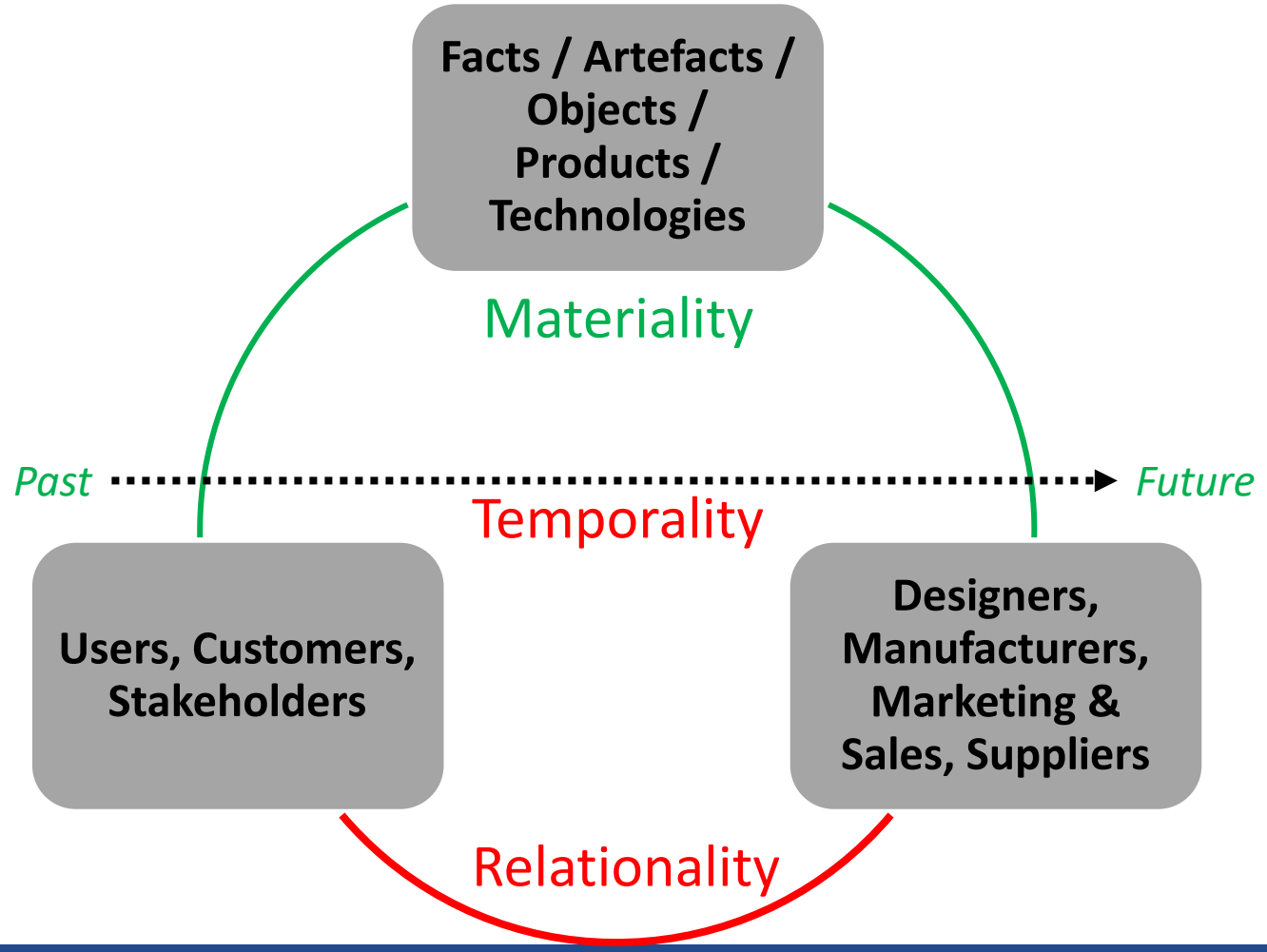
DS1001: Sociology of Design

Session 10

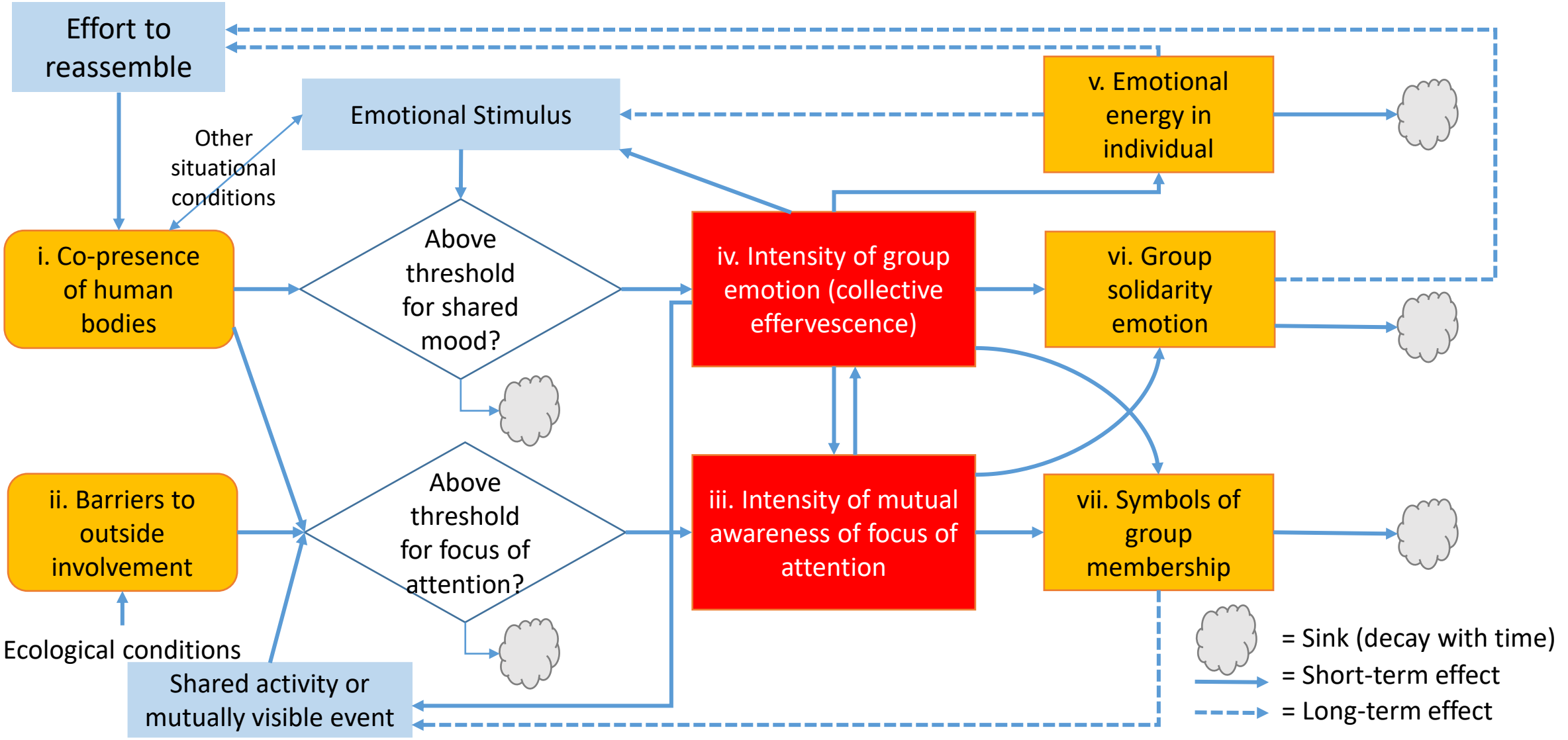
INDIAN INSTITUTE OF INFORMATION TECHNOLOGY, DESIGN AND MANUFACTURING, KANCHEEPURAM

