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A concept for measuring effectiveness of communication in project teams

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Abstract

Aim/purpose – The aim of the paper is to introduce a concept for measuring effectiveness of communication in project teams, taking into account 19 effectiveness aspects which enables to evaluate individual communication effectiveness of each team member, the overall communication effectiveness of a team or organization and to compare teams or organizations for communication effectiveness. The results of a small scale study serve as a proof of the proposed concept comprising the questionnaire and the way of presenting its results.

Design/methodology/approach – First, a list of communication effectiveness aspects is proposed, based on a literature review. They are additionally grouped into aspects dependent on the sender, the recipient, and both. On the basis of the identified communication effectiveness aspects a questionnaire for measuring the level of communication effectiveness is prepared and the way of presenting its results is demonstrated on a small scale research sample. The case study is used to validate the presented concept.

Findings – The developed questionnaire, based on the identified communication effectiveness aspects, together with the proposed form of presenting its results can be successfully applied to evaluate individual communication effectiveness of specific team members, the overall communication effectiveness of a team or organization and to compare teams or organizations for communication effectiveness.

Research implications/limitations – The presented concept enables a graphically enriched assessment of communication effectiveness of individual team members, whole teams or organizations and also brings to the attention of the respondents the various aspects which influence communication effectiveness. It should be, however, noted that

the results of the questionnaire base on the declarations of the respondents, which makes them subjective.

Originality/value/contribution – The proposed concept of measuring communication effectiveness can be used as a tool for enhancing the communication effectiveness in project teams where some flaws or infirmities are observed. It constitutes a comprehensive way of tackling this problem by addressing an extensive list of communication effectiveness aspects and provides clear and meaningful tools of presenting the results.

Keywords: communication effectiveness, project team, measuring communication effectiveness, evaluation of communication effectiveness.

JEL Classification: D38, M14, M15.

1. Introduction

Effective communication is one of the main determinants of successful project realization (Čulo & Scendrović, 2010). It is the lifeblood of any human relations and those constitute the basis of successful cooperation and joint realization of tasks (Rajkumar, 2010). Zulch (2014) in her research proves that effective communication is a foundation function that supports and integrates all other project areas. To ensure effective project communication, it is, however, essential to determine what it means that communication is effective and establish ways of measuring effectiveness. Generally speaking communication is effective when it reaches its goals and accomplishes the intended purpose. But in order to measure effectiveness, there is a need for a more specific and detailed list of aspects characterizing effectiveness of the communication process.

There have not been much research done in that field with probably the most significant study performed by the Construction Industry Institute which developed the Communication Project Assessment Tool (Compass) focused on measuring communication effectiveness in construction and engineering project teams (Thomas, Tucker, & Kelly, 1999). There is also a study by Holzman & Globerson (2003) which deals with the issue of measuring and evaluating communication effectiveness in project teams. They, however, concentrate on a limited scope of communication effectiveness aspects, such as: accuracy, timeliness, completeness, barriers and volume, or are tailored to specific project types and environment.

Therefore, the problem which is being addressed in the paper regards the lack of methods or procedures for evaluating communication effectiveness in project teams which would cover all important communication effectiveness aspects and be applicable for any project type and team. Considering only selected communication effectiveness aspects, as in the case of previously men-

tioned research, does not allow to see the whole picture of communication effectiveness in a project team. The concept proposed in this paper strives to expand the range of communication aspects taken into account in evaluating communication effectiveness and is applicable to different kind of projects and teams, which makes it more universal.

The literature review section outlines hitherto research studies related with communication effectiveness aspects and evaluation methods and introduces a list of these aspects derived from a thorough analysis of the available literature. In the research methodology section, the research procedure is described, including the questionnaire structure and content as well as methods used for presenting the results. The research findings section presents results of applying the concept on a small case study and comprises three subsections, each devoted to one of the analyzed dimensions: individual communication effectiveness of each respondent, overall communication effectiveness within an organization and a comparison of communication effectiveness among the surveyed companies. The discussion section emphasizes the most important implication of the study and the conclusions section summarizes the achieved outcomes and suggests future research.

