

Communication Management

What is communication?

Communication is the process by which humans interact with each other.

Language, both written and spoken, enables us to develop ideas and plans, and then to communicate them to others. Language and communication together make social interaction possible. Without them, there would be no society and it would be impossible to engage in engineering work.

Why is communication important in engineering projects?

Effective communication is needed in all facets of engineering work. In undertaking a project, engineers have to:

- Listen to others,
- Understand others,
- Present concepts to other engineers;
- Prepare and describe clearly documents and design details.
- Question and discuss ideas,
- Give feedback,
- Write reports,
- Present proposals to clients;
- Interact with the community in consultations and public meetings;
- Take an active part in meetings,
- Engage in conflict resolution,
- Develop and manage teams
- Participate in team work;
- Counsel staff under their supervision;
- Resolve conflicts among team members;

In all engineering work Communication plays an important role:

- It dictates how problems are formulated and how they are solved.
- The quality of the communication among team members and between client and engineer determines the quality of engineering plans and design solutions.
- Good communication is necessary in order to carry good designs and plans through to successful implementation.
- Frequent and effective communication must occur among the members of any engineering team if it is to be successful.
- Lack of communication, poor communication and miscommunication in an engineering project can lead to catastrophes as was the case in the Space Shuttle Challenger disaster where different

companies' management and NASA were told of critical safety indicators by engineers but allowed the Shuttle to be launched against many people's objections.

- In engineering communication, whether direct or indirect, a great deal of information can be transmitted clearly and unambiguously through the use of sketches and drawings. These provide an added communication channel.
- Experienced engineers, when talking to each other, usually resort to simple sketches to get their ideas across clearly. The ability to sketch and the conventions used in sketching are therefore of great importance to engineers. It is very important to learn these skills.
- Sketches and figures are also used in more formal channels of communications, such as reports, design drawings, plans, and even books, and lecture notes.

Good engineering is of necessity based on good and effective communication. In order to communicate effectively with others, it is necessary to be able to present information clearly and simply and to interpret the words and emotions and nonverbal messages of others.

Fortunately, the ability to communicate effectively can be learnt. Even those who are naturally good communicators should not rely on their native gifts. In the following sections various aspects of communication that are relevant to engineering work are discussed.

Forms of communication

1. Self communication
2. Person-to person communication
3. Group /team Communication

1. Self communication

The simplest type of communication which occurs, for example, when we talk to ourselves or write notes and messages to ourselves as reminders of things we want to remember and to record information we need to keep.

2. Person-to-person communication

Human beings have many channels of communication available to them.

Like other animals, they can employ all of their five senses to communicate; however, humans use language and non verbal communication to interact.

Social communication occurs predominantly through the use of eyes, ears and voice.

Face-to-face verbal inter-personal communication between two people, one listens and watches while the other speaks, until the roles change.

However, the message sent out by the speaker is not contained solely in the words used.

Non-verbal communication takes place, both intentionally and unintentionally by the speaker and the listener to transmit information:

- Speakers's hand movements and facial expressions, tone of voice (independent of the words used)
- Listene's gestures including facial expressions which may contain a variety of signals such as agreement or disagreement, confusion, disbelief and noncomprehension.

This is an instance of **feedback**.

Throughout history, humans have devised a wide range of ingenious ways to communicate with each other using sight and sound to overcome the barriers of both space and time.

Written Communication such as notes and letters employ sight without sound.

Oral Communication using devices such as telephone, radio and television provide other potential communication channels.

3. COMMUNICATION IN GROUPS/TEAMS

In group communication more than two people talk and listen to each other. It may be that:

- everyone in the group speaks;
- one or several may speak while the others listen.

Meetings allow direct communication to occur in a group of people. Group communication can also occur through indirect channels such as written messages.

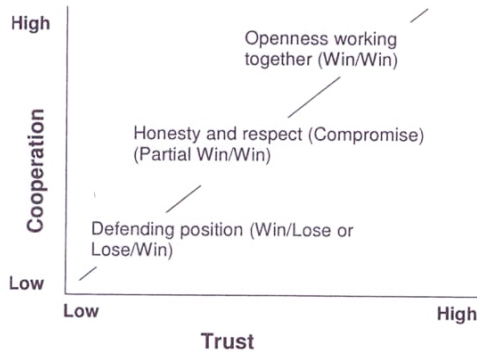
In mass communication one or several people send messages to large numbers of people. (E.g. TV, Radio, Internet)

The communication in such circumstances is often one-way, in that the receivers do not have any opportunity to send messages back to the senders.

There is often no feedback in such situations. Feedback can play an important role in communication: it provides one means for checking whether the message received is the same as the one sent. Mass communication can also take place through books and other printed documents.

The success or failure of large engineering projects inevitably depends on communication within and between groups. Engineers must therefore know the basics of communicating within groups and facilitating groups and group meetings.

