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**SEMANTICS IN E-COMMUNICATION FOR MANAGING
INNOVATION RESISTANCE WITHIN THE AGILE APPROACH**

Nadezhda N. Pokrovskaya (a, b)*, Marianna Yu. Ababkova (a), Veronika L. Leontieva (a),
Denis A. Fedorov (b)
*Corresponding author

(a) Peter the Great St. Petersburg Polytechnic University (SPbPU), Polytechnicheskaya 29, Saint Petersburg, 195251
Russia, nnp@spbstu.ru, ababkova_myu@spbstu.ru, v-leontyeva@mail.ru, +7 911 936 3897

(b) Department of Advertising and Public Relations, Herzen State Pedagogical University of Russia, Moyka 48, St.
Petersburg, Russia, nnp@europe.com

Abstract

Semantic analysis is widely implemented for management tasks to communicate and advertise, to build public relations and to assure correct branding, to motivate and to persuade stakeholders. The digital era raises new questions about semantics in the e-communication, especially, in inter-personal relationship within the working teams. The e-communication is organised in the framework of collective dynamic with specific values and norms of a group of people working together for a fixed goal, the research of the used semantic units reflects the practices of cognitive and emotional symbols and signs that appear into projects team. The paper presents the results of the research of graduate students teams' e-communication through social media during their work for preparing multi-disciplinary projects at the international double degree "European Master" course. The meanings, symbols, words and pictures used by the teams in a large scale correspond to the creativity and success of their project. The survey of enterprises' managers demonstrates that the categories of words and symbols used within the agile teams are similar by the sense and content, but different by form, comparing the e-communication of graduate students. The results allowed us to conclude about the necessity to pay attention to the organisation of e-communication from the point of view of semantics.

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1. Introduction

Semantics reflects the meanings of textual and quasi-textual sentences. The e-communication, especially within social media, led to the evolution of the semantics due to the construction of sentences with the simultaneous use of text, symbols, signs, pictures and icons. This mix simplifies and accelerates communicating process and helps to re-organise management of teamwork according the principles of the Agile-transformation. The insertion of the safe and supporting pictures and symbols helps to overcome the resistance for innovative solutions proposed. This facilitating tool can be used successfully for different kinds of team (in this research, students and corporate teams were surveyed), and it is helpful to assure the faster mutual understanding and recognition.

1.1. Industrial rationality and Agile ideology as basic value-normative regulation systems

The efficient management relies on the common ideology and value-norms disposals within enterprise. Traditional management is oriented to optimization of manufacturing process to satisfy the mass clients' needs. The economic analysis of the production optimization demonstrated the deeply enrooted socio-cultural elements of the modern mindset (Želazny, 2015) that oriented the industrial management towards the simplified mono-criterion model of the financial efficiency assessment. This kind of linear "max-min" rationality reflects the modern society' basic elements (Beck, Giddens & Lash, 1994), where the simplicity meant the optimisation according one criterion, i.e., profitability. This limited approach to evaluate the infinitely complex reality was refuted with the social movements of post-modernisation (Giddens, 1990) and was refused due to the new communicative policies (Kolomeyzev & Shipunova, 2017) of corporate brands addressing the emotions and affective stimulus, to appeal to the self-identification of customers (Berezovskaya, Gashkova, & Shipunova, 2017) and to the existential needs of workers (Bylieva, Lobatyuk, & Rubtsova, 2018).

The simplicity within the post-modern society reflects the easy understanding for people, but not necessary the simple treatment of the accumulated real phenomenon' data by machines. The information and communication technologies (ICT) progress is helping to translate the human mentality into fuzzy logics and algorithms for machine learning and neuron networks (Ababkova, Pokrovskaya, & Trostinskaya, 2017). The post-modern notion of simplicity means that the consumer or manager who makes decisions should be able to understand, compare, make choice and take responsibility for the decision due to the human natural spontaneous perception and reasoning. This approach is multi-criteria and, often, is based on fuzzy evaluations and judgements, but it is more human and requires less transaction and deliberation costs. In the era of expensive human capital that is scarcer than financial capital, the tools saving humans' time and efforts are crucial to assure the profitability for a company within the new context of economy of knowledge. The smart devices and smart environments (smart-phones, smart cities etc) (Korostyshevskaya & Pokrovskaya, 2017) re-orient the humans' attention towards the creative work and initiatives (Bylieva, Lobatyuk, & Rubtsova, 2017). Networking connects in the whole system the producing agents (connected factories) and the social actors (Evseeva, Obukhova, & Tanova, 2017).

