

Czech University of Life Sciences
Faculty of Economics and Management
Department of Management



Diploma Thesis

Features of Communication in Virtual Teams

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DIPLOMA THESIS ASSIGNMENT

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Economics and Management

Thesis title

Features of Communication in Virtual Teams

Objectives of thesis

The aim of this thesis is to analyze communication in virtual teams as well as examine if there are significant differences in communication between virtual teams and traditional teams and identify negative or positive features of communication in virtual team. In the event that negative features are discovered, then the goal of this thesis is to refer to them and suggest recommendations to eliminate or reduce their impact on the effectiveness of communication between members of virtual team.

Methodology

The thesis is divided into 2 parts: literature overview and practical part. The literature overview summarizes important resources addressed in the field of virtual and traditional teams communications. Materials for the literature overview were acquired from sources in libraries, different periodicals and web resources. The methodology of the practical part of the thesis consists of interviews research for the managers and questionnaire research for the members of virtual team.

The proposed extent of the thesis

About 60-70 pages

Keywords

Virtual team, communication, teamwork, research, questionnaire, features of communication

Recommended information sources

Adriana Schiopoiu Burlea (2007). The communication process in virtual teams. *Informatica Economica Journal*, 41(1), 113-116. ISSN 1453-1305

Blaise J. Bergiel, Erich B. Bergiel, Phillip W. Balsmeier, (2008). Nature of virtual teams: A summary of their advantages and disadvantages. *Management Research News*, 31(2), 99-110. ISSN 0140-9174

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Tugrul U. Daim, Anita Ha, Shawn Reutiman, Brennan Hughes, Ujjal Pathak, Wayne Bynum, Ashok Bhatla (2012). Exploring the communication breakdown in global virtual teams. *International journal of project management*, 30 (2), 199-212. ISSN 0263-7863

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Declaration

I declare that I have worked on my diploma thesis titled "Features of Communication in Virtual Teams" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break copyrights of any third person.

In Prague on 30th March, 2015

Anna Sakharova

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I would like to thank my supervisor Richard Selby Ph.D. for his advice and professional support during my work on this thesis. I would also like to thank those who devoted their time to participate in the survey.

Features of Communication in Virtual Teams

Vlastnosti komunikace v virtuálních týmech

Summary

The aim of this diploma thesis is to analyze communication among virtual team members as well as to examine if there are differences in communication between members of virtual teams and traditional organizations. Additionally, the diploma thesis is aimed at identifying the negative or positive features of communication among virtual team members. In theoretical part of the diploma thesis the main characteristics and process of communication are examined as well as concept of virtual team, its characteristics, advantages and disadvantages, as well as barriers to communication in virtual teams and traditional organizations and solutions to improve communication suggested in literature. The practical part of the diploma thesis is focused on the own survey, evaluation of its results. A questionnaire and an interview were chosen as data collection techniques. Questionnaires were filled out by workers of large software companies (regular employees and members of virtual teams). Based on the survey results evaluation recommendations to improve communication in virtual teams were proposed.

Keywords: virtual team, communication, teamwork, research, questionnaire, features of communication, communication barriers, communication tools

Souhrn

Cílem této diplomové práce je analyzovat komunikaci mezi virtuálními členy týmu a zjistit, zda existují rozdíly v komunikaci mezi členy virtuálních týmů a tradičních organizací. Dále je tato diplomová práce zaměřena na identifikaci negativních a pozitivních vlastností komunikace mezi členy virtuálního týmu. V teoretické části jsou zkoumány hlavní rysy a proces komunikace, koncept virtuálního týmu, jeho vlastnosti, výhody a nevýhody, stejně tak jako překážky v komunikaci ve virtuálních týmech a tradičních organizacích a také návrhy na zlepšení komunikace podložené odbornou literaturou. Praktická část diplomové práce je zaměřena na vlastní průzkum a zhodnocení jeho výsledků. Pro sběr údajů byly zvoleny dotazník a rozhovor. Dotazníky byly vyplněny pracovníky velkých softwarových společností (řádnými zaměstnanci a členy virtuálních týmů). Na základě výsledků průzkumu jsou navržena doporučení, která mají zlepšit komunikaci ve virtuálních týmech.

Klíčová slova: virtuální tým, komunikace, týmová práce, výzkum, dotazník, vlastnosti komunikace, komunikační bariéry, komunikační nástroje

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1. Introduction

Nowadays achieving high business performance and effective organization management are difficult without the usage of modern information technologies such as Internet, email, audio/video conferencing and so on. These tools allow specialists, who live in different countries and continents to work effectively all together on one common project.

In the last decade the concept of virtual teams is becoming more and more popular due to the rapid development of information technologies and increasing globalization and decentralization of working process. Virtual teams cooperate by communication technologies across geographical, temporal, cultural and organizational boundaries to achieve common goal in their organizations outputs (Nader, Shamsuddin and Zahari, 2009). In conditions of fast development of electronic means interpersonal and managerial relationships are changing.

With the fast growth of electronic information and communication media in these latest years, distributed work has become much easier, faster and more efficient (Hertel, 2005). Townsend, DeMarie and Hendrickson (1998) notice that in relation with globalization, many companies deal with a culturally diverse and geographically distant workforce and use advanced communication technologies for information exchange and decision-making. According to Johnson, Heimann and O'Neill (2001) the creation of global virtual teams is one of the fastest growing trends in organizations in our days, and is determined by the need for harmonization between different parts of multinational companies and overcoming the cultural and geographical barriers, together with the advancement of technology. Munkvold and Zigurs (2007) consider virtual teams to be important mechanisms for those organizations that are trying to overcome scare of resource across geographic boundaries as well as many other limits.

Due to relative newness of the virtual teams concept, some areas of it have not been yet fully examined. One of unexamined areas is communication in virtual teams. Communication in teamwork plays one of the main roles in effective management, efficient performance and in achieving the desired success in business.

Members of virtual teams do not have the usual daily face-to-face communication. Hence they rely on different tools of communication support technologies such as email, telephone, videoconferencing and so on. Taking into account these limitations, topic

“Features of communication in virtual team” was chosen to find out which barriers, problems in communication among members of virtual teams occur and how to overcome them.

2. Aims and Objectives

The aim of this diploma thesis is to analyze communication among virtual team members as well as to examine if there are differences in communication between members of virtual teams and traditional organizations. Additionally, the diploma thesis is aimed at identifying the negative or positive features of communication among virtual team members. In the event that negative features are discovered, then the goal of this thesis is to refer to them and suggest recommendations to eliminate or reduce their impact on the effectiveness of communication between members of virtual team.

In order to reach the main aim it is necessary to achieve the following objectives:

- to make a careful study of communication in traditional organizations
- to define what a virtual team is and detect its characteristics
- to compare communication in traditional organizations and selected virtual teams
- to detect the features of communication in examined virtual teams
- to create a list of questions for own research
- to conduct a survey with results through the website [surveymonkey.com](https://www.surveymonkey.com)
- to analyze the results of the research
- to make own conclusions

To meet the aims of the diploma thesis four following research questions were formulated:

1. Does communication among surveyed workers of virtual teams have any differences with communication among surveyed workers of a traditional organization?
2. What are the similarities and differences in communication among surveyed workers of virtual teams and traditional organizations?
3. Are there any positive aspects of communication in virtual teams?
4. Are there any negative aspects of communication in virtual teams?

3. Main Methodological Tools

The thesis is divided into 2 parts: literature overview and a practical part.

The literature overview section contains the main notions such as virtual team, communication; it describes the process of communication, its types, barriers to effective communication and solutions for its improving; it describes the features of virtual teams and communication between their members as well as comparison of communication in traditional and virtual teams. The main sources for the literature overview are materials relating to the mentioned phenomenon collected and carefully examined by theoretical methods such as induction, deduction and comparison.

The first part of diploma thesis is based on relevant professional resources such as articles, books and other documents that were acquired from sources in libraries, different periodicals and web resources.

The practical part of diploma thesis is focused on the own research of negative or positive features of communication in virtual teams, differences in communication between members of virtual teams and workers of traditional organizations.

The research conducted for this thesis focused on software development teams that create products for big software companies such as KeepSoft (Moscow, Russia), Hewlett Packard (Palo-Alto, USA), Kaspersky (Moscow, Russia), Abbyy (Moscow, Russia) and Reksoft (Moscow, Russia). All these companies have as co-located employees, as virtual teams creating new products for particular markets or specific needs.

In order to better carry out the needed practical research empirical methods and tools such as questionnaire for the members of software development teams and interview for virtual team leader were used to collect the data, analysis of answers for open questions was used to detect the features of communication in virtual teams and to propose recommendations for eliminating of negative issues.

With the purpose of providing most accurate independent responses, requests for filling out of questionnaires by software developers (regular employees and members of virtual teams) were sent to Human Recourse departments of KeepSoft (Moscow, Russia), Hewlett Packard (Palo-Alto, USA), Kaspersky (Moscow, Russia), Abbyy (Moscow, Russia) and Reksoft (Moscow, Russia).

Questionnaire is composed of 19 closed, semi-closed and open questions. Software developers (regular employees and members of virtual teams) were asked to fill out the questionnaire which was placed on the website www.surveymonkey.com. The number of respondents is 102. Moreover, the needed interview with virtual team leader was done by Skype. During the interview the virtual team leader was asked 10 questions about communication in virtual team and its features, barriers and ways to overcome these barriers.

Given the need for accurate and authentic analysis, the respondents' answers were analyzed through the integrated web survey service tools (SurveyMonkey).

4. Literature Overview

Communication among people is very important for achieving success in business. It cannot be underestimated. Group activity and achieving success are impossible without a clear understanding of the main goals, objectives and tasks by all members of organizations as well as without the crucial feedback from subordinates to managers and vice versa. If there is a misunderstanding between the members of a collective, the work will not be effective. Bernard (1938) considered communication as means of connecting people together in an organization to achieve a common purpose.

The topic of the given diploma thesis is connected with communication in virtual teams. However, it cannot be examined without basic definitions and specifications of communication. Such definitions will be further defined and exemplified as well as their main characteristics will be presented.

4.1. Definition and Main Characteristics of Communication

There are many different definitions and interpretations of the word “communication”.

The term *communication* arise from Latin *communis*, which means «common». According to that, communication is a transmission of common understanding through the using of symbols (Donnelly, Gibson and Ivancevich, 1987).

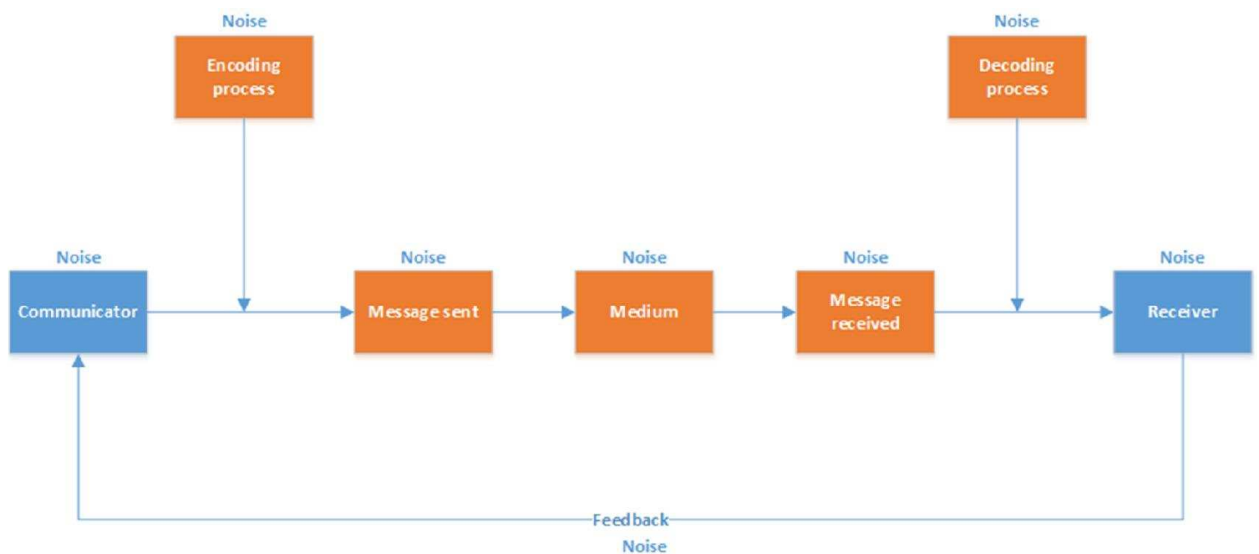
According to Adair (2009), communication is not only talking but listening as well. Additionally, Adair further states that understanding is an indispensable component of communication.

Consistent with Daneci-Patrau (2011), organizational communication is a process of transmitting the information among the members of organization and correctly understanding the messages, which are contained in the information. This is further supported by Wehrich and Koontz also define communication as "the transfer of information from a sender to a receiver, with the information being understood by the receiver" (1993).

4.2. Process of Communication

In order to best understand the process of communication it is first necessary to grasp its elements. Among the basic elements of communication are: communicator, encoding, message, medium, decoding, receiver, feedback and noise. These elements in the process of communication are presented in Figure 1.

Figure 1. Basic elements in the process of communication



Source: Donnelly, James H., Gibson, James L., Ivancevich, John M., Fundamentals of Management, Sixth Edition, 1987; own elaboration

The communication process can be summarized as: who (communicator) says what (message) in what way (medium) to whom (receiver) with what effect (feedback).

Due to the above mentioned complicity, it is necessary to say that the role of the communication cannot be underestimated. Daneci-Patrau (2011) explains why communication is necessary and names the following reasons: increasing of effectiveness of management activity, improving of relationship and understanding between the leader and the subordinate, between the employees on the same hierarchical level, or between them and the people outside the organizations, increasing of motivation, the job satisfaction, and employees' confidence in the organization.

Weihrich and Koontz, in their work, go far beyond that and clarify a few purposes of communication. According to them, communication is needed to establish the goals of

an organization, create plans for the achievement of the previously stated goals, organize resources in the most efficient and effective way. They continue to state that it is of utmost importance to similarly select, develop and evaluate members of the organization as well as lead and motivate employees and to control their performance (1993).

4.3. Communication in Traditional Organizations

4.3.1. Types of Communication. Directions of Communication.

As mentioned in the above section, it is necessary to explain in detail the types of communication that one meets while conducting business or working for a business organization.

According to Bacharach and Aiken (1977) communication in organizations should be realized in four directions: downward, upward, horizontal and diagonal. Experts such as Wehrich and Koontz also agree with this view and directions stated (1993).

Downward communication flows from higher level (manager) to bottom level (subordinates) within an organization. It usually is expressed in a form of job instructions, policy statements and feedback on employees' performance (Donnelly, Gibson and Ivancevich, 1987), speeches, meetings and other.

Upward communication is difficult to achieving especially in large companies, but is as important as downward communication. This kind of communications signifies that information flows from employees to managers, directors and supervisors. Upward communication helps to workers express their feelings, ideas and suggestions. Information exchange implements by group meetings, suggestion boxes, report to supervisors (Donnelly, Gibson and Ivancevich, 1987).

Horizontal communication takes place between workers of the same level in organizations. For example, messages between the heads of two different departments. This communication is often visible in large organizations which is comprised of more than one department or branch.