Communication is an integral part of developing synergy in a group to develop trust and cooperation. Covey (1989) describes the synergy that comes from good communication as an understanding that the whole is greater than the sum of the parts. It comes from respecting differences between individuals and relies on building on strengths to compensate for weaknesses. Most importantly it requires both trust and cooperation, as seen in Figure 7.3. Note that if there is high trust and high cooperation then a win/win situation can result.

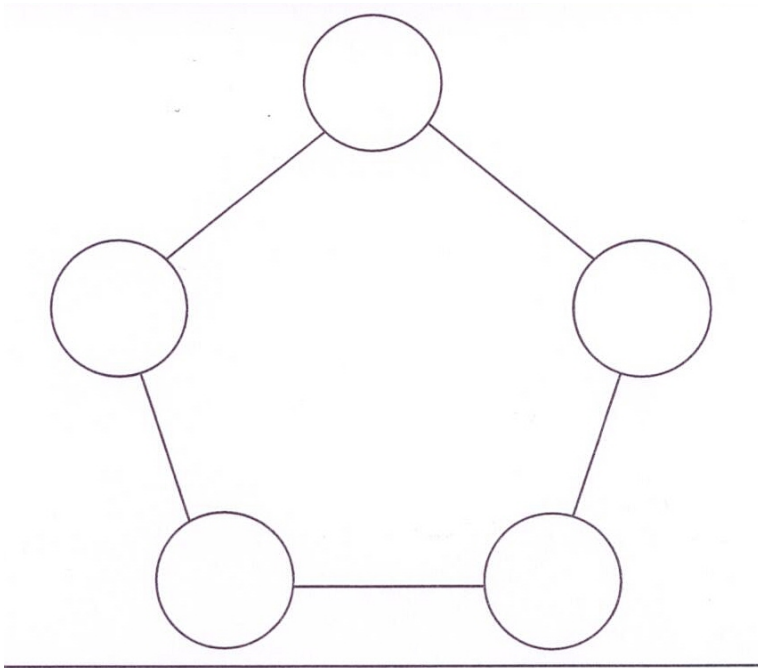


The leader of a group have to be aware of the styles-of the members of the group and the need to ensure participation from all.

In teams or groups, the more people communicate, the more complex the communications network become:

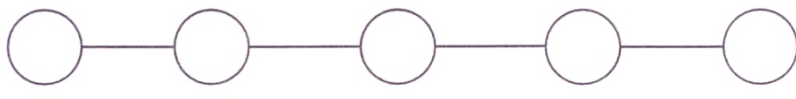
Circular Networks

A circular network shows communications in a circle. Communications in this network require some communications to pass through another communication node before reaching the intended receiver. As the circle becomes larger, there are more intervening nodes between the sender and the receiver.



Chain Networks

The chain network is commonly referred to as the chain of command. To move a message from one end to the other of this network requires that the message pass through all of the intervening nodes. This is the slowest and most error prone method of communicating, since each time the message is transferred, there is a good chance that some of the information will be lost or changed.



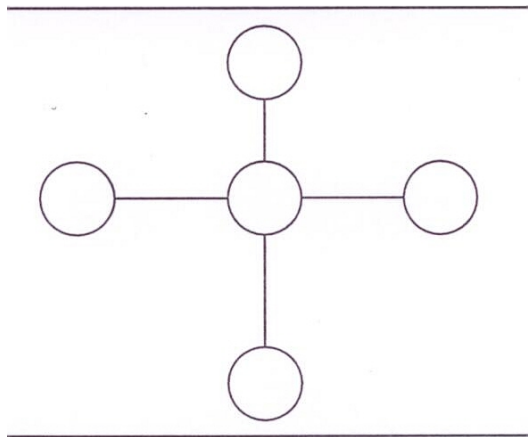
chain_network.jpg

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The Wheel

The wheel network centralizes communications and gives great power to the individual at the center.

The saying goes that "he who controls the information controls the world." All communications go through the center, and only the center gives information to the other nodes in the network.

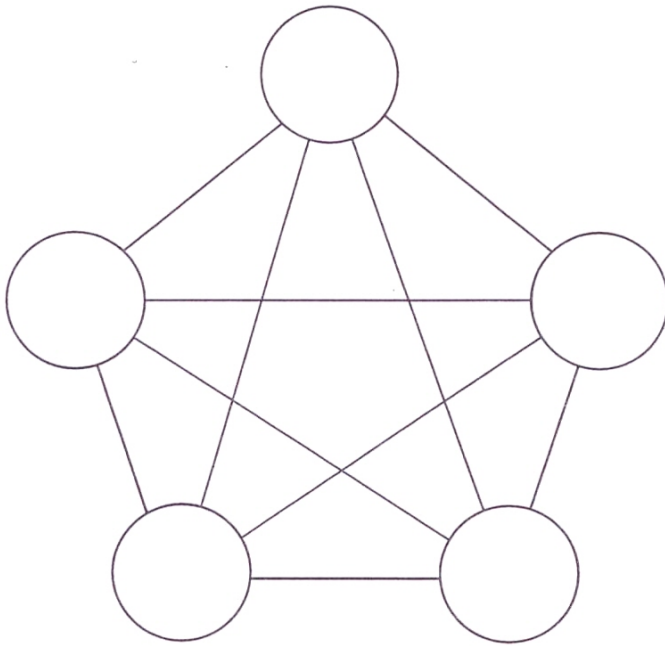


wheel_network.jpg

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Free and Open Communications

