Title: Management by Objectives as a Method of Measuring HR Teams Effectiveness

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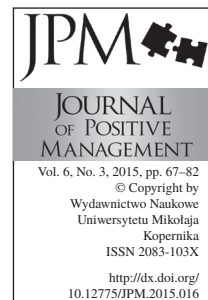# MANAGEMENT BY OBJECTIVES AS A METHOD OF MEASURING TEAMS' EFFECTIVENESS

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Abstract

The aim of the paper is to present the method of management by objectives in measuring effectiveness of teams. The main elements of this method – goals and tasks – were used to measure teams' work on the same project. The quantitative measurers of goals and tasks let assess an effectiveness of teams and compare teams to one another.

The methodology of the research was an experiment conducted with on-line management tools named goaler® and tasker® based on the system of organizational terms. This theoretical foundation represent system and positivist approach to management. However, this approach was developed in the mix research method.

This paper contains quantitative results and conclusions about effectiveness of teams. For this purpose following measurers were used: numbers of goals and tasks in each group, numbers of actions taken by team managers, duration of teamwork, number of goals and tasks editions.

Despite the fact that the method of management by objectives is thoroughly described and parameterized, human contribution in the application of the method in practice appeared still crucial. However, the originality of this paper comes from implementing online management tools which are based on the system of organizational terms and using them to measure human behavior.

Keywords: management by objectives, effectiveness, HR team, goal, task, system of organizational terms

Paper type: Research paper

1. Introduction

Management by objectives (MBO) is a classical method of management. Considering that first papers about the issue are dated half of the 20th century back, the method is strongly fostered and well known not only among scientists but also practitioners. Management by objectives (MBO) or management by

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objectives and self-control comes from classical management methods and its wide scope of use includes measuring team work effectiveness.

It is important to mention that MBO has a strong connection with a positive management philosophy. The MBO method is in itself a method of motivating employees by managerial practices that are perceived positively (commonly negotiated goals, an autonomy in searching and using means to achieve goals, self-controlling and periodical common controlling work done by team members). Considered as a successful method of motivating employees it supports accomplishment of other management functions (planning, organising, controlling). Management by objectives improves employees' motivation to work and to achieve organisational goals (Bieniok et al., 2004).

The literature of positive management gives some examples of using management by objectives to influence on employees. Chodorek writes about the management by objectives as an element of a positive relationship on the superior-inferior level (Chodorek, 2010). Other author, Szelagowska-Rudzka analyses a problem of team participation in managing an organisation which is very motivating for them. Therefore management by objectives is a method which supports implementing an idea of teams participation and it contains performing tasks, decision making process and solving organisational problems (Szelagowska-Rudzka, 2015).

The author who popularised the idea of MBO was an American guru of management, Drucker. He described basic assumptions of a simple yet effective, intuitive method of management in organisations (Reinfuss, 2009). According to Drucker (Drucker, 2008) managing business means managing by objectives. It is worth adding that the author acknowledges organisation's activity as teamwork. In his opinion every enterprise must build a real team and conjoin individual efforts in the common one. Every employee contributes specific resources and should use them to achieve a common goal. This is a direction that efforts of all people in organisations should follow. Their contributions have to match each other so that the result is „the whole – without gaps, clashes and needless doubling people's efforts".

The aim of the article is to present the method of management by objectives in measuring the effectiveness of the human resources management teams. The paper deals with a genesis and basic assumptions of the method, and also a procedure of its implementation in organisations. The last part of the elaboration shows the results of an experiment conducted with on-line management tools named goaler® and tasker® which let us measure managers' work in HR teams.

2. Theoretical assumptions of management by objectives (MBO)

The beginning of dealing with MBO method date from 50s and 60s of the 20th century. P. F. Drucker and McGregor worked on the issue then. Drucker (Drucker, 2008) named the procedure as management by objectives". McGregor

(McGregor, 1990) was searching for an alternative way to assess performance in organisation and perceived it as formulating specific goals and measuring their realisation.

Literature review shows numerous examples of implementing and using management by objectives. In the paper authors refer to selected articles presenting the philosophy, procedure, qualities and faults of the method.

The philosophy of MBO adapted by organisations is based on two general assumptions:

- managers' behaviours are more important than their personalities,
- behaviour should be defined by results of set goals.

