Sustainable development of the industry in the context of digitalization and ecolinguistics monitoring

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Abstract. The development of organizational communication monitoring involves increasing the sustainability of production development, ensuring the efficiency of production. The article sets out the experience of some research in this area carried out by the authors. The authors propose to develop a system of optimization of efforts and resources aimed at improving the methodological apparatus of communication activity of specialists in production, considering the existing experience. Development of a comprehensive approach to acting in conditions of uncertainty, quasi-stable situations of risk and communicative tension. Development of creative potential of communication participants, their ability to integrate into various management situations and respond quickly to the changing situation in the workplace. The system development of a pragmatic approach to the communicative component of company management, the development of environmentally appropriate measures to maintain continuous managerial communication in the digital space, comfort and stress resistance of the employee.

1 Introduction

One of the priority tasks of the digital economy is the development of remote management of industry and other fields. Features of the organization of harmonious anthropocentric and nature-forming working digital space, communication and the ecology of language in this new for management sciences and linguistics so far poorly studied [1-3]. The task of effective communication in a distance form currently remains relevant. For its performance theoretical developments, experimental researches, development of methodical recommendations and regular practical training of professional development of the managerial staff for mastering the ways and techniques of influencing speech and health-saving methods of the staff work organization are necessary [4].

Operational management of construction production implies not only the possibility of constant employee participation in the production process, but also an increase in entropy, increase uncertainty in the management of documented procedures, staff fatigue, information pollution of the digital workplace [5-7].

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The purpose of the study is to consider the possibility of developing a system of ecolinguistics monitoring, which takes into account new negative factors in the organization, planning and management of construction production.

The scientific novelty of the study lies in the fact that for the first time from the point of organization, planning and management of construction, as well as the theory of ecolinguistics of communication is given the idea of the possibility to consider and predict the factors that negatively affect the ecology and productivity of managerial staff in the construction organization

2 Materials and methods of research

According to the data cited by Bell, the information component of management communication decreases by 40% with respect to each link of transmission and no more than 13% of the original information reaches the final performer [3].

The successful functioning of an organization is determined, first of all, by how effectively the management system is organized. The most important part of management is the work with information, most of which is recorded in documents [2, 8-10]. The dynamically changing socio-economic situation does not allow a more effective management process through the routine technology of working with paper documents, now it is the task of digitalization of the main industries and stuffing them educational institutions. The modern level of information technology development provides opportunities for radical reorganization of management processes through the transition from the traditional paper to electronic document management and the formation of a digital workplace of the contractor [10, 11]. Electronic document management is a fundamentally new technology, a qualitatively new phenomenon that imposes new requirements on organizational communication, including the ecological nature of communication and the employee's comfort in the digital space. It should be noted that such problems as the development of the necessary communication functionality of systems, organization of staff training, comfort and the ecology of labour directly depend on its productivity and efficiency [12-14].

The relevance of the implementation of communicative and ecological monitoring systems is determined by the fact that it will allow us to define a qualitatively new approach to production management and create an effective science-based tool for the management of organizational communication in the context of digitalization, which in turn will ensure increased labour productivity and employee’s comfort, and will allow a more sensible distribution of company resources and maintain the health of the staff employed in digital workplaces.

Modern operational management of the company needs a specific and workable functionality to monitor the effectiveness of organizational communication and ecological consistency of the staff work organization [15]. For this purpose, it is offered to apply a specific plan of scientific and scientific-practical researches.

The action plan includes the following stages:

1. The stage of database formation for analysis and experiments.

I. Analysis of the system of interaction between employees of the enterprise and drawing up a scheme of the current organizational and managerial communication indicating the time parameters for the duration of communicative acts, identifying typical acts of communication

II. Interview with employees and drawing up matrices of identified communication problems

III. Photography of employee's workday communication with identification of barriers for effective communication and determination of psycholinguistic comfort of employee's work

IV. Observation of communication processes and recording of emerging problems with fixation of time and place in the communicative act

2. The stage of analysis and conducting experiments. Assessment of oral and written communication at the enterprise

I. Data systematization and identification of patterns of communicative barriers, typical location of barrier zones in the scheme of current organizational and managerial communication

II. Creation of a data corpus on communicative problems of organization interaction at the enterprise

III. Determination of enterprise losses due to ineffective communication.

IV. Conducting experiments to create an automated system for accounting delays in communication procedures and calculating the probably losses of the enterprise.

