# Communication of Technical Information In Research & Business Organization



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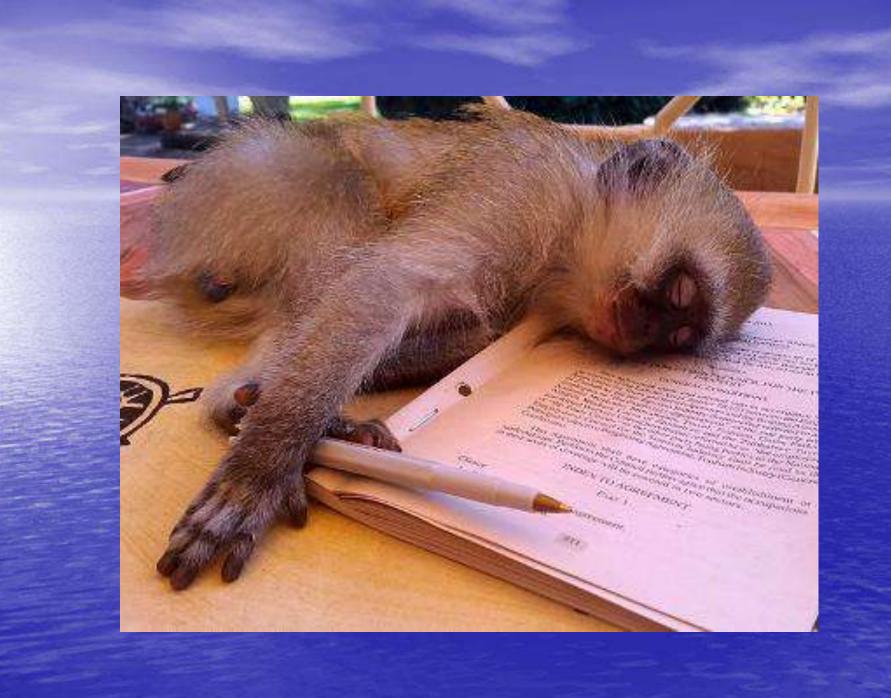
SUMDU 14-9-2020

## Skills & Behaviors Necessary for Effective Performance in an R&D Environment

- > Effective Communication:
  - Written
  - O/3/
- > Time Management
- > Managing People
- > Promote Team Work
- > Value Unique Contributions
- > Give and Seek Feedback
- > Set The Example

## Employee Professional Development Training Courses Taken

- ➤ Effective Technical Communications:
  -A 3 day course by Center for
  Professional Advancement,
  East Brunswick, NJ (J & J Sponsored)
  ➤ Effective Presentations:
- A 2 day Course by *Colgate-Palmolive*Co.Management Development Program
- >??
- > ??



#### What is Communication

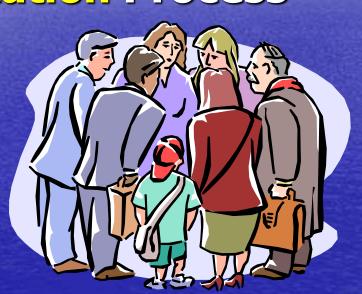
#### Few Definitions:

- "Process by which an individual (the communicator) transmits stimuli to modify the behavior of other individuals" Hovland, Janis & Kelley
- "Process of creating a meaning between two or more people" Tubbs & Moss
- "The act of transmission of information, ideas, emotions, skills, etc. by use of symbols, words, pictures, figures, graphs, etc." Berelson & Steiner

#### **Elements of Communication**

## Certain Common Elements That Together Define Communication Process

- >People
- > Messages
- >Channels
- > Feedback
- > Noise
- >Context (setting)
- > Effect



#### Types of Communications

- Verbal: (Intellectual Activity)
  - Verbal/non-vocal
    only words, no speaking: written messages
  - Verbal/vocal communicate through spoken words
- Non-verbal: (Emotional Activity)
  - Non-verbal/vocal
     no words, only sound: sighs, groans
  - Non-verbal/non-vocal
    no words, no sound, only gestures and
    appearance

# Communication of Technical Information in Research & Business Organization

**Written Communication** 

> Oral Communication

### Part A

Written Communication

Verbal-non vocal

#### Technical Writing

- ► It's NOT About Writer's Knowledge

  BUT
- > About Readers Understanding

**Goal: Communicate Data** 

- Accurately
- Clearly

## How To Assess The Clarity Of A Written Text?

#### Gunning Fog Index\*

Gunning Fog Index is a Readability Test for English writing, is used to evaluate how easily some text can be read by its intended audience.

