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CONTENTS

I. BUSINESS AND NON-PROFIT ORGANIZATIONS AS THE OBJECT OF RESEARCH

II. MODERN TOOLS FOR BUSINESS AND NON-PROFIT ORGANIZATIONS MANAGEMENT

III. BUSINESS AND NON-PROFIT ORGANIZATIONS – GLOBAL AND REGIONAL ASPECTS

IV. FINANCIAL ASPECTS OF ORGANIZATIONAL MANAGEMENT

RESULTS OF OBSERVATIONS OF MANAGERS BASED ON THE SYSTEM OF ORGANIZATIONAL TERMS

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Abstract

This paper contains the latest results of observations based on the system of organizational terms and tools in transistorshead.com. The website consists of two prototypes of managerial tools – for setting goals and for describing tasks. The theoretical foundation for the tools is the system of organizational terms described in previous works of the author. Data collected by the tools lead to a recognition of patterns of users (managers) by a graph-based theory. In the paper there are introductory conclusions from using the method and tools in research.

Keywords: *observation, system of organizational terms, graph theory, management tool*

1. Introduction

The main scientific aim of the paper is to introduce the latest observation results of managers carried out based on the system of organizational terms and online versions of management tools. The tools simultaneously played a research function implemented in the transistorshead.com platform.

The particular goals of the paper are:
- to describe the concept and the course of observations,
- to present a theoretical background of results analysis,
- to depict a mechanism of management tools in transistorshead.com,
- to present the results of observations derived from the fact theory,
- to discuss scientific fields of further research and practical results implementation.

This paper consists of many footnotes to the previous author's publications due to size restrictions. Knowledge of these sources will enable the reader to better understand the author's train of thought relating to observations themselves and results.

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2. The concept and course of observation

Observation is one of four main research methods in social science. This fact is reflected in management science. Observation is usually used to gather information such as surveys, interviews and experiments. Observation is suitable for information turned into empiric data pertaining to the world around us. However, observation seems to be used in management science quite rarely.

Nevertheless, S. Stachak claimed that observation plays an essential role in social science. The reason for that is that observation "is used to build relevant knowledge" (Stachak 1997, p. 141). There is a necessity to indicate that the observation carried out was not intuitional research and it was not based on the author's experience. According to the rules of observation this method was planned in such a way so that the results could describe a part of an organizational world. For this purpose observation was projected in a scientific way and had features such as being planned, systematic, selective and rigorous (Stachak 1997, p. 141).

The period of observation was planned for April 8th until June 4th, 2013. The group of students to be observed were second year students specializing in managements studies at the School of Economics in Katowice in their second semester. Observations were done thanks to Dr. Adrian Pyszka, PhD. The students were assigned the task of preparing a project on management innovation as part of an Organization and Management Techniques course.

The task for students was to work in teams on a project connected with management innovation. The assumption for this work was that management innovations should consist of a management tool together with a description of a technique how to use the tool. This was the content of the project which was to be prepared with two management tools: a goaler and a tasker. The goaler was designed for establishing precise states of the future and the tasker played a role in describing activities which should be taken so that goals could be obtained. The goaler and a tasker were implemented at transistorshead. com.

The observations were done systematically because every movement and change in goals and tasks was recorded by a monitoring system built as a data base. Therefore, it was possible to discover how long phases of establishing goals and describing tasks lasted and what the succession of these activities was. Intervals between managers' actions were determined by managers' decisions concerning the use of the tools.

The selectiveness of the observations consisted of two aspects of managing. The first issue was establishing goals and the issue was to describe tasks. However, the main content was comprised of a change in goals and

tasks within the timeline. Subsequent sections of this paper present some theoretical foundations.

The rigorousness of the observations means that there were only two fields of data which were collected during the period of observation. The first area was to focus on a timeline and the second area consisted of a group of measured quantities. They described primal organizational terms.

