

A summary of the doctoral thesis written under scientific guidance of

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Leadership in virtual teams

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The development of modern technologies has influenced the dynamics of social and economic changes in the modern world and has made the knowledge of virtual teams increasingly important. Recently, the popularization of working in virtual teams has also been influenced by the epidemic of the SARS-CoV-19. Therefore, **main objective of the dissertation is to theoretically and empirically determine the role of leadership in shaping the effectiveness of virtual teams.**

The dissertation is embedded in the classic trend of testing theories through quantitative research methods. The research procedure adopted in the dissertation includes the following sequence of activities: a review of the literature, identification of the research gap, construction of the model and formulation of hypotheses, conducting empirical research using a questionnaire, performing statistical analyses and formulating conclusions. The theoretical-cognitive, empirical and practical objectives of the study included.

1. Systematize knowledge about leadership, effectiveness, communication, commitment, intention to leave, and task uncertainty in virtual teams.
2. Construct a research model based on the most recent research findings taking into account team-level variables (leadership, communication, and team effectiveness) and individual-level variables (commitment, task uncertainty, and intention to leave)
3. Construct a tool to measure the relationship between variables such as leadership, communication, commitment, task uncertainty, intention to leave, and virtual team effectiveness)

4. Operationalization of the variables found in the research model. Operationalization provided the basis for conducting the empirical study. For the sake of reliability and relevance of the research, operationalization was conducted based on tested measurement tools available in the scientific literature. The constructed research tool was used in the empirical study and the collected data was prepared for statistical analyses to test the relationship between variables.
5. Identify the relationships between leadership, communication, performance, commitment, task uncertainty, and intention to leave.
6. Identify factors that need to be monitored to maintain or enhance the effectiveness of virtual teams.

The dissertation is composed of five chapters. The first three chapters contain the results of theoretical analyses. They deal respectively with: the theoretical foundations of leadership in virtual teams, the impact of leadership on performance at the team level, and the impact of leadership at the individual level. The next two chapters focus attention on the research methodology (chapter 4) and the research findings and conclusions (chapter 5).

Chapter 1 focuses on the theoretical foundations of leadership in virtual teams. The theoretical analysis began by describing the characteristics of virtual teams. Subchapter one concludes the literature analysis and formulates a definition of virtual teams. The adopted definition is applied during further theoretical and empirical research. The second subsection contains conclusions resulting from the analysis of scientific publications on the role of leadership in virtual teams. An important part of the subsection is the analysis through which two leadership styles (transformational and shared leadership) emerged. The analyses conducted at this stage led to the conclusion that these are the styles most valid for use in further empirical research. Subchapter three addresses the effectiveness of virtual teams. This section includes conclusions drawn from the analysis of academic publications on effectiveness. It concludes with a definition of virtual team effectiveness adopted for further empirical research.

In chapter two, attention is focused on the team level, specifically the two key determinants of virtual team effectiveness: leadership and communication. Special attention

was focused on the concepts of transformational leadership and shared leadership. Communication was defined as a three-element construct including communication quality, frequency, and message content. Effectiveness was defined as the quality of actions, level of satisfaction, and timeliness.

The third chapter of the dissertation attempts to organize knowledge regarding selected determinants of virtual teams' effectiveness characteristic of the individual level. The focus was on the employee's commitment, intention to leave, and uncertainty associated with the tasks performed. In this part of the study, an attempt was made to describe not only the constructs themselves but also the interrelationships between them. The results of the analyses of commitment and intention to leave are presented graphically at the end of the first and second subsections. Subsection three addresses task performance in a variable and uncertain reality. Task uncertainty is the last variable included in the research although, given the complexity of reality, it should be emphasized that the described aspects of virtual team functioning do not exhaust the topics related to leadership in virtual teams.

Chapter four covers the methodology for conducting the empirical research for this dissertation. The chapter began with a description of the objectives to then present the research model constructed from the findings and research hypotheses formulated on the foundation of the literature studies conducted in the three theoretical chapters. The model takes into account the conceptualization of the relationships between the constructs described in the theoretical section. The model contextualizes the relationship between leadership and the effectiveness of virtual teams, which is fundamental from the perspective of the thesis. Chapter four also describes the scopes of the research conducted: subject, actor, spatial, and temporal. The next part of the chapter is the characteristics of the research sample of 337 respondents from 87 teams, from 46 IT companies based in Poland, which are engaged in software development and implementation of IT systems.

The empirical research was conducted 6 months, from September 2019 to February 2020 in IT companies based in Poland. The teams were characterized by varying levels of dispersion. The respondents were people implementing IT projects in positions such as team leader, front-end developer, back-end developer, full-stack developer, IT architect, scrum

master, implementer, application designer, analyst, product owner, UX designer. Chapter four also contains information about the operationalization (measurement) of the examined variables. It presents the research tool and describes the course of empirical research and statistical analysis. Also in this part of the study, individual scales are analyzed in terms of reliability and their internal structure.

The fifth chapter presents the results of statistical analyses carried out based on data obtained from empirical studies (337 questionnaires). The chapter presents the results of the general analysis of the variables and the relationships between them, which were described in subsection one. Subsection two deals with a more in-depth recognition of the relationships between the constructs under study. The analyses conducted in this section were the basis for the verification of the research hypotheses. Subsection three organizes and synthetically summarizes the results of the research conducted. It also compares the estimated structural equation models.

The final section of the dissertation concludes with a summary of the theoretical and empirical research, theoretical and practical implications, and directions for future research. It attempts to compare the results of the empirical research in the context of the state of knowledge captured in current research conducted on the functioning of virtual teams worldwide. At the end of the dissertation, a research tool (questionnaire) and bibliography are presented.

The results of the conducted empirical research and statistical analysis allowed to determine the role of leadership in shaping the effectiveness of virtual teams with particular emphasis on team effectiveness, communication, commitment, intention to leave and task uncertainty. However, due to the complexity of reality and the dynamics of social, economic and technological changes, the conducted research broadens the knowledge about leadership in virtual teams but does not exhaust this topic.

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