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DETERMINANTS OF AN EFFECTIVE COMMUNICATION SYSTEM IN A PROJECT TEAM

Abstract: Effective project communication is one of the most important elements which determine project success. It is however difficult to achieve because of the multitude and variety of communication channels, project stakeholders and events that generate various kinds of information that has to be managed. In order to create an effective communication system in a project team such aspects as communication channels and communication forms within each channel, message information contents and time for response or delivery frequency as well as specification of applicable telecommunication and information technology tools should be defined and described. Such a communication system should also include the whole project life cycle and all project stakeholders. All these issues constitute the determinants of an effective communication system, whose description and analysis is the subject of the present paper.

1. Introduction

Communication is the key element of project management, as it is the link connecting all the phases, aspects and stakeholders of a project and the communication system influences the efficiency of the project team performance. According to the results of a survey conducted among over one thousand project managers, poor communication is the number one cause of project failure [Baar 2007]. Each project requires a well-thought-out and planned communication process with clearly defined expectations, roles, obligations and assigned responsibility. In the case of international projects there are additional aspects influencing the methods and forms of communication such as culture, language and time differences.

On the one hand numerous research and studies indicate the great importance of project communication system and on the other, project managers usually pay little

attention to the communication process realization methods, assuming that communication is something natural that does not have to be planned and organized. Therefore there is a need for deeper analysis and description of communication system within a project team. This could form the basis for constructing a communication model, which would organize the communication process among the project stakeholders with the use of telecommunication and information technology tools.

Effective project communication system ensures collection and distribution of essential information in due time, to appropriate addressees, in a proper form during the whole project life cycle. Such a system should include definitions and descriptions of communication channels and communication forms within each channel, message information contents and time for response or delivery frequency, applicable telecommunication and IT tools, and take into consideration the whole project life cycle and all project stakeholders. All these aspects influence the efficiency and quality of communication within a project team and their analysis and description is the aim of the present paper.

2. Components and determinants of the project communication system

The project communication system should show the way the communication process among project stakeholders is organized. The main components of the system are as follows:

- 1) people – project stakeholders who exchange messages and project documentation,
- 2) methods and processes – methods of organizing communication within a project team and project management and communication management processes,
- 3) technology – tools which are used for creating, sending, collecting and distributing project documentation and for the management of message exchange among project team members.

The above mentioned components indicate the complex nature of the communication system, as it includes human, organizational as well as technological elements. All of these areas must be harmonized in order to insure effective project communication.

The following determinants of the communication system within a project team will be analyzed and described in the further part of the present paper:

- 1) inclusion of the whole project life cycle within the communication system (all project development phases),
- 2) inclusion of all project stakeholders within the system,
- 3) inclusion of all communication channels within the system, both these inside the project team and those with the outside units,
- 4) telecommunication and information technology application.

3. Communication system and the project life cycle

The assumption regarding the inclusion of the whole project life cycle within the communication system means that the system should show the way communication is supported in each phase of the project development. This is essential to emphasize the comprehensive attitude to project communication management. Partial solutions will not meet the expectations and will not contribute to any significant improvement in project communication management.

Depending on the type of project as well as on the applied project management methodology there are different approaches to dividing project life cycle into phases. The most general approach distinguishes only three phases: initial (planning), intermediate (realization) and final (evaluation). The most common approach identifies four project development phases although they can assume different names. The first phase, when the problem is recognized and feasibility study is carried out, is called: initial planning, initiation, goal setting, specification or project concept. The second phase is mainly devoted to planning and is called: detailed planning, detailed study, project plan creation, or simply planning. The third phase is dedicated to project realization according to the plan prepared during the previous phase and is called: construction, realization, production, execution or implementation. The last project life cycle phase is the completion phase called also evaluation, turnover or closure [Burton, Michael 1997; Duncan 1996; Kerzner 2003; Waćkowski, Chmielewski 2007].

There are also examples of breaking the project life cycle into more phases, which depends on the characteristics of a project or of the project's product. For the purpose of the above mentioned communication system, the most popular four-phase project life cycle seems to be the most appropriate as it is the most universal and adequately detailed at the same time.

