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THE IMPACT OF SUSTAINABLE TEAM MANAGEMENT ON THE WORKING TIME OF VIRTUAL TEAM MEMBERS. RESULTS OF RESEARCH

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Purpose: The aim of this paper is to present a solution to the research problem of how sustainable team management affects working time and the distribution of activities undertaken by team members.
Design/methodology/approach: The study verified 3 hypotheses derived from the research problem. The hypotheses were verified on the foundation of the original concept of methodology in management reality and research on human managers' behavior using online management tools as research tools (TransistorsHead.com).
Findings: First (H1), there is no relationship between sustainable team management and the share of team members' working time in relation to the manager's working time. Second (H2), there is a relationship that the greater the sustainable team management, the more share of team members' working time to total team working time is balanced. Third (H3), there is no relationship between sustainable team management and the fact that the share of time of individual managerial actions in the team manager's work is more balanced.
Research limitations/implications: The study involved 5 virtual teams and every team consisted of team managers and 5-6 members. All the team members could take managerial actions and use all online management tools, however, the number of managerial actions was 10.
Practical implications: In the literature, we can find different views on the desirability of reducing the influence of the team manager to realize the full potential of team members. From this point of view, sustainable team management is based on treating one's influence in the organization as a factor shaping performance effectiveness, rather than as an attribute of one's importance and prestige. The trainings for managers could be offered based on these ideas.
Social implications: On the one hand, the literature emphasizes the leading role of the team manager in achieving high team performance, and on the other hand, there are views on reducing the influence of the team manager to realize the full potential of team members. The team manager has to choose which point of view to use.
Originality/value: The system of organizational terms used to represent managerial competencies as managerial actions, recorded by online management tools (TransistorsHead.com).
Keywords: sustainable team management, virtual teams, working time.
Category of the paper: Research paper.

1. Introduction

The concept of increasing the participation of team members in management and reducing the influence of managers on the activities undertaken by team members emerged in management science in the early 1950s. At that time, Lewin (1951, 1952) defined the work environment as the main determinant of the behaviour of organizational members. The psychological mechanism governing effective behaviour in knowledge organizations should be the manager's ability to regulate his own influence in addition to free behaviour (Gilbert, 1978; Handy, 1994).

This ability called deinfluentization or reduction of influence concerns (Kożusznik, 1996, 2005) the conscious regulation of one's influence - to consciously weaken, reduce or even get rid of it altogether when the influence of other individuals or entire groups is more appropriate to the requirements of the situation or is related to new demands on organizations. This must create conditions for a full use of the knowledge capital and skills of their participants. New challenges to management are often formulated in the form of demands – let's maximize the potential of all participants in the organization, let's give them the opportunity to exist, let's give them the space to prove themselves. These postulates can be fulfilled if we make full use of the competencies of all participants in the organization (Yukl, 2006; Pearce, Conger, 2003). However, this is not possible when influence is exerted that limits, weakens or reduces the room for maneuver and action of others.

The concept of influence reduction in a manager's work, formulated in this way, is based on treating one's influence in the organization as an instrument of efficiency, rather than as an attribute of one's importance and prestige. It is based on the fact that the manager should see the influence on the members of the organization from the perspective that he or she can, at certain times, divest himself or herself of power without losing sense of importance, autonomy, and security (Argyris, 2010).

In opposition to this approach is the traditional understanding of the manager's role as a subject of dominant influence over the behaviour of team members. In this approach, a manager may have power based on authority, the ability to reward subordinates' identification with the unique information he or she possesses (French, Raven, 1959; Raven, 1965; Bruins, 1999; Raven, 1999; Yukl, 2006).

We observe a strong attachment to influence, people who manage organizations do not want to lose it, as they have often devoted an entire career path to gaining influence, striving to influence others and make their mark on the shape and functioning of the organization. This attachment of managers to influence is an indicator of our times, where "strong" personalities, a "strong" hand or "decisive" players count (Handy, 1996; Peters, 1992).

From the opposition of the two approaches to team management, including virtual teams, there is a research gap that concerns how management teams across the spectrum of managerial influence function in the most basic organizational dimension, which is working time. This strong interest in managerial influence dominates the literature (Messic, Kramer, 2011). There is much less of research confirming the importance of all influences in a team and, as the authors claim, they should be more visible to fill this gap (Yukl, 2006; Lewin, 1951; Argyris, 2010; Haslam et al., 2011; Kożusznik, 2014) and confirm the role of influence reduction in sustainable work management.

Therefore, the purpose of this paper is to provide a solution to the research problem of how sustainable team management, based on the phenomenon of influence reduction (Kożusznik, 2014), affects the team's working time and the distribution of activities undertaken by the team manager. The measure of sustainable team management is the coefficient of variation in %, and its interpretation is as follows: the higher the value of coefficient of variation in %, the greater the variation in the influence of team members on the course of work, and thus the greater the sustainable team management.

In terms of the above research problem, three hypotheses were formulated.

H1: The greater the sustainable team management, the more share of team members' working time in relation to the manager's working time.

This hypothesis is based on the assumption of the importance of increasing the influence of the employees in relation to the influence of the manager and using the influence of the employees to a significantly higher degree than before and bringing about a balance (Park, Kwon, 2013; Xi et al., 2017; Zhu et al., 2018).

H2: The greater the sustainable team management, the more share of team members' working time to total team working time is balanced.

The hypothesis stems from the assumption that the influence of individual employees should be equalized (Bennis, Nanus, 1985; Bass, Avolio, 1993; Labelle et al., 2024).

