

**THE ROLE OF VIRTUAL TEAMS IN PROJECT MANAGEMENT
DURING THE PANDEMIC AND ECONOMIC CRISIS SITUATIONS IN
SRI LANKA: A CASE STUDY OF MAGA ENGINEERING (PVT) LTD, SRI
LANKA**

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Abstract

The main purpose of this study is to reveal the success of the virtual teams in pandemic and crisis situations in Sri Lanka since these turbulent situations impacted highly on the on-going projects and the Project Management. This research has been conducted as a Case study method and in this case study approach, semi-structured in-depth interview and participants' observation have been followed to investigate the research questions by incorporating the interpretive technique in analyzing the transcribed information from the interview of the Project Manager of the Maga Engineering (Pvt) Ltd, Colombo, Sri Lanka. Researchers found that the software development project of the company has been successfully run during the pandemic and crisis time in Sri Lanka. The virtual teams showed a positive performance since the projects have to be completed within the stipulated time frame. Further, during the crisis time also the organization saved its overhead cost which was a benefit to the company. It is also found that Maga had efficient team leaders/managers to manage these virtual projects during these turbulent situations. However, the teams' performance in the virtual environment is not much efficient as the physical environment. Therefore, the researchers recommend that the right team leaders, the appropriate leadership style, and employees' motivation are very much essential factors to a successful virtual teams' performance especially in crisis situations.

Keywords: Case Study Approach, Crisis, Pandemic situation, Project Management, Virtual Teams.

Introduction

Virtual teams are formed by organizations in the circumstance of avoiding or reducing the interaction among members for various pandemic and other crisis reasons and carry out and accomplish the task successfully without the time delay. In virtual teams, performance can be increased by providing enough training for the team members and reducing the size of the team (Gheni et al., 2016). While working in a virtual team, project team members have to face a lot of problems in communication such as trust, cultural differences, team cohesion, software, collaboration, and environmental challenges (Johnston & Rosin, 2011). By increasing the effectiveness in multiple dimensions, these problems can be eliminated (Munkvold & Zigurs, 2007). Management agenda and leadership style, requirements stealing, irregularity in processes and uncertain roles and responsibilities also act as barriers for continuing tasks of virtual project teams (Lee-Kelley & Sankey, 2008). However, time completion, budget allocation and value delivery happen in a proper manner in a virtual project team because of the determination and proper understanding about the outcome within the team members. Virtual teams are highly suitable

for the projects which consist of cross-functional or cross-boundary skilled inputs.

Considering virtual teams in Sri Lankan projects, leadership styles of project managers affect the success of virtual project team (Fernando & Jayawardane, 2016). Technology facilitates women to engage in leadership behavior within projects that utilize the virtual platform (Carte et al., 2010). Suitable human resources, coordination, communication and regular performance evaluation support to improve performance in Sri Lankan projects that include the virtual working environment (Gamage, 2016). The more the decision making is effective, the more the virtual project teams can achieve success (Shalika, 2014). Besides, there is a positive relationship between independence of the project team and the effectiveness of decision making.

The COVID-19 pandemic situation brought numerous disadvantages to various sectors in Sri Lanka. Considering the tourism industry, it was closed down because of finding a tourist guide as the first local COVID19 patient (Ranasinghe et al., 2020). Considering the education sector, especially universities started to utilize the virtual mode to continue their activities such as

examinations, assessments and thesis supervision despite the challenges concerning online teaching and learning environment and a lack of online teaching and learning skills among staff and students (Rameez et al., 2020). Hence, there is the necessity to have a hybrid education system to address the problems of virtual platform presented by staff and students to make the teaching and learning process more successful. Considering the small and medium enterprises, the pandemic situation caused them high economic and human

Research problem

Due to COVID-19 pandemic situation, the entire world faced a challenge in continuing their day to day personal and professional life styles. As the new normal situation, people started to utilize virtual environment for most of their activities. This affected project management too. Nowadays, the project managers, project team members, sponsors and other stakeholders perform most of their assigned tasks virtually even after the pandemic situation and the consequence of pandemic, economic crisis in the country emerged as a new challenge.

Research Questions

costs such as material shortage, decline in demand for products and services, difficulties in repaying loan and interest, order cancellation, ominous cash deficit and lack of savings, not being able to get employees back to work, high cost in avoiding workplace COVID19 strategies and lack of new orders (Robinson & Kengatharan, 2020). Government support and policies vastly affect for running the small and medium enterprises during the pandemic.

