

1. Name of Skill

Communication Skill in software project management

Wikipedia defines communication as follows:[1]

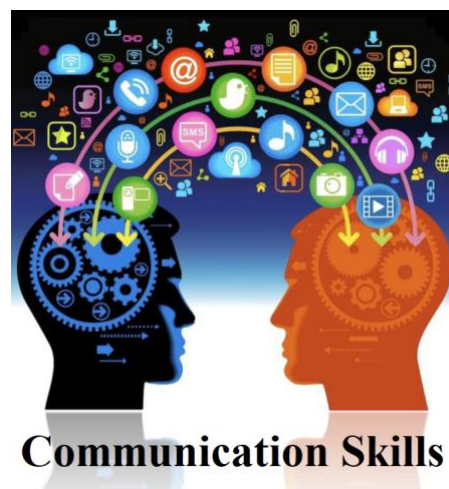
Definition: Communication (from Latin *communicare*, meaning "to share") is the act of conveying meanings from one entity or group to another through the use of mutually understood signs, symbols, and semiotic rules.

In the same page we also see the different types of communication such as Non-verbal communication, Verbal communication, Written communication, Business/Corporate, Political, Family or Interpersonal. My selected skill is about communication for a software project manager and what is necessary to communicate better and more effective. Therefore, this is more relative to business/corporate communication.

definition of business communication from business communication | Handy Answer: The Handy Communication Answer Book [2] as follows:

Definition: exchanging information in order to promote an organization's goals, objectives, aims, and activities, as well as increase profits within the company[3]

Business communication includes many topics and we investigate the related topic to software project management in this paper. Software Engineering Body of Knowledge book[4] categories communication skills under Software Engineering Professional Practice area. The main set of skills discussed in this book concerns about verbal and written skills. Skills are writing, reading, presentation and team communication. Based on the above information and some research that I did [4][5][6][7][8], I found the above list as good candidates for important areas to focus.



2. Classification of Skill

Soft skills

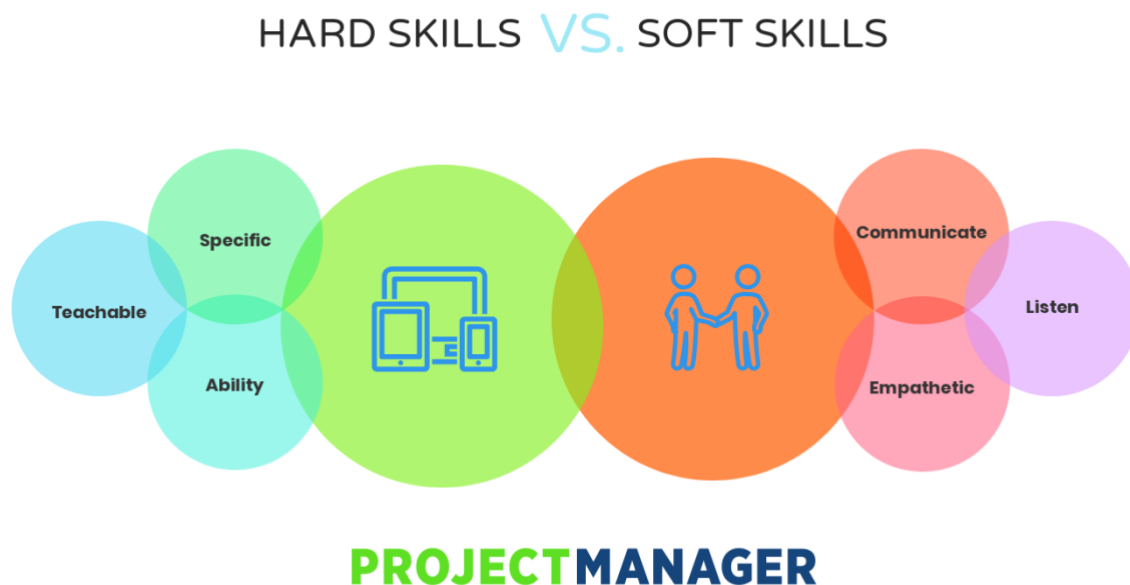
Communication skills belong to soft skill classification. Here are some definitions of soft skills.