2. Literature review

Communication is undoubtedly one of the most important areas in project management, especially in distributed and multinational teams, what has been confirmed by numerous researchers and practitioners (Ssenyange, Katerega, Masaba, & Sebunya, 2017; Muszyńska, 2017 and works cited therein; Turkulainen, Aaltonen, & Lohikoski, 2016 and works cited therein; Wellman, 2012). To communicate effectively, proper communication management schemes must be adopted to ensure appropriate distribution and sharing of project information. The stage of planning the project communication is crucial to define involved parties, determine what information should be shared and decide about the most convenient methods and tools supporting project communication (Taleb, Ismail, Wahab, Mardiah, Rani, & Amat, 2017). It is also needed to establish understanding, trust, build coordination and support from a variety of project personnel (Ahimbisibwe & Nangoli, 2012). Effective communication is an essential factor of project success, keeping project stakeholders on track to achieve project objectives and allowing to overcome issues and resolve conflicts during its realization (Zulch, 2014; Ozierańska, Skomra, Kuchta, & Rola, 2016).

In order to ensure effective project communication it is, however, necessary to know what ‘effective’ communication means and how to measure it. Available studies on project communication, communication management and project management mention different features determining communication effectiveness. Characterizing effective communication, Zulch (2014) mentions the fundamental role of feedback, the undeniable importance of understanding the message and ensuring it reaches the target audience in time. She also underlines the significance of ensuring the availability of communication records to those who need it, providing open lines of communication between project stakeholders and making best possible use of all occasions when team members meet with each other.

Butt, Naaranoja, & Savolainen (2016) point out that effective communication is when stakeholders are timely communicated with the correct and relevant information and additionally if that is done in a cost-effective manner. They also notice that communication should be simple and duplicable and that asking for feedback is a crucial method of finding out how our message was received.

Weaver (2007) also finds relevance, timeliness of communicated information and feedback features crucial for effective communication, but additionally stresses the truthfulness, honesty and credibility aspects. As equally important in ensuring communication effectiveness, he indicates choosing the right medium and messenger, and minimizing unnecessary noise in the transmission. One more attribute of effective communication denoted by this author was achieving the required or desired effect intended by the communication act.

Bourne (2016), in her research regarding targeted communication, indicates that communication must be planned and implemented taking into account the various approaches and preferences of stakeholders. There are also other essential aspects of effective communication mentioned in her study: ensuring that the information achieves its intended purpose, defining the purpose of communication, personalizing the message to specific recipient, repeating the message for it to achieve its intended outcome, making information easily accessible and using multiple channels to deliver the information.

Bond-Barnard, Steyn, & Fabris-Rotelli (2013) repeat some of the effective communication aspects mentioned by previous authors (properly used feedback and using variety of media to boost conveyance of messages), but additionally highlight high frequency of communication for building trust and the balance between formal and informal communication.

Table 1 presents names and descriptions of 19 communication effectiveness aspects together with selected literature sources where they were mentioned. The literature analysis covered 51 items including books, journal papers, doctoral

dissertations and conference papers published between 1998 and 2018. The following words and phrases were entered to identify relevant sources, using the Google Scholar search engine:

- ‘effective project communication’ (212 results),
- ‘effective communication aspects’ (18 results),
- ‘effective communication in project’ (45 results).

The displayed results were then filtered according to the actual relevancy to the topic. In order to facilitate the filtering process additional searches were done with the use of the phrase ‘effective project communication’ jointly with the following words: ‘clarity’, ‘clear’, ‘prejudice’, ‘trust’, ‘tailor’, ‘communication skill’, ‘commitment’, ‘purpose’, ‘accuracy’, ‘accurate’, ‘precise’, ‘access’, ‘communication plan’, ‘correct’. The identified aspects have been divided into three groups depending on who has influence on a given aspect – the sender, the recipient or both.

