

# Engineering, Ethics and Society: Personal Ethics & Going Forward

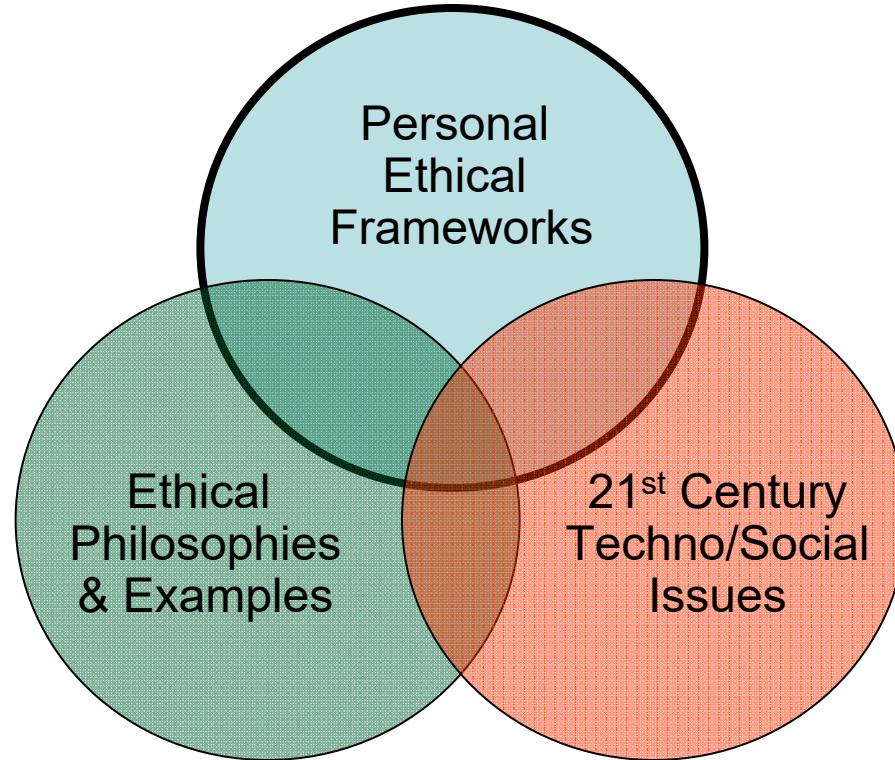
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Dr. Gershon Weltman  
Engineering 183EW, UCLA SEAS  
Lecture 17

# Lecture Contents

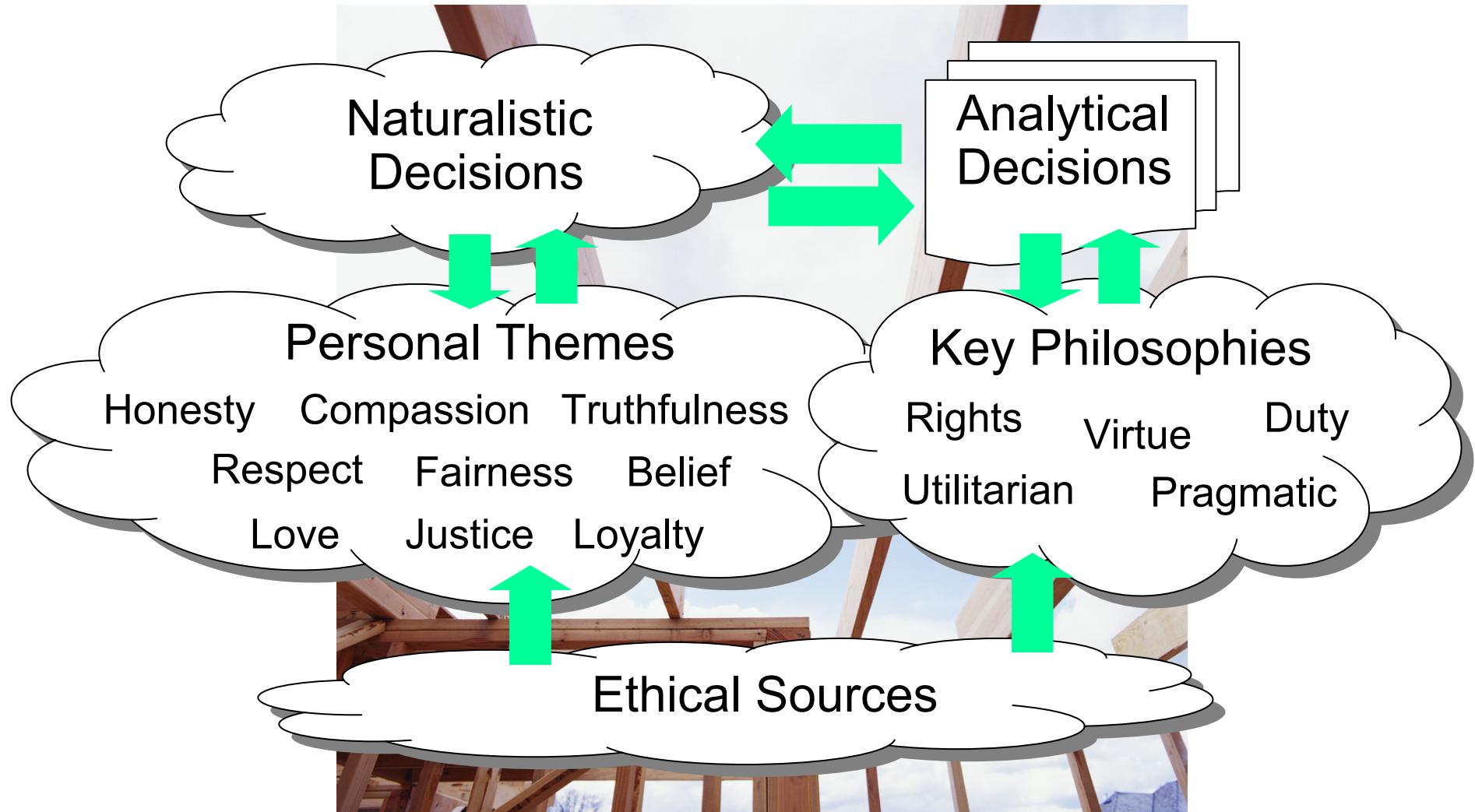
- Objectives Review
- Personal Ethical Frameworks
  - Construction
  - Professional Ethics
    - Within Organizations
    - Conflicts of Interest
  - Adaption and Utilization
- Ethics of Whistle Blowing
  - Societal Ambivalence
  - Ethical Case 1: Boeing 737 MAX on whistleblowing
  - Present Day Responses
  - IEEE Guidance
- Applying Course Ethics Knowledge
- Ethics & Society: Continued Learning
  - Needs and Goals
  - Available Sources
  - Ethical Case 2: MADMEN on business ethics
- Wrap Up

# Course Objectives



We combine several key objectives in one course,  
but our focus is on building a personal ethical framework.

