

ENBIS Workshop: Statistical Consulting and Change Management

by
**Sue Ellen Bisgaard and
Soren Bisgaard**

**Newcastle, United Kingdom
September 17, 2005**

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1.1

Learning Objectives

- The objective of this workshop is not to teach you “everything you ever wanted to know” about statistical consulting
- Rather, the purpose is to share some of our experiences and introduce to you a number of sources of further reading and issues to study – essentially getting you off to a good start or helping you further along towards becoming a more effective consultant
- Some of the materials will hopefully stimulate discussions and make us all think
- Other materials will be hands-on concrete advice, hints, tricks of the trade, resources

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1.2

Table of Content

1. Introduction and overview.
 2. Understanding human behavior.
 3. What is effective communication?
 4. Techniques for effective communication.
 5. Change management and resistance.
 6. Practical hints, do's and don'ts.
- Appendix 1: Ethics.
Appendix 2: Billing and rates.
Appendix 3: References and further readings.

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1.3

Disclosures and Limitations

- There are many types of consulting and many areas of applications
- Our experience is primarily with consulting to industry on engineering, operations and quality management type problems
- We also draw on extensive experiences working with service, healthcare and government type organizations
- We will not discuss issues involving consulting with biomedical and pharmaceutical research clients
- We will also not discuss consulting on surveys and censuses

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ENBIS Workshop:
Statistical Consulting and
Change Management
Section 1
Introduction and Overview

Newcastle, United Kingdom
September 17, 2005

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1.1

Table of Content

1. Introduction and overview.
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 3. Resistance to Change
 4. What is effective communication?
 5. Assertiveness
 6. Practical hints, do's and don'ts.
- Appendix 1: Ethics.
Appendix 2: Billing and rates.
Appendix 3: Contracts.
Appendix 4: References and further readings.

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1.3

Preliminaries

- Who are we?
 - Søren: Statistician and engineer with more than 25 years of experience in consulting
 - Sue Ellen: Psychologist and management consultant with more than 20 years of experience in counseling
- Who are you?
 - Are you new to consulting or have you already practiced consulting?
 - What do you expect from this workshop?

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Why This Workshop?

- Often, what may appear to be irrational to you, is completely rational to your client!
- What is rational, is relative
- What is rational depends on your perspective and the information you have
- Example 1:
 - Mr. Y.: "...if we discover how to increase the yield, we will be in a whole lot of trouble!"
- Example 2:
 - Dr. K.: With a doctorate in materials science and an expert in finite element simulation, statistics was to him "bad science". Further, he was not familiar with statistics, but THE company authority in the old approach. For him it was urgent to show that "Six Sigma was a bunch of baloney"
- After such consulting experiences, the two of us often discussed the psychology of consulting – hence this workshop

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Consultants Defined

- Consultants: From Webster's New World Dictionary:
 - From Latin *consultans*, prp. of *consultare*; A person who consults with another or others; An expert who is called on for professional or technical advice or opinions. Synonyms: Adviser, expert, counselor, authority, specialist
- Typically an outside expert/specialist hired to advise on particular technical, commercial or legal aspects of the organizations activities
- Not a licensed or controlled profession. Anyone can call themselves a consultant
- Consultants have no managerial authority within the firm that hire him/her.
- The consultant give advise that the manager can choose to follow or ignore
- Decisions are made by the client, *not* the consultant
- The client ultimately has responsibility for the decisions made

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Some Humorous Definitions

- Definition: “*A consultant is someone who borrows your watch to tell you what time it is and keeps the watch!*”
- “Those who can, do. Those who can’t, teach (...or consult).”
- Bohr’s Law: “*An expert is someone who has made all the possible mistakes in a very narrow field of study.*”
- Harry Truman (1955): “*I have found the best way to give advice to your children is to find out what they want and then advise them to do it.*”

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Types of Consultants

- **Internal Consultants:**
 - Typically someone in an organization with special skills — a staff person
- **External Consultants:** Someone who perform technical or professional services on a temporary basis
- **Independent Consultants**
 - Someone who hires himself/herself out for specific consulting jobs
- **Consulting Brokers:** The broker takes on the a contract with a client for a specific job, typically requiring onsite and then subcontract the work to independent consultants who works with the client, but bills the broker than in turn bills the client

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Three Consulting Roles*

- Depending on the job the consultant, external or internal, may choose to play different roles:
 1. The Expert
 2. A pair-of-hands
 3. The catalyst/collaborator/coach (Schein calls this Process Consulting, PC)
- Which role is “best” depends on the situation, you, your client and the problem at hand
- It is important to recognize and be aware which role you assume so you make a conscious choice

*Based on Schein (1985) and Block (2000)

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The Expert Consultant

- The consultant brings special skills to the table
- The manager/client defines the problem sometimes in collaborations with the client
- The organization's members provide the consultant with data and information
- Further data and information may be gathered from outside the organization
- The consultant analyzes the data and develops a solution to the problem
- The consultant hands-over the solution to the client typically in the form of a report and a presentation



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A-Pair-of-Hands Role

- The client hires the consultant as an extra pair of hands
- Typically a 'dirty job' the client does not want to do
- The consultant takes detailed orders from the client about what needs to be done and what data needs to be collected
- The client retains control
- Collaboration is typically not necessary
- Communication is limited



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The Catalyst/Collaborator/Coach Model: Process Consulting

- Coach Consulting:
 - The consultant assumes a collaborative role
 - Issues to be dealt with need a joint effort, a team approach
 - Problem solving becomes a joint undertaking
 - Equal attention to technical and human side of the diagnosis, problem solving and implementation
 - The consultant does not solve the problems. The consultant apply his/her skills to help the client solve problems
 - Analogy: A football coach. The coach does not play; the team scores all the goals

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Know Why You Were Hired

- Sometimes consultants are hired to do or say something the client does not want to say, do or be blamed for
- Other times the client may already know the answer to the problem, but wants to be able to say that the consultant said so or need the authority of the consultant to confirm his/her hunch
- Your role may also be to role model a more scientific or statistical approach to problem solving
- Your role may change over time

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Internal Consultants

- Don't think the clients will come to your office to ask for your help
- Most non-statisticians have limited understanding of what a statistician can do to help; they may not know they have a problem or identify their problems as statistical problems
- You need to walk around and identify problems you can help with
- Take a genuine interest in the clients problems
- And you need to make potential clients comfortable with you helping them
- Christer Helstands way – the “bubba” approach

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Statistical Consulting

- Successful statistical consulting involves far more than technical statistical expertise!
- Additional non-statistical skills required:
 - Interpersonal skills
 - Psychology
 - Pragmatism
 - A feel for politics
 - Problem solving skills; understanding of scientific method
 - Subject matter knowledge
 - A certain degree of self-confidence
 - Ability to manage yourself, others and provide leadership
 - Ethics, ability to stand up straight
- Observation: It is inadequate non-statistical skills that reduces the consultants effectiveness
- Consulting skills can be learned by doing consulting