- Dr. Sudhir Varadarajan
- Dr Narendran

Importance of the Present and Rhetoric-Responsive Talk for Design and Innovation



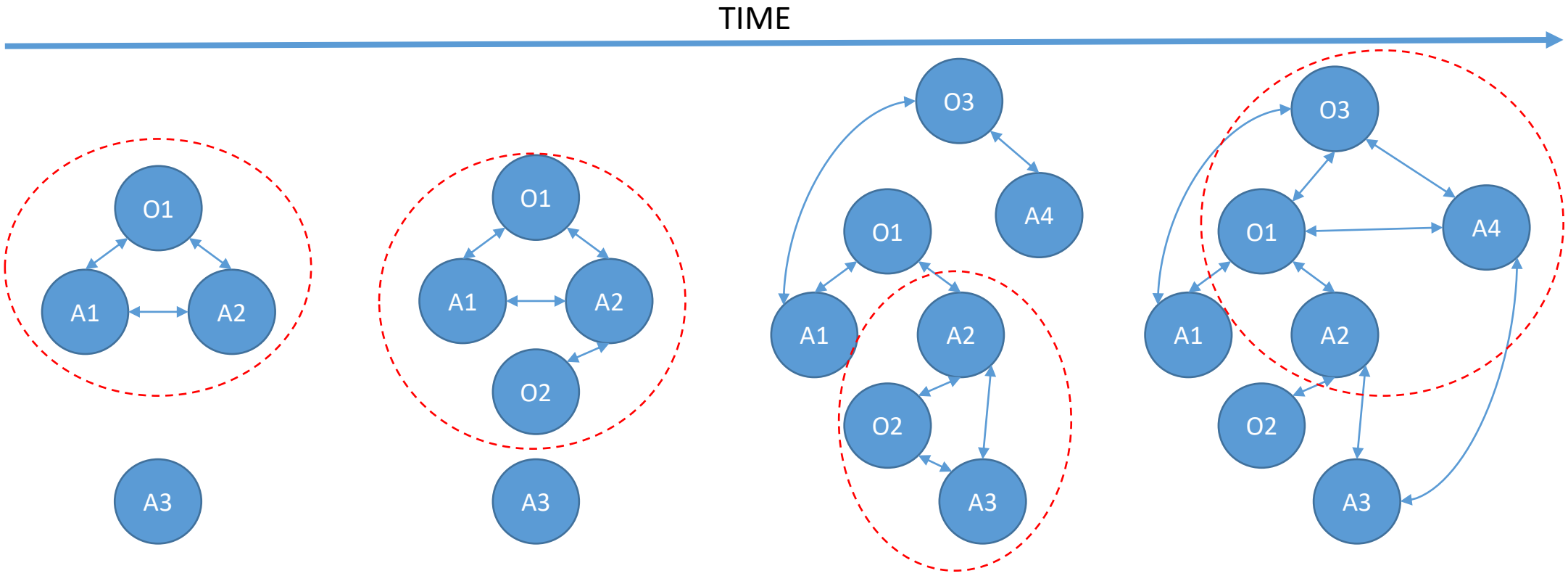
Interaction Ritual (IR): How interaction builds EE



