Approach changing into organization processes and personnel management in context of digitalization

Marina Makarchenko1*, Iolanta Borisova2 and Farrukh Sattorov3

1University ITMO, St. Petersburg, Russian Federation
2 University ITMO, St. Petersburg, Russian Federation
3University ITMO, St. Petersburg, Russian Federation

*E-mail: makarchenko68@mail.ru

Abstract: The virtual teams which are the subject of study becoming more significant in conditions of digitalization. The virtual team possess specific characteristics that determine a number of advantages and disadvantages and also makes changes to the processes of organization, management and control. The members of virtual teams can be divided in area and (or) in time from the position of organization, they can be beyond personal contact with each other and use different software for communication. Despite this the virtual team is endowed with a large grade of independence and the members of virtual team are share, plan and control all types of work by themselves. Most negative factor is the lack of direct communication between group members and this has a significant impact on all the problems and risks of a virtual team according to experts. It is important to implement an absolute indicator of performance evaluation in order to stimulate communication within the team. The authors propose to apply the temporarily oriented indicators as the most objective indicator of virtual team effectiveness evaluation. The advantages of this indicator are: simplicity of calculations, applicability to any teams, relevance in the context of digitalization and the common interest of all team members.

1. Introduction

Many authors [1 – 5] devoted their studies to the issue of economy digitalization where considered the questions of formation of the digital economy, its structure and how transformation of the economy is realizing in various industries and fields. These studies mostly reveal the technical, technological and structural components of the economy digitalization. But in our opinion, it is important to take into account the trends [6, 7] that the digital economy dictates in relation to the organization staff and which kind of changes digitalization entails in the processes of organization, management and control.

The purpose of current research is to describe a new approach of organizational transforming and managerial thinking in order to increase the efficiency of personnel in conditions of digitalization of Russian economy.

The main objectives of the research:
1. to compare the traditional and new approach for team work organization;
2. disclose the structure and content of changes in organization by taking into account the proposed approach;
3. development of virtual team effectiveness evaluation criteria

2. Methods

The object of study in this paper is virtual teams in a digital economy. The digital economy is a system of social, economic and technological relations that operates in the global information area through the widespread use of the network digital technologies. It generates new types and forms of production and promotion of products and services to the consumer, which lead to continuous innovative changes.

The subject of study is the specifics of the organization, management and evaluation of the organization staff effectiveness which involved in the activities of the virtual team.

The introduction of digital technological solutions in the activities of entrepreneurial structures has already significantly changed business processes, the principles of office operations and has significantly reduced the time and number of communications. Numerous manual operations have become automated and attaching an employee to an office workstation has ceased to be mandatory. In this regard, work in virtual teams is becoming more common.

The methodological basis of the study was a systematic approach to a virtual team.
The methodical basis was system analysis, SWOT analysis, comparative analysis and expert evaluation.

The theoretical basis was the work of Russian and foreign authors on virtual teams’ organization.

3. Results and Discussion

Modern requirements for personnel are formulated as the ability to adapt to rapidly changing environmental conditions; ability to find new solutions in the conditions of dynamic nonlinear changes; involvement in the innovation process; readiness for self-development; knowledge of information technology; regular training, etc.

Implementation of new technologies in practice not always entail changes in the processes of organizing and personnel management. Processes in entrepreneurial structures are often organized in such a way that an employee cannot fully utilize these qualities. Implementation of information technology as well as implementation of new technology should be carried out systematically and be accompanied by appropriate changes in the methods of organization, management and evaluation of the effectiveness of the enterprise personnel.

The transition to a digital economy involves not only the widespread implementation of information technology, but also a change in organizational and managerial thinking. New thinking is changing the approach to the processes of organization, management and control. The difference between the traditional and the new organizational and managerial approach is presented in table 1.

Table 1. Difference between processes of organization, management and control in the context of traditional and new approaches

| Processes | Traditional approach | New approach | Difference of approaches |
|-----------|----------------------|--------------|--------------------------|
| Organization | Teamwork | Virtual team | A virtual team is united by a common goal or task, but the participants are divided in area and (or) time. Interaction through computer technologies[^8] |
| Management | Top-down control to the workplace | The team makes decisions on work planning. | Self-sharing planning and control all types of work |
| Control | Focus on the maximum use of all types of resources | Workflows and business processes acceleration | Continuous improvement of product quality, cost reduction, on time work performance.[^9] |

1. The command form of labor organization. Modern conditions require a quick reaction of business structures to the pace of scientific and technical progress and to satisfy the needs of customers (consumers). From organization point of view, the transition to new thinking involves the implementation of a network or team organizational structure. The team is focused on the release of certain products (or the implementation of the project), is endowed with all the necessary resources and powers, which in the general is a cell focused on a specific project or product. From the digital economy point of view, the classic teambuilding is being replaced by the virtual.

