

Effective Virtual Teams: An evaluation from the perspective of virtual team members.

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Abstract: This study evaluates the effectiveness of a virtual team from the perspective of the individual's ability to work together, and the prospect that they would be willing to embark upon a similar arrangement in the future. We draw upon our earlier research where we developed a framework for evaluating virtual team effectiveness. In order to evaluate the effectiveness of a team's work relationship, a virtual team was examined from several perspectives: the virtual team leader and the ability of the leader's contributions, as well as the perspective of virtual team members, individually and collectively.

1. Introduction

This paper evaluates the effectiveness of virtual teams from the perspective of an individual's ability to work together, and the prospect that they would be willing to embark upon a similar arrangement in the future. Indeed, a virtual team project is only successful if the project objectives are met while providing a positive work environment for the individuals involved. Otherwise, capable candidates for virtual teams would quickly be depleted as prior participants pass on involving themselves in future projects due to past negative experiences.

To begin, what is it that distinguishes a highly effective group from one that is less effective? Many organizations use objective, quantifiable criteria to measure group effectiveness including measures of production output, quality improvements, cost reductions, and turnaround times. A number of organizations will also use more subjective criteria including member participation, cooperation, and involvement [1].

Research on group effectiveness suggests that, in order to determine if a group is performing particularly well, indicators should be garnered from three major areas [2]. The first area should determine whether or not those who receive or use a group's outputs consider them of value. For example, are a committee's recommendations implemented? Is upper management satisfied with the performance of the group? Second is whether or not the individuals within a group maintain or increase their desire to cooperate with other group members on future projects. The third is whether or not group members gain satisfaction and a sense of growth and well being from being part of the group. A group is unlikely to be considered effective if its own members are not satisfied and are not experiencing feelings of accomplishment by being part of the group.

While a group's quantifiable outputs may be considered the most important of the three major areas noted above, it is unlikely that a valued output will be maintained over time if the group cannot attain success in the other two areas. In other words, objective quantifiable output criteria

is important, but over time is contingent upon a group's ability to maintain more subjective, relational indicators of effectiveness.

2. Methods

We draw upon our earlier contribution to the literature on virtual teams [18] which provides a framework for a multi-faceted input-process-output (I-P-O) model. As such, we encourage the reader to refer to this previous piece for a detailed review of the literature that builds the framework. In order to evaluate the effectiveness of a team's work relationship, the virtual team was examined from several perspectives: the virtual team leader and the ability of the leader's contributions, as well as the perspective of virtual team members, individually and collectively. Much like multiple stage lights cast upon a single actor, each perspective illuminates the virtual team experience from a different angle, minimizing areas of darkness and encouraging the full shape of its effect be realized.

A single virtual team comprised of four members was studied, from the point of recruiting through to completion of the project. The virtual team was task specific in that it had a set of objectives to accomplish, upon which the team would terminate. A set of criteria was established for selection of team members. These criteria were drawn from the I-P-O model and included consideration for a candidate's comfort with technology, knowledge, skill, ability, and a disposition to trust. The criteria also took into account whether a candidate was action-oriented, self-motivated and supportive of others.

The four members of the team were selected based upon this criteria and subsequently briefed upon their tasks and trained on the technology, as well as the method in which the project was to be carried out. The four members lived in different regions of Canada and never met face-to-face until at the end of the project. This was intentional so as to determine the extent that members work together without meeting in person.

A series of questions were asked over two survey instruments that were designed to determine the extent that individual team members were able to work together and remain in a positive work environment. The questions in the surveys were drawn from the research literature and have been applied in previous studies on group effectiveness [3, 4], leadership [4], teams [5], and virtual teams [6]. Given that there were only four virtual team members, mixed success was found in the results. To complicate matters further, one of the participants declined to participate in the majority of the questions, answering approximately only one in five, which means that much of the results reported below are based upon three of the four participants. The three members however, answered all questions in both surveys.

To the benefit of the study, the questions that the fourth respondent did manage to provide were enough to generate an image of the team's assessment of working in a virtual environment. As well, roughly half of the questions involved evaluation of other members, which made it possible to understand the interaction between the three fully participative respondents and the fourth.

3. Virtual Team Leadership

Virtual team leadership was measured by using eight items. The items asked respondents to assess the team leader's ability to encourage member initiative across all backgrounds, ensuring team effectiveness. The questions also assessed how well the leader was able to set the vision of the project outcome to the team members, the work processes that will be employed, the importance of the task, and the outcomes that would benefit individual members with successful project completion.