SESSION OUTLINE

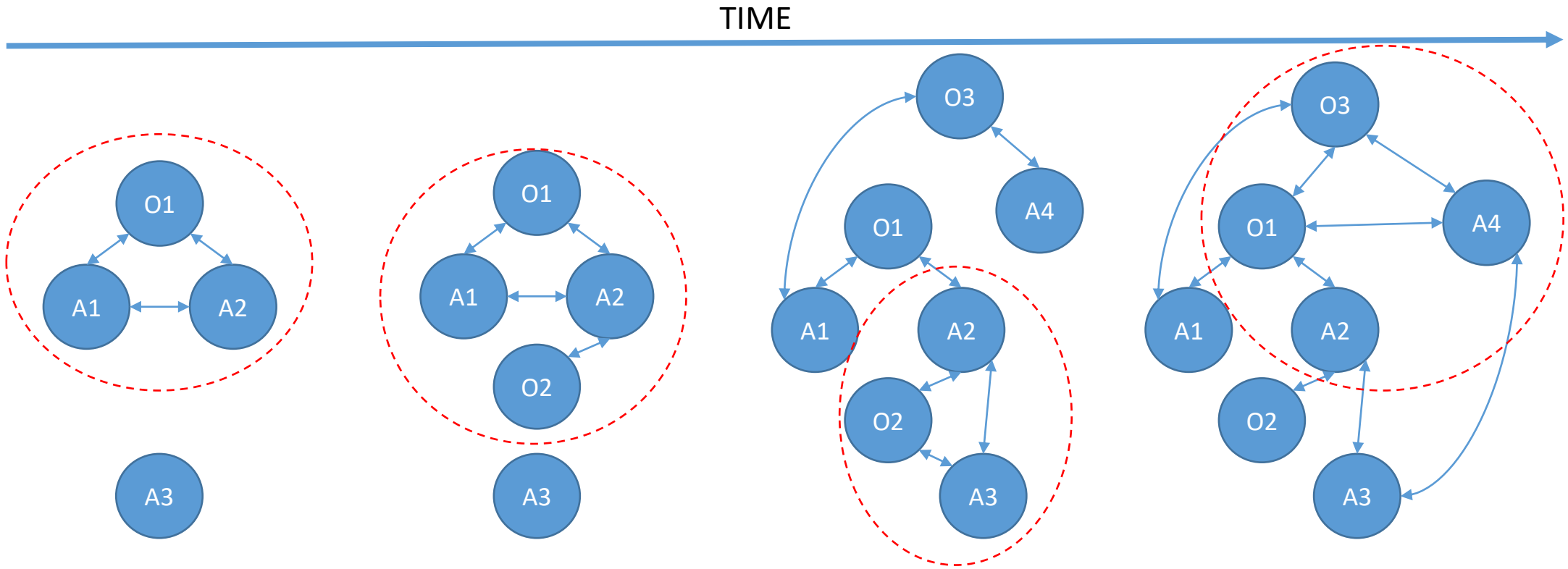
- Social Construction of Technology & Actor Network Theory
- Case of Electric Vehicles in France in the 1970s
- Case of Portuguese Expansion from 1300-1500 … British Rule … Kancheepuram

Repeated interactions & Shared symbols among actors (objects, people) leads to network formation