The initial phase consists in defining the project concept and requirements identification. In that stage communication processes are particularly intensified and numerous. It is the phase of project team creation and establishing the project's scope with the client, which results in various types of meetings with the client's representatives and presentations. In this phase most of the communication is the external communication – with the client. At the same time documentation in the form of requirements list, diagrams, prototypes is created, which is used by the project team members in the next phases for planning and realization of the project. That is why already at this initial stage it is advisable to create a project repository, which will be systematically supplemented in the next phases [Szyjewski 2004]. Telecommunication and IT solutions should be used to support cooperation between the project team and the client already at this early project stage. What is important is that application of such IT solution cannot imply a need to buy or install any additional software on the client's side. A good idea to achieve this goal is to provide access to all necessary functions through a web browser.

In the planning phase a higher percent of communication is the internal communication within the project team, which is especially important with geographically distributed teams and large projects development. It is the phase when detailed project schedule, work breakdown structure, activities networks as well as communication and control plans are created. It is crucial that the results of this phase are distributed to all project stakeholders and that all project participants are constantly informed of any updates and modifications which appear [Trocki et al. 2003]. In this project life cycle phase there is a need to support communication process with IT tools in order to set the schedule, work breakdown structure, detailed plans for the next phases and plans for other project aspects.

In the realization phase communication takes place mainly among project team members and serves coordination and control of the project work. More and more documentation, diagrams and reports are created. Continuous monitoring of work pace and compliance with the schedule is necessary and in the case of any changes the schedule must be updated and information about the modifications distributed. It is also essential to pay attention if the project work follows the scope and the product which is created meets the client's requirements [Pitagorsky 2004]. This life cycle phase is especially demanding in the field of communication support with information and telecommunication technology tools as there is a need for constant project information exchange concerning changes, progress, achieved milestones, or other documentation.

The completion phase is the time for the assessment of final project results and for revising and archiving lessons learned. In that stage external communication intensifies again, which is connected with the delivery of the final product to the client. To take full advantage of the lessons learned and use this knowledge in future projects it is advisable that the system supporting project communication has features of a knowledge management system. Such systems, in addition to collecting information, order it and facilitate creation of different views of data for different users.

4. Communication system and project stakeholders

The assumption regarding the inclusion of all project stakeholders within the system means the necessity to include both project team members and stakeholders on the client's side. This also emphasizes the comprehensive attitude to project communication management. If only some of the participants use communication support system and have access to project documentation and others are not being informed and are not included in the system it may result in information chaos and finally in deterioration of communication system within the project team.

The key project stakeholders include:

- 1) project manager – the person who is responsible for managing the project,
- 2) client – the person or organization who will use the project's product; there are usually two categories of a client distinguished: customer that refers to the company

that signs the contract with the performing organization and acquires the project's product and users who directly utilize the project's product,

3) performing organization – company whose employees are most directly involved in doing the work of the project,

4) project team – a group of people assigned to perform project tasks,

5) project management team – the members of the project team who are involved in project management activities,

6) sponsor – a person, group of people or an organization unit that provides financial resources for the project and “takes care of it”, which means insuring support and favorable atmosphere for the project development and helping to overcome arising obstacles,

7) influencers – people who are not directly related to the use of the project's product but who can influence, positively or negatively, the course of the project.

Proper identification of project stakeholders is a very important issue and can determine the project's success or failure [Stępień 2008; Verzuh 2005].

Each stakeholder has different information needs what should be reflected in the considered communication system. In the case of project manager, who is responsible for managing and coordinating the project the information range supported by the IT communication system should be very wide. This information however is usually not so detailed as information exchanged among project team members. As far as the sponsor is concerned, his information needs are still different and the communication management system should reflect that fact and support appropriate information for each user.

5. Communication system and the project communication channels

The assumption regarding the inclusion of all communication channels within the communication system means that all the communication channels between all project stakeholders within the whole project life cycle must be described in detail. This aspect, similarly like previous ones, also emphasizes the comprehensive attitude represented by the communication system. A detailed description of each channel should include the sender, addressee, message contents, message form and frequency of delivery or time for response. It is also worth mentioning that, depending on the project life cycle phase, a given communication channel between two project participants may have different contents, different form or delivery frequency.