This paper contains only part of the results for managerial activities in the timeline. A semantic analysis of goals and tasks will be the subject of further publications by this author.

3. Theoretical background of the results of observations

The theoretical foundation for conducting the observations derived from the previous phases, both conceptual (Flak 2008, pp. 13-21) and operational (Flak 2010, pp. 11-21), is the system of organizational terms (Flak 2007, pp. 64-74). The main part of the system of organizational terms are those indicating facts which may occur in the organization while it exists. These terms have been named as organizational terms (Flak 2008, p. 19). They create a complex of terms which could be understood as an entity. This means that the entity as a whole is in parts and there is at least one relation between the parts of the entity (Krzyżanowski 1985, p. 146).

The terms, which have been named in natural human languages, describe relating facts. There is a need to quote Poincare who said that "a science is always built of facts in comparison to a house which is made of stones; however the pile of stones is not a house as well as the pile of facts does not create a science" (Ciesielski, Pogoda 2008, p. 82). The system of organizational terms is a concept which combines facts in an organizational environment.

The philosophy of L. Wittgenstein and his states of entities were the foundation for the theory of facts presented in the system of organizational terms. L. Wittgenstein claimed that "all the world consists of facts as the only beings" (Brink, Rewitzky 2002, p. 544). Following generations of this theory claimed that "facts appear in the states of entities" (Prechtl 2007, p. 122), which can be understood as meaning that facts and their features can be described by the state in which they currently exist.

Features of facts, which are named by terms in the system of organizational terms, are selected in dimensions. The features are called measured quantities. It is worth mentioning that it is not only a case of quantitative features of facts but also typical objects in management such as resources (which were called things by Zieleniewski (Zieleniewski 1965, p. 44)) and processes (Grajewski 2007, p. 55). Features of facts are groups of many parameters which are called measured quantities. They are either quantitative or qualitative.

In the concept of the system of organizational terms there are two different kinds of organizational terms. The first ones are called "primal", the second ones' "secondary". Primal organizational terms are combined with facts which are things (or resources in the management vocabulary). Secondary organizational terms represent facts which are events. The events might be understood as processes in management science (Flak 2008, p. 18).

Facts may appear in the organizational environment in some combinations. The combinations create relations of both types: "creates" and "starts". It means that a certain fact derives from another fact which has occurred in the past. The "creates" relation is unintentional. For example, it means that a fact called "planning" (an event) causes another fact called "a plan" (a thing). The same relation appears in any combination of facts "an event – a thing". This is represented in the management languages by a pair of words "a process – a resource". Taking into consideration the relation called "starts" is an intentional issue, this implies that an effect always depends on doers (a manager or members of his team). For example, a fact or "an idea" (a thing) in somebody's head does not mean that the inventor would start to build a team to put the idea into practice. This result depends on the doer, who is usually a manager (Flak, being published).

It's possible to agree that a "thing" type fact represents a resource in management science and "an event" type fact is equal to the process (Flak 2008, p. 18). However, there is an essential assumption that in the system of organizational terms there is no division of different "event" type facts such as moments, happenings and processes. In order to make the theory simple all such facts are called, "events".

Having created the system of organizational terms, let us capture facts precisely so that it might be possible to look for causal relations between facts. The way of looking for such relations is totally different to common ways used in management science (Flak 2010, pp. 11-21). In science there are usually methods based on opinions and declarations of organization members and conclusions are taken not from measured facts but opinions about them (Flak 2012, p. 13).

In order to collect information about facts which could be turned into data used for reasoning, there is a strong need to use different research tools. Their foundation can be named as a trap for facts which occur in the organizational world. Nowadays, it is quite easy to do that by projecting online management tools with a function of recording users' activities. Such tools have been created and their short specification is presented in the next section of the paper.