H3: The greater the sustainable team management, the more share of the working time of individual managerial actions in the manager's work is balanced.

This hypothesis is based on the assumption that managerial influence should be based on the balanced use of multiple managerial instruments rather than focusing on selected instruments (Hwang et al., 2014).

The authors decided to conduct the study in virtual, task-oriented teams due to the fact that virtual teams are now common in the functioning of organizations (Hilarowicz, Pollak, 2010; Peifer et al., 2021). The study involved 60 participants who were members of 12 teams. The long-term indirect observation method was used as the research method, and the research tools were online managerial tools on the TransistorsHead.com platform.

Section 2 presents the theoretical considerations of sustainable team management, virtual teams and working time of teams. Section 3 describes the research method, research tools and the course of long-term participant observation. In Section 4, the authors verify the stated hypotheses that are parts of the research problem.

2. Theoretical foundations

2.1. Managerial authority vs reduction of social influence

Social authority and influence tactics - these terms are sometimes used interchangeably. Particularly in organizations, formal authority can be confused with power, assuming that those positioned higher in the organizational hierarchy are often assigned more authority, and that people at similar levels of the organizational hierarchy are assigned the same authority (Pfeffer, 2017). In reality, formal authority is only one aspect, sometimes even less significant, of the exercise of power.

This means that individuals at the same level of the organizational hierarchy may have different resources of authority due to different access to its resources (Kożusznik, 2014). This is due to their psychological characteristics and depends on the subordinates they work with. However, as suggested in the literature (Schriesheim, Hinkin, 1990; Stahelski, Paynton, 1995), the two terms should be clearly distinguished. Social power refers to the repertoire available to an individual, while influence tactics refer to the application of a specific behaviour to a specific situation (Kozlowski, Ilgen, 2006).

The definition created by French and Raven (1959) helps to see the differences between these concepts. They defined influence as the power that one person (an agent of influence) expends against another person (a target) to obtain a change in the influence addressee's behaviour, opinions, attitudes, goals, needs and values. With this view, power can be defined as the potential ability of a person (an agent) to influence another person (a target).

Thus, social influence is "kinetic energy" and (managerial) power is potential influence (French, Raven, 1959). In an organization, the agent is usually a manager endowed with formal authority in the organization.

The level of employee involvement and subordination to the goals of the organization is related to the way power is exercised (Etzioni, 1975; Keltner,2016). Those with power in an organization, i.e. managers, may expect employees to focus primarily on avoiding punishment. Etzioni (1975) calls this behaviour alienation, and if the organization is based on exchange principles, it triggers calculative behaviour on the part of employees. Employees are motivated to achieve maximum personal benefit (Pratkanis, 2007).

To this picture of phenomena in the organization, it should be added that there is a kind of game taking place in the team, in which the influence is fought for by its individual members responsible for:

- maintaining integration and differentiating the team from the rest of the organization; the greatest responsibility in this regard lies with the team leader, formally appointed, and the function performed by him can be called "boundary", since he is mainly responsible for the separation and task specialization of the team,
- developing the dynamics and development potential of the team; informal processes in the group, which can be described as dynamic functions, are responsible for this,
- meaningfulness of team activities with the definition of tasks and rewards; due to the desire for subjectivity and autonomy in the work of individual employees, they are the ones most responsible for it (Sundstrom, DeMeuse, Futrell, 1990).

The group as a whole, the individual team members and the team leader responsible for different aspects of the team's performance also generate different influences and forces to help the team processes run properly (Lewin, 1951; Kożusznik, 2020). As a result of the blurring of boundaries and "melding" with another team, and the disappearance of group processes, there will be an inability to solve any difficult situation. If there is a lack of a team's sense of its importance to the organization as a whole, this will result in the exclusion of employees from active participation.

Therefore, this paper focuses attention on sustainable team management, which is the result of reducing the manager's influence on the activities undertaken by team members. The concept of influence reduction is based on treating one's influence in the organization as a factor shaping efficiency, rather than as an attribute of one's own importance and prestige (Kożusznik, 2014). It is based on the rational disposal of influence, with full acceptance and awareness of the importance of the influence of all elements of the team (Kożusznik, 2020). Reducing a manager's influence also has many other sources:

- the natural game of influence within the team and the assumption that conformity and the search for independence are equivalent mechanisms (Hollander, 1985; Pratkanis, 2007),
- the idea of interactivity, which implies that exerting influence is not possible without the right space; even the best-equipped employee with his or her own qualities, skills and competencies will not be effective in an organization unless special external conditions are provided (Paliga et al., 2020),
- act of influence changes not only the behaviour of those who are the recipients of influence, but also the values and attitudes of those who exert influence (Haslam et al., 2011).

2.2. Virtual team

Virtual teams in organizations appeared in the last decade of the 20th century and they are associated with accelerating business activities and increasing innovations (Lipnack, Stamps, 2000; Fuller, Hardin, Davison, 2006). A virtual team as a group of people who do not stay geographically, organizationally or temporally in the same place, but co-operate with each other through the use of ICT for one or more organizational tasks (Powel, Piccoli, Ives, 2004; Kożusznik, Pollak, Chrupała-Pniak, 2020). The degree of use of new technologies then becomes an indicator of the level of virtuality of such a team (from semi-virtual to pure virtual) (Griffith, Meader, 2005; Hertel, Konradt, Voss, 2006; Lonnblad, Vartiainen, 2012).