Success of the approach depends on three variables (Ross, 1971):

- feedback given each other among employees in an organisation,
- support of top managers in the area of introducing and consequently implementing the method of management by objectives,
- managers' attitude which is goal-oriented.

Management by objectives treats a motivation, initiative and personnel's activity as the most precious and the least used resource of an enterprise (Bieniok et al., 2004).

Authors who wrote about MBO emphasize that it results in dynamics and integration of common efforts of superiors and their subordinates towards organizational development. The most important assumption of the method is the requirement of active attitude of managers. Other characteristics of the MBO are full and reliable engagement of management through introducing and implementing the MBO system, helping to set goals, allocating tasks and accepting the choice of resources and by employees. A superior should be open and accessible to his employees. The last factor is a concentration on results and reporting about the progress in tasks' accomplishment and effectiveness (Bieniok et al., 2004).

Tosi, Rizzo and Carroll (Tosi et al., 1970) present the MBO in relations to the MEA (Means End Analysis). The idea of MEA consists in maintaining a particular order in defining goals in organisation. The process starts with a general goal and then setting resources needed for its realisation. There are specific goals which need more detailed means to achieve them. The authors are convinced that MBO bases on such assumptions. Management by objectives is a process during which organisation's members work together, identify common goals and coordinate their activity to achieve them. It is important to say that whole procedure is realised in the context of future and changes. A goal is perceived as a final state or conditions which should be achieved.

Tosi, Rizzo and Carrol state as follows (Tosi et al., 1970):

- a set of goals of an organisational unit is the base of its activity and a set of an individual employee defines their work and can be perceived as a way to characterise an employee's job position;

- goals can, but do not need to, require changes. A goal can be connected with changing nothing, but maintaining the *status quo*. Authors emphasize that in most situations MBO helps to implement changes, improvements and innovations;
- goals can originate from every place in organisational structure and should be derived from general goals of an organisation, being compliant with its philosophy, politics and plans;
- setting goals takes into consideration following issues:
    — demand for a documentation in superior-subordinate relations taking into account what and in what time something has to be done,
    — giving organisation members more fixed basis for development, integration of plans and personal activity,
    — being a basis for a feedback and assessment of managers performance,
    — taking into consideration a need for controlling key organisational functions,
    — reassuring the basis for rewards adequate to work performance,
    — emphasizing the need for change, improvement and growth of an organisation and its members.

The issue of using management by objectives to measure a team effectiveness is quite well recognized. The example is a research done among health care teams where authors proved a positive influence of MBO on team performance (Adorian et al., 1990). Antoni (Antoni, 2005) presented the MBO method as an effective tool in teamwork process. Results of his research are very interesting. Antoni writes about an autonomous teams and their role in increasing effectiveness of an enterprise, and simultaneously improving competitiveness of an organisation in international dimension. The model of a team effectiveness presented by Antoni was based on the idea of E. Weldon and L. R. Weingart (Antoni, 2005). Figure 1 shows the authors' assumptions in the form of a model containing group goals and team effectiveness.
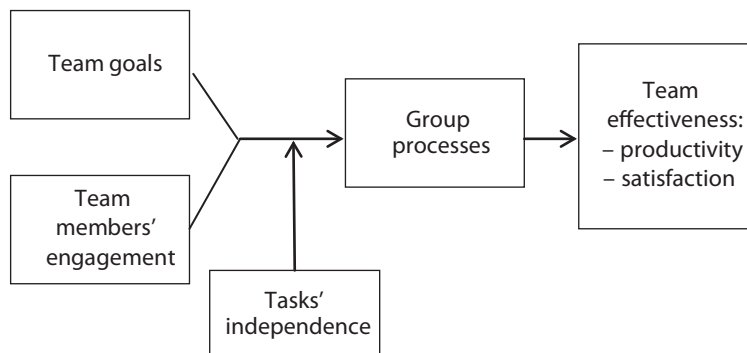
Figure 1.
Model of team goals and team effectiveness

Source: own elaboration on the basis of (Antoni, 2005).