Definition: Soft skills are a combination of people skills, social skills, communication skills, character or personality traits, attitudes, career attributes, social intelligence and emotional intelligence quotients, among others, that enable people to navigate their environment, work well with others, perform well, and achieve their goals with complementing hard skills.[10]

Investopedia defines soft skills as follows:

definition: Soft skills are character traits and interpersonal skills that characterize a person's relationships with other people. [11]

skills come to make us work better. We can use and promote our technical skills more efficiently. In positions such as management of a software team it is important that the manager use the best practice of such skills.



Hard Skills vs. soft skills [12]

The only Prerequisites are past experience, a suitable personality and good communication skills. you need to be able to communicate adequately in English

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3. Prerequisites for Skill

it is required to be able to have:

- Basic but profound knowledge of computer science.
- The person must be willing to engage in different situations and communicate well.
- Basic but profound knowledge of project management and software engineering.

It is an important prerequisite that the person knows the basics of the technologies that are going to be used in the project. This helps easier communication between the project manager and other more technical team members because both parties are more familiar with technical terms.

4. Related Software Engineering Area(s)

- As a soft skill this skill belongs to the Software Engineering Professional Practice area of Software Engineering Body of Knowledge (SWEBOK Guide)[1].

Software Engineering Professional Practice is recommended in different reputable engineering institutions. ACM/IEEE-CS Joint Task Force on Software Engineering Ethics and Professional Practices recommend and approve as the standard for teaching and practicing software engineering.[13]

5. Rationale for Skill

Effective communication, if not the most, is one of the most important skills for a software developer. Generally, it is important to be able to communicate with different stakeholders as not being able to communicate well can have catastrophic results. For instance if a software developer has a different understanding of a requirement than the customer and they don't communicate well, there could result in bugs that can be very expensive. This study[14] illustrates the role of effective communication for a software developer. They named communication skills as important as technical skills for a software engineer career development.

As mentioned in the introduction, the Software Engineering Professional Practice area is naming written writing, reading, presentation and team communication as important communication skills. In this section we investigate each of these skills and justify the rationale

Writing:

Wikipedia defines technical writing as:

Definition: Technical writing is writing or drafting technical communication used in technical and occupational fields, such as computer hardware and software, engineering, chemistry, aeronautics, robotics, finance, medical, consumer electronics, biotechnology, and forestry.[15]

computer.org(IEEE computer society) defines technical writing as:

Definition: Technical writing is a form of communication that attempts to take a technical field (like programming or software development) and convey ideas from that field as efficiently as possible, sometimes to other experts, and sometimes to non-experts.[16]

The document emphasises that technical writing is infact a type of traditional writing but there is a distinction due to the specialized or technical words. This emphasizes the need to be familiar with basic knowledge of software engineering and computer science.

Reading:

Wikipedia defines reading as:

Definition: Reading is the complex cognitive process of decoding symbols to derive meaning.

Reading is an essential part of communication in software project management. Managers must have reading skills as it improves their management style. Reading efficiently will increase both the amount of knowledge that a person can acquire and also the retention of the acquired

knowledge[17]. There are several techniques that can increase the quality of reading. Among them, speed reading techniques are shown to be effective in both speed and comprehension. [18]

Presentation:

In the university of british columbia wiki page, presentation skills defines as:

Definition: the skills you need in delivering effective and engaging presentations to a variety of audiences. [19]

A software project manager is presenting many parts of the project to different team members. This can be a small feature discussion or whole project presentation for a client. It is important to follow the important criterias to perform well in a presentation. A good presentation can help for others to understand you better.



Watch video[<https://vimeo.com/44267609>]

team communication:

Wikipedia defines teamwork as:

Definition: Teamwork is the collaborative effort of a group to achieve a common goal or to complete a task in the most effective and efficient way.[20]

Team communication is a part of team work. This skill is for a software project manager who needs to improve the connection between team members.



Watch video[<https://youtu.be/kYjqtLCNqSA>]

6. Roles for Skill

Communication, done effectively, is a significant skill in the career path of a software engineer. In this paper focus on roles related to software engineering management. We investigate some roles like project management, IT manager, Software Development Manager and team manager.

A software project manager is responsible for tasks such as project planning, time management or budget and cost estimation. Many job postings for software project manager positions include the ability of communication as well as one of the important job qualifications.

Watch: a day in the life of a project manager. As we see communication is an important part of a manager's job.



Watch video[https://youtu.be/_LDEHVIWV18]

7. Work Related to Skill (Related Activities and Artifacts)

This study[21] shows that Soft skills and communication has shown to be an important part of the job applications.

In another study[22] they provided communication skills courses for software engineering students. They provided many class activities and assignments. The results show that the students improved in communication skills and team work after finishing the course.