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A Useful Consulting Model

- Structure the consulting session(s) around the steps of the Six Sigma problem solving model of Define, Measure, Analyze, Improve and Control, DMAIC (or more generically: define the problem, diagnose the problem, develop a solution, check that it worked)
- Force the client/team to deliberately follow the DMAIC steps
- Have the client bring along data
- A productive approach: Sit around a conference table and use a PC and a PC projector to do live interactive analysis and conduct deliberate discussions
- Keep Box's zig-zag iterative learning model in mind: interactions between theory and data/deductions and induction

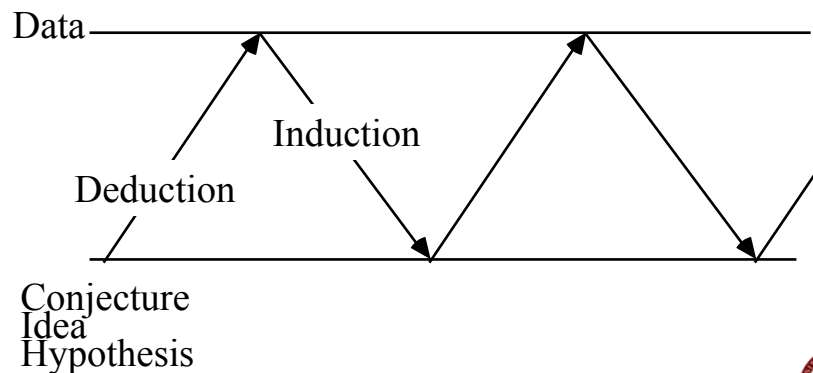
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Iterative Process of a Scientific Investigation: *Induction and Deduction*



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A Powerful Approach: *Show Me The Data!*

- The statistician's most powerful trick:
 - Ask the client if she/he has data related to the issue
 - Plotting the data is one of the most powerful methods for finding out what the problem is
 - And often the plots immediately suggests a possible solution
- We are often taught that we should carefully define the problem first before we attempt to solve it
- That may have some truth to it, but we have found that plotting the data in several ways often quickly reveals what may be wrong with a process even if we or the client did not know beforehand what the problem was

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An Empirical Foundation

“For the best and safest method of philosophizing seems to be, first diligently to investigate the properties of things, then establish them by experiment, and then to seek hypotheses to explain them.”

Sir Isaac Newton

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Hold Your Horses!

- John Dewey (1910) *How We Think*, page 13.
- “The most important factor in the training of good mental habits consist in acquiring the attitude of suspended conclusion, and in mastering the various methods of searching for new materials to corroborate or to refute the first suggestions that occur. To maintain the state of doubt and to carry on systematic and protracted inquiry – these are the essentials of thinking.”

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Be Inquisitive!

- It is OK (indeed required) that you ask many and probing questions
- Ask probing questions: Examples
 - How was the data sampled?
 - Was the experiment randomized?
 - How did you measure X?
 - Was the measurement process calibrated, stable, and in statistical control before you ran the experiment?
- Don't be afraid that the client may think your questions are “stupid”
- If you don't ask now you may not understand what follows and then it will be even more embarrassing that you don't know and don't understand

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Minimum Skills Needed

- Interpersonal skills
- Listening skills
- Diagnosis, Analysis and problem definition
- Problem solving skills and statistics
- Doing/implementing/maintaining
- Time management/working to a schedule
- Managing meetings
- Public speaking
- Writing
- Selling and marketing

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Statistical Consulting

- Cochran and Cox (1954), “The statistician who expects that his contribution to the planning will involve some technical matter in statistical theory finds repeatedly that he makes a much more valuable contribution simply getting the investigator to explain clearly why he is doing the experiment, to justify the experimental treatments whose effects he proposes to compare, and to defend his claim that the completed experiment will enable its objectives to be realized.”

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Why Change Management?

- Most industrial consulting work is requested because someone (the client or someone in upper management) in the organization wants, or perceives the need for a change
 - Examples: Quality improvement, productivity improvement, efficiency, new product development
- Typically the client wants to make fundamental changes in how they conduct business to cope with a new and challenging economic environment
- Most corporate change programs are a failure or at best only marginally successful.
- Why?
 - Typical patterns, typical errors made
 - Lessons learned
- Change needs to be carefully managed!

Adopted from Kotter, HBR (1995)

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Eight Steps to Transform An Organization

1. Establish a sense of urgency
2. Form a Powerful Guiding Coalition
3. Create a Vision
4. Communicate the vision
5. Empower others to act on the vision
6. Plan for short term wins
7. Consolidate improvements and produce further changes
8. Institutionalize the new approach

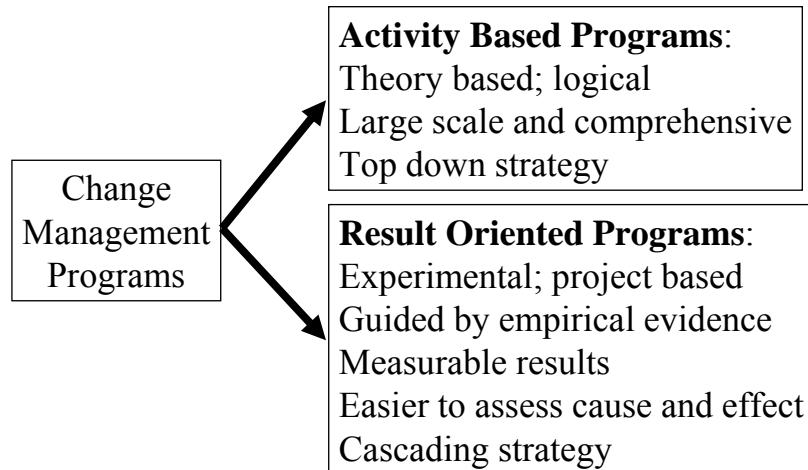
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1.26

Consulting: Two Alternative Approaches*



*Based on Schaffer and Thomson, *Harvard Business Review* (1992)

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Activity Centered Programs

- Activity Based Programs: The pursuit of activities that sound good but contribute little to bottom line performance
- Assumption: If we carry out enough of the “right” activities, performance improvements will follow
- Consultants to managers: “You need not and should not focus directly on improving results. Eventually results will follow.”