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Figure 1 presents relations between team goals and team effectiveness. Goals of a team and engagement of its members in their realisation influence indirectly team effectiveness measured by a degree of productivity and team members' satisfaction. The engagement in goals realisation is an extent to which group perceives these as important. It occurs as an effort in work and being persistent in case of encountering difficulties and obstacles. Variables intermediating in the model are tasks' independence and group processes.

Antoni (Antoni, 2005) aimed to prove an effectiveness of the MBO system as a way to manage autonomic groups. Here are the most important conclusions that he stated:

- team members' engagement in achieving the goals is positively correlated with results achieved by the team,
- there is a positive correlation between group processes and team results (partially confirmed).

Results of the research conducted by Antoni allowed to conclude that the MBO system supports team effectiveness defined by productivity and job satisfaction. Simultaneously, MBO is a method improving management in organisation and autonomic teamwork. Managers should be aware that if team members are engaged in their goals, productivity and job satisfaction can be increased. It is possible thanks to the fact that group effort and planning are causing the aforementioned effects (Antoni, 2005).

To sum up, the most important assumptions of management by objectives are as follows (Bieniok et al., 2004):

a) Full and authentic (not only formal, declared) engagement of top management of organisation in introducing and effectively implementing MBO system.

b) Employees' participation in goal setting and tasks allocation.

c) Significant self-reliability among employees relating the choice of resources and methods of realisation set goals. They should be visible in individual plans of ventures that employees undertake.

d) Openness and total accessibility of the superior to his co-workers in case of the need for advice or consultation.

e) Concentration on specific results achieved, in the contrary to actions leading to the goal achievement.

f) Obligatory, periodic review of work progress and effectiveness.

Management by objectives is known as a popular and persuasive method of defining goals and monitoring progress in their implementation. This specific system includes four key tasks which are:

- setting goals that engage employees and their superiors on every level in organisation,

- formulating plans that define the direction of an activity towards set goals – they are created on individual levels and departments of an organisation,
- periodic review of progress in the implementation of plans – often it is non-formal and early informs, when it is necessary to modify plans,
- rewarding employees for their results identified during a process of a control.

Such a procedure of MBO is cyclic (Daft, 2010). Table 1 presents advantages and disadvantages of the management by objectives.

Advantages of the MBO	Difficulties and barriers in implementing the MBO
Focus on goals	Continuous changes disturb using the MBO
Possibility to improve an effectiveness of an organisation on its every level.	Environment, in which relations between a superior and subordinate are poor, influences negatively the MBO effectiveness
Increase of motivation	Strategic goals can be supplant by operative goals
Departments' and individual goals are in line with organisational ones	Organisations operating mechanically and values that discourage the participation can harm MBO processes
MBO combines planning and controlling in the rational management system	MBO too often is treated as a remedy for all problems in organisation
MBO forces organisation to create and develop goals hierarchy from the highest to the lowest level of management	MBO is liable for autocratic managing style (theory X) and creating rigid bureaucratic rules and politics
MBO emphasizes final results more than good intentions or personal traits of employees	MBO takes too much time and effort; it causes to much paper work
MBO encourages self-management and individual engagement by participating in goal setting	Pressure on objective measurement of goals can be a threat in hands of overzealous managers

Table 1. Advantages and disadvantages of MBO

Source: (Daft, 2010; Kreitner, 2009).

3. Methodology of the research

The method used in research was an experiment. Methodologists are describing it as a type of an observation that allows to examine causal relations (Babbie, 2004). The theoretical basis of the methodology of the carried out experiment was the system of organizational terms (Flak, 2007), whose stage of conceptualization and operationalization (Flak, 2010) was described in previous publications. The most important part of the system of organizational terms are concepts reflecting facts occurring in the organization during its operation. These concepts are called

organizational terms (Flak, 2008). They form complex in the sense of the whole, which means including parts in a whole, in which there is additionally more than one internal relation (Krzyżanowski, 1985).

Concepts, named by a man in a natural language, define facts to which they correspond. Facts, as well as states of affairs, according to the philosophy of L. Wittgenstein, have certain characteristics. L. Wittgenstein, describing his theory of the facts, claimed that "the world is entirely composed of facts" (Brink and Rewitzky, 2002). The subsequent development of this theory gave rise to the claim that "these facts are in the states of things" (Prechtl, 2007) that should be understood in a way that facts – their characteristics – can be described by the states in which they are located.

