



Introduction to Engineering Systems, ESD.00

Networks III/Stakeholders

Lecture 9

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Outline

Introduction to networks (Lecture 8)

Infrastructure networks (Lecture 8)

Institutional networks (Lecture 8)

The military and networks (Lecture 8)

MIT as a network (Lecture 8)

LECTURE 9

Brain-teaser

ESD.00 as a network

Bay Area transportation

Freight railroad networks

Random and non-random networks

Stakeholders

- Military Example:

- It takes a network; the new frontline of modern warfare
 - By Stanley A McChrystal

Governing by Network

The New Shape of the Public Sector

Stephen Goldsmith and William D. Eggers

MIT

Massachusetts Institute of Technology
Engineering Systems Division

MIT

□ “From business to warfare, networked organizational forms are supplanting hierarchies. Now, Goldsmith and Eggers, two of America’s most innovative policy thinkers, show how the networking trend is transforming government. This book is a must read for anyone concerned with how to make government better and more cost effective.”

-Mitt Romney, Governor of Massachusetts

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- MIT as a network
 - ESD.00 as a network
 - Bay Area ground transportation-- control without hierarchy
 - Freight railroads

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- Random and non-random networks

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- Random networks-- Erdos, et al
 - How to generate one?
 - What are its characteristics?

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- Non-Random networks--Barabasi et al
 - How to generate one?
 - What are its characteristics?

References

[1] M.E.J. Newman, “The structure and function of complex networks”, SIAM review, 2003

[2] Duncan J. Watts & Steven H. Strogatz, “Collective dynamics of ‘small world’ networks”, Nature, Vol. 393, 4 June 1998

[3] Introduction to Graph Theory, Koh Khee Meng et. al

[4] Graph Theory: Modeling, Applications, and Algorithms, Geir Agnarsson, Raymond Greenlaw

[5] *Linked: The New Science of Networks*, Albert-Laszlo Barabasi

Stakeholders

- Definition
- Weighing schemes-- Martland
- Characterization and categorization of stakeholders-- Mitchell

Stakeholders

Definition: What is a stakeholder?

A stakeholder has material effect on the performance of a system or is materially affected by the performance of a system, or both.
(JS)

Stakeholders-Martland's text

- Weighing schemes-- suppose you are the only stakeholder

Stakeholders-Martland's text

- Now imagine multiple stakeholders; each has their own view of which performance measures are the most important

Stakeholders-- Mitchell

- Characterizing and Categorizing Stakeholders
- “The principle of who and what really counts”

Stakeholders

- The idea of stakeholder salience
 - Power
 - Legitimacy
 - Urgency

Stakeholders

Proposition 1: Stakeholder salience will be positively related to the cumulative number of stakeholder attributes –power, legitimacy, and urgency –perceived by managers to be present. (Mitchell)

Stakeholders

- Represent in three-circled Venn diagram
- Power, legitimacy, urgency
 - If one of the above, the stakeholder is latent
 - If two of the above, the stakeholder is expectant
 - If all three of the above, the stakeholder is definitive

Stakeholders

- References

- Carl D. Martland. *“Toward More Sustainable Infrastructure: Project Evaluation for Planners and Engineers,”* John Wiley & Sons, 2012.
- Ronald K. Mitchell, Bradley R. Agle & Donna J. Wood, *“Toward a Theory of Stakeholder Identification and Salience: Defining the Principle of Who and What Really Counts,”* Academy of Management, The Academy of Management Review; Oct. 1997; 22, 4; ABI/INFORM Global pg. 853.

Any comments or questions?

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