

Effective Communication and Connection with People



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The word communication comes from the Latin word, *communicare*, which means to impact or to make common. Getting to that requires transformation and transmission of information. To have effective communication, the information that is transmitted must establish a connection between the speaker and the listener.

According to leadership expert John C. Maxwell, connection in communication is the ability to identify with people and to relate to them in a way that increases one's influence on them. The ability to communicate and connect with others is an important determining factor for an engineer to reach his or her potential. Therefore, to become successful, an engineer must learn how to communicate effectively.

COMMUNICATION IN ENGINEERING

Engineering is defined as the application of science and mathematics to solve problems. However, in the context of communication, engineering may be viewed as a transformation process in which information is received, converted in some ways and the results or output transmitted to others (as illustrated in Figure 1).

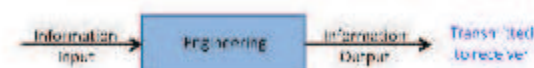


Figure 1: Engineering as a transformation process

The information input may consist of the work statement, directives, company standards and practices. The engineering transformation involves a complex process of analysis using trained skills, technical experiences as well as practical utilisation of the knowledge of science and mathematics which is largely hidden to outsiders.

The information output can be in the form of physical models, technical drawings, design specifications and technical reports. Unless the information output is properly communicated and connected, the meticulous engineering transformation process may be of little use. Yet, many engineers lose interest once a problem is solved and are often reluctant to prepare a concise report or to document the results

which may be useful for effectively connecting with outsiders or receivers. There have been numerous reports that "engineers cannot communicate" and that young engineers face great difficulty in expressing themselves and interacting with business communities.

Many parties have expressed their concerns over this and have strongly recommended that university authorities incorporate writing, oral and interpersonal communication skill subjects as part of engineering courses.

MODELLING THE COMMUNICATION PROCESS

Information input, transformed, output, transmitted, received and connected is the basic flow for effective communication in engineering. Figure 2 shows the communication model process (slightly modified) developed by Koontz and Wehrich. Each step is described as follows:

- Engineering transformation process that analyses and synthesises problems as provided by information input. Results or output are encoded into English or other languages, a computer code, mathematical expression, technical drawing, design specification or technical report with special consideration of the nature of the intended receiver.
- The code must then be transmitted via some selected medium as listed in Figure 3. The engineer must think carefully and choose the right medium which will give an effective impact and connection to the receiver.
- The reception of the message may be hindered because of distraction (noise) inhibiting the transmission or causing inattention on the part of the receiver. Examples are delay in schedule, change in intention of the receiver, interference from

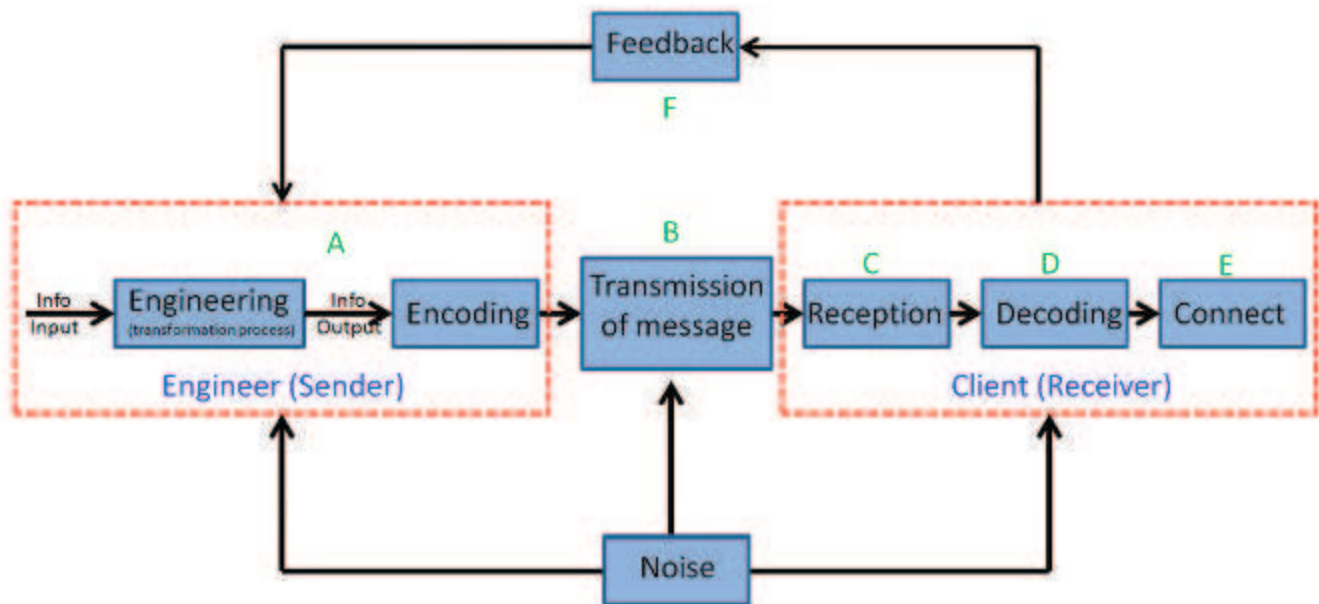


Figure 2: Communication (in Engineering) Process Model

other parties or special demand with regards to work contents.