A product/technology is one or more objects in this evolving network

Products are subject to the dynamics of the actor network and layers of meanings

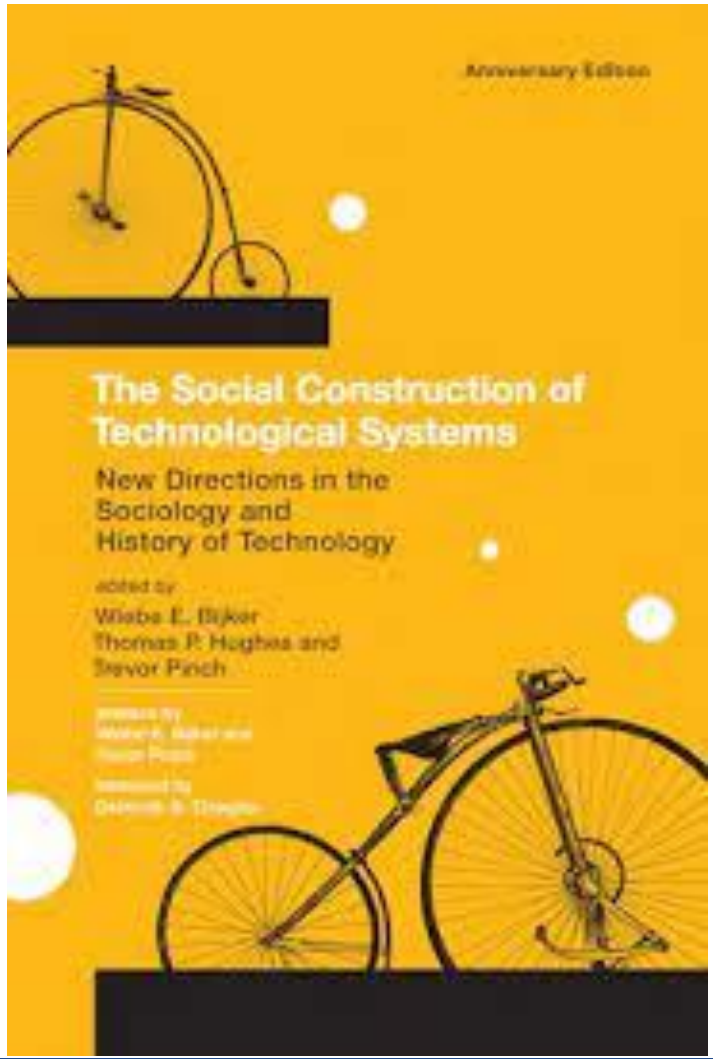


Technology is not objective, it is also Socially Constructed … It explains why some technologies are more successful than others, even though they may be technically inferior

Engineers & Innovators are partly Sociologists

- “Engineers who elaborate a new technology as well as all those who participate at one time or another in its design, development, and diffusion …
- … Constantly construct hypotheses and forms of argument that pull these participants into the field of sociological analysis …
- … Whether they want to or not, they are transformed into sociologists, or what I call engineer-sociologists.”

– Michael Callon



Engineers & Innovators would be better off taking an Actor Network Theory (ANT) Perspective

- "The engineers involved in the design and development of a technological system, particularly when radical innovations are involved, …. must permanently combine scientific and technical analyses with sociological analyses.
- The proposed associations are heterogeneous from the start of the process.
- The concept of actor network can be used to explain both the first stages of the invention and the gradual institutionalization of the market sometimes created as a result without distinguishing between successive phases".

ANT helps Understand the Heterogeneous Actors and History of Interactions

- Technology is not neutral or objective … it is shaped by actors and open to debate … especially the normative questions ("WHAT - Objectives?")
  - **Actor worlds** … includes heterogeneous elements (people, artefacts)
  - **Translation** … spokesman/enrollment, displacement, points of passage
  - **Mediators vs Intermediaries**
  - **Actor Networks** … network position of key actors
- Instead of understanding "social" or "economic" or "technical" in isolation, it is important to participate and understand how the nature of interactions and network positions of actors shape network formation over time and the direction of technologies … History matters … History of Technology & Design

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Discuss and write

1. What was the problem perceived by EDF, and how was it translated for consumers?
2. Which elements in the actor world were ready to be part of the EDF initiative?
3. Why was EDF's translation threatening to the leading car maker (Renault)?
4. Can we treat fuel cells as an intermediary or mediator?
5. What is the network position of the IC engine based motor car?

Understanding the Dynamics of Actor Networks in the Case of Electric Car… Time for some Role Play

- Each group may identify with one actor-world… EDF, CGE, Fuel Cells (components, researchers), Renault, Oil Lobby, Town Administration, Public transport bodies, Consumers

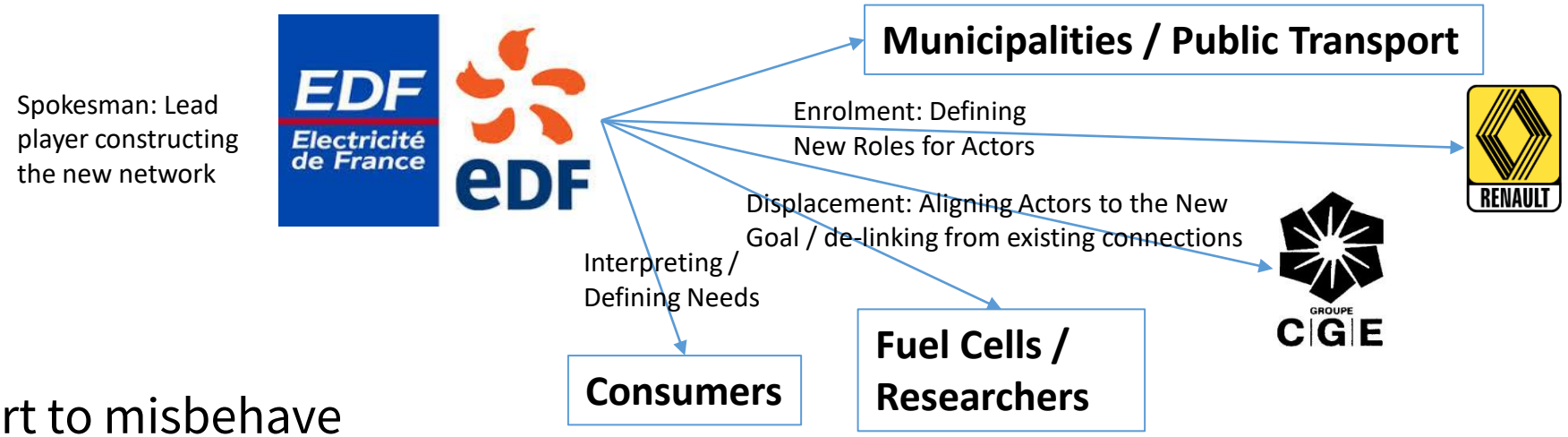
- Role Play: Enact the nature of interactions among actors and the social construction of reality