In conditions of digitalization the communications substantially transform and change their essence and meaning. Virtual team members may not engage in personal communication or even know each other. Modern software and utilities (messengers, cloud storages, google form and others) allow to work together, almost without entering into direct communication in any form. The advantage of a virtual team is flexibility and faster response to changing customer requirements. Thus, the key characteristics of a virtual team are:

1. The lack of borders, including temporary and geographical and also lack of classic structure
2. Lack of direct communication or its form changes
3. Total usage of information and digital technologies.[^10]
Working in a virtual team involves staff reduction, improved process coordination and the usage of information and communication technologies while workflows are often accelerating. Many actions can be “parallelized” by attracting additional specialists to one specific task or inviting several participants to work on one complex operation, which is unlikely in a classic team.

2. The team makes self-decisions on work planning. The virtual team is endowed with a high grade of independence, only capacity and work timing (order, project) is presented. Team members share, planning and control all types of work by themselves. All processes can be easily rearranged including the structure of the team, functions of the participants and their roles in project implementation, relatively stable and unchanged in the classic team. [11-14]

By studying a number of sources, we pointed the advantages and disadvantages of virtual teams, which are typical and specific for them, i.e. differentiate them from classic teams. A similar job done with the capabilities and threats associated with virtual team work. The result of research is summarized in the matrix of the SWOT analysis and crossing fields behavior are proposed.

Table 2. Virtual team SWOT analysis

| Opportunities | Threats |
|---------------|---------|
| Freelance base work | Loss of customers and contracts |
| Delegation of authority taking into account the characteristics and wishes of the virtual team members | “Information leak” |
| Initial analysis and coordination of IT tools with team members (video conversation, remote desktop viewing, etc.) | Team communication skills development |
| Informal communication and idea exchange promotion | Implementation of team performance indicators that encourage shorten the duration of work realization |
| Organization of 24-hour a day endeavor on the project by attracting specialists located in different time zones (the task can be transferred to colleagues at the end of working time) | A clearer explanation of the goals, roles and responsibilities at the initial stage |

An important point in addition to the SWOT analysis is how advantages and disadvantages of a virtual team are related to its specific properties. In other words, which virtual team specifically inherent properties have the most positive effect (maximize opportunities) on its functioning, and which properties give rise to the greatest risks (threats). A special study was conducted using the expert survey method and the results are presented in Table 3. 12 experts took part in the survey, the concordance coefficient was 0.908. The numbers of advantages and problems comply with their numbers in Table 2. The grade of influence of the virtual team specific characteristics on its advantages and risks estimated by points: from decisive (3) to insignificant (1). If there is no influence by the majority expert’s decision or it is impossible to evaluate a dash is put down.
Table 3. The link between advantages and problems of a virtual team with its specific characteristics

| No | Characteristic      | Strengths |            |            |            |            |            | Weaknesses |
|----|---------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
|    |                     | 1 2 3 4 5 | 6 1 2 3 4 | 5 6        |           |           |           |            |
| 1  | No boundaries       | 3 3 3 2   | 1 3 3 2   | 3 2 3     |            |           |           |            |
| 2  | No personal comm    | _ _ 1 3   | 2 3 3 3   | 2 3 3     |            |           |           |            |
| 3  | ICT usage           | 2 2 3 3   | 3 3 _ _   | 1 1 1 2   |            |           |           |            |

As a result of the study it is possible to establish that:

1. Information and digital technologies usage are the most positive factor and its influence is noticeable in the entire advantages of a virtual team, while this aspect does not have a significant impact on most problems and risks.

2. The most negative factor was the lack of direct communication or its form change. According to experts this characteristic has a significant impact on all the problems and risks of a virtual team, while at the same time the positive impact of this factor on the formation of its advantages is relatively low.

3. The virtual team most controversial characteristic was the merging (absence) of its boundaries in the organizational, time and spatial dimensions. This characteristic has a significant impact on the virtual team additional benefits formation as well as on the appearance of additional risks.

3. **Work and business processes acceleration.** It is quite difficult to evaluate the effectiveness of a virtual team. In general, there are the following areas which allows evaluate the work efficiency (Fig. 1): KPI establishment and using of objective criteria that are valued in terms of money (profit, revenue, sales), or evaluated in terms of time spent.