# Building a Personal Ethical Framework



# Engr 183EW Personal Ethical Dilemmas

- Lying and Cheating                           ~ 40%
- Stealing and Receiving                       ~ 35%
- Teams & Authority                          ~15%
- Technical Risks & Hazards               ~ 10%

In your careers, organizational dilemmas will likely predominate;  
Your responses will depend on your Personal Ethical Framework.

# Organizational Ethics: Team & Project

- Interactions with Team Members
  - Showing Respect to All
  - Maintaining Communication
  - Keeping Promises
  - Exhibiting Loyalty (Within Reason)
- Interactions with Higher Management
  - Accepting Responsibility
  - Protecting Data and Results
  - Moving Problems Upward (and Maybe Outward)
- Interactions as a Manager
  - Exhibiting Leadership
  - Respecting Subordinates as People
  - Avoiding Harassment – Sexual or Any Other Kind
  - Hiring and Assigning to Projects
  - Dismissing and Transferring from Projects
  - Making Technical and Financial Decisions

These actions are most liable to involve ‘Conflict of Interest’ issues

# Organizational Ethics: Conflict of Interest

- Typical Situations
  - Hiring or appointing a friend or relative
  - “Giving a pass” to a friend or relative who transgresses
  - Recommending a technical or financial option that
    - Benefits you directly
    - Benefits a close friend or relative
- Methods of Resolution – Not Necessarily in Order
  - Test 1: “How does it fit into MY Ethical Framework?”
  - Test 2: “Who is Harmed?”
    - Does the action violate an organizational policy?
    - Are the various interests *actually* in conflict?
    - Can any conflicts be fairly and equitably resolved?
  - Test 3: “How Does it Smell?”
    - How will others in the organization feel about this?
    - How will it affect customers and/or stakeholders?
    - How will it play on news media and/or social networks?

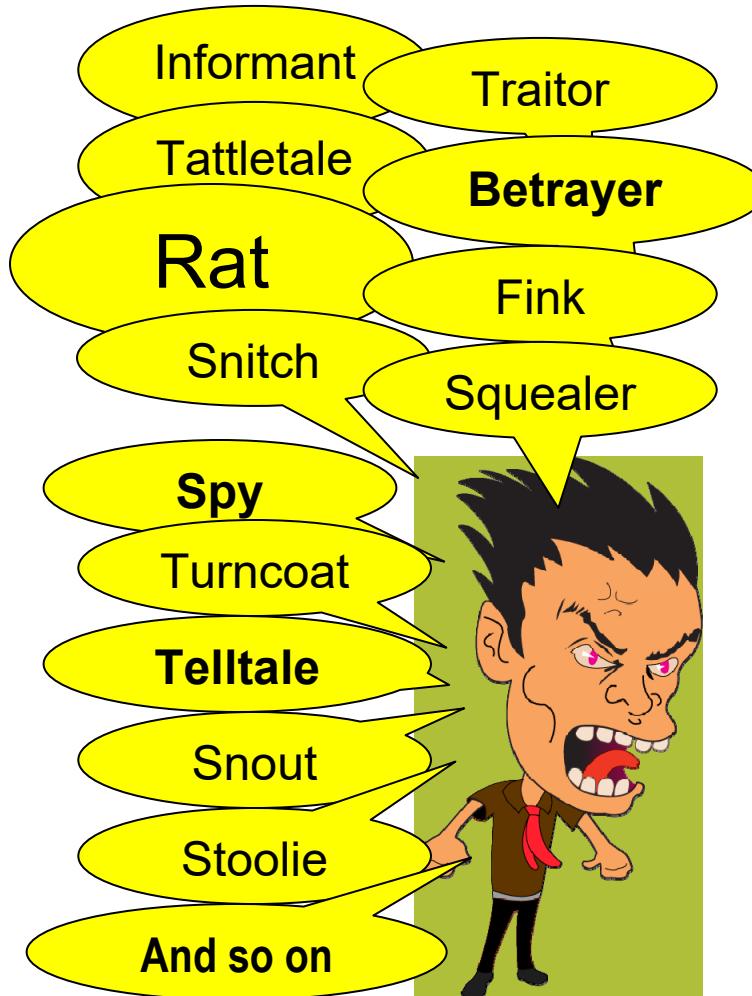
Large organizations are often most concerned with Test 3: The “Smell Test.”

# Using Your Ethical Framework 1

- As a Reference
  - Rationalization for previous actions
  - Guidance for future actions
- To Test and Modify
  - Exceptions within structure
  - Evolution of societal and personal ethics
- To Evaluate
  - Your actions
  - Other peoples' actions
- For Whistleblowing
  - Extension of personal conduct
  - Society's ambivalence

A cadet will not lie,  
cheat or steal –  
or tolerate those  
who do.

# Society's Ambivalence



Ralph Nader coined 'whistleblower' to mean a person trying to maintain order

# Ethical Case 1: Boeing 737 MAX

New engine placement leads to  
Maneuvering Characteristics  
Augmentation System (MCAS)

Boeing allegedly deficient in:

- MCAS design
- Provision of failure alert
- MCAS testing & certification
- Customer notification
- Pilot training
- Problem analysis
- Problem acknowledgement
- Preventive Action



# Ethical Case 1: Whistleblower's Complaint

## 787 Synthetic Airspeed

- Calculated from angle of attack and inertial data
  - AOA – voted dual sensors plus inertial data
  - Accurate Coefficient of Lift ( $C_L$ )
  - Airplane Mass from FMC - Validated after Takeoff
- Algorithm developed for enhanced stall protection
- Avoid displaying data known to be bad
  - Loss of valid voted  $V_{CAS}$  = Display synthetic airspeed
  - Loss of valid voted  $P_{STATIC}$  = Display GPS altitude

© The Boeing Company

Engineer Curtis Ewbank said in a memo:

- Airspeed and AOA are critical data
- 737 MAX MCAS used standard sensors
- Standard sensors often in error
- 737 MAX cockpit analysis revealed potentially serious safety problems
- 787 Dreamliner has Synthetic Airspeed computation system as backup to data from standard sensors
- **Engineers recommended installation of Synthetic Airspeed to increase safety**
- **Management refused, reflecting a new corporate culture of**
  - Cost/schedule over safety/quality
  - Ignoring engineers' proposals
- **Synthetic Airspeed installation would have prevented 737 MAX crashes**

The question is: Why were engineers not more aggressive at the time!

