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VIRTUAL TEAMS' DOMAIN: IN NEED OF ATTENTION

Introduction

For 'Y' and 'Z' Generations terminology like *Virtual Team* or *Work from Home* is a common concept. Especially current situation, which arose after the burst of the COVID-19 pandemic in 2020, popularized the concept [Buffer, 2021]. In just a few weeks, the functioning of organizations changed drastically, enforcing transformation of working style into a virtual model. For many the change was compulsory, which, in author's opinion, is the reason behind the popularity of the domain.

Some authors [e.g., Hertel, Geister, Konradt, 2005] state that virtual team "enables opportunities for companies". During the pandemic, that 'opportunity' became the only possible option. It may have indirectly led to a sudden breakthrough in development of virtual teams, and ultimately led the author to the following questions: are we able to satisfy the new demand? Are there sufficient literature sources regarding virtual teams that can meet peoples' expectations? Is this only a temporary situation or the trend of using virtual teams is going to persist? What impact it would have on an organization, how it is going to transform with the end of the pandemic and what opportunities it brings for researchers?

The author acknowledges, that these are numerous, but valid questions, and the post-COVID scientific discipline's development can stimulate many more over time. These uncertainties can create interesting research opportunities for scientists.

Therefore, the goal of this paper is to examine the popularity of virtual teams domain, considering to date findings, current state, and upcoming trends to show directions for future research. Positive verification of two hypotheses would support the thesis of the paper.

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Hypothesis 1: The scientific field of virtual teams has not been nurtured sufficiently. Before the COVID-19 pandemic, this field has been growing relatively slowly [Martins, Gilson, Maynard, 2004]. The outburst of the pandemic initiated a growing focus on the virtual teams [*Scopus – Analyze search results*, 2021]. Using the literature review author briefly verifies qualitative and focuses mostly on quantitative aspects of the subject, checking the number of publications. I present tangible proofs of subject's popularity by comparing virtual teams to different, but related domain – IT Project Management.

Hypothesis 2: The popularity of virtual team is and will continue to be high. Popularity of the domain is a common sense, but has it been explicitly outlined? The author refers to indirect quantitative studies (e.g., surveys, market research) to support this hypothesis. I verify current trends, as well as challenges in regards to the matter at hand and focus on future, analyzing trends and forecasts for post-COVID reality in the context of virtual teams.

The paper starts with literature review, and afterward it presents the research methodology: literature review, reference to external quantitative studies and comparative analysis. The following sections present findings, according to each hypothesis separately. In the end, I indicate an area of further research, limitations and provide comprehensive conclusions from the paper, finishing with the statement that virtual teams' domain is popular but seems neglected and needs scientists' attention.

1. Literature review

From the collection of literature on virtual teams, I chose few positions that with the use of literature review methodology, summarize the current state of knowledge and propose further research directions. In 2004 two publications appeared, encapsulating to date findings and describing directions for the future [Martins, Gilson, Maynard, 2004], namely "Virtual teams: What do we know and where do we go from here?" and "Virtual Teams: A Review of Current Literature and Directions for Future Research" [Powell, Piccoli, Ives, 2004].

These two positions remain in the "top" of highly cited publications within the field of study and confirm itis growing by reviewing literature to date (2004) and describing virtual teams (from input-process-output perspective).

The first one indicates multiple inconsistencies in publications, calling for empirical studies, showing that the discipline slowly moves forward but the scientific direction should be adjusted [Martins, Gilson, Maynard, 2004]. The statement "slowly" seemed to be accurate as by 2004, when according to Scopus, there were only 407 publications (created within 15 years), and only 4 of them were more popular than cited one. The second publication adds to input-process-output the "socio-emotional" factor. It

became a foundation for following publications, where the model of input-process-output evolved and was broadened by multiple authors. Nowadays, when people are facing outcomes of being closed at home, the "socio-emotional" factor seems to be truly important [Alexander et al., 2021].

In 2005 and 2008 following publications based on literature review methodology were published: "Managing virtual teams: A review of current empirical research" [Hertel, Geister, Konradt, 2005] and "How do virtual teams process information? A literature review and implications for management" [Curşeu, Schalk, Wessel, 2008]. The first one confirmed the need to evaluate the level team's virtuality, as it was indicated by [Kirkman et al., 2004]. The second one highlights the role of a leader and information processing, with its impact on teams' performance. When analyzing the most common keywords, the terms 'leader', 'trust' and 'performance' are the most popular within virtual team field (the last term was described in more than half of publications).

