



SocioTechnical Systems

LER 512: SocioTechnical Systems

Session Three – September 8, 2009

**How do I use knowledge of
work organization systems?**

Betty Barrett - LER 512

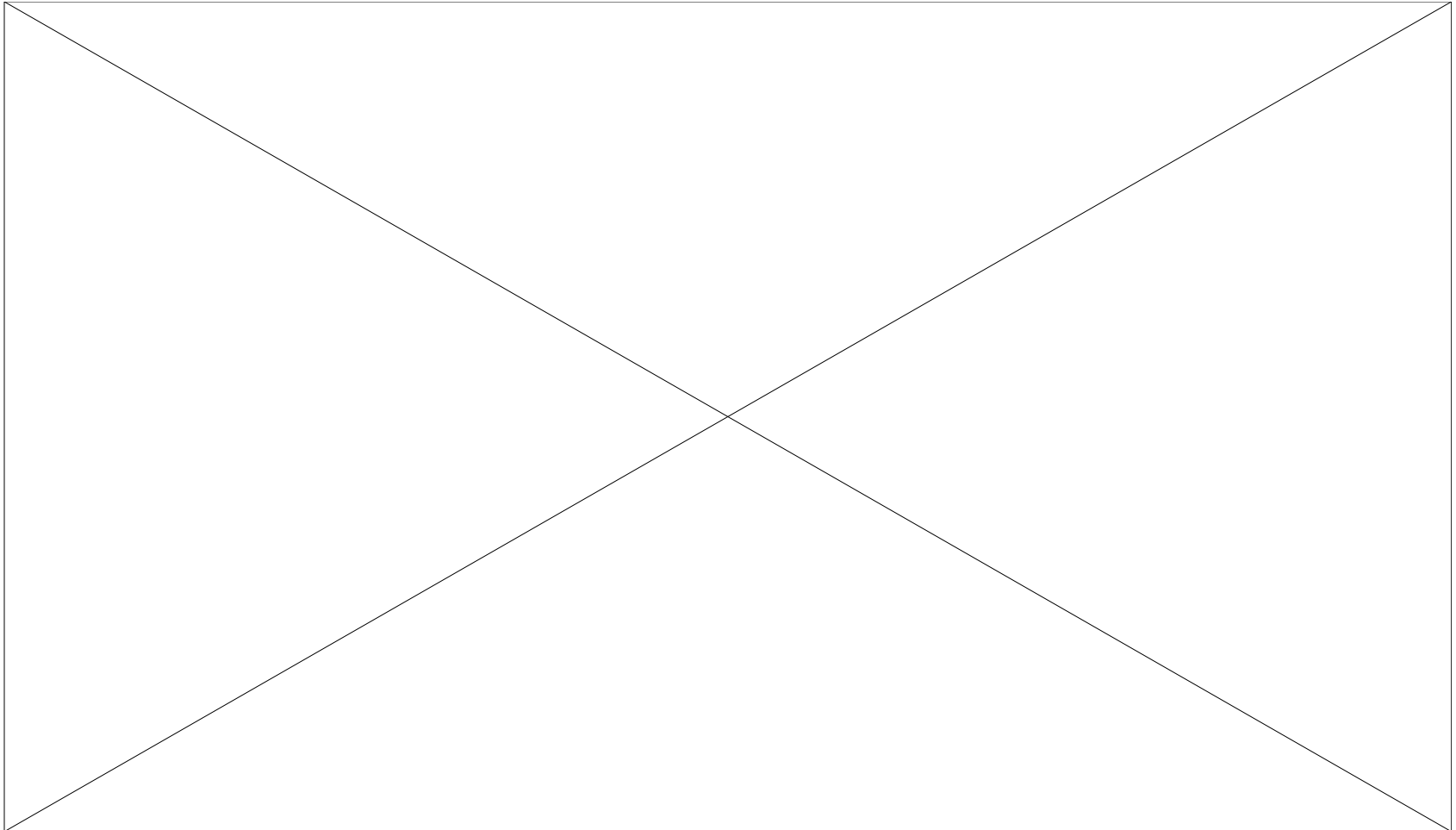


Session Agenda

- **Announcements**
 - Video loop
 - Name cards, please
 - Reflection papers turned in - Short papers due at the beginning of class
- **Lecture and discussion – intro to systems**
- **Exercises – *feel the burn***
- **Project teams**

