ANALYSIS OF FACTORS AFFECTING VIRTUAL TEAMS PERFORMANCE ON BUSINESS PROJECTS

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Abstract: Current technological developments help people to transform learning in a new era to build creativity, hone skills, and improve self-quality by changing the systems, perspectives, and patterns of community interaction with technology, one of which is virtual teams. The interaction of virtual teams has become a way to run a business for organizations can survive in a globally competitive environment. Therefore, organizations need to understand what makes virtual teams more effective and get positive results from virtual teams. The object of this research is the businesses run by students engaged in various sectors who do virtual teams in running their businesses. This research aims to determine the factors that affect the virtual team's performance. This research is quantitative research with the population of Ciputra University students majoring in the International Business Management Study Program – Regular Class (IBM-RC) who is running a virtual team. Data was gathered using online questionnaires, and then a Confirmatory Factor Analysis (CFA) test was used to confirm the components found in the research variables. The results of the study show that coordination, communication, relationship building, cohesion, trust, and reward are factors that affect the virtual team's performance.

Keywords: virtual teams, team performance, factor analysis

A. INTRODUCTION

Based on data from the Ministry of Communication and Information of the Republic of Indonesia (KOMINFO), the Directorate General of Informatics Applications explained that in 2021 internet users in Indonesia would experience an increase of 11 percent from the previous year, namely 175.4 million to 202.6

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million users. This increase is balanced with a good understanding of activities in the digital space (aptika.kominfo.go.id/2021). Current technological developments help people to transform learning in a new era to build creativity, hone skills, and improve self-quality by changing the systems, perspectives, and patterns of community interaction with technology (pusdatin.kemdikbud.go.id/2021). Virtual teams have become a way to run a business for organizations can survive in a competitive global environment. Therefore, organizations must understand what makes virtual teams run more effectively and can get positive results from virtual teams (Tan et al., 2019). Furthermore, according to Tan et al. (2019) virtual teams that work effectively with good collaboration and superior performance in organizational innovation are believed to be one of the primary sources of competitive advantage in today's modern era.

In running a virtual team, a business project does several things, such as coordinating virtually with the team when working on a joint project, trying to communicate with fellow virtual team members to exchange information, building relationships between teams, developing teams, building trust, build motivation and team spirit by providing rewards or prizes for team members who can increase sales. Although business projects seek to improve the virtual team's performance, there are several problems, such as a lack of team cohesiveness and misunderstandings in coordinating and communicating to develop and run business projects. Virtual team members are also less active and enthusiastic in running a virtual team when compared to meeting in person. Another problem that occurs is the phenomenon of a decline in sales. This is certainly different from the expectations of several business projects that hope to experience a consistent increase in sales every month.

Virtual team activities meet mainly electronically (Nemiro, 2016). Virtual teams help work with professionals or other group members located in other geographic areas, thereby improving the quality of work (Hoch & Dulebohn, 2017). To find out the factors that can improve virtual team performance, organizational practices such as coordination, communication, relationship building, cohesion, trust, and rewards also need to be considered and studied further (Tan et al., 2019).

Although it is known that virtual teams have many benefits, virtual teams are also seen as one of the challenges many organizations face (Hoch &

Dulebohn, 2017). Horwitz et al. (2006) stated that virtual teams have weaknesses that can occur, such as set-up costs, maintenance, training, potential cross-cultural difficulties in team interactions, feelings of isolation, and lack of trust.

B. LITERATURE REVIEW

1. Virtual Team

According to Hoch & Dulebohn (2017), several general characteristics define virtual teams: two or more people work across different geographic distances and time zones, collaborate interactively to achieve common goals, and communication and coordination are primarily based on communication—electronic media such as email, fax, telephone, conference, video, etc. Virtual teams also consist of members who do not meet face-to-face or members who meet electronically (Nemiro, 2016). Recently, virtual teams have been popularized in various fields, both practically and academically; observers have recognized the potential advantages and disadvantages offered by virtual teams to overcome the limitations of functional expertise by collaborating with professionals located in other geographic areas to improve the quality of work (Hoch & Dulebohn, 2017; Tan et al., 2019).

