution that are the most appropriate to describe the given data.

3. Results and Discussion

As shows the Table 2, the respondents consisted of 311 males (80%) and 76 females (20%). Of them, 203 respondents (52%) use both online and face-to-face modes for communication with other teams; 35 respondents (5%) only use face-to-face; and 149 respondents (43%) only use online communication within their virtual teams. Further, 90% of the respondents (350) were team members and 10% of the

respondents (37) were team leaders. Moreover, 70 respondents (34.48%) were in the age group from 22–29, 124 respondents (61.08%) were in the age group between 30 and 39, and 4.44% (nine) of the respondents were over 50 years old. Further, 24% (90) of the respondents have less than one year of experience in VTs; 31% (120) have between 1 and 5 years of experience; 25% (96) have 6–10 years of experience working in VTs; and 20% (81) have over ten years of experience in VTs. Members that are currently working in VTs were the following: 88 respondents have been working in the current VT for less than 1 year; 177 members—1–5 years; and 122 have been members in their current VT for over five years.

Table 2. Demographics.

Details	Percentage
Gender	Male: 80 Female: 20
Mode of Communication	Online: 43 Face-to-face: 5 Both online and face-to-face: 52
Designation	Team member: 90 Team leader: 10
Age	22–29: 34.48 30–49: 61.08 >50: 4.44
Work experience in years as a virtual team member	<1: 24 <1 and <5: 31 <5 and <10: 25 >10: 20
Work experience in years in the current virtual team	<1: 22 <1 and <5: 45 >5: 33

To contrast the proposed hypotheses, the structural equation model shown in Figure 2 was developed. This study sought to examine the factors that affect decision making within virtual teams and the way decision making affects team performance. Structural equation modelling (SEM) technique was used together with AMOS 23.0 to test the research questions of the study. We used the maximum likelihood method. To validate the measurement model, we assessed its convergent and discriminant validities. The standardized path loadings of all items were significant and exceeded 0.5 value. The composite reliability (CR) exceeded 1.96 and the average variance extracted (AVE) exceeded 0.5. Therefore, convergent validity was supported. We calculated maximum squared variance and it was found to be less than AVE, thus discriminant validity is supported. Multicollinearity also tested the correlation between independent variables to be less than 0.3, thus there were no multicollinearity issues found.

The model fit also verified the results for CFI, SRMR, RMSEA, PCLOSE and is acceptable, results shown in Table 3.

Table 3. Model fit.

Measure	Estimate	Threshold	Interpretation
CMIN	1117	–	–
DF	376	–	–
CMIN/DF	2.97	Between 1 and 3	Acceptable
CFI	0.97	>0.90	Acceptable
SRMR	0.057	<0.08	Acceptable
RMSEA	0.046	<0.06	Acceptable
PClose	0.08	>0.05	Acceptable