Table 1. Communication effectiveness aspects

Communication effectiveness aspect	Description	Literature source
<i>1</i>	<i>2</i>	<i>3</i>
Aspects dependent on the sender		
<i>Time aspect</i>	making sure the information is current and that the recipient gets it instantly	Adu, 2004; Wooding, 2005; Barakat, 2009; Nangoli, 2010; Nangoli, Namagembe, Ntayi, & Ngoma, 2012; Natu & Kennedy, 2012; Burger, 2013; Mnkandla, 2013; Meid, 2014; Zulch, 2014; Aidoo, Aigbavboa, & Thwala, 2015; Lys, 2015; Streich & Brennholt, 2015; Freeman, 2016; Zulch, 2016; Ikechukwu, Fidelis, & Celestine, 2017; Khabiqheya, 2017; Liu & Li, 2017
<i>Correctness aspect</i>	providing correct information, planning and checking what is communicated	Adu, 2004; Gutierrez, 2008; Natu & Kennedy, 2012; Liapaki, 2013; Lys, 2015; Streich & Brennholt, 2015; Freeman, 2016; Zulch, 2016; Liu & Li, 2017
<i>Specificity aspect</i>	well-thought-off and well planned communication, also delivering information incrementally	Gutierrez, 2008; Burger, 2013; Mnkandla, 2013; Tzanakaki, 2013; Meid, 2014; Zulch, 2014; Aidoo et al., 2015; Lys, 2015; Khabiqheya, 2017; Liu & Li, 2017
<i>Accessibility aspect</i>	making sure that communication records are available for team members	Gutierrez, 2008; Meid, 2014; Zulch, 2014; Freeman, 2016; Zulch, 2016; Ikechukwu et al., 2017; Khabiqheya, 2017; Liu & Li, 2017
<i>Proper medium aspect</i>	finding out which communication methods/channels/media are preferred by the recipient; choosing the right messenger	Adu, 2004; Gutierrez, 2008; Nangoli, 2010; Bond-Barnard et al., 2013; Liapaki, 2013; Mnkandla, 2013; Meid, 2014; Aidoo et al., 2015; Lys, 2015; Freeman, 2016; Liu & Li, 2017

Table 1 cont.

<i>1</i>	<i>2</i>	<i>3</i>
<i>Multi-medium aspect</i>	using multiple channels to deliver the information (for better chances of achieving the goal)	Adu, 2004; Wooding, 2005; Bond-Barnard et al., 2013; Lys, 2015; Streich & Brennholt, 2015; Zulch, 2016; Khabiqheya, 2017
<i>Simplicity / / accuracy aspect</i>	communicating clearly, precisely, leaving no space for guesses and doubts	Adu, 2004; Wooding, 2005; Gutierrez, 2008; Barakat, 2009; Nangoli, 2010; Liapaki, 2013; Tzanakaki, 2013; Meid, 2014; Zulch, 2014; Lys, 2015; Freeman, 2016; Ikechukwu et al., 2017; Khabiqheya, 2017; Liu & Li, 2017
<i>Purpose clarity aspect</i>	defining the purpose of communication (addressing the 'why')	Wooding, 2005; Streich & Brennholt, 2015; Ikechukwu et al., 2017
<i>Goal-achieving aspect</i>	achieving the required or desired effect by, e.g., repeating the message	Affare, 2012; Lys, 2015; Ikechukwu et al., 2017; Khabiqheya, 2017
<i>Formal-informal balance aspect</i>	making sure both types of communication are appropriately used	Barakat, 2009; Bond-Barnard et al., 2013; Mnkandla, 2013; Tzanakaki, 2013; Zulch, 2014; Freeman, 2016; Khabiqheya, 2017
Aspects dependent on the recipient		
<i>Engagement aspect</i>	putting personal effort in the communication process, commitment	Nangoli et al., 2012; Aidoo et al., 2015; Lys, 2015; Khabiqheya, 2017
<i>Personality aspect</i>	individual communication predispositions, communication skills	Barakat, 2009; Nangoli, 2010; Affare, 2012; Nangoli et al., 2012; Burger, 2013; Mnkandla, 2013; Zulch, 2014; Aidoo et al., 2015; Lys, 2015; Freeman, 2016; Zulch, 2016; Liu & Li, 2017
Aspects dependent on both the sender and the recipient		
<i>Intelligibility aspect</i>	meaningfulness of information to the recipient, fundamental role of feedback	Adu, 2004; Wooding, 2005; Gutierrez, 2008; Affare, 2012; Bond-Barnard et al., 2013; Liapaki, 2013; Zulch, 2014; Lys, 2015; Streich & Brennholt, 2015; Freeman, 2016; Zulch, 2016; Khabiqheya, 2017; Liu & Li, 2017
<i>Openness aspect</i>	providing open lines of communication between communicating parties	Affare, 2012; Zulch, 2014; Zulch, 2016; Khabiqheya, 2017
<i>Relevancy / / personalization aspect</i>	tailoring message to specific recipient, thinking from the perspective of the recipient	Gutierrez, 2008; Barakat, 2009; Nangoli, 2010; Natu & Kennedy, 2012; Mnkandla, 2013; Meid, 2014; Zulch, 2014; Lys, 2015; Zulch, 2016; Khabiqheya, 2017; Liu & Li, 2017
<i>Cost-effectiveness aspect</i>	providing information in a cost-effective way, choosing the most cost-saving methods/channels/ /medium which are acceptable to the recipient	Adu, 2004; Natu & Kennedy, 2012; Lys, 2015
<i>Credibility aspect</i>	honesty, trustfulness, achieved inter alia through high frequency of communication	Adu, 2004; Wooding, 2005; Gutierrez, 2008; Barakat, 2009; Bond-Barnard et al., 2013; Burger, 2013; Liapaki, 2013; Tzanakaki, 2013; Freeman, 2016; Zulch, 2016; Khabiqheya, 2017