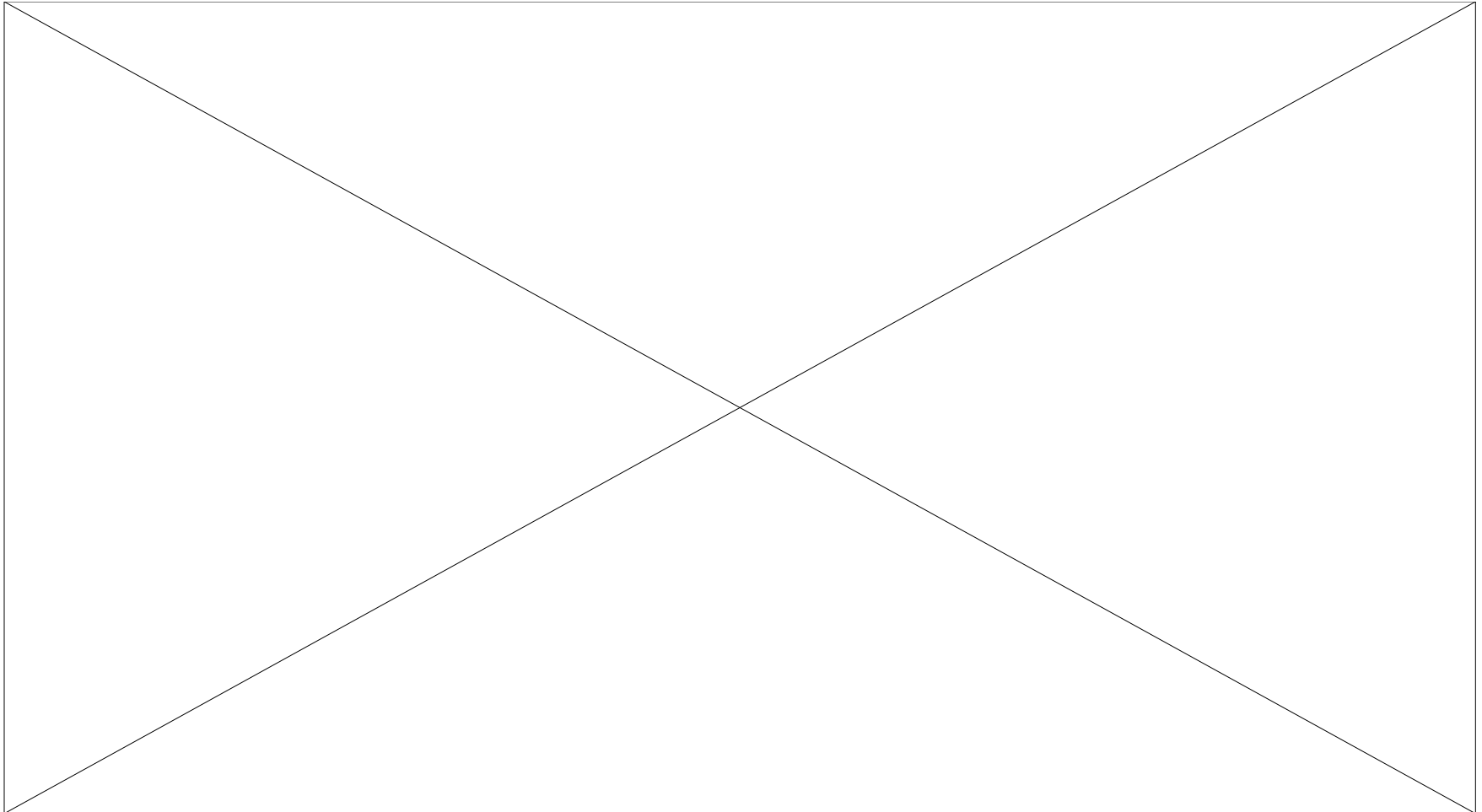


Robots Dance





Warehouse Bots





A quick review: Background, History, Trends

- Why is Scientific Management vital for us to understand?
- What made it possible for Ford to be successful?
- Why is the work of Woodward and her team important to us today?
- Thinking about the Crawford article – what ideas or thoughts should we take away.