# Ethical Case 1: The Reason Why

“Given the nature of this complaint, *the fear of retaliation is high*, despite all official assurances that this should not be the case. There is a  *suppressive cultural attitude* towards criticism of corporate policy — especially if that criticism comes as a result of fatal accidents.”



Curtis Ewbank, Boeing safety engineer

Mr. Ewbank acknowledged the problem that whistleblowers are often attacked and harmed despite the positive results of their revelations.

# Society's Attitude Seemed to be Evolving...

## Snowden asylum in

The US wanted Russian intelligence leaker so



ECUADOR

2013

Employed at  
Booz Allen Hamilton in

1 May

Contacts the Washington Post and The Guardian news. Reveals details of secret intelligence program.

20 May

Leaves Hawaii and flees

\* US National Security Agency

## Analyst admits to cyber-spying leaks

An NSA contractor steps forward and calls U.S. surveillance abilities 'horrifying.'

By BOB DROGIN  
AND KATHERINE SKIBA

WASHINGTON — Calling America's spying capabilities "horrifying," a 29-year-old former CIA employee revealed himself Sunday as the primary source of unauthorized disclosures of highly classified U.S. telephone and Internet surveillance systems that were among the intelligence community's most closely held secrets.

Both the Washington Post and the British newspaper the Guardian said Edward J. Snowden gave them his consent to reveal his identity as an analyst for the National Security Agency, which is America's largest spy organization and conducts cyber-spying. Both papers have published a startling series of top-secret documents in recent days.



EWAN MACASKILL, The Guardian

**EDWARD SNOWDEN** has fled to Hong Kong and says he will seek a country for asylum.

The Guardian said Snowden was staying in a luxury hotel in Hong Kong and had lined his hotel room door with pillows to prevent eavesdropping.

"I have no intention of hiding who I am because I know I have done nothing wrong," he was quoted as saying. He said he expected U.S. authorities to "demonize" him and said he planned to "ask for asylum from any countries that believe in free speech and oppose the victimization of global privacy."

In a 12-minute video interview [See Surveillance, A7]



1983  
Elizabeth City (North Carolina)

2002  
Computing  
S state of Maryland to obtain his diploma

Job with a Japanese media company

2004  
Training with the US Special Forces.  
ended after breaking a leg

or the CIA  
ava (Switzerland)

ed at the NSA  
Technician

AFP

[www.yahoo.com](http://www.yahoo.com), November 28, 2013

# ...Into Somewhat Different Responses...



# But Recently Old Style Attacks Return...

## Cohen accuses Trump of criminal acts



**"I AM ASHAMED** that I chose to take part in concealing Mr. Trump's illicit acts rather than listening to my own conscience," Michael Cohen, President Trump's former personal lawyer, told members of Congress.

President's former lawyer alleges extensive financial and moral wrongdoing

BY CHRIS MEGERIAN,  
DELQUENTIN WILBER AND  
JENNIFER HABERKORN

**WASHINGTON** — Michael Cohen, once among President Trump's most ardent defenders, fiercely turned on him Wednesday, describing a culture of rampant criminality and nonstop lying around Trump involving payoffs to his alleged mistresses, inflated personal wealth and secret efforts to build Europe's tallest skyscraper in Moscow.

Cohen, who worked as Trump's personal lawyer and New York fixer for more than a decade, suggested in a congressional hearing that Trump had skirted or violated federal banking, tax and campaign finance laws, and he indicated that some of those actions were already under criminal investi-

lawyer and convicted felon repeatedly saying he was ashamed of his actions — at times fighting back tears — even as he held his ground against fierce attacks on his credibility by Republicans.

Cohen provided fresh details on scandals that already have come to light — most notably displaying a \$35,000 check signed by the president in August 2017 to reimburse Cohen for a hush-money payment — and he provided House Democrats with new clues for their probes into a president he described as a "racist," a "con man" and a "cheat."

"I am ashamed that I chose to take part in concealing Mr. Trump's illicit acts rather than listening to my own conscience," Cohen said.

Asked about his most recent conversation with the president, which occurred

CBS News. October 2, 2018

# But Recently Old Style Attacks Return...

A screenshot of a HuffPost Politics tweet from Matt Gaetz (@mattgaetz). The tweet is framed by a black border. It features a profile picture of Matt Gaetz, his name with a blue checkmark, and his handle @mattgaetz. The tweet text reads: "Hey @MichaelCohen212 - Do your wife & father-in-law know about your girlfriends? Maybe tonight would be a good time for that chat. I wonder if she'll remain faithful when you're in prison. She's about to learn a lot..." Below the tweet are engagement metrics: 15.7K likes and 4:12 PM - Feb 26, 2019. The background shows the HuffPost website interface with other news items and social sharing icons.

# Rules for Ethical Whistleblowing<sup>1</sup>

- Don't trust too much!
- Collect persuasive evidence
- Don't exaggerate
- Build support among colleagues
- Seek outside guidance
- Weigh your options carefully
- Choose the right opportunity
- Present a helpful approach
- Anticipate a personal attack
- Prepare an escape route

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<sup>1</sup>Jean Kumagai, The Whistle-Blower's Dilemma, IEEE Spectrum, April 2004

# Using Your Ethical Framework 2

- Professional Career
  - Submitting resumes and endorsements
  - Choosing jobs and positions
  - Deciding and communicating at all levels
- Societal Exchanges
  - Everyday interactions
    - Advice and recommendations
    - Promises and commitments
    - Respect of privacy
  - Participating in social or professional groups
  - Participating in online communities
  - Buying and selling products and services

# Example: \$10 False Endorsements

CL santa barbara > gigs > labor gigs      post | account

[reply](#)  [prohibited](#) ?      Posted 14 days ago      [print](#)

**★ Love amazon? Make \$10 per review**

We're looking for great individuals or companies to help us grow our online reputation on Amazon in the form of reviews. Your reviews will help us launch new products into the marketplace and maintain current ones. For every review posted, you will earn \$10 or receive free new and exciting products. There is also room for growth! Once you successfully post 10 reviews in total, we will start paying \$12

All you need is active, good-standing Amazon accounts that can leave positive reviews for our product listings. You do NOT need to buy the item in order to leave the review. The only requirement is for the review to be at least 50 words (sometimes less is okay) and 5 stars.

