VIRTUAL TEAMS IN THE DIGITAL AGE

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Abstract: The world, nowadays, is closer and closer thanks to information communication technology (ICT). Actually, virtual teams are considered as a great way to connect people and bring advantages to organizations. From the existing literature, it is expected to extend knowledge about two big issues: the global virtual teams and ICT, as well as their benefits and drawbacks. For doing so, many academic and scientific journals are used for the purposes of summarizing and synthesizing. This study is secondary research combining some practices to explore the issue. On the one hand, virtual teams enable to cooperate with members from different geography and time zones. On the other hand, organizations have to deal with many challenges when applying them. Two typical examples of a reputable global brand and the success of a national company are presented to explain this issue, including IBM Company in the USA and FPT Group in Vietnam. By identifying the pros and cons, organizations can suggest suitable solutions to manage and establish their teams in a better way.

Keywords: information communication technology, virtual teams, virtual working, team management, multinational teams

1   Introduction

In the age of booming technology, virtual interaction is increasingly becoming the basis for establishing trans-local production networks with the support of computer-mediated communication [14]. In fact, mobile technology has removed the space and enhanced communication [46]. Therefore, the world is getting closer and closer among different time zones, areas, geography, and nations.

Technology takes a crucial role in improving processes, making many things smaller, faster, more powerful and cheaper [5]. In fact, Brynjolfsson & McAfee [5] show that the power of the computer has expanded its strength thousands of times in the last 30 years. Grosse [13] indicates that many remote places are connected by technology. It also helps build and establish relationships with strangers without moving or face-to-face meeting. However, this is not always a perfect method to bring all benefits to organizations or everyone [5].

These days, many companies create competitive advantages by building global collaboration that can work on non-barriers of geography. Then, these special groups are called virtual teams created by the variety of nations and cultures, working experience, and different perspectives on strategic [49]. A survey from the Society for Human Resource Management [47]

reveals that 46 percent of enterprises are using virtual teams. In this survey, 379 randomly selected Human Resource professionals from their memberships indicate that 66 percent of multinational firms cooperate with global virtual teams and 28 percent of enterprises with U.S-based operations depend on these groups. Besides, another investigation of 600 organizations all over the world about teamwork reveals that three-quarter of teams are complicated cooperation in multi areas, 30% are working in different time zones, 50% are in virtual teams [48]. Therefore, it is evident that dispersed working proves its benefits by the wide usage of many global firms.

Firstly, this research reviews the development of ICT and how ICT promotes virtual collaboration, and what the related advantages and disadvantages are. Secondly, the practices of IBM company and FPT Group are discussed in the virtual context to understand how it works in reality.

2   Methodology

This study uses secondary research (or desk research) relating to the collection, summary, and synthesis of existing research rather than primary research [8]. Glass [12] defines secondary analysis is the re-analysis of data to answer the original research questions with better statistical techniques or answering new questions with existent data.

The databases for this research are collected from books and internet-based literature indexes, including EBSCOhost-Elton B. Stephens Co. Host, ScienceDirect, Web of Science, IEEE Explore, ACM Digital Library, Willey, SpringerLink.. For further information, some websites satisfied with the criteria in authority, purpose, coverage, currency [57] are used in this research (ex. Business Insider, The New York Times, IBM sites, FPT sites.)

In order to get a clear view of the virtual context, an example is analyzed to explore the issue in practice. Therefore, IBM and FPT Group are taken as a typical example because of their success in remote working as mentioned before. They are two reputable companies working on technology area with an international and national scale. Most of the information is collected from IBM and FPT sites, its annual or internal reports and news, and some relevant studies.

3   Digitalization

3.1   Digitalization

Digital is understood as numbers in which the information can be sorted, stored, changed and processed. For example, the basic forms of a long series of numbers are a photo from a digital camera, a new application, a text message – as mentioned by Woodford [52]. Therefore, digital

technology can be a great tool not only for entertainment but also to support people to complete their tasks more quickly, safely and conveniently than traditional methods.

In this research, digital can be understood as ICT (Information communication technology). OECD [37, p. 90] defines ICT as products *intended to fulfil or enable the function of information processing and communication by electronic means, including transmission and display*.

3.2   Benefits and challenges of Information Communication Technology

Madadipouya [32] mentions that if ICT is well aligned to the business, it can support a variety of strategic objectives, including the redesign of innovative applications and business processes. It also links organizations with their business partners and facilitates sharing information. Costs can dramatically be reduced as well, and acquiring competitive intelligence can be fully supported. Besides, it helps to drop the constraints of time and space during doing knowledge work [9]. ICT enables to increase productivity and effectiveness [3, 5]. Moreover, it has capacities for communication, collaboration, and knowledge exchange [3, 27].