Individual team members rated the leadership very highly, with a team average across eight items of 4.88 (N=3) on a Likert scale from 1-5, five being the highest rating (all measures in this section of the report apply the same scale, unless otherwise noted).

Virtual team leadership was also assessed via an open-ended question, asking respondents if there was anything they would like to add regarding their experience working with the virtual team leader. Three of the four respondents offered a response:

"Leaders do not command excellence, they build excellence". I think that is completely true for our team leader. She is Competent, Courageous, Broad-minded, Intelligent; Forward-looking above all she has Inspiring personality. Each and every single member from virtual team got priority top of anything. That is excellent. I think she could be a role model for any team environment (Virtual or physical).

"Team leader was excellent. Project would have not been as successful as it was without the team leader providing leadership, organizing, motivating all members of the team. Team leader was also invaluable in guiding projects in terms of direction and input."

"I like the virtual team leader's perspectives on different scenario projects...This gave me a lot of courage on the economic aspects of different projects..."

Although the fourth team member failed to respond to the question in the survey, the individual did volunteer the following assessment by way of e-mail, directly to the team leader:

"I have benefited greatly from working with you and have learned a lot. I really admire how you handled the numerous project challenges, and never wavered from treating me with respect and appreciation."

An important litmus test for the assessment of any experience is whether an individual would be willing to embark upon the same experience a second time. One question asked team members if they would be willing to work with the team leader again. The response to this question by the three respondents was 5.00/5.00 (N=3).

Where we found hesitancy in the team members' experience with leadership (only slight at that) was in the administrative support they received in doing their work. Whether this is the result of the leader or can be attributed to the culture of the organization was not discernible from the questions asked. Yet, in a two-item measure, asking respondents if they felt they had adequate training and resources, the average response was 3.50/5.00 (N=4), ranging from a low of 2.50/5.00 to a high of 5.00/5.00.

One team member offered this assessment in an open-ended statement on the second survey regarding the administrative support given to members of the virtual team:

“One key thing that has to be kept in mind is that being a virtual employee requires a lot of time for administrative activities, including setting up, maintaining and dismantling technological equipment, paperwork, retrieving and shipping packages, etc...I often felt that the time required to take care of all those things, and the impact on my ability to make progress with the actual project work, was not fully understood.”

The same team member further noted:

“I think the biggest challenge we faced on this project was taking on too much for the allotted time period. In addition, due to administrative challenges, team members started work on the project at different times – this is particularly challenging with a virtual team. Due to these issues I was in the position of having to work alone to a great extent – this was challenging given the amount and breadth of work required. And meant that I didn’t benefit as much as I would have liked to from discussions about the issues, or the contribution of others to the scenarios I worked on. It also meant that I wasn’t able to contribute very much to the other scenarios. As a result, the group teleconferences were not very useful to me and I felt my time could have been better spent completing the work that I was doing on my own.”

In summary, it is clear that the personal traits of the team leader resulted in a very positive assessment of the individual and collective team member experiences with project supervision. It also appears that given the nature of the tasks there was an ample supply of intrinsic satisfaction in developing the project, which minimizes the pressure upon a team leader to heighten an already high level of individual motivation and to focus upon coordination of the team tasks. At the same time however, there is a noted gap in the expectations that individual team members had with respect to administrative support and the level that the team members received.

4. The Virtual Team

4.1 Team Cohesiveness

Cohesion is “the degree to which members are motivated to remain in a group” [7]. The most consistently important factor that builds cohesion is whether members of a group think that they have something in common with other members and tend to like being with them. Team cohesiveness has several benefits for teams. Greatest among these is the heightened quantity and quality of group interaction within a team. A second benefit is that it influences members to conform to group norms [1].

Team cohesiveness is also an indicator of individual satisfaction, and is necessary for effective exchange of information, regardless of the means by which the information is exchanged (i.e., e-mail, memo, telephone) [8]. Cohesiveness is based upon interpersonal attraction among members and identification with the group in general, and the extent that individual group members want to remain in a group [1]. Research has found that individuals will only enter and maintain a relationship with people that they perceive as supporting their own self-concept. The greater the perceived similarity the greater the amicability among individuals, which in turn positively impacts team cohesion and overall team performance [9].