The virtual team is also described by the category of temporality when short, undefined time of the team's activity is conditioned by the needs of the organization and individual motivations of its members (Gassmann, Von Zedtwitz, 2003). Virtual teams are also found in organizations which bring together specialists who design and conduct research or collect data (Engerer, 2019). During the COVID-19 pandemic virtual teams appeared en masse in organizations as a necessity to meet the challenges of isolating employees and virtual teams became a hallmark of the pandemic (Forst, Duan, 2020). The pandemic has boosted the implementation of virtual teamwork, with many employees working at homes using virtual tools to collaborate with their teammates (Feitosa, Salas, 2020). The changes during the COVID-19 pandemic are linked with uncertainty because of the growing variability and complexity of many work processes. Result of this is that work has become more cognitively demanding due to increased technology, task variety and knowledge-based work.

2.3. Working time

Time is a resource that virtual teams use to carry out processes in the organization (LePine et al., 2008; Santos, Passos, 2013). A person's work in a team always relates to time, which means sharing the working time of task execution among team members, a largely shared perception of time among team members, but also conflicts over the time allocated to perform team processes (Standifer et al., 2015).

The time perception of individual team members affects the working time of the team as a whole (Waller, Franklin, Parcher, 2020). Individual perception of time determines the perceived distribution of attention to past, present and future goals (Zhang et al., 2013).

Based on the above-mentioned studies, it may seem appropriate to assume that the optimal configuration of task performance in a team, which in our view involves undertaking managerial activities (Flak, Kożusznik, 2023), is related to the degree to which team management is balanced.

Hollenbeck, Beersmy and Schouten (2012) outlined three important conditions for teams and their performance of working time tasks, namely:

- access to a task environment,
- diversity of skills in task performance,
- structural interdependence of tasks.

All of these conditions were met during the empirical study, which we describe in Section 3 and Section 4. If all team members have uniform access to a task environment that is structurally interdependent, this is likely to lead to a high level of situational awareness at the individual level, and thus positively affect the distribution of working time among team members (König, Waller, 2010). Since time is a key dimension in shaping teamwork and the team experience (Arrow et al., 2004), the distribution of team members' time can be influenced by the degree of sustainable team management.

3. Methodology of research

The research method used to solve the research problem and verify the hypotheses indicated in the Introduction was a long-term indirect observation, conducted from December 18, 2023 to January 29, 2024 among students of the Faculty of Law and Social Sciences at Jan Kochanowski University of Kielce. Observation is a method of collecting information that involves making observations in a deliberate, planned and systematic manner in order to find the answer to a clearly posed question (Anguera, 2018). Observation can be direct or indirect. As in the research we used indirect observation, we defined it as using information obtained from other people or from documents or other data sources. In this research we used online management tools as research tools. Unlike questionnaires, which mostly collect opinions and facts, online management tools recorded the actual activities undertaken by virtual teams. The advantage of the research method used was to reduce the subjectivity of respondents' findings about the real managerial activities they undertook while performing a complex task.

As a result of the organizational steps taken prior to the survey, it was possible to build a group of 60 respondents whose activities on the task for a month and a half were recorded by online management tools on the TransistorsHead.com platform. The participants were involved in the study in 12 virtual teams working during the course "Laboratory management". Each team consisted of 4-6 members. All participants in the study had basic skills in management techniques and tools, acquired in management subjects during their studies.

As it was mentioned above, the measurement tools were online managerial tools hosted on the research platform TransistorsHead.com. Participants were tasked with preparing program design documentation on a YT channel in Talent Show format using online management tools implemented on the TransistorsHead.com platform, including 10 online management tools.

It is necessary to present how these tools work and their methodological basis. The methodological basis of the study carried out is the system of organizational terms, which is an original concept for studying organizational reality (Flak 2018) through the method

of observation using online managerial tools as research tools. Such a concept was inspired by the philosophy of L. Wittgenstein, who viewed facts and their "states of affairs" as the only entities in the surrounding reality (Cheung, 2006).

According to the concept of the system of organizational terms in the organizational reality ontology, it is assumed that any fact can be represented by an organizational term (Zalabardo, 2015). Organizational term is a symbolic object that can be used as an element of an organizational reality model (Rios, 2013). Organizational term is a close analogue to a physical units in the SI unit (length, mass, time, etc.). It is assumed that organizational terms are abstract objects that only serve to represent facts occurring in organizational reality. The characteristics of an organizational term, on the one hand, derive from its definition, and, on the other hand, derive from causal relationships or co-occurrence relationships with other organizational terms (Backlund, 2000). Organizational terms can change quantitatively, qualitatively and mereologically (Kulieshov, 2018).

According to the logical division, organizational terms are divided into two classes: primal and derivative terms. Facts, which are resources in organizational reality, are represented by primal organizational terms. Facts, which are processes in organizational reality, are represented by derivative organizational terms. In the same way, the arrangement of organizational terms combines the resource approach (Wernerfelt, 1984) and the process approach (Glukas, 2011) in management. In addition, another logical division creates different types of organizational terms. The number of types is not specified (Flak, 2020).

In the organizational size system, a manager's action is represented by a combination of "event" (derivative organizational term) and "thing" (primal organizational term) (Flak, 2020). The event or thing is denoted by the symbols "n.m", where n denotes the number of the event or thing and m denotes its next version. An example of the layout of various managerial actions is illustrated in Figure 1.

