

## **Team Flow and Team Effectiveness in Virtual Teams**

*Abstract for the general public*

We are currently seeing huge developments in the field of information and communication technologies (ICT), which have created the possibility of virtual teamwork. Firstly, thanks to virtual teamwork, more and more teams have been working together virtually all over the world for years, saving time and overcoming geographical and cultural barriers. Companies save on travel expenses, costs and meeting times, duplication costs and other logistical expenses. Secondly, a literature review shows that there is a consensus that the effectiveness of a virtual team includes both the performance of the organization and positive psychosocial outcomes for team members. Thirdly, the COVID-19 pandemic has accelerated the implementation of virtual teamwork, with many employees working from home using virtual tools to work with teammates.

It is claimed that virtual teams make organizations more flexible and enable companies to more easily cope with the challenges posed by growing market globalization and competition, changing organizational structures and increasing customer requirements for punctuality and service effectiveness. However, so far it is not known which factors influence the effectiveness of virtual teams and the results are not uniform. Factors that have been identified so far include social, individual and contextual conditions, including those related to the performance of tasks. What is more important, a concept with great potential for supporting team effectiveness is the concept of team flow. Recent but few studies provide evidence of this relationship.

The main objective of the project is to check the causes of such links and differentiate them in terms of different measures of team effectiveness. While more research is needed to identify and verify the conditions of team flow in general, there is a clear research gap in the search for causes in the context of virtual teams.

Capturing the dynamics of team processes is necessary to better understand the dynamic mechanisms of team processes. Main issue in building this knowledge are conditions of team flow. In order to do that it is necessary to apply a multi-level theoretical approach and methods that will enable us to capture the dynamics of team processes. So far there are only measures of team flow as self-assessment that require the interruption of a team process for evaluation and therefore are not suitable for evaluation of team processes. In order to examine the dynamics of team flow during the team processes, we must identify a continuous, uninterrupted team flow indicators. Such an indicators could be based on behavioral and sensor data.

Therefore it is necessary to develop innovative measurement tools such as ready-made simulations and games, sampling methodology, video/audio recording, communication analysis and behavioral sensor systems as we propose in our project. One of our research tools will be TransistorsHead V-T-Flow which will include 6 online tools which participants of the research will use for 1) conducting creative thinking sessions, 2) planning their path from idea to innovation, 3) setting goals and tasks for team members, 4) calculating budget for the invention, 5) solving problems and make decisions, 6) checking their motivation and solve conflicts. The research will include 3 studies: a) exploratory surveys among 400 team members and managers, b) an experiment of virtual teamwork of 20 virtual self-managed teams (5 people in every Polish-German team), c) an experiment of virtual teamwork of 20 virtual teams with a manager (5 people in every Polish-German team). After this the machine learning and pattern recognition will be applied to develop of new application-based algorithms for flow team analysis.

Scientific results of this project will be a significant contribution of basic knowledge in social science on the relations of team flow and team effectiveness in virtual teams.