The network diagram in figure 8-8 illustrates the free and open communications model. Each node in the network is able to communicate with every other node in the network. This means that information that any member has can be communicated to any other member of the network. This network model does not come without problems.



freecomm.jpg

freecomm.jpg

The number of communication links can actually be calculated by the formula:

$$\text{Channels} = [N \times (N - 1)] / 2$$

For example, if there are five persons on a project team and it is necessary

for them to communicate with each other, how many communications channels are there?

$$\text{Channels} = [5 \times (5 - 1)] / 2$$

$$\text{Channels} = 20/2$$

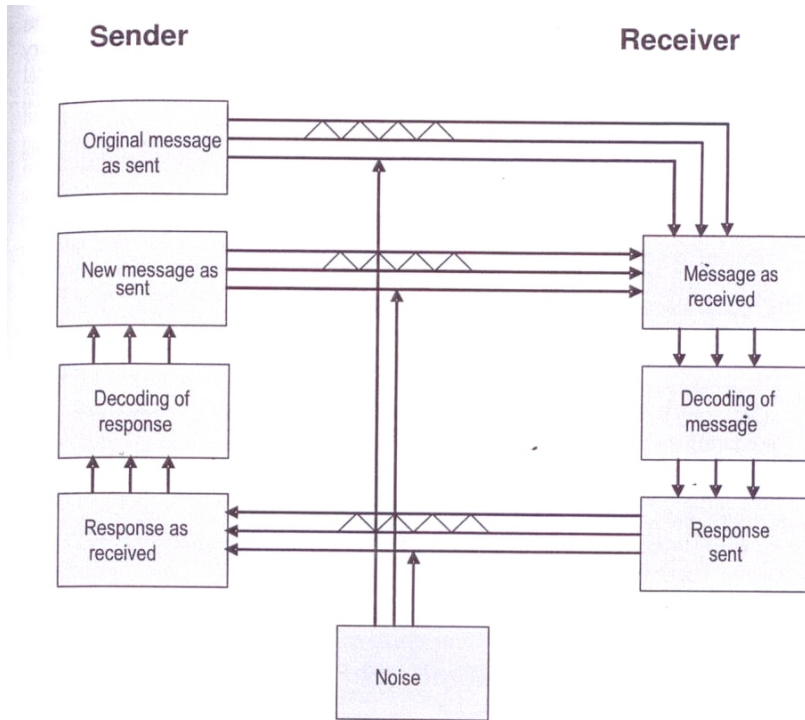
$$\text{Channels} = 10$$

Poor communication/ miscommunication

In human communication, the message that is sent is unfortunately not always the same as the one received. Poor communication and miscommunication can occur in many ways:

- The fault may be that the original message is ambiguous or misleading.
- Alternatively, the error may be in a misreading of the received message.
- Messages can also be distorted and corrupted during the process of transmission, perhaps as a result of the channels used to send the messages.
- Nonverbal messages are susceptible to misinterpretation.
- Some people seem to be naturally good and effective communicators and almost always get their message across. Others do not communicate clearly and effectively, even in the simplest circumstances.
- Some people are good listeners, others less so. Depending on the channel of communication used, the message can become distorted during transmission.

In all forms of successful human communication, irrespective of the channels employed, there must be at least one person sending information (the sender) and at least one person receiving the information (the receiver). Some of the problems of communication are illustrated in the model shown in Figure below, where there are two parties who send and receive information in turn. Each message is encoded and sent, but is susceptible to noise which may result in loss of clarity and distortion. The noise depends on the channel used for communicating. When received, the message is decoded. The presence of noise, coupled with the possibility of faulty encoding and decoding, means that the message received may not be the same as the message sent. The model stems from Shannon's original model of communication in a telephone network (Shannon and Weaver, 1949).



commModel.jpg

commModel.jpg

PREPARING FOR COMMUNICATION

One of the first and most important keys to successful communication is adequate preparation. Before an effective and successful engineering message can be sent, the content of the message has to be clearly worked out and fully understood by the sender. This is particularly important if the message is complex, which is often the case for engineers.

Even when the content of the message has been worked out, it is necessary for the potential sender to put time and effort into choosing the best way in which to present the information so that it will be most easily understood by persons receiving the message.