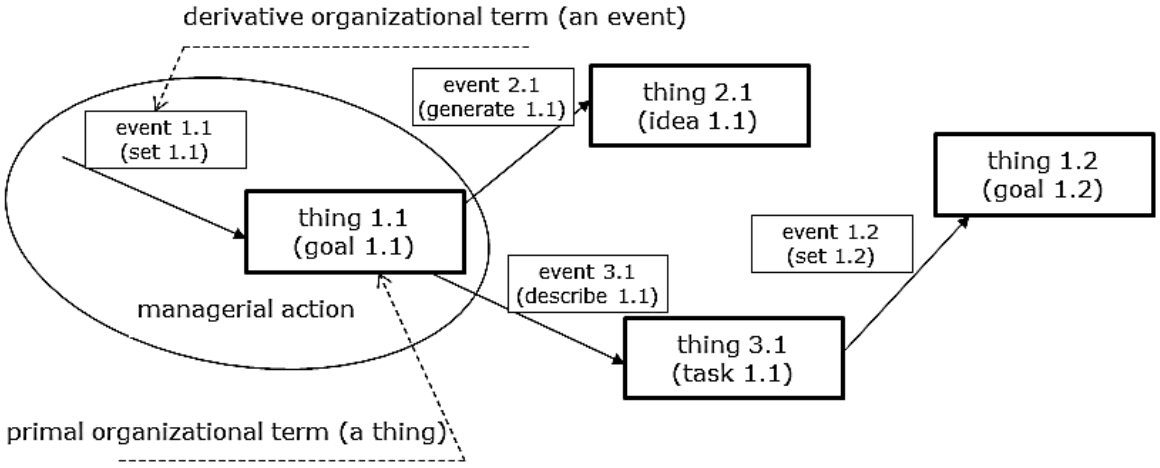

Figure 1. Example structure of managerial actions.

Source: Flak, 2021.

Based on the system of organizational terms, 10 managerial tools were designed and implemented, whose function is also to record the parameters of 10 managerial activities during their use as it follows: 1 - set goals (GOALS), 2 - describe tasks (TASKS), 3 - generate ideas (IDEAS), 4 - specify ideas (SPECIFICATIONS), 5 - create options (OPTIONS), 6 - choose options (DECISIONS), 7 - check motivation (MOTIVATION), 8 - solve conflicts (CONFLICTS), 9 - prepare meetings (MEETINGS), 10 - explain problems (PROBLEMS). The dashboard of the online management tools is presented in Figure 2. In this way, the online management tools function as research tools (Flak 2021). The tools are available on the TransistorsHead research platform at: http://transistorshead.com/

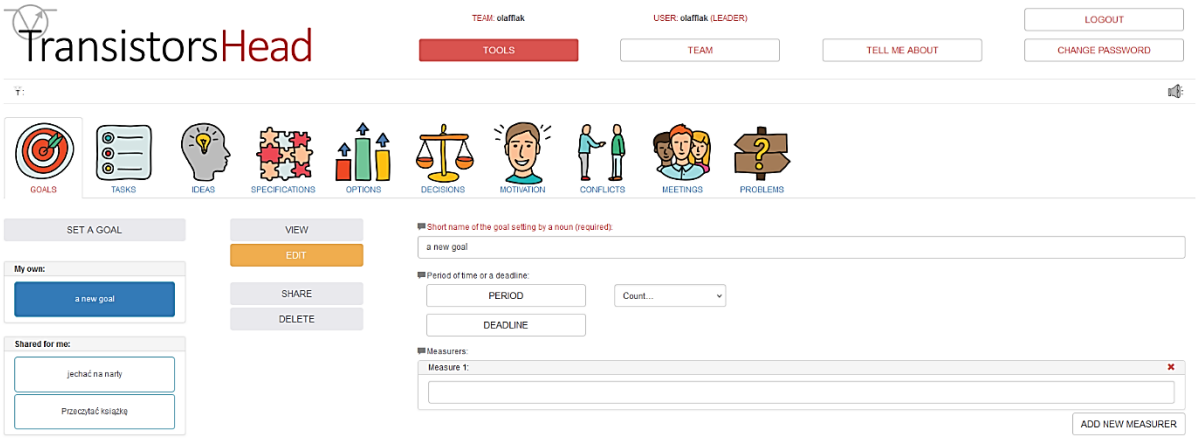

Figure 2. The dashboard of online management tools as research tools.
Source: Flak, 2023.

4. Results of research

The research problem, which was defined as a result of the research gap described in the Introduction, concerned the impact of sustainable team management, based on the phenomenon of influence reduction (Kożusznik, 2020), on the working time of the team and the distribution of managerial actions undertaken by the team manager. In terms of the above research problem, three hypotheses were formulated and verified based on empirical data recorded by TransistorsHead.com online managerial tools during the long-term non-participant observation. For all three hypotheses, a measure of sustainable team management was established. To do so, the number of managerial actions undertaken (counting all 10 measured managerial actions in total) by individual members of the virtual teams was measured. Basic statistical measures were then calculated to assess the degree of balanced influence of team members on the team's workflow (Table 1).

Table 1.
Statistical measures on the work of virtual teams based on the number of managerial actions taken

virtual team	managerial actions in total	arithmetic mean	standard deviation	gap (max-min)	coefficient of variation in %
1	5456	1091,20	806,07	2221	73,87
2	5218	869,67	310,38	913	35,69
3	4893	815,50	535,62	1481	65,68
4	4292	858,40	168,44	480	19,62
5	2749	549,80	224,49	651	40,83
6	3856	642,67	332,44	920	51,73
7	6498	1299,60	233,61	726	17,98
8	2815	563,00	410,41	1137	72,90
9	1692	423,00	245,84	627	58,12
10	4973	1243,25	389,32	1044	31,31
11	3158	631,60	274,33	860	43,43
12	2736	684,00	435,98	1063	63,74

Source: own elaboration.