V. Conducting an experiment to determine the degree of psychological comfort reduction as a result of ineffective communication

VI. Development of a temporal model of communication barrier zones

VII. Development of recommendations for their elimination

VIII. Development of a predictive model for the effectiveness of communication and reduction of losses due to the elimination of barrier zones

3. The stage of analysis and conducting experiments. Assesment of digital communication at the enterprise

I. Assessment of the existing digital management document workflow according to the communication effectiveness criteria developed in the second stage of the project.

II. Fixing the zones of communication barriers

III. Conducting an experiment to build a temporal model of communication barrier zones, considering the probability of stochastic instability of the digital communication system and the possible crisis of communication due to imperfections in the communication component of the document workflow

IV. Conducting an experiment to create a model of effective document workflow, taking into account organizational communication

V. Development of the monitoring system for effective communication and psycholinguistic comfort at the enterprise.

VI. Conducting an experiment on the implementation of organizational communication monitoring software and assessment its effectiveness at the enterprise

VII. Development of recommendations for the implementation of the organizational communication monitoring software and assessment of its effectiveness at the enterprise

Each experiment developed in the project is aimed at obtaining a specific result, allowing the development of a methodology and the creation of a comprehensive software product that would simplify production management at the stage of communicative interaction.

The expected results are:

1. Development of the methodology for determining the zones of communication barrier in the organizational schemes of production.

The experience of this kind of work exists in domestic science, but it is focused on the traditional, pre-digital management system.

2. Creation of a corpus of units and communicative models, allowing software products to find and determine the zones of barriers in organizational communication. The task set by the authors implies the creation of such a corpus for modern digital organizational communication.

3. Development of a temporal model of organizational communication, taking into account the possibility of identifying zones of barriers and predicting the development of the communicative situation, its impact on the efficiency of production, taking into account time and resource factors. The use of Gantt charts and other types of network planning in production is a common practice, but so far it has not considered ecoinguistic factors and features of digitalization of main production cycles. The authors propose the creation of visualizable and measurable models of the dependencies of communication efficiency and resource intensity of organizational relations.
4. Development and implementation of a software product, which will allow to introduce a monitoring system of ecological and ecolinguistics interaction of managerial staff and working staff of various productions in conditions of digitalization into organizational relations, which will allow to quickly eliminate arising difficulties. The development of systems involves the creation of a self-learning automated complex capable of recognizing emerging communication difficulties, predicting losses and issuing recommendations of a regulatory nature.

An example of the genesis of organizational communication is the experience of the American firm Austin Company, which in the 1940s contributed the construction of one-story industrial buildings across the United States. For this purpose, they developed a system of control cells, which made it possible to exchange correspondence and make organizational decisions by telegraph during the day. The special code implemented in the company made it possible to compensate for imperfect technical means and to communicate remotely and as efficiently as possible, taking into account the technological capabilities of that era. Then the construction of multi-story buildings using elevators for bringing raw materials to the upper floors and chutes for bringing materials and finished products down to the lower floors became more common. However, the appearance of more powerful and heavier process equipment in industries such as steel and food has forced many firms to refuse from existing industrial buildings with limited floor loading capacity and rooms cramped inside by columns. Today, most industrial plants are located in one-story buildings with a controlled climate, applying air conditioning with additional heat and vapor insulation of walls and coatings to limit heat loss and its entry from the outside and thus reduce energy consumption. Other innovations were excellent lighting (facilitated by white concrete floors) and sound insulation. The first such facility was the Symonds Saw and Steel Company building (Fitchburg, Massachusetts). All these innovations are the result of the development of a special concept of accounting and processing complaints, the study of production experience and the wishes of a consumer, the effect that the creative component of the communicative stage in project management achieves.

3 Research results

During the preliminary experiment to assess the company's communication problems, the following results were obtained (Figure 1).