In preparing for sending, it is important to evaluate the potential receivers, their backgrounds and expertise, and their level of understanding of the technical matters involved in the engineering message. For example, the communication of design information to non-specialist clients and the interested public will require a different form of presentation from that used for engineering colleagues who have a good technical understanding of the field. It may well be that a broad overview is better for non-specialists than detailed data which will not be understood.

The sequencing of information also needs careful attention. While a logical sequence is usually preferable, it will not always be the best. A logical but long and complex argument can rapidly become boring and hence lead to inattention and misunderstanding.

Generational Differences.

- 'Traditionalists', born between 1925 and 1945, tend to be uncomfortable challenging the status quo and authority. They value income and employment security.
- 'Baby boomers' (born between 1946 and 1964) have lived through significant social changes, with technological advances and increasing social freedoms. Baby boomers are typically more adaptable and flexible than traditionalists.
- 'Generation X' (born between 1965 and 1979) typically value unexpected reward for work accomplishments, opportunities to learn new things, praise, recognition and time with the manager.
- 'Generation Y' employee (born between 1980 and 1994) are often described as more globally aware, technologically savvy and difficult to retain in one organisation or job.
- 'Generation Z' (born between 1995 and 2009) are most likely to be children of Generation X; they are already influencing employment via their parents' concerns with work-life flexibility and childcare options.

Generation X and Y employees, whether salespeople or service industry workers, aren't into being told what to do-but they have a thirst for knowledge and are keen to explore new ways of selling.

In summary, Generation X and Y employees:

HATE the older-style 'my way or the highway' command-and-control managers
LOVE bosses who allow them to think creatively to achieve results quickly
HATE hearing about people with the same skills being paid more money than them
LOVE being given constructive feedback rather than carping criticism
HATE spinning their wheels in jobs where they can't reach their full potential
LOVE networking and learning from co-workers really into collaboration
HATE tokenistic rhetoric. Don't just preach diversity, demonstrate it
LOVE being educated at their boss's expense-it keeps them loyal for a few more months

Methods for organising thoughts and for presenting ideas and concepts.

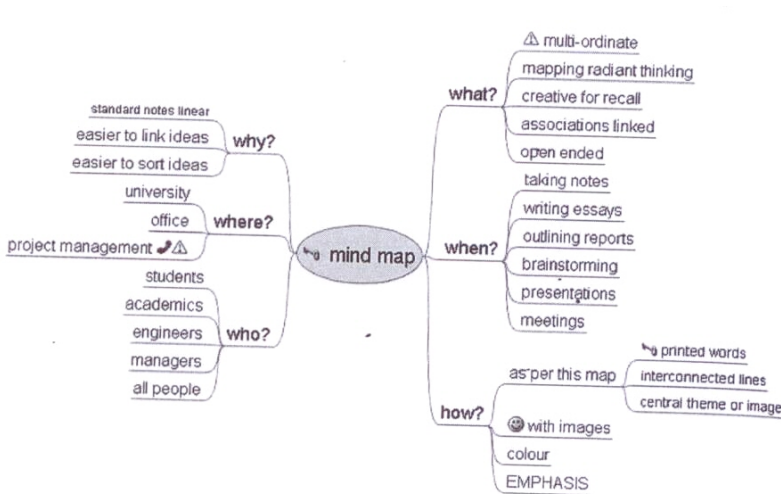
Before an idea can be communicated it must be developed. There are a number of simple tools which can assist in the development of ideas, ranging from hierarchal lists, using word outline for ease of developing hierarchy, mind mapping, and picture and concept mapping (Checkland, 1981; Buzan, 1988; Horan, 2002). These methods advocate a systems approach to thinking by using images to link key ideas and hence enable transference of ideas between thinking and communicating. The mind mapping terminology was popularised by Buzan (1988) to be used for problem solving but also for learning, communicating and remembering. It appears that the future will include more tools for these techniques, as Bill Gates (cofounder of Microsoft) stated that "a new generation of 'mind-mapping' software can also be used as a digital 'blank slate' to help connect and synthesize ideas and data - and ultimately create new knowledge" (Gates, 2006). The basics of developing a mind map will now be discussed.

Mind mapping

A mind map is a graphical representation linking related ideas and concepts. It is created by starting with a central image, word or concept under consideration. Around this central concept up to 10 main ideas which relate to this concept can be drawn or placed. Ideas can be generated by using Kipling's six question words: What? Why? When? How? Where? and Who? Each of these images, words or concepts are considered and a further 10 main ideas or concepts which relate to each of them are generated. Without too much effort a large number of related ideas can be produced. With this simple technique it is possible to get a clear understanding of almost any problem. As an example of what is meant, a mind map has been created using Free Mind (2006) of a mind map. This is shown in Figure. Despite the fact that mind maps follow the way the brain is believed to work, mind mapping may seem an unnatural way to record or process information. Experience has shown that a little persistence pays off and people who use mind mapping find it a valuable tool that can be employed to assist in communication. These techniques can be an instrument in developing a systems approach to problem solving and most web pages store their information in a similar way, with links to relevant information being the cornerstone of the world wide web.