- Debrief: Did you see how actor-worlds emerge, how translation happens or fails and how networks resist or undergo change

Failure of EV in France in the 1970s

Source: Wiebe E. BiJker et al (eds), The Social Construction of Technological Systems, 1993

- The central role of IC engine based automobile in the old world
- The new world of 1970s - oil crisis and urban air pollution
- Actor worlds (EDF, Renault, CGE, fuel cells, users) and translation

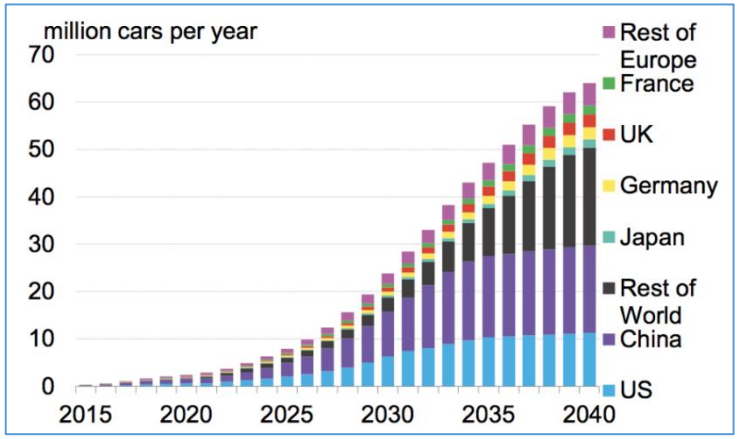


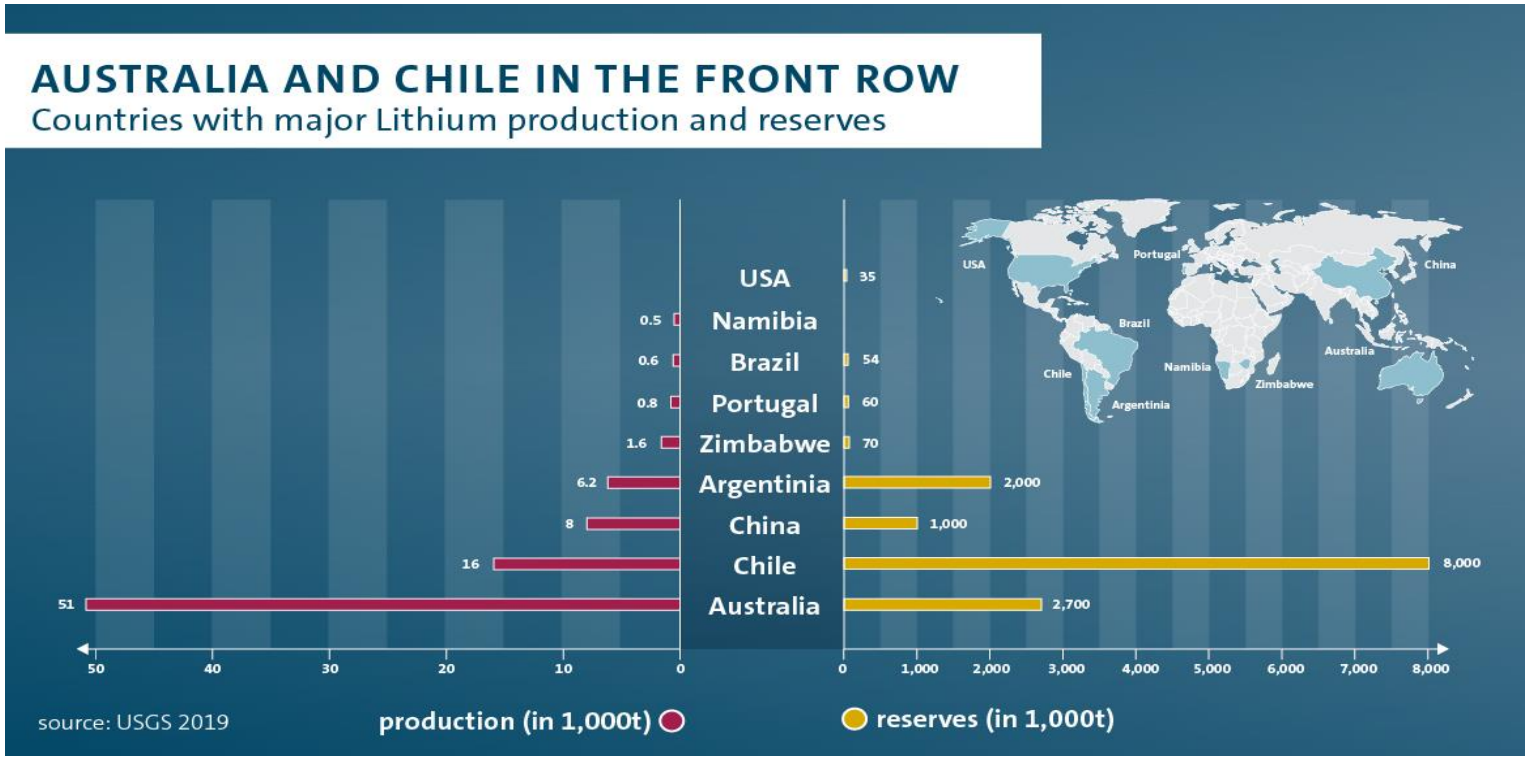
- Fuel cells start to misbehave
- Re-interpreting the need – an electric car or a more efficient car?
- The central position of IC engine in the network could not be dislodged (status quo prevailed)

