The (Global) Digital Entrepreneurial Ecosystem

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The Digital Economy in a Multi-Polar World
Introduction

- A significant gap exists in our understanding of the digital economy in a multi-polar world.
- We introduce a conceptual framework for understanding entrepreneurship and innovation in the digital age by integrating two literatures: the digital ecosystem and the entrepreneurial ecosystem.
- The Digital Entrepreneurial Ecosystem framework consists of four building blocks: digital infrastructure governance, digital user citizenship, digital technology entrepreneurship, and digital multisided platforms.
Studying Startups

• The entrepreneurship literature focuses on thousands of small startups and often these small startups fail due to the lack of customer base.

• In the digital economy it is precisely the opposite—we have much fewer startups and each startup has millions of users.

• In some sense entrepreneurship research has ignored both the role that digital technologies play in entrepreneurship and the role that users play in digital multi-sided platforms as organizational form.

Why Systems

• Regional Systems of Innovation, Cooke 1998.
• Clusters and Competitive Advantage, Porter 1990.
• National Systems of Entrepreneurship, Acs et al. 2014.
Studying Digital Entrepreneurship

• ... entrepreneurship research has yet to contextualize within the digital economy in terms of how institutions and agency will be changed as a result of digitization

• And information technology has not fully understood entrepreneurship and innovation.

Ecosystem Interdependencies
The Digital Ecosystem

Digital User

Digital Infrastructure

Digital Ecosystem
Definition of a Digital Ecosystem

• “...a self-organizing, scalable and sustainable system composed of heterogeneous digital entities and their interrelations focusing on interactions among entities to increase system utility, gain benefits, and promote information sharing, inner and inter cooperation and system innovation.”

• Korpela, K et al (2016), IEEE.
The Entrepreneurial Ecosystem

Agents + Institutions = Entrepreneurial Ecosystem
Definition of Entrepreneurial Ecosystem

• “...dynamic institutionally embedded interaction between entrepreneurial attitudes, abilities and aspirations, by individuals, which drives the allocation of resources through the creation and operation of new ventures.”

• Acs, Szerb, Autio (2014) Research Policy
The Merging of Two Ecosystems

- Digital Ecosystem
- Entrepreneurial Ecosystem
Digital Entrepreneurship Ecosystem

Digital User Citizenship

Digital Multi-sided Platform

Digital Infrastructure Governance

Digital Technology Entrepreneurship
Digital Entrepreneurship Ecosystem

Digital User Citizenship

Digital Multi-sided Platform

Digital Infrastructure Governance

Digital Technology Entrepreneurship
Digital Infrastructure Governance

- Digital infrastructure governance pertain to all government policy and regulations that govern social and economic activities of users agents and platforms at the local national and international levels in the digital age.
- Digital infrastructure is decentralized and tends to be subject to bottoms-up discourse in the setting up of standards, digital governance that is socially-embedded, open without dominant players, and rely more on informal than formal process.
Digital Entrepreneurship Ecosystem

Digital User Citizenship

Digital Multi-sided Platform

Digital Infrastructure Governance

Digital Technology Entrepreneurship
Digital Entrepreneurship Ecosystem

- Digital User Citizenship
- Digital Multi-sided Platform
- Digital Infrastructure Governance
- Digital Technology Entrepreneurship
Digital Users Citizenship

- Digital users consists of consumers (Demand) and producers (supply) that are proficient in platform usage (open table, uber, airbnb)
- Digital users connect to each other through the internet and mobile devices on various platforms.
- Users are voluntarily engaging in discourse with other users online in a wide range of issues and behaviours, a highly participatory and empowered digital citizenship that is self-governed, self-monitored, and self-controlled.
Digital Entrepreneurship Ecosystem

- Digital User Citizenship
- Digital Multi-sided Platform
- Digital Infrastructure Governance
- Digital Technology Entrepreneurship
Digital Entrepreneurship Ecosystem

Digital User Citizenship

Digital Multi-sided Platform

Digital Infrastructure Governance

Digital Technology Entrepreneurship
Digital Technology Entrepreneurship

• Digital technology entrepreneurship refers broadly to all agents that contribute to experimentation, entrepreneurial innovation and value creation on platforms.

• The success of digital platforms depends on independent complementors (app developers).

• Giones and Brem (2017) Technology Innovation Management Review.

Digital Entrepreneurship Ecosystem

Digital User Citizenship

Digital Multi-sided Platform

Digital Infrastructure Governance

Digital Technology Entrepreneurship
Digital Multi-sided Platforms

- Digital Multi-sided platforms are demand side driven intermediaries enabled by digital technology that orchestrate social and economic activities among various users and agents.
- The core value proposition of digital platforms is in reducing transaction costs and organizing the value creation process among its users and agents.
- [Evans and Schmalensee (2016) Matchmakers.](#)
- Jean Tirole won the Noble Prize for his work on multisided platforms
Ecosystem deepening

Digital User Citizenship
- Digital literacy
- Digital access
- Digital rights

Digital Multi-sided Platform
- Networking
- Matchmaking
- Financial facilitation

Digital Infrastructure Governance
- Digital openness
- Digital freedom
- Digital protection

Digital Technology Entrepreneurship
- Technology absorption
- Digital adoption
- Technology transfer
**Key Propositions**

**Digital User Citizenship**
For a sustainable DEE, terms to user privacy should be clearly laid out and upheld through a social contract since public trust is a prerequisite to user participation in the digital economy.