If interested, please get back to us with your contact #.

Thank you!

- do NOT contact me with unsolicited services or offers



© craigslist - Map data © OpenStreetMap  
(google map)

compensation: \$10 / Review

# Example: \$17K-\$3M False Qualifications

A8 WEDNESDAY, MARCH 13, 2019

Los Angeles Times

LATIMES.COM

COLLEGE ADMISSIONS SCANDAL

## Wealthy parents cheated admissions

[Scheme, from A1]

Federal investigators said they have charged 50 people in the case, including the USC administrator who helped Loughlin's kids, and accomplices Singer allegedly paid to rig college admission test scores — as well as coaches at USC, UCLA, Stanford and Yale.

The charges stunned the upper echelons of American academia, heightening debate about the advantages the ultra-rich enjoy in accessing the country's best colleges amid intense competition in which merit alone is not enough to assure admission, even for students with perfect grade-point averages and stellar resumes. The accusations also raised serious questions about how university admissions officials, athletic departments and others could have allowed such blatant fraud to go undetected.

There was particular upheaval at USC, a campus already reeling from several scandals. Prosecutors alleged that a top athletic department leader as well as three current and former coaches accepted nearly \$2 million in bribes to get students into the school.

The case names celebrities, corporate executives, investment bankers, business owners, top-tier law-



ALLEN J. SCHABEN Los Angeles Times

**USC** was rocked by the scandal. A senior associate athletic director and the coach of the men's and women's water polo teams were fired Tuesday after being indicted. UCLA's men's soccer coach was indicted as well.

"He didn't have inside information about the answers, he was just smart enough to get a near-perfect score on demand or to calibrate the score," Lelling said of Riddell.

Huffman, who allegedly told Singer she was interested in hiring him again for her younger daughter but ultimately decided against it, made a brief court appearance Tuesday afternoon. As Macy watched from the gallery, she told a federal magistrate she understood the charges against her and was released on bond.

For larger fees, parents could avail themselves of the contacts Singer built with Donna Heinel, the senior associate athletic director at USC, as well as coaches at USC and other schools who were willing to lie about students' athletic abilities in exchange for bribes. In some instances, Singer had photos doctored to superimpose the faces of children onto the bodies of athletes. Coaches used the fake images to prove to colleagues that the kids were athletes.

Of the \$1.2 million Singer admitted to taking from a family that wanted to go to Yale, \$400,000 was paid to the women's soccer coach, Rudolph "Rudy" Meredith, prosecutors said. The young woman was admitted to the