Features of the facts (reflected by concepts) in the system of organizational terms are grouped in dimensions and called measured values. It is not only the colloquially measurable objects' characteristics which in management science are resources (Wernerfelt, 1984) or processes (Glykass, 2011). Features of the facts cover the full spectrum of parameters – the measured values, both in a quantitative and qualitative way.

The concept of the system of organizational terms, includes two types of organizational terms: primary and derivative. Primary ones reflect the facts of a "thing" type – in the language of management sciences these are the resources. Derivative organizational terms reflect the facts of "event" – in the language of management sciences these are the processes (Flak, 2008).

Facts can be linked together in the relationship of "creates" and "starts" type, which means that their existence depends on other facts that occurred in the past. "Creates" relationship is unintentional, for example, fact of "planning" (event) causes that another fact "plan" (thing) will be created. It is similar in any other combination event thing (in the language of management sciences: process->resource). In case of "starts" it is an intentional relationship. It results from the intention of a "causer", who in organization is mainly a manager, but also their subordinates. E.g. the fact "idea" (thing), namely that someone came up with an "idea" does not automatically mean that there is another fact "build" (event), e.g. build a team to implement this idea. Whether this relationship will exist depends on the "cause", i.e. a manager or any of their subordinates (Flak, 2013).

Creating concepts (i.e. the organizational terms) reflecting the above-described types of facts allows you to search for causal relationships between them (in other words: between the facts) in a totally different way than existing research methods in management sciences (Flak, 2010). Usually, these methods are based on declarations of people working in an organization, and conclusions are drawn based on the collected opinions about facts, not the facts (Flak, 2012).

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As a research tool in the conducted experiment an IT tool transistorshead. com was used. It was designed to record the presence of the attributes of facts of a "thing" type at different times, so it registers changes in these facts. Given what has been explained above on the relationship of facts and corresponding them concepts in natural language, and organizational terms, it should be emphasized that the IT tools record the information on the primary organizational terms at different times. Figure 2 shows the diagram of recorded facts occurring in time. Registered facts are marked with a gray background. Event n.m is a derivative organizational term, and thing ij is primary organizational term.

Figure 2.
Diagram of registered facts by the means of transistorshead.com tools

Source: (Flak, 2013).
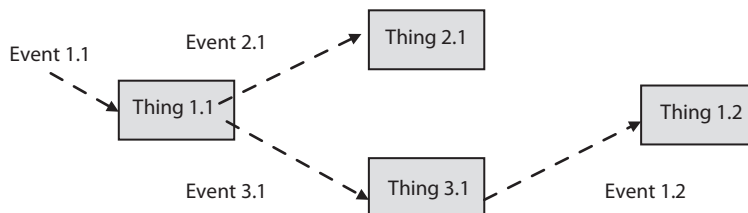
There are currently two tools in transistorshead.com. One – goaler – is used for setting goals, and the second – tasker – to determine the tasks necessary to achieve these goals. They are used for recording the characteristics of the fact which is a goal (fact of the type of thing), and the characteristics of this fact which are the task (fact of the type of thing). Tools record the activity of a user as a function of time, which is necessary to detect patterns for behavior of managers (and more broadly users).

To familiarize yourself with the functions of management tools on transistorshead.com, you can log on the website http://transistorshead.com as a user: John Smith, password: smith.

In the experiment respondents were students who were asked for doing a task given by their teacher. In the groups of three or four persons they worked on a problem which is presented in Table 2.

Table 2.
Task for students

Source: Own elaboration.

Group task
You are working in the HR department in the company X. You are responsible for appraisals. The system which has been in the company till now does not well. Employees complain on subjectivity during appraisals, too long period of assessment, lack of knowledge about assessment techniques among managers. Your CEO appoint you for a project manager, who will prepare and implement a new system during 6 months.
Create a project of a new appraisal system. Prepare a plan of action by using tools: GOALER and TASKER.

Projects were done by students during the classes to prepare the new appraisal systems system and also at home. The effect expected from each group was to set goals and tasks by fulfilling electronic forms. Next, students were planning their projects by achieving goals and tasks. The teacher gave the students instruction and tools. Moreover, during the classes and also via e-mail she was available for students and ready to answer their questions.