4. The mechanism of management tools in transistorshead.com

The research and management tools in the transistorhead.com were projected to measure features of facts which are things in several moments of time. They record changes in the states of entities. Taking into consideration what was mentioned in the previous sections there is necessity to underline that, precisely speaking, the tools record information (structured as data) about primal organizational terms in successive moments of time. The schedule of recording in the way described above is presented in figure 1. The facts which are recorded, are marked with a grey background. The event n.m is a secondary organizational term and the thing i.j is a primal organizational term. N and i mean the following number of the event or the thing. M and j mean the following version of the event or the thing.
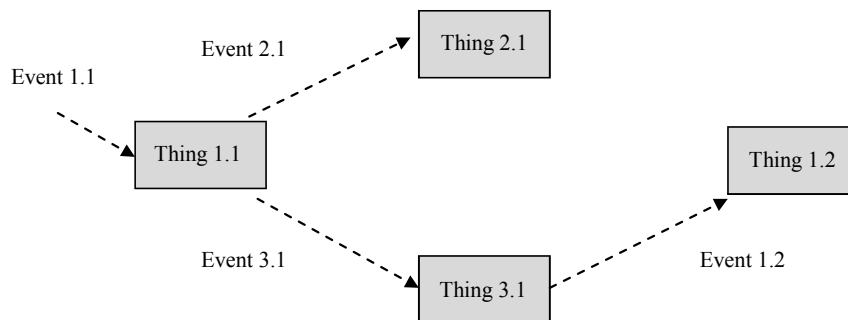
Figure 1. Facts recorded by transistorshead.com
Source: (Flak 2013, s. 192).

It is essential to recall that in the ontology of the organizational world mentioned above and based on the system of organizational terms there are two types of relations between facts: "creates" and "starts". The "creates" relation is an intrinsic property of the relation between one primal organizational term and one secondary organizational term. This can be presented by a combination "an event – a thing". In the vocabulary of management science there exists such a pair named "a process – a resource". Nevertheless, if they were to research more deeply, there would be a strong need to use semantic analysis of the state of entity change.

On the other hand the „starts" relations are intentional. It means they are caused by a manager or other members of the organization. These relations, named with abbreviation "S", are presented in the next section of the paper. They are able to be discovered by tools in the transistorshead.com which record primary organizational terms (Flak 2013, pp. 187-197).

Prototypes of two tools for managing and doing the research were designed by the author of the paper during a scholarship at the University of Siegen. The author managed a project dedicated to Pattern Recognition Techniques for Management Science funded by the Scholarship for Scientists and Academic Employees in Germany (DAAD). Its implementation and validation were conducted by the olafflak.com company. This company is the owner of the tools.

In transistorshead.com there were two such tools implemented: a goaler (to set goals) and a tasker (to describe tasks which are needed to obtain the goals). At the same time the management tools are also research tools to capture facts such as goals (things) and tasks (things). To understand the reasons, see the figure 1. The tools record activities of managers in the timeline. This is indispensable to prepare data for pattern recognition of managers' behaviors.

There is a possibility of gaining knowledge about the tools in transistorshead.com by visiting http://transistorshead.com with login: kowalski, password: kowalski (this is an exemplary user). If there is a need to check how the tools work by setting goals and describing tasks, visit http://transistorshead.com with login: nowak, password: nowak (this user is to test the tools).

5. Results of observations derived from the fact theory

The ontology designed in the system of organizational terms let us present a pair of primal and secondary organizational terms as nodes in graphs. The "starts" relations might be treated as edges in the graph [Flak, being published]. According to such an approach, graphs show us the appearance of organizational terms in the timeline. These organizational terms represent facts!

At this stage of the research it is very difficult to reckon a dominating shape of graphs. However, there is an assumption the graphs are directed and contain multiplied edges and loops (Wilson 2012, p. 13).

Basing on the graph theory, it is possible to make the premise that if there is much data about facts which occurred (represented by primary organizational terms) and their measured quantities in the timeline, there is a possibility of doing pattern recognition of managers' behavior. It is possible to use typical methods for recognizing physical objects or sounds (Theodoridis, Koutroumbas 2009, p. 261).