Table 1 cont.

<i>1</i>	<i>2</i>	<i>3</i>
<i>Past experience aspect</i>	making good communication atmosphere to get rid of prejudice	Wooding, 2005; Burger, 2013; Tzanakaki, 2013; Lys, 2015; Streich & Brennholt, 2015
<i>Clarity / /undisturbedness aspect</i>	minimizing unnecessary noise in the transmission	Adu, 2004; Wooding, 2005; Affare, 2012; Nangoli et al., 2012; Liapaki, 2013; Tzanakaki, 2013; Aidoo et al., 2015; Lys, 2015; Streich & Brennholt, 2015; Zulch, 2016; Ikechukwu et al., 2017; Khabiqheya, 2017

The most significant research regarding measuring communication effectiveness was done by the Construction Industry Institute (Thomas et al., 1999). The developed Communications Project Assessment Tool (Compass) was designed to enable project managers to assess project team communications during the execution phases of an engineer-procure-construct project. The tool permits detailed analysis through the scoring of six critical categories of communication: accuracy, timeliness, completeness, understanding, barriers and procedures, and targets three project groups: project management, engineering, and construction. Information regarding all six communication categories comes from responses to automated survey questionnaires prepared for each of the three project groups. Two of them concentrate on design and engineering issues and the project management questionnaire captures overall project issues.

Another study on communication effectiveness evaluation considers only four communication effectiveness aspects: completeness, accuracy, timing and volume and relates them to nine outputs of the communication process as defined by PMBoK (Holzman & Globerson, 2003).

The main motivation for developing the concept of measuring communication effectiveness presented in this paper was the limitation of communication effectiveness aspects taken into account in previous studies or applicability only to specific project types.

3. Research methodology

The research procedure comprises two main stages. The first one includes preparation of a questionnaire based on the aspects of effective project communication described in the previous section, and the second one proposes a set of rules and graphical tools to present the results. The questionnaire is divided into four sections – the first section with 22 questions concerns the communication effectiveness aspects dependent mainly on the sender. The second section contains 4 questions relating to the aspects dependent mainly on the recipient. The third section, with 12 questions,

concentrates on the communication effectiveness features influenced by both the sender and the recipient and the last section collects information about the kind of projects realized within the organization and the size of teams realizing them. Table 2 lists the questions from the first three sections of the questionnaire, assigned to corresponding communication effectiveness aspects.

