



# The mediating role of value capture – a quantitative study on the determinants of social capital on open innovation platforms

Anja Leckel

Innovation intermediaries and emerging digital technologies | 07 July 2020

# Motivation | Which problem is addressed?

## Open Innovation (OI) research

OI platform goal: Maintain long-term participation and continuous **knowledge exchange**. Create win-win situations.

### But: OI Platforms face difficulties

- ▶ **Lack of trust** in anonymous online setting.
- ▶ **Deficient platform Design**  
(van Alstyne et al. 2017; Boudreau & Lakhani, 2013).
- ▶ **Community of solvers neglected**, although most essential resource  
(Kohler, 2015; Malhotra & Majchrzak, 2014; Afuah & Tucci, 2012).

Management Problem:  
Building social capital in a digital context as a basis for continuous knowledge exchange on OI platforms

## Social Capital Theory

▶ Enables to focus on the relationships between different actors in an OI ecosystem.

- ▶ defined as “the connections among individuals and the norms of **reciprocity and trustworthiness** that arise from these social networks”  
(Putnam, 2001a, 2001b).
- ▶ key to **activate and cultivate knowledge exchange** in a network  
(Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998; Chiu et al., 2006; Coleman, 1988; Rost, 2011).

**Answer calls to examine sustainable platform design and governance structures for OI intermediary services** (e.g., Alstyne et al., 2017; Randhawa et al., 2018), **and investigate OI ecosystems for knowledge sharing from a social capital perspective** (Rass, Dumbach et al., 2013; Padilla-Meléndez, Del Aguila-Obra & Lockett, 2013; Wu, Chang & Chen, 2008).




# Motivation

## What we know

- ▶ **Building social capital is key to activate and cultivate knowledge transfer in a network** (Nahapiet & Ghoshal, 1998).



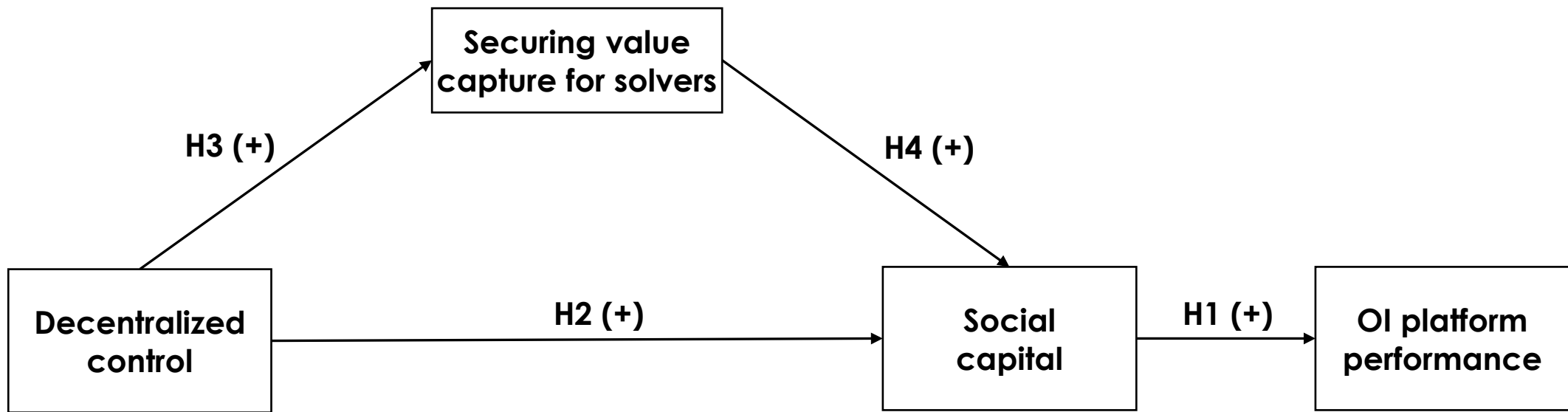
## Research Gap

- ▶ **Need to transfer social capital construct into the **context of digital collaboration**, and identify important antecedents and mechanisms** (Mandarano et al., 2010). 
- ▶ **Little evidence on the effects of **platform design** in terms of solving the trade-off between diversity and **control**** (Bordieu, 2010). 
- ▶ **Need to extent research on how to **secure value capture in OI** (Chesbrough et al., 2018) and the **role of the orchestrator to facilitate networked innovation**** (Randhawa et al., 2018). 