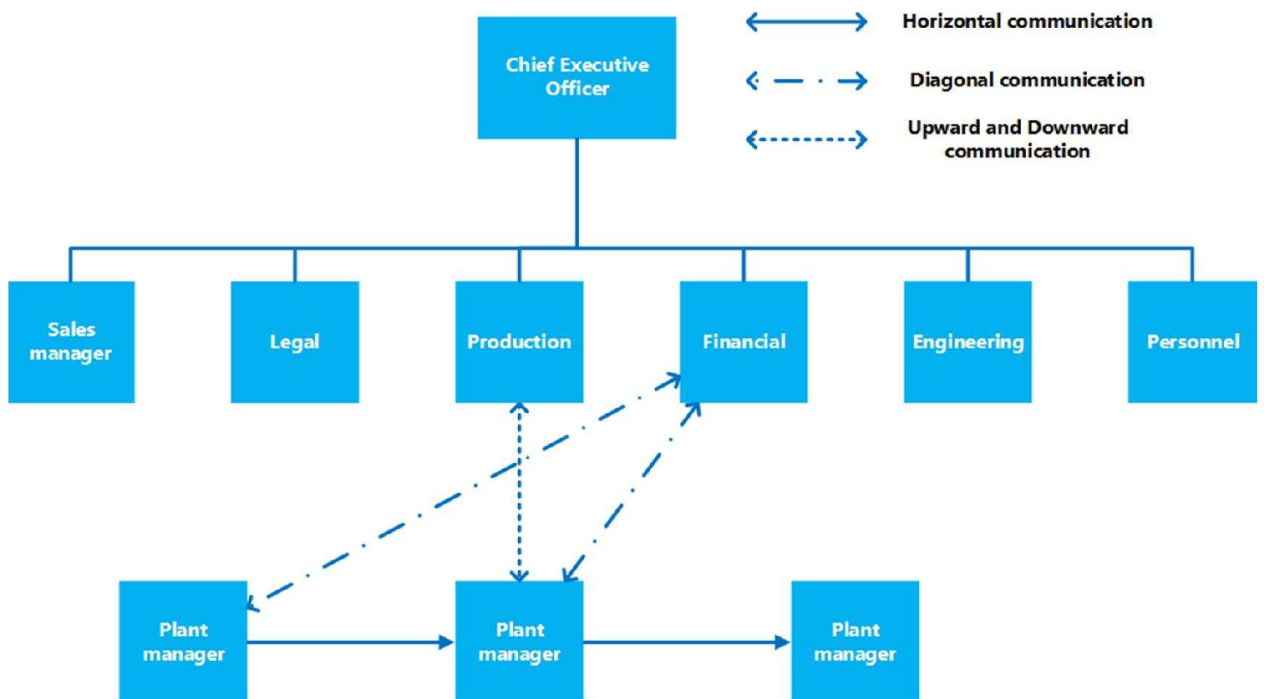
Diagonal communication helps to save time and efforts to get the necessary information passed. Diagonal flow takes place among persons at different levels who have no direct reporting relationship with one another. This channel works when for example

the head of sales department requires marketing report from the manager of marketing department directly, without asking of the head of marketing department.

Horizontal and diagonal communication can be expressed in the corporate newspaper or magazine, company's web site, board notices.

Figure 2 illustrates all four directions.

Figure 2. Communication in traditional organizations



Source: Donnelly, James H., Gibson, James L., Ivancevich, John M., Fundamentals of Management, Sixth Edition, 1987; own elaboration

4.3.2. Barriers Effective Communication

In line with Donnelly, Gibson and Ivancevich (1987) expertise, there are following barriers to effective communication: differing frames of reference, selective perception, poor listening skills, value judgments, source credibility, semantic problems, filtering, time pressures, and overload.

The first barrier, the differing frames of reference mean that people can interpret the same communication differently depending on different previous experience. When

encoded and decoded processes are similar, communication is most effective. As a result of differing frames of reference, communication can be distorted.

The second barrier occurs when a person blocks out new information, especially if this information differs from what he or she believes. This barrier is then called the selective perception. In such situation people prefer to hear only information, which agrees with their own personal beliefs.

Value judgment, another barrier, means that receivers make the conclusion about the worth of the information before the entire message is received. Here, the conclusion is based on a previous experience with the communicator and the evaluation of the communicator.

Source credibility applies trust of receiver to words and actions of communicator. Source credibility term is used to imply a communicator's positive characteristics that affect the receiver's acceptance of a message.

Additionally, as barriers can be named listening without full attention and receiver's self-discipline, i.e. poor listening skills, complex language, lack of planning and preparation to communication and different languages, cultures in international companies.

The barrier, termed as semantic problems, is connected with using of jargon, professional terminology and with the fact that even one word can have several different meanings. For example, communication between workers of IT department and sales department can be distorted if IT manager uses a lot of specific terminus, the meaning of which is not known to sales manager.

Filtering is a common barrier especially inherent to upward communication. In such circumstances subordinates only provide positive information to their superiors and conceal unfavorable one, hence not allowing all information pass, often information that can be crucial in a given situation.

Another unpleasant situation can occur as a result of time pressure. In such event, the person who usually should be included has been left out of the formal channel of communication and is not receiving the needed information and hence possibly not responding nor is he/she active.

The final barrier as mentioned by Donnely, Gibson and Ivancevich (1987), is a communication overload, which means that managers are often full of information and

cannot reply to all the messages directed to them. Moreover, Weihrich and Koontz (1993) note that person who has too much information can make processing mistakes, errors and delay processing the information.

4.3.3. Solutions for Improving Communication in Traditional Team

To get better communication Donnelly, Gibson and Ivancevich (1987) suggest that managers should work in two directions - make their messages more clearly for subordinates and improve the understanding of messages from employees. There are several techniques for improving communication, such as: following up, regulating information flow, utilizing feedback, empathy, simplifying language, effective listening, and utilizing the grapevine.

To avoid misunderstanding it is necessary to make sure that communicator's message has the same meaning for the receiver and that the information was interpreted properly. Without a doubt, following up on a given message helps improve communication as it assures that the message was properly received.

Regulating the information flow helps to overpass communication overload barrier. This technique is based on the principle that managers have to pay attention only to significant digression from policies.

In order to improve communication in a traditional team, the managers should utilizing the feedback which is important in both the downward communication and upward. It provides a channel for response and creates the opportunity to be heard.

Empathy is the capability to put oneself in the other person's role and to accept the viewpoints and emotions of that person. It is needed to make sure the message will be decoded properly. Empathy can reduce many barriers to effective communication such as differing frames of reference, selective perception, and value judgments.

Similarly, simplifying language helps to reduce such barriers to effective communication as so do semantic problems and complex language. Managers have to remember that effective communication involves transmitting information as well as understanding. If receiver doesn't understand the message, there will not be effective communication.

Effective listening starts from decision to listen and implementation of some suggestions that Davis and Newsroom (2004) stated, such as: stop talking, show the speaker you want to listen, remove distractions, be patient, and ask questions.

Using of the grapevine (informal communication system) transmits information faster than common formal way. The grapevine creates a sense of unity among the employees who share and discuss their views with each other. Thus, grapevine helps in developing group cohesiveness. The grapevine might be a supplement in those cases where formal communication does not work

4.4. Virtual Teams

4.4.1. Definition of Virtual Team and its Characteristics

In order to examine the communication in virtual teams, first, the definition of these teams should be considered. What is the difference between a traditional organization and virtual team? Which features do they have?

Virtual team can be described as a set of independent in their actions individuals who share responsibility for results and collectively manage their relationships across organizational boundaries (Hackman, 1987). Gibson and Cohen add to the given definition two more attributes: geographical dispersion of the virtual team's members and dominance of technology-supported communication rather than face-to-face interaction to achieving common tasks (2003). Maznevski and Chudoba (2000) define virtual team as "internationally distributed groups of people with an organizational mandate to make or implement decisions with international components and implications". According to these authors, members of virtual team rarely meet in person and use communications technologies for decision making process and interaction.

Lipnack and Stamps (1997) consider a virtual team as “a group of people who interact through interdependent tasks guided by common purpose” and work “across space, time, and organizational boundaries with links strengthened by webs of communication technologies.”

As per MacDuffie (2007) virtual team is geographically dispersed team created to collect unique combinations of knowledge across various organizational and cultural boundaries, and as a result, arising of operating over distance as a founding condition.

Another one definition describes virtual team as a collection of geographically distributed, functionally and/or culturally diverse entities that are linked by electronic forms of communication and rely on lateral, dynamic relationships for coordination (DeSanctis and Monge, 2006).

One of the most widely accepted definition of virtual team was provided by Powell (2004) who defines virtual teams as “a groups of geographically, organizationally and/or time dispersed workers brought together by information technologies to accomplish one or more organization tasks”.

To sum up all presented definitions by several authors a virtual team can be depict as a group of geographically, organizationally distributed workers with unique set of skills and knowledge whose work coordinated by electronic information and communication technologies in order to achieve common goals.

Thus, main characteristics of a virtual team are geographical dispersion and the use of technologies to communicate.

To keep in touch with each other members of virtual team use electronic devices and technologies such as telephone, email, videoconference, faxes. However, communication between people by using electronic devices does not make these peoples members of virtual team. Team has to have real task to perform, independent members, and shared outcomes (Gibson and Cohen, 2003).

Members of virtual team are not usually collocated; they live in different cities, countries and even continents. Maznevski and Chudoba (2000) distinguish the following characteristics of virtual teams: a group of people who is identified by the members as a team; common responsibility for decision making or/and implementation of the decisions; prevalence of technology-supported communication over face-to-face interaction; working and living in different locations.

Some authors further implement the term «virtual» only to team whose members never meet each other in person (Canney Davison and Ward, 1999).

Also, virtual organizations might be characterized by (a) highly dynamic processes, (b) contractual relationships among entities, (c) edgeless, permeable boundaries, and (d) reconfigurable structures (DeSanctis and Monge, 2006).

Nader, Shamsuddin, Zahari (2009) designate the following main characteristics of virtual team:

Geographically dispersed (over different time zones)

Driven by common purpose (guided by a common purpose)

Enabled by communication technologies

Involved in cross-boundary collaboration

Some authors add extra characteristics such as small team size, high qualification of members, non-permanent team (Bal and Teo, 2000); belonging of team members to different companies (Dafoulas and Macaulay, 2002).

Wong and Burton (2000) argue that every virtual team corresponds with the following characteristics: culturally and organizationally differentiation of members; temporarily character of work; connection between members by weak lateral ties; physically dispersion of members; performing non-routine tasks.

4.4.2. Advantages and Disadvantages of Virtual Teams

The concept virtual teams is a relatively new one and is subjected to many discussions about its advantages and disadvantages. Given such increase is the development of such virtual team, it is no wonder that they are so often discussed in terms of its benefits or shortcomings.

One of the main advantages that Bell and Kozlovsky (2002) notes is the fact that thanks to the availability of virtual teams many organizations are able to hire the most qualified workers for a particular job regardless of their geographical location. For example, software companies often invite software developers from India, Egypt and other countries for collaboration. This advantage also was emphasized by Cascio (2000), Badrinarayanan and Arnett (2008), Prasad and Akhilesh (2002), Boudreau et al. (1998).

Members of virtual teams have high degree of freedom and flexibility to work from home or any other place hence this freedom and flexibility allows for business owners to be pickier in their choice of hire and hence getting the best of the best (Bell and Kozlovsky, 2002; Badrinarayanan and Arnett, 2008; Prasad and Akhilesh, 2002).

Some authors such as McDonough (2001) and Mulebeke and Zheng (2006) suppose that virtual teams have higher productivity and shorter development times in comparison with traditional organizations. Virtual teams tend to be more task-oriented and the members do not share unnecessary information such as personal feelings, socio and

emotional information as they are not in day contact to pass such information. This certainly can be of a great advantage to a company that values efficiency.

The results of oriented evaluation lead to better outcomes and an improvement of the entire performance. In virtual teams, the achieved result is more important than time spent on work (Rice et al., 2007; Chen, et al., 2008).

Virtual teams are often more creative (Badrinarayanan and Arnett, 2008; Prasad and Akhilesh, 2002) and innovative due to team members coming from different countries with different ideas and points of view on the same object that provides new ideas and approaches.

Undoubtedly, work in virtual teams provides shortening of relocation time and cost, reduced travel costs (McDonough, 2001; Rice et al., 2007; Cascio, 2000; Prasad and Akhilesh, 2002; Boudreau et al., 1998). Furthermore, Badrinarayanan and Arnett (2008) daresay that training costs are reduced as well in virtual team. Both of these factors are of utmost importance for any modern company as the cost plays an enormous impact of the company's revenue.

Besides, computer-mediated communication supports lateral communication and broad participation across social groups. Interaction between members of virtual team is less prone to domination by high-status members and based not on the hierarchy in comparison with traditional organizations (DeSanctis and Monge, 2006).

Finally, another advantage is that virtual teams are able to react rapidly to changing business environment (Mulebeke and Zheng, 2008). Chen (2008) presumes that virtual teams are constantly improving communication and coordination; stimulate the mutual sharing of knowledge and experiences, resources and competencies.

The flexibility, responsiveness, lower costs, and improved resource utilization are advantages of virtual teams according to Mowshowitz (1997).

Finally, among the many advantages of virtual teams can be noted the possibility to work for disabled persons, people with special needs, senior citizens, introverts, single parents and others whose work will benefit if they are able to work from home (Plump and Ketchen, 2013)

As it was mentioned at the beginning of this section the discussion about virtual teams has not only focused on its benefits and gains, but also on the drawbacks it causes.

In terms of disadvantages associated with virtual teams Cascio (2000) names 5 main shortcomings: lack of physical interactions, lack of trust, lack of social interaction, loss of face-to-face synergies, predictability and reliability issue. Virtual teams are vulnerable to mistrust, conflicts and communication breakdowns. Hence, there are issues of managing conflicts and developing trust among the members of virtual teams (Bell and Kozlovsky, 2002; Badrinarayanan and Arnett, 2008).

Obviously, different languages and cultural backgrounds complicate work of virtual teams. However, Badrinarayanan and Arnett (2008) opine that challenges of project management are more related to the distance between team members than to their cultural or language differences. Additionally, Jarvenpaa and Leidner (2006) note that computer mediated communication might make cultural differences irrelevant – the absence of nonverbal cues eliminates cultural difference’s influence. Also, the written medium eliminates the effect of accents and asynchronous character of communication gives members more time to write messages and to reply without language errors, particularly among non-native speakers of the language used by the group.

As Pawar and Sharifi (1997) state there is a decrease of monitoring and control of activities in virtual teams. That is why all processes should be a much more structured and formalized than in traditional organizations.

Maznevski and Chudoba (2000) maintain the belief that virtual team members’ mobility can negatively influence the virtual teams’ outcomes.

A final disadvantage that one can see in a virtual team is the fact that not all members are trained equally and have experience in virtual team. Hence, as Ryssen and Godar (2000) suggested, it might be necessary to consider the need for special trainings for all virtual team members.

4.5. Communication in Virtual Teams

Communication is essential to any form of organizing, but it is vital in virtual organizations. Without communication common work of virtual team members would not be possible. Electronic communication provides parties the opportunity to link across distance, time, culture, departments, and organizations, thereby creating “anyone/anytime/anyplace” alternatives to the traditional same-time, same-place, functionally-centered, in-house forms of organizational experience (O’Hara-Devereaux and

Johansen, 1994). Further electronic communication tools and issues of communication in virtual teams will be considered.