**Digital Multi-sided Platform**
For a sustainable DEE, digital platforms should be kept in check from partaking in monopolistic behavior that stifles market competition, innovation, and entrepreneurial activities.

**Digital Infrastructure Governance**
For a sustainable DEE, governments are responsible for enacting and enforcing rules and regulations that discourage destructive activities that undermine data security and encourage productive activities.

**Digital Technology Entrepreneurship**
For a sustainable DEE, third-party agents engage in entrepreneurial innovation and knowledge exchange that close the gap between supply opportunity and demand need within platforms that increase platform efficiency.
Key Propositions

**Digital User Citizenship**

“Privacy”

**Digital Multi-sided Platform**

“Competition”

**Digital Infrastructure Governance**

“Security”

**Digital Technology Entrepreneurship**

“Efficiency”
Key Propositions

Digital User Citizenship

Digital Multi-sided Platform

Digital Infrastructure Governance

Digital Technology Entrepreneurship
The structure of the (Global) Digital Entrepreneurship Index

<table>
<thead>
<tr>
<th>Sub-Indexes</th>
<th>Pillars</th>
<th>Variables (entrepreneurship/digital)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Infrastructure Governance</td>
<td>Digital openness</td>
<td>Digital Openness Institutions</td>
</tr>
<tr>
<td>Digital freedom</td>
<td>Digital Freedom Institutions</td>
<td></td>
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<tr>
<td>Digital protection</td>
<td>Digital protection Institutions</td>
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<td>Digital User Citizenship</td>
<td>Digital literacy</td>
<td>Digital literacy Institutions</td>
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<tr>
<td>Digital access</td>
<td>Digital access Institutions</td>
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<tr>
<td>Digital rights</td>
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<tr>
<td>Digital Multi-sided Platform</td>
<td>Networking</td>
<td>Networking Agents</td>
</tr>
<tr>
<td>Matchmaking</td>
<td>Matchmaking Agents</td>
<td></td>
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<tr>
<td>Financial facilitation</td>
<td>Financial facilitation Agents</td>
<td></td>
</tr>
<tr>
<td>Digital Technology Entrepreneurship</td>
<td>Digital adaptation</td>
<td>Digital adoption Agents</td>
</tr>
<tr>
<td>Technology absorption</td>
<td>Technology absorption Agents</td>
<td></td>
</tr>
<tr>
<td>Technology transfer</td>
<td>Technology transfer Agents</td>
<td></td>
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</tbody>
</table>
The connection between the DEI scores and per capita GDP

\[ y = 0.2029x^{0.5212} \]

\[ R^2 = 0.8119 \]
The correlation between the four pillars the DEI scores and the per capita GDP

<table>
<thead>
<tr>
<th>Correlations</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td>1 DEI score</td>
<td>1</td>
<td>,610**</td>
<td>,898**</td>
<td>,921**</td>
<td>,927**</td>
<td>,910**</td>
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<td>2 GDP per capita international $</td>
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<td>1</td>
<td>,648**</td>
<td>,619**</td>
<td>,622**</td>
<td>,432**</td>
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<td>3 Digital technology absorption</td>
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<td></td>
<td>1</td>
<td>,879**</td>
<td>,739**</td>
<td>,706**</td>
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<tr>
<td>4 Digital freedom</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>,804**</td>
<td>,732**</td>
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<tr>
<td>5 E-education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
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<tr>
<td>6 Digital business</td>
<td></td>
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</table>
Digital User Citizenship vs GDP
Digital Infrastructure Governance vs GDP
Digital Multi-sided Platforms vs GDP
Digital Technology Entrepreneurship vs GDP
## Rankings

<table>
<thead>
<tr>
<th>DEI RANKING</th>
<th>Country</th>
<th>DEI Score</th>
<th>GDPPC (2017)</th>
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<tbody>
<tr>
<td>1</td>
<td>United States</td>
<td>85.3</td>
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<td>2</td>
<td>United Kingdom</td>
<td>82.7</td>
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<td>3</td>
<td>Netherlands</td>
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<td>Sweden</td>
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<td>$46,949</td>
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<tr>
<td>5</td>
<td>Switzerland</td>
<td>77.4</td>
<td>$57,410</td>
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<td>6</td>
<td>Canada</td>
<td>77.0</td>
<td>$44,018</td>
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<tr>
<td>7</td>
<td>Norway</td>
<td>76.0</td>
<td>$64,800</td>
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<tr>
<td>8</td>
<td>Singapore</td>
<td>71.8</td>
<td>$85,535</td>
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<tr>
<td>9</td>
<td>Denmark</td>
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<td>$46,683</td>
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<td>Finland</td>
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<tr>
<td>13</td>
<td>Australia</td>
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<td>25</td>
<td>Portugal</td>
<td>55.1</td>
<td>$27,937</td>
</tr>
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</table>
Thank You

• Questions and discussion