



34th Annual **INCOSE**
international symposium

hybrid event

Dublin, Ireland
July 2 - 6, 2024



Human Frailties:

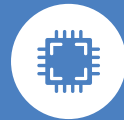
Springboard to Increased Systems Engineering Influence

by Eileen Arnold and Dorothy McKinney

Content



Introduction



Specific Human Frailties Covered

The “Heavy-Hitters”
for SysE influence



Increase Influence on
Key Decision-Makers

Using Insight into
Human Frailties



Strategies and Tactics

Leveraging Multiple
Human Frailties

Conclusions



Introduction

As a SysE, have you ever experienced:



that your carefully researched and meticulously refined investigations of issues and alternatives, even when communicated effectively to key decision-makers, do not result in decisions by others which lead to

1. successful working systems and
2. projects completed on time and on budget?

We provide strategies and tactics for increasing your successful influence!

The Problem – and Some Consequences

Systems Engineers are not always successful in getting decision-makers to take their input seriously

Decisions may not lead to success on projects

Systems engineers may get discouraged

Systems engineers may follow uninformed direction which leads to predictable problems

Systems engineers may conclude that decision-makers are stupid

Other unintended consequences

Influencing and Ethics

- We have observed the successful influence achieved through approaches borrowed from advertisers, marketers, sales and social media influencers.
- A critical difference between systems engineers and advertisers is that systems engineers consistently work in the interests of stakeholders.
- Ethical performance may be questionable without this key element!

Advertisers may see higher immediate profits when they disregard the best interests of customers



