From Diffusion of Innovations to System Transformation

Charlie Wilson

Manchester, June 2018
International Sustainability Transitions (IST) Conference
Innovation-centric models of adoption & diffusion have a robust evidence base and are analytically tractable.

**Diffusion** = communication over time about an innovation among members of a social system.

- Early adopters reduce risks of a new technology perceived by later adopters.
- High initial risk aversion.
- High adoption propensity.
Innovation-centric models of adoption & diffusion have a robust evidence base and are analytically tractable

Diffusion = communication over time about an innovation among members of a social system

Five attributes of innovations determine adoption rates:
(1) relative advantage
(2) compatibility
(3) ease of use
(4) observability
(5) triallability
Multi-level perspective explains change and stability at the systems level

“With regard to consumers and households ... crossovers to traditional adoption approaches (Rogers, 1996) ... are under-explored, perhaps because of an excessive fear of using reified analytical categories.”

Diffusion of innovations’ contribution to MLP? (1): users (consumers) & social influence

Diffusion of Innovations --> MLP

locally-rich explanation of diffusion, emphasising users and social networks
Diffusion of innovations’ contribution to MLP? (2): innovation attributes as a lens into regimes

- (1) relative advantage
- (2) compatibility

Diffusion of Innovations --> MLP

locally-rich explanation of diffusion and role of social networks (and users)

perceived attributes of innovations reveal regime influence on niches, e.g., extent of alignment
Diffusion of innovations’ contribution to MLP? (3): inter-related innovations, adopters, niches

- Socio-technical landscape (exogenous context)
- Socio-technical regime
- Niche-innovations

**Diffusion of Innovations --> MLP**

- Locally-rich explanation of diffusion and role of social networks (and users)
- Perceived attributes of innovations reveal regime influence on niches
- Clusters of innovations (by attribute) with inter-related niches & adopters
Diffusion of innovations’ contribution to MLP? next steps ... meta-analyse niche-led MLP studies

Diffusion of Innovations --> MLP

locally-rich explanation of diffusion and role of social networks (and users)

- perceived attributes of innovations reveal regime influence on niches
- clusters of innovations (by attribute) with inter-related niches & adoption

attributes

innovations

(1) relative advantage
(2) compatibility

Socio-technical regime
Socio-technical landscape (exogenous context)

Markets, user preferences
Science
Industry
Policy
Culture
Technology

(1) relative advantage
(2) compatibility

Niche-innovations

attributes

innovations

A
B
C
Dol meets MLP
Disruptive innovations also identify (1) potential of consumer novelty (2) on incumbents

Disruptive Innovations

dislodging incumbent providers of mainstream goods and services

Diffusion of Innovations --> MLP

locally-rich explanation of diffusion and role of social networks (and users)

perceived attributes of innovations reveal regime influence on niches

clusters of innovations (by attribute) with inter-related niches & adoption
Different low-carbon innovations appeal to consumers in similar ways

<table>
<thead>
<tr>
<th>novel attributes (relative to displaced incumbent)</th>
<th>pay per use</th>
<th>service-based</th>
<th>multiple uses</th>
<th>choice variety</th>
<th>relational involvement</th>
<th>ease of use</th>
<th>control</th>
<th>autonomy</th>
<th>clean at point of use</th>
</tr>
</thead>
<tbody>
<tr>
<td>electric vehicles (EVs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mobility-as-a-service</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>car clubs, car sharing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>internet of things</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>urban (vertical) farms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PV + storage + peer-to-peer trading</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Clusters of innovations (with similar appeal)

Groupings of attributes
**KEY VARIABLES AND RELATIONSHIPS**

**diffusion of innovations**
- social networks & communication behaviour
- innovation performance attributes
- adopter characteristics & market segments

**disruptive innovation**
- incumbent & new entrant firms
- business models (value propositions)
- innovation novel attributes

**multi-level perspective**
- exogenous landscape-level developments
- regime rules, networks & infrastructures
- radical innovations & niche characteristics

**Increasing scale and scope**