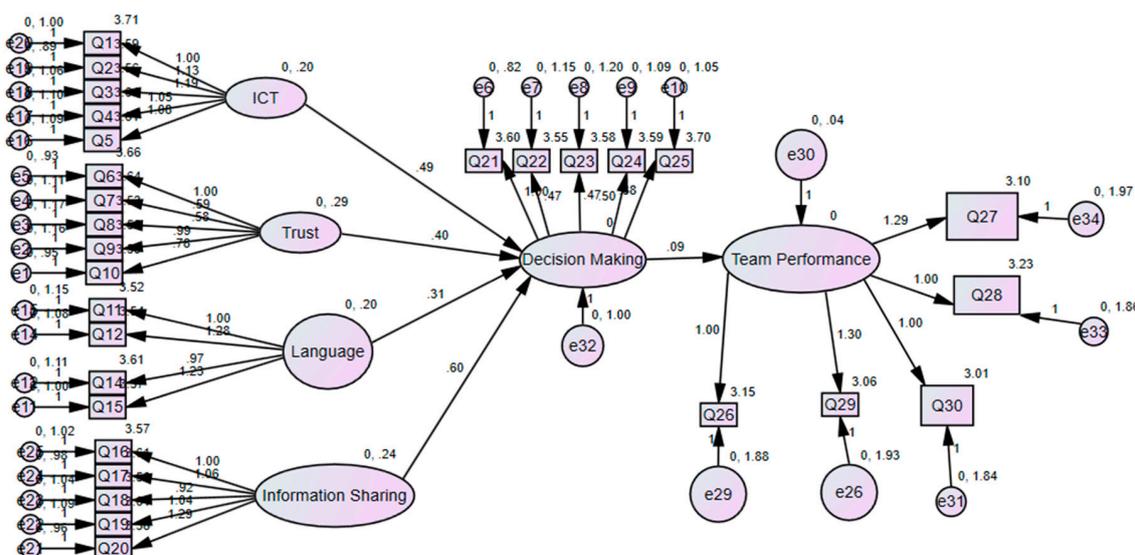


Figure 2. Structural Equation model for Decision Making.

In Table 3, we have the fit indices for structural equation model, chi-square called CMIN divided by degree of freedom (DF) is 2.97 which is between 1 and 3. Comparative fit index (CFI) is 0.97 which is above 0.90, standardized root mean square residual (SRMR) and root mean square error of approximation (RMSEA) are below the threshold as shown in Table 3, PClose (P of Close Fit measure is a one-sided test of the null hypothesis, which indicates close-fitting model) which gives the result for a close fit as 0.08 is above the threshold of 0.05, which results in model fit.

As shown in Table 4, the results indicate that decision making (H1) has a composite reliability (CR) of 2.165, an estimate of 0.091, a standard error (SE) of 0.042, and a *p*-value equal to 0.030. This means that the regression weight for decision making in the prediction of VT performance is significantly different from zero at the 0.05 level (two-tailed). In other words, H1 is significant. Trust (H2) has a composite reliability (CR) of 2.114, an estimate of 0.398, a standard error (SE) of 0.188, and the *p*-value equals 0.034. This means that the regression weight for trust in the prediction of VT decision making is significantly different from zero at the 0.05 level (two-tailed). In other words, H2 is significant. Language (H3) has a composite reliability (CR) of 1.411, an estimate of 0.313, a standard error (SE) of 0.222, and a *p*-value of 0.158. This means that the regression weight for language in the prediction of VT decision making is not significantly different from zero at the 0.05 level (two-tailed). In other words, H3 is not significant. ICT (H4) has a composite reliability (CR) of 3.079, an estimate of 0.092, a standard error (SE) of 0.210, and a *p*-value equal to 0.021. This means that the regression weight for ICT in the prediction of VT decision making is significantly different from zero at the 0.05 level (two-tailed). In other words, H4 is significant. Information sharing (H5) has a composite reliability (CR) of 3.052, an estimate of 0.596, a standard error (SE) of 0.195, and a *p*-value equal to 0.002. This means that the regression weight for ICT in the prediction of VT decision making is significantly different from zero at the 0.05 level (two-tailed). In other words, H5 is significant.

Table 4. Standardized regression weights.

Hypotheses	DV	IV	Estimate	Standard Error	Composite Reliability	<i>p</i> -Value	Result
H1	Team Performance	Decision-making	0.091	0.042	2.165	0.030	Supported
H2	Decision-making	Trust	0.398	0.188	2.114	0.034	Supported
H3	Decision-making	Language	0.313	0.222	1.411	0.158	Not Supported
H4	Decision-making	ICT	0.485	0.210	2.312	0.021	Supported
H5	Decision-making	Information Sharing	0.596	0.195	3.052	0.002	Supported

We tested the model by collecting the data through an online survey and used AMOS SPSS software. As shown in Table 4, the results indicate that ICT choice (H5), trust (H2), information sharing (H4), and decision making (H1) are supported. When employees choose the correct ICT to collaborate and communicate, it enhances and facilitates the decision-making process. When trust increases between employees, they are more willing to share information with each other, which leads to a better decision. When a favorable decision is reached, it enhances the performance of the team. However, language (H3) was not supported and it did not show any effect on decision making as opposed to results in the existing literature, where some researchers have found that language has a direct effect on decision making. This can be due to the large number of multilingual expatriates from different countries working together in the UAE, so the employees are used to dealing with other employees in different languages.