In 2020, the number of publications on virtual teams drastically increased [*Scopus – Analyze search results*, 2021]. In the author's opinion, it is researchers' response to satisfy the growing demand caused by the COVID-19 pandemic. Results are visible – over 200% growth in publications between 2019 and 2021 which can stimulate the popularity of the domain. Studies stated that virtual teams struggle with effective communication [Buffer, 2021; Brodsky, 2021], luckily recent publications start providing also some practical help for teams and leaders [Zeuge et al., 2020; Garro-Abarca, Palos-Sanchez, Aguayo-Camacho, 2021].

The most important literature review findings include: the role of the leader is essential for successful transformation and that (via using socio-emotional factor) a leader can positively impact relations within a virtual team. Future studies could add a post-COVID context.

In the next sections, the author is going to present the research methodology and quantitatively verify whether that has been sufficient for the current audience.

2. Research methodology

Research Methodology included Literature Review (carried out from November 2020 to December 2021), review of quantitative studies on people, conducted by external, analytical companies and comparative analysis with a similar domain. Literature review verifies Hypothesis 1; external quantitative studies – verify Hypothesis 2; comparative analysis – verifies both Hypotheses.

The author started literature review by exploring online literature databases – Scopus, EBSCO and Web of Science. I collected comprehensive results regarding both fields: virtual teams and IT project management and selected papers based on:

popularity, citation rate, author's keywords and relevance to the topic of searched phrases/keywords in publications' titles (*Virtual Teams* OR *Remote Teams)* (often directing to further positions from the paper's bibliography). Similar analyses were conducted for IT project management field (*IT project management* OR *IT projects* OR *Information Technology Projects*). Additionally, a keyword's analysis has been made to understand the most common sub-areas of research.

In the paper author indicated not only theoretical background, but also human aspect, represented in quantitative studies (e.g., surveys, market research). These were conducted by external companies (among others: PwC, McKinsey, Gartner, Statista) and evaluated entrepreneurs' and employees' opinions. All surveys were conducted within 2019–2021. Author selected few aspects that structure the review, facilitate analysis of results and verify hypothesis, which are: activity of virtual users, satisfaction and performance, challenges and benefits of virtual teams, forecasted spending on collaboration software and current and post-COVID-19 trends on work from home.

Additionally, to compare popularity of both research fields, author refers to online literature databases (Scopus and Web of Science) and online tool – Google Trends – illustrating keywords' popularity searched by users in Google Search Engine. This additionally supports both hypotheses.

3. Research findings/results

Findings from the research are presented in two sections, which refer to each hypothesis individually.

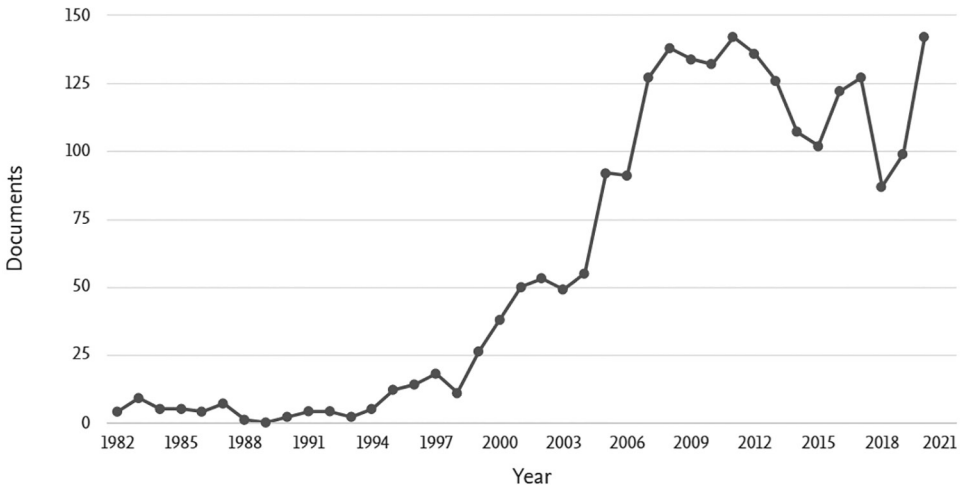
Hypothesis 1: The scientific field of virtual teams is not nurtured sufficiently