Systems engineers focus on what is best for customers

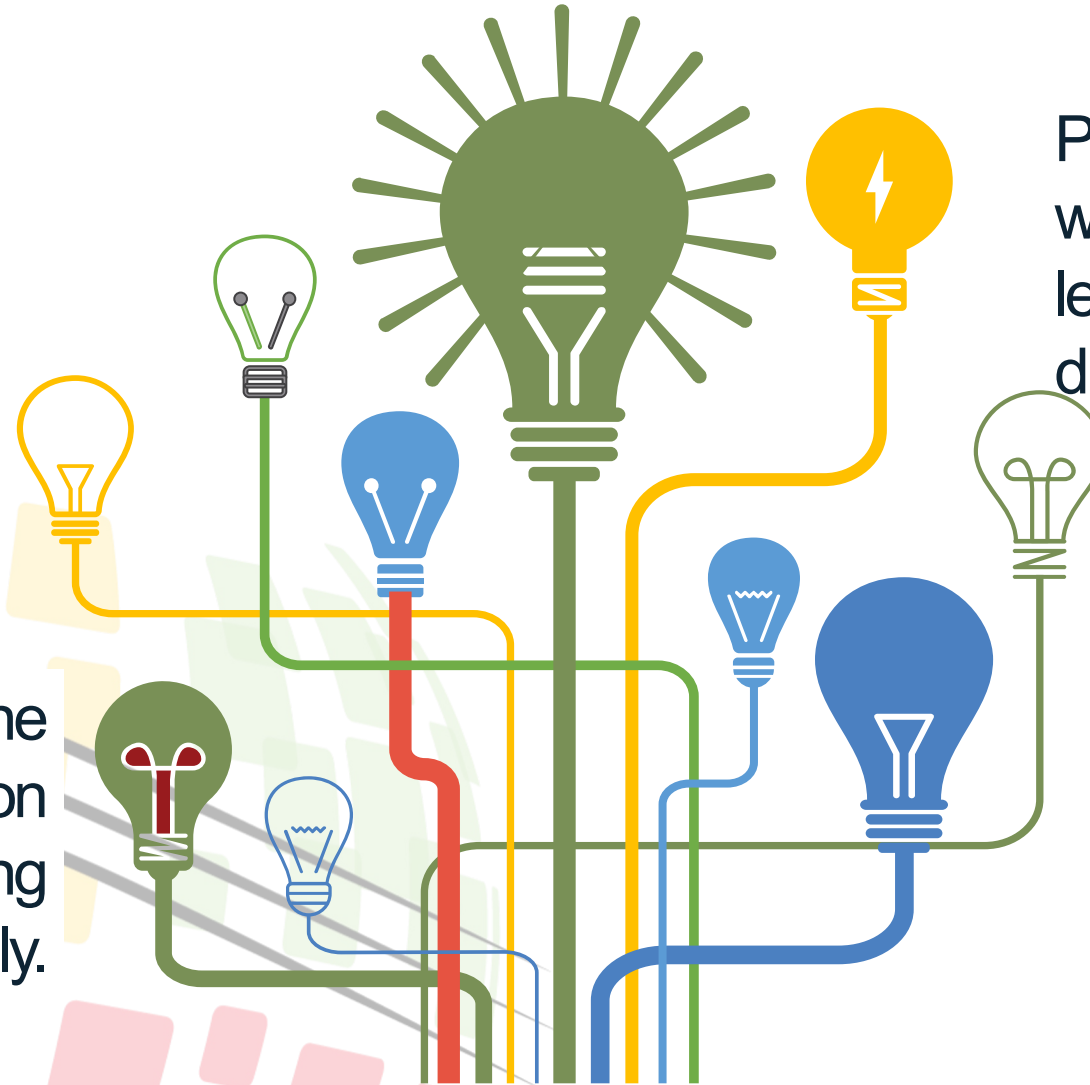
Aim of This Paper

Offer insight into human frailties you can leverage to have more influence.

Offer some of the latest insights on influencing effectively.

Provide specific ways you can leverage each frailty discussed.

Provide strategies and tactics you can use to increase your influence, and references to find out more about each.



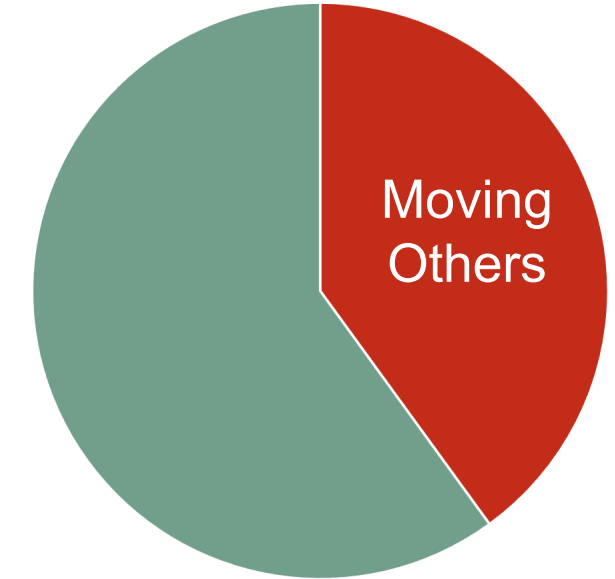
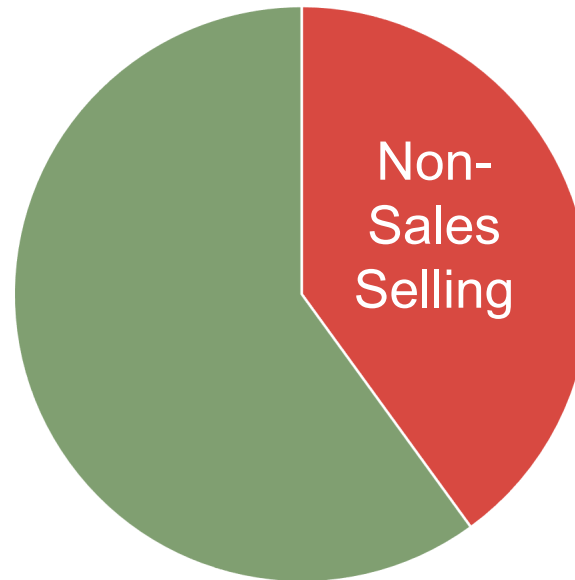
Pink Survey of 7000 Participants

Pink, D. H. (2013) *To Sell Is Human: The Surprising Truth About Moving Others*: Riverhead Books.