There are five key findings in our analysis related to the effects on decision making and team performance. We have found that ICT, information sharing and trust all positively affect decision making; decision making positively affects team performance; they all have a significance p -value of <0.05 using the 95% confidence interval. On the other hand, as demonstrated in Table 4, language is not significant. When the quality of ICT choice, information sharing, and trust increase, the quality of decision making in organizations also increases. This is very beneficial for organizations when building strong teams that have the ability to reach optimal decisions, which in turn results in effective and highly performing VTs. For existing virtual teams, managers can measure the quality of decision-making processes and work on enhancing the factors influencing decisions, which in turn improve VT performance. When hiring new team members, organizations must take into consideration those factors and hire members that show cohesion with the existing team members. These models form a basis to build on for organization in developing countries when measuring VT decision making and virtual team performance. It can be further integrated with new modules that propose implementation plans with a view to assist in creating highly performing VTs. The results we found in the UAE are quite similar for the studies conducted in Europe and the US in terms of factors such as ICT, information sharing, trust and decision making. However, differences in language in Europe and the US have a significant effect on VT decision-making processes, although this was not observed to be the case in the UAE.

Granted that research has limitations, the limitations of this article are as follows: firstly, we used four factors affecting decision-making processes, although there are other factors that affect decision making and were not included in this study, e.g., culture, conflict, etc.; there are also factors affecting team performance other than decision making, e.g., knowledge sharing, etc. Secondly, the study is conducted in the IT organization industry. Future studies should include other industries. Finally, this study was conducted in the UAE and future studies should include other countries.

4. Conclusions

VT decision-making processes and performances are key indicators that drive changes and survival in organizations. Organizational survival depends on creating competitive advantage and maintaining it. The most significant advantage that organizations can obtain is through the creation and correct implementation of VTs. Organizations must understand and identify the key factors that affect decision making and team performance in the VTs of the organization. Moreover, they should work on enhancing it to increase their market share and to remain competitive. In order to implement this improvement, organizations should focus on ICT, trust, and information sharing as this article has shown that there is a significant positive correlation between these factors and VT decision making. Furthermore, results showed a significant positive correlation between VT performance and VT decision making. On the other hand, there is no correlation with language. Language is the factor that was found to be different between the US, Europe, and the Middle East, where it affects VT decision making in both the US and Europe and has no effect in the Middle East. Therefore, top management should consider these factors to achieve an acceptable level of VT decision making. Based on these

results, this article provides a guideline for organization management to measure decision making and team performance. For example, when measuring decision making in VTs, management should concentrate on the implemented ICT, trust between VT members and their willingness to share information within the VT. Measuring and controlling these factors will help organizations to achieve optimal decision making, which in turn will result in highly performing teams. This study proposes a framework for future studies that can add factors to these models and create new models not only for measuring, but also for building models for the implementation of decision-making processes that enhance VT performance.

This study has several implications for research as it is the first one to study the four factors of information sharing, language, ICT, and trust together with regards to their effect on decision making and the effect of decision making on team performance in a developing country (the UAE). Promoting and encouraging the decision-making process in organizations remain challenging for organizations. It is important for organizations to develop strategies that promote optimal decision-making processes in the organizations. These require the organizations to understand the factors that affect the decision-making process.