One of the key reasons why mind mapping is so successful is that it forces the listener to not just record the points a speaker or article is making, but to engage with them and to consider not just their importance but also their relationship to the general theme or argument. This results in a deliberate sense

of active listening or thinking that works the brain harder tending to produce greater understanding . Lazslo (2001) also noted that "The full potential of human communication unfolds only when the communicators understand the strands of connection through which they communicate". To communicate at a high level requires people to make use of the different paths of communication. Preparation for communication is not purely the task of the sender. The receiver also has preparatory work to do in order to ensure good communication. Even when attending a meeting purely to listen and to obtain information, it is worthwhile planning for the event by thinking about what can be achieved and what information can be obtained. It is rare that the attendees at a meeting all have the same aims and agendas. With minimal preparation it is easier to question speakers to obtain clarification and to ensure they provide the required information.



mindmap.jpg

mindmap.jpg

A mind map of the concept of mind maps.

Preparation can even be worthwhile prior to self communication. Probably the most important thing is to take sufficient time to organise yourself properly and develop techniques for storing information so that it is can easily be found and retrieved. Being systematic is something that is well worth learning and developing.

Types of Communication methods/ channels

Verbal/ Oral PRESENTATIONS

Woodrow Wilson, the 28th president of the United States said, "If I am to speak ten minutes, I need a week for preparation; if fifteen minutes, three days; if half an hour, two days; if an hour, I am ready now". This clearly indicates that good presentations do not just happen, and if someone makes it look easy then it is likely that much more effort and practice has gone into the talk than appearances would indicate.

Oral communication skills are required by all engineers, as a consultant to present a company's case to win work, to present results to senior management and clients, or to present details of projects to the community. Technical presentations can involve both oral and written communication. In all communications, an awareness of the audience is essential to ensure a consistent style, flow and clarity of detail. There is no easy way to ensure a presentation goes well. However, there are some key points that should be addressed well before the time of the presentation.

A common failing with presentations is running short or running out of time.

Speakers should consider their timing very carefully and practise their talk to ensure that it will run to time. It is at the end of the talk where it is likely that the key points are to be made and where, if the ending is rushed, much impact will be lost.

Checklist: Oral Presentations

Preliminaries

- ~ What is the objective of the talk?
- ~ What do you want your audience to think or do as a result of this talk?
- ~ Analyse the audience: what do you know about them, their backgrounds, age needs, motivation? '
- ~ Consider issues like the time of day, number in audience, and size of room.

Opening

- ~ How will you hook the audience?
- ~ What will your first words be?
- ~ Ensure that you thank the chairperson and address the audience!
- ~ What is the purpose of the talk? .
- ~ What benefit will the talk be to the audience?

Signposts/Material Content

- ~ Can you create a mind map showing the content of the talk?
- ~ Point the way through your talk - use headings.
- ~ Research your talk thoroughly. Preparation is the key to a good talk.

Notes

- ~ Short memory aids only.
- ~ Key words or ideographs or even a mind map on a small card.
- ~ **DO NOT READ**

Visual aids

- ~ Ensure visual aids are clear, easy and appropriate for ideas being expressed.
- ~ Present them effectively - do not have colours that make the text unintelligible.

- ~ Use a sans serif font (e.g. Arial) and a minimum font size of 18pt.
- ~ Have a maximum of 30 to 35 words per slide: fewer is better.
- ~ Describing a picture or graph is better than a slide full of words.
- ~ Reinforce, explain and illustrate your ideas.
- ~ Aim for approximately one minute per slide (as a rough guide)

Delivery

- ~ Transmit energy and enthusiasm - use positive gestures and eye contact.
- ~ Ensure voice is clear and well modulated.
- ~ Body behaviours have to be congruent - generally be yourself.

Closing

- ~ What are the main points to be reinforced in the summary?
- ~ What is the final impression I wish to make?
- ~ What will be my final words?
- ~ Summarise and finish with a well prepared strong close.

Question time

- ~ Remember, it is the Chairperson's responsibility to handle question time.

Rather than just attempting to say everything more quickly, it is better to leave out a whole section so that time can be spent on giving a good summary of the rest of the work and leaving the audience with a positive feeling about the presentation. If there are people in the audience who are particularly interested in the details of the work, they can always seek the speaker out after the talk.

ACTIVE LISTENING

People who are good listeners have a high success in getting the information they want from others. It has been suggested that they follow a process called active listening (Steinmetz, 1979). Active listening includes being encouraging, being reflective, probing for information, and using a summary technique. One way of being encouraging is to use open rather than closed questions. A closed question is one where the answer is either a single word or a short phrase. Closed question words include: Is, have, has, does, could, can, will, are and shall.

For example: "How old are you?" and "Where do you live?" are closed questions.