This simplicity reflects the options to facilitate and to accelerate communication between the economic agents. The new ideology of Agile management is based on the dynamic evolution of the e-

communication, such as social media messages, and physical personified interaction (Shipunova, Rabosh, Soldatov, & Deniskov, 2017), or a mix of e- and real tools, of electronic and physical reality communicative elements.

1.2. Agile-management and innovation resistance

The innovative growth complicates the sustainable support of competitive advantages of companies due to the constant and quick changes of the market environment. The agile approach appeared in manufacturing sector to cope with the rigidity of the traditional management methods (Denning, 2016). The producing enterprises are acting with the industrial ideology of rationality and perfection (Drouot, Irving, Sanderson, Smith, & Ratchev, 2018), but the market ideology is oriented to the satisfaction of clients, who are more interested in the dynamic change and evolution of the product, than in a “perfect” product. The “waterfall” or cascade approach was used to manage the projects of new product development by following consecutive steps leading to a perfect product (Gregory, Barroca, Sharp, Deshpande, & Taylor, 2016). But the changing environment provokes changing requirements of consumers: “The users keep changing the requirements... I’m surprised anyone is surprised by changing requirements. I’ve never come across a serious project where requirements don’t change” (Fowler, 1998, p. 55). The dynamic design proposed by Fowler (1998, p. 56) was based on the idea to reject attempts to find the best solution for the search of some reasonable solutions: “As you build the solution, as you understand more about the problem, you will realize that the best solution is different from what you originally came up with”.

The IT-industry representatives expanded the approach of agile management methodology and created the Agile Manifesto, explaining essential values and principles of the philosophy of the agility for consumer’ satisfaction. The semantics plays the key role in the agile approach due to the values presented and the priorities to mutual understanding between developers and consumers. The best organisation of a new product developing is oriented to the iterative approximation of the design to the client’ needs, the balance between wants and costs can be reached through the better cooperation of the developer with the personified client. To communicate the mutual limitations and possibilities, options and wishes, the semantic competence is necessary, especially, within the digitalized economy and the environments constructed in a large part on the basis of e-communication through social media and messengers, without the physical presence.

2. Problem Statement

The speed of making decisions is a crucial element of competitiveness of a company on the innovative market. The semantic elements can be complex and fuzzy for computing, but easy to understand and to treat for humans through the ontology of a concrete context (Timermanis, Ivanov, Zamorev, & Smaragdina, 2017). The agile management approach relies on the cognitive and affective elements that contribute to the faster perception and help to determine the priorities, to identify the preferences and to make choice. The traditional documents aim to clarify the negotiations and to fix the agreements (Evseeva, Bashkarev, Pozdeeva, & Tarakanova, 2017), but the e-communication within the Agile-management is intended to create the whole representation and to adapt it faster and closer to the

ideas of customer, who usually has only a vague concept with few details. The objective of the iterative communication, including the e-communication, is to approximate to the real need of the consumer.

2.1. The balances to be reached

The problem relates to the following balances:

- cognitive and affective elements help to understand, if the consumer really likes the concept of the product. The cognitive rational semantic elements reflect more functional solution, the emotional or relational aspects of the product or service represent cultural and psychological factors influencing the potential result of the development;
- textual and visual elements can be more or less clear for the people with different modalities of information input and treatment, the visual elements of communication, such as emoji signs and different types of likes and dislikes, can be obvious for visual-driven people but not “readable” for kinaesthetic- or audio-oriented persons;
- positive and negative signs are embedded into the traditional management in the form of “stick and carrot” approach, but in the actual economy the positive elements motivate and mobilise people, and negative ones can sensitize or de-motivate and reject people, that considerably limits the possibilities to apply the negative texts, words or symbols;
- cross-cultural differences can complicate the mutual understanding especially in the global or trans-national companies, both inside and outside the corporate business-processes, in the interactions among members of corporate teams and between the company and clients or external stakeholders.

The differentiated parameters can play mutually complementary roles: cognitive and affective elements as well as textual narrative and visual content within a creolised communication produce the whole informational (descriptive) and transformational (forming new attitudes) impact of a communicative act. The choice between the dichotomies (positive-negative evaluations) produce the judgements that are capable to stimulate a desired behavioural model, as well as cross-cultural differences are mutually enriching (Samylovskaya, 2017) if not presented as opposite ones.