A research by[23] measured the effectiveness of team work on communication skills. Their results shows that ho improving these skills increase the product quality

8. Real-World Example/Scenario of Skill (Text, Graphic, Audio, Video)

This section studies couples of situations in which communication is an essential related to software project management. Situations like a job interview or managing a software team. Communication is an important skill, in fact studies show ineffective communication is the main reason for one third of the project failures[24].

Job interviews:

Communication skills can help in different steps of a job interview. It is important to have proper written practice while communicating with the representatives from a company. During the job interview it is crucial to communicate well verbally and present yourself well.

Team management:

a situation in which the manager has a different understanding of a feature from the customer is a real world example that shows the use of correct communication practice.

Engineering Project Management Learning

Communication skills can improve the learning process of project management. For instance, in a study by[25] the authors investigated the communication aspect of becoming a good project manager. They used a role play method (with roles of team member and project manager). The results show the significance of communication in learning project management.

9. Role of Academia or Industry in Cultivating the Skill

In academia there are many ways to reinforce communication skills. These ways could be the group projects, workshops and even credit subjects. Industry too, provides many opportunities to practice communication skills. Opportunities like workshops, conferences, coaching or providing tools to ameliorate communication. This part of the paper provides such examples.

University of toronto - Engineering Communication Program

An academic structures program to improve communication skills for engineers. The program works with industry and the goal is to improve engineers communication skills.[26]

Companies can provide workshops to improve communication skills for managers. Companies can also systematically apply these workshops in their practice. For example, BCIT Workplace Communication Workshops[27] provide corporate training for communication skills.

business communication course

A edX online course provided by Rochester Institute of Technology. The course provides a short but rich content in business communication and is a great tool to learn more about communication.[28]

10.Tools Supporting the Skill

Depending on the type of communication, there are many tools to facilitate communication between managers and team members or stakeholders. This paper provides some of the best tools a software project manager can use to improve and support their communication skills.

Tools:

Microsoft Teams: Is a communication tool for team members to collaborate with each other. The software provides many features such as chat, meetings, remote access and ms office integrity. A great tool to manage communication among team members.[29]

Zoom: A cloud-based peer-to-peer service that provides communication services to clients. Zoom is widely used in industry and academia as a medium of communication.[30]

documentation: a great way to communicate with project stakeholders. Practicing proper documentation methods provides a great opportunity to communicate. For example, when we write code it is important to document the code's behavior. This helps the project manager to understand it easily and more conveniently. Here is a very interesting reading about the role of documentation in communication.[31]

Grammarly: great tool to grammar check written documents. Using proper grammar can have a significant difference when it comes to communicating efficiently. This online tool is integrated with many other applications and provides a great service in different platforms.[32]

Speed Reading: Books such as Speed Reading with the Right Brain: Learn to Read Ideas Instead of Just Words by David Butler[33] or The Evelyn Wood Seven-Day Speed Reading and Learning Program by Stanley D.

11. Skill Self-Assessment (My Skill Score (1 – 10) and Reasons for Self-Assigned Score)

In this section I provided a self assessment of my communication skills based on the communication section in this questionnaire[34] from exeter university in uk. U used these areas as a reference to assess myself before and after the project. I would rate myself with skill score of 7.5-8 after doing the project. I rate myself 6-6.5 before doing this project. This project introduced my new ways of improving my communication skills. I read about speed reading I can really see the difference as I am becoming better. The group project helped me communicate better with my teammates especially in pandemic time. I think my verbal communication improved during this project.

BEFORE THE PROJECT	1	2	3	4
Present oral/visual information competently			X	
Use appropriate language in a range of activities (essays, reports, presentations, interviews)			X	
Listen actively and effectively		X		
Offer constructive criticism		X		
Verbal communication (speak fluently and confidently to a variety of audiences)			X	
Produce a variety of written documents (using appropriate formats, accurate information, spelling, punctuation and grammar)		X		
Use charts, diagrams and other illustrations to support verbal and written communication		X		
Evaluate and adapt strategies for communication		X		

BEFORE THE PROJECT	1	2	3	4
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Listen actively and effectively			X	
Offer constructive criticism		X		
Verbal communication (speak fluently and confidently to a variety of audiences)			X	
Produce a variety of written documents (using appropriate formats, accurate information, spelling, punctuation and grammar)			X	
Use charts, diagrams and other illustrations to support verbal and written communication		X		
Evaluate and adapt strategies for communication			X	

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