Closed questions have the following characteristics:

- they request factual information;
- they are quick and easy to answer; and
- they enable the questioner to control the conversation

On the other hand an open question is one that generally receives an extended answer. Open question words include: describe; what; why; and how. Thus "Describe what you think you will be doing in five years time?" is an open question.

Open questions have the following characteristics:

- they ask the respondent to think and reflect;
- they try to elicit opinions, knowledge and feelings; and
- they deliver control of the conversation to the respondent.

The open question gets the respondent thinking and giving useful information about themselves or the subject being discussed. Note: some question words can elicit either a short answer or a long answer depending on how they are phrased. Some examples of closed and open questions are given in Table below.

Closed question	Open question
Are you happy with the job?	What do you like or dislike about the job?
Are you sad about the decision?	What did you think about the decision?
Do you like your manager?	How do you feel about your manager?

Once the open ended question has been asked, an active listener will give free rein to the person answering and so encourage an uninhibited response. The aim is to get the responder to talk freely, and part of this freedom to talk involves the listener not talking. Silence can promote talking but so can non-verbal communication. Appropriate body motion should not be distracting, artificial or forced. Movement, through the head, eyes, hands or any other body part which signals interest and attention, improves communication. Awareness of other people's non-verbal communication is paramount for clear understanding.

Reflective skills intend to help the listener keep track of the message. Reflecting skills improve the dialogue, by providing, as well as asking for, information. The most effective reflecting device is "paraphrasing". It serves to confirm that the person has been listening, but also requests more information. Paraphrasing helps to clarify a message or attempts to reflect the feelings of the speaker by summarising what has been said in fewer words.

Applying active listening skills takes practice and people should beware of jumping to an incomplete picture of what others are talking about and then offering a master plan to solve the problems, without recognition of the thoughts, feelings and emotions of the person they are supposedly listening to. Rogers and Farson (1979) stress the importance of listening as "an important way to bring about changes in people". They suggest it involves three activities: listening for the full meaning including both the content and the underlying emotions; responding to feelings (if the real message is an emotional one then the response should address that) and noting all the cues by observing the non-verbal messages.

NON-VERBAL COMMUNICATION

Non-verbal communication can be thought of as all the information transmitted other than the message

contained in the actual words used. It includes both the visual element and the vocal tones (Samson and Daft, 2003). The face is used a great deal to transmit information and this is usually the first visual element noticed. People often notice the hand signals, shrugs, head movements and body movements but do not necessarily interpret the whole message. Non-verbal communication can be used for:

- expressing emotion (e.g. smiling to show happiness);
- conveying attitudes (e.g. staring, glaring to show aggression); and
- demonstrating personality traits (e.g. open palms to show accepting qualities).

Non-verbal behaviour varies across cultures, although, the six emotions of anger, fear, disgust, sadness, happiness and surprise seem to prevail around the world. The ability to understand and use non-verbal communication is valuable for any workplace environment. Some non-verbal communication strategies are easier to use than others. For example, when going to a meeting or interview, the way a person dresses can portray a certain image.

Other non-verbal communication strategies such as being punctual, animated and demonstrating friendliness by a smile are able to communicate an image about a person in a much more effective way than the spoken word.

Facial expressions, eye movements, and head movements constitute a significant percentage of recognised non-verbal communication. This is because people tend to look at a person's face and eyes when speaking with them. It is estimated that the human face can show more than 50,000 different expressions (Hamilton and Parker, 1990) and most people are able to interpret the meanings or feelings associated with many of the common ones, such as surprise, joy, suspicion, anger or menace. The skill to read small facial changes and eye movements requires greater observation and awareness but is useful to ensure that one obtains all the information being transmitted in a conversation.

Being able to interpret body language and gestures is vital in establishing and maintaining good working relations with work colleagues and clients. If clients exhibit discomfort or unwillingness to participate, then it is possible to alter the environment and the communication strategy to help them feel more comfortable. It is doubly important to be aware what messages your own body language is sending, to avoid sending an incorrect or ambivalent message, and, more importantly, to ensure that you send the correct message. A useful strategy is to watch for reactions when speaking and then to try and spot contradictory messages when, for example, the voice says one thing and the body says another. This can indicate deception but one should always check this out by follow up questions in the context of the conversation.

A simple test can be performed to illustrate the importance of non-verbal communication: listen to someone with your eyes closed, then listen and watch. It should be evident that there are differences and that it is much easier to understand someone when you can see them.

Non-verbal behaviour patterns for communication

To deliver a greater impact when a person delivers a message, the use of nonverbal behaviours will raise the level of interpersonal communication. The following material has been compiled from a variety of sources (Eunson, 1994; Hunt, 1979; James, 1995; Quilliam, 1995; Tidwell, 2005; Pease and Pease,

2004).