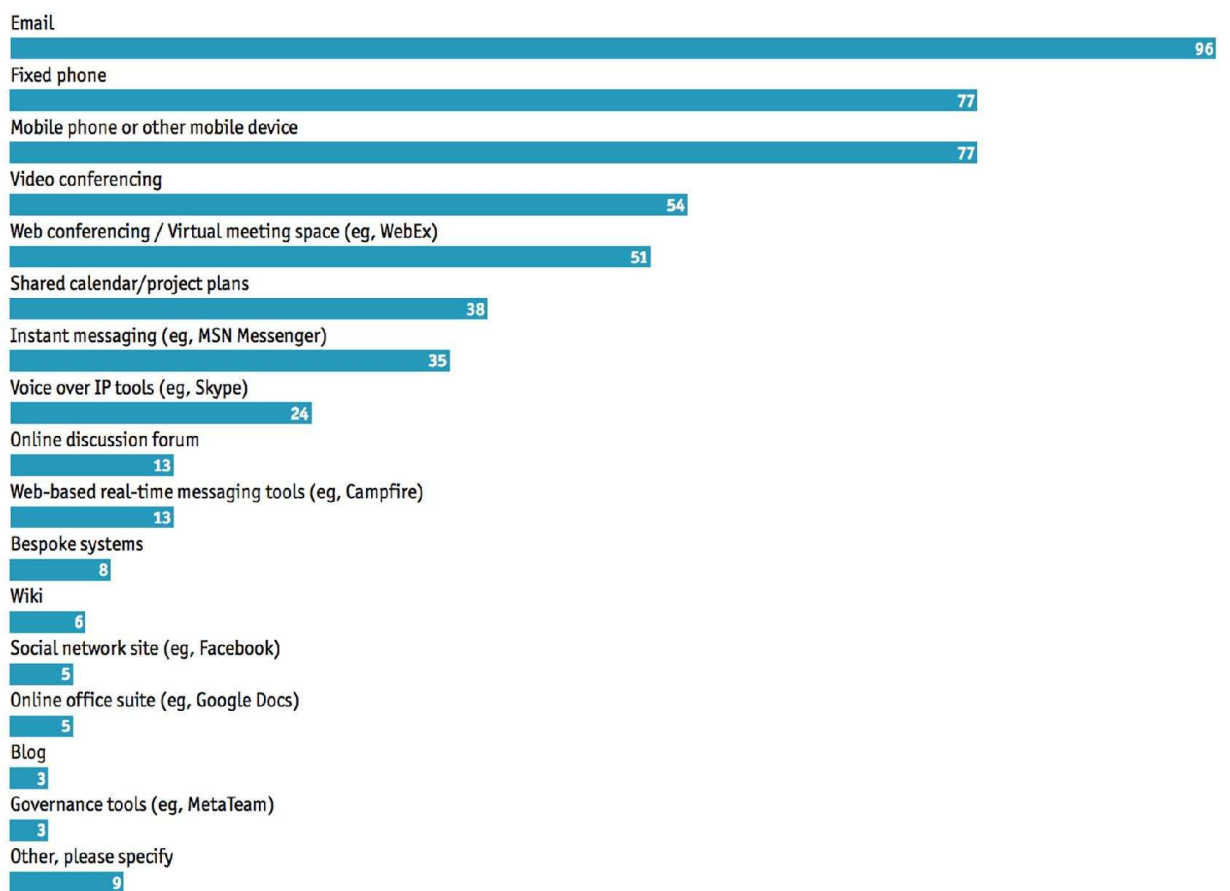
4.5.1. Communication Tools

Given the fact that the geographically dispersed collaboration and its effectiveness is impossible without the usage of proper, efficient and trustworthy tools, it is necessary to focus on those tools as a main component in the life of a virtual team.

In accord with Economist Intelligence Unit survey (2009) the most popular communication tools are email, fixed (land lines) and mobile phones, video and web conferencing. Whole set of communication tools and preferences of virtual team members are illustrated in Figure 3.

Figure 3. Communication tools

Which of the following tools do you regularly use to communicate and collaborate with your virtual team? Select all that apply.



Source: Economist Intelligence Unit survey, 2009

According to Suchan and Hayzak (2001), to interact with each other members of virtual teams use the following communication tools:

- Email, information repositories and file sharing, databases;
- Mobile phones and voice mail;
- Group software packages for managing projects, archiving documents, brainstorming, etc.;
- Voice- and videoconferencing (as the Skype, the Facetime, etc.)
- Webinars;
- Chats, messengers;
- Project kickoff meetings

4.5.2. Issues of Communication in Virtual Teams

Virtual teams usually face the same issues as traditional organizations. However, it should be noted that absence of face-to-face communication among members of virtual teams amplifies as benefits as difficulties.

MacDuffie (2007) states the problems of virtual teams. Problems such as cohesion, trust, conflict solving, and casual attribution.

According to McGrath and Hollingshead (1994), due to geographical distribution members of virtual teams interact less often and do not use all forms of communication in comparison with face-to-face. That does not contribute to the formation of friendship and interpersonal attraction but rather it promotes stereotyping; hence the members are less likely to identify with the team. Lea et al (1992) note that due to limited information and the absence of individuating and non-linguistic cues, which is typical for communication by means of information technologies, stereotypes can occur. Additionally, lack of face-to-face contact in virtual team communication might negatively impact message understanding.

At the same time, Davidsen et al (1997) found that social discussion, depth, and intimacy might be on a higher level in virtual teams in comparison with co-located teams. It is possible that virtual team member has information about co-workers, which indicates common characteristics. Similarity with others positively influence on the identification as a group member and readiness to collaborate.

Also, Marshall and Novick (1995) discovered that removing visual channels from interactions does not significantly demolish conversational control and understanding. That means that reducing of the visual channel of interaction can have a positive affect. Evaluation of other members of virtual team may be less stereotyped and can improve the quality of message understanding by the removal of inconsequent irritants.

Many authors emphasize the concern of establishing trust in virtual teams. Among them are MacDuffie (2007), Daim et al (2012), Burlea (2007), McKnight, Cummings, and Chervany (1998), Jarvenpaa and Leidner (1999), Child (2001). McKnight, Cummings, and Chervany (1998) suggest that high level of trust is often presented at the beginning of any team's work. However, that trust is based on assumptions and attributions rather than on experience; and it can be lost rapidly due to any negative information about reliability and trustworthiness of the other members. In compliance with Child (2001), usual kindred or ethnic ties, or institutional assurances provided by law are used as a base for trust. In case of multinational virtual teams with diverse members there is no such basis to establish trust; and it can be built throughout task-oriented activities.

Jarvenpaa and Leidner (1999) point out that in their virtual teams trust depended on the volume of the team members' personal information provided by them at the beginning of the project. However, during the common work on a project trust was based more on task-related communication.

Jarvenpaa and Leidner (1999) suppose that persons from individualistic cultures (such as Austria, Germany, Great Britain, the United States of America) may be more predisposed to trust than persons from collectivist culture (as Spain, China, India, Italy, France, Brazil) using information and communication technologies for work.

In traditional organizations lack of trust might be expressed in form of value judgment and source credibility problems.

With respect with to conflict, many authors presume a higher possibility of conflict in virtual teams in comparison with traditional organizations. Sproull and Kiesler (1986) count that communication through information technologies might filter out social cues and make it feel more impersonal. In this case, collective identity becomes weak due to geographical distribution members of virtual teams (Griffith and Neale, 2001). Hinds and

Bailey (2003) found that distance and communication mediated by information and communication technologies provokes three types of conflict (a) task, (b) interpersonal, and (c) process.

At the same time, Mortensen and Hinds (2001) compared 12 virtual teams and 12 collocated teams and they did not find any differences in interpersonal or task conflict.

Cramton (2002) supposes that the fundamental attribution error is likely to be aggravated in virtual teams. The relative lack of contextual information about virtual team member can lead to conflict-inciting attributions.

What is more, in virtual teams there are difficulties connected with utilization of virtual technology and cultural diversity (Kwantes, 2003). Kwantes counts that effective work in virtual team caused by sharing information and developing a shared understanding. The main difficulty, which arose during an interactive exercise in transnational virtual teamwork are language, tough deadlines, and differences with respect to time. Within the research, it was detected that all members of virtual teams use English language. However, misunderstanding often occurred due to the fact that not all members of virtual team speak English as a native speaker and every worker possibly has a different level of the English language. That can be a major cause for many types of misunderstandings. Using of specialized phrases, expressions and terms can only further aggravate this situation.

Suchan and Hayzak (2001) point out that members of virtual teams come from absolutely different language communities. One virtual team can consist of software engineers, information network specialists, and of contracting and accounting specialists.

Hence, semantic problem and problem of complex language, which traditional organizations meet with, is inherent for virtual teams as well; and using of foreign language and cross-cultural differences enforces this problem.

MacDuffie (2007) opines that nonlinguistic cues that usually help understanding are eliminated by using information and communication technologies by members of virtual teams. For instance, email does not provide neither visual nor verbal cues, telephone and voice conference provide only verbal cues, even videoconference cannot transmit body language and other cues to the full, but only some eyes contact and verbal cues.

Members of virtual teams might often face in traditional organizations communication overload issue. This might happen in case of misapplication of information and technical communication tools. For instance, frequent calls, emails without any particular reason might divert, annoy or interfere worker to do his/her job.

4.5.3. Solutions for Improving Communication in Virtual Teams

Given the fact that virtual teams play such vital part in today's business world it is necessary to focus as well on the ways to improve communications in those teams, especially faster detection of several problematic areas. As a mean to improve communication in virtual teams, Kogut and Zander (1992) name an increase of shared understanding and shared identity. Shared understanding is defined as the level of commonness in expectations, convictions, and perceptions about goals, tasks, processes, skills and knowledge of virtual team members. In conjunction with using common language and a common grounding in the challenges it should help virtual team members to work on separate but interdependent tasks in order to better and more effectively perform in the workforce. Malhotra and Majchrzak, who examined 54 successful virtual teams, also emphasize the importance of shared understanding. The authors point out that shared understanding of objectives and goals, requirements and responsibilities have only a positive influence on outcomes (2004).

Providing rich social contextual information to virtual team members can increase shared understanding, because compared with face-to-face communication, the social and normative context may be of even greater importance in computer-mediated communication (DeSanctis and Monge, 2006).

To solve the lack of trust problem Suchan and Hayzak propose to organize three days long "kick-off" meetings face-to-face at the beginning of the project. These meetings should have a carefully planned agenda by team leader, which among others includes some exercises. That helps to demonstrate team leader's competency, qualification and creativity; and encourage the establishment of trust in his/her skills and leadership. At the beginning of the meetings the team leader should describe the project goals and discuss with the members of virtual team the ways to achieve those goals, what communication technologies will be used. The problem-solving exercises play an important role in team

development. Members of virtual team go through several early group development stages (affiliation, uncertainty and competitiveness) by means of decision-making, conflict resolution, and cooperation within the problem-solving exercises (2001).

According to Jarvenpaa and Leider (1999) although during the common work on the project trust was dependent more on task-related communication, social communication and sharing of some members' personal information might strengthen trust.

Development of shared language. It is very important to use common language and all accessible means to avoid misunderstandings, including the usage of metaphors and analogies. At the beginning of the project a manager should make sure that every member of virtual team knows the meaning of all special terms and phrases, which are going to be used, as well as assure that their meaning is the same for software developer and designer, for instance.

Information sharing. All information connected with the project should be collected in one place (a virtual repository) and be available to every member of a virtual team at any time with no limits to his/her location. That helps to avoid the problem of communication overload in form of frequent calls and emails.

Moreover, setting up of special norms or/and rules makes using of communication tools more efficient in any situation. The importance of establishing procedures for communication in virtual teams is emphasized by DeSanctis and Monge (2006). Suchan and Hayzak (2001) offer the following voice mail norms:

- State who you are first;
- State the purpose at the beginning of the message;
- Use voice mail to refer receivers to detailed email message in case of subject of the call is detailed;
- Check voice mail at least twice a day.

Jarvenpaa and Leidner (1999) also point out the importance of providing guidelines for setting up rules how often to communicate and a pattern of communication, which

increases the predictability, reduce the uncertainty and misunderstandings, helps to coordinate the team and to establish trust.

As for conflict solving, Jarvenpaa and Leidner (1999) recommend noticing a potential or arising discontent as early as possible and consider all ways of approaching it. In the event that this is not done, it is possible that a small conflict can lead to negative comments that will be hard to resolve asynchronously. Moreover, it is better to identify a person(s) who is/are a potential source of conflict and handle the conflict using private messages than involve entire virtual team in solving of problem.

5. Own Research

The aim of this diploma thesis is to analyze communication among virtual team members as well as to examine if there are differences in communication between members of virtual teams and traditional organizations. Additionally, the diploma thesis is aimed identify the negative or positive features of communication among virtual team members. In order to fulfill this aim four research questions were formulated.

1. Does communication among surveyed workers of virtual teams have any differences with communication among surveyed workers of a traditional organization?
2. What are the similarities and differences in communication among surveyed workers of virtual teams and traditional organizations?
3. Are there any positive aspects of communication in virtual teams?
4. Are there any negative aspects of communication in virtual teams?

In order to best answer these research questions, an independent custom made survey was conducted. Questionnaires and interview were used to collect the needed data.

It was decided to collect the data from respondents who work in large companies in information technologies industry. According to Economist Intelligence Unit survey (2009), information technology industry is the second most frequent user of virtual teams industry after financial services.

Due to above mentioned characteristics of virtual team small size and temporary collaboration, it was hard to find one virtual team to get the appropriate amount of relevant responds for the research. Hence, it was decided to focus on workers of five large IT companies, which use virtual teams for projects - KeepSoft (Moscow, Russia), Hewlett Packard (Palo-Alto, USA), Kaspersky (Moscow, Russia), Abbyy (Moscow, Russia) and Reksoft (Moscow, Russia).

5.1. Questionnaire Design and Promotion

The questionnaire was created especially for the purpose of this research using web service www.surveymonkey.net. It contains 19 questions – 13 closed, 2 semi-closed and 4 open ones. Two open questions were available only for people who indicate themselves as a member of virtual team and dual jobholders, i.e. regular employees and virtual team members at the same time.

After the questionnaire was created and placed on www.surveymonkey.net, the link to the survey was sent to the human recourse departments of large software development companies such as KeepSoft, Reksoft, Kaspersky, Abbyy, Hewlett-Packard. Human resource managers were asked to spread the link among the software developers and other IT workers who currently work on a project as a member of virtual or traditional team.

The perspicuity of the questionnaire was tested on people who are not familiar with the field of study. After the test some questions were simplified and clarified.

Collected data was processed using built-in analyze tools of web service www.surveymonkey.net.

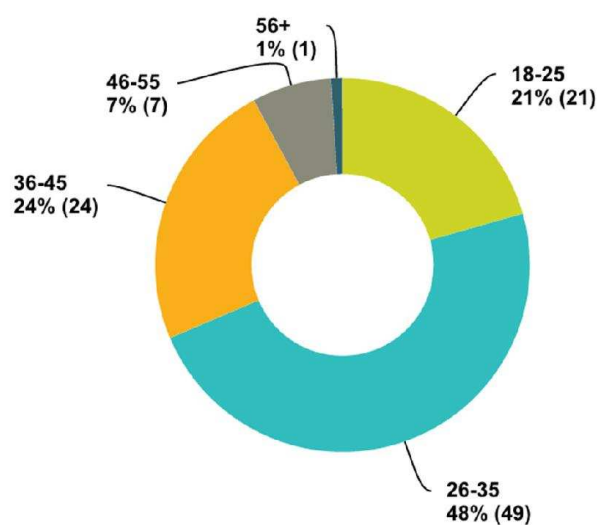
5.2. Analysis of Collected Data

5.2.1. Structure of Respondents

The total number of received and fulfilled questionnaires is 102.

