

The Emergence of Digital Platform Ecosystems: *A Problem-solving Perspective*

Ramya K Murthy

Anoop Madhok

Schulich School of Business, York University



- In digital platform ecosystems value is cocreated by both the platform sponsors and complementors
 - Value cocreation → shared agreement of the scope of activities of the respective actors (Gulati, Wohlgezogen, and Zhelyazkov 2012)
- Generativity of digital technologies → complementors and their complements are ex-ante unknown (Zittrain 2005; Dattée, Alexy, and Autio 2018; Hannah and Eisenhardt 2018)
 - Despite the unknowns the platform sponsors have to make key decisions about the scope of the platform at the outset
 - Platform sponsors' choice of scope signals fair and attractive opportunities (Cusumano and Gawer 2002; Kapoor and Lee 2013)
 - Surviving the incipient stage → critical mass of complementors and users → successful ecosystem emergence (Schilling 2002)

- **Research Question:** How does a digital platform sponsor's choice of scope facilitate the emergence of a platform ecosystem?
- **Our premise:** For successful emergence of *de novo* ecosystems, the platform sponsor's choice of activity scope should be aligned with the problem they seek to solve
- The platform sponsor's choice of scope defines the latitude they have to control, communicate and incentivize the actors within the ecosystem

- Digital context is similar to that of knowledge
 - Distributed ownership of assets or resources (Hayek 1945)
 - Search for solutions not known ex-ante
- Knowledge-based theories / Problem-solving perspective
 - Focal actors' agency in selecting the 'right' problem to solve and the governance mode explains superior firm performance (Nickerson and Zenger 2004; Macher 2006)
- Mitigating value creation hazards (self-interest and misappropriation) is necessary for an efficient search for solutions to problems
 - Governance modes that are aligned with problem dimensions help mitigate hazards
 - controlling decision rights, communication and providing incentives
 - In platform ecosystems, platform sponsor scope defines the latitude in governance

- Problem dimensions – problem structure, complexity, context and property rights – dictate search processes
 - Problem dimensions are distinct, yet co-occur and are interconnected
 - Efficiency of the solution search depends on the focal problem dimension and the other dimensions that co-occur
 - Best studied using a configurational approach
- We identify patterns of problem dimensions and platform sponsor scope related to successful emergence of ecosystems
 - Configurational approach handles:
 - conjunctural causation - interdependence of multiple conditions
 - equifinality - multiple pathways to outcome
 - asymmetry – differences in value of a condition across configurations

- We use fuzzy-set qualitative comparative analysis (fsQCA) to identify configurations of problem dimensions and scope
- **Data:** Kickstarter campaigns to launch digital platforms (apps, web, hardware and software categories). Dataset of 63 campaigns.
- Outcome: Campaign Success = ratio of funds raised to the funding goal
- Causal conditions:
 - Problem Structure: coded for presence or absence of three elements – initial states, problem-solving approaches and end states – in the campaign description
 - Problem Complexity: magnitude of the communication channel bandwidth
 - Problem Context: least cost incurred to access all features of the platform
 - Property Rights: platform sponsors' property rights on complements
 - Platform Sponsor Scope: coded for presence or absence of activities of information exchange, matching, trading, competition and group-level coordination

| | Solution | | | | |
|-------------------------------------|----------------------|------|-------------|------|-----------------------------|
| | Successful campaigns | | | | Highly successful campaigns |
| | 1a | 1b | 2 | 3 | 4 |
| Problem dimensions | | | | | |
| Well-structured problem | ⊗ | ● | | ⊗ | ⊗ |
| High complexity | ⊗ | ⊗ | ● | ● | ● |
| Platform property rights | ● | ● | ⊗ | ⊗ | ⊗ |
| High cost context | ● | ● | ⊗ | | ⊗ |
| Platform sponsor scope | | | | | |
| Narrow scope | ⊗ | ● | ⊗ | ⊗ | ⊗ |
| Consistency | 0.91 | 0.96 | 0.89 | 0.90 | 0.80 |
| Raw Coverage | 0.10 | 0.10 | 0.2 | 0.20 | 0.15 |
| Unique Coverage | 0.02 | 0.04 | 0.04 | 0.03 | 0.15 |
| Overall Solution Consistency | | | 0.89 | | 0.80 |
| Overall Solution Coverage | | | 0.31 | | 0.15 |

| | Not Successful Campaigns | |
|-------------------------------------|--------------------------|------|
| | Solutions | |
| | 5 | 6 |
| Problem dimensions | | |
| Well-structured problem | ● | ● |
| High complexity | ● | ● |
| Platform property rights | ⊗ | ⊗ |
| High cost context | ● | |
| Platform sponsor scope | | |
| Narrow scope | | ● |
| Consistency | 0.83 | 0.86 |
| Raw Coverage | 0.18 | 0.29 |
| Unique Coverage | 0.03 | 0.14 |
| Overall Solution Consistency | 0.86 | |
| Overall Solution Coverage | 0.32 | |

- There is no one path to a successful emergence of the ecosystem but rather an alignment between the problem dimensions and platform sponsor scope
- Inductively identified configurations for open source ecosystems, complementary innovation ecosystems and information ecosystems (Cennamo 2019)

- We identified the agency of platform sponsors and the attributes of scope and problem that can facilitate the emergence of ecosystems
 - Crowdfunding campaigns help capture early decisions of platform sponsors regarding their scope and problem
 - Highlights trade-offs that managers make at the outset in facilitating emergence
- Using problem-solving perspective we explained the emergence of ex-ante unknown complementors and complements
 - Established the similarity of digital platforms and knowledge context
- Configurational approach highlighted equifinality in emergence outcome
 - This result underscores that digital platform ecosystems can emerge in multiple forms and types

Questions or Feedback? Please contact
Ramya K Murthy (rkmurthy16@schulich.yorku.ca)

Thank You!