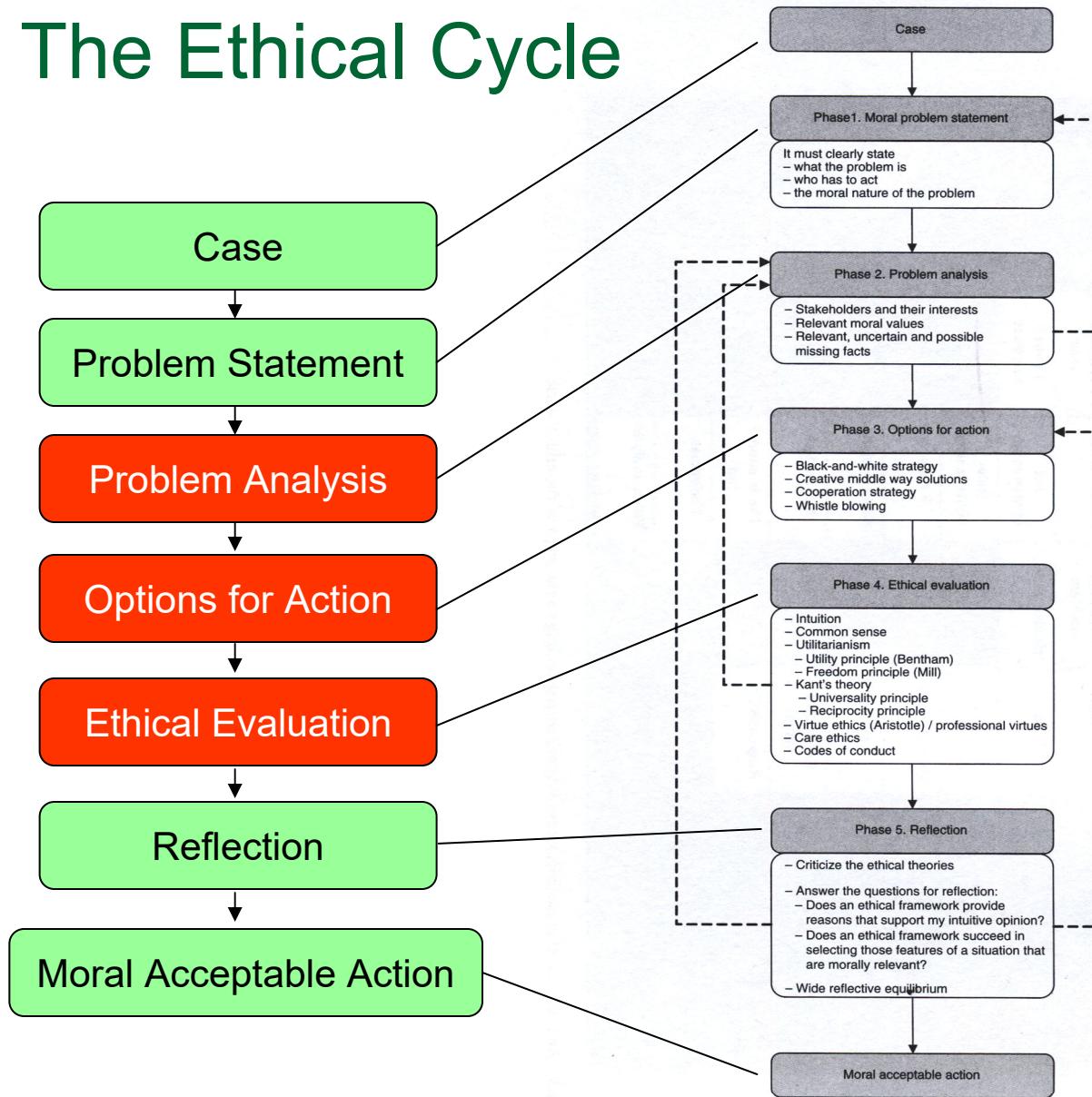
# Using Your Ethical Framework 2

- Professional Career
  - Submission of resumes and endorsements
  - Choice of jobs and positions
  - Decision making and communication at all levels
- Societal Exchanges
  - Everyday interactions
    - Advice and recommendations
    - Promises and commitments
    - Respect of privacy
  - Participation in social or professional groups
  - Participation in online communities
  - Buying and selling of products and services
- Parenting & Mentoring
  - Establishing an ethical environment
  - Reinforcing children's ethical conduct

# Moving Forward: The Path to *Being Ethical*

- Theoretical Approach
  - **Recognize the important decision points!**
  - Identify the options and **ALL** their consequences
  - Include relevant ethical and societal factors
  - Apply some type of analytical decision making process
  - Choose the right thing to do

# Example: The Ethical Cycle



# Moving Forward: The Path to *Being Ethical*

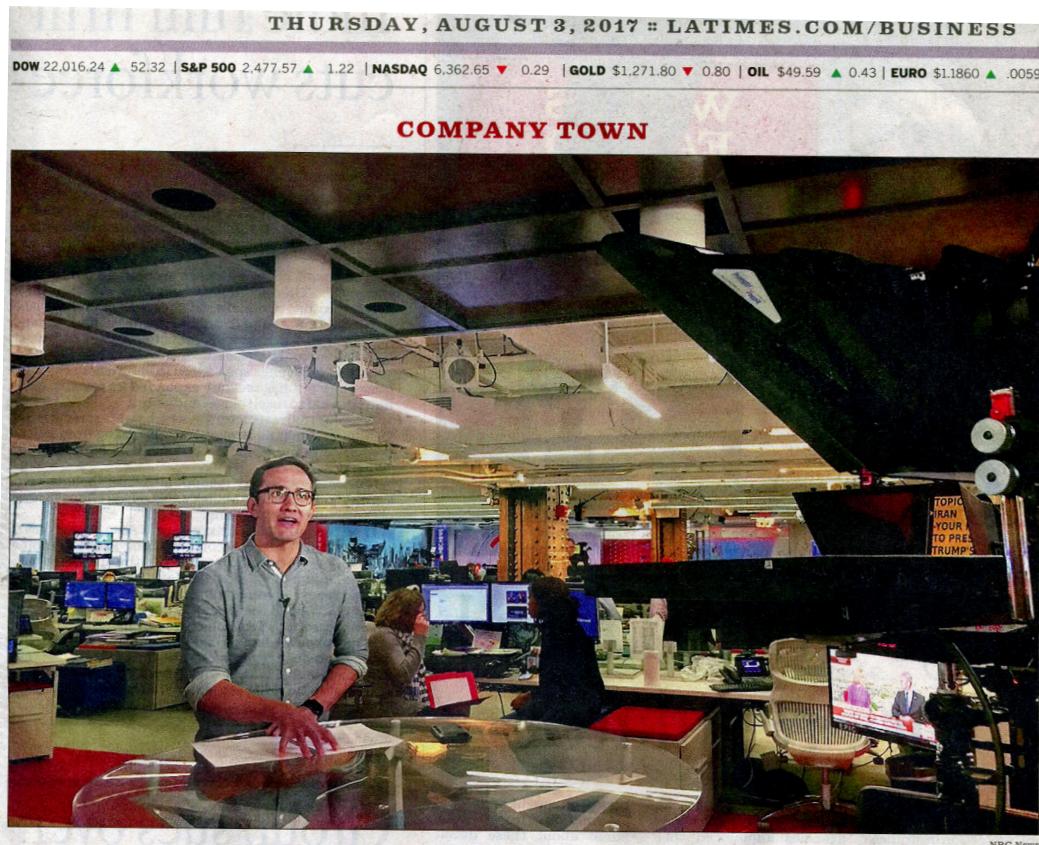
- Theoretical Approach
  - ❑ Recognize the decision point
  - ❑ Identify the options and consequences
  - ❑ Apply some type of analytical decision making process
  - ❑ Include relevant ethical and societal factors
  - ❑ Choose the right thing to do
- The Practical Problems
  - ❑ Identifying the set of suitable options
  - ❑ Understanding the societal as well as the technical consequences
- One Solution: Real-Life Experience
  - ❑ Is arbitrary
  - ❑ Takes too long
- Another Solution: Directed Continued Learning
  - ❑ ‘The Two Cultures’ revisited: Engineering *and* Society together
  - ❑ Simulation returns: Condensing experience

# Engineering and Society Sources

- Scientific/Technical Journals
- University Courses
- Literature
- Investigative Magazines
- Movies and TV
- Drama and the Arts
- Serious Games
- Current News Media
  - Daily newspaper (?)
  - Online news and blogs
  - TV and radio news and specials
- Social Networks