Though this is supportive to continue projects as usual, it is essential to know whether project team members perform successfully in the virtual environment. In order to get the correct finding, researchers selected one of the popular Engineering companies in the country which deal with many construction and software development projects. Researchers intentionally selected the software development project since this project could be accomplished through virtual environment too.

Based on the research problem, researchers developed the following research questions for the current study.

RQ 1: Is the project successfully completed in the virtual environment?

RQ 2: Does the virtual environment cause higher team performance as physical environment?

From the research questions researchers intended to establish the below stated objectives to understand the real situation in the organization.

Literature Review

Project Management

When market orientation moderated the relationship between agile project management and organizational agility, there would be a significant impact of agile project management on organizational agility (Manurung & Kurniawan, 2021). By the way, Deep et al. (2021) found out inept planning, execution constrictions, external constrictions, client-induced constrictions, project constrictions and partner experience as risk factors for real estate construction projects. In addition to that, stakeholder engagement and stakeholder communication highly affected negative risks, opportunities and contingency strategies (Figueiredo Filho et al., 2021). This helped project leaders collect excellent data to deal with

Research objectives

- To investigate whether the project is successfully completed in the virtual environment.
- To examine whether the virtual environment causes higher team performance as physical environment.

stakeholders and improve probability of project success.

Apart from that, Bjorvatn (2021) created a lively, cross-level framework to demonstrate the organizational processes and outcomes that define project-based strategy implementation within an organization. This framework was highly useful for vital discourses in project management, strategic management, innovation studies, knowledge management and organization studies. Managers were aware of the strategic role of inner projects, how they link strategy and performance and the nature of processes and outcomes of associated organizations. However, Moyo and Chigara (2021) utilized factor analysis to determine important parts

with highest ranked parts including organizational perception and project constraint management. Univariate analysis was also utilized to identify the three most critical competencies which were effective communication, leadership and excellent team-building skills. Competencies of construction project managers and demographic-specific interventions could be enhanced by changing curricula designs of higher education institutes and launching mentorship programmes within construction organizations.

Project Management during COVID-19

Chigara and Moyo (2021) identified that change and innovation-related, monitoring and enforcement-related, production-related, access to information and health service-related, on-site facilities and welfare-related, risk assessment and mitigation-related, job security and funding-related, cost-related and COVID-19 risk perception-related factors helped to provide ideal health and safety for the construction projects in Zimbabwe during the pandemic period. Factor analysis had been supportive in this regard. Furthermore, Ayat, Ullah and Kang (2021) acknowledged that working style and behavioral changes, challenges and risks, stakeholders and new directions for the

construction sector impacted to continue construction projects during the pandemic situation. Apart from that, Pakistan had less strength in construction project management during the pandemic due to low digitalization, complex cash flow, abundance of labor-intensive methods, diverse stakeholders, and dependencies on foreign proficiency, imported material and machineries.

Likewise, schedule delays, unsettled cash flows, delayed permits, approvals and assessments, travel restrictions, serious health and safety concerns and lack of material and equipment negatively affected the delivery of outputs of construction projects in United Arab Emirates during COVID-19 pandemic (Rehman et al., 2021). In order to battle with contrary impacts of COVID-19, economic support programs, digitization of processes, fee and fine waivers and health facilities highly supported these project based organizations. The government organizations and stakeholders of construction projects also contributed to handle the effects of COVID-19 pandemic by providing different techniques and solutions. Moreover, Ogunnusi et al. (2021) identified overhead cost reduction, secluded working

environment, focus on health and safety, improved productivity and sustainability goals as positive impacts and low business turnover, delays in construction payment and output, difficulties in working from home and job losses as negative impacts of COVID-19 pandemic on construction projects. They had also found out supply chain management, improvement of construction project management, attentiveness on health and safety and effective virtual working environment as lessons learned for project management during the pandemic period.

Pandemic & Economic Crisis situation in Sri Lanka

Ranasinghe et.al (2021) reframed the resources and capacities of the country identifying the diverse identifications from the perspective of different stakeholders to entrench the vital flexibility after the COVID-19 pandemic. They further introduced measures to build up a strong destination, strategic planning for policymakers and provisions for stakeholders to consider about the health and safety of travelers from future health epidemics. Anyway, during the pandemic situation, Sri Lankan university lecturers

utilized versatility and devotion, pillars of support, conformity over individualism and avoidance and detachment to conduct online lectures successfully (Fernandez-Chung & De Zoysa, 2021). Moreover, Abeygunasekera (2021) found out that Sri Lankan university students and lecturers had different perspectives on online lecture sessions and their benefits during the pandemic. In addition to that, virtual learning environment was very useful to engage in activities and understand the course content during the pandemic due to its flexibility, access to learning resources and use of technology in education (Wijenayaka & Iqbal, 2021).