Having established a period of time ΔT and having measured "thing" type facts (primal organizational terms), we could know the state of entities in successive moments of time. Then there is the possibility of showing how a manager acted in graph form (Flak, being published).

This technique of reasoning allowed us to be able to describe an individual graph for one man during his work on a certain project. If the projects are

repeatable it is possible to count parameters of similarities between graphs which mean similarities between activities taken by a manager in different projects. The extended version is an analysis and a comparison of activities of different managers. According to suggestions, in the future it would be possible to replace a human manager with a machine which could manage a team instead of a man.

Returning to the observations which were carried out, activities of 8 managers of small projects were recorded. The projects were the setting of goals and describing tasks. In this section 3 examples of managers' activities under observation are presented. The graphs of their activities are shown in figure 2, 3, 4. In tables 1, 2, 3 there are periods of time when the tools were being used by managers. It is essential to know that in this paper there is only an analysis of the appearance of the activities in a timeline and no semantic analysis.

In the figures 2, 3, 4 the green color means "starts" relations which were activated by the "add" function in the tools (add new {goal; task}). Blue arrows mean "starts" relations revealed by the "view" function in the tools (view {goal; task}). Red arrows are "starts" relations launched by the "edit" function in the tools (edit {goal; task}). The last color – orange – was used to indicate "starts" relations launched by he "delete" function in the tools (delete {goal; task}).
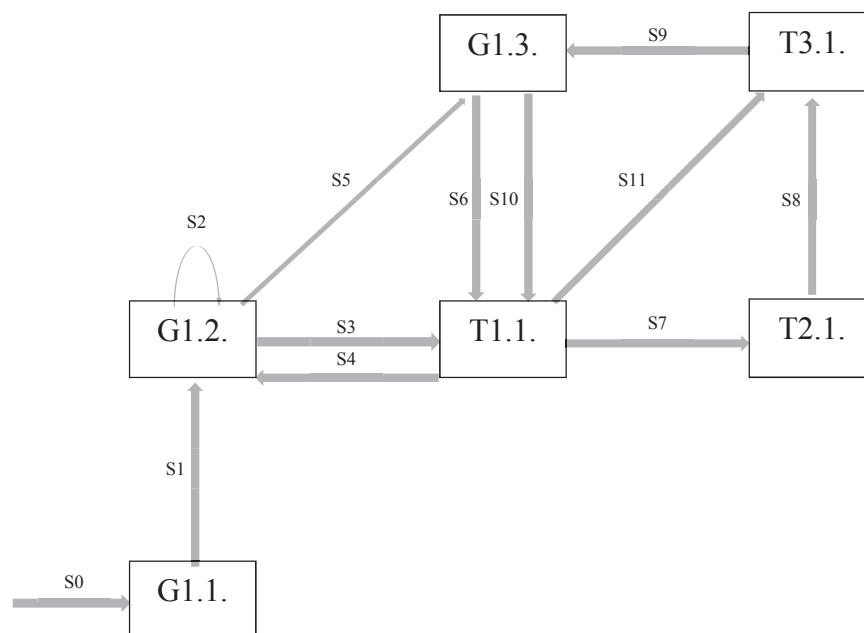

Figure 2. Graph of the first manager
Source: transistorshead.com.