1 of every 9 jobs in the U.S. explicitly involves selling

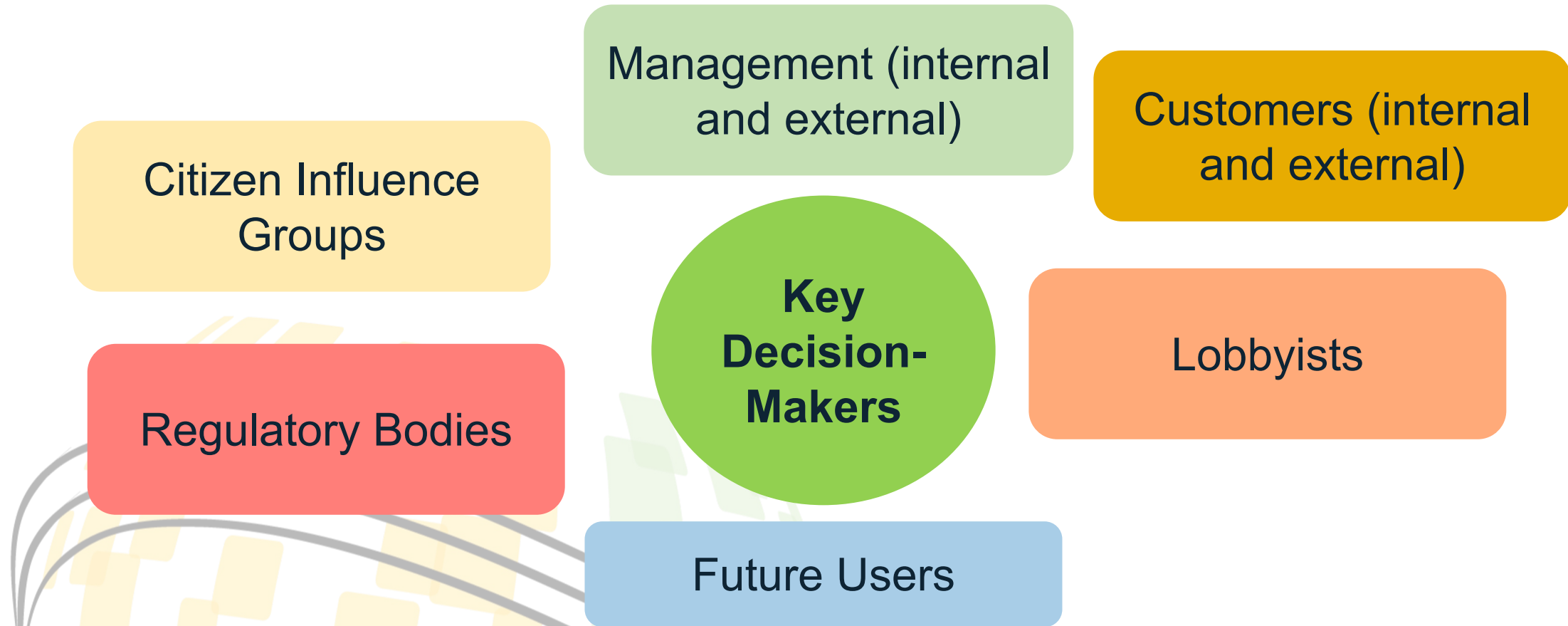
People spend 40 percent of their time at work engaged in “non-sales selling”



Twenty-four (24) minutes of every hour are devoted to “moving others”

Many jobs require persuading or convincing other people, a.k.a. influencing

Key Decision-Makers to Influence



People without a systems perspective risk inappropriately balancing systems engineering concerns with competing concerns.



Specific Human Frailties Covered

Human Frailties

Most Leverageable Frailties

From the combined
70+ years of
experience of the
authors.

01 Anchoring



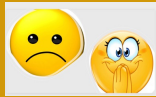
The first input influences judgment of all that follows. The order in which we receive information helps determine our perceptions and judgments.

02 Groupthink



Desire for harmony overrides the judgement needed to achieve the best outcome. Often the first or loudest voice will determine group decisions.

03 Emotional Reasoning



Emotions accepted as fact; Incorrect assumptions based on feelings.

04 Fortune Telling



Make conclusions/predictions without evidence; Catastrophizing; Fantasizing.

05 Magnification/Minimization/ Over-optimism



Overstating/Understating; Unfair Comparison; Blow Things out of Proportion; Worst-case Scenarios; Over-Optimistic Predictions.

06 Negative Mental Filter



Focus on the negative; Ignoring positives; “awfulizing”.