- d) The message is then decoded, which is effective only if both the sender and receiver attach the similar meanings to the symbols used in the message.
- e) Connect is when the receiver or client understands the intended message delivered by the engineer.
- f) Feedback is very essential for effective communication. It enables the engineer to determine exactly what the receiver understands and to correct any miscommunicated message.

COMPARISON OF COMMUNICATION METHOD BY ENGINEER

1. Characteristic

Communication can be transmitted in many ways, each with its own advantages and disadvantages, as indicated in Figure 3 below.

2. Retention of information

According to Babcock & Morse, studies have proved that a learning experience which uses bio-sensors (audio, visual) and active participation, has a significant impact on the retention of information as summarised in the following:

We tend to remember

- 10% of what we read
- 20% of what we hear
- 30% of what we see
- 50% of what we hear and see
- 70% of what we say
- 90% of what we say and do

When our involvement is

- passive reading
- passive verbal receiving
- passive visual receiving
- passive visual receiving
- receiving and participating
- being

Communication Method	Speed	Feedback	Record Retain?	Formality	Complexity	Cost
Informal conversation	Fast	High	No	Informal	Simple	Low
Oral presentation	Medium	Medium	Yes	Formal	Medium	Medium
Telephone conversation	Fast	Medium	No	Informal	Simple	Low → Medium
Internet	Fast	High	Yes	Informal / Formal	Medium	Low → Medium
Tele-conferencing	Fast	High	Yes	Formal	Complex	High
Letter	Slow	Low	Yes	Formal	Medium	Medium
Formal Report	Slow	Low	Yes	Formal	Complex	High

Figure 3: Characteristics of Common Communication Method

3. Effectiveness

According to author Thomas B Smith, effectiveness in transmitting information that can connect with the receiver is also determined by the media of communication. In the order of decreasing effectiveness, these are:

1. Verbal plus written presentation
2. Verbal only
3. Written only.

For effective communication, it is recommended that the engineer utilises both the verbal and written approach. For example, prepare in detail a written analysis with perhaps a graphic or drawing presentation which will appeal to the understanding level of the receiver. Make an attempt to approach the client or receiver and explain information output of the written material as mentioned earlier.

It is common to see an engineering transformation process that yields many complex analysis results and is supported by an abundance of information output. As such, in the course of preparing the written material, it is important that the engineer participates fully, previews carefully, practises presentation and anticipates potential questions from the receiver. These are good ways for an engineer to retain information which is expected to be delivered in a confident manner to the receiver.

OTHER FACTORS IN EFFECTIVE COMMUNICATION

1. Active listening

This is about paying attention and listening positively to the speaker with the aim of understanding the content and absorbing the right information that will allow the engineer to act effectively. By making a conscious effort to digest what others have to offer, the engineer can gain useful information and identify opportunities for improvement. Listening also demonstrates to the speaker that his or her views and feelings are appreciated; this is a vital component for building relationships based upon mutual respect.

Listening skills can be learnt and trained. Here are some key points for active listening:

- a) Project a positive and active facial appearance.
- b) Focus attention on the speaker when he or she speaks. Listen carefully and try to pick the content. Defer judgment by reflecting on the true meaning of what is being said.
- c) Take notes to help you retain the right and important information
- d) Analyse the speaker's attitude and frame of mind. Is the person an optimist or pessimist? Generally, is the speaker reliable or unpredictable?
- e) If possible, assemble meaningful responses that assimilate the various points made.
- f) Consider the speaker's non-verbal language (or body language) when he or she is speaking.

These simple steps of listening allow the engineer to communicate effectively with insight and value. Active listening demonstrates professionalism. It can enhance an engineer's reputation and improves the quality of decision making.

2. Non-verbal Communication

Studies have shown that verbal, vocals and facial expression have a profound influence on the effectiveness of oral communication. The percentage of effectiveness is as follows:

- 7% Verbal (words)
- 38% Vocal (pitch, stress, tone, length and frequency of pauses)
- 55% Facial (expression, eye contact)

It is obvious that to become effective in oral communication, the engineer must, just like a professional actor, learn to control vocals and facial expression in order to create impact and to connect with the audience. Body language,

such as posture, gesture and body movement, is equally important to influence and gain the attention of listeners. Attending special courses, reading self-improvement books, observing good speakers and making a committed effort to practise are some useful ways to improve non-verbal communication.