Table 1. Periods of activities of the first manager

Starts (S)	tool	begining of Creates	end of Creates
0	goaler	2013-05-10 14:47	2013-05-10 14:55
1	goaler	2013-05-10 14:56	2013-05-10 15:03
2	goaler	2013-05-10 15:03	
3	tasker	2013-05-10 15:04	
4	goaler	2013-05-13 20:32	2013-05-13 20:44
5	goaler	2013-05-13 20:44	2013-05-13 20:47
6	tasker	2013-05-13 20:47	2013-05-13 20:50
7	tasker	2013-05-13 20:50	2013-05-13 20:51
8	tasker	2013-05-13 20:51	2013-05-13 20:52
9	goaler	2013-05-14 11:37	
10	tasker	2013-05-14 11:37	
11	tasker	2013-05-14 14:16	

So that the reader could understand the sequence of events which is presented in figure 2 and in table 1, it is necessary to describe them more widely. Manager 1 (called M) decided to create a new goal (G.1.1.) at 2:47 p.m. 2013-05-10. It took 8 minutes (until 2:55 p.m.). The S0 relation appeared and afterwards „creates" relations appeared within the node G1.1. One minute later the manager launched the S1 relation which meant editing the goal created a while ago. The manager shaped it into the goal G1.2. (this is the same goal but in another version). At 3:03 p.m. the M started the S2 relation. This was also "editing" the goal G1.2. However he did not save any changes to the database (finally the goal was not changed). That is why the goal stayed in the same version G1.2.

There is place for a short explanation. Firstly, it is possible to ask how long the "starts" relation lasts. There is the premise that its period is coming up to 0. So that this is an endlessly short moment of time. Secondly, there is the question of how long the "creates" relation lasts within a mode. This relation connects a primal and a secondary organization term. Its moments of starts and ends have been presented in table 1. Thirdly, it is necessary to explain, why in some relations shown in table 1 there are no moments of time in the „creates end" column. The reason is so the tool could be closed either by the "Save & Close" button or by the close button in the web browser. When the manager used the close button in the web browser, the monitoring system of transistorshead.com did not record this action. This mistake during monitoring activities of users was discovered after the observation and this is the case of prototypes. That is why it is not possible to point the exact time of the end of editing the goal G1.2.

When we follow subsequent actions of the manager, we can discover that at 3:04 p.m. 2013-05-10 he started creating a task called T1.1. However, he left the "tasker" browser without saving this point of time in the data base. This means he did not create the task.

The manager came back to the transistorshead.com at 8:32 p.m. 2013-05-13 and he launched the S4 relation by viewing the goal G1.2. which had been set before. The manager worked over the task about 12 minutes and at 8:44 p.m. he finished viewing. Then he started the S5 relation by editing G.1.2. and changing it into G1.3. It took 5 minutes.

Then he started the S6 relation which meant creating a task called T1.1.. He finished it at 8:50 p.m. Afterwards he implemented the S6 relation consisting of creating the task T1.1. and finishing this process at 8.50 p.m. Then the S7 relation appeared and suddenly the task 2.1 appeared. It means that the manager at 8.50 p.m. started describing the task 2.1. This action was finished at 8:51 p.m. Then the S8 relation appeared and the node called T3.1. On May 13, 2013 the manager finished his work at 8:52 p.m.

The next day at 11:37 a.m. the manager started the S9 relation which was viewing the goal G1.3. Then he started the S10 relation by viewing the task T1.1. The monitoring system did not record the end of this process. The last relation, called S11, occurred the same day at 2:16 p.m. and its aim was to view the task T3.1.

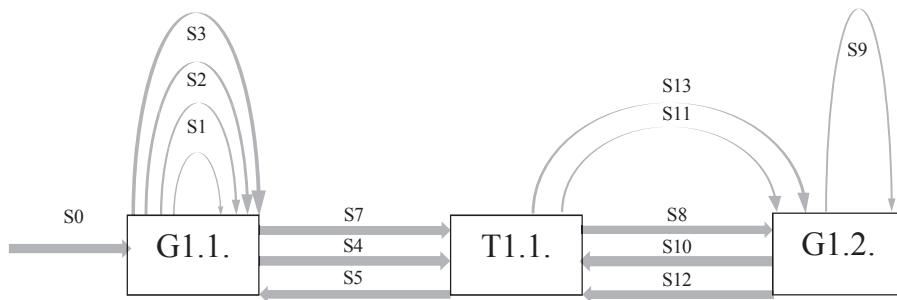Another example of manager's activities is shown in the figure 3 and in the table 2.