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An Alternative: Results-Driven Improvement Programs

- Results-Driven Programs: Focus on achieving *specific, measurable, operational* improvements within a few months
- Examples of specific measurable goals:
 - Increased yield
 - Reduced delivery time
 - Increased inventory turns
 - Improved customer satisfaction
 - Reduced product development time

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An Effective Strategy

1. Map out how the organization should look after a major change
2. Use a series of rapid cycle projects that provide the employees opportunities to develop their skills in managing change
3. As they learn to change, mount increasingly larger scale, more strategic efforts and move upstream
4. Periodically review and modify the overall strategic plan

Benefit: The projects pay for the program

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Result Oriented Programs:

- Project based
- Experimental
- Guided by **empirical evidence**
- Measurable results
- Easier to **assess cause and effect**
- Cascading strategy



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“Logical” Top Down vs. an Incremental Approach

- It may sound logical and rational to thoroughly analyze the whole organization, make a careful assessment, develop a comprehensive plan for change and then institute changes
 - Examples: TQM, ISO 9000, EFQM
- In practice it works better to immediately start solving the most obvious problems, create short term wins and then roll out the change programs to wider areas of the organization
 - Example: Six Sigma



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The Focus of Six Sigma

- Accelerating fast breakthrough performance
- Significant financial results in 4-8 months
- Ensuring Six Sigma is an extension of the Corporate culture, not the program of the month
- Results first, culture change will follow!

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Conclusion

- Consultants are typically hired to help with or guide organizational change programs
- The reason is most often competitiveness problems, poor quality, high costs, etc.
- Consultants should be familiar with basic concepts of organizational change

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Understanding Human Behavior
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2.1

**Skills We Will Focus On In
This Workshop**

- Interviewing
- Identifying resistance
- Some skills to defuse immediate resistance
- We will not focus on major system change
- Understanding human behavior

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2.2

The first step to successful change management is understanding human behavior

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2.3



Understanding Human Behavior

- Human behavior is rational
- The study of human behavior is called Behavior Analysis
- What people do is called behavior
- Past behavior is the best predictor of future behavior (better than traits)
- Behavior is maintained by consequences

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2.4



A Functional Analysis of Effective Consultant's "data side manners"

- Able to obtain necessary information through interview
- Able to obtain "buy in"
- Able to motivate and gain cooperation
- Able to recognize and deal effectively with resistance
- Able to convey complicated, technical information without being smug

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2.5

**Most management theories
address causation of human
behavior rather than control**

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2.6

Behavioral science attempts to answer questions about the causation and control of human behavior

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2.7

Organizational Behavior management

- Basic principles
 - Behavior is largely a function of its consequences
 - An empirical, scientific perspective
 - Emphasis on experimentation to assert cause and effect
 - Emphasizes performance improvement
- Example: DW
- Most other theories use unobservable, internal cognitive states

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2.8

ABC's of Behavior

A	B	C
Antecedents	Behavior	Consequences
Causes of behaviors	Observable and measurable	Increases or decreases the probability that a behavior will occur

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A:Antecedents

- Rules
- History
- Biology/genetics
- Environment
- Sociological
- Learning
- Perceived expectations

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2.10

B: Behavior

- Is observable and measurable
- Is not attitudes, beliefs, feelings, traits
- If you change behavior, attitudes and beliefs will follow
- “What you do speaks so loudly that I cannot hear what you say.”
Ralph Waldo Emerson

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C: Consequences

+		-
Positive Reinforcement	↑	Extinction ↓
Punishment	↓	Negative Reinforcement ↑

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2.12

Positive Reinforcement (R+)

- Something that occurs after a behavior, that increases the probability that the behavior will occur
- May be immediate or in the future
- May be concrete (a bonus) or may be abstract (recognition)
- You only know something is R+ if the behavior is strengthened

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Extinction

- The weakening or elimination of a behavior by removing the positive reinforcement
 - Removal of bonus, attention, etc.
- If behavior is being maintained by R+, it can be stopped by removing the R+

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Negative Reinforcement (R-)

- The avoidance or termination of an aversive stimulus
- Increases the probability that a behavior will occur
- Has same side-effects as punishment
- Examples include: criticism, demotions and assignments to disliked tasks



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Punishment

- Decreases the probability that a behavior will occur
- Side effects:
 - Tends to work only in the presence of the punisher
 - People seek to avoid the person who punishes
 - Usually only works temporarily
 - Increases anxiety



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Caution!

Consequences have the same
effect on desirable and
undesirable behaviors

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Antecedents

- Barriers
 - Unrealistic objectives, plans or schedules
 - Training deficiencies
 - Inadequate or inappropriate tools
 - Conflicting orders, instructions
- Aides
 - Clear and realistic plans
 - Realistic schedules
 - No threatening questions about progress
 - Constructive suggestions
 - Training

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2.18

Some Antecedents Can Be Changed

- Changeable
 - Rules
 - Situations
 - Some environmental issues
 - Stated missions
 - Defining what will be rewarded or punished
- Not changeable
 - History, past experiences
 - Biological
 - Some environmental issues

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2.19



Rearrange Antecedents to Provide Opportunities and Remove Barriers

- Antecedents are cues that tell us to behave in certain ways

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Isolate Key Job Behaviors

- Behavior is what counts
 - What behavior is necessary to obtain the objectives?
 - Focus on behavior, not implied motives, needs or drives
 - Focus on what is right, rather than what is wrong

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R+ Performance Improvement

- Behaviors that are R+ will be repeated
 - Consequences must be specific
 - R+ must be conditional
 - R+ may be intermittent

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If a behavior occurs, it is being reinforced, either positively or negatively

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Bribery is when the R_+ is given before the behavior occurs

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Workshop

Creating a behavioral analysis of a situation

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2.25

**ENBIS Workshop:
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Section 3
Resistance to Change
Newcastle, United Kingdom
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3.1



*Resistance to Change:
How to recognize it!
and
How to deal with it!*

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3.2



Resistance to Change

- Resistance to change is natural – will exist in any organization
- Resistance to change may happen at all levels of an organization
- If pervasive or by key individuals, resistance to change will have detrimental effects for the whole program
- **MUST** not be ignored!!!

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3.3

Resistance to Change is Normal

- The positive side of resistance is that it leads to stability and predictability in an organization
- Resistance can stimulate a healthy discussion
- Resistance can come from the organization or from individuals

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3.4

Faces of Resistance

- **Overt**
 - Vocal complaints by employees
 - Engaging in a work slowdown
 - Threatening a strike
- **Covert**
 - Loss of loyalty to organization
 - Less motivation
 - Increased errors
 - Increased absenteeism
 - Dragging feet

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3.5

Causes of Individual Resistance

- **Habit**
 - Habits are behaviors we do without thinking about them
 - All humans are creatures of habit
 - To cope with life's complexity, we rely on habits
 - When confronted with change, the tendency to respond in known ways becomes resistance
- **Fear**
 - That change will lower income or job security
 - That change will involve new tasks that one cannot perform
 - Loss of power and influence

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3.6

Causes of Organizational Resistance

- Organizations actively resist change through structural mechanisms to provide stability
 - People are hired to “fit in”
 - Rules, job descriptions and training shape and direct people to perform in specific ways
 - Changes in organization threatens power relationships and expertise
 - History/culture

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3.7



What's really going on here?