Nonetheless, Adikaram, et al (2021) identified health and safety bundle, cost-saving bundle and employee motivation and engagement bundle as three main human resource management bundles that would entail human resource management practices and activities. These would be supportive to manage employees in Sri Lankan organizations during the pandemic. Online working, telecommunicating, work from home (WFH), remote working, and more similar conditions were not new, and

their necessity and accompanying settings gained significant traction during the COVID-19 pandemic in Sri Lanka (Rodrigo & Rupasingha, 2022). Harshana & Wanniarachchige (2022) further suggest that the COVID-19 pandemic has introduced statistically significant adverse effects on bank performance.

Moreover, several studies have been conducted about the economic crisis situation in Sri Lanka and its consequences for the economy (Tripathy et.al, 2022; Gunasekara, 2021). However, there is a lacuna in the area of the crisis and its impact for organizations. Therefore, the current study tried to investigate the virtual teams' performance in the organizational context.

Teams

Teams were organizational units that shared a common goal and whose members had a feeling of mutual responsibility for the results (Kimble, 2011). Teams were also self-managing, as to work in this way required mutual commitment if the team wanted to achieve its goal. By working together, team members could develop trust and shared identity that increased their

ability to share and learn from each other. If a team can develop a sense of trust and mutual respect, then people feel able to share their thinking, the reasons behind their conclusions, and even the doubts that they have about their conclusions.

Team-working strategies have been used in various industries, from mobile phones to banking and financial institutions (Gyllenhammar, 1977). Some examples could be found in manufacturing, where teams of multi-skilled operators worked together to build a complete subassembly.

Virtual teams

The nature of modern teamwork has changed considerably (Kimble et al., 2010). Due to the power of information technology and fastcommunications networks, organizations have become geographically distributed, and firms have begun to work in partnerships that span different industries where once teams were about relationships inside an organization, now they include those that were earlier considered to be outside, such as customers, suppliers, and other organizations with whom they work together.

Virtual teams in Projects

Virtual project teams provided educators and international organizations with comprehensions on how projects deliver the skills to reduce costs, access knowledge, skills and abilities across borders, maintain work schedules and arrangements, and utilize multiple time zones for enhancing productivity (Swartz & Shrivastava, 2021). Furthermore, social media tools such as YouTube, Dropbox, SlideShare, flickr, CrowdStorm and Instagram facilitated virtual project teams to communicate efficiently and confidently affecting team dynamics (Kanagarajoo et al., 2019). Apart from that, virtual teams helped project based organizations reduce costs and improve performance and benefits (Lin & Roan, 2021). It was tranquil to manage different traits of team behavior at each stage of development when projects were implemented with virtual teams. Managers and leaders of the organization could use the quantified approach to improve processes, set priorities, provide principles and guidelines and improve virtual project team performance.

Likewise, shared mental models supported to enhance quality of communication in virtual project teams (Zamani & Pouloudi, 2021). It was essential to arrange all of

project work properly in order to gain a satisfactory virtual team performance. However, when peer evaluation was applied for virtual project teams, they showed high group effort, low productivity, low motivation and ultimately low team performance (Tavoletti et al., 2019). Peer evaluation could improve only the team's opinions of strength and performance.

Virtual Team Project Management

Apart from evolving communication, virtual teams have enhanced business opportunities for people around the world (Reehman et al., 2010). Virtual teams bring exposure to the business from an information and cultural point of view.

There was an unanticipated outcome as in the limited outsourcing actions the organization's project management strategy simulated their collocated approach (Casey, 2010). This had been facilitated by the nature of the work which was self-contained, straightforward, and required basic technical skills to be executed. Where only straightforward outsourcing had been undertaken, a collocated project management strategy had been successful. As with all the successful projects, it was required to plan, monitor, and control costs,

time, and quality. In addition, there was the necessity to plan, implement, and monitor communication and coordination activities with helpful policies and procedures. A logical team must be developed from a diverse and dispersed group that was required to work as a single unit to achieve goals. Procedures were needed to be developed to identify and address these problems when they surfaced. There was a clear need for the development of trust among virtual team members. This was a serious problem which time did not reduce which must be acknowledged by management and specific measures taken to address it.

Organizational Virtual Team Strategy

A major component for the success of long-term organizational strategies was the level of sustained support given by senior management, for its implementation, and operation (Casey, 2010). For securing the required support for a geographically distributed virtual team strategy, it was necessary to implement an approach to achieve these goals and objectives. The potential for cost saving was cited as a factor for organizations embarking on that kind of strategy.