As it is presented in Figure 4, the majority of respondents are in 26-35 age group (48%), people whose age is 36-45 are on the second position (24%), on the third position are young workers (21%), people who are 46-55 and older than 56 are in the minority (7% and 1% respectively).

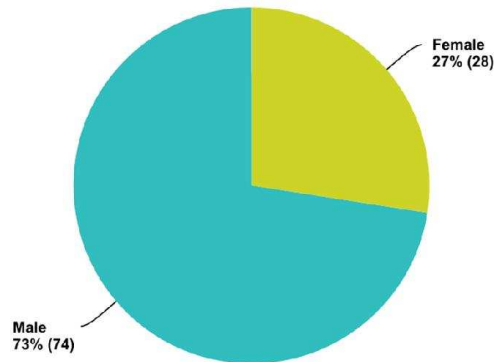
Figure 4. Age distribution of the respondents, % (amount of respondents)



Source: Own elaboration, 2015

As for gender distribution, Figure 5 illustrates it accordingly: 27.45% of the respondents are female and 72.55% are male.

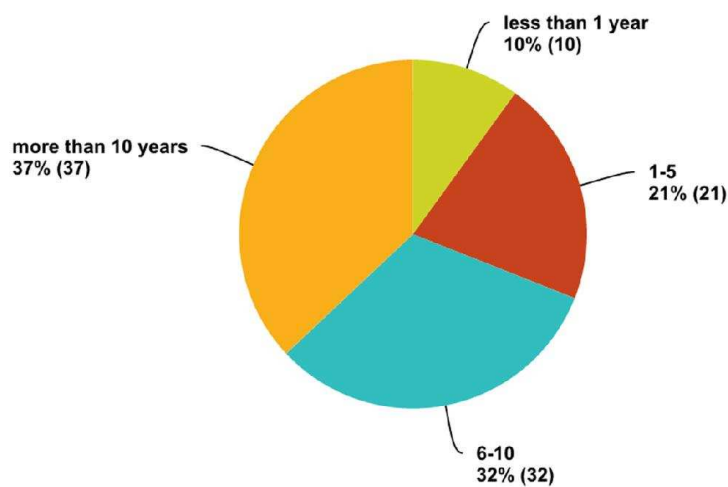
Figure 5. Gender distribution, % (amount of respondents)



Source: Own elaboration, 2015

In terms of work experience, the respondents were divided into four groups. Two respondents preferred not to answer this question. Respondents whose work experience is more than 10 years constitute 37% of those surveyed; workers with 6-10 years' of experience – 32%; share of 1-5 years experienced workers is 21%; the remaining 10% of the respondents have worked less than 1 year. This distribution is illustrated in Figure 6.

Figure 6. Work experience distribution, % (amount of respondents)

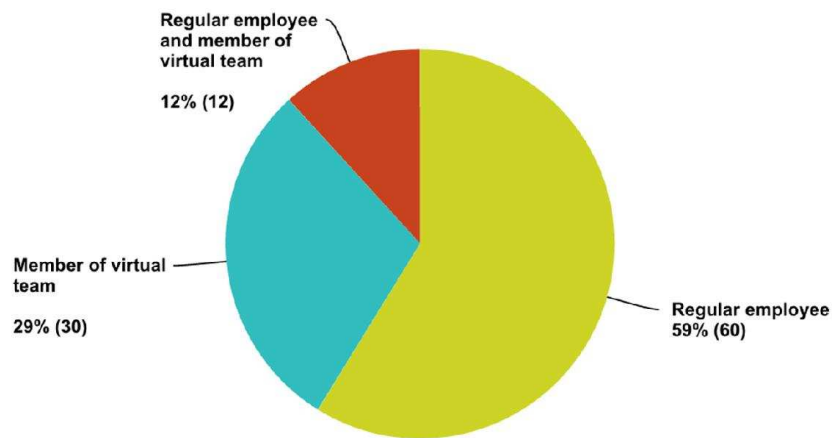


Source: own elaboration, 2015

Figure 7 demonstrates the distribution of responds according to belonging to virtual teams.

59% respondents have answered that they work as a regular employee, 29% - as a member of virtual team and 12% - as a regular employee and a member of virtual team at the same time (further – “dual jobholders”)

Figure 7. Belonging to virtual teams, % (amount of respondents)



Source: own elaboration, 2015

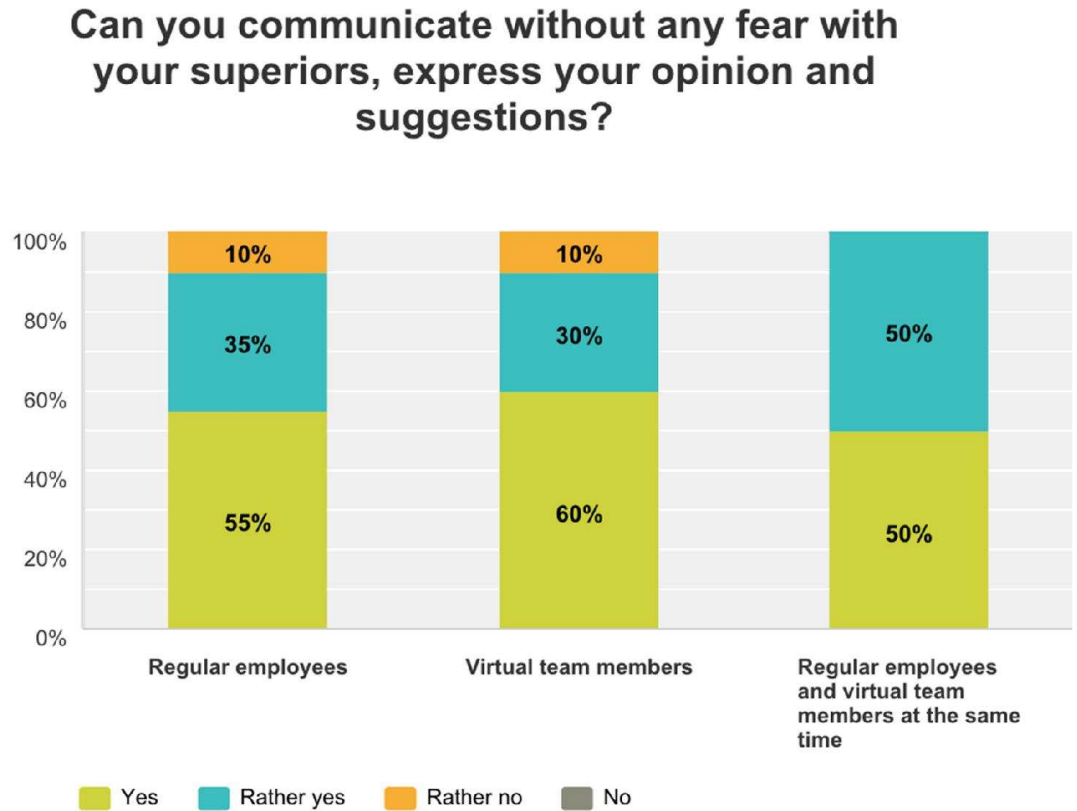
5.2.2. Analysis and Interpretation of the Results

In order to best gather information and hence answer the first and second research questions about differences and similarities of communication in virtual teams and tradition organizations in the questionnaire were included questions investigated trust, coherence, communication tool, influence of different factors on efficiency of communication, barriers to effective communication and ways to overcome them. Answers to these questions will be analyzed and interpreted below.

To examine trust, three questions were included in the questionnaire. For the first question respondents were asked if they could communicate without any fear with superiors, express their opinion and suggestions. As it is shown in Figure 8, 90% (60% “yes” and 30% “rather yes”) of virtual team members do not have any problems with communication between them and superiors as well as 90% (55% “yes” and 35% “rather yes”) of regular employees. 10% of virtual team members and 10% of regular employee

marked “rather no” answer. As for the people who work as a member of virtual team and as a regular employee at the same time, half of them do not have any communication problem with superiors at all (answer “yes”) and half of them marked “rather yes” answer.

Figure 8. The answers for the fifth question

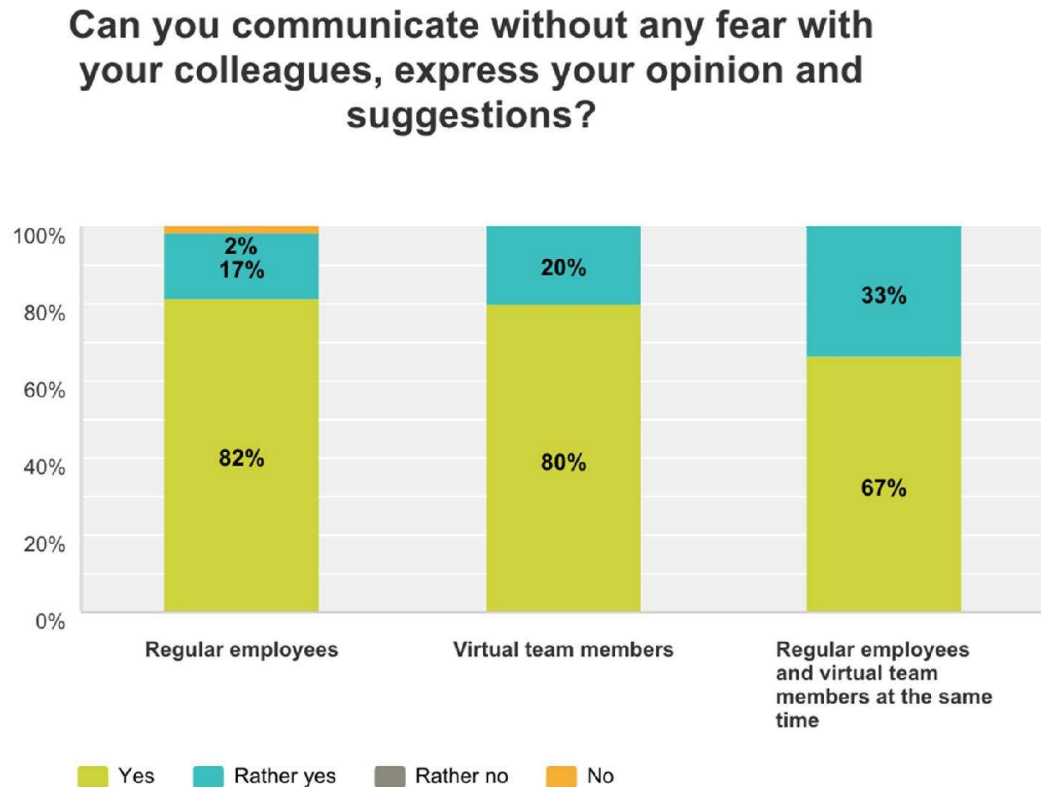


Source: own elaboration, 2015

The following question was similar to the previous one, but it focuses on the communication problems with colleagues and if the respondents could communicate without any fear with their colleagues, express their opinion and suggestions. Figure 9 illustrates the results for this question.

Majority, 82% of regular employees responds “yes”, 17% - “rather yes” and 2% (one person) – “no”. As to virtual team members, results are quite similar: 80% chose “yes” and 20% - “rather yes”. The shares of “yes” and “rather yes” answers among respondents working as a regular employee and as a virtual team member at the same time are 67% and 33% respectively.

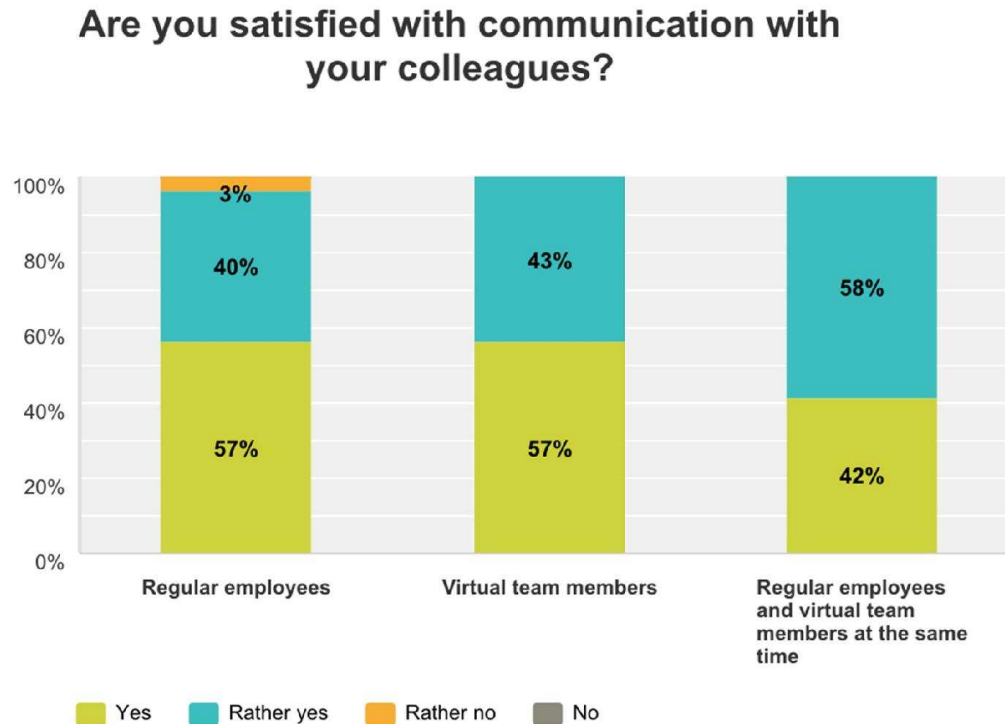
Figure 9. The answers for the sixth question



Source: own elaboration, 2015

The next question is about satisfaction with communication, and was formed as “Are you satisfied with communication with your colleagues?” As it is seen on Figure 10, which presented the results, the share of those who are absolutely satisfied with their communication with colleagues is the same among regular employees and virtual team members – 57% of respondents. The difference in share of “rather satisfied” answers (40% of regular employees and 43% of virtual team members) is explained by the presence of two who have stated that they are rather not satisfied with their communication with colleagues (3%). As for dual jobholders, the share of absolutely satisfied respondents are lower in comparison with regular workers and virtual team members; it is 42%. The share of respondents who are rather satisfied is 58%.