07 Fundamental Attribution Error



We attribute own lack of progress to adverse circumstances but see lack of progress in others as their poor performance.

08 Reactance



People feeling forced to do something often prefer to do the opposite.

Leverage Successes





Increase Influence on Key Decision-Makers

Opportunities to Increase Influence

Human Frailty	See the Opportunity	How to Increase Your Influence
Anchoring	A judgment is needed	Offer an estimate; suggest approach
Groupthink	Misinformation circulating	Share evidence with influencers
Emotional Reasoning	Emotionally charged arguments	Use Transdisciplinary SysE to co-create new knowledge; use evidence
Fortune Telling	Predictions without evidence	Identify assumptions; offer solution alternatives
Magnification/ Minimization & Over-Optimism	Blowing things out of proportion; reluctance to accept risk assessments	Share basis for risk assessments; develop joint risk assessments; explore trends to assess levels of risk
Negative Mental Filter	Stakeholders are too pessimistic to accept a path forward	Share positive progress and trends showing improvement in key indicators
Fundamental Attribution Error	Key stakeholders impute negative intentions to systems engineers	Clarify SysE Team intentions; use the “halo effect:” have team’s most highly regarded member brief
Reactance	Reluctance of stakeholders to accept systems engineers’ recommendations	Share the facts and your reasoning; co-develop a path forward with stakeholders



Strategies and Tactics

5 Strategies

Strategy 1

- Change Your Mindset

Strategy 2

- Understand Stakeholders

Strategy 3

- Frame Information Purposely

Strategy 4

- Improve Your Resilience

Strategy 5

- Use a Transdisciplinary Approach

Strategy 1: Change Your Mindset

From

“I need to present my data and conclusions to convince them”

To

“I need to have an information exchange in which I use each of their hesitations as a prompt to offer multiple solutions addressing their perspective”

- Take every response as a **constructive offer** to build on (NOT to disagree with or correct)
- Use open-ended questions to better understand decision-makers' perspectives and priorities
- 3 tactics presented on the following charts

Tactic for Strategy 1: Persuasion Jujitsu (Daniel Pink)

Use weakness as strength

Assume you have less power than decision-makers.



Share positivity

Amusement, appreciation, joy, interest, gratitude, serenity, hope, inspiration.



Look for solutions where you and decision-makers both benefit

Understand what they value

Tactic for Strategy 1: Improvisational Theater (Daniel Pink)

Treat every response as an opportunity

Find a way to make it a constructive step forward.

Make the decision-maker look good

Share ways that using your input (data and conclusions) can enhance their image and improve the results for which they are responsible.



Say “yes”

Never say “yes, but . . .”

Tactic for Strategy 1: Preparation for discussion with key decision-maker

Think of likely outcomes if you do not succeed in convincing the decision-maker in this session

List the reasons the decision-maker might have for rejecting your input and advice

Write down 5 specific reasons why you can convey information in a way which demonstrates respect for their perspective and concerns, and a desire for them to succeed

Case Study: Geothermal Mindset Change

Jamie Beard, an energy lawyer, entrepreneur, and life-long environmentalist

- Was inspired by a 2006 MIT report that concluded geothermal energy can provide 130,000 times the current energy consumption in the USA
 - Concluded that geothermal energy harvesting needed knowledge and cooperation from the oil and gas industry (changing her own mindset)

Gave a TED talk sharing her conclusions

- Convinced oil and gas executives to collaborate
- Convinced University of Texas at Austin to hire her as director of an entrepreneurship center

Got a grant from the U.S. Department of Energy to start a geothermal program at the university

- Put on a conference which attracted 4,000 people the first year, then 14,000 the second
 - Geothermal start-up companies were formed by conference participants
 - Convinced several climate-related philanthropies to fund these start-ups
- Convinced the McAllen family the pivot from cattle to geothermal

Strategy 4: Improve Your Resilience

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After your advice is rejected, identify possible temporary reasons for the rejection



Use your SysE training to look at the whole as well as the parts, and identify what you know (especially what other stakeholders may not know) and what you don't know (avoiding "the curse of knowledge") to identify key priorities, take needed action, and supply just-in-time information to stakeholders



Focus on the long term, and don't let short-term setbacks discourage you



Welcome change, and look for ways to leverage change to create opportunities to improve project prospects for success