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References

- Zuofa, T.; Ochieng, E.G. Working separately but together: Appraising virtual project team challenges. *Procedia Soc. Behav. Sci.* **2017**, *23*, 227–242. [CrossRef]
- Wei, K.; Heckman, R.; Crowston, K.; Li, Q. Decision-Making Processes and Team Performance in Self-Organizing Virtual Teams: The Case of Free/Libre Open Source Software Development Teams. Citeseerx. 2017. Available online: <https://www.semanticscholar.org/paper/Decision-Making-Processes-and-Team-Performance-in-%3A-Wei/338a4e7c8a471fcad19f87c562764ffd4ebabd61?p2df> (accessed on 17 October 2020).
- O'Neill, T.A.; Hancock, S.E.; Zivkov, K.; Larson, N.L.; Law, S.J. Team decision making in virtual and face-to-face environments. *Group Decis. Negot.* **2015**, *25*, 995–1020. [CrossRef]
- Presbitero, A. Foreign language skill, anxiety, cultural intelligence and individual task performance in global virtual teams: A cognitive perspective. *J. Int. Manag.* **2020**, *26*, 100729. [CrossRef]
- Cordes, S. Virtual team learning: The role of collaboration process and technology affordance in team decision making. *Knowl. Manag. E-Learn. Int. J.* **2016**, *8*, 602–627. [CrossRef]
- Saafein, O.; Shaykhian, G.A. Telematics and Informatics Factors affecting virtual team performance in telecommunication support environment. *Telemat. Inform.* **2017**, *31*, 459–462. [CrossRef]
- Zakaria, N. Emergent patterns of switching behaviors and intercultural communication styles of global virtual teams during distributed decision making. *J. Int. Manag.* **2017**, *23*, 350–366. [CrossRef]
- Tan, C.K. Factors in influencing virtual team performance in Malaysia. *Kybernetes* **2019**, *48*, 2065–2092. [CrossRef]
- Paul, S.; He, F.; Dennis, A.R. Group atmosphere, shared understanding, and team conflict in short duration virtual teams. In Proceedings of the 51st Hawaii International Conference on System Sciences, Big Island, HI, USA, 3–6 January 2018; Volume 9.
- Organ, D.; Flaherty, B.O. Intuitive decision-making and deep level diversity in entrepreneurial ICT Intuitive decision-making and deep level diversity in entrepreneurial ICT teams. *J. Decis. Syst.* **2018**, *25*, 421–435. [CrossRef]
- Gibbs, J.L.; Sivunen, A.; Boyraz, M. Investigating the impacts of team type and design on virtual team processes. *Hum. Resour. Manag. Rev.* **2017**, *27*, 590–603. [CrossRef]
- Hacker, J.; Johnson, M.; Saunders, C.; Thayer, A.L. Trust in virtual teams: A multidisciplinary review and integration. *Australas. J. Inf. Syst.* **2019**, *23*. [CrossRef]