While ICT produces a "*competitive weapon*" to enhance the ability of enterprises in the dynamic business environment [41], it can bring many challenges for organizations and individuals to get used to new technology. ICT can create a gap between high-skilled and low-skilled employees [5] and change the structure of the labor market [38]. While ICT can increase income inequality [5], it can decrease well-being [28]. Furthermore, organizations face many problems in keeping up with and accepting the changing of technology [40].

4   Virtual teams

4.1   What are virtual teams

Lipnack and Stamps [30, p. 6] mention that "*a virtual team works across space, time, and organizational boundaries with links strengthened by webs of communication technologies.*" Henry and Hartzler [16, p. 5] define global virtual teams as "*groups of people who work closely together even though they are geographically separated by miles or even continents*".

Overallvirtual teams are remote workers who work far away from their office either at home, in other cities or different countries. In these teams, the main interaction is taken place with the support of digital technology, including e-mail, voice mail, fax or other information communication tools offered by the company [15]. Bal and Teo [2] confirm that a global virtual team should satisfy four common criteria and some additional characteristics, namely (1) a dispersed global group, (2) driven by common purpose, (3) using communication technologies, (4) cross-boundary collaboration.

4.2   Advantages and disadvantage of a Global Virtual Team

Global virtual teams are applied significantly because of their ability to bridge time, space and organizations [26]. Table 1 represents a clear summary of the benefits and drawbacks of virtual teams.

Table 1. A summary of the main advantages of virtual teams

Advantages	References	Disadvantages	References
Reducing time and cost	[4, 6, 43, 25, 13]	Bringing problems in resolving conflicts	[18]
Creativity and originality among team members	[4]	Lack of physical interaction	[6, 25, 24]
Ability to recruit talented employees over the world	[43, 6, 25]	Getting problem in developing a conceptual understanding of an issue	[43]
Improving productivity or higher profit	[6, 34]	Lack of expertise in technological application	[4, 31]
Bringing equal opportunities to all employees	[6, 4]	Challenge for firms to apply a virtual team because it does not fit all types of organizations	[4]
Reducing age and race discrimination	[4]	Challenge for employees	[4, 25]
Knowledge sharing	[39]	Problems in trust, expectation, experiences	[25, 24]
Reduce pollution	[39]	Trouble in promotion	[25]
Ability to work across places and time zones	[43, 42, 26, 30]	Challenges for managers in changing management style to adapt to new virtual collaborations	[25, 24]

Source: Summarized by author

In virtual teams, the expenses for accommodation, transportation, travel, and daily allowances can be reduced by the support of technology systems [4, 13]. Despite the flexibility in a virtual team such as the freedom in geographical areas or time zones, team members face many problems including levels of trust, expectations, experiences, cultures, and clash personalities [25].

5   Global virtual teams in the technological age

Emergence of global virtual teams in the 21st century

Employees have had more options for time and place to work. According to a study of the Families and Work Institute in 2016, 66 percent of employers allow their employees to work remotely, while there was only 34 percent in 2005. The year 2016 witnessed a slight increase in the choices of managing time, up to 91% from 78% in 2005 [35, 36].

Recently, virtual teams are more universal and 48% of respondents indicate that in 2016, over half of their teams are operated by members from different countries, an increase of 17% compared with that in 2014 [44]. In fact, this phenomenon tends to increase quickly due to the development of technology. According to Laitinen and Valo [29], communication technology in virtual teams meetings provides some meanings, such as technological tools, a challenge, a subject of guidance, a useful benefit, an object of competence, a way to express affection, or a shared space. Therefore, communicative technology is considered as a crucial element for virtual team members to complete their tasks.

6   Virtual teams in IBM

According to Sarah [45], IBM has operated remote work for decades and occupied a significant percentage of employees working in other places than centers or headquarters. The company began to install special equipment called "remote terminals" to support employees to work outside the office in the early 1980s. In 1995, it was the first time, IBM started to encourage employees to telecommute. The purpose of this program was to retain talents by respecting and supporting the balance between their life and work [20].

To prove their strong statement that "*Innovation rarely occurs in isolation*", 12 research laboratories were built on six continents as collaboration centers where more than 3,000 researchers have shared and implemented ideas leading to great breakthroughs [22]. In 2005, when remote working became popular and IBM facilitated 40 percent of about 400,000 IBMers to work in a virtual environment [10, 15]. In early 2006, small teams of innovators around IBM began exploring virtual world technologies for business enablement [7].

6.1   The virtual teams meeting in IBM

According to Fortune, IBM is one of the Top Companies for Leaders in applying technology to narrow the distance among human [10]. In 2007, IBM set up a task called OTTO (for Other Than The Office) to connect virtual workers by informal online networks. As for a high-tech company, IBM is able to create and apply many specific tools to support working in a virtual environment. Therefore, some platforms are conducted to complete the task, such as Active Worlds, Forterra OLIVE (On-Line Interactive Virtual Environment), OpenSimulator, Second Life, Unity 3D, or Beehive. These platforms are used for collaborating, meeting, training, learning, and events.