2. Team Performance

Performance results from work in quality and quantity achieved by team members or groups in carrying out tasks by the responsibilities given (Mangkunegara, 2011). At the same time, the work team is defined as a group whose individual efforts result in higher performance as a unit (Putri, 2021). The success of good team performance can be seen from external (market) factors that apply to commercial outcomes of development projects, such as customer satisfaction or financial performance, and internal (project) effectiveness is implementation (Tan et al., 2019). Organizations must develop various performance support activities to achieve good team performance management to ensure that virtual teams understand the organization's steps to achieve joint performance because virtual work is seen as more complex and motivating (Nurmi & Hinds, 2016). Team performance factors are coordination, communi-

cation, cohesion, reward, relationship building, and trust (Choi et al., 2008; Lin et al., 2008; Lurey & Raisinghani, 2001).

3. Coordination

According to Lin et al. (2008), coordination is defined as the level of effort between team members to manage collective resources and the extent to which the work activities of team members are logically consistent and coherent, as well as a well-coordinated organization, work and carry out activities that complement each other and have a purpose. Coordination, especially inter-functional, can improve performance (Sudarmadji et al., 2020). There are several indicators or measuring tools for Coordination, according to Lin et al. (2008), namely expressing all team concerns openly, working to find solutions, exchanging information, and investigating problems to find solutions.

4. Communication

According to Horwitz et al. (2006), communication is defined as the transition of information and understanding through the use of verbal or non-verbal common symbols between two or more team members in an appropriate way. Therefore, communication plays a role in clarifying ambiguous issues, which ultimately increases efficiency and effectiveness between team members. Communication has essential functions such as building relationships, providing information, persuading, motivating, integrating, and socializing team members (Topaloglu & Anac, 2021). Good communication between business members will create a high sense of ownership in running the business (Soekanto & Mustikarini, 2017). There are indicators or communication measuring tools, according to Lin et al. (2008), namely communicating regularly, staying on the main goal in the discussion, and effective team communication.

5. Relationship Building

According to Powell et al. (2004), relationship building is an interactive process designed to increase feelings of inclusiveness or being part of a team that can foster cohesion and trust. Building relationships within teams can substitute

face-to-face work by providing a temporal coordination mechanism that influences how teams experience and resolve conflict (Peters & Manz, 2007; Tan et al., 2019). There are indicators or measuring tools for relationship building, according to Lin et al. (2008), namely relying on and consulting each other, having a sense of one goal, sharing knowledge and information as team norms, and building good relationships in completing projects.

6. Cohesion

According to Hambley et al. (2007), cohesion is defined as a dynamic process that is reflected in the tendency of a group to stick together and remain united in pursuit of its instrumental goals for the satisfaction of members' affective needs. Team cohesion leads to team task performance, implying that leaders can influence team cohesion which ultimately leads to changes in team performance; this is because team cohesion will care about the team and want their team to perform at their best. Hence, the team exerts more influence on each other to create a good team (Lu, 2015). According to Lin et al. (2008), there is a cohesion indicator or measurement tool, namely a cohesive team unit, the entire team gathers as a group during the team project work period, and the entire team spends time together outside of work project.

7. Trust

Trust is defined as the willingness of team members to become dependent on one another based on the expectation that each member will act beneficial to the team's success. According to Mayer et al. (1995) & Tan et al. (2019), team trust is the ability of members to trust each other in critical decision-making without taking direct monitoring or control actions. It is also known that Trust helps in improving interaction patterns and increase productivity by increasing the willingness to share confidential information among team members. Trust plays an important role that unites the entire team, where virtual team members are not physically placed together and where technology is used as the primary means of communication (Tan et al., 2019). There are indicators or tools for measuring cohesion, according to Choi et al. (2008), namely believing that team members are honest and reliable, believing that team members treat each other

reciprocally, believing that team members are acting in the best interest, believing that team members are knowledgeable and competent in their fields.

8. Reward

According to Drouin et al. (2010), the reward is the main motivator to encourage individual and group performance through various mechanisms such as salary increases and performance bonuses. Reward systems can motivate employees to focus on achieving shared organizational goals and rewards ranging from extrinsic incentives, such as bonuses, to intrinsic rewards, such as praise and public recognition (Choi et al., 2008; Tan et al., 2019). There are indicators or measuring tools for cohesion according to Choi et al. (2008); Lurey & Raisinghani (2001) which are valued at individual money values, have promotion opportunities, and rewarded with value when the team achieves the goal.