# New News Media



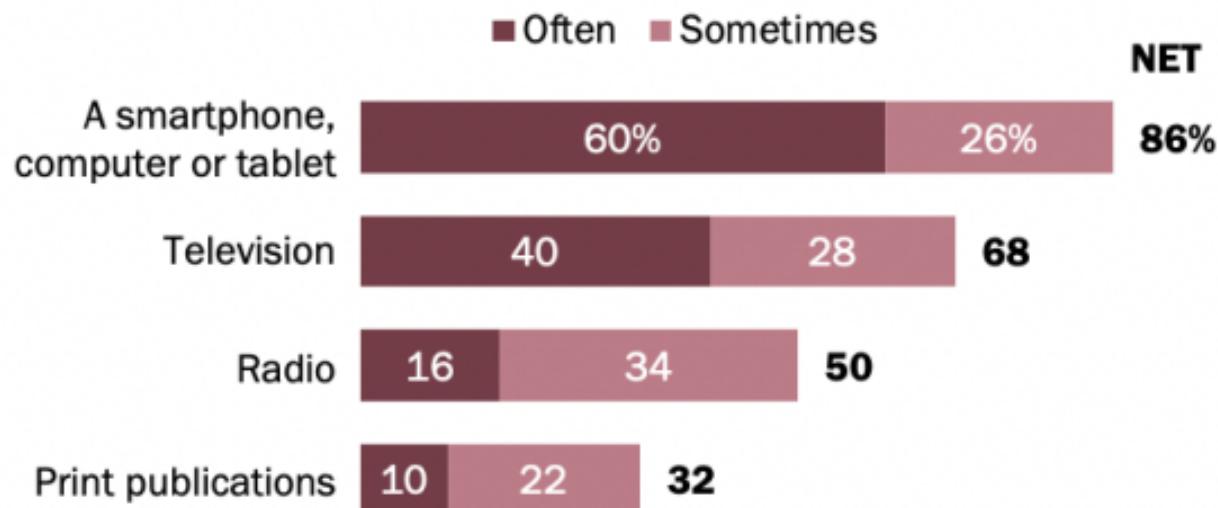
## TV news via Snapchat?

Audiences for traditional formats are getting smaller and older. Here are some ways broadcast networks are trying to stay afloat.

# New News Media

## Large majority of Americans get news on digital devices

% of U.S. adults who get news \_\_\_\_ from ...



Source: Survey of U.S. adults conducted Aug. 31-Sept. 7, 2020.

PEW RESEARCH CENTER

# Literature: The Broad-Ranging Resource

- Contributions to science and technology
  - Sapiens, The Age of AI, The Double Helix, The Machine that Changed the World, The Crime of Galileo, The Ancient Engineers .....etc., etc.
- Fiction as well as non-fiction
  - The Corrections, Lucky Jim, Grapes of Wrath, Catch 22, Catcher in the Rye, Lord of the Flies, Bonfire of the Vanities, The Human Stain...etc., etc.
- Popular authors as well as Noble Prize contenders
  - Detective stories, adventure and exploration, biography and autobiography, historical novels.....etc., etc.
- Science Fiction & Fantasy as well as reality
  - Never Let Me Go, The Road, 1984, Brave New World, Animal Farm, Clockwork Orange, I Robot, The Martian Chronicles, Jurassic Park, Lord of the Rings, Snow Crash, Hyperion, etc., etc.

There are numerous lists of “100 greatest” non-fiction works and novels.

# Movies & TV: America's Grand Contribution

- Technology Effects and Influences
  - *Imitation Game, Social Network, The Right Stuff, Apollo 13, The Aviator, Tucker: The Man and the Car, On the Beach, Park, No Highway in the Sky, The Man in the White Suit...etc.,*
- Emotional Intelligence
  - *Death of a Salesman*

Arthur Miller's play about salesman Willy Loman is perhaps the one best American play. It covers the importance of work and also the technical transition in society.

# Willy Loman in Bernard's Office



Willy activates the tape recorder and doesn't know what it is or how to turn it off; Bernard clicks the off switch. The message is: 'old times gone, new times begin.'

# Movies & TV: America's Grand Contribution

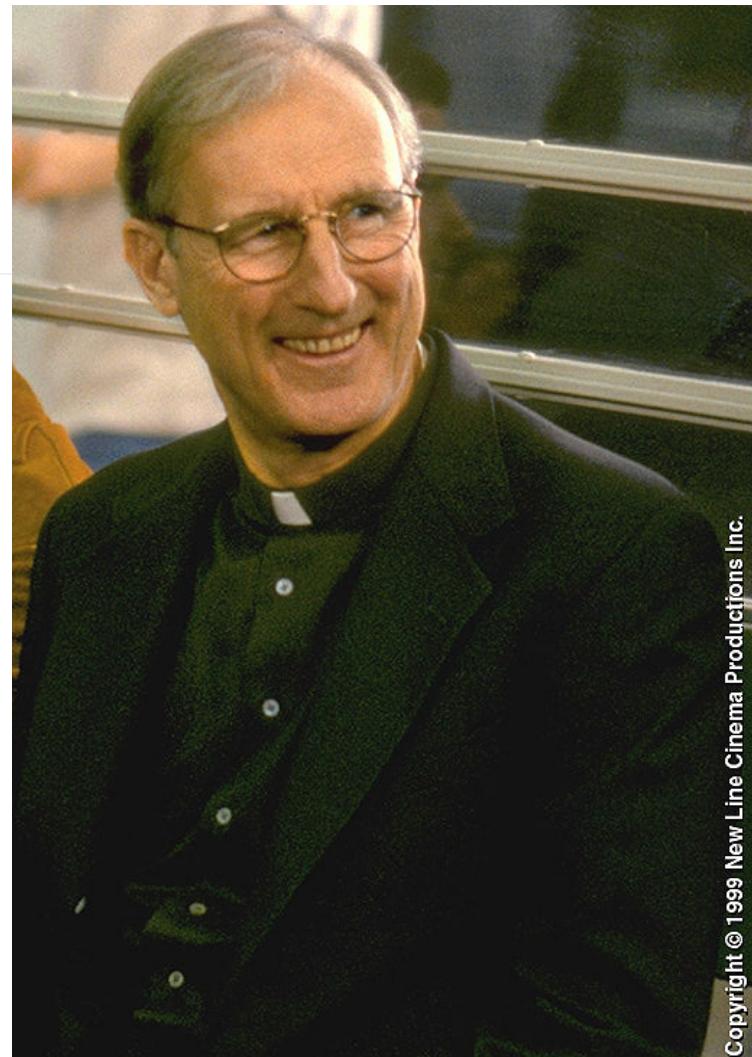
- Technology Effects and Influences
  - *Imitation Game, Social Network, The Right Stuff, Apollo 13, The Aviator, Tucker: The Man and the Car, On the Beach, Park, No Highway in the Sky, The Man in the White Suit...etc.,*
- Emotional Intelligence
  - *Death of a Salesman, Twelve Angry Men, Raging Bull, Taxi Driver.....etc.,*
- How Businesses and Organizations Operate
  - *MADMEN, The Godfather Trilogy, Up in the Air, Wall Street, Good Night and Good Luck, Frost/Nixon, Citizen Kane, Schindler's List, Wonderful Life, Erin Brockovitch,, ....etc.,*
- Moral and Ethical Narratives
  - *Lord of the Rings, Harry Potter, Hunger Games, Star Trek, Star Wars, The Matrix, Avatar.....etc., etc.*

Downloads, streaming and DVDs make the movie library easily available

# What We Can Learn

"One of the functions of a good movie or play is to mirror back to the audience a reflection of itself, so that the individual can recognize the choices the characters make and evaluate their effectiveness and appropriateness. This empowers the individual to make better -- that is, more conscious and conscientious -- choices in his or her own life."