- What we perceive as resistance is really a part of the system we do not understand
- We need to know what is causing a behavior and what is maintaining it
- You can only change behaviors. You cannot change attitudes, beliefs, cultures
- You can only change behaviors if you understand human behavior

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3.8



Participation Can Reduce Resistance

- Participation has little effect on productivity, motivation and job satisfaction
- Participation can reduce resistance to change, it's difficult to resist a change you helped design (cognitive dissonance)
- Examine conditions for participation
 - Is there adequate time?
 - Is the issues relevant to the person?
 - Does the organization support employee participation?

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3.9

Methods to Involve People

- Quality circles
- Teams
- Suggestion programs
- Six Sigma

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3.10

**ENBIS Workshop:
Statistical Consulting and
Change Management**
Section 4
What is Effective Communication
Newcastle, United Kingdom
September 17, 2005

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4.1

**Now that you can recognize
some forms of resistance, how
do you deal with it?**

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4.2

How do you find out what you need to Know?

- Effective interview
- Observing
- Applying your past experiences
- Hearing is not listening. Listening is making sense out of what we hear.

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4.3

Understanding Other's Communication

- Good understanding involves:
 - Observing (what one does)
 - Hearing (what is said and how it is said)
 - Feeling (what they are feeling)
 - Sensing (what is not said)

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4.4

Characteristics of Good Understanding

- Being aware of the major aspects of communication
- Make use of the information
- Avoid imposing your situation on others
- Assume nothing



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4.5

Major Aspects of Communication

- Nonverbal behavior
- Recognizing types of nonverbal behavior
- Recognizing verbal quality



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4.6

Using Effective Communication

- **Nonverbal Behavior:**
 - Eye Contact
 - Postural position
 - Verbal quality
- **Verbal Behavior:**
 - Response Types:
 - » Continuing
 - » Leading

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4.7

Eye Contact

- **Eye contact:** Most powerful way you convey that you are paying attention
 - Good eye contact consists of looking at someone when you are talking
 - If you are uncomfortable with eye contact, look at the bridge of their nose
 - Poor eye contact is never looking at them, staring blankly, and looking away as soon as they look at you

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4.8

Body Position

- Good postural position is sitting facing another person, spontaneous facial expressions
- Poor postural position includes head and body not facing the other, rigid body, restless fidgeting, being preoccupied with with notes, etc.



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4.9

Verbal Quality

- Good verbal quality includes pleasant tone, affect appropriate of message, etc.
- Poor verbal quality includes a flat tone of voice, irrelevant responses, excessive use of jargon, etc.



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4.10

Response Types

- Continuing Responses:
 - MmHm
 - Content
 - Affective
- Leading Responses:
 - Influencing
 - Advice Giving
 - Questioning
 - » What kinds of questions

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Listening

- Avoid imposing you own thoughts
- Let them finish talking before you offer a solution
- Active listening

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4.12

Assume Nothing

- Distinguish between what has happened and what really happened
- There may be discrepancy between perceptions and what really occurred
- There may be a motivation to mislead you
- They don't know what information you need

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Workshop

Interviewing for information

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4.14

Examples

- You have neighbors who consistently play loud music. This has started to interfere with your sleep.
- You have a co-worker who spends more time on the phone than doing work. You frequently have helped them out, but you are becoming resentful.
- Your connection at the bank you are consulting with does not return your phone calls in a timely manner. This is making it difficult for you to get ready for your time at the bank.
- You are organizing a conference. The participants don't get requested information to you in a timely manner.
- The company you consult with consistently pays you 30-60 days beyond the time agreed upon in your contract. This is causing some difficulty because you pay your expenses up front.
- You suspect a team is "fudging" data in their projects.
- On evaluations of your training, you consistently get complaints about things you cannot control. They are really under the control of the organizer from the company. You don't want to alienate your customer.
- You have a colleague who you believe is "padding" their bills.

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4.15

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Statistical Consulting and
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Section 5
Assertiveness
Newcastle, United Kingdom
September 17, 2005

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5.1

**How do I Deal with Resistance
I Observe?**
Assertiveness

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5.2

Assertiveness

- An attitude and a way of acting in any situation where you need to:
 - Convey information
 - Ask for what you need
 - Deal with resistance

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5.3



What is Your Dominant Behavior Style?

- Passive
- Aggressive
- Passive aggressive
- Assertive

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5.4



Your Dominant Style

1. You are kept waiting more than 10 minutes for a meeting to start
2. You are sitting in a movie and people are talking behind you
3. Your neighbor is playing loud music
4. You would like to return something to a store and get a refund
5. You're standing in line and someone steps in front of you
6. You receive food at restaurant that is over or under cooked
7. You would like a colleague to write a letter of recommendation for you
8. Your spouse/partner/roommate is not doing their fair share of work around the house
9. Your colleague is not doing their fair share of a project
10. You are at a meeting with your supervisor and would like to speak up, but are sure they will not like what you have to say

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5.5

Your Dominant Style Con't

11. You are at a gathering and would like to meet new people, but don't know what to say
12. Someone near you is smoking and it is starting to bother you
13. You find a friend's behavior unacceptable
14. You are talking to someone about something important and they don't seem to be listening
15. Someone stops you in the hall just as you are heading to the restroom
16. You are speaking and someone interrupts you
17. You receive and unjust criticism from someone
18. Your phone rings, but you don't feel like answering it
19. Your friend has owed you money for a long time and you could use it
20. Your boss keeps you waiting for more than 20 minutes

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5.6

Aggressive

- Demanding, abrasive, hostile or condescending
- Attempts to get what you want by force
- Creates enemies and conflict
- Sets up others to be withdraw or fight back
- Creates passive-aggressive behavior

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5.7

Passive Aggressive

- Instead of openly confronting conflict, anger is expressed in a covert manner
- Complaining about something or someone
- Seldom get what you want
- Leaves others feeling angry, confuse, and resentful

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5.8

Manipulative

- Attempts to get what you want by making others feel sorry for them or guilty
- Play the martyr role to get others to do what they want
- Causes people to feel angry and resentful



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5.9

Non-assertive Behavior

- Yielding to someone else's preferences
- Not conveying information
- You may be overly invested in being "nice" or not offending someone
- You may be afraid they will not listen to you



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5.10

Assertive Behavior

- Asking for what you want or need in a simple, direct fashion that does not negate, attack or manipulate
- You communicate while maintaining respect and consideration for others
- You communicate without apologizing



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5.11

The Assertive Interaction

- Use assertive nonverbal behavior
- Keep it simple
- Be specific
- Use “I” statements
- Talk about behaviors not personality
- Don’t apologize



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5.12

Nonverbal Assertive Behavior

- Looking directly at another person when addressing them
- Maintain an open rather than closed posture
- Do not back off or move away
- Stay calm

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5.13

Assertiveness does not mean you always get what you want

Assertiveness improves your chances
of being effective

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5.14

Assertiveness Techniques

- Broken record
- Fogging
- Content to process
- Assertive inquiry
- Defusing

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5.15

Broken Record

- Stating what you want repeatedly in a calm, direct manner with the persistence of a broken record

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5.16

Fogging

- Agree impart with the criticism
- If you don't agree with the specifics, agree with the general principle behind the criticism
- Best used if someone is being critical
- Do this in a calm, quiet tone of voice without being defensive or sarcastic

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5.17

Content to Process

- Changes the focus of the discussion from the content to a description of what's happening
- If someone gets angry, makes a joke, or brings up something irrelevant, you point out what they're doing and bring the focus back to content
- "That's not what we're talking about"

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5.18

Assertive Inquiry

- When attacked you can often defuse the attack by asking what is their problem with your input

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Ways in Which Someone Might Resist

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5.20

Diversions Tactics

- Floods you with details
 - You ask a simple question, you get more information than you need
 - You feel bored or confused about what this has to do with the problem at hand
- Technique: Assertive inquiry
 - How is this relevant to the problem?
 - What is the point here?
 - How does this effect the issue?