Table 2. Questions regarding different communication effectiveness aspects included in the questionnaire

Questions addressing the aspects of communication effectiveness dependent on the sender	
<i>1</i>	<i>2</i>
<i>Time aspect</i>	Do you make sure to send/provide only up-to-date information? Do you check promptly if the recipient received and acknowledged the message you sent/provided? Do you make sure that information available to the stakeholders is up-to-date? (on webpages, intranet, wiki)
<i>Correctness aspect</i>	Do you double-check messages sent/information provided regarding its logic and linguistic correctness? (to avoid mistakes, ambiguity, etc.) Do you use spell/grammar checking tools? (especially when writing messages in a foreign language)
<i>Specificity aspect</i>	Is a communication plan developed for the projects you realize? (to avoid inconsistency, chaos, omissions, etc.) Is a meeting agenda prepared for each meeting? Is the meeting agenda followed during the meetings?
<i>Accessibility aspect</i>	Do you make sure all interested stakeholders have access to appropriate project information? Do you make sure all interested stakeholders have access to tools they need for communication?
<i>Proper medium aspect</i>	Do you ask stakeholders about their favorite communication medium? Do you tailor the medium of the message to specific stakeholder (group)? Do you analyze what kind of messenger (person, tool) is the most appropriate to communicate with a specific stakeholder?
<i>Multi-medium aspect</i>	Do you use multiple media/methods to deliver the same information/message? (to increase the probability of reaching the receiver)
<i>Simplicity / / accuracy aspect</i>	Do you formulate your messages in such a way that the receivers do not ask you to repeat/clarify them? Do the recipients answer your messages as if they understood them properly?
<i>Purpose clarity aspect</i>	Do you plan the purpose of your communication? (what you want to achieve) Do you inform the recipients of the message about the goal you want to achieve?
<i>Goal-achieving aspect</i>	Do your recipients act accordingly to your expectations? (do you achieve the expected outcome?)
<i>Formal-informal balance aspect</i>	Do you use formal forms of communication with project stakeholders? (reports, proceedings, etc.) Do you also use informal forms of communication with project stakeholders? Do you communicate with project stakeholders concerning non-project topics?
Questions addressing the aspects of communication effectiveness dependent on the recipient	
<i>Engagement aspect</i>	Do you engage actively in reading the messages you receive or listening to someone talking?
<i>Personality aspect</i>	Do you find it easy to communicate with other people? Do you find it easy to control your emotions? Do you find it easy to make others do what you ask/tell them?

Table 2 cont.

1	2
Questions addressing the aspects of communication effectiveness dependent on both the sender and the recipient	
<i>Intelligibility aspect</i>	Do you ask your recipients for feedback on your messages? Do you provide feedback to messages you receive?
<i>Openness aspect</i>	Do you keep open communication with all stakeholders? (without withholding information and/or excluding stakeholders)
<i>Relevancy / / personalization aspect</i>	Do you know who is the receiver of the information/reports/documents you produce? Do you communicate your needs concerning the scope, form and frequency of communication? Do you tailor your communication routines to specific stakeholders (groups)?
<i>Cost- -effectiveness aspect</i>	Do you analyze the cost effectiveness of communication methods?
<i>Credibility aspect</i>	Do you communicate honestly? Do you maintain regular contact with your stakeholders? (to be able to make the best possible predictions about the future of the project)
<i>Past experience aspect</i>	Do you actively work against prejudice in project communication? Do you try to make your past negative experiences with a specific stakeholder not influence your communication with them?
<i>Clarity / / undisturbed- -ness aspect</i>	Do you actively eliminate any disruptions hindering the process of communication?

All the questions are close-ended and there are five possible answers for each question, wherein the first answer on the list indicates poor communication effectiveness while the last one reflects the most effective approach to communication. For example, to the question: ‘Do you communicate your needs concerning the scope, form and frequency of communication?’, the possible answers are: ‘nearly never/never’, ‘seldom’, ‘sometimes’, ‘usually’, ‘nearly always/always’. For some questions the answers are a bit modified, for example to the question: ‘Do you tailor the medium of the message to a specific stakeholder (group)?’, the possible answers are: ‘nearly never/never’, ‘sometimes in case of particularly important stakeholders and never in case of less important ones’, ‘sometimes’, ‘always in case of particularly important stakeholders and sometimes in case of less important ones’, ‘nearly always/always’.

