

Socio-Technology Systems (STS)

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“We live in a society exquisitely dependent on science and technology, in which hardly anyone knows anything about science and technology.”

---Carl Sagan (1934–1996)

“The more people we can attract to science and technology - men, women, everybody - the more economic opportunity we have as a nation.”

---Megan Smith (1964–)

Purpose:

The primary purpose of this document is to complement the course with the theory and practice of Socio-technology Systems (STS). It is not possible to separate technology from people. Therefore, we need to understand not just technology or people, but the myriad of relationships between technology and people. This is especially true for business students, and doubly so for management students in particular.

This document does not try to present a complete examination of STS but rather structures STS 1) by one of three conceptual levels, and 2) by examples of alternatives, or even opposites, that help define that level. The beauty, of course, is seeing not just the extremes in the provided examples but all of the possibilities in between and around these examples. All of the examples are taken from articles appearing in the Wall Street Journal.

Sociotechnology (short for "social technology") is the study of processes on the intersection of society and technology. It is "the study of processes in which the social and the technical are indivisibly combined." Sociotechnology is an important part of socio-technical design, which is defined as "designing things that participate in complex systems that have both social and technical aspects." Sociotechnology can be seen as the creation, modification and maintenance of social systems. "Society is not determined by technology nor is technology determined by society. Both emerge as two sides of the sociotechnical coin." The things made are socially constructed just as much as technically constructed. The merging of these two things, construction and insight, is sociotechnology.

--<https://en.wikipedia.org/wiki/Sociotechnology>

Socio-Technical Systems refers to the interrelatedness of *social* and *technical* aspects of a technology. STS theory is about *joint optimization*, that is, designing the social system and technical system in tandem so that they work smoothly together. In practice, this is usually the intersection between productivity and wellbeing. Each of these are difficult to measure individually; measure both simultaneously is even more difficult.

--https://en.wikipedia.org/wiki/Sociotechnical_system#Overview

Society-level (macro-level, high-level):

Does a sovereign nation or a set of sovereign nations need to excel in opportunity and innovation?

Fairless, T., and D. Luhnnow (May 21, 2025), "Europe's Firms Fall Far Behind In the Race to Create Big Tech --- Lack of innovation holds economies back, weighing on continent's future", *Wall Street Journal*.

Which specific technologies (emerging or existing) does a sovereign nation need to excel in?

Lahart, J. (April 14, 2025), "U.S. News: How the U.S. Slipped From Top Manufacturing Perch", *Wall Street Journal*.

If you buy something, should you have the right to fix it yourself?

Haggin, P. (January 9, 2023), "Deere to Allow Farmers To Repair Own Equipment", *Wall Street Journal*.

Why are individuals who submit patents more productive in smaller firms than in larger firms?

Mims, C. (April 8, 2023), "EXCHANGE --- Keywords: More Spending, Less Innovation", *Wall Street Journal*.

New, Big Data Centers for AI (pro):

AI needs much computing/storage/network resources. Where do we get the land and power?

Hiller, J. (March 31, 2025), "U.S. News: An AI Data-Center Boom Is Coming for Rural America", *Wall Street Journal*.

New, Big Data Centers for AI (con):

AI needs much computing/storage/network resources. Why don't all regions want a data center?

Maher, K. (May 19, 2025), "U.S. News: West Virginia's Big-Tech Push Stirs Backlash", *Wall Street Journal*.

Organizational-level (meso-level, middle-level):

Since technology has improved society in many ways, do we still need to work five days a week?

Schor, J. (May 31 - June 1, 2025), "REVIEW --- Of Course Workers Want A Four-Day Week. Companies Should Too. --- Businesses and nonprofits that adopt a shorter work week see excellent results in performance metrics and revenue -- and they rarely want to go back.", *Wall Street Journal*.

Remote Work (pro):

What are the strengths and opportunities of remote work (e.g., more leisure time, less burnout)?

Feintzeig, R. (November 7, 2022), "Work & Life: Escape Your Packed Schedule And Take a Rest From Work", *Wall Street Journal*

Remote Work (con):

What are the weaknesses and challenges of remote work (e.g., more miscues, less productivity)?

Ziegler, B. (May 15, 2023), "Innovations in Work (A Special Report) --- Why Remote Work Could Lead to Less Innovation", *Wall Street Journal*

Post-Pandemic Office Work:

Smith, R. (April 23, 2025), "Workplaces Are Ditching Harsh Fluorescent Lights --- From faux skylights to circadian-tuned systems, lighting upgrades aim to lure employees back", *Wall Street Journal*

Individual-level (micro-level, low-level):

Do we acknowledge, much less understand, the full extent of the technology experience?

Samuel, A. (November 21, 2022), "Customer Experience (A Special Report) --- I Love Using Technology -- but I Hate Buying It", *Wall Street Journal*.

Why is it so hard to get a person to use a technology that could one day save that person's life?

Hirsch, J. (November 21, 2022), "Customer Experience (A Special Report) --- My Glucose Monitor Can Drive Me Crazy -- And I Wouldn't Have It Any Other Way", *Wall Street Journal*.

It's taken almost 250 years to remove the penny. Should/Can paper currency be replaced?

Broughton, P. (April 23, 2025), "When Paper Beats Plastic ", *Wall Street Journal*.

Can one ever really know the true shape of an S-curve, especially at the end of a lifecycle?

Perez-Castells, A. (May 20, 2023), "What the Beep? Die-Hards Refuse to Let Go of Their Pagers", *Wall Street Journal*.