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5.21

Attacking

- Angry words directed at you
- Making a joke of what you say
- You are reminded that they live in the “real world” and are facing “real world” problems
- Technique: Fogging
 - You may be right, however, the issue here is...
 - That’s true
 - It may seem that way to you, but I’ve observed...
 - I disagree



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5.22

Delaying

- Keep asking for more details
 - No matter how much you provide, it's not enough
 - You get impatient
- Keep putting you off
 - Telling you they're too busy to
 - » meet with you
 - » implement a plan
 - » start a project
 - » finish a project
- Technique: Broken record
 - Keep repeating the request
 - I want, we will, the approach we will use is...

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5.23



Why — Not What

- Questions about your methodology
- Repeated questions about method or suggestions of alternatives
- Spending time and energy spinning theories
- Talking about how things should be instead of how things are
- Technique: Content to process
 - “We’re not talking about the methodology right now”
 - “We resolved that issue before we started”
 - “I know you don’t like what this means, but...”
 - “We gotten off the subject now, let’s go back to the results”
 - “What, specifically, do you think should be done?”
 - “How would that be different?”

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5.24



Workshop

Assertiveness

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5.25

Examples

- You have neighbors who consistently play loud music. This has started to interfere with your sleep.
- You have a co-worker who spends more time on the phone than doing work. You frequently have helped them out, but you are becoming resentful.
- Your connection at the bank you are consulting with does not return your phone calls in a timely manner. This is making it difficult for you to get ready for your time at the bank.
- You are organizing a conference. The participants don't get requested information to you in a timely manner.
- The company you consult with consistently pays you 30-60 days beyond the time agreed upon in your contract. This is causing some difficulty because you pay your expenses up front.
- You suspect a team is "fudging" data in their projects.
- On evaluations of your training, you consistently get complaints about things you cannot control. They are really under the control of the organizer from the company. You don't want to alienate your customer.
- You have a colleague who you believe is "padding" their bills.

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5.26

**ENBIS Workshop:
Statistical Consulting and
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Section 6
Practical hints; do's and don'ts
Newcastle, United Kingdom
September 17, 2005**

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6.1

Introduction

- The section is a collection of miscellaneous hints, do's and don'ts
- Most is based on what we have learned “the hard way”
- Higdon's Law:
 - Good judgment comes from bad experience
 - Corollary: Experience comes from bad judgment

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6.2

Do I know Enough to be a Statistical Consultant?

- Statistical consulting always involve some other subject matter area, typically rather complicated technology
- Question: How much do you need to know about the subject to be able to be an effective consultant?
- Answer:
 - You are asked to join the team because of your statistical knowledge and general problem solving skills, not because you know a great deal about any other subject.
 - With that said you should always try to learn as much as you possibly can about the subject matter both before and during the consulting engagement

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6.3

How Do I Quickly Learn About X?

- My Trick:



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6.4

Other Resources: Handbooks

- A few examples we use:
 - Juran, J. M. and Godfrey (2000), *Juran's Quality Handbook*, Fifth Edition, New York: McGraw-Hill.
 - Handbook of Chemical Engineering
 - Doyle, L. E., Keyser, C. A., Leach, J. L., Schrader, G. F. and Singer, M. B. (1985) *Manufacturing Processes and Materials for Engineers*, Third Edition, Englewood Cliffs, NJ: Prentice Hall.
 - Maynard, H. B. ed. (1970), *Handbook of Business Administration*, New York: McGraw-Hill.
 - Riggs, J. L. (1976), *Production Systems, Planning, Analysis and Control*, Second Edition, New York: John Wiley and Sons.

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6.5



Pragmatism

- Really useful solutions are typically simple. Indeed they are useful because they are simple!
- Clients don't want to hear about how difficult it is to solve a problem. They don't want to hear about violated assumptions. They want a quick solution!
- A good solution is seldom "optimal" in any narrow sense but satisfactory in a number of ways
- The key to success is to cut out the complexity and develop a simple and useful solution.
- Sometimes you need to shoot from the hip:
 - Example SPC for autocorrelated data. Multiply the sigma estimate by 2
- H. Hofmann: "The ability to simplify means to eliminate the unnecessary so the necessary can speak."
- A. Einstein: "Everything should be made as simple as possible, but not simpler."

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6.6



Solicitation and Marketing

- Don't do media advertising and fancy brochures; not effective
- Clients typically find consultants through indirect channels, word-of-mouth recommendations from friends and colleagues, meeting the consultant at business meetings or conventions, hearing the consultant speak, reading articles by or about the consultant, books written by the consultant, news items
- Teach short courses, pre-conference workshops and give talks pro-bono for a variety of trade and professional organizations including non-statistical societies
- Write books and articles

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6.7



Solicitation and Marketing

- Cultivate relationships
- Network, get together, express interest in getting acquainted, conduct conversations, establish contracts, exchange business cards, etc.
- Work on referrals
- Develop a brand; develop a good reputation
- Use a broker
- Write proposals
- Do good honest work! Nothing succeeds like success. (Many consultants do such poor jobs that you will quickly develop a reputation if you are doing good solid work)

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6.8



Novice Consultant's Mistakes

- Unnecessary overheads and expenses
- Fancy offices, cars and other paraphernalia
- Expensive marketing efforts and brochures
- Failure to do sales work until business is slow
- Incorporating

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6.9

Engagement Maintenance

- Long term relations are the best:
 - You learn more,
 - Get exposed to better problems and
 - Can make more significant contributions to the clients operations (short term engagements are mostly training)
 - Requires less selling
- Rule number 1: Be effective! Aim for saving the client 5-10 x your fee.
- Rule number 2: Do what you promised to do (and don't promise what you cannot or will not do).