\*Developed in 1952 by Robert Gunning, an American businessman who was involved in news paper and text book publishing.

#### Gunning Fog Index

#### **Gunning Fog Score**

$$O.4 \times \left(\frac{\text{total words}}{\text{total sentences}}\right) + 100 \left(\frac{\text{complex words}}{\text{total words}}\right)$$

Complex Words = 3 Syllables or more

Advantage 3
Amazement Syllables

**Calculation Architecture** 

Syllables

#### Fog Index:

#### Example A

A studied consideration of heat-induced expansion of aqueous substances necessarily entails significant complications on account of the following reasons:

A definite linear or surface dimension is not demonstrated by them as they align themselves exactly according to the vessel containing them.

A container is essential to hold fluid materials. Accordingly, when heat is applied to the container, there is a veritable difference between the heat-generated expert: of the container and that of the fluid. For this reason, it is possible to record in document the expansion of the fluid material as compared to the expansion of container holding it

Words: 101

Word/Sentence: 20.5

**Complex Words:** 17

Fog Index: 15

#### Example B

The study of thermal expansion of liquids involves special problems due to the following reasons:

They do not have fixed linear or surface dimensions, as they take the shape of the container. Liquids require a container to hold them. Hence, when the container is heated, expansion of the liquid does not correspond with that of the container. Thus, we can record thermal expansion of liquids relative to its container.

Words: 69

Words/Sentence 13.5

**Complex Words:** 6

Fog Index: 7.8

Write short sentences, Average Sentence length:15-20 words

#### Gunning Fog Index.... Conta

The index also estimates the years of formal education a person needs to understand the text on the first reading.

<b>Gunning Index</b>	Read Level By Grade
6	<b>Sixth Grade</b>
7	<b>Seventh Grade</b>
8	<b>Eight Grade</b>
9	<b>High School Freshman</b>
10	<b>High School Sophomore</b>
11	<b>High School Junior</b>
12	<b>High School Senior</b>
13	College Freshman
14	<b>College Sophomore</b>
15	College Junior
16	College Senior
17	<b>College Graduate</b>

### Fog Index

Literature/Publication	Fog Index	
Bible		
Shakespeare	6	
Mark Twain		
Time Magazine		
News Week	11	
<b>New York Times</b>		
Wall Street Journal		
<b>Technical Documents</b>	10-15	
Professional Prose (Novels, Text Books, Literature)	18	

#### Other Reading Indices

- > Coleman Lian Index
- > SMOG Index
- > Flesch Kincaid Reading Ease Index
- Automated Readability Index (ARI)

Microsoft Word can Auto check Fog Index and other indices

#### Fog Index

A General Guide

Not A Substitute for Clear Logical Thinking Foundation of Clear Writing

### Four Steps of Writing

Step One: Plan

#### Step 1: Planning ......

#### First step:

Consideration of Organization with a view to eliminate those unsuited to the material

#### Second Step:

Consider who the readers are and organize in a manner most helpful to them

### Four Steps of Writing

Step 1: Plan

Step 2: Write (Rough Draft)

Step 3: Cool

Step 4: Revise

**Revisions: A Necessary Evil** 

".... I rewrote every day whatever I had written before, and also went over the whole when it was completed, then corrected and rewrote the typescript and finally revised the proofs ..."

Ernest Hemingway Nobel Prize in Literature: 1954

"... I write everything many times over. All my thoughts are second thoughts. And I correct each page a great deal, or rewrite it several times as I go along ..."

Aldous Huxley
Nominated for Nobel Prize: 7 times

#### First Revision.....

#### Two Questions in Mind

- Does this paper contains all the materials that the reader needs
- 2. How munch material can I remove without interfering with my reader's understanding and needs?