Figure 10. The answers for the seventh question



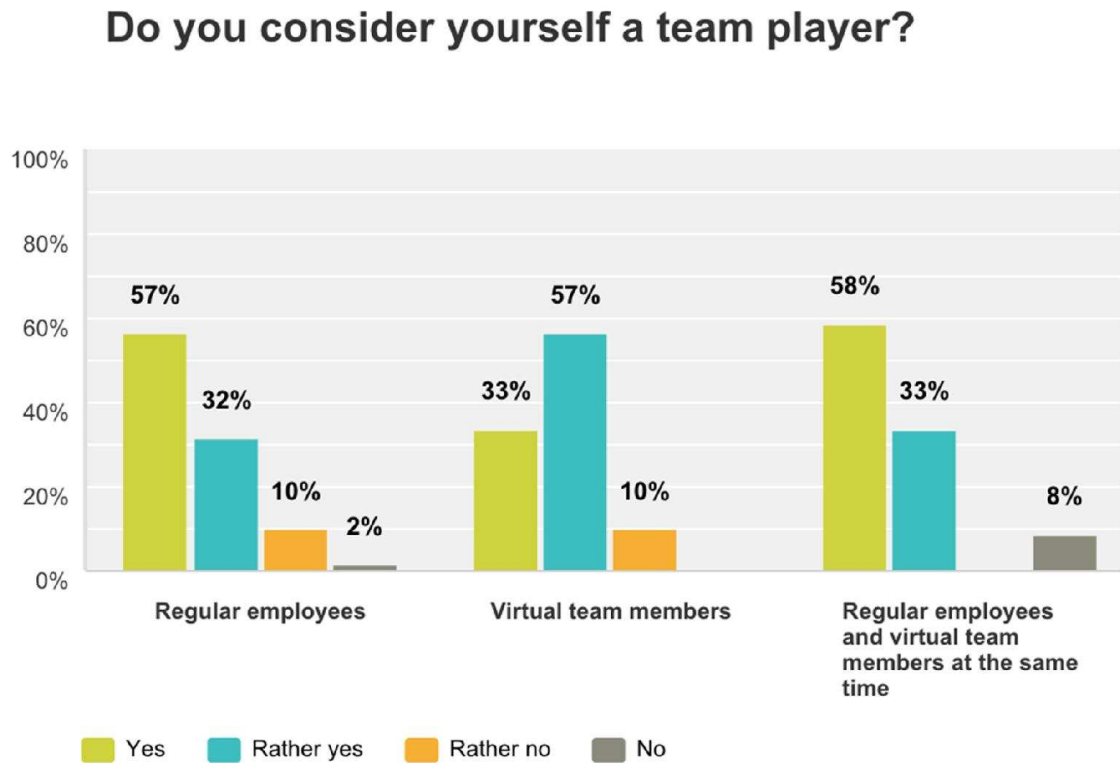
Source: own elaboration, 2015

To sum up the results of questions focused on trust, it is crucial to emphasize that there is no big difference between the level of trust among the regular employees and members of virtual teams. A sporadic dissatisfaction with communication with colleagues and some problems of communication with colleagues and superiors among regular employees was detected. However, the share of these people was not so big enough to make the conclusion that in traditional teams level of trust is lower than in current virtual teams, which were formed and have been working on the moment of conducting the survey.

As for dual jobholders there is a difference in answer distribution in comparison with regular employees and virtual team members. It is complicated to find out what factors influence the level of trust in this category without additional data.

The next block of questions is dedicated to cohesion of team members. The intention of the eightieth question was to find out if respondents consider themselves a team player. Figure 11 presents the results for this question.

Figure 11. The answers for the eighth question



Source: own elaboration, 2015

Among regular employees 57% of respondents marked “yes”, 32% - “rather yes”, 10% - “rather no”, 2% - “no”. The share of virtual team members who answer “yes” is lower than share of “rather yes” answer – 33% and 57% respectively. 10% of virtual team members answered “rather no”. As for workers that combine regular employment and virtual team membership their results are similar with regular employees’ ones – 58% “yes”, 33% - “rather yes”, 8% - “no”.

The ninth question: Who is responsible for project failure? Within this questions, it was possible to choose one out of three possibilities – the team leader, the whole team and the person who did not his / her job properly. The results are presented in Figure 12.

The results for the ninth question are quite similar in all three groups. Majority of respondents in all three groups points out that the whole team is responsible for project failure (53% of regular employees, 50% of virtual team members, 42% of dual jobholders).

Figure 12. The answers for the ninth question



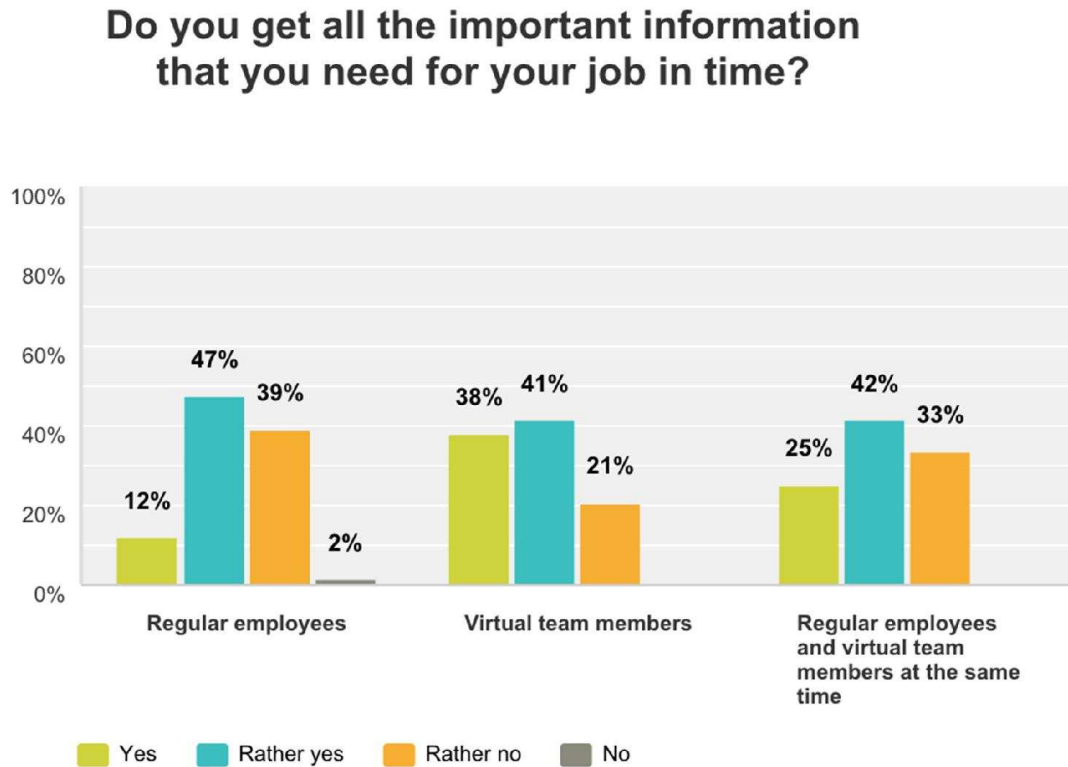
Source: own elaboration, 2015

About one third of respondents in all groups answered that the team leader would be responsible in case of project failure (37% of regular employees and virtual team members and 33% of dual jobholders). Minority of respondents (10%, 13%, 25%) would lay the blame on the person, who did not his / her job properly.

The absence of significant differences among answers of the groups for the ninth question allows for making a conclusion about similarities of the level of cohesion in current tradition organizations and virtual teams, i.e. teams that were formed and have been working on the moment of conducting the survey. However, the distribution of answers, which illustrate the degree of affiliation to the team (“yes” / “rather yes” correlation – 57% / 32% in traditional organizations and 33% / 57%), lets us assume that in virtual teams to be considered a team member is not unconditional and to achieve the cohesion in virtual team it is necessary to make an extra effort at the beginning of project.

The following questions are focused on communication tools used by workers. The first one is aimed to find out if respondents get the important information needed for work in time.

Figure 13. The answers for the tenth question



Source: own elaboration, 2015

As it is shown in Figure 13, in spite of the distance between virtual team members about 80% of respondents answered “yes” and “rather yes” (38% and 41% respectively). The rest, 21% of virtual team members, rather do not have necessary information for work in time. It can be caused by the more frequent usage of sharing information services (Dropbox, Evernote, etc.) as inalienable part of remote working. In comparison with virtual team members, 39% of regular employees and 33% dual jobholders rather do not have all needed information in time. This is probably caused by access to co-located colleagues and potential possibility to get the information at any time. However, as every working person can attest to, in practice delays of providing information may still and often do occur.

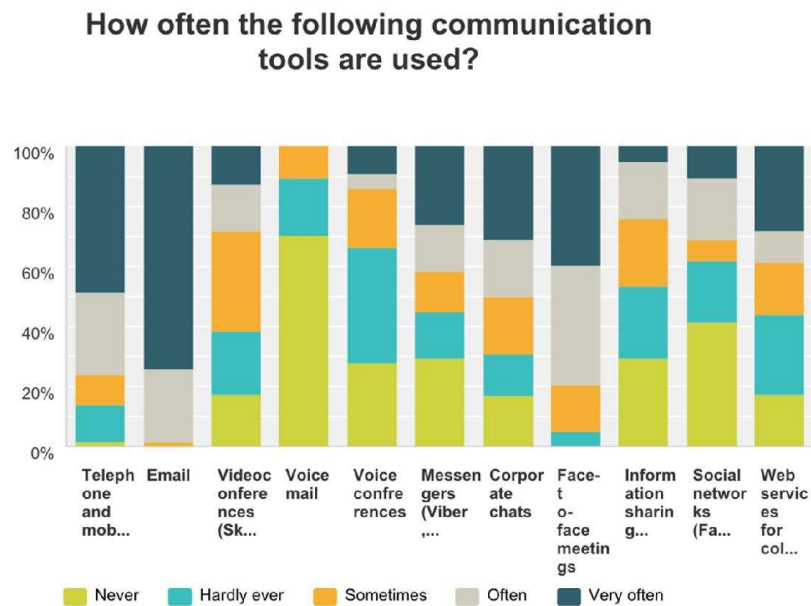
The eleventh scaled question is connected with frequency of usage of different communication tools. The respondents were asked to indicate how often they use communication tools presented in the list – “never”, “hardly ever”, “sometimes”, “often”, “very often”. Full results for this question are presented in Figures 14 - 16, contained the diagram and in Tables 2-4. Table 1 contains consolidated data about the most and the least often used communicated tools.

Table 1. Frequency of usage communication tools. Consolidated data

| | Regular employees | Virtual team members | Dual jobholders |
|--------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| “Never” | Voice mail – 70% Social networks – 41% Information sharing – 29% Messengers – 29% Voice conferences – 28% | Voice conferences – 70% Corporate chats – 63% Voice mail - 56% Social networks – 53% | Voice mail - 67% Voice conferences –33% Information sharing – 33% Collaboration services – 33% |
| “Often” | Meetings – 40% Telephones – 28% Email – 24% | Telephones – 43% Information sharing – 37% Email – 20% | Telephones – 33% Email – 25% Meetings – 25% |
| “Very often” | Email – 74% Telephones – 48% Meetings – 40% | Email – 73% Collaboration services – 62% Telephones – 26% | Email – 66% Telephones – 58% Meetings – 42% |

Source: own elaboration, 2015

Figure 14. Frequency of usage communication tools among regular employees



Source: own elaboration, 2015

Definitely, the least often used communication tools among all respondents are voice mail, social networks, and voice conferences. Besides, 29% of regular employees and 33% of dual jobholders do not use information sharing services. This fact confirms the assumption mentioned above about potential reason of low level of information accessibility among tradition organization workers and dual jobholders. Moreover, 63% of virtual team members do not use corporate chats. This result is predictable. Corporate chats are mostly used by co-located workers due to their setting on corporate computers at offices.

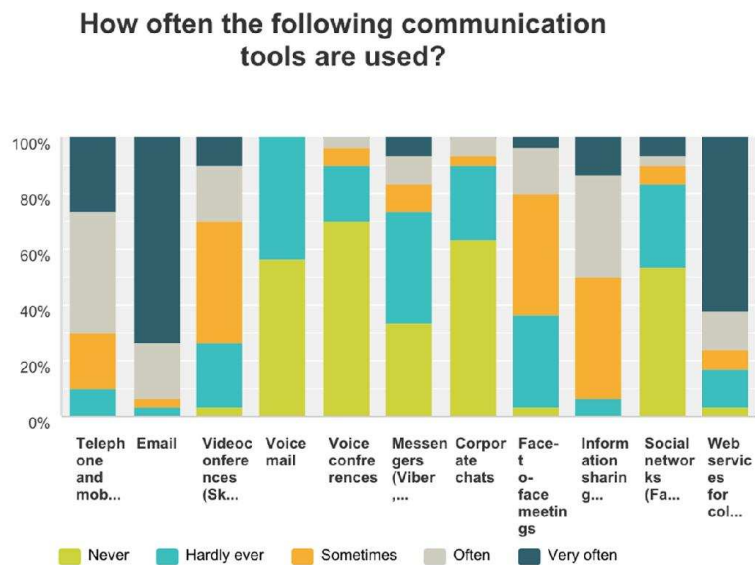
Table 2. Frequency of usage communication tools among regular employees

| | Never | Hardly ever | Sometimes | Often | Very often | Weighted mean |
|---------------------------------------------|--------------|--------------|--------------|--------------|--------------|---------------|
| Telephones and mobile phones | 1.72% 1 | 12.07% 7 | 10.34% 6 | 27.59% 16 | 48.28% 28 | 4.09 |
| Email | 0.00% 0 | 0.00% 0 | 1.72% 1 | 24.14% 14 | 74.14% 43 | 4.72 |
| Videoconferences (Skype, FaceTime, etc.) | 17.54% 10 | 21.05% 12 | 33.33% 19 | 15.79% 9 | 12.28% 7 | 2.86 |
| Voicemail | 70.69% 41 | 18.97% 11 | 10.34% 6 | 0.00% 0 | 0.00% 0 | 1.40 |
| Voice conferences | 28.07% 16 | 38.60% 22 | 19.30% 11 | 5.26% 3 | 8.77% 5 | 2.28 |
| Messengers (Viber, What'sUp, etc.) | 29.31% 17 | 15.52% 9 | 13.79% 8 | 15.52% 9 | 25.86% 15 | 2.93 |
| Corporate chats | 7.24% 10 | 13.79% 8 | 18.97% 11 | 18.97% 11 | 31.03% 18 | 3.33 |
| Face-to-face meetings | 0.00% 0 | 5.17% 3 | 15.52% 9 | 39.66% 23 | 39.66% 23 | 4.14 |
| Information sharing (Google Drive, Dropbox) | 29.31% 17 | 24.14% 14 | 22.41% 13 | 18.97% 11 | 5.17% 3 | 2.47 |
| Social networks (Facebook, Vk) | 41.38% 24 | 20.69% 12 | 6.90% 4 | 20.69% 12 | 10.34% 6 | 2.38 |
| Web services for collaboration | 17.54% 10 | 26.32% 15 | 17.54% 10 | 10.53% 6 | 28.07% 16 | 3.05 |

Source: own elaboration, 2015

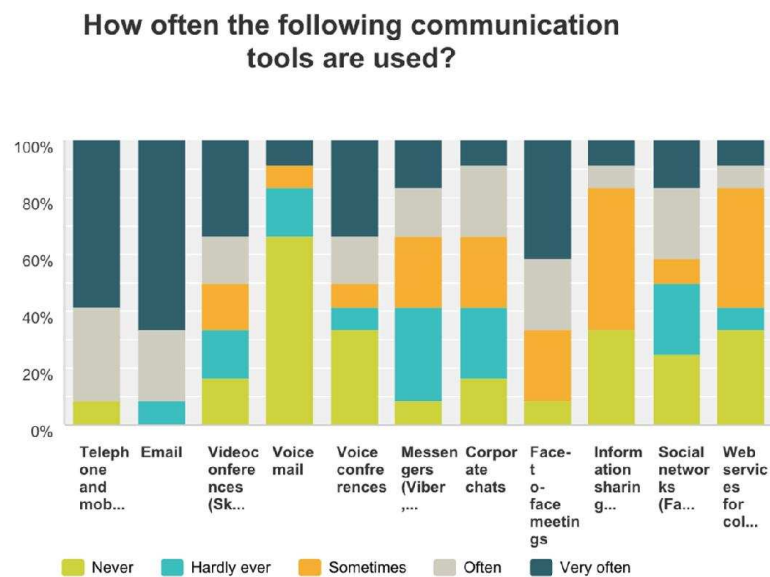
Speaking about often used and the most often used communication tools it is important to mention that all respondents pointed out the same tools – telephone, email. In addition to that regular employees and dual jobholders very often have personal meetings in contrast to virtual team members who have meetings “sometimes” (43,3%) and “hardly ever” (33,3%).