—  
James Cromwell  
Actor and Activist  
San Luis Obispo Film Festival  
March 10, 2007



Copyright © 1999 New Line Cinema Productions Inc.

## Ethical Case 2: A **MADMEN** Story



**MADMEN** Writers Room

# Ethical Case 2: A **MADMEN** Story

Sterling Cooper agency is competing for prestigious Jaguar car account

The head of the Jaguar dealers association says he will make sure that they don't get the account...

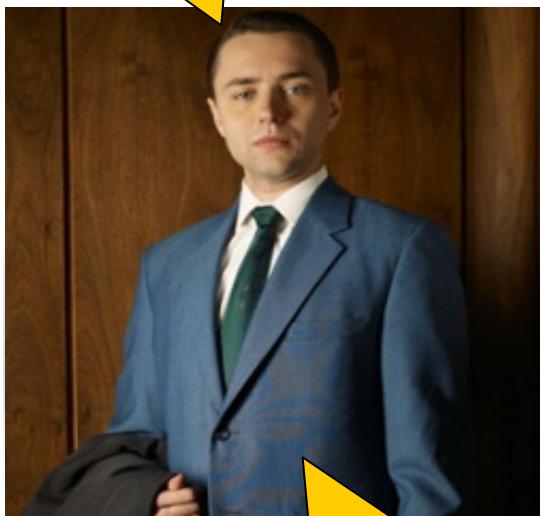
Don Draper, agency president, says definitely: "No! That's not us!"



...unless they give him a night with Joan, the capable and curvaceous office manager.

## Ethical Case 2: **MADMEN** Continued

Account executive Pete Campbell says: "Let's ask Joan if she'll do it - for a large amount of money"....



Joan first says "No way," but after getting some outside advice and considering it further ...



The board agrees, Joan complies, the agency gets the Jaguar account, Joan becomes a partner, and....



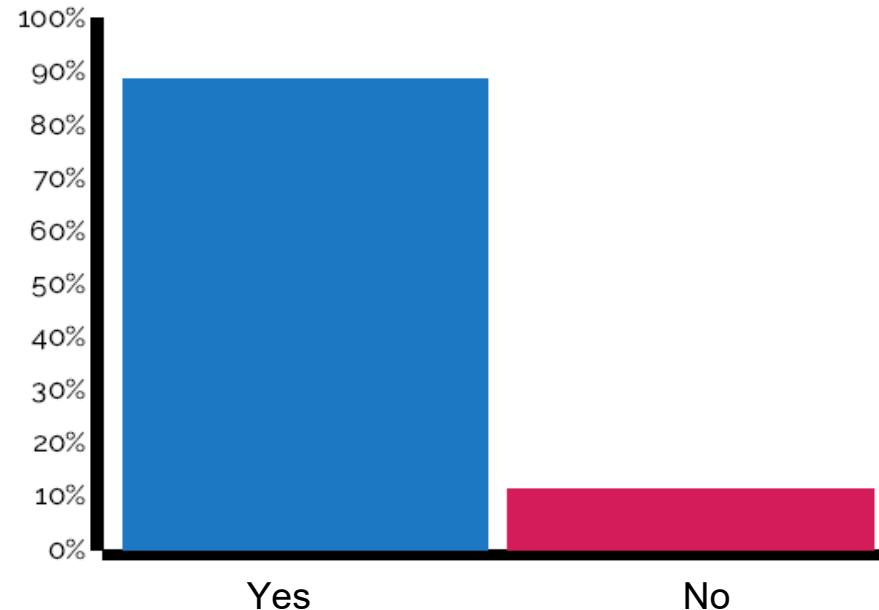
...and the agency Board of Directors agrees with Pete, overriding Don Draper.

...then says, "I'll do it if you make me a Partner, with a 5% share in the agency."

...the audience is left to consider the wisdom and ethics of these decisions.

# Online Poll: Engineering Enterprises As Well?

Can this type of ethical issue ever apply to engineering or technology companies?



Students got this mostly right; ethical issues such as this *can* come up in engineering organizations.

# Engineering Equivalents

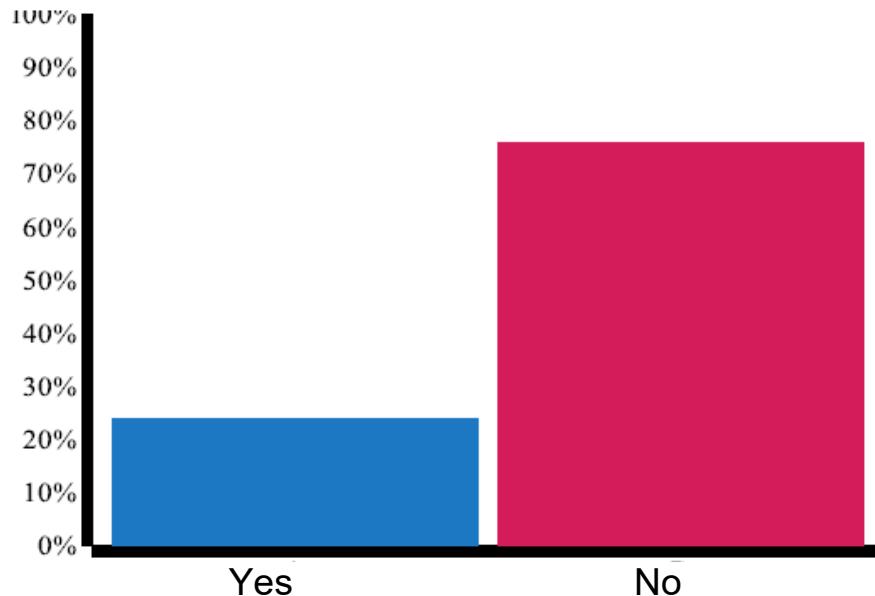
A client or customer demands/requests that the enterprise:

- **Provide undesirable favors:** Sexual acts, supplier or employee rewards, finder kickbacks, bribes to officers or officials, etc.
- **Bend its rules:** Against discriminating, providing protected IP, spying on other companies, falsifying or ignoring data, etc.
- **Reduce product quality:** Use materials, parts or processes inferior to established specifications and/or experience, etc.
- **Ignore safety:** Bypass or violate standards, regulations or laws in contradiction to usual practice, etc.