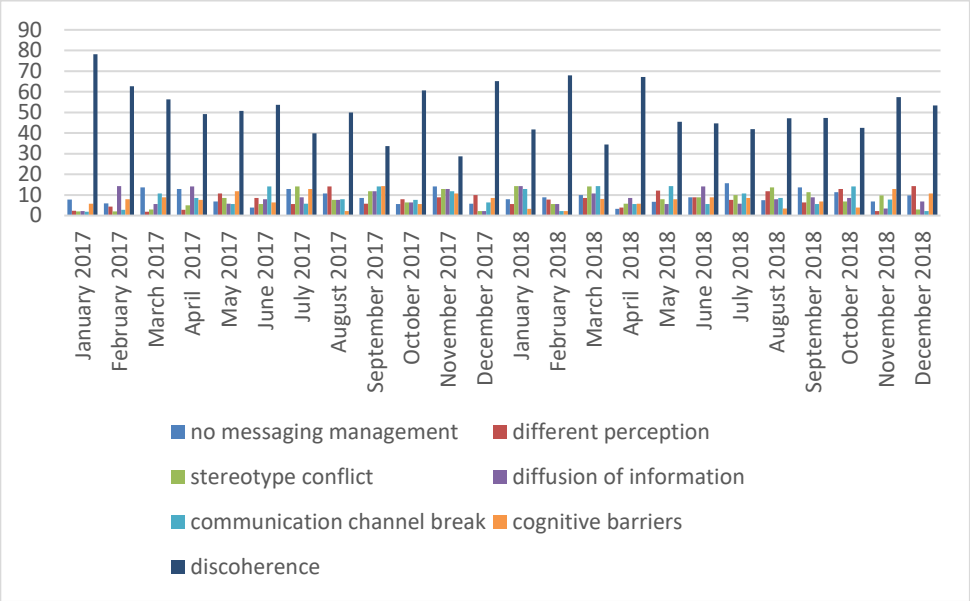

Fig.1. Chart of communication problems and delays in a construction company, data in % of 100% (the data obtained by the authors).

As the study shows, the main volume of delays is due to discoherence of communication. The concept of discoherence of communication defines the inconsistent course in space and time of communicative processes. Communication by its nature resembles a wave response consisting of interacting phases and reactions of communication. Inconsistency of these phases at any of the stages leads to the disruptive effect of communication and prevents the achievement of the goal of its participants. The presence of discoherence in the communication of the construction company is determined by a sharp increase in the information flow on the same operation, the emergence of duplicate flows, the presence of returns and clarifications of information, which serves as an indicator of the lack of proper conditions for communication compared with the period of goal achievement by the average time/resources for the same communication operation.

For example, the order to carry out the next stage of construction and installation works at the site due to artificially created barriers on the part of additional visiting services of the enterprise (legal department, design supervision department) was four days late and was implemented in an unfavorable weather period (precipitation, temperature drop), despite the objections from the contractor. As a result, the work turned out to be of low-quality, which led to specific losses of the enterprise. When analyzing the situation, when the barrier zones in the communication component were identified, the persons responsible for the delay and issuance of instructions that were no longer appropriate under the current conditions, denied their guilt, referring, among other things, to the lack of personal motivation in skipping the information message further along the communication line: "I do not understand what these two days decide"; "If the instruction is issued, agreed by lawyers, it must be executed, no matter what the weather is like. The lawyers approved it" (quotes from the employees).

The experiment on developing a temporal model showed the peak nature of the greatest delays in production communication (Figure 2).

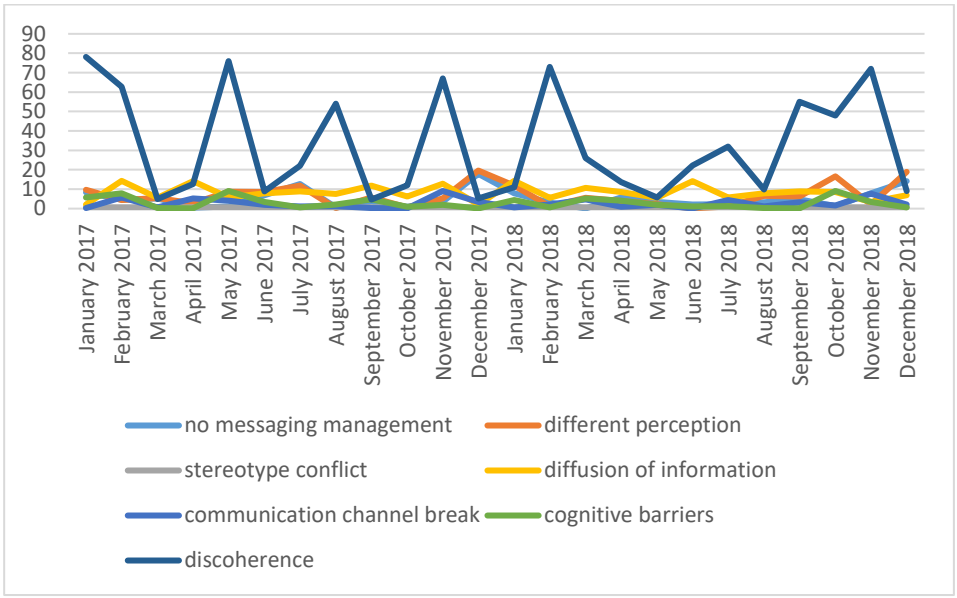

Fig. 2. Chart of the temporal model of communication problems and delays in a construction company, data in hours per month (data obtained by the authors).