Figure 15. Frequency of usage communication tools among virtual team members



Source: own elaboration, 2015

Figure 16. Frequency of usage communication tools among dual jobholders



Source: own elaboration, 2015

In turn, virtual team members often use information sharing (37% “often”) and collaboration (62% “very often”) services, which are less popular among regular employees (19% “often” and 8% “very often” respectively) and dual jobholders (8% “often” and “very often” for both services).

Table 3. Frequency of usage communication tools among virtual team members

| | Never | Hardly ever | Sometimes | Often | Very often | Weighted mean |
|---------------------------------------------|--------------|--------------|--------------|--------------|--------------|---------------|
| Telephones and mobile phones | 0.00% 0 | 10.00% 3 | 20.00% 6 | 43.33% 13 | 26.67% 8 | 3.87 |
| Email | 0.00% 0 | 3.33% 1 | 3.33% 1 | 20.00% 6 | 73.33% 22 | 4.63 |
| Videoconferences (Skype, FaceTime, etc.) | 3.33% 1 | 23.33% 7 | 43.33% 13 | 20.00% 6 | 10.00% 3 | 3.10 |
| Voicemail | 56.67% 17 | 43.33% 13 | 0.00% 0 | 0.00% 0 | 0.00% 0 | 1.43 |
| Voice conferences | 70.00% 21 | 20.00% 6 | 6.67% 2 | 3.33% 1 | 0.00% 0 | 1.43 |
| Messengers (Viber, What’sUp, etc.) | 33.33% 10 | 40.00% 12 | 10.00% 3 | 10.00% 3 | 6.67% 2 | 2.17 |
| Corporate chats | 63.33% 19 | 26.67% 8 | 3.33% 1 | 6.67% 2 | 0,0% 0 | 1.53 |
| Face-to-face meetings | 3.33% 1 | 33.33% 10 | 43.33% 13 | 16.67% 5 | 3.33% 1 | 2.83 |
| Information sharing (Google Drive, Dropbox) | 0.00% 0 | 6.67% 2 | 43.33% 13 | 36.67% 11 | 13.33% 4 | 3.57 |
| Social networks (Facebook, Vk) | 53.33% 16 | 30.00% 9 | 6.67% 2 | 3.33% 1 | 6.67% 2 | 1.80 |
| Web services for collaboration | 3.45% 1 | 13.79% 4 | 6.90% 2 | 13.79% 4 | 62.07% 18 | 4.17 |

Source: own elaboration, 2015

Table 4. Frequency of usage communication tools among dual jobholders

| | Never | Hardly ever | Sometimes | Often | Very often | Weighted mean |
|---------------------------------------------|-------------|-------------|-------------|-------------|-------------|---------------|
| Telephones and mobile phones | 8.33% 1 | 0.00% 0 | 0.00% 0 | 33.33% 4 | 58.33% 7 | 4.33 |
| Email | 0.00% 0 | 8.33% 1 | 0.00% 0 | 25.00% 3 | 66.67% 8 | 4.50 |
| Videoconferences (Skype, FaceTime, etc.) | 16.67% 2 | 16.67% 2 | 16.67% 2 | 16.67% 2 | 33.33% 4 | 3.33 |
| Voicemail | 66.67% 8 | 16.67% 2 | 8.33% 1 | 0.00% 0 | 8.33% 1 | 1.67 |
| Voice conferences | 33.33% 4 | 8.33% 1 | 8.33% 1 | 16.67% 2 | 33.33% 4 | 3.08 |
| Messengers (Viber, What'sUp, etc.) | 8.33% 1 | 33.33% 4 | 25.00% 3 | 16.67% 2 | 16.67% 2 | 3.00 |
| Corporate chats | 16.67% 2 | 25.00% 3 | 25.00% 3 | 25.00% 3 | 8.33% 1 | 2.83 |
| Face-to-face meetings | 8.33% 1 | 0.00% 0 | 25.00% 3 | 25.00% 3 | 41.67% 5 | 3.92 |
| Information sharing (Google Drive, Dropbox) | 33.33% 4 | 0.00% 0 | 50.00% 6 | 8.33% 1 | 8.33% 1 | 2.58 |
| Social networks (Facebook, Vk) | 25.00% 3 | 25.00% 3 | 8.33% 1 | 25.00% 3 | 16.67% 2 | 2.83 |
| Web services for collaboration | 33.33% 4 | 8.33% 1 | 41.67% 5 | 8.33% 1 | 8.33% 1 | 2.50 |

Source: Own elaboration, 2015

The next two questions are open. They are based on the eleventh question about frequency of the usage of communication tools. Its aim is to explain why respondents use some communication tools very often, but never use the others.

The questions are formulated as: “Why do you use those communication tools, which you marked as “very often used” / “never”?”

Not all respondents answered the open question. The most popular reasons are listed below.

Arguments in favor of email:

- Email is one of the most popular, useful and familiar tools, it is easy to use, and Internet is easily available everywhere
- It does not demand speedy reaction, it allows for pondering the information, making a decision and preparing detailed answer. It does not interrupt the working on current task if it is not desirable
- Low costs in comparison with other tools
- The information is fixed and available at any time if it is needed to be checked or refreshed
- As a rule there is no excessing data, only necessary for work information
- Email requires clear and precise wording from sender, so this tool helps to avoid misunderstandings
- It is suitable for big amount of information; for detailed description of task or issues

Arguments in favor of telephone:

- It is the fastest way to get information any time; it provides a rapid feedback from receiver.
- Telephone is one of the most popular and familiar tools; it is easy to use. Almost every person has telephone nowadays
- Intonation, emotional tone and other nonverbal cues provide additional information to interlocutors

Arguments in favor of personal meetings:

- The whole set of non-verbal cues are available during personal meetings
- Agreements are made faster than using indirect channels (“While face to

face we can see the other person's reactions and also we can express ourselves better”)

- Big amount of information can be discussed in a short time

Arguments in favor of collaborate services:

- Collaborate service is one of the essential working tool for software developers
- It provides the ability to share information, discuss working task in the real time in integrated chats without using additional tools, develop the code at the same time by several persons
- As a rule there is no excessing data, only necessary for work information

While answering the question why do you use those communication tools, which you marked as “never”, respondents often name the following reasons.

Arguments against voice mail:

- Voice mail is obsolete; nowadays more appropriate communication tools are available
- There is no confidence that receiver checks voice mail regular and get the message in time
- Fast feedback in real time is inaccessible
- It cannot be used to send large amount of information, only short messages

Arguments against social networks:

- Usage of social networks is forbidden by employers
- Entertainment character of social networks can divert attention away from work
- Social networks are more suitable for personal communication with friends and family

Arguments against voice conferences:

- The situation when all team members have to participate in discussion is rare
- It is difficult to set the time of voice conference due to geographical dispersion of team members and time differences

Arguments against information sharing:

- Usage of information sharing services is forbidden by employers due to protection from information leak
- Information can be received by workers after request

Arguments against messengers:

- It cannot be used to send large amount of information, only short messages
- Messengers are more suitable for personal communication with friends and family than for formal communication

Arguments against corporate chats:

- Corporate chats are rarely used because dispersed workers do not work from office as a rule
- Virtual team members do not need the access to all workers of the client company

The next block of questions is connected with factors influencing the communication in virtual team, communication problems that occur and ways to overcome these problems.

The respondents who determine themselves as a member of virtual team and as a regular employee and a virtual team member at the same time in fourth question were

asked what influence on virtual team communication. Within this question, it was possible to evaluate five factors on scale – “No influence”, “Small influence”, “Strong influence”.

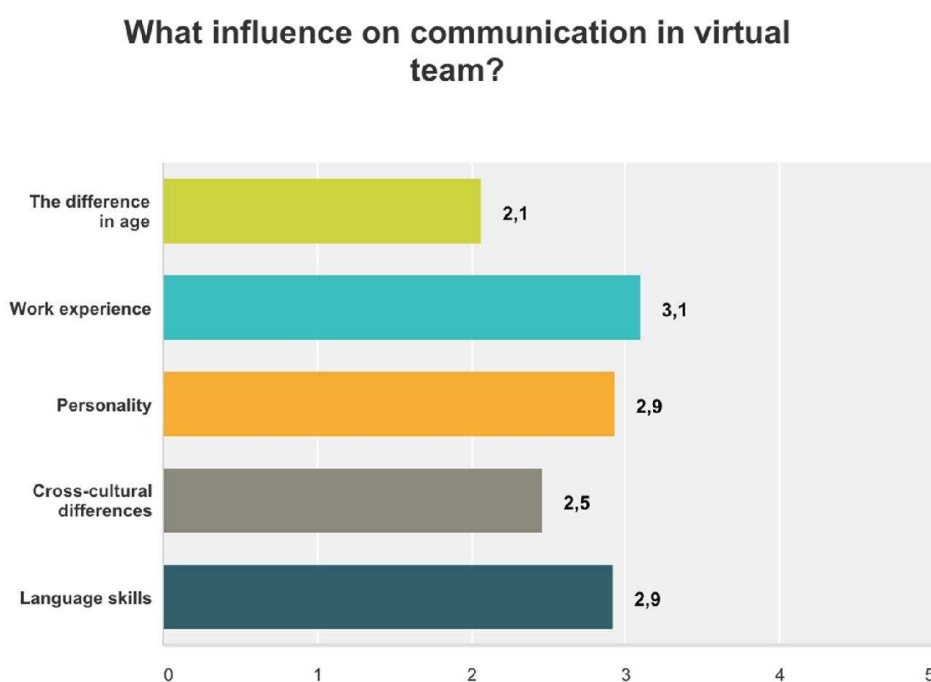
Received results are presented in Table 5 and illustrated in Figure 17.

Table 5. Factors influencing the communication in virtual team

| | No influence | Rather no influence | Small influence | Strong influence | Weighted mean |
|----------------------------|--------------|---------------------|-----------------|------------------|---------------|
| The difference in age | 29.27% 12 | 36.59% 15 | 31.71% 13 | 2.44% 1 | 2.07 |
| Work experience | 4.88% 2 | 9.76 % 4 | 56.10% 23 | 29.27% 12 | 3.10 |
| Personality | 4.88% 2 | 21.95% 9 | 48.78% 20 | 24.39% 10 | 2.93 |
| Cross-cultural differences | 9.76% 4 | 41.46% 17 | 41.46% 17 | 7.32% 3 | 2.46 |
| Language skills | 2.5% 1 | 22.50% 9 | 55.00% 22 | 20.00% 8 | 2.93 |

Source: own elaboration, 2015

Figure 17. Factors influencing the communication in virtual team (weighted mean)

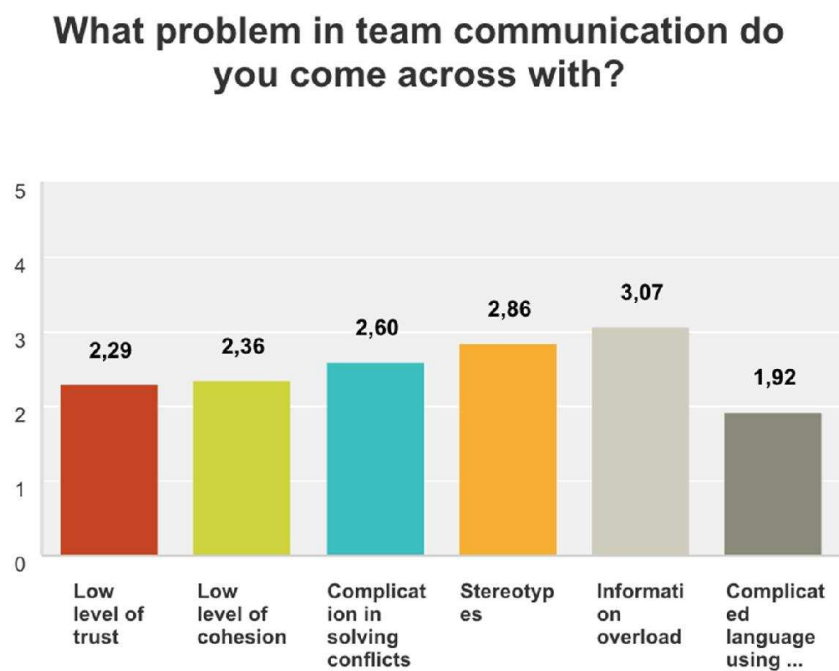


Source: own elaboration, 2015

Evidently, work experience, personality of virtual team members and their language skills have a bigger influence on communication, according to respondents' opinion, than cross-cultural differences and difference in age among virtual team members.

In the fifteenth scale question there were offered to mark the barriers of communication, which the respondents come across and the frequency of their occurring – “never”, “hardly ever”, “sometimes”, “often”, “very often”. Full results for this question are presented in Figure 18 and Table 6 contained the diagram and the data for regular employees, in Figure 19 and Table 7 - for virtual team members.

Figure 18. Barriers of communication regular employees come across (weighted mean)



Source: own elaboration, 2015

Based on gathered data from regular employees the most prevalent communication barrier in traditional organizations is information overload. Also, traditional organization face stereotype issues and complication in solving conflicts. However, respondents point out that low level of trust and cohesion are not peculiar to tradition teams as well as complicated language used by colleagues.