Based on Literature Review section from this paper, author's findings are:

1. Reviewed publications conclude that discipline under study is not yet sufficiently developed [Martins, Gilson, Maynard, 2004].
2. There should be more scientific focus on empirical studies [Zeuge et al., 2020; Garro-Abarca, Palos-Sanchez, Aguayo-Camacho, 2021].
3. The fact that the number of publications is growing supports the hypothesis 2, confirming the growing popularity of the domain [*Scopus – Analyze search results*, 2021].
4. Following this thread, author conducted quantitative study to verify the volume of publications on virtual teams in popular literature databases. I searched EBSCO,

Scopus, and Web of Science databases and found over 2300, 2000, 1800 publications respectively regarding the studied subject[1].

Figure 1. Number of publications in Scopus over the years 1982–2020 (Virtual Teams OR Remote work)



Source: *Scopus – Analyze search results* [2021].

The trend line for number of publications is positively upward and it seems that the trend is going to persist. The peak of publications was around 2010, when virtual collaboration became a common working style. Another visible fluctuation took place in 2019, when the global COVID-19 pandemic aroused. This represents scientists' reaction to the growing trend of working from home, and the gap that needs to be fulfilled – due to the growing demand.

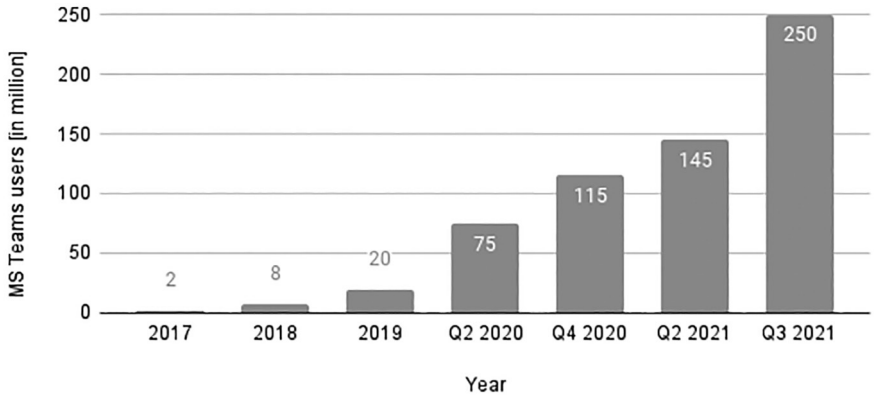
Considering specific topics of publications and described findings, qualitative study can be a separate part of research. Therefore, author briefly presents only main areas described within virtual teams field to date. According to Web of Science [Web of Science, 2021] publications mainly relate to "Management", "Computer Science" and "Business" domains. Within the first ten results there is also "Psychology Applied" field which represents sociological aspect of virtual teams domain. Other than that, analysis confirms also the accuracy of search parameters chosen by the author.

Last aspect representing scientific popularity of the field is number of citations. The overall number is growing, the sum of citations exceeds 22 thousands and the h-index equals 67. It proves that the concept is still important for researchers.

[1] Until December 2021.

Additional aspect that verifies the hypothesis is human factor – activity of virtual team members (evaluated in the external studies). Usage of teleconferencing software is essential for successful connection between dispersed, virtual team members. Figure 2 presents data from leading communication software provider, stating on intensity of its usage [Microsoft, 2021]. High volume of daily users who connect virtually also reflects the twist in virtual teams' popularity – supporting the first hypothesis.

Figure 2. Comparison of active users/day using MS Team vs. Zoom



Source: Microsoft [2021].

Numbers state clearly: twelve times growth in MS Teams number of users between 2019 and Q3 2021. This represents how common, casual and global virtual team domain is. This may result in potential challenges for researchers to follow up on such dynamically growing discipline, leading to potential literature gap.

Hypothesis 2: Popularity of virtual team is and will continue to be high

Multiple quantitative studies (e.g., surveys, market researches) confirm high demand on virtual teams-related topic. Author selected few metrics, which comprehensively describe the popularity of virtual teams across common people: performance & satisfaction, challenges and benefits, software spending and current and post-COVID-19 trends for virtual teams. In the following paragraphs author presents findings of these studies.