What is the actor-network of the electric cars today?

Is lithium centric EV in the interest of India? India's interest in Australia? Lithium deposits found in J&K

Should India look at alternatives like hydrogen?





Source: WEF

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Actor Networks in Portuguese Expansion

1300s … 1440s 1480s 1500

Dissociating Cape Bajador & the coast

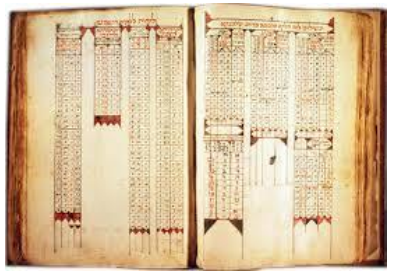
By the 1400s, sailors were using a **magnetic needle** for the compass. They had found ways to make the compass **more accurate** for sea exploration.

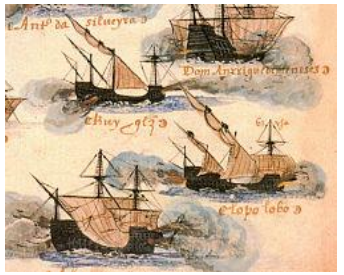
Aligning Stars… Simplified Astrolable & Data tables to calculate Latitude

Vasco da Gama meets Zamorin of Calicut-spice trade

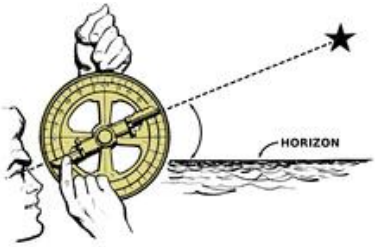
Galley (War)

Mixed-Rigged Vessel (Sea worthy)





Caravel & Superior Guns



Astronomical Navigator

Discovery of volta do mar- Aligning Winds & Currents

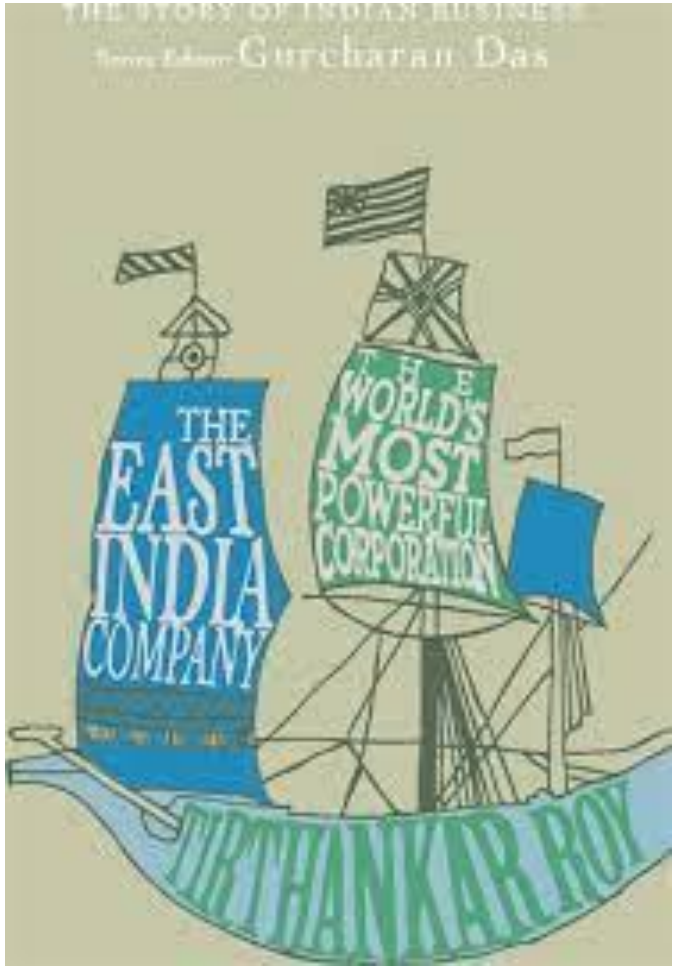
Source: Law, J. (1987). Technology, closure and heterogeneous engineering: The case of the Portuguese expansion.