## Research Question

- ▶ **What is the role and impact of social capital on OI platform success?**
- ▶ **How can the intermediary design the OI platform in order to build social capital?**

# Theoretical background | Hypotheses

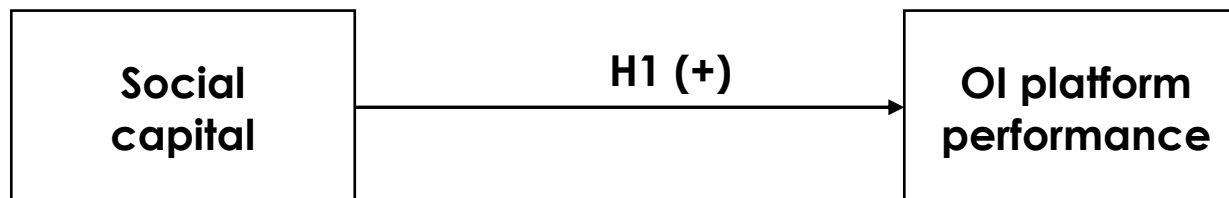


# Theoretical background | Social capital

## Social Capital is a key success factor for OI platforms as it..

- is the foundation for the creation of **new intellectual capital** (Nahapiet & Ghoshal, 1998).
- it facilitates innovation and creativity through **sharing of ideas and resources**, leading to successful cooperation (Fowler & Etchegary 2008; Wasko & Faraj 2005; Tsai & Ghoshal, 1998).
- enhances **knowledge sharing** and **integration** and the **quality of decision-making** and **reduces miscommunication and conflict** in digitally connected teams (Robert et al., 2008; Dissanayake et al., 2014; Lipnack & Stamps, 1997; Lorenzen, 2007)
- maintains and enhances **social cohesiveness** (McClenaghan, 2000)
- helps **overcoming structural holes** (Burt, 2004; Zogaj et al., 2014)

➤ **H1: Social capital has a positive effect on OI platform performance.**

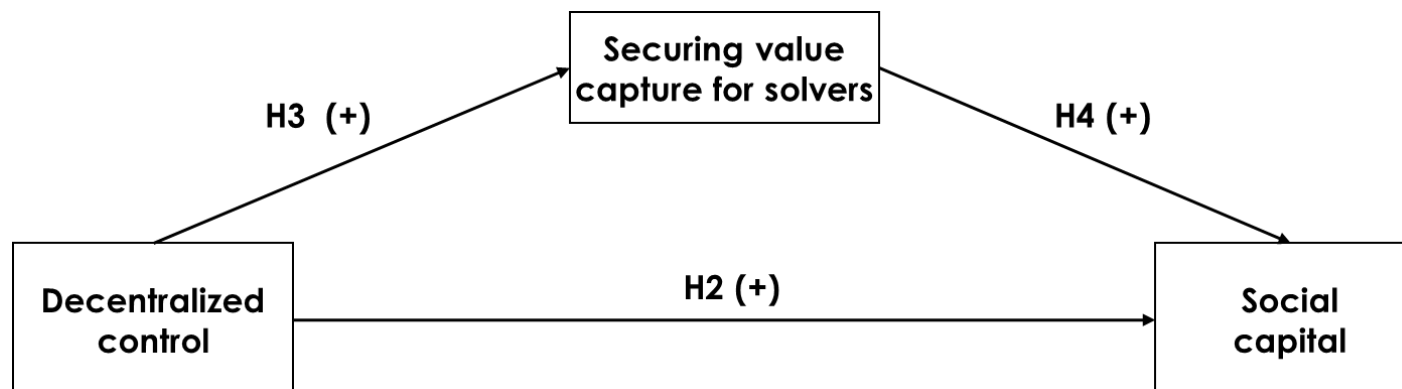


# Theoretical background | Decentralized control

**Sharing coordination and decision rights among seekers, solvers and the intermediary leads to..**

- an **increase of interaction**, i.e. structural social capital, through simplified access to one another and accelerated communication without a central filtering mechanism (Boudreau, 2010; Choudary et al., 2015; Mortara & Minshall, 2011).
- an **improved mutual understanding** and development of a common perspective (cognitive social capital)
- while the accompanying **increase in transparency** leads to more trust (relational social capital) (Lauritzen, 2017; Radtke, 2014; Paxton, 2002).