In addition, to bring tangible example within the field (IT), author studied the popularity of virtual teams vs. IT project management domain comparing users' interest and pace of development of both disciplines.

Performance & satisfaction from virtual teams

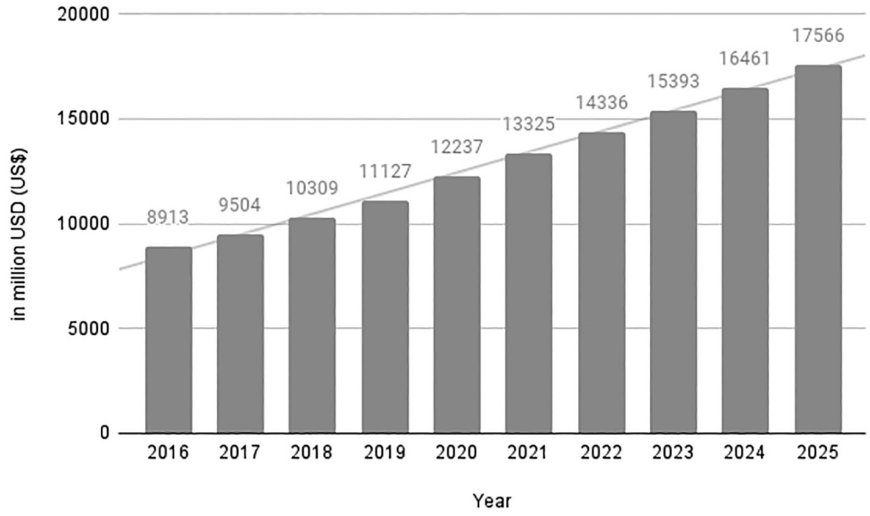
Considering current and forecasted popularity of the domain it is essential to refer to important employers' and employees' factors, as satisfaction and performance in the context of work in virtual environment. According to the PwC research on employees' satisfaction from working from home, it continues to grow, reaching 83% in the beginning of 2021 (71% in June 2020) [PwC US Remote Work Survey, 2021].

The same research shows that 63% of organizations under study reported productivity increase. Moreover, regarding projects specifically in the research over 52% of employers claim that company productivity has increased after COVID-19 compared to the level before it [PwC US Remote Work Survey, 2021]. Both employers and employees seem to be satisfied with working from home which may impact their long-term approach to this working style, resulting in growing interest on virtual teams structure, organization and management.

Collaboration software spendings

Another factor that proves growing demand are companies' spendings on collaboration software. Statista [2021] reports that since 2016, when the income of software providers has equaled almost 9 billion USD, it went through 12 billion USD in 2020 and is forecasted to reach 17 billion USD in 2025 (~1 billion USD growth each year).

Figure 3. Forecast of revenue in the Collaboration Software segment



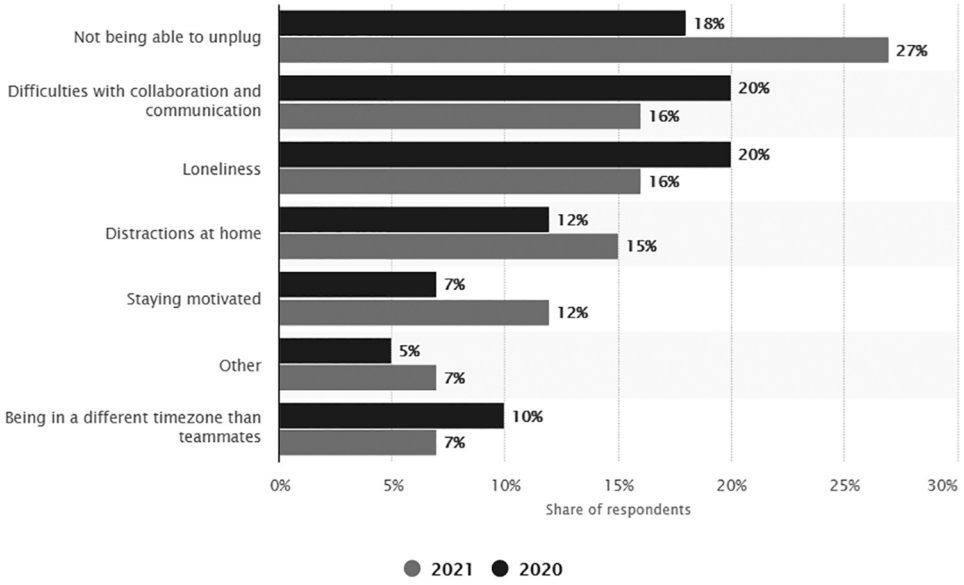
Source: Statista [2021].

