IMPACT OF VIRTUAL TEAMWORK IN THE ENVIRONMENT OF TECHNOLOGICAL TRANSFORMATION ON PERFORMANCE OF THE IT COMPANIES

Bayan Hisham Alraqqad, Career counselor at Jesuit Refugee Service (JRS)

ABSTRACT

This research is aimed at investigating the impact of virtual teamwork on the performance of IT companies.

To achieve the objectives of the research, the researcher depended on quantitative research methods because of its relevance to the research topic.

For the purpose of data collection, a questionnaire has been developed by the researcher to collect primary data from the respondents, while the secondary data was collected from a deep review of previous studies.

The study population consisted of managers, head of divisions, and employees working in IT companies in the capital of Jordan, Amman.

The study sample was selected by simple random sampling and there were 100 individuals who participated. 75% of surveys (75 out of 100) were valid for statistical processes.

Data was analyzed using (SPSS) software, statistical package for social sciences. Based on the data analysis, the researcher proposes a number of suggestions and recommendation to improve performance of virtual teamwork which will ultimately improve the IT companies' performance.

Keywords: Virtual Teamwork, Technological Transformation, IT Companies

INTRODUCTION

The information and communication technology revolution, the huge advancements in information technology, globalization, and new trends in the market have imposed tremendous challenges on the managers of firms to develop strategically flexible organizations that are able to cope and respond to the dynamic business environment and to the increasingly competitive marketplaces.

The new generation of information and telecommunications provides the foundation for more resilient organizational structures and forms including the adoption of virtual teams which enables the firms to be more flexible in facing the turbulent business environment, which is a continuing to shift from production to service and knowledge-based work environments.

Accordingly, the adoption of virtual work teams takes place through sophisticated technological tools, such as video conferences, tele – conferences, internet and e-mail (Symons & Stenqel, 2007). Virtual teams are possible only because of recent advances in computer and tele-communications technology. These technologies define the operational environment of the virtual team and the ability of the team members to share information, ideas, experiences, and skills.

Research findings demonstrate that virtual work teams could produce significant savings for organizations due to reduction in travel expenses, meeting times, and other logistic expenditures (Carins, 2013). Also, it was found that virtual work teams help organizations from different sectors be more adaptable to the growing globalization and market competition, changing organizational structures, and high expectations from the customers and users (Kanar & Bell, 2013).

Statement of the Problem

The problems this research seeks to address stem from the need to find out the impact of virtual work teams on firms' organizational performance when they adopt and employ this strategy to conduct their business in a technologically driven business environment.

Questions Emerging From the Statement of the Problem

From the problem statement the following questions emerge:

1- What impact do virtual work teams have on firms' ability to achieve a competitive advantage?
2- What is the impact of virtual work teams in enabling firms to face the challenges imposed by the rapid technological changes in the business environment?
3- What is the impact of virtual work teams on employees' performance, which ultimately reflects on the firms' performance?
4- What are the advantages of employing virtual work teams for the firm?

Importance of the Research

This research is important mainly for the reason that it attempts to answer questions and to clarify the impact of forming virtual work teams and the advantages of adopting this business strategy and its impact on firms' organizational performance.

Objectives of the Research

This research aimed to achieve the following objectives:

1. To find out the impact of forming virtual work teams on firms' organizational performance.
2. To find out the impact of virtual work teams on achieving competitive advantages.
3. To find out the impact of virtual work teams on enabling the firms to face challenges imposed by technological transformation.
4. To shed the light on the employees' attitudes toward virtual work and its impact on their performance.

Significance of the Research

The research is significant for two reasons:

- Theoretical significance: by adding new understandings and insights about the impact of adopting virtual work teams on firms' organizational performance in the midst of technological transformations.
- Practical significance: applying this study finding will serve as a blueprint for the companies adopting the virtual teamwork, also this study will open up new researcher's avenue regarding virtual teamwork and IT companies' performance.
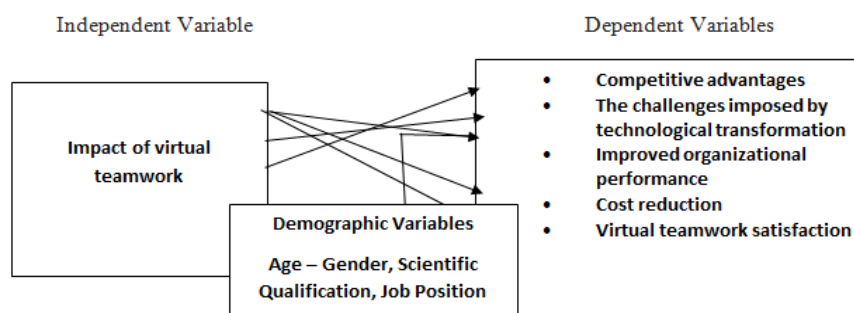
Model of the Research