The statistical measures presented in Table 1 show how the teams participating in the study varied in terms of the influence of team members on the workflow. On the one hand, there were teams with a low balance of team management and thus the dominance of one person (e.g. team 1, team 3, team 8). On the other hand, it is possible to identify teams and a high balance of team management and, consequently, the similar influence of team members on the course of work of the team - team 4 and team 7. The measure of sustainable team management is the coefficient of variation in %, and its interpretation is as follows: the higher the value of coefficient of variation in %, the greater the variation in the influence of team members on the course of work, and thus the greater the sustainable team management.

The first hypothesis was (H1) that the greater the sustainable team management, the more share of team members' working time in relation to the manager's working time. To verify it, the share of the manager's time in relation to the time of all team members was calculated for each of the 12 teams separately. This calculation is shown in Table 2, and Figure 3 illustrates the relationship between sustainable team management and the share of manager's working time to team members' working time.

Table 2.
Statistical measures on timeshare of manager and other team members

Team	total working time	working time of a manager in seconds	working time of team members in seconds	working time of a manager in %	working time of team members in %
1	50701	24559	26142	48,44	51,56
2	28160	8753	19407	31,08	68,92
3	60916	19888	41028	32,65	67,35
4	48764	12576	36188	25,79	74,21
5	32561	11963	20598	36,74	63,26
6	38649	10188	28461	26,36	73,64
7	54691	18686	36005	34,17	65,83
8	31604	17848	13756	56,47	43,53
9	40736	21295	19441	52,28	47,72

Cont. table 2.

10	49052	13972	35080	28,48	71,52
11	52172	17476	34696	33,50	66,50
12	46049	15625	30424	33,93	66,07

Source: own elaboration.

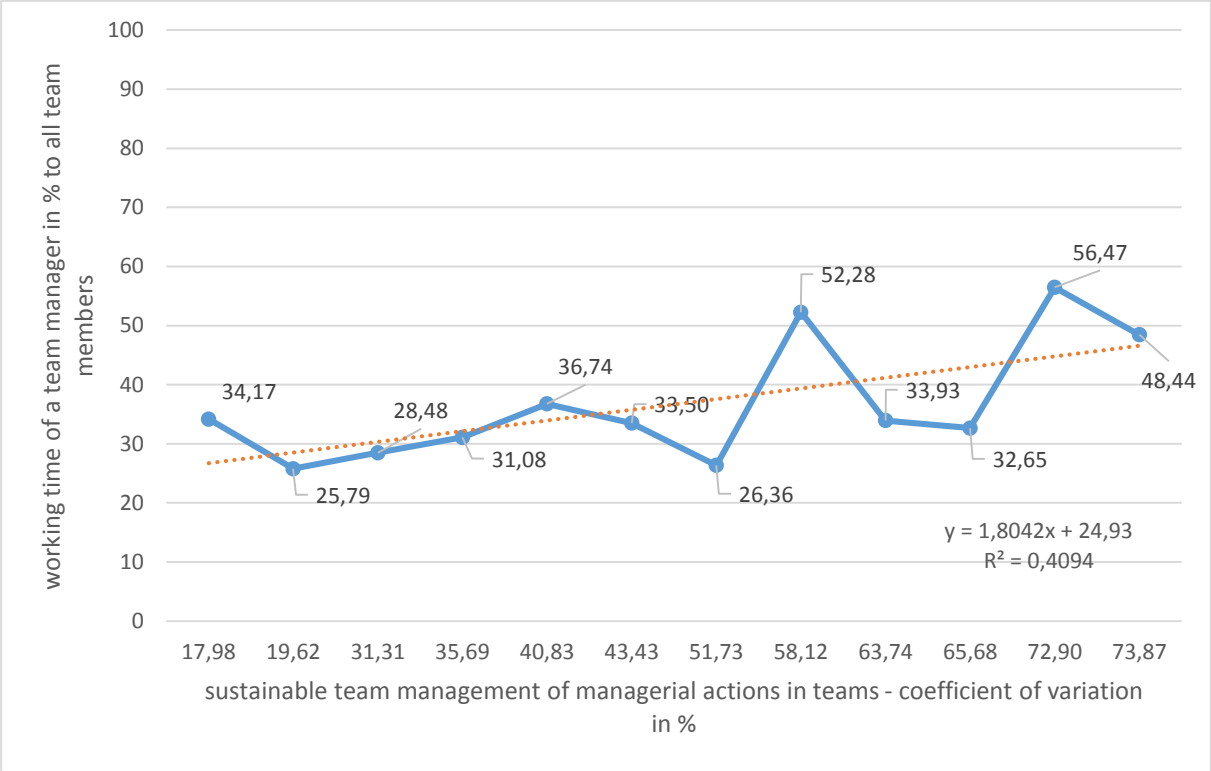

Figure 3. Relationship between sustainable team management and the share of manager's working time to team members' working time.

Source: own elaboration.