Each team member assessed how similar he/she was to other members of the team. The average score for the four-item measure of perceived similarity was 3.15/5.00 (N=4), with a rating of 5.0 indicating very similar. The lowest average that a team member evaluated their perceived similarity to others was 2.17/5.00, and the highest was 4.08. Interestingly, the team members' collective evaluation of perceived similarity to a single member did not reflect the same individual assessment. For example, the member that considered him/herself least like other members (2.17/5.00) was not considered the least similar by the rest of the team (3.17/5.00 in a range of 2.5/5.00 to 4.17/5.00).

In measuring the cohesiveness of the virtual team we found that individual members ranked cohesiveness moderately high (3.50/5.00, N=4), with the lowest score being 1.00 and the highest being 4.00. It should be noted that the very low score on cohesiveness (1.00/5.00), came from the individual that assessed the lowest perceived similarity scores to other team members, and also declined to fully complete the survey. As well, when we look at the individual members' evaluation of the quality of relationships among members we find consensus among the remaining three members, each rating the quality as 4.00/5.00, while the fourth that rated cohesiveness a 1.00 also rated the quality of relationship lower at 3.00/5.00.

4.2 Team Member Satisfaction

Research has shown in the past that satisfaction of individuals on the team is linked to group cohesiveness and the extent that members are invited to participate as well as enjoy participating with other members on the tasks they were assigned [2]. All responding members rated their level of satisfaction with the experience the same with a score of 4.00/5.00 (N=3).

4.3 Team Effectiveness

A two-item measure of team effectiveness was used in the questionnaires. The individual team members were asked whether or not they found the team effective and if there was any difference from their initial expectation of the team's ability to be effective. The average response rated team effectiveness as 4.33/5.00 (N=3). This is a high rating for effectiveness in the context of previous studies using the same measure where effectiveness averaged 3.50/5.00 [6]. More importantly, the assessment of effectiveness was rated consistent with how they rated their initial expectations (that is to say that both items were scored the same for each individual respondent), suggesting that individual member expectations of team effectiveness were met; and their initial expectations were set fairly high. As indicated at the beginning of this section, internal rating of team effectiveness is an important indicator of team effectiveness...particularly if it dovetails well with an external assessment of outputs as evaluated by management.

4.4 Team Performance

Team performance was a single item measure with all responding members consistent with a score of 4.00/5.00 (N=3). Again, this is a high rating for the team in comparison to responses to the same question from previous studies [6] and is important from the context of external observers of the team's ability to function.

In summary, we discover that the majority of the team had a relatively positive experience with each other in working through the tasks. As found in research literature, and supported here in the team evaluations, a high rating of team cohesiveness translates into a high rating of team performance, effectiveness, satisfaction, and quality of relationships [9, 8, 4]. Part of this high

score can be attributed to the initial trust that individuals had in the capability of the other team members to carry out their tasks.

In a team setting, members develop a system of trust based on shared goals, rewards and penalties [8]. When there is no time to build a trusting relationship, such as when a group of people in different locations are tasked to work on a project or complete a given task together, teams may need to build trust more quickly. The concept of swift trust has been developed to account for temporary teams whose existence, like those on virtual teams, was formed around a common task with a finite life span [10]. Such teams consist of members with diverse skills, with a limited history of working together, and with little prospect of working together again in the future [9]. The tight deadlines under which these teams work leave little time for relationship building. Because the time pressure can hinder the ability of team members to develop expectations of others based on first hand information, members tend to import expectations of trust from other settings with which they were familiar [11].

In a one-item measure individual members were asked if at the outset they trusted that other members were competent in the assigned tasks, even though they had not met. The responses were consistent at 4.00/5.00 (N=3), suggesting a high level of initial, or swift trust. High quality exchanges between members involve high degrees of mutual trust, respect and obligation toward one another [12]. The higher the quality of these exchanges between team members, the better the performance of the team. The creation of high quality relationships between team members helps the team advance their goals as well as the organization's goals. A series of fourteen questions that leads to a more refined measure of trust [5], based upon the work experiences of each other over the duration of the project generated a team average of 3.82/5.00 (N=3), with a range of 3.60 – 3.95. The values between the initial swift trust granted at the outset and the level of trust reflected in the more refined measure at the end of the project suggests that for three of the four members, their trust remained high and relatively constant throughout the project.