Similar results come from Gartner report [Gartner, 2021] on IT sector spendings, where Communication Services consume the biggest share (>35% of total spendings), exceeding other IT segments. All things considered, popularity of virtual teams grows in line with companies spendings on IT collaboration software.

Challenges and benefits of remote work

Aside virtual teams popularity, there are still some challenges stemming from virtual work. Recent study [Buffer, 2021] reports that the most important challenge users are facing is being unable to unplug (27%).

Figure 4. The biggest challenges of remote work



Source: Buffer [2021].

The next most challenging factor, according to the research, is virtual communication and collaboration – inseparable part of virtual teams. However, there is already an improvement in this area (decrease from 20% in 2020 to 16% in 2021). It indicates the need of support from scientists on how to deal with communication issues. Findings from this quantitative research are in line with scientific papers [Waizenegger et al., 2020; Brodsky, 2021].

Despite the above, people point to numerous benefits of remote work: flexible work schedules, possibility to work from any location, no waste of time commuting

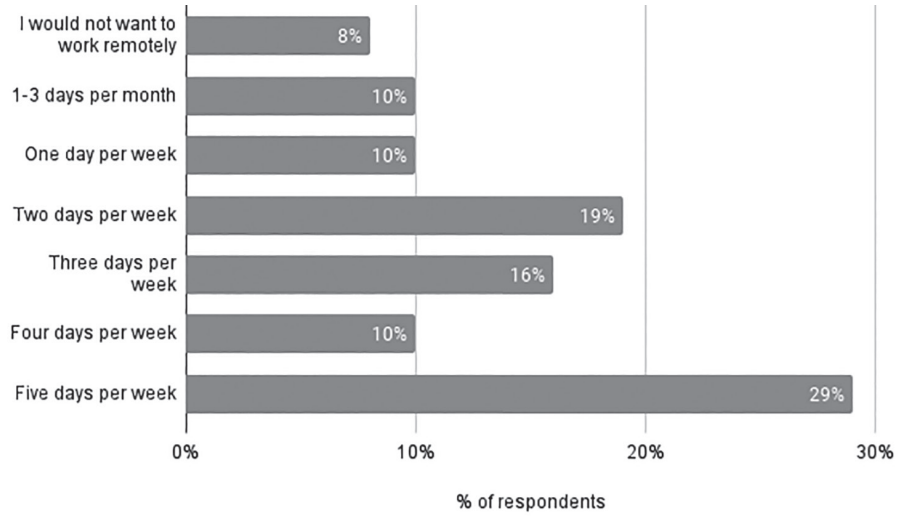
to work, therefore they can spend more time with their families [Buffer, 2021; Feitosa, Salas, 2021]. These advantages can also maintain the willingness of employees to work from home.

Current and post-COVID-19 trends on work from home

The final aspect considered in this paper are current and upcoming trends on work from home model. Both researchers [Wang et al., 2021; Garro-Abarca, Palos-Sanchez, Aguayo-Camacho, 2021] and external studies [PwC US Remote Work Survey, 2021; Granieri, 2020] indicate the trend is to persist.

Additionally, there are multiple questions and concerns in regards to future working style. Hybrid model is a widely considered option [Alexander et al., 2021], however controversies arise about the most effective workday split between work from home vs. office [PwC US Remote Work Survey, 2021]. This may result in interesting turn in approach to virtual teams definition, as due to frequent changes in employees' work locations (once from home, once from office) the virtuality level of a team may fluctuate, but it rarely reaches the state when the whole team meets face-to-face. It's because, although employees perform partially their duties from offices, there can always be a one team member who works from home. This may contribute to the team remaining in some part virtual – and supports the hypothesis on continuous popularity of virtual teams work model.

Figure 5. "How often would you like to work remotely after COVID-19?"