2.2. Digital economy influence

The competition through the digital aggregative platforms can be tense and rough, that is why the agile teams try to create a specific secure space for creativity to generate ideas and to build the trustful and sustainable relationship with the clients. The comparison of different proposals on the level of aggregators, the possibility to use intelligence systems to find the best solution, the fog computing and digital twins accumulating and structuring technical data about the human behaviour (Pokrovskaya, 2017) increase the value of the h2h (human-to-human) or p2p (person-to-person, peer-to-peer) sustainable relationship.

The threats of the domination of intellectual tools or of replacing people with robotized technologies are the sources of both the motivation to improve the human capital competencies and of innovation resistance. The pressure of the innovative competition forces companies to overcome the resistance of the human resources towards innovative methods or technologies, the semantics helps to choose between the perception of the innovations as threats or opportunities.

3. Research Questions

The research intends to fill in the research gap to better understand the essential meanings and tools of the e-communication inside the teams, especially in the agile management environment, to point out the impact of the digitalized relationship on the weigh of the physical and virtual communication and to understand the possibilities to implement the semantics as a tool to overcome the innovation resistance.

3.1.Semantics study of meanings

The denotations and connotations of used words and symbols raise questions about the meaning and context that are created in the communication. The e-communication is placed initially in a specific environment of a concrete messenger or social media, e.g., in Russia using Telegram has connotation of breaking rules, that is why the use of Telegram as the internal communicative network in Sberbank as a giant financial institution during its Agile-transformation had a connotation that Sberbank is on the edge of advance in the banking sector.

3.2.Digital environment for personified and client-oriented relationship

The social media communication helps to know not only the essential business aspects of the work with a client or co-worker, but to get acknowledge of her/his family and personal interests, e.g., the aikido as a common hobby can serve as a base for construction of trustful relationship, and the information about the children of the collaborator or customer helps to organise the schedule of meetings in a more comfortable manner for all participants. Despite the agile management is usually based on the physical personal presence, the e-communication can give larger possibilities to ask questions at any moment when it is necessary to precise any details.

3.3.Semantics as a tool to support agility and innovation

Semantics is the essential tool to solve the misunderstanding between people and to present the different intentions and options in a situation. The innovation or change can be seen as a dangerous crash, the task of the manager in this case is to look at the same circumstances from another point of view and present to collaborators the possibility to find the opportunities and chances in this situation. Usually, this also means the emotional support, in addition to the cognitive reframing, that is to be given to colleagues, team members or customers.

4. Purpose of the Study

The purpose of the research was to find out the essential options of the semantics for the agile corporate and project management. The purpose also concerns the question, if the different kinds of e-communication create dichotomies (cognitive-affective, textual-visual, positive-negative) or a balanced mix (Table 01):

Table 01. Type of semantic element – Dychotomy/Balance

Type of semantic element	Dychotomy	Balance
Content	cognitive-affective	information enhanced with psychological support

Form	textual-visual	clear and funny symbols, emotional facet
Intention	positive-negative	motivation mixed with the sensitizing

The research includes two parts –

- the examination of the processes and results of graduate students preparing and defending their inter-disciplinary group business projects, during 2015-2018,
- the survey of enterprises’ linear, middle and top managers organising the work activity of agile teams, in 2017-2018.

The both parts of the research intend to clarify the dependence between different level of success and the form and content of the e-communication.

4.1.Purpose of the study of the graduate students’ projects

The analysis of the students’ projects demonstrates that among the factors that influence on the result there are several factors related to the form and content of the communication. Young generation actively uses the social media and other tools of e-communication in their everyday life, they have the wide experience and clear profiles of the messengers and social medias’ branding, the students are open to use kitties, racoons, smiles or hearts to give answers instead of writing “indifferent” words: yes, ok, or no. This study aims to discover the use of words, sentences, symbols, emoji and pictures mixed (“creolized”) in the e-communication as tools for cognitive and affective support for coordination and mutual understanding inside teams.

4.2.The enterprises agile management research objectives

The survey of management of agile team work inside enterprises aims to answer two groups of questions:

- if the e-communication is an important and ineluctable phenomenon in the actual digitalized economy, and how it influences on the close or distant relationship among people involved in the same business-processes;
- if the semantics through e-communication can be helpful to facilitate and accelerate the project or product design, to negotiate and approve the changes of requirements, etc.

The agile project management within the innovation growth context at economy of knowledge requires the efficient tools of the e-communication to translate the meanings and to transfer the competence and knowledge between the agile-teams. The survey intends to clarify the emotional and rational semantics of professional e-communication that is developed in the close relationship of team-members at enterprises, where the activity is centred on a project or product creation.

5. Research Methods

The both research parts were organised in the form of interview, for the case of students the survey was supplemented with the real life observing of the exchange among team members of messages during the defence of the projects.