5. Individual Level

5.1 Participation

Team participation, as rated by members within the team, was fairly high. The average participation score for the team was 3.63/5.00 (N=3). The lowest score for participation by other team members went to the individual that failed to respond to all the survey questions (3.00/5.00). In one of the open-ended questions there was a comment regarding participation, which appeared to relate to the fourth person on the team:

“If anyone can't participate [on] most of the team activities, then s/he should make space for a new one.”

This suggests that the majority of the team members wanted to participate, and that the expectation of other team members was maintained. The highest score given to any individual on the team was 4.00/5.00. Team members were also asked to rate their own participation. Interestingly, the difference between their self-evaluations and the team's evaluation were no greater than 0.33. These results suggest that responding team members were 'on the same page' with each other in reference to what was expected of themselves and of others on the team.

5.2 Responsiveness

Responsiveness is another indicator of an individual's interest in being a part of the team and willingness to contribute. In this particular measure we find the average score is 4.17/5.00 (N=3) – a high score – suggesting diligence in the team members, ensuring they maintained an appropriate turnaround in dialogue and output with other team members. Again here, the lowest rating in responsiveness by other members of the team was to the individual that did not complete the survey (4.00/5.00) while the remaining three members each received a score of 4.33/5.00. It is interesting to note the three members that fully participated in the survey rated themselves lower in effectively responding than the other members rated them. This suggests that individuals had hoped they could have been more responsive, but at the same time the rest of the team was more than satisfied with their effort. At the same time however, the fourth individual rated him/herself with a value of 5/5, which was higher than the average score of the rest of the team's evaluation of that individual's responsiveness.

5.3 Task Interdependence

Task interdependence is the extent that one person depends upon another to successfully complete a particular task [1]. By and large, the project that the virtual team was working on involved two types of interdependence: 1) Pooled interdependence, where team members are independent in their activities but as a group contribute to the team's output. We saw this with individuals undertaking specific scenarios independent of other members. 2) Sequential interdependence, where individuals rely upon each other for someone else's work in order to conduct their own. This was present when several team members worked on the same scenario and one had to wait upon the output of another in order to complete their task. The following responses to an open-ended question are from the fourth team member, and sheds some light on some frustration this person had in the virtual team experience as it relates to task interdependence:

“...it is critical to have a discussion upfront about what working on a team means to us and then come to a consensus on how we are going to work together on the current project.”

“I think it would be better to work together on one scenario at a time, each member contributing their expertise and all members benefiting from learning from each other.”

“One team member didn't have a basic understanding of [the research topic], making it very difficult to benefit from working together.”

“Another team member didn't honour his commitments to contributing to the scenarios that I was leading so I had to work intensely over the last few weeks to fill in work that he was supposed to complete, in addition to completing my own work.”

In contrast to these comments, the remaining team members conveyed a generally positive account of their working with each other on the project. There was some suggestion that schedules and other commitments made group meetings challenging:

“...it was hard to find time to debrief/discuss important issues because of different schedules of each individual.”

However, the experience of working together was primarily deemed rewarding and enjoyable. Team members were asked questions to assess the extent they felt the project was task interdependent [13]. The average team score for the three-item measure was 3.61/5.00 (N=4), suggesting that team members collectively felt that their was a moderate to high level of interdependence. The highest assessment by an individual member was 4.00/5.00, while the lowest was 3.33/5.00.

5.4 Psychologically Safe Communication Climate

A psychologically safe communication climate includes variables such as member participation in decision making and openness in communication. It has also been shown to predict satisfaction and commitment in team members (Gibson and Gibbs, 2006). A psychologically safe communication climate also helps overcome potential barriers to innovation due to dispersion in virtual teams, encouraging the sharing of knowledge across members (Gibson and Gibbs, 2006).

Virtual teams should be psychologically safe environments, where individuals can contribute unsolicited information. This is achieved through encouraging support, trust, openness, risk taking, and respect within the team [4]. Values such as these can be instilled in training and by designing teams of a size that maintains goodwill and intimacy [4]. As well, if the leader displays a democratic and supportive approach, welcoming questions as well as challenges from members of the team, then they will more likely feel a greater level of psychological safety in the team [14]. The presence of individual trust in a team is an indicator that a psychologically safe work environment may be present, where individuals feel comfortable with the support, openness, mutual respect and ability to take risks [4].