Eye contact

One of the most important behaviour patterns of communication. Eye contact signals interest in others and increases the speaker's credibility and helps to regulate communication flow. However, people should be aware of cultural differences:

- In Western countries people who make eye contact open the flow of communication and give a message which shows interest and credibility. On the other hand people from Japan, China, Africa, Latin American, and the Caribbean avoid eye contact to show respect.
- Western cultures see direct eye to eye contact as positive but there are peculiarities even within a country. For example, in the United States African-Americans use more eye contact when talking and less when listening, with the reverse being true for Anglo-Americans. While a prolonged gaze is often interpreted as a sign of sexual interest, Arabic cultures use prolonged eye contact because they believe it indicates interest, and hence assists them in gauging the truthfulness of others. A person who doesn't reciprocate is 'seen as untrustworthy.

Facial expressions

Facial expressions, such as smiling, transmit friendliness, happiness, warmth, and a connotation of welcoming. People who smile frequently are perceived as more likable, friendly, warm and approachable. Smiling can be contagious and people tend to mirror smiling to gain rapport. They will be more comfortable and will want to listen more. It appears that facial expressions have similar meanings world wide with respect to smiling, crying, or showing anger, sorrow, or disgust.

Many Asian cultures suppress facial expression as much as possible. Many Mediterranean (Latino/Arabic) cultures openly express grief, whereas it has been a trait of men of English speaking cultures to hide grief or sorrow.

Overall, there is a tendency for women to smile more than men but in some groups such as African-Americans there is little difference in the degree of smiling between genders.

Gestures

Gestures are a natural part of human communications and failing to make gestures while speaking may lead to a perception of the speaker being uninterested or boring. Congruent gestures with speaking capture the listener's attention, and facilitate understanding. It is impossible to list all gestures but it is important to remember that what is acceptable in one's own culture may be offensive in another. Some cultures are restrained in gestures while others are animated, with the consequence that the restrained cultures feel the animated cultures lack manners. On the other hand, animated cultures often feel restrained cultures lack emotion.

The use of hands for pointing or counting differs from country to country. For example, in Australia and

the United States pointing is done with the index finger, whereas in Germany the little finger is used. The Japanese prefer to use the entire hand (in fact, most Asian cultures consider pointing with the index finger to be rude).

Posture

Posture and body orientation can also be used for communication.

Standing erect and leaning forward communicates to listeners that the speaker is approachable, receptive and friendly. Interpersonal closeness results when the speaker and listener face each other. Speaking with the back turned or looking at the floor or ceiling should be avoided as it communicates lack of interest.

There are also cultural differences for a range of what might appear to be quite common actions:

- In Japan and Korea bowing shows rank and is a sign of respect.
- Slouching is considered rude in most Northern European countries,
- Standing with hands in pockets is disrespectful in Turkey.
- Sitting with legs crossed is offensive in Ghana and Turkey, but traditional in Korea.
- Showing the soles of the feet is offensive in Thailand, Malaysia, and Saudi Arabia.

Proximity

Proximity, the distance between speaker and listener, is a key area where problems can occur. Cultural norms dictate a comfortable distance for interaction with others and people should look for signals of discomfort caused by invading other people's space. Some of these signs are rocking, leg swinging, tapping, and gaze aversion.

The context is also important what is perfectly acceptable on a crowded train or bus is not acceptable in a normal business meeting.

In Arab cultures, invasion of space and to stare closely into the eyes is considered normal.

Speaking

Although speaking is the essence of verbal communication, it can also have non-verbal aspects to it. The way the words are spoken, through such aspects as tone, pitch, rhythm, volume and inflection can have an important effect on the message being transmitted. One of the major criticisms of many speakers is that they speak in a monotonic voice. Listeners perceive this type of speaker as boring and dull.

Touch

Touch is generally culturally determined, with each culture having a clear concept of what parts of the body one may touch or not touch. Touch generally shows emotions or control and varies between genders and cultures.

- In Western cultures, particularly in the United States, Australia, Canada and the United Kingdom, handshaking is common (even for strangers).
- It is the custom in India to break bread only using the right hand (a difficult task for non-Indians).
- People of Islamic and Hindu backgrounds avoid touching with the left hand because to do so is a social insult, as the left hand is used for toilet functions.
- Islamic cultures don't approve of touching between genders in public (even hand shakes), but consider such touching (including hand holding and hugs) between same-sex people to be appropriate.
- Many Asians avoid touching the head because the head houses the soul and a touch puts it in jeopardy.
- Cultures such as the English, German, Scandinavian, Chinese, and Japanese which have high emotional restraint have little public contact, whereas those which encourage emotion, such as the Latino, Middle-Eastern and Jewish, have more frequent touching.

Look and dress

Judgements, based on looks and dress, seem to be a trait of all cultures.

Europeans and Americans appear to be almost obsessed with dress and personal attractiveness, partly induced by marketing and wealth.

Around the globe there are differing cultural standards on what is appropriate, attractive in dress and what constitutes modesty. Many companies have different dress codes which can be used in the corporate world as a sign of status.