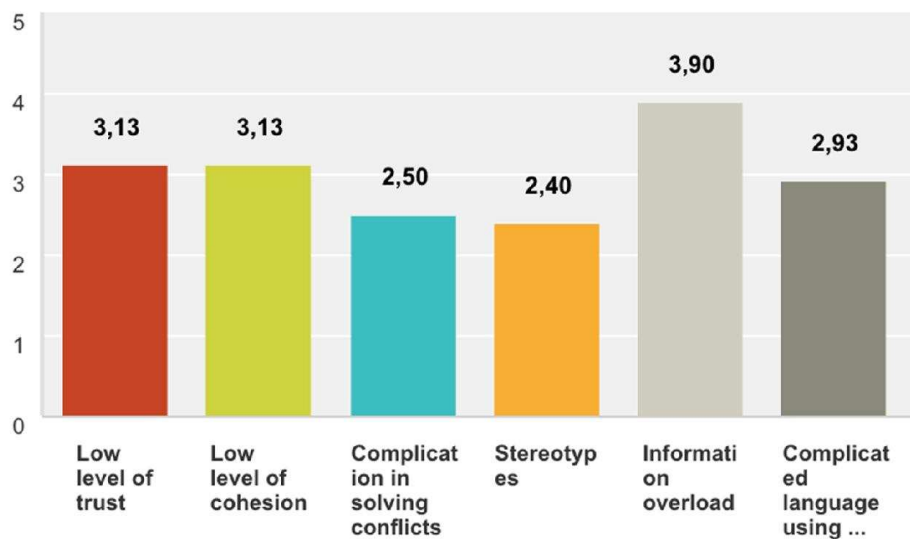
Table 6. Barriers of communication regular employees come across

| | Very often | Often | Sometimes | Hardly ever | Never | Weighted mean |
|------------------------------------------|-------------|--------------|--------------|--------------|--------------|---------------|
| Low level of trust | 1.69 % 1 | 5.08% 3 | 28.81% 17 | 49.15% 29 | 15.25% 9 | 2.29 |
| Low level of cohesion | 0.00% 0 | 6.78% 4 | 33.90% 20 | 47.46% 28 | 11.86% 7 | 2.36 |
| Complication in solving conflicts | 1.72% 1 | 12.07% 7 | 36.21% 21 | 44.83% 26 | 5.17% 3 | 2.60 |
| Stereotypes | 6.78% 4 | 18.64% 11 | 40.68% 24 | 22.03% 13 | 11.86% 7 | 2.86 |
| Information overload | 10.17% 6 | 20.34% 12 | 42.37% 25 | 20.34% 12 | 6.78% 4 | 3.07 |
| Complicated language using by colleagues | 3.39% 2 | 3.39% 2 | 16.95% 10 | 33.90% 20 | 42.37% 25 | 1.92 |

Source: own elaboration, 2015

Figure 19. Barriers of communication virtual team members come across (weighted mean)

What problem in team communication do you come across with?



Source: own elaboration, 2015

Table 7. Barriers of communication virtual team members come across

| | Very often | Often | Sometimes | Hardly ever | Never | Weighted mean |
|------------------------------------------|-------------|--------------|--------------|--------------|-------------|---------------|
| Low level of trust | 0.00% 0 | 33.33% 10 | 46.67% 14 | 20.00% 6 | 0.00% 0 | 3.13 |
| Low level of cohesion | 0.00% 0 | 33.33% 10 | 46.67% 14 | 20.00% 6 | 0.00% 0 | 3.13 |
| Complication in solving conflicts | 0.00% 0 | 10.00% 3 | 40.00% 12 | 40.00% 12 | 10.00% 3 | 2.50 |
| Stereotypes | 0.00% 0 | 10.00% 3 | 33.33% 10 | 43.33% 13 | 13.33% 4 | 2.40 |
| Information overload | 23.33% 7 | 50.00% 15 | 20.00% 6 | 6.67% 2 | 0.00% 0 | 3.90 |
| Complicated language using by colleagues | 0.00% 0 | 30.00% 9 | 36.67% 11 | 3.00% 9 | 3.33% 1 | 2.93 |

Source: own elaboration, 2015

As can be seen from Table 7, information overload is the main barrier in communication among virtual team members. There is no one person who would not face this problem at least once. Lack of trust and cohesion issue is common for virtual team communication as well as complicated language using by virtual team members.

To compare significance of communication barriers for tradition organization and virtual teams weighted means are included in Table 8.

Table 8. Comparison of weighted means of communication barriers

| | Tradition organization | Virtual team |
|------------------------------------------|------------------------|--------------|
| Low level of trust | 2.29 | 3.13 |
| Low level of cohesion | 2.36 | 3.13 |
| Complication in solving conflicts | 2.60 | 2.50 |
| Stereotypes | 2.86 | 2.40 |
| Information overload | 3.07 | 3.90 |
| Complicated language using by colleagues | 1.92 | 2.93 |

Source: own elaboration, 2015

Obviously, information overload issue is characteristic for communication in traditional organizations (3.07) as well as virtual teams (3.90). However, virtual team members are faced with this problem much more often. Large flow of emails and phone calls might interfere in implementation of work tasks.

Stereotypes are on the second position among barriers, which prevent communication in traditional organizations (2.86). At the same time, this issue has the least meaning for communication among virtual team members (2.40). This finding corresponds with mention above conclusion of Marshall and Novik (1995) that reducing of visual channel of interaction may make members of virtual team less susceptible to stereotypes.

As for the second most important barrier for communication in virtual team, lack of trust and lack of cohesion divide this position as these points have the same results (3.13). Speaking about regular co-located workers, this problem is less expressed (2.29 and 2.36 respectively). Thus, the results of the survey conform to the theoretical statements examined in the first part of the diploma thesis.

On the third place among communication barriers in traditional organization is complication in solving conflicts (2.60), which has similar significance level for virtual teams (2.50) as well. This result matches with the findings of Mortensen and Hinds (2001) who did not find any differences in interpersonal or task conflict comparing traditional organizations and virtual teams.

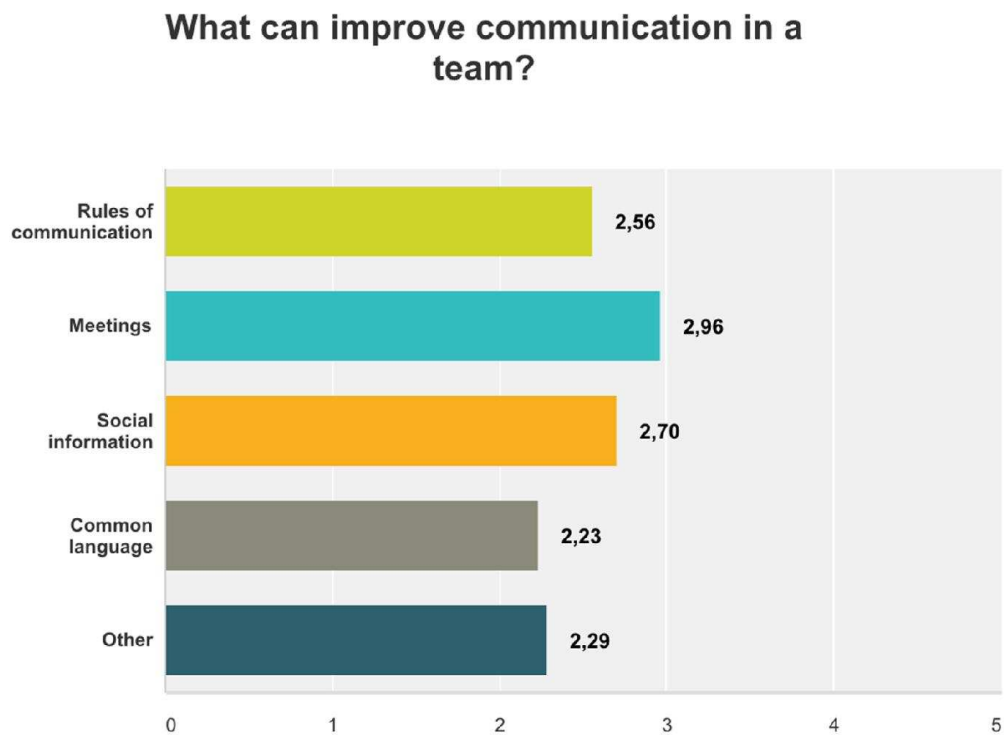
Virtual team members name complicated language using by colleagues as the third most important barrier of communication (2.93). At the same time it is the least significant barrier for communication in traditional organization (1.92). Probably this difference can be explained by the fact that the greater part of communication occurs between workers who work in the same department and use the similar terms and expression. Whereas, in virtual team might be included specialists from completely different professional fields.

Evaluating the difference between traditional organizations and virtual teams with respect to communication barriers in general, it must be noted that as a rule for virtual teams the same issues as for traditional team have much bigger intensity, expressiveness and occur more often.

The aim of the following question was to find out which measure might be helpful to overcome the communication barriers. The sixteenth scale semi-closed question offers to respondents to answer what can improve communication in a team choosing from four variants or just writing their own suggestion. Seventeen persons marked the “other” variant. However, only six of them commented their choice.

The results are presented in Figure 20 and in Table 9.

Figure 20. Weighted means of ways to overcome the communication barriers



Source: own elaboration, 2015

According to the respondents, the best way to improve communication in a team and overcome the barriers is to have regular personal meetings in traditional organization and to organize three days long “kick-off” meetings face-to-face at the beginning of the project for virtual teams. Personal meetings promote building of trust and cohesion development among team members, which are important factors especially for virtual teams. Two of the respondents marked “other” measure, which can improve communication in a team, however their commentaries were “frequent personal meetings” and “personal meetings for distributed teams”.

Table 9. Weighted means of ways to overcome the communication barriers

| | Strongly disagree | Rather disagree | Rather agree | Strongly agree | Weighted means |
|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|--------------|----------------|----------------|
| Setting of special rules regulating communication | 9% | 34% | 49% | 8% | 2.56 |
| Regular personal meetings (for regular employees) / personal 3 days meetings at the start of new project (for virtual team members) | 3% | 16% | 63% | 18% | 2.96 |
| Providing some personal data and social information about team members to get to know each other better | 6% | 33% | 46% | 15% | 2.70 |
| Agreement to use common language without specialized terms if it's not necessary or to make sure that all team members know its meaning | 20% | 45% | 27% | 8% | 2.23 |
| Other (17 persons) | 47.06 % | 5.88% | 17.65% | 29.41% | 2.29 |

Source: own elaboration, 2015

Providing of some personal data and social information about team members to get to know each other better might be helpful for these purposes as well. As it was mentioned before, providing rich social contextual information to virtual team members can increase shared understanding because compared with face-to-face communication, the social and normative context may be of even greater importance in computer-mediated communication (DeSanctis and Monge, 2006).

Setting of special rules regulating communication can aim to reduce information overload, which is the main issue of communication in both types of teams (traditional and virtual). One of the respondents left the following commentary offering the way to improve team members' interaction - "Maximum awareness of employees about the rules of tasks execution and communication".

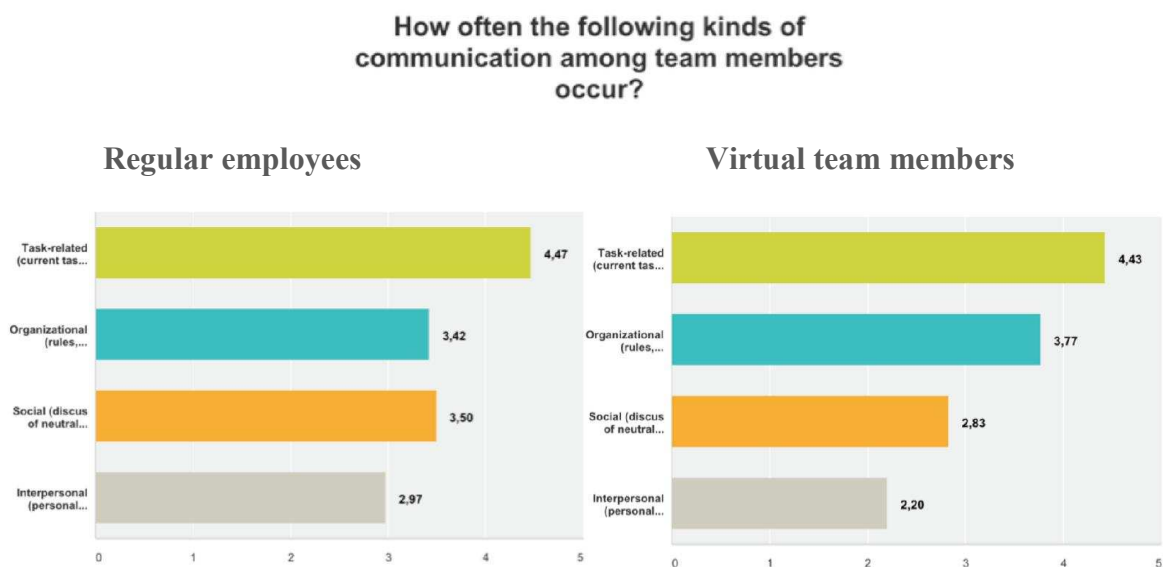
Agreement to use common language without specialized terms if it's not necessary or to make sure that all team members know their meaning was not considered as an effective method to improve team members' interaction. Probably, it is connected with complication to control the agreement implementation.

Among other measures, which were suggested by the respondents, were topics such as clear division of task (it can help to share understanding), common motivation,

including material motivation, development of openness, trust and mutual respect, setting clear and intelligible aims, goals and objectives, having a code of conduct.

The last question is about frequency of different types of communication. Respondents were asked how often colleagues discuss tasks (current tasks, aims, objectives), organizational issues (rules, technologies to use, etc.), neutral topics, world news, events (social communication) and personal information, private life. Answers given by regular employees and virtual team members were divided in order to compare them. The results are presented in Figure 21.

Figure 21. Frequency of different types of communication



Source: own elaboration, 2015

As it is shown in Table 10, task-related communication occurs more often than other types, weighted means of tasks discussion is similar for traditional organization and for virtual teams (4.47 and 4.43 respectively).

Discussions about organizational issues also take place quite often. However, comparing traditional organizations' and virtual teams' results, it might be concluded that among members of distributed teams organizational issues are discussed more often (3.42 and 3.77 respectively). It is caused by the fact that every virtual team is unique and exists for relatively short time, its' members use different tools. Hence, setting of common rules

and developing of common procedures are inalienable condition for efficient performance of virtual team.

Table 10. Frequency of different types of communication

| | Regular employees | | | | | | Virtual team members | | | | | |
|----------------|-------------------|-----------------|---------------|-----------|----------------|----------------|----------------------|-----------------|---------------|-----------|----------------|----------------|
| | Never (%) | Hardly ever (%) | Sometimes (%) | Often (%) | Very often (%) | Weighted means | Never (%) | Hardly ever (%) | Sometimes (%) | Often (%) | Very often (%) | Weighted means |
| Task related | 0 | 0 | 3.45 | 46.55 | 50.00 | 4.47 | 0 | 0 | 6.67 | 43.33 | 50.00 | 4.43 |
| Organizational | 0 | 15.79 | 33.33 | 43.86 | 7.02 | 3.42 | 0 | 3.33 | 33.33 | 46.67 | 16.67 | 3.77 |
| Social | 0 | 12.07 | 37.93 | 37.93 | 12.07 | 3.50 | 0 | 40.00 | 40.00 | 16.67 | 3.33 | 2.83 |
| Interpersonal | 5.17 | 15.52 | 62.07 | 12.07 | 5.17 | 2.97 | 20.00 | 50.00 | 23.33 | 3.33 | 3.33 | 2.20 |

Source: own elaboration, 2015

Social and interpersonal communications also are more popular among regular employees (3.50 and 2.97) than among virtual team members (2.83 and 2.20). These results correspond with Cascio (2000) who points out that lack of social interaction, might harm trust in virtual team and prevent effective communication and high performances. The respondents' answers for fifteenth question confirm it – virtual team members come across with lack of trust and cohesion more often than regular employees who have frequent social and interpersonal interaction.

The last two questions were available for virtual team members and dual jobholders only. The questions were open. The respondents were asked to name positive and negative aspects of communication in a virtual team. Processed and grouped results are presented in Table 11.

Without a doubt, communication is the most challengeable and open to objections component of management in a virtual team. That is why negative aspects of communication in virtual team prevail above the positive ones.