As can be seen from the chart, the conflict of stereotypes plays the least role in the ratio of time delays, and the discoherence plays the greatest. Delays of three days of total time mean significant losses for the company or lost profits with a better organization of enterprise management.

4 Discussion

Surveys of employees and analysis of their data showed the following problems in the organization of digital workplaces of remote access and their ecological compatibility in terms of comfort, communication, psychological state of employees.

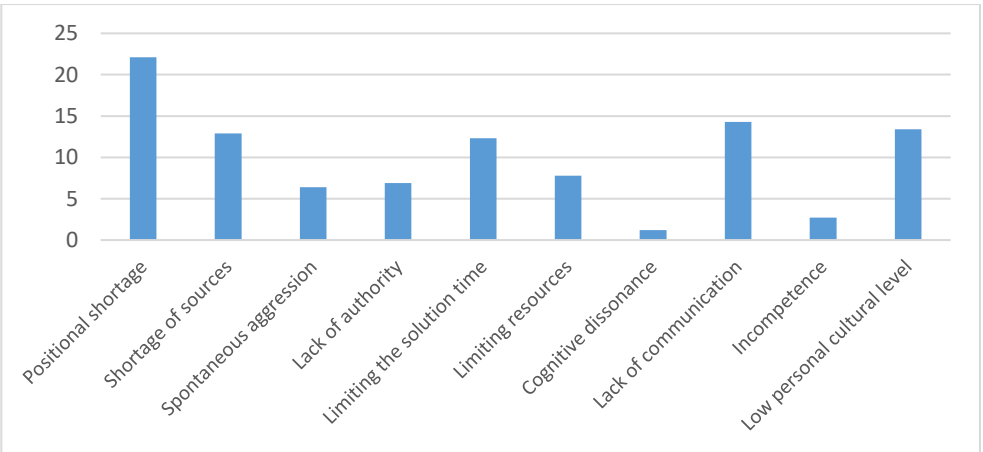

Fig. 3. Chart of the distribution of potential for conflict in the digital workplace in % of 100% (data obtained by the authors).

Questionnaire survey and open conversation with employees showed that high stress, fatigue, decreased quality of work, motivation for work and labour discipline directly depend on the organization of the digital workspace, user-friendly interface and well-thought-out communication system in the company. Most delays associated with positional shortage, lack of time for processing and making decisions and insufficient level of communicative competence are associated with a badly-designed system of relations, incompetence of employees with their duties, lack of understanding of the essence of incoming demands, lack of respect for other participants in the communicative process. Changing the communication system and implementation of optimized communication schemes as well as a number of measures to optimize communication, including through elimination of duplicate units, significantly increases the effectiveness of the enterprise.

Globally, there has been a steady increase in interest in the issues of industry sustainability in the new digital economy, reducing costs and improving production efficiency. The issue of introducing new technologies and equipment in order to improve the economy and environmental safety of production requires well-designed monitoring. The authors intend to develop a system that is based on the fundamental principles of creative development of scientific and organizational staff in production, taking into account existing experience:

I. Development of the creative potential of communication participants, their ability to integrate into various managerial situations and respond quickly to the changing situation in the workplace. For this purpose, the concept of teaching risk theory, risk management, anti-crisis management should be included in the course of special training.

II. Systematic development of a pragmatic approach to the communicative component of company management, development of environmentally appropriate measures to maintain continuous managerial communication in the digital space, comfort and stress resistance of the employee. This methodology involves the development of a culture of digital organizational thinking and affects the system of perception of communicative space, considering the negative factors, and the ability to level them.

III. Optimization of efforts and resources aimed at improving the methodological apparatus of communicative activity of specialists. Development of a comprehensive approach to acting in conditions of uncertainty, quasi-stable situation of risk and communicative tension.

5 Conclusions

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