Socio-Technical Transition (STS) Theory in a Nutshell
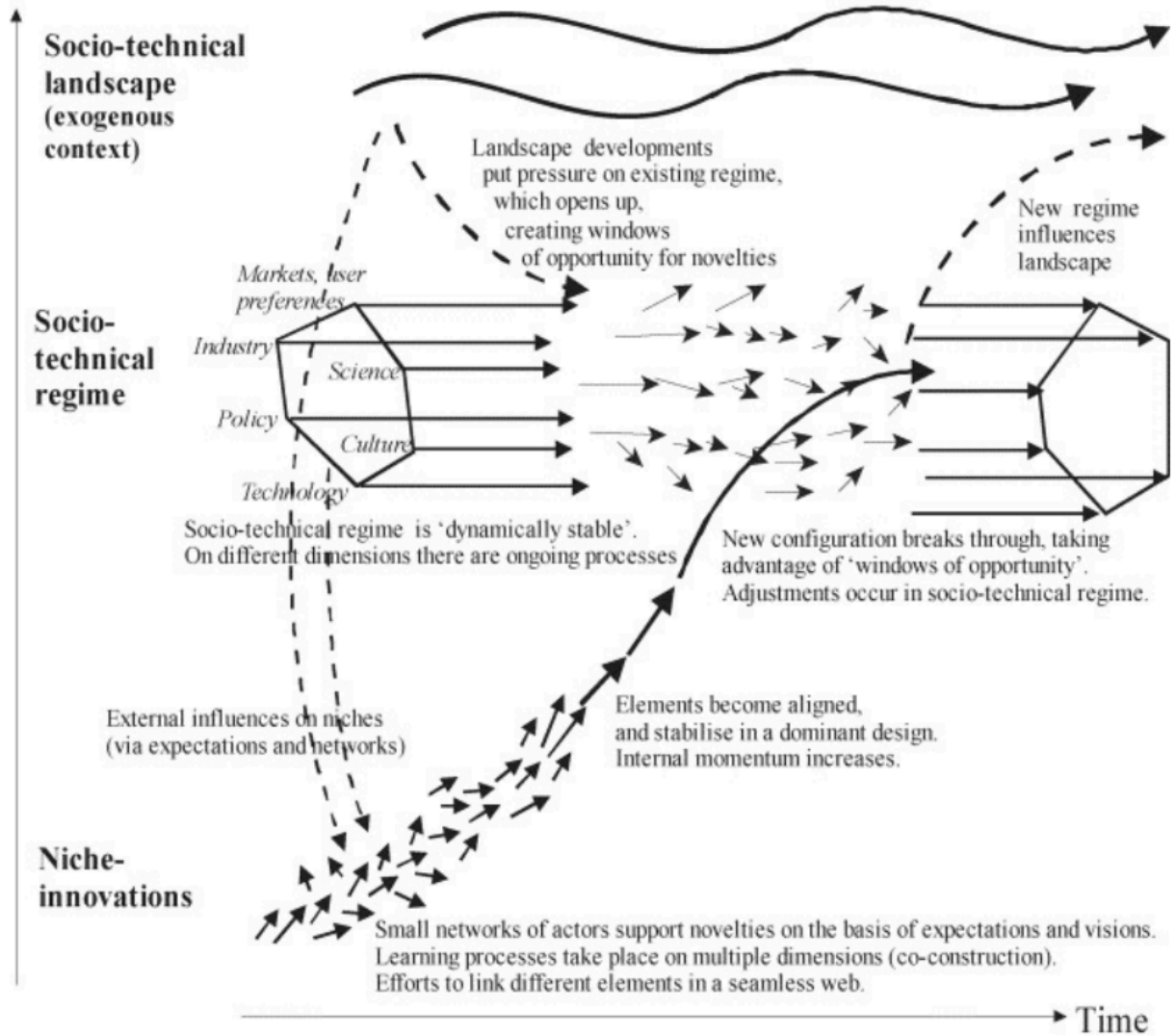

Figure 1: Multi-level perspective on transitions[1]

This framework highlights the importance of interactions among innovations, policies and context while simultaneously accounting for complex change processes. This is a departure from typical approaches that tend to isolate system elements for the purposes of simplification.

- **Niche Innovations**: 'where radical novelties emerge[2]'; these typically have many competing innovations
- **Socio-technical Regimes**: are the 'rules of the game'; they define and stabilize socio-technical development pathways[3] through policy, markets, infrastructure, cultural narratives, etc. Innovation at this stage tends to be incremental.[4]

[1] FW Geels, "The Multi-Level Perspective on Sustainability Transitions: Responses to Seven Criticisms," *Environmental Innovation and Societal Transitions 1*, no. 1 (June 1, 2011): 24–40.

[2] FW Geels and Johan Schot, "Typology of Sociotechnical Transition Pathways," *Research Policy 36*, no. 3 (April 2007): 399–417

[3] FW Geels, "Technological Transitions as Evolutionary Reconfiguration Processes: a Multi-Level Perspective and a Case-Study," *Research Policy 31*, no. 8 (2002): 1257–74, doi:10.1016/S0048-7333(02)00062-8.

[4] E Gawel, et al., "The Future of the Energy Transition in Germany," *Energy, Sustainability and Society 4*, no. 15 (July 8, 2014): 1–9.

- **Socio-technical Landscapes**: these are macro-level forces such as cultural values, demographic trends, and macro-economic factors that may change slowly (as with climate) or quickly (as with oil price shocks).

When collections of niche innovations align, they put pressure on the policy regime. At the same time, landscape level changes (e.g. elections, economic crises) create windows of opportunity for niche innovations to take hold within the regime. It is important to note that regime and landscape changes can take place over years, decades, or even generations.

Questions for Design

1. **Is a transition happening? If so, did the process contribute?**
   STS framing provides a baseline for evaluation of a current system (Where are we now?) and assessment of whether socio-technical system transitions have or are taking place (Is the system changing?). This lens helps reveal the extent to which the process under analysis has contributed to that transition (How much did we contribute to the change?)

2. **Where should we intervene?**
   STS can help process designers identify hurdles and opportunities for the system to transition, ensuring the portfolio of interventions is designed appropriately. For example, a process might focus on accelerating regime transition through policy innovation with the intention of nurturing niche innovations or it might take advantage of landscape shifts and change how people see and talk about an issue.

3. **What should we include in our design?**
   STS process characteristics can also lead to successful socio-technical transition. These include providing space for:
   a. Learning and experimentation
   b. Developing networks of people working across the three STS levels so they can make integrated decisions[5], and
   c. Amplifying dynamics between niche innovations that are aligned, which works to pressure their shared socio-technical regime[6].

4. **What should we pay attention to?**
   Sustainability transitions are particularly sensitive to *changes* in the system, especially at the landscape level and in times of rapid change, as these inevitably impact the design and implementation of interventions. Additional measures may need to be put in place such as processes for monitoring context.

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[5] Seyedeh Paniz Pajouhesh, "From Theory to Practice: an Analysis of Transformative Social Innovation at the University of British Columbia," ed. John Robinson 2016.

[6] John Grin, Jan Rotmans, and Johan Schot, "On Patterns and Agency in Transition Dynamics: Some Key Insights From the KSI Programme," *Environmental Innovation and Societal Transitions 1*, no. 1 (June 1, 2011): 76–81, doi:10.1016/j.eist.2011.04.008; Darcy Riddell, "Scaling Forest Conservation: Strategic Agency and Systems Change in the Great Bear Rainforest and Canadian Boreal Forest Agreements," ed. Frances Westley (2015).