4. Results

The article presents the examples of two projects done by the participants of the experiment. As described above, the project was done by groups of students who had their manager. The manager determined the objectives and tasks using the management tools at transistorshead.com.

Because in all the groups participating in the experiment hundreds of steps were recorded, exemplary differences in the application of the method of management by objectives have been shown for two and more aforementioned groups. These differences are seen on the example of 50 first actions undertaken by a manager. A quantitative analysis aimed to evaluate the effectiveness of the HRM (human resource management) process has been presented with the full workflow of both managers.

Table 3 shows the first 50 actions of both managers. Actions include in its scope the setting of objectives (set a goal) and description of the tasks (describe a task). In the context of management tools, initiating the following actions was possible:

- setting a new goal or a task,
- saving a goal and a task,
- editing an existing goal or a task,
- saving changes in an existing goal or a task,
- viewing a goal or a task,
- finishing viewing a goal or a task,
- indicating an intention to remove a goal or a task,
- confirming the removal of a goal or a task,
- printing a goal or a task,
- viewing the map of links between the goals and tasks.

Each goal (G) and task (T) received a number and a version symbol, e.g. goal of G.n.m, where n is the number of a goal, and m is the symbol of the goal's version.

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Operation no:	Manager no: 1 (group no: 1):	Manager no: 2 (group no: 2):
1	Creates goal G.1.1.	Creates goal G.1.1.
2	Saves goal G.1.1.	Saves goal G.1.1.
3	Creates goal G.2.1.	Creates goal G.2.1.
4	Saves goal G.2.1.	Saves goal G.2.1.
5	Creates goal G.3.1.	Creates goal G.3.1.
6	Saves goal G.3.1.	Saves goal G.3.1.
7	Intends to delete goal G.2.1.	Creates task T.1.1., but doesn't save it.
8	Deletes goal G.2.1.	Edits goal G.1.1., but doesn't save changes in goal G.1.1.
9	Creates goal G.4.1.	Edits goal G.1.1.
10	Saves goal G.4.1.	Saves changes in goal G.1.1. – as goal G.1.2.
11	Creates goal G.5.1.	Creates task T.1.1., but doesn't save it.
12	Saves goal G.5.1.	Edits goal G.2.1.
13	Creates goal G.6.1.	Saves changes in goal G.2.1. – as goal G.2.2.
14	Saves goal G.6.1.	Edits goal G.3.1.
15	Views goal G.1.1. and stops viewing goal G.3.1.	Saves changes in goal G.3.1. – as goal G.3.2.
16	Edits goal G.1.1.	Edits goal G.3.2.
17	Doesn't save changes in goal G.1.1.	Saves changes in goal G.3.2. – as goal G.3.3.
18	Edits goal G.6.2.	Edits goal G.3.3.
19	Saves changes in goal G.6.1. – as goal G.6.2.	Saves changes in goal G.3.3. – as goal G.3.4.
20	Edits goal G.1.1.	Edits goal G.1.2.
21	Saves changes in goal G.1.1. – as goal G.1.2.	Saves changes in goal G.1.2. – as goal G.1.3.
22	Edits goal G.1.2.	Edits goal G.2.2., but doesn't save changes in goal G.2.2.
23	Saves changes in goal G.1.2. – as goalG.1.3.	Creates task T.1.1.
24	Views goal G.3.1.	Saves task T.1.1.
25	Finishes viewing goal G.3.1.	Creates task T.2.1.
26	Views goal G.3.1. and finishes viewing goalG.3.1.	Saves task T.2.1.
27	Edits goal G.3.1.	Edits goal G.1.3.

Table 3. Description of the first 50 actions of both managers

Source: Own elaboration.