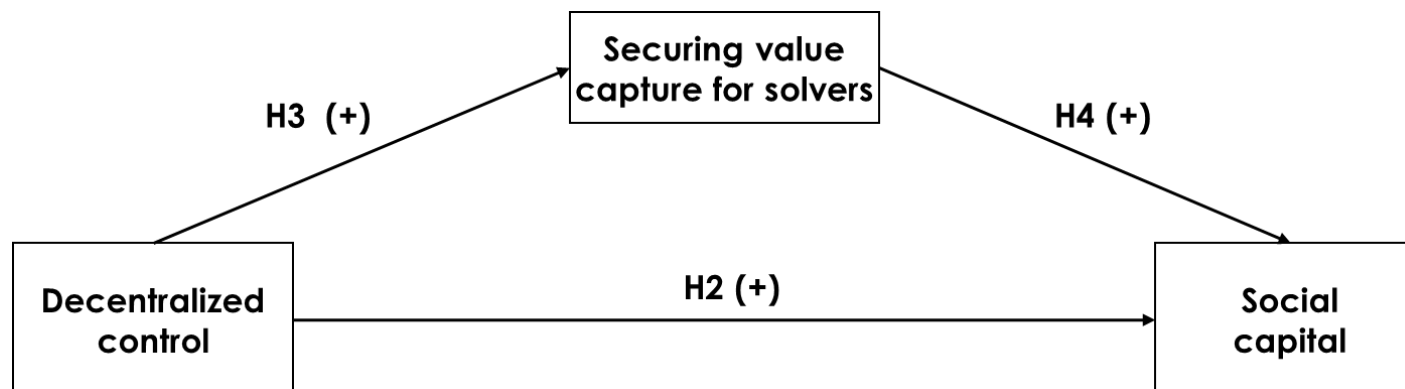
➤ **H2: OI platforms with a higher degree of decentralized control establish more social capital with and among their users.**



# Theoretical background | Decentralized control

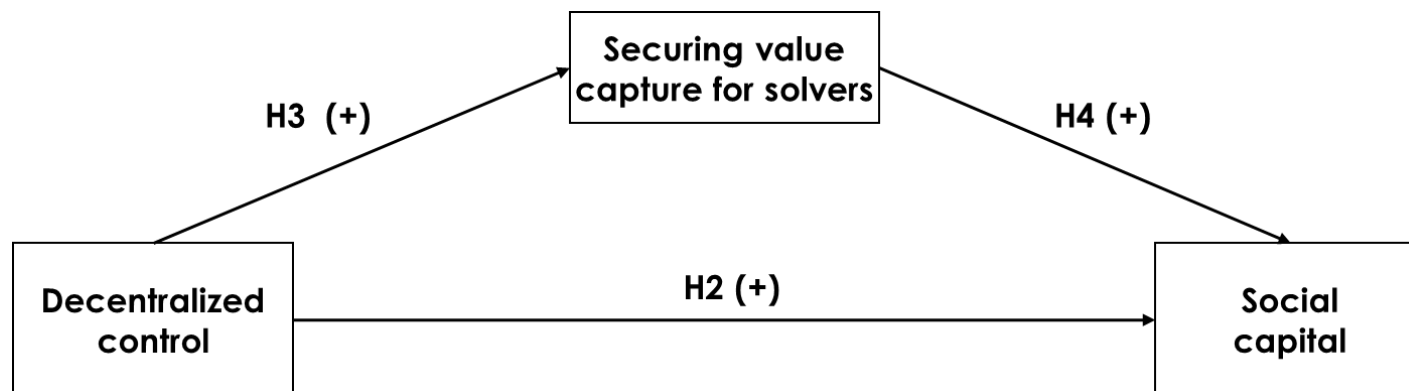
**Sharing coordination and decision rights among seekers, solvers and the intermediary leads to..**