FIGURE 1
INDEPENDENT VARIABLE AND DEPENDENT VARIABLES

Hypotheses of the Research

Ho1: There is no impact with statistical significance at significance level (α≤0.05) of virtual work teams on firms achieving competitive advantage.

Ho2: There is no impact with statistical significance at significance level (α≤0.05) of virtual work teams on facing challenges imposed by technological transformations.

Ho3: There is no impact of virtual work teams on improving organizational performance.

Ho4: There is no impact with statistical significance at significance level (α≤0.05) of virtual work teams on cost reduction.

Ho5: There is no impact with statistical significance at significance level (α≤0.05) of virtual work team's on employees' satisfaction.

Limitations of the Research

Limitations of the research including the following:

1. Temporal limitations: this research is conducted in the year 2020-2021.
2. Spatial limitations: this research is limited to information technology firms.
3. Human limitations: it is limited to the managers, heads of divisions and employees in IT firms.

THEORETICAL FRAME AND LITERATURE REVIEW

Information and communication technology enable organizations and individuals to communicate through time and space in real time. Businesses are capable of accomplishing their tasks almost instantly from diverse geographic locations around the world, regardless of the distance with the customers, enabling all firms to take advantage of these technologies (Gatautis, 2009).

Virtual work teams are working under the pressures created by technological transformations to produce clear solutions to issues faced, and to achieve higher levels of perceived performance. Saying that, employees exert extra efforts in order to achieve the organization's objectives and customer's satisfaction (Mukherjee, Lahiri & Billing, 2012).

Inductively, workplace will impose many changes on business environment in terms of re-thinking its organization structure and re-evaluating its work processes.

Due to the developments in IT, new workplaces will no longer be restricted by geography, time, and organizational boundaries. Virtual workplaces will allow productivity, flexibility, and collaboration between team members to reach new levels. This will be happening in the shadow of increasing global competition and recent advancements in IT.

Inductively, on the basis of this detailed categorization, a number of themes began to emerge. Specifically, these themes were identified because they represent areas where there were either consistent results.

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Virtual teams are defined as geographically dispersed, electronically dependent, dynamic teams that include diverse members working remotely, in which members share a mutual goal and work to achieve the organizations objective, in addition to that, members work completely virtually and only interact *via* ICT (Peralta et al., 2015). Virtual teams are growing in number and importance (Kirkman & Mathieu, 2005).

Grober & Baumol's (2017) study entitled "Virtual teamwork in the context of technological and cultural transformations" aimed to show that mobility and flexibility influence our everyday lives and intensely alter the way we work, and the deployment of virtual teams concur with the new chances emerging with these new trends.

The researchers have indicated that employees aspire to work virtually due to benefits such as, flexibility regarding the location and flexible working hours.

They also mentioned that organizations deploy virtual teams to remain competitive regarding new technological opportunities, employee retention, and because of the costs savings from working digitally.

Benetyte & Jatuliviciene's (2011) study entitled "Building and sustaining trust in virtual teams within organizational context" aimed to show why and how trust and its components are important within an organizational context. They also discussed specific challenges virtual teams face when attempting to establish trust between its members due to the fact that virtual teams is featured with geographic dispersion, electronic dependence, dynamic structure and cultural diversity, and that mainly alter the level of trust needed

Moreover, the researchers have provided suggestions as to what actions and behaviors can build trust in virtual teams, in order to overcome the challenges specific to virtual teams.

The researchers have shown that trust levels in a virtual team can be improved. This was after evaluating the trust of virtual teams' weaknesses with a focus on openness and honesty and concern for internal and external stakeholders.