Source: PwC US Remote Work Survey [2021].

Comparison of virtual team with IT project management domain

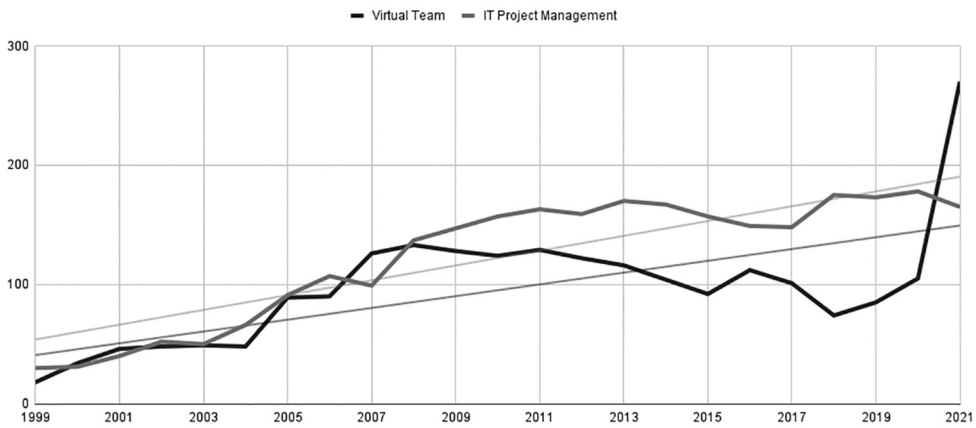
Author decided to compare two domains: virtual teams and IT project management. It is due to their similarities. Both can be placed within management and IT scientific discipline. Both started growing along with IT field popularity (back in the 90's). Author perceives them both as a common subject of interest among IT leaders and employees.

Interesting is also a fact, that sometimes one field may fall into another – management of IT projects can require managing a virtual team, and vice versa.

Author's assumptions are that virtual teams domain should be much more popular/nurtured than IT project management, due to its universality – it can be applied to almost anyone, which was proved by the pandemic. IT project management, on the other hand, is a smaller discipline, applicable only to selected group of people that works specifically within IT field.

When considering number of publications: IT project management discipline is ahead of virtual teams, scoring 500 publications more (20%). The number may not seem to be high, however for such relatively new discipline it signalizes a research gap.

Figure 6. Comparison of number of publications in Scopus over years



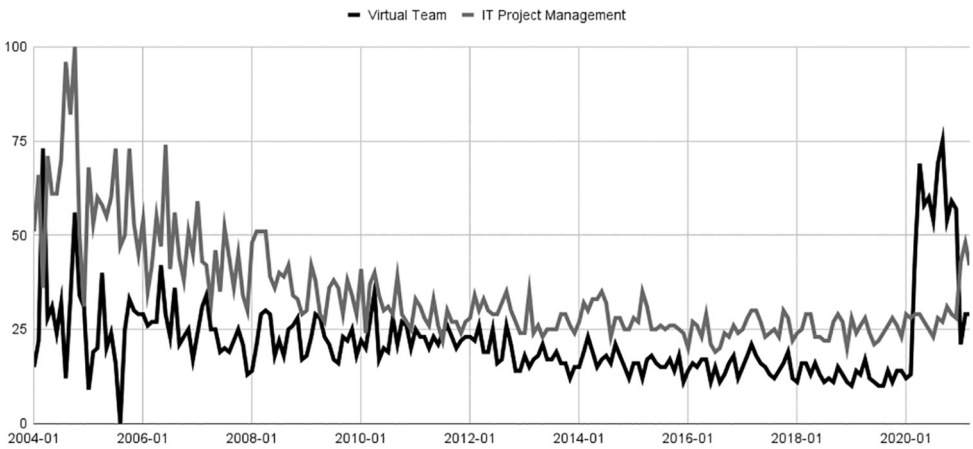
Source: *Scopus – Analyze search results* [2021].

When referring to changes over time, initially both domains grew equally fast (Figure 6). Breakthrough occurred around 2009, when IT project management discipline speeded up, with, on average, a 40% higher number of publications a year than virtual teams (till 2019). Continuously growing number of publications on IT project management impacted also the overall trend line – which is more aggressive

than for virtual teams. Lastly – after the burst of the pandemic – the virtual team domain started exceeding IT project management, which raises a question: is it not too late?