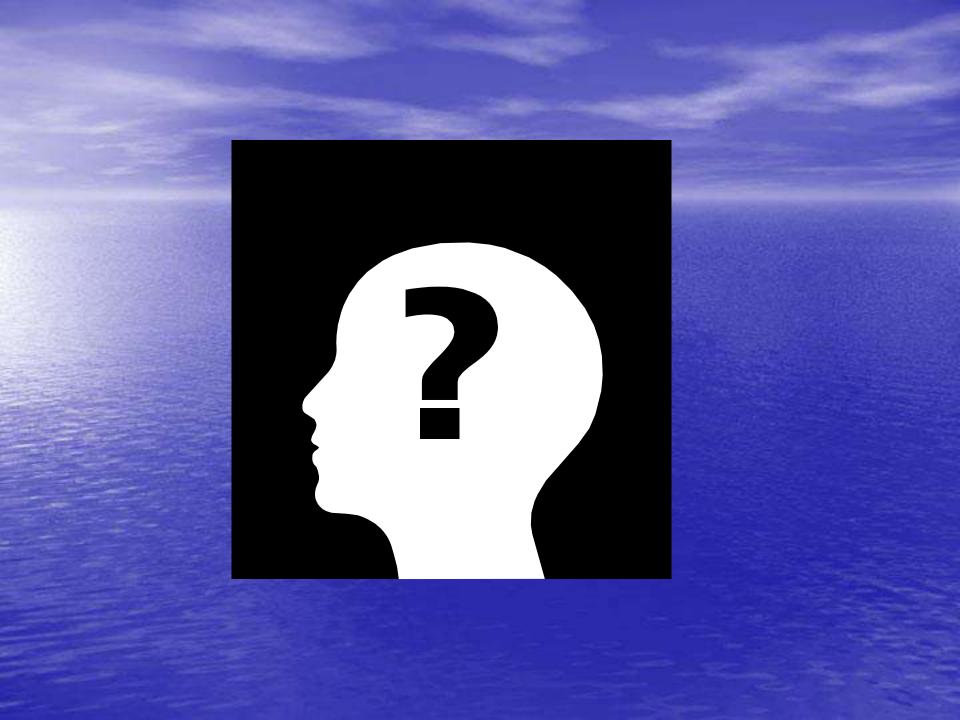
H. J. Tichy

#### How Scientists Should Write

- > Explanation
  - >Needs of the Reader
  - >Explain what it is
  - >What have you done
- **Clarity**
- > Impartiality
- Order
- **>**Accuracy
- **Objectivity**
- **Simplicity**

#### Parts of A Research Report

Introduction	What did you do and why?
<b>Methods &amp; Materials</b>	How did you do it?
Results	What did you find?
Discussion	Interpretation of Results
Summary	Statement of Main Findings
Acknowledgements	Who helped you?
References	Details of Ref. Cited



#### **Business Letter**

Date: / /

**Full Name** 

Title?

Complete Add.

Dear Dr./Mr./Ms.

- Opening reason for the letter
- Preparation set the stage for message
- Motivation ask for action
- □ Close

**Sincerely** 

#### DR. SANDHU,

My name is Richard, we spoke together earlier today, 5/4/98 around 2'00 pm concerning the internship position. Here is a copy of my resume that you requested. Thank you for any consideration.

Sincerely, Buchard Hi, I read about the internship position on the job track. But I am looking for a full time position. So if you guys have any full time positions I will be real grateful if you would consider me for that. Thanks

Gorniak Drive KAMALPREET CONTROL

ph:

Parlin, New Jersey E-mail: kpvirdi@eden.rutgers.edu Beeper:

Objective A position within the Pharmaceutical Industry that will use my educational and organizational skills and further enhance them.

Education Cook College, Rutgers University, New Brunswick, NJ B.S in Biochemistry Cumulative Grade Point Average: 3.41, Expected date of graduation- May 1998

Honors Dean's list 1994-1997, Recipient of Biodiversity Scholars Award Alpha Zeta Freshman of the Year Award

Publications Co-Author of an article on Chlorophyllin Copper Compounds in journal "Cancer Letters"

Laboratory High Performance Liquid Chromatography, Gas Chromatography, Tissue skills culture, Tissue extraction, Column Chromatography, Thin Layer

Chromatography, Flourometry, Spectrophotometry, Gel electrophoresis, PCR Amplification, Protein determination, purification and sequencing

Computer Software: MS WindowsNT, MS Windows95, MS Windows3.1, Sigma Plot, ChemDraw, Hyperchem, MS OFFICE 97, Word Perfect, Quatro Pro.