9. Previous Research

The first previous research was by Tan et al. (2019) entitled Factors Influencing Virtual Team Performance in Malaysia. This study aims to analyze the factors that affect virtual team performance and examine the impact of the six factors of coordination, communication, relationship building, cohesion, trust, and reward on team performance. This study's results or findings found a positive and significant relationship between communication, relationship building, cohesion, and trust in team performance. However, it was found that no significant relationship was found between coordination and reward on team performance.

The second previous study was by Topaloglu & Anac (2021) entitled Exploring Major Factors Affecting Virtual Team Performance. This study aims to identify and explore the main factors that affect the performance of virtual teams. The results found that leadership, communication, collaboration, cohesion, commitment, conflict, interpersonal relationships, knowledge sharing, feedback, trust, diversity, recognition, and empowerment affect virtual team performance.

The third previous study was by Garro-Abarca et al. (2021) entitled Virtual Teams in Times of Pandemic: Factors that Influence Performance. This study aims to analyze the factors that affect the performance of virtual teams during the pandemic. The results of the study found that there are factors that directly affect the virtual team's performance, namely communication, trust, empowerment, and cohesion.

The fourth previous research was by Paul et al. (2016) entitled Global Virtual Team Performance: The Effect of Coordination Effectiveness, Trust, and Team Cohesion. This study aims to determine the effectiveness of coordination, trust, and team cohesion. The results or findings in the study show that higher coordination effectiveness leads to higher trust and team cohesion within teams which indicates that effective coordination can lead to individual-level trust. Individual team members and group trust result in team cohesion; forming a reciprocal positive relationship with one another proposes a reciprocal influence between individual trust and team cohesion. The two constructs influence each other simultaneously, and trust and overall team cohesion enhance team performance indicating that team performance is determined by individual trust and team cohesion.

C. RESEARCH METHODS

This research method uses quantitative research. The data used in this study is primary data. They collected data in this study using questionnaires distributed directly to respondents, measuring the questionnaire using a Likert scale and statistically analyzing using the Confirmatory Factor Analysis (CFA) method. The population in this study were representatives of students from Ciputra University International Business Management Study Program - Regular Class (IBM-RC) semester 7/8 who were CEOs of business projects. The research sample was 31 people, determined using the convenience sampling technique.

The data analysis method used in this research is Confirmatory Factor Analysis (CFA). Variable analysis in this study used SmartPLS 3.0 software as a medium for confirmatory variable analysis using second-order confirmatory factor analysis.

Table 1 Variables and Operational Definitions

Variables	Conceptual Definition	Indicators	Source
Coordination (X_1)	Coordination is defined as the degree of effort between team members to manage collective resources and the degree to which the work activities of team members are logically consistent and coherent	1. Express all team concerns openly. 2. Work to find a solution. 3. Exchange information 4. Investigate problems to find solutions	Lin et al., (2008, in Tan et al., 2019)
Communication (X_2)	Transition of information and understanding using common verbal or non-verbal symbols between two or more team members in appropriate ways	1. Communicate regularly. 2. Stick to the main goal in the discussion. 3. Effective team communication	Lin et al., (2008, in Tan et al., 2019)
Relationship Building (X_3)	An interaction process designed to promote feelings of inclusivity or being part of a team that fosters cohesion and trust	1. Rely on and consult each other. 2. Have a sense of purpose. 3. Sharing knowledge and information as a team norm 4. Build a good relationship in completing the project	Lin et al., (2008, in Tan et al., 2019)
Cohesion (X_4)	A dynamic process that is reflected in the tendency of a group to stick together and remain united in the pursuit of its instrumental goals for the satisfaction of members' affective needs	1. Cohesive team unit 2. The whole team gathers as a group during the team project work period. 3. The whole team spends time together outside of project work	Lin et al., (2008, in Tan et al., 2019)
Trust (X_5)	Willingness of team members to become dependent on one another based on the expectation that each member will take an action beneficial to the team's success	1. Believe that team members are honest and reliable. 2. Believe that team members treat each other reciprocally. 3. Believe that team members act in the best interest. 4. Believe that team members are knowledgeable and competent in their field	Choi et al., (2008, in Tan et al, 2019)
Reward (X_6)	The main motivators used to encourage individual and group performance are through various mechanisms such as salary increases and performance bonuses.	1. Value for money individually 2. Have promotion opportunity 3. Rewarded when the team achieves performance	Choi et al., (2008, in Tan et al, 2019) Lurey and Raisinghani (2001, in Tan et al., 2019)