Actor Networks that shaped Kanchi-Chennai

1600-30 | 1639-74 | 1740s | 1760s | 1790s | 1820s | 1900 | 1930s | 1950

Formation of East India Company, the world's first Global Corporation

6-8 voyages – link with Jahangir/Agra, Factories setup in Surat, Pulicat, Masulipatnam EIC defeats Portuguese – Surat HQ



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Madras Presidency

French enter Pondicherry

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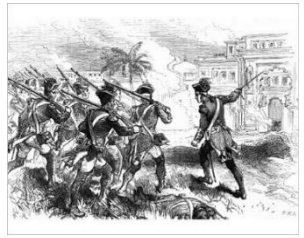
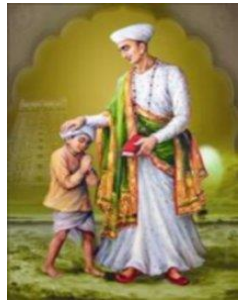


Carnatic Wars – Fight with French (Conjeevaram) – Robert Clive becomes a hero



Nabob gifts Jagir to British (400k pagodas)
Barnard Survey
Locals engage thru Dubash
Invasion by Hyder Ali

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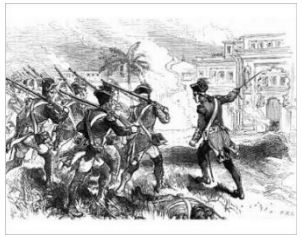

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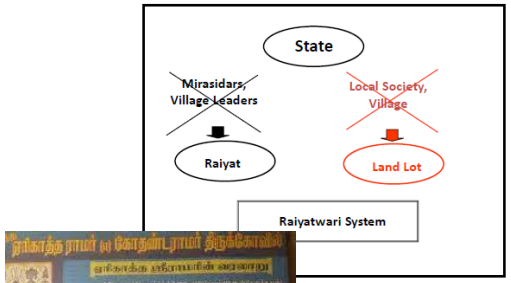
Period of spatial transformation



Collector Lionel Place (disruption to economy / labor relns) / Revival of temples/tanks

Munro Ryotwari system (Patta) / Increasing power of Dubash

Centralization of admin / Civil Services / **English** Education … **Dubash**-patron of arts (Music) **Cooperative movement** to revive rural economy

Justice Party and the politics of power, alignment with British DK-anti-brahmin

National congress vs Dravidian politics

Tamil vs Telugu

Sources: Irschick, E (1994), Dialogue & history: Constructing South India 1795-1895; Baker C (1976); The politics of south India 1920-1937; Muthiah, Madras Rediscovered + several others