The second stage of the procedure describes how the results obtained on the basis of the questionnaire can be analyzed and presented in three dimensions: the individual communication effectiveness of each respondent, the overall communication effectiveness within an organization/team and the comparison of communication effectiveness among the surveyed companies/teams.

The individual communication effectiveness is determined by comparing the answers provided by a given respondent to the reference model. The refer-

ence model assumes three levels of communication effectiveness: high, medium and low. Reference percentages for each level are presented in Table 3. Questions regarding the specificity aspect should not be included as they do not correspond to the individual habits and approach of a given respondent.

Table 3. Reference percentages of communication effectiveness reference model

Level of communication effectiveness	Reference percentage for most favorable and most unfavorable answers	
	Answers 1 & 2 (unfavorable)	Answers 4 & 5 (favorable)
<i>High</i>	< 10%	> 70%
<i>Medium</i>	< 20%	> 50%
<i>Low</i>	≥ 20%	≤ 50%

The overall communication effectiveness within an organization/team is measured by aggregating the number of all five types of answers (ranging from those testifying high communication effectiveness to those indicating low communication effectiveness) for all questions from the first three sections. The results are illustrated with a graph.

Comparison of the overall communication effectiveness among the surveyed organizations/teams is based on comparing the aggregated values for answers 1 & 2, 4 & 5 and answer 3 among all compared companies/teams and is also presented on a graph.

4. Research findings

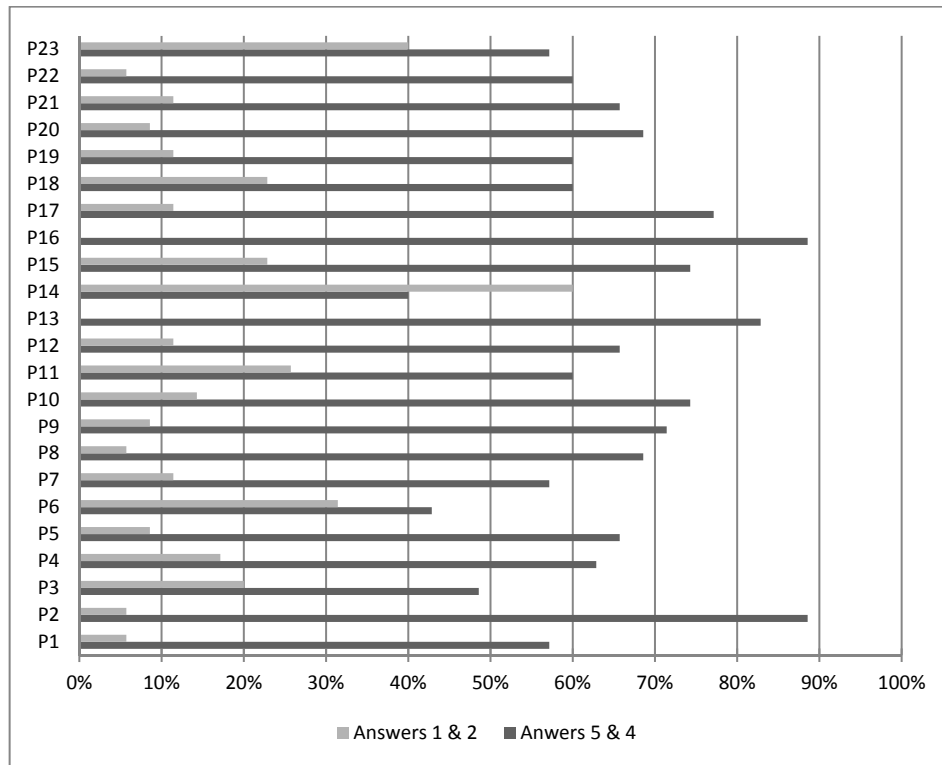
In order to validate the presented concept of measuring effectiveness of communication in project teams, a small scale study was conducted. Within the first stage of the procedure, the questionnaire was prepared and distributed in an online form to four project-based companies. A total of 23 respondents (from 5 to 7 from each company) filled in the questionnaire. The analysis of the results for this case study, which constitutes the second stage of the procedure, is presented in the subsequent subsections.