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6.10

Engagement Maintenance

- You must always listen carefully to client feedback, try to understand what they need, work with them to make sure they are satisfied customers
 - Example: The one trick pony: The client needed and requested a talk on management of experimentation but the consultant gave a lecture on consulting.
- Keep the client team on your side, involved and get buy-in
- Make the client shine!
 - ...it is not about you!
 - If your client looks good in the eye's of the superiors, you will have repeat work
- Identify new client needs while you work on the current assignment and let the client know that you have additional expertise that can help with XYZ

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6.11

Arrogance

- Arrogance is “Problem Number 1” of consulting
- Don't ever be condescending and patronizing to your client
- Statistics is difficult -- many people have “stat anxiety”
- Avoid “disdainful punitiveness”
- There are always tactful ways to bring the bad news
- Clients hire consultant to get help, not to be insulted
 - Example: “Didn't you learn in Stat 101 that you cannot do that?”
- Help the client explore how critical mistakes were made
- Words like “trivial”, “obviously”, and “easy” should be banned

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6.12

Solve the Clients Problem

- The purpose of consulting is not to show how smart you are!
- The purpose is not to find the most sophisticated way to solve a problem or to provide an “elegant” demonstration of a particular technique
- Consulting is not necessarily a statistical research project.
- Technique Driven Problem Solving: Don’t act like the expert wanting to solve all problems with your favorite technique
- Problem Driven Problem Solving: The purpose is to solve the client’s problem
- Solve the clients problem quickly and with concern for the cost and urgency
- Be prompt with your services
 - Example: Circuit board manufacturer

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6.13



Never Forget Who is Your Client?

- You may think you consult with for a company, but the person who retained you is your client!
- It is your job to make whoever hired you look good
- It is not about you! As a consultant you are in the “hero-making,” not “hero-being,” business!
- Always give your client credit and assume an inconspicuous role
- If you are effective, your client will be successful. If you fail or are not effective, the person that hired you will end up with “eggs on his/her face”
- Consulting is a person-to-person business
- Be sure you know who really hired you
 - Example: Mr. C or Mr. S?

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6.14



Who Makes Decisions?

- **A Fundamental Principle:** Consultants do *not* make decisions!
- Consultants provide input to making decisions, but in the end the client/manager makes the decision
- The manager ultimately is responsible for the decision, not the consultant
- The consultant can help determine what conclusions can be drawn from a set of data and with what confidence, but should then back off
- If the evidence is weak, the consultant is responsible for pointing this out, preferably with analysis to back up the claim

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6.15

Statistical Consulting Rules

- Avoid answering any statistical questions until the subject matter background is understood
 - Example: “Should I run an ANOVA on this data set?”
 - Example: “Don’t you agree that a t value of 7.2 is very good?”
- It is legitimate to help endorse a client's own solution, but you must first understand the problem, grasp the objective of the study, scrutinize the data, understand how the data was collected and carefully examine how the client developed the solution
- It is OK to say “I don’t know.”
- You should know your limitations and you should make them known to your client (C. Daniel, 1969)

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6.16

What is a Statistical Problem?

- Deming's definition: "I'm a statistician, I helped solve the problem, ergo it is a statistical problem."
- Deming's shoe story
- Some times it takes someone, an outsider, non-expert, a person not bound by "conventional wisdom" to identify and solve a problem
- "Experts" tend to think in conventional ways
- Beware of the "expert" that says it cannot be done!
- To come up with a new way or a new solution may often require someone coming in naively asking "why not!"

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6.17

An Observation

- You typically cannot do good consulting in your own immediate neighborhood
- If you do, you end up doing low-level work for a low fee, on an hourly basis, gain little respect for what you do and end up with complaints about your bill
- A definition of a consultant: "Someone who flies in from at least 500 miles away"

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6.18

Solo or Going Big?

- Going big or going it alone?
 - There are many advantages by being a sole consultant – small overheads, no financial commitments to others
 - However, it is hard to do marketing while you are working on a contract so you end up with going from feast to famine
 - There are also limits to how large jobs a sole consultant can take on
- On the other hand you need to get quite large before you make as much money as a multi consultant company as you did as a sole consultant
- Going big you end up doing nothing but selling
- You will have problems with quality control
- Compromise: Use subcontractors; act as a broker

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6.19



Why Consult?

- Why should you consult?
 - If you are an academic:
 - » Consulting teaches you what is really important for the practice of statistics
 - » You get much better “war stories” to tell in class and better examples; you become a better teacher of statistics
 - » Rich source for research ideas
 - If you are an internal or external industrial statistician:
 - » Consulting is very rewarding, will make you a much better statistician, and a more successful professional
 - » The best way to learn!
 - » Your clients teach you so much about statistical as well as non-statistical issues
 - In any case, consulting is great fun!

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6.20



The Importance of Practice in the Development of Statistics

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The article shows how application and consideration of the scientific context in which statistics is used can initiate important advances such as least squares, ratio estimators, correlation, contingency tables, studentization, experimental design, the analysis of variance, randomization, fractional replication, variance component analysis, bioassay, limits for a ratio, quality control, sampling inspection, nonparametric tests, transformation theory, ARIMA time series models, sequential tests, cumulative sum charts, data analysis plotting techniques, and a resolution of the Bayes-frequentist controversy. It appears that advances of this kind are frequently made because practical context reveals a novel formulation that eliminates an unnecessarily limiting framework.

KEY WORDS: Practice; Theory; Least squares; Ratio estimators; Correlation; Contingency tables; Studentization; Experimental design; Analysis of variance; Randomization; Fractional replication; Variance component analysis; Bioassay;

Technometrics (1984)

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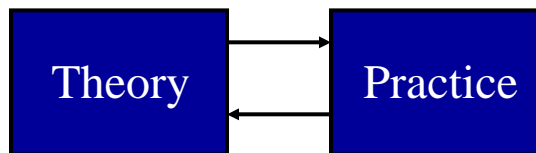


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6.21

Statistical Theory and Practice

- A primary stimulus for innovations in statistical theory comes from challenging applications
- Historically, major and minor statistical theory developments have occurred in direct response to the demand for solutions to important practical problems
- It is a two-way street:
 - Challenging problems stimulate the development of new procedures, methods and theory
 - New theory and methods stimulate new applications



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6.22

Conclusion

- The human side of consulting is much harder than the technical
- This workshop was not intended to teach you “everything you ever wanted to know about consulting”
- The purpose was to stimulate thoughts and discussions about effective consulting skills
- Consulting can only be learned by “doing consulting”
- We hope this workshop was thought-provoking

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6.23

**ENBIS Workshop:
Statistical Consulting and
Change Management**
Appendix 1
Ethics and Intellectual Property

**Newcastle, United Kingdom
September 17, 2005**

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A1.1

Ethics

- As a consultant, your reputation and integrity are your most important assets
- It may take 10 years to build up a reputation, but only one unethical act or indiscretion to lose it!

A Few Useful References:

Deming, W. E. (1965), "Principles of professional statistical practice, *Annals of Mathematical Statistics*, 36, pp. 1883-1900.

Deming, W. E. (1972), "Code of Professional Conduct," *International Statistical Review*, 40, No. 2, 215-219.