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Operation no:	Manager no: 1 (group no: 1):	Manager no: 2 (group no: 2):
28	Saves changes in goal G.3.1. – as goal G.3.2.	Saves changes in goal G.1.3. – as goal G.1.4.
29	Views goal G.1.3. and finishes viewing goal G.1.3.	Intends to remove task T.2.1.
30	Edits goal G.4.1.	Removes task T.2.1.
31	Saves changes in goal G.4.1. – as goal G.4.2.	Edits task T.1.1., but doesn't save changes in task T.1.1.
32	Intends to remove goal G.5.1.	Creates task T.3.1.
33	Removes goal G.5.1.	Saves task T.3.1.
34	Edits goal G.4.2., but doesn't save changes in goal G.4.2.	Edits task T.3.1., but doesn't save changes in task T.3.1.
35	Edits goal G.4.2.	Edits task T.3.1.
36	Saves changes in goal G.4.2. – as goal G.4.3.	Saves changes in task T.3.1. – as task T.3.2.
37	Intends to remove goal G.4.3., but doesn't remove it.	Edits task T.3.2., but doesn't save changes in task T.3.2.
38	Intends to remove goal G.4.3., but doesn't remove it.	Views task T.3.2.
39	Intends to remove goal G.4.3., but doesn't remove it.	Finishes viewing task T.3.2.
40	Intends to remove goal G.4.3., but doesn't remove it.	Edits task T.3.2., but doesn't save changes in task T.3.2.
41	Views goal G.1.3. and finishes viewing goal G.1.3.	Creates task T.4.1.
42	Views goal G.3.2.	Saves task T.4.1.
43	Finishing viewing goal G.3.2.	Creates task T.5.1., but doesn't save it.
44	Edits goal G.3.2.	Edits task T.4.1.
45	Saves changes in goal G.3.2. – as goal G.3.3.	Saves changes in task T.4.1. – as task T.4.2.
46	Edits goal G.4.3.	Creates task T.5.1.
47	Saves changes in goal G.4.3. – as goal G.4.4.	Saves task T.5.1.
48	Intends to remove goal G.6.2., but doesn't remove it.	Edits task T.5.1.
49	Views goal G.6.2. and finishes viewing goal G.6.2.	Saves changes in task T.5.1. – as task T.5.2.
50	Intends to remove goal G.6.2.	Views map of goals and tasks.

Table 3.
continue

It can be noticed from the Table 1 that:

- as a result of 50 operations manager 1 created 4 goals goals and 0 tasks, and manager 2 created 3 goals and 5 tasks assigned to them,
- first 6 steps were identical for both managers, the differences in the application of the method of management by objectives were revealed beginning from the 7th step,
- after 50 operations manager 1 identified the following objectives: G.1.3. (goal number 1 in version 3) G.3.3., G.4.4., G.6.2., and two other goals - G.2.1. and G.5.1. have been removed; manager 1 did not create any tasks for these goals,
- after 50 operations manager 2 identified the following objectives: G.1.4., G.2.2., G.3.4., and the following tasks: T.1.1., T.2.2., T.3.2., T.4.2., T.5.2.; they did not remove at that time any goals or tasks,
- manager 1 seems to be more hesitant in terms of setting goals – repeatedly establishes and removes them, while manager 2 sets goals methodically, however, hesitates when setting tasks – first task T.1.1. is set in the 23rd operation after two abandoned attempts in operation 7 and 11,
- indecision of manager 1 confirms the fact that, within 50 steps, 7 operations are passive viewing of previously established goals, while manager 2 focuses more on active setting of goals and tasks.

When analyzing the work of managers, it must be noted that differences in the use of the method of management by objectives did not only apply to the first 50 operations, but the entire work scope. Manager 1 established 6 goals, and ultimately kept 3 of them. Manager 2 established 8 goals, but ultimately kept 4 of them. Manager 1 described 12 tasks, but kept 6 of them. Manager 2 described 13 tasks, but also in the final draft of the project kept only 6 of them.

Table 4 summarizes the number of goals and tasks created by both managers. The goals' numbers indicate the consecutive goals created in the project in the function of time. The number of the goal's version is the last version created by managers. Table 2 also indicates (yes/no) whether the goal of the given number remained in the final draft of the project. Similar symbols were applied for the tasks described by the managers.

Grey colour determines goals and tasks that were deleted by managers before they finished their work. The system of deleted and kept goals and tasks confirms another way of work of both managers.