13. Ackermann, F.; Yearworth, M.; White, L. Micro-processes in group decision and negotiation: Practices and routines for supporting decision making. *Group Decis. Negot.* **2018**, *27*, 709–713. [CrossRef]
14. Eisenberg, J.; Post, C.; Ditomaso, N. Team dispersion and performance: The role of team communication and transformational leadership. *Small Group Res.* **2019**, *50*, 348–380. [CrossRef]
15. Gilson, L.L.; Maynard, M.T.; Bergiel, E.B. Virtual team effectiveness: An experiential activity. *Small Group Res.* **2013**, *44*, 412–427. [CrossRef]
16. Harzing, A.; Pudelko, M. Comprehensive overview of the role of language differences in headquarters—Subsidiary communication. *Hum. Resour. Manag.* **2014**, *25*, 696–717. [CrossRef]
17. Parlamis, J.; Dibble, R. Teaming: Are two communication modes better than one? *Team Perform. Manag. Int. J.* **2019**, *25*, 318–333. [CrossRef]
18. Flavián, C.; Guinalú, M.; Jordan, P. Antecedents and consequences of trust on a virtual team leader. *Eur. J. Manag. Bus. Econ.* **2019**, *28*, 2–24. [CrossRef]
19. Lowry, P.B.; Scheutzler, R.; Giboney, J.S.; Gregory, T.A. Is trust always better than distrust? The potential value of distrust in newer virtual teams engaged in short-term decision-making. *Group Decis. Negot.* **2014**, *24*, 723–752. [CrossRef]
20. Chang, H.H.; Hung, C.; Hsieh, H. Virtual teams: Cultural adaptation, communication quality, and interpersonal trust. *Total Qual. Manag. Bus. Excell.* **2014**, *25*, 1318–1335. [CrossRef]
21. Gao, S.; Guo, Y.; Chen, J.; Li, L. Factors affecting the performance of knowledge collaboration in virtual team based on capital appreciation. *Inf. Technol. Manag.* **2015**, *17*, 119–131. [CrossRef]
22. Klitmøller, A.; Luring, J. When global virtual teams share knowledge: Media richness, cultural difference and language commonality. *J. World Bus.* **2013**, *48*, 398–406. [CrossRef]
23. Yilmaz, G.; Peña, J.; Yilmaz, G.; Peña, J. How do interpersonal behaviors and social categories affect language use?: The case of virtual teams. *Commun. Q.* **2015**, *63*, 427–443. [CrossRef]
24. Acai, A.; Sonnadara, R.; O'Neill, T.A. Getting with the times: A narrative review of the literature on group decision making in virtual environments and implications for promotions committees. *Perspect. Med. Educ.* **2018**, *7*, 147–155. [CrossRef] [PubMed]
25. Bartelt, V.L.; Dennis, A.R.; Yuan, L.; Barlow, J.B. Individual priming in virtual team decision-making. *Group Decis. Negot.* **2013**, *22*, 873–896. [CrossRef]
26. McLeod, P.L. Distributed people and distributed information: Vigilant decision-making in virtual teams. *Small Group Res.* **2013**, *44*, 627–657. [CrossRef]
27. Bajis, D.; Chaar, B.; Basheti, I.A.; Moles, R.J. Identifying perceptions of academic reform in pharmacy using a four-frame organizational change model. *Res. Soc. Adm. Pharm.* **2018**, *14*. [CrossRef]
28. Cordes, S.C. Share (And Not) Share Alike: Improving Virtual Team Climate and Decision Performance. *J. Interact. Learn. Res.* **2017**, *28*, 29–48.
29. Johnson, K.J.; Martineau, J.T.; Kouamé, S.; Turgut, G.; Poisson-De-Haro, S. On the unethical use of privileged information in strategic decision-making: The effects of peers' ethicality, perceived cohesion, and team performance. *J. Bus. Ethics* **2018**, *152*, 917–929. [CrossRef]
30. Shi, W.; Tang, Y. Cultural similarity as in-group favoritism: The impact of religious and ethnic similarities on alliance formation and announcement returns. *J. Corp. Financ.* **2015**, *34*, 32–46. [CrossRef]
31. Turpin, S.; Marais, M. Decision-making: Theory and practice. *ORiON* **2004**, *20*. [CrossRef]
32. Fülöp, J. Introduction to Decision Making Methods. 2001, pp. 1–15. Available online: https://www.researchgate.net/publication/240754177_Introduction_to_Decision_Making_Methods (accessed on 17 October 2020).
33. Flores-Garcia, E.; Bruch, J.; Wiktorsson, M.; Jackson, M. Decision-making approaches in process innovations: An explorative case study. *J. Manuf. Technol. Manag.* **2019**. [CrossRef]
34. Šmite, D.; Wohlin, C.; Aurum, A.; Jabangwe, R.; Numminen, E. Offshore insourcing in software development: Structuring the decision-making process. *J. Syst. Softw.* **2013**, *86*, 1054–1067. [CrossRef]
35. Kolbe, L.M.; Bossink, B.; De Man, A.-P. Contingent use of rational, intuitive and political decision-making in R&D. *Manag. Decis.* **2019**, *58*, 997–1020. [CrossRef]
36. Paul, R.; Drake, J.R.; Liang, H. Global virtual team performance: The effect of coordination effectiveness, trust, and team cohesion. *IEEE Trans. Dependable Secur. Comput.* **2016**, *59*, 186–202. [CrossRef]
37. Maynard, M.T.; Mathieu, J.E.; Gilson, L.L.; Sanchez, D.R.; Dean, M.D. Do I really know you and does it matter? Unpacking the relationship between familiarity and information elaboration in global virtual teams. *Group Organ. Manag.* **2018**, *44*, 3–37. [CrossRef]