![Directions of virtual team effectiveness evaluation](image1)

The disadvantages of using KPI \[15 - 18\] include: first subjectivity (the values of the indicators are not always fully justified) and second if their introduction can negatively affect the team spirit, as it can bring a competitive aspect into virtual team.

Cost indicators (profit, revenue or sales) in assessing the effectiveness of a virtual team are not always applicable. For example, when it comes to social and volunteer projects, the activities of which cannot be evaluated in terms of money. There are also many works that are difficult to evaluate in terms of value during working on a commercial project. For example, the development of technical specifications, paperwork, the business plan development etc.

One of our previous publications has been devoted to the implementation of a time-oriented approach in production processes. Based on the results of previous studies, we propose the use of time-oriented indicators in virtual team effectiveness evaluation.

The time indicator \[19\] seems to us more objective and applicable to any team, including a virtual one, since:

- first, it does not require complex calculations;
- secondly, the time indicator can be applied to any activity in a team;
- thirdly, in the context of digitalization, the time indicator is a very important criteria, because commercial success mostly depends on how quickly the team was able to complete the order (project);
- fourth, the time indicator allows to evaluate the quality of team organization. If the members of the virtual team were able to speed up the execution of the order (project), then the quality of the organization can be evaluated as high. If the team members, having all the required professional competencies, completes an order (project) longer, then the quality of the team work organization is assessed as low.
The virtual team members material motivation should be tied to reducing the lead time of the order (project). Since psychologically people react more positively to increasing indicators, it is recommended to impose a performance index of the time cycle, the increase of which reflects the time percentage reduction for complete an order (project). The growth of this index means that other indicators, for example, total production costs are reduced. If the indicator decreases, then the management needs to analyse the reasons and provide assistance in the work of the team.

In order to realize this complete order initial (base) time is determined and fixed and compared with the current one \( K_0 = 1 \). \[20\]

\[
K_t = \frac{t_0}{t_i}
\]

where \( K_t \) is lead time coefficient; 
\( t_0 \) is the base lead time; 
\( t_i \) - current lead time.

The coefficient growth indicates that the team is working efficiently. Consider its stimulating role in a specific example (table 4).

| Table 4. Index performance calculation of the time cycle critical path |
|-------------------------------------------------|
| Phase | Team work, days | Index performance |
|-------|----------------|-------------------|
| Phase I | 14 | 1 |
| Phase II | 12 | 1,2 |
| Phase III | 11 | 1,3 |

At the first phase (beginning of team work - the base period) the duration of the order was 14 days. After part of the staff was able to remotely work on the order the duration was 12 days. At the third phase the part of the tasks (which are irregular) were performed by freelance experts and the number of days was reduced by only one day. However, the results of the team are estimated at a value of 1.3, since the fact is that at the initial phase of improvement it is easier to achieve, but to reduce the same 2 days not in relation to fourteen, but in relation to twelve days are more difficult which index performance indicates.

The time cycle critical path index performance indicates that by removing of the actual period from the base period, it is more and more difficult to achieve reduction of the time cycle critical path, but at the same time, time cycle critical path index performance continues to grow and to stimulate the team. This dependence is well illustrated in Fig. 2. In addition, time cycle critical path index performance can be used to compare the performance of teams of the entire enterprise, despite the fact that they perform different types of work.

Figure 2. The dynamics of the TCCP indicator and the index performance

All calculations of the time cycle critical path index performance are carried out until the team provides the completed work. During switching to another work the calculation of TCCP index performance is starts over, but in relation to new work.
After new project shows results related to reducing the duration of the time cycle critical path, reducing costs, improving product quality, it is necessary to bring this information to the attention of all employees. This will be the best evidence of the high effectiveness of the strategy.

It should be noted that it is impossible to implement a command form of labor organization without endowing it with independence. It is also important to understand the necessity of investments in training in related professions and finally it is impossible to evaluate workers by the indicators of maximum capacity of equipment and workers.

4. Conclusions

In the context of digitalization, organizations must quickly adapt to changes in the external environment. The increased pace of external environment changes dictates new requirements for employees of the organization: flexibility, the ability to quickly learn new things, analytical skills, etc. The traditional approach involves narrow specialization of personnel and top-down management. In the context of digitalization, the application of this approach is not recommended, since the knowledge, skills and abilities of employees lose their relevance, and making managerial decisions from top to down requires losing a lot of time. Therefore, the authors propose to change the content of the processes of organization, self-organization, management and control and use new thinking based on lead time. This approach creates a new community of employees who capable not only get important information, but also generating and implementing innovative ideas in future practical work.

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