Medina & Macias' (2018) study entitled "Perception of transformational leadership style and its effectiveness on Virtual Work Teams (VWTs): A literature review in the organizational context" aimed to present the findings of different studies on the perception of the transformational leadership style applied in VWTs. To study the phenomenon, a literature review was conducted to comprehend and establish the importance of VWTs in organizations.

Results of their study could provide VWT leaders with important information to counteract distance and time difficulties. Building leadership capabilities can have a significant role in changing global business scenarios, hence generating adequate response of VWTs at the organizational arena, and that will eventually lead to find out how does technology affect the quality and quantity of communication between VWTs members and performance of the organization.

Townsed, Demarie & Hendri Ckson's (2020) paper "Virtual teams: technology and work place of the future" showed that managers are challenged to develop flexible organizations in response to increasingly competitive marketplaces, since virtual teams have the potential to enable firms to become more flexible, productive, and adaptable with regards to the new changes and challenges in the business environment, depending on the new generation of information and telecommunications technology to provide the bases for new organizational structure.

Firms will benefit from virtual teams because it will improve access to expertise and enhance cross-functional interaction. Virtual teams work best when they use systems that improve the quality of the virtual team's work.

METHODOLOGY AND PROCEDURES

Type and nature of the research:

This study is an applied study research, as it investigates the impact of virtual work teams in IT firms on organizational performance within technological transformations in the Jordanian context.

The Strategy Used in Conducting this Research

The strategy used in conducting this research:

Regarding the quantitative research method, the study is employing, a descriptive analytical method was used, to describe the effect and relationship between the variables under study. This has led the research to present new knowledge and relevant solutions relating to virtual work teams.

The Following Procedure was used

1. Referring to previous studies, research studies and articles that have addressed the topic of virtual work teams.
2. Following up-to-date reports related to the present research.
3. Data collection and analysis of the study variables.

Study Population and Sample

The study population consisted of directors, heads of divisions and employee working in IT companies, with referring to int@j website for all IT companies in Jordan.

Study Sample

Study sample individuals were selected using the simple random sampling technique because of the large number of the study population.

A sample of (100) individuals was considered sufficient for the purpose of this study, with reference to sample size determination formula for large populations.

Unit of the Study

The unit of the analysis used in this research were the individuals survey (the managers, heads of departments, and the employees working in IT companies).

Sources of Data Collection

In data collection phase, a combination of primary and secondary data was used to enrich this research.

Secondary data collection: Referring to the previous studies, research studies and articles that have looked at virtual work teams.

Primary data collection: through the use of the questionnaire which was developed by the researcher after the review of a number of studies. The questionnaire was distributed to the respondents for data analysis.

Structure of the Questionnaire

The questionnaire was designed in two sections:

1. Section one addresses the demographic variables of the respondents regarding age, gender, years of experience, and job position.
2. Section two represents the questionnaire which consisted of (28) closes to measure the independent variables and dependent variables.

Statistical Methods

To answer the research questions and to test the hypotheses, statistical package for social sciences (SPSS) software was used as follows:
1. Extracting descriptive statistic measures to describe the demographics of the respondents including means and percentages to measure the frequencies of characteristics within the study sample.
2. Standard deviations to measure the extent of dispersion in the answers from the mean.

Statistical Analysis

Data obtained from the questionnaire was analyzed using (SPSS) software, including the following statistical methods:

- Cronbach's Alpha stability coefficient – to find the extent of the measures' stability by measuring the degree of internal consistency between the questionnaire's clauses.
- Multiple regression analysis: to test the effect of the independent variable dimension on the dependent variable.

Table 1 THE SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS		
	Frequency	**Percent**
Gender		
Male	14	33.3
Female	28	66.7
Age (years)		
20 –<25	7	16.7
25-29	22	52.4
≤30	13	31.0
IT Education level		
Diploma	8	19.0
Bachelor	30	71.4
Masters	4	9.5
Job Position level		
Employee	38	90.5
Head of department	4	9.5
Company size		
Startup (1-9)	8	19.0
Small (10- 49)	9	21.4
Medium (50 - 99)	7	16.7
Large (100≤)	18	42.9

Forty two employees participated in this study (14 male and 28 female). The socio-demographic characteristics of participants Table 1. The majority of the participants were female (n=28, 66.7%) aged between 25-29 years old (n=22, 52.4%). About two third had bachelor's degree (n=30, 71.4%). Almost all of the participants their job position as employee (n=38, 90.5%). More than half of the participants worked in company with medium to large size (n=35, 59.6%).