- more transparency, unfiltered interaction → **visibility and voice for solvers' demands** instead of quietly leaving the platform (Bayus, 2013; Lauritzen, 2017)
  - intermediary less involved in interactions as omnipresent moderator, mediator or filter-mechanism → **need to provide regulation for ensuring fairness** (Mortara & Minshall, 2011)
- **H3: Decentralized control has a positive effect on securing value capture for solvers.**



# Theoretical background | Value capture

- Governance structures leading to securing value capture for the crowd often involve the **implementation of interaction channels** between platform participants and their actual utilization (structural social capital).
- **Recognition** as an intangible form of value capture positively affects the relational embeddedness of contributors (relational social capital) and serves as motivation for further social exchange (structural social capital).
- **Receiving feedback on ideas and further training** facilitates a shared language, common focus and understanding (cognitive social capital) (Soliman & Tuunainen, 2015), increasing willingness to continue to interact (Collins, 2014; Piezunka & Dahlander, 2019)
- **H4: Ensuring value capture for solvers has a positive effect on social capital.**





# Method and Data | Details

## Sample

- ▶ A total of **225 OI platforms were invited** to participate in the survey, **80 (partially)** responded of which **61 complete data sets** could be used in the analysis.
- ▶ Slide controls or numeric input.

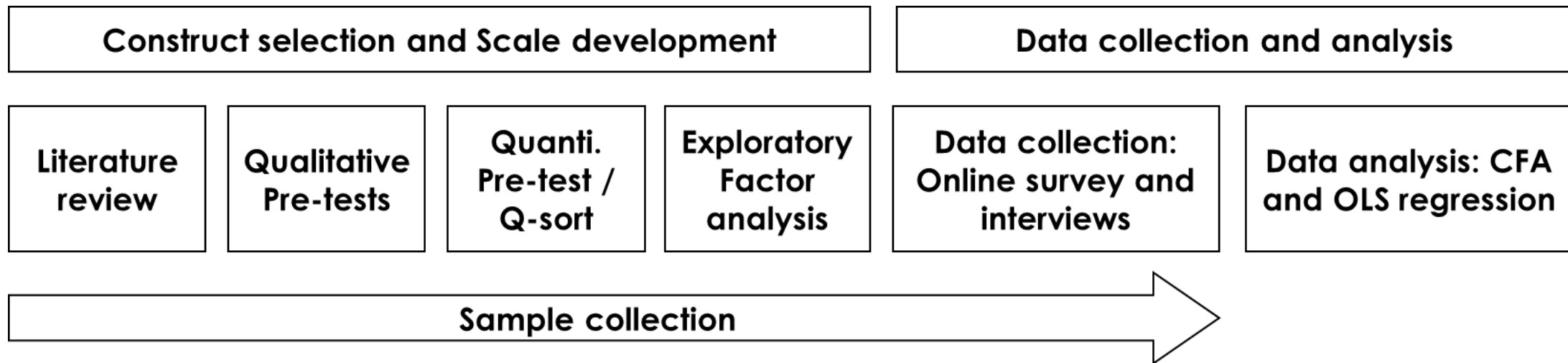
## Method

- ▶ **Multiple pre-tests for scale development:** Interviews, quantitative data collection for EFA, expert rating with Q-sort technique
- ▶ **Scale analysis:** CFA using AMOS
- ▶ **Regression analysis:** SPSS PROCESS (Hayes, 2018)

## Measures

- ▶ **Social capital:** Three dimensional structure Nahapiet & Ghoshal (1998), measured as outcome, i.e. effects of networks on relationships between its members (Williams, 2006). Adapt Wang et al. (2013) items to the context of digital collaboration on OI platforms based on Chang & Chuang (2011).
- ▶ **Decentralized control:** Reversed Herfindahl-index, i.e.  $1 - (a^2 + b^2 + c^2) = [0-1]$ .
- ▶ **Regulation for value capture:** Literature review of OI and business model innovation literature 2005-2017 to derive large set of distinct activities for securing value creation and value capture on digital platforms. Q-sort technique. Additive index.
- ▶ **Control variables:** Firm age, environmental dynamism

# Method and Data | Overview



# Results | Regression analysis H1

## Regression Analysis Explaining OI Platform Performance


	a) Repeat Clients	b) Seeker Benefits	c) Knowledge Exchange
Social Capital	0,5453* (0,2996) N=34	0,4509** (0,2124) N=36	<i>not sign.</i>
Relational SC (Trust)	<i>not sign.</i>	0,355*** (0,138)	0,5511*** (0,2189) N=46
Cognitive SC (Mutual understanding)	0,355* (0,219) N=34	<i>not sign.</i>	<i>not sign.</i>

a) How much of your revenue comes from repeat clients?

b) According to our clients, project outcomes contribute significantly to the functionality of their new products/technologies.

c) In how many projects is the intended knowledge exchange considered successful?