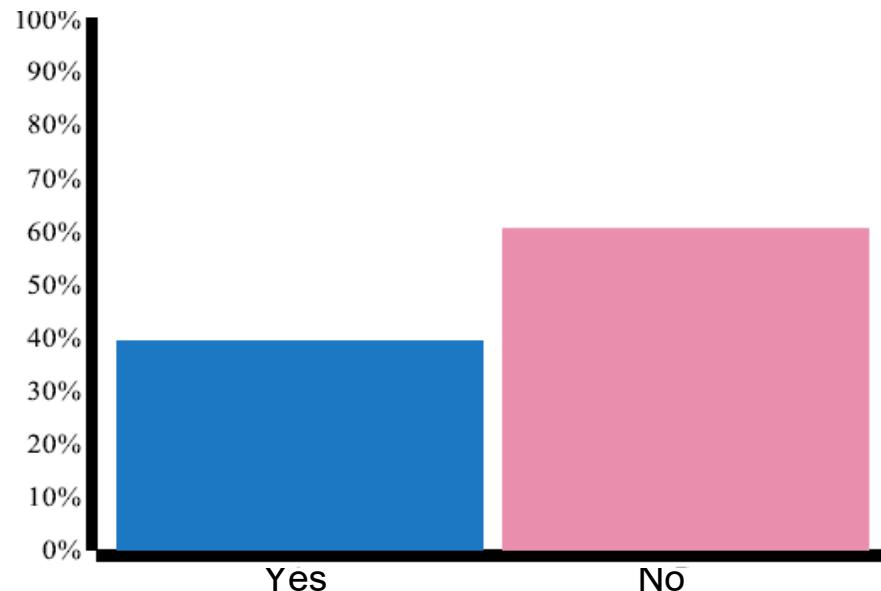
A common element is that an executive or an employee is asked to do something that violates norms and/or the company's ethical framework.

# Online Poll: Personnel Ethics

Did the agency do the right thing by asking Joan to make the decision?



Did Joan do the right thing by asking for and accepting the partnership deal once she was asked?

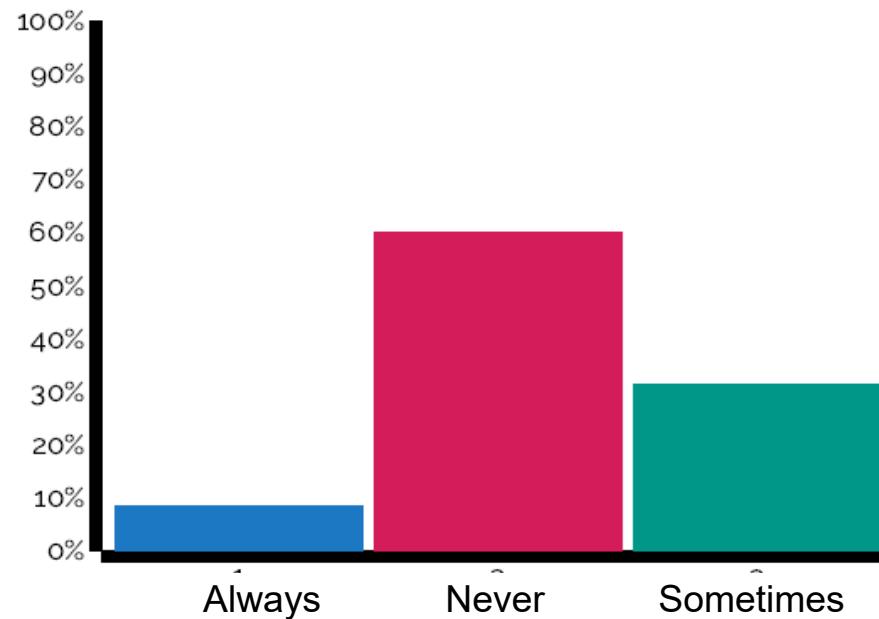


The majority tend to get this correct. We've said sometimes ethics trumps economics. This is one of those times. Asking Joan puts her in a position where it is nearly impossible to say no.

Once Joan has been asked, the decision is up to her, but there are negative consequences that need to be weighed carefully, as we have previously emphasized in class.

# Online Poll: Enterprise Ethics

Is it right to bend your organization's ethical principles when you're blackmailed or for "good" business reasons?



Always is definitely not a good answer and the class agrees. Never is much better, and it's nice to see it at 60%; and while it is tempting to believe ethical principles can sometimes be waived, the results are frequently bad.

# Additional Help: Professional Societies



Association for Computing Machinery



American Society of Mechanical Engineers



American Society of Civil Engineers



American Institute of Chemical Engineers



Institute of Electronic & Electrical Engineering



Materials Research Society



American Institute of Aeronautics & Astronautics



Biomedical Engineering Society



Human Factors & Ergonomics Society

These and other Societies can provide ethical guidance in special fields.

# The Main Point: Effective Use of Resources

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- Continued Study: *Ethical Engineering Practice*
- Awareness of Objectives: *Cases and Principles*
- Evaluation and Feedback: *Own and Others' Actions*
- Desired Results: *The Best Possible Decisions*

# The Reason Being...

Ethics is a lifelong enterprise --  
not a one course requirement.

## .. So in Summary



**“Go Forth and Be Ethical  
-- People *and* Engineers!”**

## And Finally

Please complete the  
Course Evaluation Form.  
We welcome your feedback  
-- particularly now!

Thank you for attending  
-- and for your attention!