As you can read from Figure 3, the relationship is largely linear, but the correlation coefficient R2 is very low (0.4094). It should be noted that tests were also conducted for other functions determining the relationship between the two variables, but even for a polynomial of the 6th degree, R2 equals 0.5196. Therefore, it can be concluded that in the study group, there was no relationship between sustainable team management and the share of manager's working time to team members' working time. Therefore, hypothesis H1 cannot be considered true, so it is not true that the greater the sustainable team management, the more share of team members' working time in relation to the manager's working time.

The second hypothesis stated (H2) that the greater he sustainable team management, the more share of team members' working time to total team working time is balanced. In order to verify it, the rate of variation in the work time of individual team members, including the manager, was calculated separately for each of the 12 teams participating in the study. The calculation is shown in Table 3, and Figure 4 illustrates the relationship between sustainable team management and the coefficient of variation in % in terms of each team member's working time.

Table 3.
Statistical measures on the balance of working time of individual team members

team	total working time	arithmetic mean	standard deviation	gap	coefficient of variation in %
1	50701	10140,20	8955,52	22969	88,32
2	28160	4693,33	2354,91	6441	50,18
3	60916	10152,67	8099,22	19838	79,77
4	48764	9752,80	4069,11	10315	41,72
5	32561	6512,20	3405,34	8987	52,29
6	38649	6441,50	4269,79	11842	66,29
7	54691	10938,20	5166,22	13482	47,23
8	31604	6320,80	6126,32	16575	96,92
9	40736	10184,00	7127,49	19478	69,99
10	49052	12263,00	6047,16	15623	49,31
11	52172	10434,40	5311,70	13342	50,91
12	46049	11512,25	4704,48	11487	40,86

Source: own elaboration.

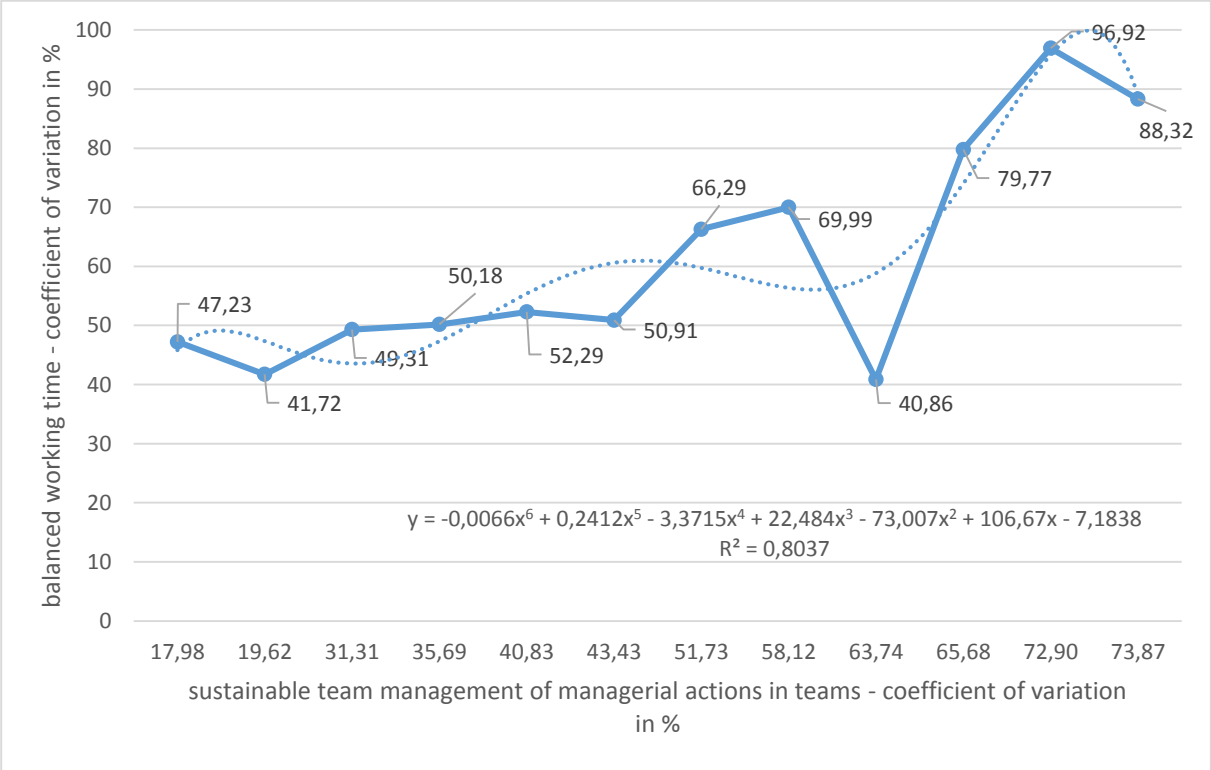

Figure 4. Relationship between sustainable team management and the coefficient of variation in % in terms of each team member's working time.

Source: own elaboration.

As it can be read from Figure 4, the relationship between sustainable team management and the coefficient of variation in % in terms of each team member's working time is largely based on a 6th-degree polynomial function. The correlation coefficient R2 is quite high at 0.8037. Therefore, it can be concluded that there was a relationship between sustainable team management and the balanced working time of team members in the study group. Thus, hypothesis H2 can be considered true, so, indeed the greater the sustainable team management, the more share of team members' working time to total team working time is balanced.