Strategy 5: Use a Transdisciplinary Approach

Work with stakeholders

- Reach out to all stakeholders, not just customers and funders
- Co-create together the new knowledge needed to succeed

When critical choices are difficult

- Look for "and" solutions rather than either/or solutions
- Address all key decision-maker needs, for their own career success as well as for project success

Use multiple media

- Immersive modeling
- Video and audio as well as text
- Consider brainstorming and role-playing to help stakeholders understand each others' concerns

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Strategy 5: Use a Transdisciplinary Approach

Mobile Phone Development Engineering Disciplines

- Industrial Design – collaborates on aesthetic and ergonomic elements
- Human System Integrators – User Interface Design
- Materials Science – Research and Selection of sustainable materials
- Environmental Science – Minimization of Environmental Impact across life cycle stages
- Electrical Engineering – processor, battery, connectivity
- Mechanical Engineering – Assembly, structural integrity
- Software Engineering – Operating System and software applications
- Supply Chain Management
- Quality Assurance - Sourcing of ComponentD
- Cybersecurity – secure from threats and vulnerabilities
- Systems Engineering – Last but not least!

Strategy 5: Use a Transdisciplinary Approach

1. Look for collaborative “or” solutions”

2. Use multiple media (visual, auditory, frequency, etc.) approaches to share information and involve stakeholders

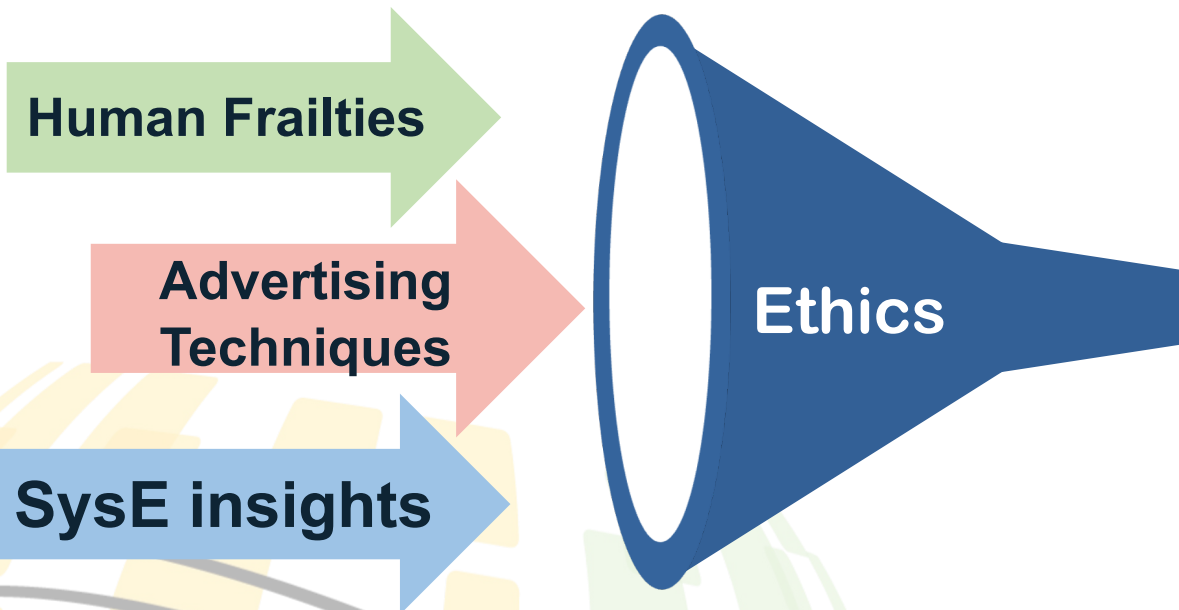
Engineering Disciplines

Software
Product Designers
Human Computer Interaction
Specialists
Industrial
Etc.

Other Disciplines

Project Managers
Financial Analysts
Health and Safety
Legal Advisors
Marketing
Etc.

Conclusions



Multiple strategies
and tactics to
Increase influence
on decision-makers

Human frailties can be used, ethically, to increase System Engineers' influence on decision-makers

Questions and Comments

- We welcome questions and comments

Thanks for listening to this talk!



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