Second Life is a virtual space where IBM conducted as a virtual world firstly at the beginning of 2006. It provides a virtual space for IBMers around the world to meet, connect and open new business connections. Via Second Life, users can know who is using it and interact with them. This program provides many options, such as text chat, voice functions, and avatar customization [7]. In the virtual spaces, the representation of avatars opens new access for flexible identity, personal information, reputation, and trust [1].

Figure 1. IBM Academy of Technology poster session

Source: Cherbakov, Brunner, Smart and Lu [7, p.10]

Figure 1 shows how Second Life was used by IBM to create a poster session. IBMers are using Second Life for many purposes, such as implementing meeting and events with both internal and external participants, team building, conferences, training and education, product marketing, demonstrations, e.g. the green data center and visualizing complex structures [7].

6.2   The reasons for virtual teams in IBM

By allowing 40 percent of total IBM's employees working remotely, IBM reports that virtual working helps reduce the office space by 78 million square feet and bring an effective cost saving of more than $100 million in the US annually [19]. Besides, enterprises can save travel and hotel expenses. The performance of the company indicates that in 2007, over 75% of IBMers felt working remotely and flexibly brought positive effects on performance, morale, and commitment. Besides, a rise of 7% of employees recognizing the support from their managers in both work and life [20].

Virtual teams create competitive advantages by recruiting excellent employees from over 175 countries [19], and IBM is a successful firm to do it [22]. Virtual working is a great solution to connect talents, researchers or employees in any regions in the world [10, 15]. Global virtual teams enable to broaden the diversity that leads to innovation and success for IBM [21]. Therefore, virtual teams can be used as a chance for a change in the company and help adapt to the new environment more quickly [19]. In a study of Hill et al. [17] conducted in 48 countries where IBM operates, a survey of IBM Global Work and Life indicates that virtual workers show higher performance than those who work in home office due to the flexibility during the working process.

6.3   The challenges of virtual teams in IBM

First, trust normally built through a face-to-face way is considered as the most challenge in a virtual team [19]. Second, a virtual team can affect the quality of the communication process because of a shortage of physical interaction among team members during a virtual conversation. Third, the differences in culture might appear in global virtual teams and create some related concerns. Fourth, the size of a remote team should be less than twenty members; otherwise, it becomes complex for managers and the company. Finally, Hill et al. [17] indicate that virtual office can relate to the decrease in work and life balance and less success in personal and family than traditional office workers or home office workers because of personal and family concern.

6.4   The trend of backing to the office and the reasons

There is a decline in management rewarding support for flexible work arrangements from 31% in 2005 down to 14% in 2016 [35]. According to Weller [50], about 2,600 employees who are in IBM's marketing department and a number of employees in IT, and procurement and Watson-related department were informed for co-location to work in one of six US cities, including Atlanta, Austin, Boston, New York, Raleigh, and San Francisco. Thereby, employees have choices to work in their preferred cities or they can find a new job freely. Besides, Michelle Peluso, who is an IBM's chief marketing officer, mentions that "*There is something about a team being more powerful, more impactful, more creative, and frankly hopefully having more fun when they are shoulder to shoulder*". She believes that "*Bringing people together creates its own X Factor*." [50] This statement shares the same message to stop remote work and encourage office time.

As a giant in the technological industry, IBM is the pioneer in facilitating employees to work remotely and is proud of the benefits of saving and productivity [23]. However, IBM spokeswoman Laurie Friedman claims that "*In many fields, such as software development and digital marketing, the nature of work is changing, which requires new ways of working. We are bringing small, self-directed agile teams in these fields together*". Therefore, IBM is changing its policy, in which labors are called back to office life [23, 51].

In one of IBM's internal research, IBM's spokesperson cites that "*marketing teams that work in a co-located, agile environment are more effective and have better job satisfaction. In fact, there has been a very positive response to making this universal across marketing*." [50] The evidence shows that IBM recognizes the effectiveness of face-to-face teams in some specific cases. Furthermore, it points out the decrease or revenue in the quarter over five years in its report.

In conclusion, the policy calling employees back to the office would open a debate about benefits and drawbacks to the organization. Actually, IBM is not the first technology company planning to change its policy. In 2013, Yahoo under the leadership of CEO Marissa Mayer required its employees who work remotely to relocate company facilities [23]. There is no right answer for organizations to work or not in a virtual environment. The decision of working

whether with virtual collaboration or fixed in a brick office should depend on the different types of work.