Figure 3. Graph of the second manager
Source: transistorshead.com.

Table 2. Periods of activities of the second manager

Starts (S)	tool	begining of Creates	end of Creates
0	goaler	2013-04-30 20:37	
1	goaler	2013-04-30 20:46	
2	goaler	2013-04-30 20:46	
3	goaler	2013-04-30 20:49	
4	tasker	2013-04-30 20:51	
5	goaler	2013-04-30 20:54	2013-04-30 21:22
6	goaler	2013-04-30 21:22	
7	tasker	2013-04-30 21:23	2013-04-30 21:32
8	goaler	2013-04-30 21:32	2013-04-30 21:33
9	goaler	2013-04-30 21:33	
10	tasker	2013-04-30 21:33	
11	goaler	2013-05-21 18:02	
12	tasker	2013-05-21 18:03	
13	goaler	2013-05-26 17:47	

As it is shown in figure 3, the second manager did something else compared to the first manager. In the graph there are 13 relations of the type, "starts". However, all of them concern only two primal organizational terms: one, goal (in two versions G1.1. and G1.2.) and one, task (T1.1.).

In figure 4 another example of managers' behavior is presented in the field of setting goals and describing tasks. This third manager created many more facts (primary organizational terms) than others. The graph consists of 33 relations of the type, "starts". Periods for the relations are placed in table 3.
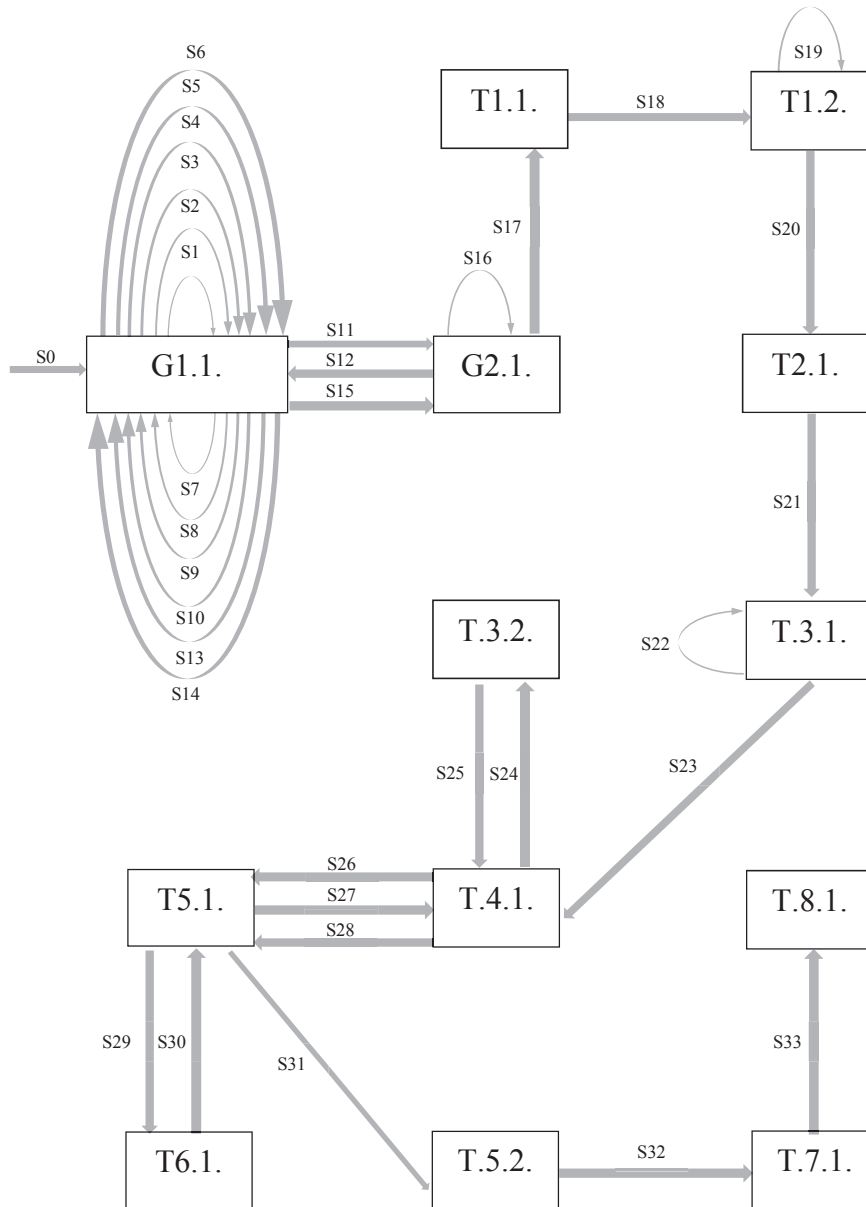
Figure 4. Graph of the third manager