The third hypothesis stated (H3), that the greater the sustainable team management, the more share of the working time of individual managerial actions in the manager's work is balanced. In this case, the focus was on the time of individual managerial actions performed by team managers. Table 4 shows the time spent on individual managerial actions in seconds by individual managers (a description of which is presented in Section 3), while Table 5 presents statistical measures describing the time spent on individual managerial actions for individual managers. The most important indicator is the coefficient of variation in % of time spent undertaking individual managerial actions. The lower the coefficient, the more balanced the share of time of individual managerial actions was for a given team manager. Figure 5 illustrates the relationship between sustainable team management and the coefficient of variation in % of time undertaking individual managerial actions by individual team managers.

Table 4.
Time to perform each managerial actions in seconds

team manager	type of managerial actions									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	5142	4323	4001	2962	2865	1009	907	1912	550	888
2	2192	759	854	497	779	953	353	262	512	1592
3	4867	4551	1771	680	210	510	1792	2744	1390	1373
4	2358	1802	1028	1377	476	771	842	538	1411	1973
5	4287	3370	622	260	691	523	503	633	768	306
6	1597	757	1472	1177	309	865	683	692	937	1699
7	1300	3281	611	1935	732	1136	1567	3625	1377	3122
8	4538	1896	1755	2861	1846	965	295	249	807	2636
9	3926	2662	567	3246	2152	671	2338	873	808	4052
10	3474	2589	1028	711	1316	316	614	1529	1298	1097
11	4746	3854	868	1387	984	654	555	857	136	3435
12	3116	1377	1328	1605	20	1183	2366	1371	1423	1836

Source: own elaboration.

Table 5.
Statistical measures describing working time for individual managerial actions for individual managers

team manager	**total time in seconds**	**min**	**Max**	**arithmetic mean**	**standard deviation**	**gap**	**coefficient of variation in %**
1	24559	550	5142	2455,90	1561,77	4592	63,59
2	8753	262	2192	875,30	565,75	1930	64,63
3	19888	210	4867	1988,80	1526,67	4657	76,76
4	12576	476	2358	1257,60	603,97	1882	48,03
5	11963	260	4287	1196,30	1340,39	4027	112,05
6	10188	309	1699	1018,80	430,08	1390	42,21
7	18686	611	3625	1868,60	1035,44	3014	55,41
8	17848	249	4538	1784,80	1252,45	4289	70,17
9	21295	567	4052	2129,50	1280,29	3485	60,12
10	13972	316	3474	1397,20	908,13	3158	65,00
11	17476	136	4746	1747,60	1541,76	4610	88,22
12	15625	20	3116	1562,50	761,87	3096	48,76

Source: own elaboration.

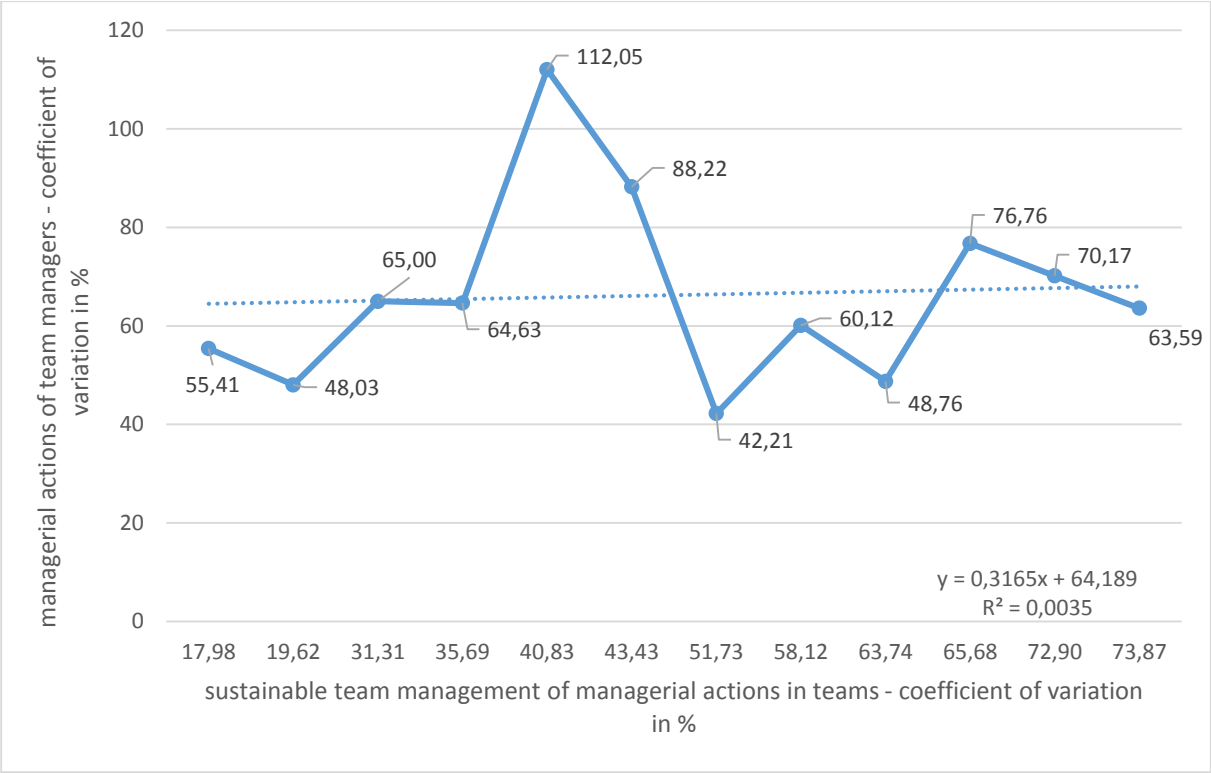

Figure 5. Relationship between sustainable team management and the coefficient of variation in % of time undertaking individual managerial actions by individual team managers.