D. RESULT

Data Analysis

First Order Construct Testing is a latent variable measurement test based on the latent construct forming indicators to test the validity and reliability (Ghozali & Latan, 2015). The convergent validity test in the first order construct test was carried out by looking at the results of the loading factor value with the provisions of the value > 0.70 and the average variance extracted (AVE) > 0.50

(Ghozali & Latan, 2015). The results of the loading factor value on all indicator items have a value of > 0.70, indicating that all indicators meet the valid criteria in the convergent validity test and reflect the dimensional construct. The table also shows the average variance extracted (AVE) > 0.50, which indicates that all AVE values meet the predetermined criteria so that they can be declared valid. The discriminant validity test in the first order construct test was carried out by looking at the results of the cross-loading value with the provisions of the value > 0.70 and the square root value of the average variance extracted (AVE) correlation between latent constructs (Ghozali & Latan, 2015). The results of the cross-loading value all have a value > 0.70, and the construct have a greater value than the other constructs, so it can be stated that the indicators used in the study are valid.

The reliability test is used to test the consistency and accuracy of the indicator instrument to measure a construct to see the reliability of a study can be seen through the value of Cronbach's alpha is > 0.7, and the value of composite reliability is > 0.07 (Abdullah & Hartono, 2015). The results show that the value of Cronbach's alpha of all variables in the study is > 0.7, and the value of composite reliability is > 0.07. These results indicate that the variables used in this study are reliable.

Second Order Construct is a latent construct measurement of its dimension construct. In the Second Order Construct, it is necessary to evaluate the bound construct through the path coefficient value with provisions more than 0.6 and see the value of the coefficient of determination (R^2). The results of the path coefficient show that all variables in the study have a path coefficient value that meets the requirements, which is more than 0.6.

The value of the coefficient of determination R^2 on the coordination variable shows the number 0.760 or 76.0% as a factor affecting team performance. The value of the coefficient of determination R^2 on the communication variable shows the number 0.723 or 72.3% as a factor affecting team performance. The value of the coefficient of determination R^2 on the relationship-building variable shows the number 0.778 or 77.8% to be a factor that affects team performance. The value of the coefficient of determination R^2 on the cohesion variable shows the number 0.787 or 78.7% as a factor affecting team

performance. The value of the coefficient of determination R^2 on the trust variable shows the number 0.775 or 77.5% as a factor affecting team performance. The value of the coefficient of determination R^2 on the reward variable shows the number 0.763 or 76.3% as a factor affecting team performance.

E. DISCUSSION

The coordination factor is a factor of the level of effort between team members to manage resources on the team and the work activities of team members to achieve common goals (Lin et al., 2008). This is supported by the mean value or overall average value of 3.69 with the information that respondents agree that coordination is a factor that affects team performance. The highest mean value on coordination was in the statements of respondents X1.1 and X1.2, which stated that "I try to express all of our team's concerns openly so that problems can be solved in the best way" and "I try to work with group members to find solutions that meet the team's expectations." with a value of 3.74 which is included in the agreed category. Thus, it explains that virtual teams need to express all team concerns openly to solve problems and try to work with group members to find solutions to meet team expectations. The lowest mean value is in the respondent's statement X1.3, which states that "I exchange useful information with members of my group to solve common problems," with a value of 3.64 which is included in the agreed category. So, it explains that in coordinating, the virtual team also exchanges useful information with group members to solve problems together.