7   Implication in Vietnam

The industrial revolution 4.0 is the current trend in automating and exchanging data in production technology. It includes virtual systems, everything connected, and cloud computing. According to Truong Gia Binh – CEO of FPT Group [53], humans are cooperating with a highly knowledgeable and intelligent partner – Robotics. The gap between the real world and the virtual one can be filled with technology and innovation. In this evolution, therefore, Vietnamese enterprises are required to keep up with the change of trend and quickly apply new technologies in their business for better effectiveness. Otherwise, they will be out of date and losers in their market.

7.1   Reason for virtual groups in FPT and its application

FPT Group is the leader in researching and developing new technologies and is present in 63 provinces with more than 32,000 employees, including 13,695 technology experts, engineers, and developers. Besides, this company opens 200 trading rooms and appears in 33 countries of the 5 continents [54]. It is necessary to frequently connect human resources among its headquarters, branches, and departments when operating in such a large scale to complete the common goals. Therefore, virtual groups are applied to connect employees from different parts of Vietnam into a group without moving. This kind of team can help members connect, exchange information and work anytime and anywhere. As a firm, FPT Group can save expenses for transportation, accommodation, and document prints.

Figure 2. Virtual meeting room (Source [55])

In case of high demand in the connection between Hanoi and Ho Chi Minh City, FPT's business department and its online journal department have to open online meetings with their partners frequently. Therefore, a virtual group is necessary to work across distances. Normally,

their employees use some social media such as Facebook or Skype to connect in the virtual conversation. However, these media and applications are not stable with a bad quality of sound and image. Besides, using the employees' private accounts may reduce their professional working style during online meetings with their partners [55]. Therefore, FPT becomes a leader who has changed the traditional working method by experimenting and developing a solution named the Virtual meeting room to solve the connection demand in different areas since 2017.

7.2   Benefits and difficulties of virtual meetings in virtual groups

Opening virtual teams in virtual meeting rooms is simple in usage and cost saving. With this application, it is easy to invite users to join the online conference through a simple URL. Besides, an online meeting room is set up with many functions, such as meeting chat, live stream conference, saving conferences by videos for documents purpose, desktop sharing and presentation [55]. Moreover, this innovation brings more choices for users with two different systems, including internal meetings and public meetings [56]. The quality of image and sound is improved and the meetings can be applied in smartphones [56]. Furthermore, virtual meeting rooms are a great way to solve the shortage of space in the company.

This application is used for many purposes, such as conferences between two big regions monthly, setting up online meeting rooms with the same functions as traditional ones, and opening a virtual meeting room by a far-distanced journalist to exchange information. This innovation helps FPT Group save hundreds of million VND and increase the performance of information exchange over 30%. Therefore, virtual meeting rooms are being daily applied in the Engineering department and the Business department in FPT online and electronic newspaper Vnexpress [56].

It can be seen that this is the first step of FPT Group for its building and applying virtual worlds and e-commerce. Besides, the 4.0 industry revolution and artificial intelligence are bringing many opportunities for innovating and creating perfect tools for virtual working. With its vision to lead new technology, FPT Group tends to follow the trend of virtual working. Due to the new working environment, managers should improve their ability to guide their virtual teams, in which the members can be different in thinking, working style, and backgrounds. Therefore, they should have many skills, including conflict resolutions, time management, or how to encourage or train their team members when they are in a far distance.

8   Conclusion

8.1   Conclusion and discussion

This research examines the virtual collaboration in the age of technology and the practical example of this kind of work. The paper aims to help leaders, team members, and organizations

have a clear and bright perspective on the virtual context to implement the virtual environment for remote cooperation and creating competitive advantages. In the first part, the paper defines virtual teams, ICT and their emergence as well as the summary of their benefits and drawbacks. In the second part, IBM and FPT practices highlight the same views for the benefits of virtual teams on the development and success of their organizations.

In the future, virtual teams will become a "*natural way*" [30, p. 241] and commonly used in many organizations [33]. The cooperation between virtual teams and technologies brings opportunities to reshape the shared world by affecting the effectiveness, value-based performance, expenditure, and decentralization [30]. However, it can be a difficult task to implement and manage a virtual workforce because the organizations are unique in terms of challenges and demands [11]. The decision of working virtually should depend on the specificity of work and points of views of organizations.

Although FPT Group is the pioneer in following the trend of revolution by creating innovation in virtual cooperation, it is not difficult to recognize that this Vietnamese high tech company still stands behind the companies from developed countries for a decade. While IBM created virtual environments for virtual teams in 2007, a virtual meeting room did not appear at FPT until 2017. Therefore, Vietnamese companies should have their own strategies to keep up with the trend and bring it into their opportunity to gain the best result.

8.2   Limitation and further research

The research is conducted via the secondary research and explores the literature from every industry. For future research, it would be interesting to enlarge the study scale by looking at more international and national companies and comparing the differences among them in terms of virtual collaboration issue. Then, quantitative research should be carried out to collect the response of team members and managers during working in a virtual team and find the factors that affect the performance of such teams.

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