ISI (1986), "International Statistical Institute Declaration on Professional Ethics." *International Statistical Review*, 54, 227-242.

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A1.2

A Few Ethics Principles

- Principles of ethics are personal. We suggest you make up your own set of ethics principles.
- Here are a few of ours:
 - Be totally ethical in everything you do
 - Don't promise what you cannot deliver
 - Over-deliver rather than under-deliver on your promises
 - Don't withhold important facts
 - Tell it as it is! Delivering "bad news" is sometimes part of the business
 - Don't become arrogant and pompous
 - Be business like, professional and respectful in all your dealings with the client
 - Be completely honest, courteous and respectful, do an honest day of work, completely honor your contract or agreement with the client,
 - Submit only scrupulously honest invoices
 - Refrain from judging other consultant's work
 - Take responsibility for your errors and mistakes
 - Give credit where credit is due

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A1.3

Confidentiality

- Confidentiality is of paramount importance if you want to be involved in consulting on important problems
- Firms typically guard closely their data, information and internal problems/issues. To gain their confidence you will need to assure the client that their information will not be share with others
- You must never appear to compromise a clients confidentiality; appearing to be loose-lipped or gossip about other clients indicates that you may do the same about the current client

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A1.4

Conflict of Interest

- Retaining work with a direct competitor of a current client is not advisable
- Do not directly use or cite what you learned about one client to another
- Do not in any way embarrass or compromise a former client
- Disclose fully if you at all feel that there might be a conflict of interest or even a perception of one. Let the client be the judge if there might be a conflict
- The information you acquire can be used to further your own consulting business, but the information itself must remain confidential
- Be careful taking jobs from clients with which you have or may be perceived as having a conflict of interest relationship
 - Example: Company in R-ville

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A1.5



Intellectual Property Rights

- Educate yourself about intellectual property (IP) rights issues
 - it is a developing domain:
 - Example: Copying or distributing copyrighted material may be illegal if you charge for your teaching or consulting. This may even be true if you are the author but transferred the copyright to a scientific journal.
- Theft of IP is like any other theft
- The clients data is the clients property
- If you developed teaching material or software on a clients time, make sure you clarify in writing who owns the IP before the work is initiated
- If you at a client's site use and present teaching material or software developed by you and on your time, you still own it
 - If you buy a book you own that book, but not the copyright to the book

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A1.6



Basic Rules of IP

1. Do not publicly disclose patentable information to anyone outside your organization until a patent application has been filed
2. Even if you obtain a patent your invention may still infringe on the patent rights of someone else
3. Copyright
4. When you start a new employment, carefully read and fully understand the agreement and the consequences before you sign
5. If you adopt a name, trademark or logo conduct a careful search
6. If you ask a client or a vendor to provide input to a project, have them sign an agreement clearly stipulating the ownership of the IP.
7. Keep adequate document records of development work.
8. The copyright law prevents copying. Do not copy the same expression
9. Assume initially that your work can be patented or copyrighted. The law is in flux.

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A1.7

Copyrights

- The copyright law is a device giving the author the right to control the reproduction of the expression embodied in his/her's creation.
- The key word is “expression”. You can copyright an expression, not an idea. Anyone is free to use the idea and further evolve it.
- Although not strictly necessary, it is recommended to label all material with “Copyright © 2005 by X. All rights reserved.” If so, no weight is given to an “innocent infringement” defense
- To be on the safe side it is recommended to register copyrights within 3 month of publication
- Software can be copyrighted
- Check with the USPTO or similar agency. The rules are constantly evolving.

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A1.8

Proprietary Data

An example from a research contract: An excerpt, edited to protect confidentiality.

11. Proprietary Data

Unless otherwise required by law, the Consultant will exercise best effort to maintain in confidence proprietary or trade secret information disclosed or submitted to Consultant by Sponsor (=The client) which is designated in writing as confidential information at the time of disclosure. Confidential information does not include information which at the time of receipt:

- (A) Is generally available in the public domain or thereafter becomes available to the public through no act of the Consultant; or
- (B) Was independently known prior to receipt thereof or was discovered independently by an employee of the Consultancy who had no access to the information supplied by Sponsor under this Agreement; or
- (C) Was made available to the Consultant as a matter of lawful right by a third party without obligation of confidentiality.

The Consultant retains the right to refuse to accept any such information which is not considered to be essential to the completion of the work. The obligations of the Consultant under this paragraph shall survive and continue for two years after termination of this Agreement.

Upon completion of the work project or upon earlier termination of this Work Agreement, the Consultant agrees to remove all Sponsor proprietary information from electronic storage and to return or destroy all documents containing Sponsor proprietary information in its possession unless otherwise agreed to in writing by Sponsor.

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A1.9

Deming's Consulting Principles*

1. I only consult if invited by top management
2. Top management will study with me, my principles of management
3. A necessary condition for my participation is that the management agrees to redesign the organization according to my principles
4. Top management will understand that my work is company wide
5. The engagement will be long-term, but I may break it off at any time. My annual fee will be stated at the outset.
6. I will put in enough time to satisfy myself.
7. I will continue beyond 3 years if I think it is useful
8. I may suggest the company engage specialists to work on specific problems
9. I may accept engagements from competitors

*Paraphrased and condensed from Deming (1986), *Out of the Crisis*, MIT Press, p. 472.

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A1.10

Further Reading

- Consult Deming's paper on professional ethics for statisticians
- See also ISI (1986), "International Statistical Institute Declaration on Professional Ethics." *International Statistical Review*, 54, 227-242.
- For IP issues, consult Rockman, H. B. (2004), *Intellectual Property Law for Engineers and Scientists*, New York: John Wiley and Sons, Inc.

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A1.11

**ENBIS Workshop:
Statistical Consulting and
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Appendix 2
Billing, Rates and Invoicing

**Newcastle, United Kingdom
September 17, 2005**

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A2.1

A Few Basic Principles

- Stand up straight! What you know is valuable and took a long time to learn. Billing a reasonably high fee is ok.
- A rate calibration rule of thumb: Is your hourly rate as high as your accountant's, lawyer's or dentist's rate?
- A day is a day. If the client wants to use my services for 2 hours or for 12 hours the rate is the same.
- I do not charge overtime or weekend rates
- Your rate should account not only for time spent on site but also overhead
- Overheads are real:
 - You need to support office space, clerical work, book keeping, copying, travel arrangements, credit card charges, tax advice, insurances, tips, etc.
 - This should be true even if you (or your spouse) does the work
 - Try to calculate/estimate what your overhead really is
 - To do a week long job (5 billable days) in Malaysia you may need to spend a total of 9 days and endure much discomfort
 - There is typically much preparation and post-session work involved that you cannot directly bill for

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A2.2



Differential Rates

- It is legitimate to maintain different rates for different types of work:
 - Straight one-on-one consulting
 - Talks
 - Lectures (with extensive preparation)
 - Data analysis
 - Report writing
 - Work done at home or at the client's site
- When you are new to consulting, your need to recognize that you have a lot to learn and that you need to “pay your dues”