To assess the popularity of both fields (not only from scientific perspective but also at the source – common people) author refers to Google Trends report. Figure 7 presents how often people were looking for specific keywords in Google Search Engine. Google doesn't reveal specific numbers of daily searches, but using the tool one can observe correlation between searched terms and trends.

Figure 7. Google search popularity of terms: virtual team and IT project management



Source: Google Trends [2021].

Figure 7 shows that despite its limited field of application, IT project management has been a more frequently searched keyword, in comparison to virtual teams. Situation drastically changed with the outburst of COVID-19 pandemic, what is in line with author's suggestion (and other publicists [Zeuge et al., 2020]) on growing demand for virtual teams research.

Interesting can be also the most recent trend, which suggests that either concern in IT project management grew significantly or the interest in virtual teams starts dropping.

During literature analysis author did not found references to comparison of both fields.

4. Limitations and further research

My additional goal when writing this paper was to draw scientists' attention to the fact that virtual teams are a valid domain and require their focus. For many teams, the change from face-to-face communication to virtual one was sudden and they need help on how to do it effectively. Hope is that researchers would lean on how to quickly help them to adapt to the new situation.

The research of this papers focuses mostly on quantitative evaluation of the discipline and peoples' opinions. This creates a need to conduct similar or broader research from qualitative aspect: review the topics of to date publications and identify research gaps. Author noticed a trend that there are multiple publications from either organization's or manager's perspective (e.g., trust, performance, comparison with traditional model), whereas there is little to no focus on end users approach – usually employee's – which may become an interesting field of further research.

Author also refers to external, analytical companies' publications which, unfortunately, can be easily manipulated. To provide highly reliable studies it is recommended that researchers conduct them on their own.

To assess users' opinion, I use a new technological tool – Google Trends – which can be a promising source of information for scientists. It is worth recommending to look for modern methods of concept validation which may provide interesting users' insights.

Due to high impact of COVID-19 on companies' operating style there may be a need to review current findings and update them to match new reality. This includes the definition of virtual teams concept.

As discussed, the dynamics and popularity of the virtual teams domain is high and starts to convert into number of new publications [*Scopus – Analyze search results*, 2021]. For author this is a desirable approach that can 1. Address the high demand and 2. Provide tangible help for virtual teams.

I noticed few challenges resulting from the new reality, namely: what is the most productive division between work from home vs. office, childcare support, need to redesign workspaces and to encourage employees to visit them, employers' empathy level, effective collaboration of dispersed teams (some people in the office, some working from home), and probably many others outlined in the research [Granieri, 2020]. These challenges occurred with the growth of virtual teams popularity and create opportunities for further research.

Conclusions

The COVID-19 pandemic is the major factor that impacted people interests on virtual teams. This has been already established among few recent publications [Zeuge et al., 2020] [Lee et al., 2020]. However, this paper presented also "voice of people", proving validity of the topic and their needs in multiple quantitative studies [PwC US Remote Work Survey, 2021].

To examine the '*Hypothesis 1: The scientific field of virtual teams has not been nurtured sufficiently*' author referred to literature review and comparison with another domain.

I found multiple publications in the literature on the subject [Martins, Gilson, Maynard, 2004; Curşeu, Schalk, Wessel, 2008; Powell, Piccoli, Ives, 2004] that assess to date heritage of the discipline, and all conclude with similar considerations: the field is not elaborated enough and there is a need for empirical studies. Fortunately, as we are leaning to the end of pandemic, the number of publications on virtual teams domain grows as well.

While checking the volume of publications, by 2019 it has already started to decline [*Scopus – Analyze search results*, 2021]. The outburst of the pandemic reminded scientists about "dusted" discipline and put it again in the spotlight. The question was, wasn't it already too late? What are the topics that have been already covered and which ones require researchers' focus? It indicates possible directions for future studies.

Additionally, comparison with a similar domain – IT project management – proves that despite its universal character, focus on virtual teams was relatively low (20% lower than IT project management). Considering the literature review, comparative analysis and quantitative aspect, the verification of Hypothesis 1 is positive.

To examine the 'Hypothesis 2: Popularity of virtual team is and will continue to be high' author referred to external quantitative studies and compared it with IT project management.