Table 11. Positive and negative aspects of communication in a virtual team

| Positive aspects |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Free communication with colleagues • Free communication with superiors, absence of fear and doubts • Developed information sharing • Predominantly task-oriented interaction, unobtrusiveness • Possibility not to react on message immediately • Possibility to send message any time |
| Negative aspects |
| <ul style="list-style-type: none"> • Time differences limitations • Lack of trust and cohesion • Information overload • Decision-making process requires more time and efforts • Misunderstandings due to absence of non-verbal cues • Absence of immediate feedback • Misunderstandings due to different languages and cultures • Technical issues • Security of information |

Source: own elaboration, 2015

5.2.3. Analysis of the Interview

For the interview, the Executive Director of Keep Soft Company was chosen. The interview was led by means of a Skype videoconference. The interviewee works as the executive director of the company on the permanent basis and as a team leader in virtual teams. Hence, the interviewee is experienced in both fields.

During the dialog the interviewee was asked 10 questions about his experience in the field of communication in a virtual team, and about his recommendations to improve it.

Below are both the questions and the interviewee's answers from the interview.

1. How long have you been working as a virtual team member?

I have been working in software develop industry since 1998. First, I worked as a regular worker in small software company and worked on some project as freelancer. I started to participate in virtual teams in 2004 when development of information technologies made it possible to work together on a project living in different cities and countries.

2. Why virtual team concept is becoming so popular nowadays? What are advantages and disadvantages of virtual team?

Rapid development of IT industry provides new opportunities and promotes new forms of organizations instead of traditional ones. For employers and customers advantages of virtual teams are possibility to hire the most qualified workers with respect to a particular project, higher productivity of labor due to workers' orientation on result, reducing costs. In terms of employees among advantages can be name higher level of freedom in accordance with working hours, flexibility to work from home or elsewhere worker is, possibility to have a job for disabled persons. Speaking about disadvantages, I would say that distributed work requires more efforts from manager and from workers as well. I mean more efforts to control, to time management, to setting the rules and procedures. Workers should be able to self-discipline, time management and be ready to take responsibility.

3. Which communication barriers do you come across with?

During the work on project virtual team members encounter with information overload, sometimes with conflicts. Virtual team members as a rule need time to get used to work with particular team and tune them on effective work together. Thus, the low level of trust and cohesion can be observed during the first weeks of project. However, in a month the whole team starts to function without any concerns.

4. According to you, how can virtual team communication be improved?

At the beginning should be set clear and reachable goals and objectives, every team member should know his/her work and take responsibility for the results. Effective communication is impossible without regulation by special rules and instructions.

5. Is there a dependency between communication in a team and its performances?

Certainly, communication affects the outcomes. Achieving of success is impossible without effective communication neither in tradition organizations nor virtual teams.

6. How do you solve conflicts among virtual team members?

It is important to solve the conflicts on the initial stage, with the initiator before all members of virtual team will involved in it. Sometimes it is just remind that all of team members have common goal.

7. Do you organize personal meetings for virtual team members? How often?

It depends on the project, number of members, their location and so on. Last five years we try to conduct the personal meeting for virtual team members at the beginning of project to get to know each other.

8. Do you face the problem of complex language?

As we produce software usually all team members are from IT industry. So all of us know all terms and phrases. Time to time some language issues can occur if we work on international project. But we try to avoid this problem hiring persons with advanced language skills.

9. Which measures do you implement to prevent information overload?

There was created basic code of communication, which regulates the frequency of contacts, deadlines to feedback. Before starting work on new project all members of virtual team have to be informed about rules, and if it is needed to change them or modify them for particular team.

10. Don't you think that it is easier to find a common language with the team of experienced workers?

Definitely, if two persons have already worked together and achieved success working together on the project before, it would be easier to communicate again. Even if

individuals have not worked together in the same team, but all of them have this kind of experience, it would be faster to get contact between them.

5.2.4. Evaluation of Results

The results of the conducted research redound to answer on set research questions.

1. Does communication among surveyed workers of virtual teams have any differences with communication among surveyed workers of a traditional organization?
2. What are the similarities and differences in communication among surveyed workers of virtual teams and traditional organizations?
3. Are there any positive aspects of communication in virtual teams?
4. Are there any negative aspects of communication in virtual teams?

While answering on the first research question it should be mentioned that there are differences between communication among members of virtual team and among workers of traditional organization. Their presence is discovered within the survey.

Speaking about similarities and differences, one of the similarities is the same set of communication barriers, which respondents face within the work. However, the intensity or level of these challenges as a rule is higher in virtual teams than in traditional organizations. Both groups are faced with information overload, but virtual team members face it more often and their level of information overload is higher in accordance with received data. Thus, the degree of challenge is different for virtual teams and traditional organizations.

Level of trust and level of cohesion among workers of current virtual teams and traditional organizations can be associated as other major similarities. This means that the teams with formed structure that have been working on the moment of conducting the survey. Basing on the received data it is possible to state that there were not detected differences in these characteristics.

However, answering the question about communication barriers as lack of trust and lack of cohesion in general (not in the current virtual team, but taking into account the whole experience), virtual team members pointed out higher level of these challenges than

regular employees did. It is possible to assume that majority of new created virtual teams encounter with low-level trust and cohesion at the beginning of collaboration. But after short period of time they are able to overcome these barriers. This assumption is confirmed by the interview with virtual team leader and by obtained data.

As for tools that maintain communication there are as similarities as well as differences. Similarities are expressed in the constant use of email and telephones and absolute disuse of voice mail, voice conferences and social networks for work. However, in addition to the most popular communication means virtual team members use information sharing services and collaboration services as main tools to do namely their job – produce software, write the software code. In turn, regular employees much more often meet each other in person. Due to objective reason (geographical boundaries) face-to-face communication is not available to virtual team members.

The other difference is the fact that virtual team members are more informed and usually have access to necessary information any time due to the active usage of information sharing services in comparison with regular employees.

The conducted research discovered the following positive aspects of communication in virtual teams: liberal style of communication with colleagues and superiors, absence of fear and doubts to discuss something or suggest new ideas, developed information sharing, predominantly task-oriented interaction, unobtrusiveness, possibility not to react on message immediately and possibility to send message any time.

Among negative aspects of communication in virtual teams discovered factors were: time differences limitations, lack of trust and cohesion, information overload, decision-making process requires more time and efforts, misunderstandings due to absence of non-verbal cues, absence of immediate feedback, misunderstandings due to different languages and cultures, technical issues, security of information.

5.2.5. Recommendations

As some negative aspects of communication in virtual teams were discovered it is necessary to focus on their elimination. The following recommendation should be implemented to improve communication in virtual teams.

1. Starting face-to-face meetings.

The starting face-to-face meetings within two or three days at the beginning of a project promote building of trust and cohesion development, to state clear goals and objectives, getting to know members of virtual team better, demonstrate their competency, qualification and creativity.

2. Code of communication development.

Setting of special rules regulating communication is aimed to reduce information overload, which is the main issue of communication in virtual teams. Rules should include regulation of communication at operation activity (the setting of main communication tools, frequency of sending message, frequency of checking inbox and other mediums, deadline for reaction on received message, etc.), procedures of solving conflicts and consideration of proposals, information security requirements, procedures in case of technical and other accidents.

Certainly, managers should control implementation of communication code.

3. Careful selection of virtual team members.

A common database with potential or experienced virtual team members was not discovered. Thus, the best way for managers to keep in a mind a collection of potential workers is to create own database with profiles contained basic information about person such as age, experience, qualification, skills (including level of language skills), and some personal characteristics. Profiles can include feedbacks and comments from previous colleagues or personal rating position. This database can help to collect the appropriate individuals for a virtual team.

The other way to find the appropriate virtual team member is professional social networks (as LinkedIn, for example), which provides to get the information about participation in previous projects and person's skill evaluation.

4. Promotion of social communication and providing the platform for informal interaction.

Providing of some personal data and social information about team members to get to know each other better is helpful for trust development. Facebook project group can play the role of the platform for informal interaction. Also sharing information service can include virtual team members' profiles with some basic information about them with possibility to add photo or other data by the member him/herself. As it was mention before providing rich social contextual information to virtual team members can increase shared understanding.

6. Conclusions

During the last 10 years, virtual teams have been growing in popularity and many organizations have responded to their dynamic environments by introducing virtual teams. Additionally, the rapid development of new communication technologies has accelerated this trend. Advantages and disadvantages are widely discussed. In connection with relative newness of the virtual teams concept, some areas of it have not been examined. One of the most challenged components is communication, which plays one of the main roles in effective management, efficient performances and achieving of success in business.

The main aim of this diploma thesis is to analyze communication among virtual team members as well as examine if there are differences in communication between members of virtual teams and traditional organizations and identify negative or positive features of communication in examined virtual teams.

In theoretical part of the diploma thesis were examined main characteristics and processes of communication, concept of virtual team, its characteristics, advantages and disadvantages, as well as barriers to communication in virtual teams and traditional organizations and solutions to improve communication suggested in literature.

In practical part of the diploma thesis is focused on the own survey. Obtained from results of survey data let to answer on four research questions, which were formulated to meet the main aim of the diploma thesis.

There were discovered as similarities as differences between communication in traditional organizations and virtual team members. Similarities are the same set of communication barriers that workers face within work; the main communication problem is information overload in both groups; the most used communication tools in both groups are email and telephones, in turn the least used communication tools are the same too - voice mail, voice conferences and social networks for work; the similar level of trust and cohesion in traditional organizations and formed virtual teams, which started to work some time before the survey.

Speaking about differences, the following should be emphasized: in spite of the same set of communication barriers, the intensity or level of these challenges is higher in virtual teams than in traditional organizations; level of information overload as well as other barriers is higher in accordance with received data. Thus, the degree of challenge is different for virtual teams and traditional organizations. In contrast to traditional

organizations, majority of new created virtual teams encounter with low-level trust and cohesion at the beginning of collaboration. But after short period of time they are able to overcome these barriers. This assumption is confirmed by the interview with virtual team leader and by obtained data.

There are differences in according to communication tools. In addition to most popular communication means virtual team members use information sharing services and collaboration services as main tools to do namely their job – produce software, write the software code. In turn, regular employees much often meet each other in person. Due to objective reason (geographical boundaries) face-to-face communication is not available to virtual team members.

The other difference is the fact that virtual team members are more informed and usually have access to necessary information any time due to active usage of information sharing services in comparison with regular employees.

The conducted research discovered the following positive aspects of communication in virtual teams: liberal style of communication with colleagues and superiors, absence of fear and doubts to discuss something or suggest new ideas, developed information sharing, predominantly task-oriented interaction, unobtrusiveness, possibility not to react on message immediately and possibility to send message any time.

Among negative aspects of communication in virtual teams were discovered: time differences limitations, lack of trust and cohesion, information overload, decision-making process requires more time and efforts, misunderstandings due to absence of non-verbal cues, absence of immediate feedback, misunderstandings due to different languages and cultures, technical issues, security of information.

As negative features of communication in virtual team were detected, the following recommendations to eliminate or reduce their impact on the effectiveness of communication between members of virtual team were suggested.

1. Starting face-to-face meetings, conducted at the beginning of new project
2. Code of communication development and control of its implementation.
3. Careful selection of virtual team members.
4. Promotion of social communication and providing the platform for informal interaction.

Implementation of these recommendations should help to overcome the communication barriers among virtual team members and do their job effectively.

Further researches in the field of virtual team management is needed, because there is no doubt that the concept of virtual team and distributed work maintained by information technologies has become an integral part of the business environment, which will only further develop and increase in the future.

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Supplements

Supplement 1: Questionnaire

Dear Sir/Madam,

I am a student of Czech University of Life Sciences (Economics and Management Faculty) and I am currently writing a diploma thesis on topic called Features of Communication in Virtual Teams. I would like to ask you to fill out this questionnaire, which will help to obtain the data for my research. The questionnaire is anonymous and is used only for purposes of my diploma thesis. Thank you very much for your time and kind help.

1. What is your age?

- a) 18 - 25
- b) 26 - 35
- c) 36 - 45
- d) 46 - 56
- e) 56 +

2. What is your gender?

- a) Male
- b) Female

3. How long have you been working in software development?

- a) less than 1 year
- b) 1 - 5 years
- c) 6 - 10 years
- d) more than 10 years

4. Now you work as

- a) regular employee
- b) member of virtual team
- c) regular employee and member of virtual team

5. Can you communicate without any fear with your superior, express your opinion and suggestions?

- a) yes
- b) rather yes
- c) rather no
- d) no

6. Can you communicate without any fear with your colleagues, express your opinion and suggestions?

- a) yes
- b) rather yes
- c) rather no
- d) no

7. Are you satisfied with communication with your colleagues?

- a) yes
- b) rather yes
- c) rather no
- d) no

8. Do you consider yourself a team player?

- a) yes
- b) rather yes
- c) rather no
- d) no

9. Who is responsible for project failure?

- a) the team leader
- b) the whole team
- c) the person, who did not his / her job properly

10. Do you get all the important information that you need for your job in time?

- a) yes
- b) rather yes
- c) rather no
- d) no

11. How often the following communication tools are used? (1 - very often, 2 - often, 3 - sometimes, 4 - hardly ever, 5 - never)

- telephone and mobile phones
- email
- videoconferences (Skype, FaceTime, etc.)
- voice mail
- voice-conferences
- messengers (Viber, What'sUp, etc.)
- corporate chats
- face-to-face meetings
- information sharing (Google Drive, Dropbox, Evernote)
- social networks (Facebook, Vk, etc.)
- web services for collaboration

12. Why do you use those communication tools, which you marked as «very often used»? _____

13. Why don't you use those communication tools, which you marked as «never»? _____

14. Question for members of virtual team: According to your opinion what influence on communication in virtual team.

- age
- work experience
- personality

- national mentality
- language skills

15. What problem in team communication do you come across with? (1 - very often, 2 - often, 3 sometimes, 4 - hardly ever, 5 - never)

- low level of trust
- low level of cohesion
- complication in solving conflicts
- stereotypes
- information overload
- complicated language using by colleagues
- other: _____

16. What can improve communication in a team? (1 - strongly agree, 2 - rather agree, 3 - do not know, 4 - rather disagree, 5 - strongly disagree)

- setting of special rules regulating communication
- regular personal meetings (for regular employees) / personal 3 days meetings at the start of new project (for virtual team members)
- providing some personal data and social information about team members to get to know each other better
- agreement to use common language without specialized terms if it's not necessary or to make sure that all team members know its meaning
- other: _____

17. How often the following kinds of communication among team members occur? (1 - very often, 2 - often, 3 sometimes, 4 - hardly ever, 5 - never)

- task-related (current task discussed, aims, objectives)
- organizational (rules, technologies, etc.)
- social (discus of neutral topics, world news, events)
- interpersonal (personal information and life)

18. Question for members of virtual team: Which positive aspects of communication in virtual team can you name?

19. Question for members of virtual team: Which negative aspects of communication in virtual team can you name?

Supplement 2: The List of Questions Asked During the Interview

1. How long have you been working as a virtual team member?
2. Why virtual team concept is becoming so popular nowadays? What are advantages and disadvantages of virtual team?
3. Which communication barriers do you come across with?
4. According to you, how can virtual team communication be improved?
5. Is there a dependency between communication in a team and its performances?
6. How do you solve conflicts among virtual team members?
7. Do you organize personal meetings for virtual team members? How often?
8. Do you face the problem of complex language?
9. Which measures do you implement to prevent information overload?
10. Don't you think that it is easier to find a common language with the team of experienced workers?