5.1. Graduate students' projects

The European Master course includes the cross-cutting project that is to be prepared under teaching of 5 disciplines and to be defended by graduate students at a Business Idea contest at the University Business incubator. The European Master programme is a Russian-Italian double degree program that was an educational innovation since its appearance and it stays during the last 14 years an innovative program for both Universities that realize the program (La Sapienza University of Roma, Italy, and the Saint-Petersburg State university of Economics) in the field of Economy of enterprise, quality and innovation.

As the teacher and academic director, the co-author of this paper, Pokrovskaia has the possibility to observe the whole process of the students' projects creation, generation of idea, tuning and finishing of projects. This possibility gives the two research methodology options – observation and interview after defence of projects.

During 2015-2018, the 57 students have prepared 13 group projects observed and were surveyed at the different stages of their projects' development.

5.2. The enterprises' managers survey

The 47 managers of different levels (from linear to middle and top) were interviewed in 2017-2018 within the research of Agile transformation. The study was included into Saint-Petersburg city' research aimed to better understanding of the industrial innovative environments in the Northern capital of Russia, the 5-million inhabitants city, usually called as intellectual, cultural and industrial capital of the country.

6. Findings

The research allowed to accumulate the experience and the practices of team members using different kinds of the signs and symbols, sentences and pictures in their e-communication. The interviews permitted to understand the intentions and the meanings of these semantic forms.

6.1. E-communication through preparing cross-cutting students' projects

The study demonstrates the essential semantics used by students at the process of the team project preparing (fig. 01):

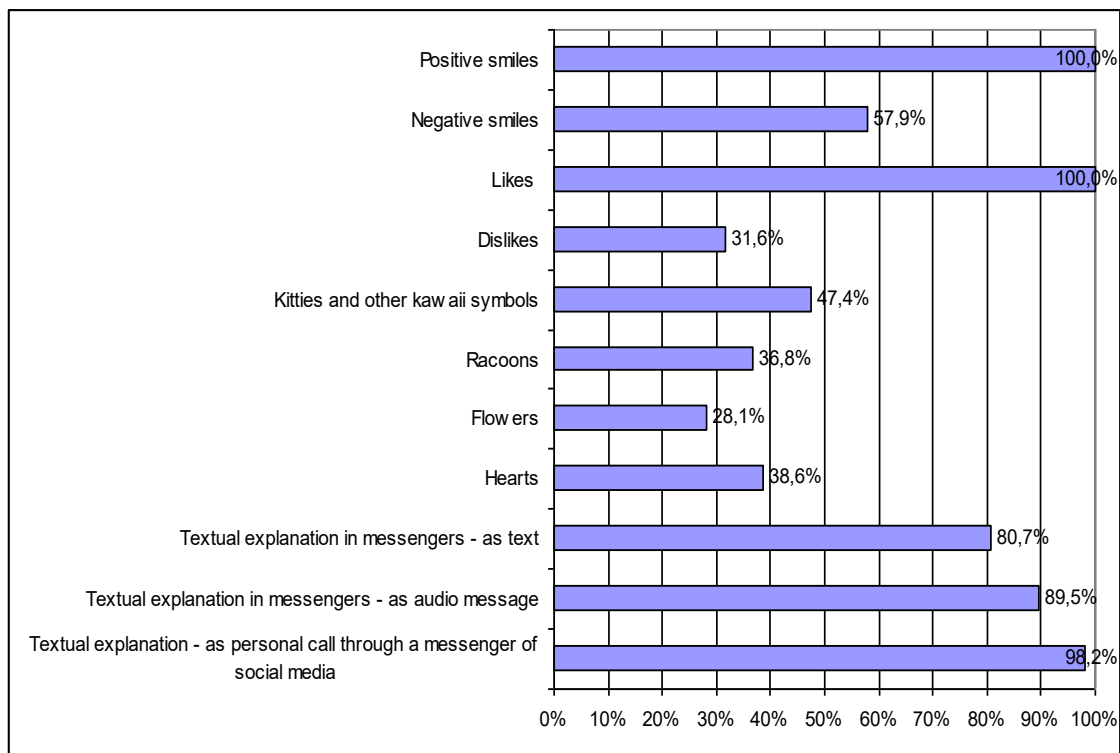


Figure 01. Students’ e-communication during team work for projects preparing and defence

The diagram of results witnesses that there are 3 semantics elements that persist almost in each team work: the positive smiles, the likes and the oral conversation by any digital tool (usually, e-telephone through messengers) in the cases that require detailed explanation. The students have to present several formal documents, but they prefer to use text in the form of a talk.