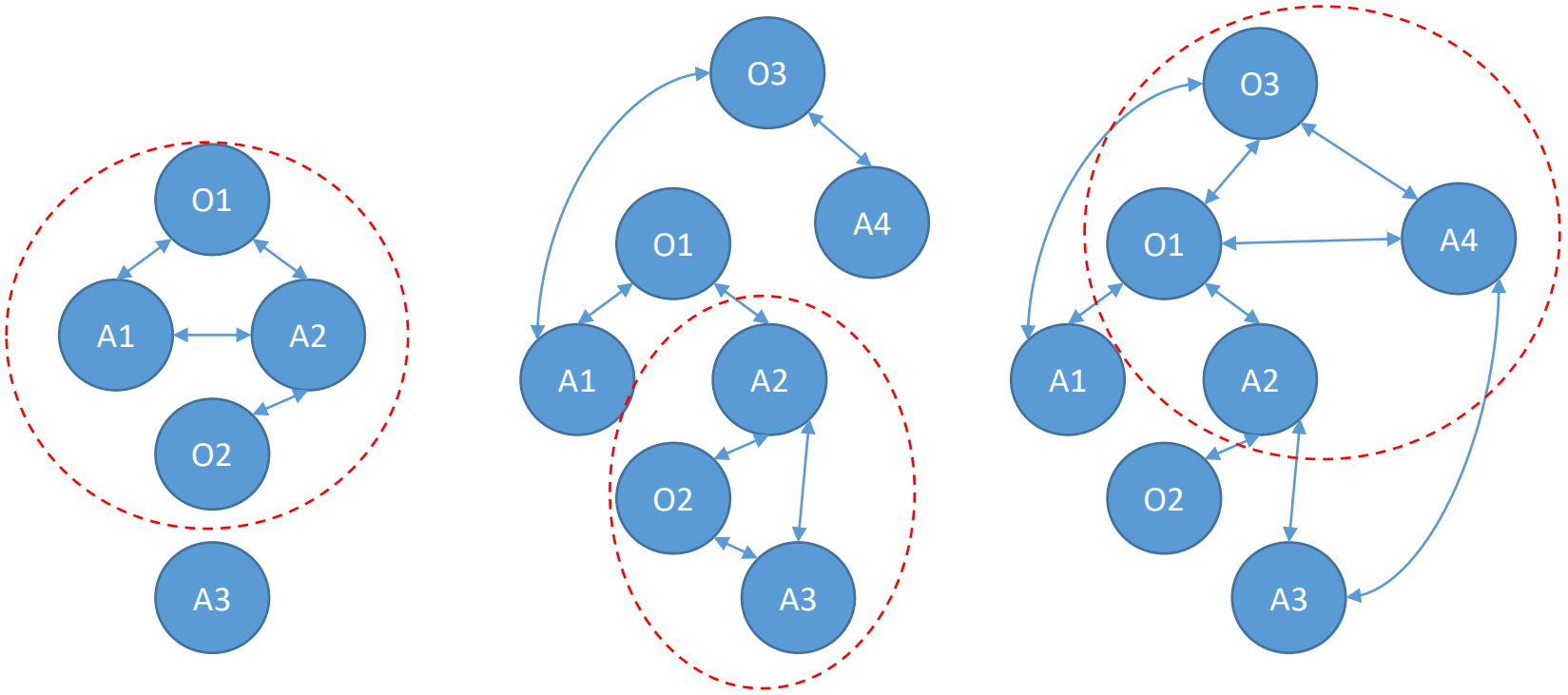
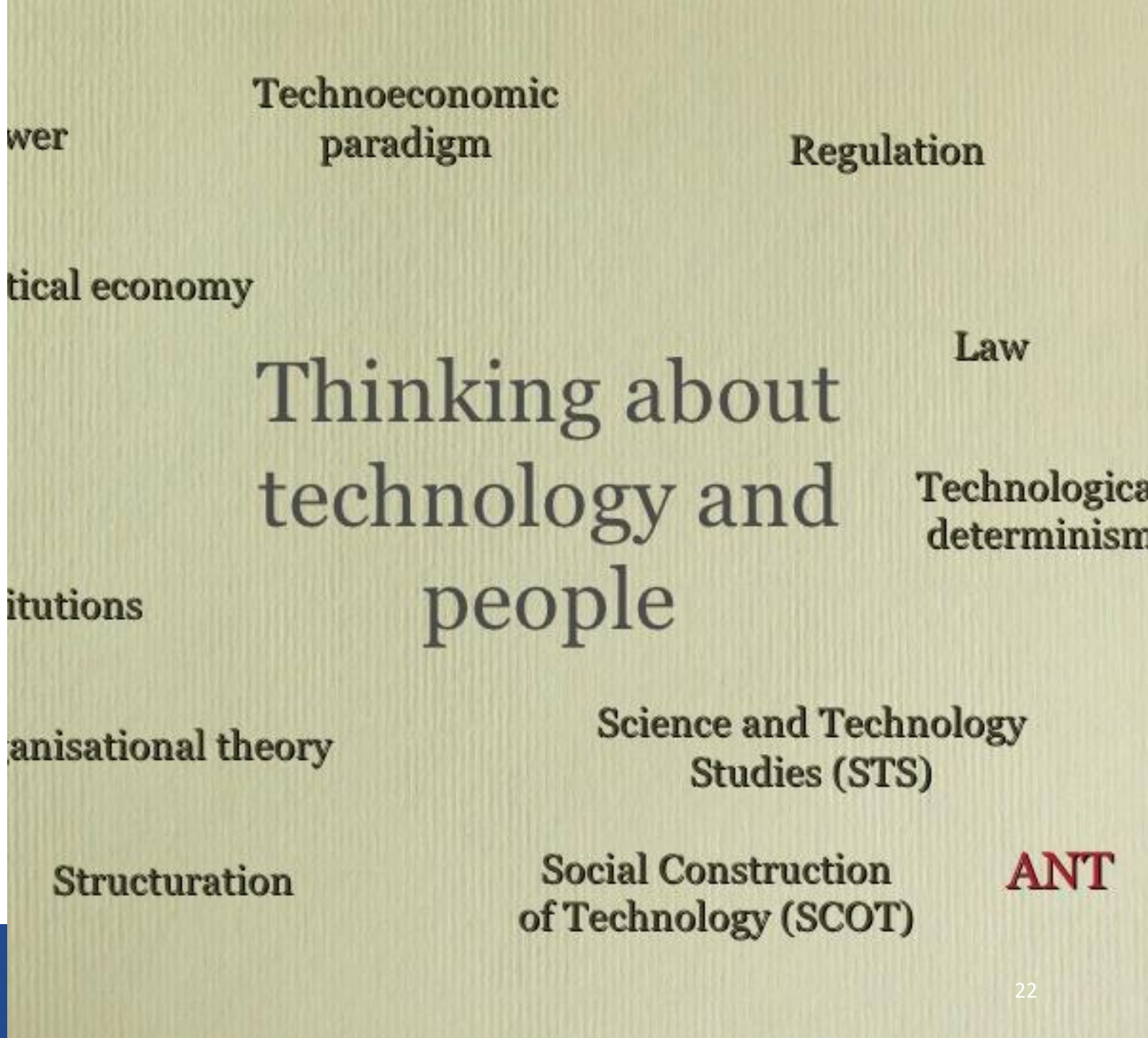
Construct your actor-network in the next 3 years

June 2024 (Sem 2) Nov 2024 (Sem 3) …. Apr 2026 (Sem 6)

Actor World (people, artefacts-courses/labs/curriculum /clubs/hostel/WiFi/Note books)

Translation (enrollment, displacement)

Points of Passage (Exams, Design Competitions, Prototype, Internship, Incubation)



Next week: Semiotics