In order to calculate the number of communication channels in a project the following formula is used: $K = n(n-1)/2$, where n describes the number of the project participants. As can be seen, increase in the number of project stakeholders results in a near exponential increase in the number of communication channels. If the team size exceeds 10 people, face-to-face communication tends to break down and more needs to be written, which takes longer and conveys less information. The larger

the project the higher the probability that communication gaps will occur [Griffiths 2007].

To determine the communication channels and their information content, form and frequency of message delivery different kinds of methods are used. One of such methods is preparing a matrix form containing, in columns or rows, levels of communication (channels) and ascribed to them form and frequency of delivery [Mingus 2002]. It is a good method for preparing project communication plan and determining preferred forms of information exchange, what can be then reflected in the selection of adequate IT tools for supporting communication and facilitating access to the project documentation.

To make it possible to include all communication channels in the communication system it is crucial to identify them, describe in detail and list possible forms of their realization. The next step includes selection of appropriate methods, technologies and IT tools, which will contribute to perform project communication in the best possible form.

6. Communication system and telecommunication and information technology

The assumption of applying telecommunication and information technology in the communication system indicates the conviction that its application can significantly improve project management and contribute to the project's success.

In project development different forms of communication are used: verbal (formal and informal), written (formal and informal). Each of these forms has its advantages and disadvantages and each is appropriate for a given communication channel or a specific kind of message, that is why all of them can and should be used in the project team communication system. The assumption is, however, that the widest possible range of communication among project team members and other project participants should be supported by telecommunication and information technology, what will result in communication effectiveness and transparency improvement, as well as prevent information gaps and contribute to project knowledge base creation.

One of the best ways of supporting communication management in a project is application of an Internet portal. It is a system which, on the one hand, supports group work of the project team members and, on the other, ensures cooperation of the project team with the client and future users. It has to be a solution which ensures appropriate document and communication flow among all project stakeholders and enables constant control over project development progress. An additional advantage of such a portal is a possibility of archiving collected information, messages and documents in a manner, which makes it possible to quickly and effectively access desired information in future projects. This means that such a portal should have the features of a knowledge management system. In the next step the functionalities of such a portal should be examined. The most important include:

- task management, monitoring task status,
- graphical form of task realization progress
- control, monitoring and notification of changes within the project,
- file archive creation, versioning,
- bugs detection,
- calendar,
- notebook, project discussion forum,
- statistics and project reports.

To support verbal communication, teleconferencing and videoconferencing tools can be used. For supporting meetings, there are Group Support Systems. What is important is that even informal electronic conversations and exchange of ideas concerning the project could be archived and used if needed, because often such informal communication among project team members is the source of many interesting ideas and solutions, which are worth saving. It also serves well project knowledge base development and prevents crucial information loss in the case when a key team member resigns from the project. Communication system can also be a combination of separate but appropriately selected and integrated IT tools, whose functionalities form a well coordinated network.

The assumption of applying telecommunication and information technology tools to communication system aims at structuring and improving effectiveness of project communication and increasing project stakeholders' responsibility for the communicated messages and documents.

7. Conclusions

In the face of growing market competition and pressure on the project development cost and time reduction, effectiveness of project management is strongly desired. According to numerous surveys and studies, one of the most neglected areas in project management is project communication process organization, that is why it needs special attention. It is also doubtless that in the current technologically advanced era it is not only advisable but even inevitable to support project communication with telecommunication and information technology. It is however the way of organizing this support, which should be especially stressed. The present paper brings special attention to the comprehensive attitude to the topic. The basis for the considered information technology communication system is to include the whole project life cycle, all the stakeholders and all communication channels which exist among the project's participants within it and to apply appropriately selected telecommunication and information technology tools wherever and whenever such communication realization form is most effective. Application of such a communication system aims at improving project communication process and increasing probability of the project's success.

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