External studies, referring to employees' and employers' opinions support the hypothesis:

- people are intensively using communication software (only in Q3 2021 there were 250 million users served by one provider [Microsoft, 2021]), meaning that they are part of a virtual team. The trend also continues to be positive;
- we are noticing a positive slope of the forecasted spending on collaboration tools trend line, the same as usage of communication software and number of publications. This indicates the growing popularity and trend tends to persist [Wang et al., 2021];
- both employers and employees are satisfied with work from home (83%). Forecasts on future of remote teams indicate hybrid approach as upcoming work style [PwC

US Remote Work Survey, 2021]. Even if part of the team will be working from office, another part can work from home – it will continue to be a virtual team. That said, the element of virtuality would remain for good [PwC US Remote Work Survey, 2021];

- Google Trends reports the volume of queries on 'virtual teams' grew after pandemic, exceeding IT project management-related searches, making the domain more popular.

Conclusions from external studies and comparative analysis support the hypothesis 2, proving its validity. Virtual teams domain is and for some time will continue be popular.

Last, but not least, are the opportunities for further researchers. One of the biggest challenges is still a communication issue, i.e., practical help for virtual teams on how to communicate efficiently is needed [Brodsky, 2021]. With evolution of pandemic, new challenges occurred, like: finding the most productive division between work from home vs. office, approach to workspace design and encouraging employees to come back to an office, employers' empathy level, effective collaboration of dispersed teams (some people in the office, some working from home) and more [Granieri, 2020]. These virtual teams-related areas constitute potential directions for new researches to support people and organizations.

All of the above can be summarized with the following statement: virtual teams are a valid and dynamic domain that people (and now also researchers) are interested in. The scientists' focus should be to meet people' expectations and help to adapt to this evolving work style.

Acknowledgements

Since this is my first publication, there couldn't be better moment to express my special thanks of gratitude to my parents, who inspire me to always aim high and work hard, but smart. Thank you for your continuous support throughout the years. I hope you are already proud and I can promise you there is still more to come.

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VIRTUAL TEAMS' DOMAIN: IN NEED OF ATTENTION

Abstract

Due to COVID-19 implications many people work as part of a virtual team. This paper verifies popularity of the scientific discipline and whether it has been developed sufficiently. It compares virtual teams domain to another discipline, summarizing trends for post-COVID reality. The author uses a literature review to analyze findings from previous studies. He refers to external, quantitative studies (e.g., market research) and comparative analysis to assess scientific and social character of the domain. Findings show that virtual teams subject is indeed popular and it gained on popularity right after the COVID-19 outbreak. Despite its universality, it seems to be less developed in comparison to IT project management. According to forecasts, remote work is to persist and become a common working style. Author indicates

a need for qualitative and empirical studies and outlines areas for further research that can support practitioners.

Keywords: virtual teams, work from home, COVID-19, IT project management

JEL classification codes: M24, M15, M54

WIRTUALNE ZESPOŁY: W POTRZEBIE ATENCJI

Streszczenie

W związku z implikacjami po COVID-19 wiele osób pracuje w zespołach zdalnych. W opracowaniu zweryfikowano popularność domeny oraz to, czy jest ona wystarczająco zgłębiona. Porównano zespoły zdalne z inną dyscypliną i omówiono trendy w postcovidowej rzeczywistości. Autorka posłużyła się analizą literatury w celu przeanalizowania dotychczasowych opracowań. Odwołała się do zewnętrznych badań ilościowych (np. badań rynkowych) i analizy porównawczej, aby ocenić naukowy i społeczny charakter domeny. Na podstawie wniosków stwierdzono, że dyscyplina jest popularna, a przełom nastąpił wraz z wybuchem pandemii COVID-19. Pomimo swojej uniwersalności, dyscyplina wydaje się być mniej rozwinięta w porównaniu z zarządzaniem projektami IT. Powołując się na prognozy uznano, że praca zdalna pozostanie popularnym stylem pracy. Autorka zarazem wskazała na potrzebę prowadzenia pogłębionych badań jakościowych i empirycznych w zaproponowanych przez nią obszarach. Badania te wspomogą praktyków dyscypliny.

Słowa kluczowe: zespoły wirtualne, praca zdalna, COVID-19, zarządzanie projektami IT

Kody klasyfikacji JEL: M24, M15, M54