The second survey asked team members several questions in order to tease out the extent that a psychologically safe communication climate existed. The four items in the measure sought agreement from each member towards statements indicating they were able to say what they think, communicate about a problem, be assertive about what they think and feel, and others were considerate of their feelings [4]. Agreement with these statements would indicate the presence of a psychologically safe communication climate.

The team members generated a collective average score of 4.50/5.00 (N=3), which suggests not only a high level of individual trust (as already indicated in the swift trust and 14 item measure of trust), but also an ability to feel free in their ability to communicate. The scores ranged from a low of 4.25/5.00 to a high of 4.75/5.00. The importance of this indicator of effectiveness is that it can offset potentially negative attributes associated with a high level of team cohesion such as rejecting ideas that deviate from a group norm or possibly move as a group away from the organization's goals due to the lack of a dissenting voice within the group [1].

5.5 Electronic Dependence

It should come as no surprise that the virtual team members relied extensively on electronic methods of communication [4] to complete the project (4.00/5.00; N=4). The greatest dependence noted by the team members was the use of e-mail (3.67/5.00; N=4). However, it was surprising to see that they depended the least upon the portable means of collecting e-mail, the BlackBerry, for receiving and sending messages (2.67/5.00; N=4). The next form of electronic communication that the team members relied upon was collaborative software (3.50/5.00; N=3), followed by teleconferencing (3.00/5.00; N=4). The results suggest that the individual members relied heavily upon collaborating via e-mail for the project, but the communication was by and

large occurring from a stationary location, such as a home office. The need to collaborate while on the go by way of BlackBerry was deemed not critical for their work. Part of this may also be explained by the technology they were using was rather new to each of the participants, having only received a BlackBerry for the project and therefore not fully versed, or reliant upon, its mobile features.

6. Conclusion

The objective of this paper was to report the effectiveness of the virtual team from the ability of the individual members to work together and to determine if they would be willing to embark upon a similar arrangement in the future. From this standpoint, there are three major conclusions to report: the success of the virtual team experience, the greatest weakness in the team, and the impact of the absence of a face-to-face launch.

First, the virtual team has been effective in generating an amicable environment, one in which the majority of members built, and maintained, a high level of trust and willingness to work together. Indeed, there were two questions in the survey that specifically asked if the members would be willing to work with each other again, and if they would be willing to embark upon another virtual team project in the future. The average team score for members willing to work with others in the future was 4.44/5.00 (N=3). Higher still, was the reported interest in working on a virtual team again in the future 4.67/5.00 (N=3).

At the same time, there has been a noticeable fault-line within the team that cannot be overlooked, which forms the basis for the second conclusion. It has been apparent within the reported data that most of the values have an N of 3. While three of the four members report an overwhelmingly positive experience, a fourth member has at best offered a tepid assessment.

Fault-lines will often occur at logical distinctions between sub-groups, based on characteristics such as demographics [15]. There was significant diversity in the team members with respect to background (each were originally from a different country) and age (spanned across nine years, no two the same) there was also complete homogeneity regarding the level of education (all doctoral). However, the fourth individual was the only female in the team. Whether gender played a factor in the fault-line that existed between the three members and the fourth that exhibited less participation in the evaluation is not clear from the data gathered. However, in previous research, teams with mixed gender have been found to communicate more effectively [16]. As well, female participants in a virtual team will more often perceive virtual teams as more inclusive and supportive and satisfying than in traditional teams [16, 9].

From the context of looking at teams as an inputs/processes/outputs model [17, 18] the more likely explanation for the differences between the three members and the fourth is less likely the virtual team processes, and more likely a result of input; recruiting an individual that was not an optimal fit for the virtual team experience. While the selection criteria applied to recruit team members was extensive, it may not have drilled far enough in the area of discerning whether a candidate is supportive of, and has the ability to, get along with others, as well as a disposition to trust [8].

A third conclusion to report here is regarding face-to-face meetings. There were several questions asked regarding the decision not to have a face-to-face launch, but what we have found in the results here, as in other studies conducted elsewhere [6, 9], is that a face-to-face launch is not required for the building of trust and relationships. Our surveys indicate that the absence of a face-to-face launch had a nil effect on the project – it did not hamper or improve

the work of the team. Given this, an important conclusion to this study on virtual teams is that organizations should feel comfortable in employing the practise of launching virtual teams without the members meeting in person. If a face-to-face meeting were to occur, it would be optimal to have it take place several weeks into the project, once members have established a similar work attitude, or at the end, as a means to wrap-up the team's work and provide closure.

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