SocioTechnical Systems



A Systems Thought Exercise

Japanese farmers display watermelons at a farmers' market.

Why are they square?

What stories can you tell about this system?

Who are the main players in these system stories?

What is one idea you will take away to use from these watermelons?



Thinking about Systems

- Von Bertalanffy is generally called the father of systems theory. Others who helped shape the discipline include Ackhoff, Forrester, and Senge.

Definitions of systems and systems terms

- A “system “ is defined as “an organized, unitary whole composed of two or more interdependent parts (subsystems) where the whole contains identifiable boundaries from its environment (suprasystem). O’Connor (2006)
- Systems must be viewed as a whole; changes in one part of the system affect the other parts.
- “The **defining characteristic** of a system is that *it cannot be understood as a function of its isolated components.*
 - *First*, the behavior of the system doesn’t depend on what each part is doing but on how each part is interacting with the rest.
 - *Second*, to understand a system we need to understand how it fits into the larger system of which it is a part.
 - *Third* and most important, what we call the parts need not be taken as primary. In fact, how we define the parts is fundamentally a matter of perspective and purpose, not intrinsic in the nature of the “real thing” we are looking at. Kofman and Senge (1993)



A Knowledge-Driven Work Option

- Describe an example of a systems approach that you read in the knowledge-driven work article.
- What do Cutcher-Gershenfeld et.al. say about social contracts? What assumptions make them work?
- What ways are technology and people integrated in the article?
- What are unintended consequences and do you have any examples from your personal experience?



Systems: Feedback and Learning

Experts, like Norbert Wiener recognized the need for mechanisms that allowed for monitoring a system and gathering information about how the system is working.

- Can you think of any feedback mechanisms that we read about?
- Where did you see learning as integral to the system in today's readings?



STS and Mass Customization

- What exactly is mass customization?
- What was most interesting to you in the Hirschhorn, Noble and Rankin article?
- What did you make of the idea of “dynamic complementarity”?
- Look at Table 1 on p.249 – pick a pair of items and tell us why you find that interesting
- What did you think about the question at the end of the article about the future for STS?



Large Scale Systems and Change

- Who said “system, system, and more system and why?”
- Hughes says the “Information and electric energy have similar effects and generate comparable developments because both are means of transmission and distribution, in one case energy and in the other information.”
- Do you think Gilder is correct when he says that machines and material things will be displaced by human minds as the measure and source of wealth?
- Do you observe Negroponte’s prediction “that like an irresistible force of nature, digitalization will decentralize, globalize, harmonize, and empower.”



The Information Age is Shifting to Digital and Nano

Globalization is essential for and drives networks (among other things), can you name a couple of these networks?

This world brings us virtual collaborations, privacy concerns, security threats/protections, medical breakthroughs.

- Do you feel like this shift is something positive for your lives? If so, why?
 - Are you speaking from real knowledge or intuition?



Technological and Organizational Changes

The relationship between technology and organizational change is **co-evolutionary**.

Compare this with Trist's characteristics of a sociotechnical system?

*from Hughes p. 101

Shift in Management Characteristics*	
The Second Industrial Revolution	The Information Age
hierarchy	flatness
specialization	interdisciplinarity
standardization	heterogeneity
centralization	distributed control
expertise	meritocracy
bureaucracy	nimble flexibility



Feel the Burn Exercise

In small groups:

Using the material in the chart on the shift in management characteristics and the Trist's STS principles, identify one organization that has each set of characteristics and speculate about what the work systems might look like. Feel free to include Woodward's work in your discussion.

You may want to first discuss what each of the terms means and then think about how they are evolving. Do the best you can and we'll discuss it together at the end.



For Review: Sociotechnical System - Some Principles Trist Identifies

- A work system in which the activities make a whole rather than decomposable single jobs
- A work group is more central than the individual worker
- The system can be run internally rather than externally by supervisors
- There is a redundancy of functions rather than a redundancy of parts
- The discretionary parts of work are more valued than the prescribed
- The individual is complementary to the machine rather than its extension
- The work is variety increasing for both the individual and the organization rather than variety decreasing



Next Week

- Don't forget that you have a reflections paper due next week

- <http://www.youtube.com/watch?v=Vdmtya8emMw>
- <http://www.youtube.com/watch?v=Fdd6sQ8Cbe0>