The interesting conclusion can be drawn up from the refuse to use negative smiles and dislikes. During interviews, the students told that they prefer to avoid any negative judgement in the common work, and the most successful projects are prepared by teams who did not use the negative smiles or dislikes.

The gender factor in a large scale influenced on the frequency of use of kitties, flowers and hearts, but males uses the racoons even more often that females.

The reasons to use different kinds of semantic elements were presented in different ways, but the essential ideas were related to the importance of personal involvement of team members (and the danger of rejecting someone of the team in case of potential use of negative judgements or symbols) and to the possibilities to supplement the text written or said with the double support of pictures or emojis, e.g., the “ok” and a smile together.

The combination of different tools with the similar semantics enhances the meaning and support the idea.

6.2. Agile management semantics

The interview with enterprises discovered that the specialists inside the agile teams and in their negotiations with clients also use e-communication, but not as an essential tool to prepare and realise common work, but to discuss the urgent questions when some people are not reachable personally. That

reflects that the digitalized economy is a supplement for the physical reality life and interaction and it does not replace it, the digital tools of e-communications are helpful for several situations and does not produce additional negative effects of distance among the people interacting.

The reason to use e-communications were related also with the necessity to co-ordinate the written documents to be signed by clients. In the case of enterprises, the documents are used in almost all cases (95.7%) (fig. 02):

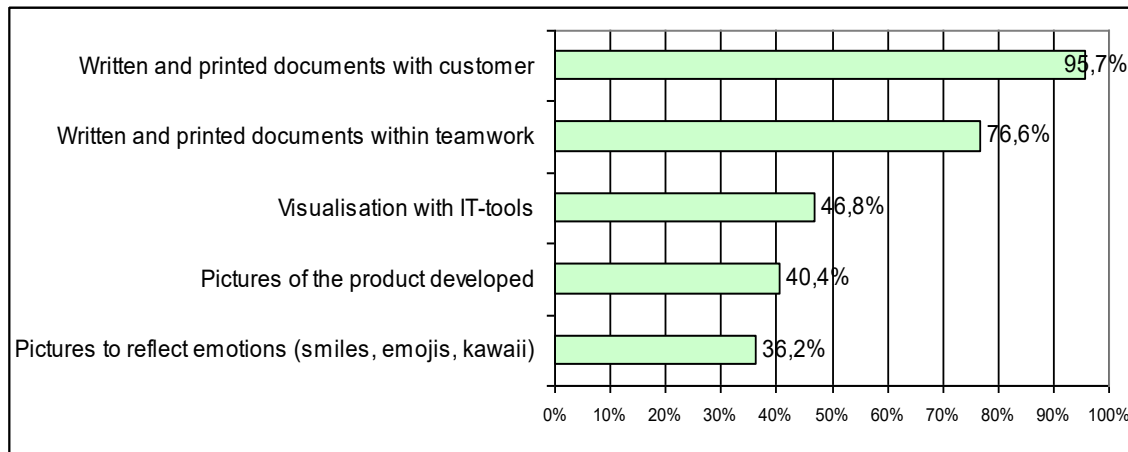


Figure 02. Semantics used by the agile teams members at enterprises

The formal documents are used less often in the communication inside the team, but they are present with a high frequency to make protocols of meetings and making decisions about solutions.

At the same time, the enterprises' agile teams use much less, than students, the emotional supports in the form of smiles, emojis or kawaii symbols (only 36.2%), but in this case it is possible to put under question this answer, because the sample' respondents are managers and only a few agile team members, probably, the managers don't know exactly the emotional content of the messages that team members exchange among them. We can conclude that the affective elements also plays quite important role for an agile team successful work.

The agile teams management is based on the deep involvement of each team member into the process of a product development or a project realisation, but, according the interviews, the psychological reasons and meanings in the e- and physical communication did not play a significant role. This result can be explained with the previous stages of team building, from the determination of the list of team members to the accumulated experience of the realised projects, during these previous stages the team members were selected and trained their mutual support and understanding, and, according 2 of respondents, have had created their own language, that helps them to understand each other inside the team.

7. Conclusion

The study results demonstrates the specific importance of semantic analysis of the e-communication during the stage of the forming team, when the new team members are to tune and adjust their mutual requirements and expectations, when they start to form their specific work language. Within

the agile transformation the semantics can be crucial for the success of the potential team project, but during the experience and practice the team members prove their involvement and less need the emotional and psychological support than at the beginning stages.

Nevertheless, even the experienced agile teams use the symbols of feelings, recognition and emotional support in their work.

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