4.1. Questionnaire results for individual team members

Individual communication effectiveness was assessed by investigating responses of each respondent and comparing the results to the reference model described in the previous section. Figure 1 presents the percentage of the favorable (5 and 4) and unfavorable (1 and 2) answers provided by each surveyed person.

Comparison of the results of respondents with the reference model shows that only four of them have high communication effectiveness, 12 – medium and others (7) have low communication effectiveness due to too high percentage of unfavorable answers (three out of those seven persons had also too low percentage of favorable answers).

Figure 1. Individual communication effectiveness of the surveyed team members



4.2. Questionnaire results from the company's perspective

Respondents from company A hardly ever chose answers indicating the lowest efficiency of communication (answers 1) – there were only 7 such answers (about 2%). The majority of answers (about 46%) were answers pointing to quite high efficiency of communication habits and processes of team members employed in this company (answers 4), 24% were medium (answers 3) and about 16% of answers indicated a very high communication efficiency (answers 5).

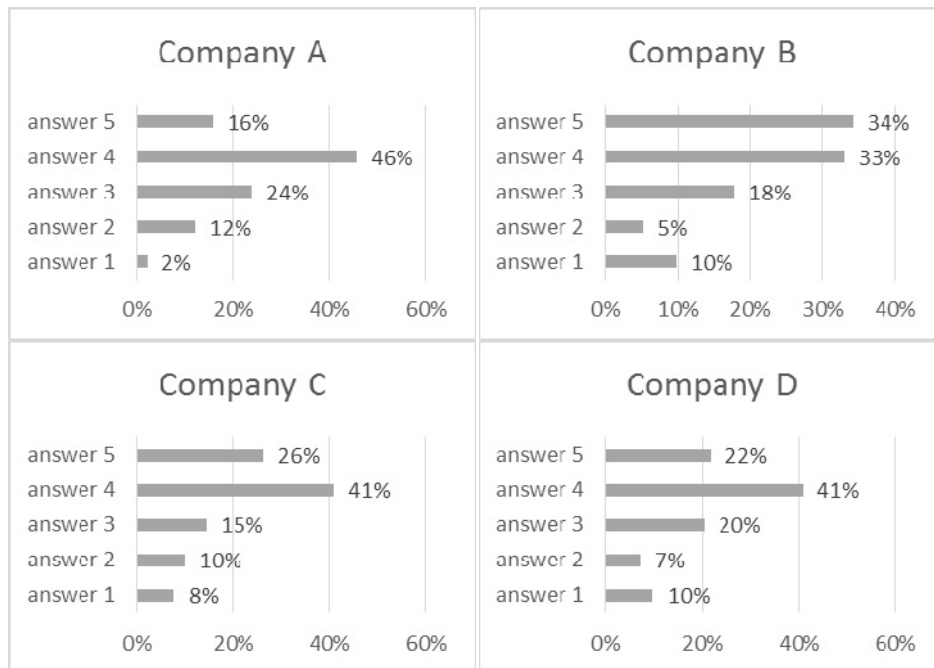
Answers of the respondents from company B were quite evenly distributed regarding answers 4 and 5 – 33% and 34% respectively, with 18% of answers 3 and 10% the least favorable ones (answers 1).

In company C, similarly as in company A, there was a strong dominance of answers 4 (41%), with 26% most favorable answer, 14% of the middle one and 8% of the least favorable one.

Company D had the same percentage of answers 4 as company C, about 21% each of answers 5 and 3 and nearly 10% of the worse answers.

Graphical representation of the results can be seen in Figure 2.