Source: transistorshead.com.

Table 3. Periods of activities of the third manager

Starts (S)	tool	begining of Creates	end of Creates
0	goaler	2013-05-02 12:03	
1	goaler	2013-05-12 21:53	2013-05-12 22:17
2	goaler	2013-05-12 22:18	
3	goaler	2013-05-12 22:18	
4	goaler	2013-05-12 22:18	
5	goaler	2013-05-12 22:18	
6	goaler	2013-05-12 22:18	2013-05-12 22:19
7	goaler	2013-05-12 22:19	
8	goaler	2013-05-12 22:19	
9	goaler	2013-05-12 22:19	2013-05-12 22:19
10	goaler	2013-05-12 22:19	
11	goaler	2013-05-12 22:19	2013-05-12 22:19
12	goaler	2013-05-12 22:21	2013-05-12 22:21
13	goaler	2013-05-12 22:21	
14	goaler	2013-05-12 22:21	
15	goaler	2013-05-12 22:21	
16	goaler	2013-05-12 22:22	
17	tasker	2013-05-12 22:22	2013-05-12 22:23
18	tasker	2013-05-12 22:23	2013-05-12 22:27
19	tasker	2013-05-12 22:27	
20	tasker	2013-05-12 22:27	2013-05-12 22:33
21	tasker	2013-05-12 22:34	2013-05-12 22:35
22	tasker	2013-05-12 22:35	2013-05-12 22:35
23	tasker	2013-05-12 22:35	
24	tasker	2013-05-12 22:37	
25	tasker	2013-05-12 22:37	2013-05-12 22:38
26	tasker	2013-05-12 22:39	
27	tasker	2013-05-12 22:40	2013-05-12 22:40
28	tasker	2013-05-12 22:40	
29	tasker	2013-05-12 22:40	2013-05-12 22:42
30	tasker	2013-05-12 22:42	2013-05-12 22:43
31	tasker	2013-05-12 22:43	2013-05-12 22:43
32	tasker	2013-05-12 22:43	2013-05-12 22:44
33	tasker	2013-05-12 22:44	2013-05-12 22:44

6. Conclusions

As the figures 2, 3, 4 imply the same project in the designed observations were differently managed by different managers. The number of primary organizational terms and their sequence is completely different. Every manager might have had his own managing style which could be presented as a graph.

This paper contains only these three examples of using the graph theory as a mathematical tool to represent data gathered by transistorshead.com. The theoretical foundation was the system of organizational terms. Having enough information about managers' activities, it seems possible to create individual graphs and compare one to another. The next step would be a trail of automation for some operational management in the team. Another result could be creating functions between organizational terms (Flak 2010, pp. 16-18). Such steps will be taken by the author in future research and publications.

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