38. Berg, R.W. The anonymity factor in making multicultural teams work: Virtual and real teams. *Bus. Commun. Q.* **2012**, *75*, 404–424. [[CrossRef](#)]
39. AlSharo, M.; Gregg, D.; Ramirez, R. Virtual team effectiveness: The role of knowledge sharing and trust. *Inf. Manag.* **2017**, *54*, 479–490. [[CrossRef](#)]
40. Drouin, N.; Bourgault, M. How organizations support distributed project teams Key dimensions and their impact on decision making and teamwork effectiveness. *Manag. Dev.* **2013**, *32*, 865–885. [[CrossRef](#)]
41. Shagholi, R.; Hussin, S.; Siraj, S.; Naimie, Z.; Assadzadeh, F.; Moayedi, F. Value creation through trust, decision making and teamwork in educational environment. *Procedia Soc. Behav. Sci.* **2010**, *2*, 255–259. [[CrossRef](#)]
42. Ureña, R.; Kou, G.; Dong, Y.; Chiclana, F.; Herrera-Viedma, E. A review on trust propagation and opinion dynamics in social networks and group decision making frameworks. *Inf. Sci.* **2019**, *478*, 461–475. [[CrossRef](#)]
43. Bond-Barnard, T.J.; Fletcher, L.; Steyn, H. Linking trust and collaboration in project teams to project management success. *Int. J. Manag. Proj. Bus.* **2018**, *11*, 432–457. [[CrossRef](#)]
44. Klitmøller, A.; Schneider, S.C.; Jonsen, K. Speaking of global virtual teams: Language differences, social categorization and media choice. *Pers. Rev.* **2015**, *44*, 270–285. [[CrossRef](#)]
45. Cordes, S. Method for decision making in virtual library teams. *Libr. Manag.* **2016**, *37*, 55–67. [[CrossRef](#)]
46. Baumann, M.R.; Bonner, B.L. Member awareness of expertise, information sharing, information weighting, and group decision making. *Small Group Res.* **2013**, *44*, 532–562. [[CrossRef](#)]
47. Davidavičienė, V.; Raudeliūnienė, J.; Vengrienė, E.; Jakubavičius, A. Consolidation of the activities of regulatory institutions while implementing e-government solutions. *J. Bus. Econ. Manag.* **2018**, *19*, 307–322. [[CrossRef](#)]
48. Davidavičienė, V.; Raudeliūnienė, J.; Buleca, J. Virtual organization: Specifics of creation of personnel management system. *Ekon. Manag.* **2015**, *18*, 200–211.
49. Mahraz, A.O.; Bouhalouan, D.; Adla, A. Facilitating virtual group decision making. *Procedia Comput. Sci.* **2016**, *83*, 1050–1055. [[CrossRef](#)]
50. Handke, L.; Schulte, E.-M.; Schneider, K.; Kauffeld, S. Teams, time, and technology: Variations of media use over project phases. *Small Group Res.* **2019**, *50*, 266–305. [[CrossRef](#)]
51. Carita, S. Virtual teams: Opportunities and challenges for e-leaders. *Procedia Soc. Behav. Sci.* **2014**, *110*, 1251–1261.
52. Bisbe, J.; Sivabalan, P. Management control and trust in virtual settings: A case study of a virtual new product development team. *Manag. Account. Res.* **2017**, *37*, 12–29. [[CrossRef](#)]
53. Ruppel, C.P.; Gong, B.; Tworoger, L.C. Using communication choices as a boundary-management strategy: How choices of communication media affect the work-life balance of teleworkers in a global virtual team. *J. Bus. Tech. Commun.* **2013**, *27*, 436–471. [[CrossRef](#)]
54. Wolf, E.; Harrington, K.; Clark, S.; Miller, M. Sample size requirements for structural equation models: An evaluation of power, bias, and solution propriety Erika. *Educ. Psychol. Meas.* **2015**, *76*, 913–934. [[CrossRef](#)] [[PubMed](#)]

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