Soft and hard skills were needed for the IT project manager to lead a virtual team (El-Sofany et al., 2014). However, the research has not given any indication as to what was needed to manage an IT project using virtual teams.

Team empowerment

It was necessary to bring virtual teams together for face-to face meetings to increase process improvement (Kirkman et al., 2004). Where face-to-face meetings are not feasible, managers must make more efforts to empower virtual teams to deal directly and decisively with process improvement issues. Team empowerment was the increased task motivation that was due to team members' collective, positive assessments of organizational tasks (Kirkman et al., 2002).

Organizational problems on virtual team

In virtual teams, the status and identity of a person were uncertain, as many of the basic indications in the physical world were absent (Kimble, 2011). Besides, in the virtual world, one could have many electronic personas based on the time and energy. At the individual level, this led to the problems of trust, but at the level of the team, it led to difficulties in establishing a sense of collective identity and could inhibit

effective communication among team members. Identity helped to establish shared meanings through providing a common perspective. Within a group, a shared interest or a common domain of knowledge provided the "common sense" definitions for the words and terms used by the group. Sharing that group's identity implied the shared knowledge and shared competencies.

McDermott (1999) argued that cross-functional teams focused on outputs such as

Methodology

In this paper, researchers adopted the case study method. The case study method is a very popular form of qualitative analysis and involves a careful and complete observation of a social unit, be that unit a person, a family, an institution, a cultural group or even the entire community. It is a method of study in depth rather than breadth. The case study places more emphasis on the full analysis of a limited number of events or conditions and their interrelations. The case study deals with the processes that take place and their interrelationship. Thus, case study is essentially an intensive investigation of the particular unit under consideration. The object of the case study method is to locate

products, processes, or market segments, while Communities of Practice focused on working together to solve shared problems, to learn, and to build a body of knowledge. He identified that Communities of Practice could maintain a technical focus within a broader discipline, while cross-functional teams united those disciplines around a common product. Instead of sharing product or process-specific information via team leaders, they shared knowledge and standardized practices across teams.

the factors that account for the behavior-patterns of the given unit as an integrated totality. Therefore, researchers have chosen this method by incorporating the interpretive technique in analyzing the transcribed information from the in-depth interview of the Project Manager of the Maga Engineering (Pvt) Ltd, Colombo, Sri Lanka and through the participants' observation. Although the particular company has many construction projects, researchers only considered the software development project since it has to be completed within the stipulated time frame. Moreover, researchers gathered other organizational data from the published materials.

Results and Discussion

Researchers interviewed the Project

Manager and the relevant questions and the respective answers are given below.

Question 1: Please give a brief description about the NetExam software project.

We have structured the hierarchy as General Manager and Director after that the Head of Engineering. It is a software development project named as NetExam a Learning Management System. We have been as vendor for different clients. We are getting those clients from the head office. Most of their clients are from US. So what we are doing is we are customizing our product and they are giving some enhancement and all are as per the requirement of the clients *Engineering lead and me (Project Manager) are controlling everything.*

Question 2: When did you start this Net Exam?

December 2007 in Sri Lanka.

Question 3: which types of organizations or institutions you supply that Learning Management System?

Mainly we are focusing on companies which are training the people. Dell, Oracle, MacAfee, Johnson and Johnson and Sony.

Question 4: How about your experience in lockdown and crisis time?

When you are doing work from home, it is a difficult task to the top management, when you are working in the office and when the people are working from home the difficulty comes to the top level management. They are getting stress because when the people are working from home they can get a lot of excuses especially in Sri Lanka, like power failure, internet failure and other health related issues as well. In the office they can't get these privileges but only their performance is measured. If they have any performance issue and the works are delayed, there is another mechanism adopted to complete the tasks, but when the work from home is practiced, if the work is delayed, we don't have any control so the pressure comes to the top level. That's the difference.

Question 5: Is there any benefits while work from home (WFH)?

For us actually only the benefit is power. Power consumption and water consumption are less. These will be a great benefit since the power cut and fuel crisis are existing problems in the country. Again if we want to use the electricity during the power cut times, we have to utilize the generators. Then it will increase the fuel consumption. Therefore, the WFH practice is beneficial to us.

Question 6: What about the progress of this project when you work from home?

That's depending on the team. If we have a good trusted team then the progress can be faster as similar as the office.

Question 7: Do they finish their assigned task on time when they are at home?

Yes. That's what we have to manage. People in the top, we get into pressure. If the engineers are working or not, we have to check time-to-time.