The projects done by students undoubtedly were managed using the MBO method. Each group achieved a similar final results. Nevertheless, if we would like to assess the effectiveness of a particular group, there is a need for indicating measures. In fact HR teams consisted of students prepared a plan of creating and implementing the new appraisal system in their organisations. Therefore,

manager 1 (group 1)	goal number	1	2	3	4	5	6						
	numer of goal version	3	1	4	6	1	1						
	final goal	yes	no	yes	yes	no	no						
	task number	1	2	3	4	5	6	7	8	9	10	11	12
	numer of task version	6	4	1	1	5	1	1	1	1	4	5	3
	final task	yes	yes	no	no	yes	no	no	no	no	yes	yes	yes

manager 2 (group 2)	goal number	1	2	3	4	5	6	7	8				
	numer of goal version	3	1	3	1	1	1	3	1				
	final goal	no	no	no	no	yes	yes	yes	yes				
	task number	1	2	3	4	5	6	7	8	9	10	11	12	13
	numer of task version	1	2	5	3	2	1	2	1	3	2	1	2	1
	final task	no	no	no	no	no	no	yes	yes	yes	yes	yes	yes	yes

Table 4.
System of goals and tasks – numbers, subsequent versions and final versions in the project

Source: Own elaboration.

measures that authors used for the effectiveness assessment are connected with parameters important during planning (e.g. time, number of actions, decision making process). Having very detailed data from the transistorshead.com authors chose following categories to measure the effectiveness of planning in both groups:

- a number of goals and tasks in each group,
- a number of actions,
- time of projects,
- time for teamwork in projects,
- a number of work intervals,
- a number of goals and tasks versions,
- a number of versions by object.

Table 5 shows the numerical values describing the work of managers. Manager 1 performed 215 operations, and manager 2–172. Work took manager 1–60.847 minutes (the period from the beginning of the project to its final version), out of which the manager worked actively setting goals and defining tasks for only 253 minutes. Their work was performed in 7 intervals, whose duration in minutes is shown in the corresponding grey boxes in Table 3. In contrast, work took manager 2 a bit less, because 48.987 minutes, but the main activity took similar time like manager 1–246 minutes. However, manager 2 did their work in 4 intervals.

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Measures	Manager 1 (group 1)	Manager 2 (group 2)
number of goals in each group	3	4
number of tasks in each group	6	7
number of actions	215	172
project duration (minutes)	60847	48987
duration of teamwork (minutes)	253	246
number of work intervals (from log in to log out)	7	4
number of goals editions	16	14
number of tasks editions	33	26
number of editions by object (goal)	2,67	1,75
number of editions by object (task)	2,75	2,0

Table 5.
Measures of team effectiveness

Source: Own elaboration.

Results achieved by each group are similar. Analysing details of their work we can state that manager 2 (group 2) worked more effectively. Arguments that stand by this conclusion are as follows:

- group 2 worked in shorter time than group 1 as it comes to a whole project duration and duration of the teamwork,
- group 2 met less times than group 1 and worked on average longer per one meeting (61 minutes in group 2 and about 36 minutes in group 1),
- group 2 checked the tools for some time and after that they set goals and tasks with bigger certainty than group 1 (less editing goals and tasks by group 2).

Results presented in the Table 3 also allow to suggest that more effective planning is possible, if a group uses the time effectively. But being able to conclude in such a way, it is recommended to measure time and frequency of group work using for that proper tools.

5. Conclusions

Analyzing the assumptions, procedure, strengths and weaknesses of the method of management by objectives, we can say that the aspect of team action occurs in this method already at the moment of reconciliation of goals by the superior together with their subordinates. The phase of control in the form of joint periodic reviews, or so-called self-control, are actions which essence is to evaluate the efficiency of individual employees and entire teams.

The conducted experiment showed that the method of management by objectives can also be a method of measuring the effectiveness of the HR team. For this to happen right executive tools, which are also research tools, are necessary. Such a situation occurred in the case of use of the system of organizational terms and based on it transistorshead.com tools.

Both analyzed groups taking part in the experiment, worked differently on the project, though, the resulting effect was very similar. It happened in a unified environment and with similar boundary conditions of the study. This confirms how big is a human contribution in the application of the method of management by objectives, although this method is thoroughly described and parameterized.

In conclusion, we can say that the implementation of the method of management by objectives can yield tangible results in the measurement of the effectiveness of teamwork. However, while the concept may be universal in nature, yet its adaptation to a particular environment should be a systematically controlled and rationalized process.

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