As can be read from Figure 5, the correlation coefficient R2 for the linear function is very low (0.0035). A search for another function describing the correlation between these phenomena did not yield significantly better results. The highest correlation coefficient R2 was 0.5774 for a 6th-degree polynomial. However, even such a value does not allow us to conclude that in the study group, there was a relationship between sustainable team management and balanced timeshare of individual managerial actions in a manager's work. Thus, hypothesis H3 cannot be true, so it is not true that the greater the sustainable team management, the more share of the working time of individual managerial actions in the manager's work is balanced.

5. Discussion

Our research has confirmed that the influence reduction represented by sustainable management contributes to a balanced distribution of influence in the team, which reinforces the importance of research not so much on the role of the manager, as is common in research, but on the influence of all team members and the necessity for managers to reduce their influence to enable that influence. In practice, training based on de-influence can be rolled out, using proven DEI behavior and TIRES methods, as well as the original TransistorsHead.com platform for measuring team influence and effectiveness.

According to the literature review virtual team effectiveness can be analyzed from four perspectives: creative behavior (Han et al., 2020), task performance (Martins et al., 2004), teamwork (Lin et al., 2017), organizational citizenship behavior (Waizenegger, 2020). Virtual teams are viewed as complex, adaptive, dynamic systems, and they are embedded in organizations and contexts and performing tasks over time (Ilgen, 1999). The ways of achieving goals, e.g. carrying out tasks, as well as the team's potential, especially in a service-oriented organizations, are crucial when the performance is closely related to the behavior of the employees toward their customers and fellow teammates (Spencer, 2022). Some authors suggested additional motivation and job satisfaction, which refer to attitudes and behaviors of the team members with psychosocial elements at the interface between the group and the individual (Khaliqur, Upadhyay, 2021).

Therefore, our research is not a confirmation that sustainable team management should be taken care of in every case, but in the case of working time, it can have an impact on the effectiveness of a virtual team.

The limitations of our study concern three main aspects. First, the study involved 60 students who solved an organizing problem over a month and a half. Their number is too small and their working time too short to be able to transfer the conclusions of the hypothesis verification to virtual team managers in general. Second, research tools in the form of online managerial tools on the TransistorsHead.com platform recorded 10 managerial activities, and the hypotheses posed in the Introduction were verified on the basis of this data. In the future, when more online managerial tools are built, it will be possible to study the relationship between sustainable management and working time more extensively. Third, the observation involved management students, not professional managers. Therefore, the conclusions may be limited in scope.

6. Conclusions

As a result of research on the influence of people on others in the organization, two opposing approaches to the importance of social influence in achieving team or organization-wide performance have developed. On the one hand, the literature emphasizes the leading role of the team manager in achieving high team performance (Kets de Vries, 2008), and on the other hand, there are views on reducing the influence of the team manager in order to realize the full potential of team members (Kożusznik, 2020). From this contradiction, a new approach is emerging, which can be called sustainable team management (Cizmaș et al., 2020), which is based on treating one's influence in the organization as a factor shaping effectiveness, rather than as an attribute of one's own importance and prestige (Kożusznik, 1996). Therefore,

an important and timely research area is sustainable team management, which is a consequence of reducing the influence of the team manager on the activities of team members.

In this research area, the paper verifies 3 hypotheses, resulting from the research problem, which was the impact of sustainable team management on the working time of the team and the distribution of actions undertaken by the team manager. Summarizing the empirical research conducted, the following can be stated.

First (H1), there is no relationship between sustainable team management and the share of team members' working time in relation to the manager's working time. Which means that the reduction of influence is not about the influence of team members in relation to the influence of the manager because they are different types of influence (Kożusznik et al., 2020). This hypothesis is based on the assumption of the importance of increasing the influence of employees in relation to the influence of the manager and using the influence of employees to a significantly higher degree than before and bringing the balance (Park, Kwon, 2013; Zhu et al., 2018).

Second (H2), there is a relationship that the greater the sustainable team management, the more share of team members' working time to total team working time is balanced. Confirms the assumption of the importance of the influence of each employee and the balance of influence in the team (Yukl, 2006; Kożusznik et al., 2020). The hypothesis stems from the assumption that the influence of individual employees should be equalized (Bennis, Nanus, 1985; Bass, Avolio, 1993).

Third (H3), there is no relationship between sustainable team management and the fact that the share of time of individual managerial actions in the team manager's work is more balanced.

It should be noted that these hypotheses were verified on the basis of a 60-person research group, so in order for these conclusions to apply to a wider population of virtual teams and their members, further research should be conducted in the future. At the same time, the presented results were obtained through the use of an innovative research method, which is the system of organizational terms and measurement through online managerial tools (Flak, 2018).

The research problem presented in the article and the resulting hypotheses can contribute to the development of management science in the field of managerial automation. The contribution to management science is the results of the verification of research hypotheses that relate to the use of sustainable management to manage virtual teams. Both the automation of the manager's work and virtual teams will be studied in the future (Flak, Kożusznik, 2023), and on the basis of this research, conclusions will be made for the development of management science (Lily et al., 2023).

The results of the research show that the research method used, in the form of long-term indirect observation, as well as online managerial tools built on the basis of the system of organizational terms, make it possible to conduct research, the results of which will be used to implement artificial management. The system of organizational terms is also an original contribution to organizational reality research methodology (Flak, 2018).

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