Figure 2. Results of the questionnaire with regard to each company

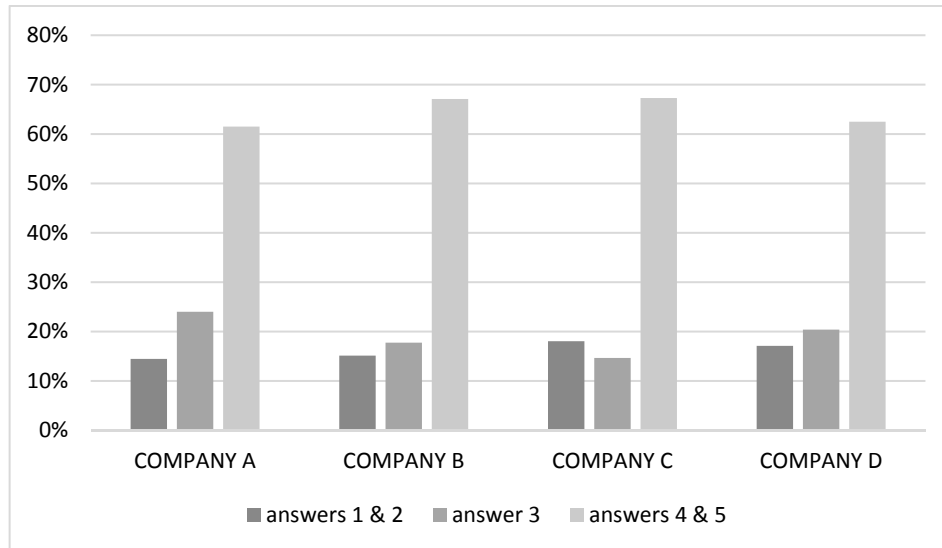


4.3. Comparison of the questionnaire results among the surveyed companies

Comparison of the questionnaire results among the surveyed companies shows percentage of aggregated values of answers 4 & 5, 1 & 2 and the middle answer 3 provided by the employees of each company. The comparison can be seen on Figure 3.

The highest and almost identical percentage of the most favorable answers (4 & 5) was obtained by companies B and C, but it was also company C that had the highest percentage of the least desired answers (1 & 2). Company A has the highest percentage of the middle answer (3).

Figure 3. Comparison of survey results among companies



5. Discussion

The main goal of the small scale study described in the previous section was to validate and present the usefulness of the concept for measuring communication effectiveness in project teams. It can be successfully applied to measure and analyze communication effectiveness of individual team members, the whole company/team and to compare the communication effectiveness among companies or teams. The intention was to propose how communication effectiveness can be measured and evaluated and that it can be a way to assess communication effectiveness of particular team members, different project teams and whole organizations.

It is, however, important to have in mind a certain weakness of the presented concept, which is due to the fact that the obtained answers reflect only declarative communication habits and behavior of the surveyed team members which are not confirmed otherwise. As some studies prove, the discrepancy between declarations and reality can be quite big (Szyjewski & Fabisiak, 2017).

But despite this frailty, the proposed concept of measuring communication effectiveness may help to identify possible problem areas regarding communication, as well as bring to the attention of the respondents all important aspects of the communication process which they may have not been aware of.

6. Conclusions

6.1. Research contribution

The concept of measuring communication effectiveness in project teams introduced in the paper and exemplified with a small scale study offers an easy to use method for evaluating and monitoring communication effectiveness of individual team members, whole teams/organizations and comparing communication effectiveness between teams/companies with respect to 19 communication effectiveness aspects. The results are presented in a graphical form, which facilitates their analysis. So far, no similar tool for measuring effectiveness of communication in project teams has been proposed in the literature.

6.2. Research implication

The presented proof of concept confirms that it is possible to measure communication effectiveness in a full range of aspects affecting it in a fast and uncomplicated way. The proposed concept may prove beneficial for project teams to access their communication habits, find possible problem areas or notice communication effectiveness aspects which are being neglected. The comprehensive list of aspects that influence project communication effectiveness identified through an in-depth analysis of available literature may be used in future research regarding communication in projects.

6.3. Research limitation and future works

The weakness of the proposed concept lies in the declarative character of the information provided by the respondents concerning their communication habits and behaviors. That is why future research could include some form of verification of the obtained declarations. This could be done by the analysis of communication records (email, logs, messages, documents, etc.), communication networks or in-depth interviews. All these methods are, however, highly time-consuming and demanding, that is why their usage should depend on the seriousness of the communication problems in a given project team or organization.

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