Question 8: Do you take phone calls or is there any other mechanism in monitoring the project?

Yes, every day we are having managers' meeting. We have different teams and those team managers have been met together in the morning meeting. From the meeting we get updates and assign our works to the team leaders. They will monitor the works accordingly.

Question 9: During the pandemic period also do they follow the office timing to their work?

Yeah, at the beginning period we get meeting every day and getting ready for work. At least 1hour we need for a meeting but when we work in the office, we can know about their progress time to time physically.

Question 10: Do all the staff finish their assigned work before 5pm every day?

That's depending on people. Some engineers work more than office hours during the pandemic period. Some staff request us to allow them to work in the office, because they cannot consider their work from home practice. Sometimes we have allowed them to come and work in the office as individually.

Question 11: Do all staff get all the mandatory facilities to finish their work from home tasks?

they have all software In their machine. We arrange all those facilities to them.

Question 12: Is there any changes in the progress of the project?

No, progress is the same because whatever struggles we face is not an issue but we have to finish our tasks on time.

Question 13: What about the success of team working?

We do have google meetings and video conferencing. Through the meeting software we manage the team.

Question 14: Is that efficient in working as a team in pandemic and crisis times?

No. Working at the office is the efficient way. Because, we cannot interact the staff directly and it is not possible to understand the problem they face to complete the tasks.

Question 15: What about the communication level with your staff during the pandemic and crisis period?

We used mostly google meeting and it is the way for communication among the staff.

Question 16: Whether all staff have enough knowledge about the software and internet?

Yes, because we usually run a software company. Anyhow I face this problem with accounting department, but they are supposed to familiar with all software.

Question 17: What are the barriers you face in managing the team?

We have releases on every Friday, which means we have to update the websites of the clients based on their requirement. In some major releases we faced difficulties on testing the updates with the team before release, because production team members are the persons have to do the testing but in pandemic situation we never work together so, we face difficulties on it.

Question 18: How do you overcome that difficulty?

We got some permission from Public Health Officer to work together and work within some allowed time period with allowed team members. Our team members work on weekends too to finish the release.

Question 19: Are those problems continued and affecting the project now?

No, because when we work as a team in the same place in the office there is no problem to finish our release. Because some times when we work in the online some guys, they finish their personal works from the home and will join to the meeting or the job, and then we cannot organize the team in the same time to do the preparation work to finish the release on the time.

Question 20: Could you please suggest any ways to overcome the barriers faced on this work from home practice?

All team members are human beings so their attitudes are also definitely different. Then we have to understand every person's attitude and character to handle them in the correct way because in the pandemic and crisis period, they are also morally very much affected.

However, we got success because we work with internet. If we have a laptop and the network connection, we can work there at our convenient time without tension. However, work in physical environment is the most effective way to get the success because the working environment will boost the staff to work and monitor the tasks appropriately.

Researchers found from this study that virtual teams have become popular and effective after the pandemic and crisis

situations in Sri Lanka since there were WFH mechanisms practiced by the government of Sri Lanka among various sectors. Considering virtual teams in Sri Lankan projects, leadership styles of project managers affect the success of virtual project team. It supports the findings of Fernando & Jayawardane (2016). Apart from that, virtual teams helped project based organizations reduce costs and improve performance and benefits which is similar to the findings of Lin & Roan (2021). If the decision making is effective, the virtual project teams can achieve success. The study of Shalika (2014) also supports the

Conclusion & Recommendation

According to the findings of the study, researchers conclude that the software development project of the Maga Engineering (Pvt) Ltd, Colombo, Sri Lanka has both positive and negative effects in the completion of the project. The success and failures are determined by many factors. However, during the pandemic and crisis time in Sri Lanka, the virtual team showed a positive performance since it has to be completed within the stipulated time frame. Further, during the crisis time also the organization saved its overhead costs. It is

findings of the present study. There were studies found that the virtual Team's performance was in negative way during the pandemic situation (Harshana & Wanniarachchige,2022; Rehman et al., 2021). As per the situation in the particular company, the project is successfully completed in the virtual environment based on the Team Leader's skills and the members efficiency. However, it is also found that the virtual environment didn't cause higher team performance as physical environment due to various issues in the virtual environment.

also found that Maga had efficient team leaders/managers to manage these virtual projects during the above stated turbulent situations. However, the teams' performance in the virtual environment is not much efficient as the physical environment. Therefore, the researchers recommend the right team leaders should be assigned to each project and the appropriate leadership style and employees' motivation are very much essential factors to a successful virtual teams' performance especially in crisis situations.

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