The communication factor is how virtual team members transition information and understanding verbally and non-verbally appropriately or effectively (Lin et al., 2008). This is supported by the mean value or overall average value of 3.98, with information that respondents agree that communication is a factor that affects team performance. The highest mean value on communication is in the respondent's statement X2.3, which states that "I think our group members have effective communication," with a value of 4.03 which is included in the agreed category. This explains that to get an excellent virtual team performance, it is necessary to have effective communication. The lowest mean value is in the respondent's statement X2.2, which states that "I want to stick to the main goal

of the team discussion," with a value of 3.93 which is included in the agreed category. This explains that in communicating, it is necessary to stay focused on the primary purpose of the discussion rather than communicating things that are not important so that communication can run well and effectively.

Relationship-building factors are factors in how team members proceed in interactions designed to increase feelings of inclusiveness or being part of a team that can lead to cohesion and trust. (Lin et al., 2008). This is supported by the mean value or overall average value of 3.76, with information that respondents agree that relationship building is a factor that affects team performance. The highest mean value in relationship building is in the respondent's statement X3.3, which states that "sharing knowledge and information is understood as a group norm in my group," with a value of 4.06 which is included in the agreed category. This explains that building a good relationship with the team is influenced by efforts to share knowledge and information between teams as the norm in virtual teams. The lowest mean value is in the respondent's statement X3.4, which states that "I am interested in building good relationships such as in completing projects," with a value of 3.51 which is included in the agreed category. This explains that in building a good relationship in completing a project within the team, it is necessary to be realized and carry out by all team members because it can improve the virtual team's performance.

The cohesion factor is a factor in how a dynamic process is reflected in the tendency of a group to stick together and remain united in spelling out the common goals of team members (Lin et al., 2008). This is supported by the mean value or overall average value of 3.94, with information that respondents agree that cohesion is a factor that affects team performance. The highest mean value on cohesion is in the respondent's statement X4.2, which states that "I feel that my group members work well together during the project work period," with a value of 3.96 which is included in the agreed category. This explains that cohesion factors such as group members being cohesively aware of working well together while doing business are things that have an impact on team performance. The lowest mean value is in the statements of respondents X4.1 and X4.2, which state that "my group members gather as a group during the project period" and "my group members spend time together outside of project work" with a value of 3.93 which is included in the agreed category. This explains that

the entire group gathers while working on business projects and also spends time outside of business project work to improve performance on virtual teams.

The trust factor is a trust factor where team members are willing to depend on each other and think that team members will take actions that are beneficial for the team's success (Choi et al., 2008). This is supported by the mean value or overall average value of 3.81, with information that respondents agree that trust is a factor that affects team performance. The highest mean value for trust is in the respondent's statement X5.4, which states, "I believe that other team members are knowledgeable and competent in their field," with a value of 4.00 included in the agreed category. This explains that team members have confidence that other team members are knowledgeable and competent in their respective fields according to their respective portions, so mutual trust is a factor in the virtual team's performance. The lowest mean value is in the statement of respondent X5.3, which states that "I believe that other team members will act in their best interests," with a value of 3.54 which is included in the agreed category. It explains that team members have confidence that other team members will act or make any decisions within the team in the best interests of the team.

Reward factors motivate or encourage individual and group performance through various mechanisms such as salary increases or performance bonuses (Choi et al., 2008; Lurey & Raisinghani, 2001). This is supported by the mean value or overall average value of 3.82, with information that respondents agree that reward is a factor that affects team performance. The highest mean value for the reward is in the respondent's statement X6.3, which states that "all team members are rewarded with monetary value when the team achieves its goals," with a value of 4.00 included in the agreed category. This explains that efforts to reward team members' achievements or efforts with monetary value when the team can achieve its goals can trigger team spirit to improve team performance. The lowest mean value is in the respondent's statement X6.1, which states that "I am rewarded with the value of money individually for my work efforts," with a value of 3.77 which is included in the agreed category. So that it explains that team members who are rewarded with value for money individually or outside of team or group work for individual work efforts can trigger team performance.

F. CONCLUSION

Based on the results of the study, it can be concluded that coordination, communication, relationship building, cohesion, trust, and rewards are factors that affect the virtual team's performance on business projects. This research was conducted at the time of the Covid-19 pandemic, so the data collection process was only carried out online via the Google Form link, so researchers could not accompany and explain directly to respondents when filling out the provided questionnaires, this also led to the collection respondent data or research sample is not optimal.

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