Table (2) represent the impact of virtual teamwork on firms achieving competitive advantage. The results shows more than two third of the participants agree and strongly agree that virtual teamwork has emerged in response to the ICT revolution, virtual teamwork is the result of global market trends, and Virtual teamwork responds to the emerging new trends in conducting businesses.

The mean of basis of competitive advantage range between 3.81-4.17 out of 5, the highest mean was for virtual teamwork is the result of global market trends and lower mean was for virtual teamwork has emerged in response to digital commerce.

The overall mean was 4.02 out of 5 which mean that virtual teamwork had a positive impact on firms achieving competitive advantage.

Table 2 A COMPETITIVE ADVANTAGE						
Basis of competitive advantage	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**	**Mean**
Virtual teamwork has emerged in response to the ICT revolution	0(0.0)	1(2.4)	4(9.5)	28(66.7)	9(21.4)	4.07
Virtual teamwork is the result of global market trends	0(0.0)	2(4.8)	5(11.9)	19(45.2)	16(38.1)	4.17
Virtual teamwork has emerged in response to digital commerce	0(0.0)	1(2.4)	14(33.3)	19(45.2)	8(19.0)	3.81
Virtual teamwork	0(0.0)	1(2.4)	8(19.0)	22(52.4)	11(26.2)	4.02

responds to the emerging new trends in conducting businesses						
Mean±SD				4.02±0.52		

Table (3) represents the impact of virtual teamwork on facing challenges imposed by technological transformations. The results shows more than two third of the participants agree and strongly agree that virtual teamwork enhances firms adapting to the challenges of the business environment (mean=3.83), and virtual teamwork has launched to enable firms to confront the challenges surrounding the business environment (mean=3.86).The overall mean was 3.86 out of 5 which mean that virtual teamwork had an positive impact on facing challenges imposed by technological transformations.

Table 3 THE CHALLENGES IMPOSED BY TECHNOLOGICAL TRANSFORMATION						
Basis of challenges imposed by technological transformation	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean
Virtual teamwork enhances firms adapting to the challenges of the business environment	0(0.0)	6(14.3)	5(11.9)	21(50.0)	10(23.8)	3.83
Virtual teamwork has launched to enable firms to confront the challenges surrounding the business environment.	0(0.0)	3(7.1)	9(21.4)	21(50.0)	9(21.4)	3.86
Mean±SD				3.84±0.74		

Table (4) represent the impact of virtual teamwork on improving organizational performance. The overall mean was 3.80 out of 5 which mean that virtual teamwork had a positive effect on firms improving organizational performance. The results shows around half of the participants agree that; organizations deploy or implement virtual teams to benefit from the new technological advancement, organizations deploy virtual teams to build new knowledge of the practice, virtual teams have the potential to impact work environment, virtual teams have the power to provide the organization with technical solutions in the work, virtual teams have the power to provide the organization with technical solutions in the work environment, the organization offers virtual teamwork to establish a flexible work environment, and virtual teams help organizations in knowledge transformation between individuals.

The mean of basis of organizational performance range between 3.60-4.12 out of 5, the highest mean was for the organization offers virtual teamwork to establish a flexible work environment and lower mean was for virtual teams allow integration and focus on performance.

Table 4 ORGANIZATIONAL PERFORMANCE						
Basis of organizational performance	Strongly disagree	Disagree	neutral	Agree	Strongly agree	Mean
Virtual teamwork supports the organization to remain competitive	1(2.4)	4(9.5)	10(23.8)	18(42.9)	9(21.4)	3.83
Virtual teamwork helps organizations in dealing with new opportunities.	0(0.0)	8(19.0)	7(16.7)	18(42.9)	9(21.4)	3.86
Organizations deploy or implement virtual teams to benefit from the new technological	1(2.4)	2(4.8)	8(19.0)	22(52.4)	9(21.4)	3.86