Graph Builder, Millenium Chromatography Manager,
Lotus 123, Adobe photoshop 3.0, Internet Explorers,
DOS6.1, UNIX , C++

Experience
Dept of Biochemistry and Microbiology, Rutgers University, New
Brunswick, NJ
Research Assistant, May'96-Present
\* Worked with a pH independent lipophilic photosensitizing drug(CAME),
derived from specifically modified plant chlorins on rats to enhance
Photodynamic Therapy.
\* Cultured and grew tumor cells to be used for subcutaneous injection in
rats.
\* Injected tumor affected rats with the preparations of CAME and at

April 19,

Dr. Sukhvinder S. Sandhu Senior Technical Associate Colgate Palmolive Co. 909 River Rd. Piscataway, NJ 08854

Dear Dr . Sandu:

The Colgate Palmolive Company according to reliable publications, is a fast growing firm which is reliable and beneficial to all its customers. I am interested in the CosMair Co. because of their continued dedication to safety and quality in their products and manufacturing.

I noticed your advertisement for a Biologist position on a Web-site called Jobtrack. I have submitted my resume for your consideration. I am currently attending Rutgers University. I plan to graduate in May 1999 with a Bachelor of Science degree. My major is Microbiology (Biological Sciences).

You mentioned in the advertisement that the successful candidate must meet certain requirements and I do have the following qualifications for those:

- 1) Working towards BS in Biology
- 2) Can work independently
- 3) Has good laboratory, computer and interpersonal skills
- 4) Works well with others, is reliable, a self-starter, and responsible

This is a job that I believe was made for me. I am available immediately, and offer you competence, dedication, and a good work ethic. If you do not mind, I will call you next week to see if a personal interview can be scheduled. Thank you for your consideration and I look forward to speaking with you soon.

Sincerely,

Metlars Lane. Piscataway, NJ 08854

May 9,

Colgate Polmolive Co. 909 River Road Piscataway, NJ 08854 FAX: (732) 878-7134

Attn.: Dr. Sukhvinder S Sandu

Re: Interest in Lab Intern Position #100445597

Dear Dr Sandu:

After viewing Jobtrak this past Friday, I greatly appreciate the opportunity of being a team player for your company. Your company is a recognized innovator in the scientific industry. I am aware that you receive many resumes, but mine is worth reviewing. I have a unique background which gives me the expertise to make significant contributions to your company.

Actively working to receive my Biochemistry and Microbiology degree from Cook College, Rutgers University is, perhaps, nothing unusual. What is unique is that Cook College represents a professional school with a strong emphasis on environmental awareness. This experience has helped me become proficient in using the most cost-effective laboratory techniques with the reduction of environmental waste. Currently, I am launching my career with the goal of participating as a laboratory intern for your company.

My background is well suited to the needs of your company. Specifically, my education and positive attitude serves as a context for evaluating changes and issues that could impact the company. This translates into better informed analysis and, subsequently, more precise and effective decision making. My experience as a lab assistant for Dr. Gene Hall, Quantitative Chemistry Dept., allowed me the opportunity to sharpen not only my analytical skills but my communication skills as well. My previous lab team consisted of Ph.D. students from various ethnic backgrounds. This work setting enhanced the opportunity to communicate with a wide range of people. Through this I developed an ability to relate to people on all levels, which, combined with my quest for scientific inspiration, has given me a solid foundation for achievement.

I am excited at the prospect of broadening my career in the chemical industry. I look forward to hearing from you soon so that we can arrange a convenient time to meet and discuss how I can contribute to Colgate Polmolive's continued success. Thank you for your time and consideration.

Sincerely, Debbie Quanul

#### Suggested Readings....

# Effective Writing for Engineers, Managers, Scientists H.J. Tichy

Scientists Must Write

Robert Barrass\*

(\* Students Must Write: Robert Barrass)

#### End: Part A

#### **Written Communication**

#### Technical Writing

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### Thank You