IMPORTANT COMMUNICATION TOOLS

1. Written report

The results of the engineering transformation process are often documented in a formal, written technical report. The usefulness of this report is determined by whether it is read and understood. Some key points that need consideration in writing effective report are as follows:

- a) Complete data mining, gather all relevant information and allocate adequate time to write the report. Rushing to complete a report may lead to some salient points being excluded.
- b) Begin with a brief introduction to give the reader an idea what the objective of the report is.
- c) Consider putting conclusions and recommendations at the beginning, followed by essential discussions, with peripheral material relegated to appendixes.
- d) Outline the report carefully and write according to the outline. Spend time to check for clarity.
- e) Correct spelling and proper grammar are important because these indicate the value of the writer and the report. It is good practice to let someone else, a colleague for example, check the report and provide feedback. Make corrections if necessary.
- f) Most importantly, write with a sense of responsibility, based on actual facts concluded from the engineering transformation process (engineering principle based analysis).

2. Visual aids

Today, visual aids, especially computer software such as Power Point and projectors, are used widely for presentation purposes. Power Point is equipped with a variety of functions suitable for presentations and, if smartly applied by the engineer, can greatly enhance communication effectiveness.

Here are some key guidelines for preparing Power Point presentation slides.

- a) Select the right font and size for visibility and appeal. It is good practice to maintain consistency in font type and size for every slide.
- b) Select the right background template. Avoid fanciful templates that have confusing graphics or bright colours which may overshadow the main point of the subject.
- c) To add to presentation creativity, the engineer can include animation to create attraction and keep the audience attentive. But again, do avoid excessive usage which may overshadow the main presentation point.
- d) For each slide, put in only important statements or short sentences for the audience to easily capture the main point. Do not fill the entire slide with words or sentences. Remember that an oral presentation is for the audience to listen to the verbal explanation by presenter (engineer) while slides are used to help them get a better understanding.
- e) Allow a presentation time of 1-2 minutes for each slide.
- f) The first slide should give the title of presentation and name of presenter (or engineer). The second slide should provide the outline of the presentation.
- g) The final slide should summarise the entire presentation and message that the engineer intends to deliver.
- h) If you need to use a slide more than once, insert a second copy in the appropriate sequence.
- i) If there is a need for discussion between slides, insert a blank slide to avoid distraction.

3. Oral presentation

An oral presentation is a verbal explanation of the results of the engineering transformation process to receivers such as the client, a superior or fellow workers.

The results to be shared are normally engineering analysis, findings and recommendations for a certain problem assigned to the engineer. An oral presentation provides opportunities for the engineer to closely interact with and to influence the receiver (audience) with regard to his work and abilities. To enhance the effectiveness of an oral presentation, the above-mentioned tools, such as a written report and visual aids, may be applied.

It is strongly recommended to allow a question and answer (Q&A) session at the end of the presentation. This serves two important purposes. Firstly, it's an opportunity for the audience to get a better understanding of the presentation and secondly, it's an opportunity for the engineer to get feedback for possible improvements.

The essence of effective oral presentations is none other than preparation and practice.

Preparation includes:

- Defining the oral presentation goals to be accomplished
- Identifying the audience. If the audience consists of technocrats, the oral presentation should be focused on technical explanations. But if the audience is from the business community, then a financially-based explanation will be appropriate.
- Outlining important points to be explained to avoid distractions and needless hours spent on discussion.
- Updating details and preparing effective supporting materials such as visual aids, flip charts, drawings, models etc.

Practice includes:

- Reviewing and identifying weaknesses that must be tackled before the actual presentation.
- Rehearsing to get the right vocal condition like pitch, tone, stress and pause. This also helps to ensure a smooth presentation flow.
- Getting the right timing to ensure the presentation is within the allotted time frame.

CONCLUSION

Effective communication is a major factor that guarantees a successful career for an engineer. Beside a promising career, it also helps to add value by projecting the capability and professionalism of an engineer.

Therefore, an engineer should master all aspects of communication skills – verbal, non-verbal and written. It is not impossible or too difficult for an engineer to learn. All that is required is a change in attitude and mindset to learn the skills and apply them. ■

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Congratulations

IEM would like to congratulate Ir. John Cheah *PLS* on being the recipient of the 'Anugerah Konvesyen Combi' Award 2015 for his relentless and selfless service to society in fighting dengue in the District *Jawatankuasa Tindakan Wabak Denggi* to "Fight the Bite".

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