advancement.					
Organizations deploy virtual teams to build new knowledge of the practice.	1(2.4)	3(7.1)	9(21.4)	21(50.0)	8(19.0)	3.76
The deployment of virtual teams affects the whole organization.	0(0.0)	4(9.5)	11(26.2)	19(45.2)	8(19.0)	3.74
Virtual teams allow integration and focus on performance.	1(2.4)	5(11.9)	10(23.8)	20(47.6)	6 (14.3)	3.60
Virtual teams are considered drivers for change in the organization.	1(2.4)	1(2.4)	11(26.2)	19(45.2)	10(23.8)	3.86
Virtual teams have the potential to impact work environment.	0(0.0)	2(4.8)	7(16.7)	22(52.4)	11(26.2)	4.00
Virtual teams have the power to provide the organization with technical solutions in the work environment.	0(0.0)	3(7.1)	6(14.3)	24(57.1)	9(21.4)	3.93
The organization offers virtual teamwork to establish a flexible work environment.	0(0.0)	2(4.8)	4(9.5)	23(54.8)	13(31.0)	4.12
Virtual teams help organizations in knowledge transformation between individuals	2(4.8)	7(16.7)	5(11.9)	21(50.0)	7(16.7)	3.71
Mean±SD				3.80±0.53		

Table (5) represents the impact of virtual teamwork on cost reduction. The results shows more than two third of the participants agree and strongly agree that virtual teamwork would significantly reflect on organizations' savings (mean=4.17), and virtual teams make organizations more adaptable to growing market compaction. (mean=3.78).

The overall mean was 4.07 out of 5 which mean that virtual teamwork had an positive impact on cost reduction.

Table 5 COST REDUCTION						
Basis of Cost reduction	**Strongly disagree**	**Disagree**	**neutral**	**Agree**	**Strongly agree**	**Mean**
Virtual teamwork would significantly reflect on organizations' savings.	0(0.0)	1(2.4)	8(19.0)	16(38.1)	17(40.5)	4.17
Virtual teams make organizations more adaptable to growing market compaction.	0(0.0)	4(9.5)	9(21.4)	26(61.9)	3(7.1)	3.98
Mean±SD				4.07±0.54		

Table (6) represents the impact of virtual teamwork on employees' satisfaction. The overall mean was 3.81 out of 5 which mean that virtual teamwork had a positive effect on employees' satisfaction. The results shows around 80% of the participants agree and strongly agree that employees' aspire to work virtually in order to save time and employees' appreciate work virtually in saving transport costs.

The mean of basis of employees' satisfaction range between 3.40-4.10 out of 5, the highest mean was for the employees' aspire to work virtually in order to save time and lower mean was for virtual teams help to meet the employees' needs, requests, or expectations.

Table 5 **VIRTUAL TEAMWORK SATISFACTION**					
Basis of satisfaction	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**	**Mean**
Virtual teamwork is considered convenient for the employees	0(0.0)	1(2.4)	8(19.0)	27(64.3)	6(14.3)	3.90
Employees' aspire to work virtually in order to save time	0(0.0)	3(7.1)	5(11.9)	20(47.6)	14(33.3)	4.07
Employees' appreciate work virtually in saving transport costs.	1(2.4)	3(7.1)	4(9.5)	17(40.5)	17(40.5)	4.10
Employees' in virtual teams are enhanced to exchange ideas and experiences with individuals.	1(2.4)	9(21.4)	8(19.0)	19(45.2)	5(11.9)	3.43
Employees' in virtual teams can apply knowledge to critical tasks in international organizations.	1(2.4)	1(2.4)	11(26.2)	25(59.5)	4(9.5)	3.71
Employees' can experience flexible work hours when they work virtually.	0(0.0)	2(4.8)	8(19.0)	17(40.5)	15(35.7)	4.07
Virtual teams help to meet the employees' needs, requests, or expectations	1(2.4)	7(16.7)	12(28.6)	18(42.9)	4(9.5)	3.40
Mean±SD				3.81±0.48		

Table 6 shows overall mean for performance variables. The highest mean was for cost reduction (mean=4.07), while the lowest mean was for improving organizational performance (mean=3.80).

Table 6 **THE OVERALL MEAN FOR ALL PERFORMANCE VARIABLES**	
Variables	**Mean±SD**
Competitive advantage	4.02±0.52
The challenges imposed by technological transformation	3.84±0.74
Improving organizational performance	3.80±0.53
Cost reduction	4.07±0.54
Virtual teamwork satisfaction	3.81±0.48

Summary

The results show that virtual teamwork had positive impact on the performance of the IT companies. The highest impact was on cost reduction, while the lowest impact of virtual teamwork was on improving organizational performance.

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