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A2.3

Rates

- Think carefully when you offer up a rate
 - It is hard to increase your rate once you have started working for a client
 - Use a consistent rate
 - Don't blink
 - Don't lower your rate if you get “hungry”
 - You may consider differential rates for short-term and long-term engagements
- Try to get a sense from colleagues what the market can take – what is “normal”
- Is consulting your main business or a side business?
- Often you cannot charge for “sales calls”



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A2.4

Billing Rate

- My advise:
 - Bill by the day
 - Avoid as much as possible billing by the hour
 - Bill always as “plus expenses”
 - 30 days
 - Sometimes you may have to “swallow time” if the work does not help the client
 - Sometimes it may be better to work longer than your billable hours than lowering your fee

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A2.5

Lessons from the Trenches

- Sometimes if you don't want to do a job, rather than saying no, it may be better to quote a very high fee
 - Example: Lawn mover company
- If the client insists on knowing your fee right away, then you likely may not want the job!
- Clients that want everything on the cheap are not worth working with
 - Example: Client that wanted to compare my rate for DOE course with standard training rate by local community college teachers hourly rate
- Sometimes if you are too cheap the client may not respect you
- If the client haggles over your billing, you may want to consider discontinuing the relationship

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A2.6

Lessons from the Trenches

- Some clients are simply not worth having
 - Example: Chemical company A; Quality Manager
- Avoid local consulting:
 - One definition of a consultant is “someone from at least 500 miles away!”
 - You cannot be local and an expert at the same time
 - Client wants you for a few hours at a time causing excessive overheads and wasted time for you
 - Example: Filter company -- Local client that wants you because you are local and obviously must be “cheap.”
The “local college professor” problem.

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A2.7



Learned in the Trenches

- You can also price yourself out of good work
 - Example: Gas/CO detector company
- Sometimes you get more interesting hands-on statistical work if your fee is more moderate
- If you want long-term, statistically satisfying, consulting with a company, you may want to set your rate somewhat lower than if you just want to come in and pontificate
- Sometimes you may want to do pro-bono work:
 - The work is of value to you professionally
 - The work is for a good cause
 - The exposure may be good for future sales

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A2.8



Expenses

- Key Principle: *Never stick it to the client!*
- Mistake: “I am on expense account so I am going to live it up!”
- A few simple principles:
 - Never run up unreasonable, unnecessary or excessive expenses
 - Fancy wine and expensive dinners are your choice and on your own account
 - Fly coach class unless you explicitly have an agreement with the client to go business class
 - Bill for laundry services, phone calls, movies and minibar sparingly and only if on extended trips
 - Expenses that are not directly related to the consulting engagement or are above the necessary minimum for doing the job are out of your own account
 - On the other hand don't go too cheap either
- Which Hotel? Answer: Ask the client to suggest a convenient (and appropriate) hotel
- Rental car: Compact or midsize if necessary
- Try to solicit some guidelines from the client
- Pride yourself in not having your expenses disputed

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A2.9



Dilemma's

- Malaysian wine story
- Billing for what turned out to be a more or less useless data analysis
- Billing for hotel when stranded for two days in Chicago Airport during a blizzard?

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A2.10



Regular Invoicing

- Submit you invoice monthly:
 - Small and frequent invoice are better than large infrequent invoices
 - If you submit a accumulated bill for several month worth of work at an agreed rate and for an agreed number of days/hours, the invoice may nevertheless become big enough to cause internal problems for the direct clients/raise eyebrows with higher-ups/hit the radar screen

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A2.11



Retainers

- Retainer (Def. 1): Advanced payment made at the outset of a consulting contract
- Retainer (Def. 2): Advanced payment for a guaranteed availability when needed for consulting services for a period of time, typically a year
- Retainer (Def. 3): Fixed monthly sum paid by the client to retain you for anticipated work. If there is a credit left at the end of the year, using your standard billing rate, you keep the difference. A new contract is negotiated for the next year. If the work exceeds the anticipated amount before the end of the year, the client pay for the additional amount using the usual rate. (Of course, the client should be notified before going over the limit)
- It is legitimate to ask for a retainer. It is a recognition that you may have cash flow problems delivering the services
- Pro: Nice to have guaranteed work and the cash in advance especially if you have a lot of costs (e.g. airfares, hotels) delivering the services
- Con: Do you really want to be available on short notice whenever the clients calls?

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A2.12



Other Forms of Payment

- Examples:
 - Share of equity in the company
 - Barter of products for services
 - Percentage of savings
- My advice: Just don't do it!

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A2.13

Payments

- It is normal to stipulate payment 30 days after invoicing
- It is ok to “remind” the client beyond that
- Large companies typically need a purchase order before you can bill them
- Large companies typically are extremely bureaucratic about their billing; be prepared for Snafus
- *Knock on woods: I have never been stiffed!*
 - (Actually that is not completely true – once by ¥\$ç, a Washington consulting company)

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A2.14

Conclusion: Billing and Invoicing

- Be completely honest, do an honest day of work, completely honor your contract or agreement with the client
- Submit only scrupulously honest invoices
 - Carefully record billable hours/days
 - Meticulously account for reasonable expenses
- Be clear about limits not to be exceeded
- My bottom line principle: *Aim to deliver consulting work worth a multiple of 5 to 10 × your bill to the client!*

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A2.15

**ENBIS Workshop:
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Appendix 3
Consulting Contracts

Newcastle, United Kingdom
September 17, 2005

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A3.1

Consulting Contracts

- For small jobs it is best not to introduce unnecessary or excessive legalese
- Proposals or statements of work are sometimes required, but that is not the same as a formal contract
- Purchase orders are sometimes also required
- Asking the client to sign a formal contract for small jobs can be risky because it causes the client to worry
- I have done most work on a handshake

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A3.2

If Contracting, Make it Simple

- A simple letter of agreement might do
 - State the daily fee
 - Charge “plus expenses”
 - No overtime; a day is a day however long the client wants you to work
 - Do whatever the client wants you to do
 - “to the best of your ability”
 - “Not to exceed” estimate



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A3.3

Contract Items

- Minimum items to include in a simple contract:
 - Start date
 - Termination date
 - Calendar/Dates, Milestones when the work will take place
 - Delivery of reports/results
 - Payment terms, fees, what is included (expenses) and what is not
 - Project scope
- Items not to include:
 - Overly legalistic terms
 - Promises of results you cannot guarantee
 - Unrealistic deadlines or deadlines based in circumstances beyond your control



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A3.4

Formal Contracts

- Large companies typically require formal contracts for large jobs
- If a formal contract is required, then you need a lawyer
- Lawyers typically have boiler plate contracts
- Standard contract language is around (search the internet)
- You can save yourself a lot of money by drafting the first draft and by making it clear to yourself what you want from the contract

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A3.5

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