Checklist: Tips for Improved Nonverbal Communication

- ~ Make yourself at ease with the person you are communicating with'. Avoid being too close or too far away. (Within 600-700 mm is a comfortable range for city dwellers of Anglo Saxon heritage.)
- ~ Be attentive and try to relax, but avoid slouching or sitting rigidly. Show interest by leaning slightly toward the other person.
- ~ Avoid staring or glaring, but try to maintain frequent eye contact.
- ~ Respond with non-verbal communication while the other person is talking"by simple nods for approval or agreement. •
- ~ All non-verbal gestures should be natural, smooth and unobtrusive. Do not allow gestures to dominate your words. Be aware of gestures that reveal negative emotions and frustration.
- ~ Slow down your rate of speech to a little slower than normal, to avoid indicating impatience. Use the tone of your voice to give a feeling of warmth and acceptance.
- ~ Do not mumble but maintain a clearly audible voice, not too loud nor too soft.
- ~ Avoid using your limbs, hands and feet as barriers,
- ~ Appropriate genuine smiling assists in gaining rapport.

~ Closing eyes and yawning can block communication, so attempt to be alert when interacting with others.

Adapted from Messina (1999)

WRITEN COMMUNICATION

Written communication take the forms of

- Memoranda
- Email
- Business letters
- Reports
- Technical Reports
- Drawings

Written communication is perhaps the form of communication where the most effort is expended.
No immediate feedback

During the normal course of 'events, engineers will be required to write resumes, business letters, memoranda and reports for many different reasons. In the following sections suggestions are given to make writing as easy as is possible and to ensure that it conforms to some basic standards. The idea that writing should follow a standard may seem somewhat constraining but it should be remembered that one of the main reasons for communication is to present information clearly and to make the job of the reader as easy as possible. If this means a little extra effort for the writer, so be it.

Checklist: Writing

- ~ Avoid jargon.
- ~ Have a structure with an introduction, main content and a conclusion or recommendations.
- ~ Ensure all written material is checked for spelling, grammar and punctuation.
- ~ Read the whole piece from top to bottom.
- ~ Have colleagues read at least key sections of the report
- ~ Leave sufficient time so that it is not rushed. Rushed sections are likely to be at the end and this is where the key results are found and impressions made.

PLAGIARISM

Plagiarism is the unacknowledged use of the material written by others with or without the intention of passing it off as your own work. With the development of electronic information systems, plagiarism is on the increase, as it is becoming much easier to source material from a range of different areas.

Plagiarism is wrong and dangerous for a number of reasons. If you have read something it is actually in your interest to cite the source and to quote directly if it is something that is going to help your argument. That is what is referred to as scholarship.

Plagiarised material is often quite easy to detect, either by simply reading the material and reflecting on the changes in language, or by using one of the many plagiarism detectors that are available nowadays that can check submissions against a vast range of publicly available material from around the world.

It is essential, therefore, to reference all the sources of information which are used in any report or design. When using material, ensure that the source is credited somewhere in the material, e.g., according to Smithers and Smith, 1999.

When exact phrases from the original source are used, be sure to use quotation marks to set off any exact text. Paraphrasing can also be deemed to be plagiarism when the same ideas are used as in the original source, so make sure all ideas are referenced.

SUMMARY

- Good communication skills are required by all engineers, whether in managerial positions or technical specialist areas.
- Communication involves more than simply sending a message; it necessitates that the correct message is received by using feedback and active listening.
- Managing personnel in project teams also requires an understanding of how the individuals within the team can facilitate or block communication between members.
- In all communications, an awareness of who is receiving the message is essential to ensure a consistent style, flow and clarity of detail.
- There is no easy way to ensure an oral presentation or a written report is well received other than by putting a lot of effort into the structure and flow of the material, enquiring and that it is relevant to the topic being discussed, and looking for feedback.
- In larger organisations the manager of groups must be aware that there are some people who listen and others who do not.
- A strategy that assumes everyone understands what has been said can lead to disaster, therefore asking listeners and readers if clarification of details are needed can avoid miscommunication.
- A good rule is to attempt to keep communication channels open and be receptive to communication at all levels.
- It is imperative that other people's body language is observed when involved in discussions and when there are conflicts.
- It is important that as a manager and leader of engineering teams you have congruent

communications, body language and actions, thus imparting a feeling of trust amongst the team. This example to fellow team members will then be the catalyst to open communication within the group and across the boundaries of other groups within the organisation.

- Use simple language to convey your message in all reports, memoranda and letters.
- Remember to read and check the spelling of all outgoing correspondence.
- Always reference all sources of ideas and information .
- It appears that as verbal codes are used within a particular cultural context they evolve over time (Underwood, 2003). This also happens to non-verbal codes.
- Through travelling and working in different countries, an increased awareness of how specific gestures are different from one country to another is developed.

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