## Summary

- **H1: not rejected** 
- **Social Capital has a positive effect on OI Platform Performance**




# Results | Regression analysis H2-H4

## Regression Analysis Explaining Social Capital

Variables	Model 1a Social Capital	Model 1b Social Capital	Model 2 Value Capture for Solvers	Model 3 Social Capital	Model 4 Social Capital
1. Constant	0.4239*** (0.0422)	0.3385*** (0.0839)	0.4368*** (0.1308)	0.2326*** (0.0856)	0.323*** (0.092)
<b>Main effects</b>					
2. Decentral. Control	0.4338*** (0.0884)	0.4370*** (0.0890)	0.4039*** (0.1389)	0.3391*** (0.0891)	
3. Value Capture				0.2425*** (0.0793)	0.351*** (0.082)
<b>Control variables</b>					
4. Firm Age		0.0005 (0.0016)	-0.0012 (0.0024)	0.0008 (0.0015)	0.001 (0.002)
5. Environ. Dynamism		0.1348 (0.1155)	0.1575 (0.1802)	0.0966 (0.1086)	0.065 (0.120)
<b>R<sup>2</sup></b>	0.290	0.307	0.140	0.406	0.252

Note. N = 61. Unstandardized efficient estimates from ordinary least square estimator reported. Robust standard errors reported in parentheses. \*\*\*p < .01. \*\*p < .05. \*p < .10.

## Summary

- H2: not rejected 
- H3: not rejected 
- H4: not rejected 
- Partial mediation

# Results | Regressions on the Dimensions of Social Capital

Variables

Constant

**Decentralized Control**

Social capital	Structural social capital	Relational social capital	Cognitive social capital
0.432 (0.041)***	0.234*** (0.087)	0.697*** (0.059)	0.366*** (0.055)
0.345*** (0.086)	0.560*** (0.181)	0.123 (0.122)	0.352*** (0.115)

**Decentralized control strongly affects structural & cognitive social capital**

Variables

Constant

**Regulation for Value Capture**

Social capital	Structural social capital	Relational social capital	Cognitive social capital
0.369*** (0.055)	0.124 (0.115)	0.525*** (0.072)	0.456*** (0.079)
0.315*** (0.076)	0.520*** (0.160)	0.327*** (0.101)	0.098 (0.109)

**Regulation for value capture strongly affects structural & relational social capital**

# Implications

## Theory

- ▶ **Transferring social capital construct into the context of digital collaboration**
  - ▶ **reframing innovation outcomes** and digital innovation processes **influenced by social processes** (Nambisan et al., 2017)
  - ▶ **orchestrating the digitalization of collaborative processes** to manage interpersonal relationships (Orellana, 2017).
- ▶ Examine value capture as a necessary step towards **sustained OI activities among distributed but interdependent actors** (Chesbrough et al., 2018)
- ▶ **Specifying, operationalizing and measuring** processes and activities for OI intermediaries to ensure value capture and build social capital

## Practice

- ▶ Intermediaries benefit from viewing their businesses as **more than virtual service platform providers** (Verona et al., 2006)
- ▶ **Analysis of specific platform design characteristics**
  - ▶ need to provide a platform for knowledge sharing that goes **beyond one-off technology-focused inputs**
  - ▶ Guidance on involving **seekers and solvers alike in value creation and capture**
  - ▶ Evidence and guidance for building **long-term relationships** with and among seekers and solvers (Randhawa, Wilden & Gudergan, 2018)

# Limitations and future research

**Examine further antecedents and mechanisms behind building social capital on OI platforms**

- ▶ focus on **perception of seekers & solvers**
- ▶ how much social capital is useful for OI?
- ▶ clarify how **different types of intermediaries** affect their network's ability to build social capital

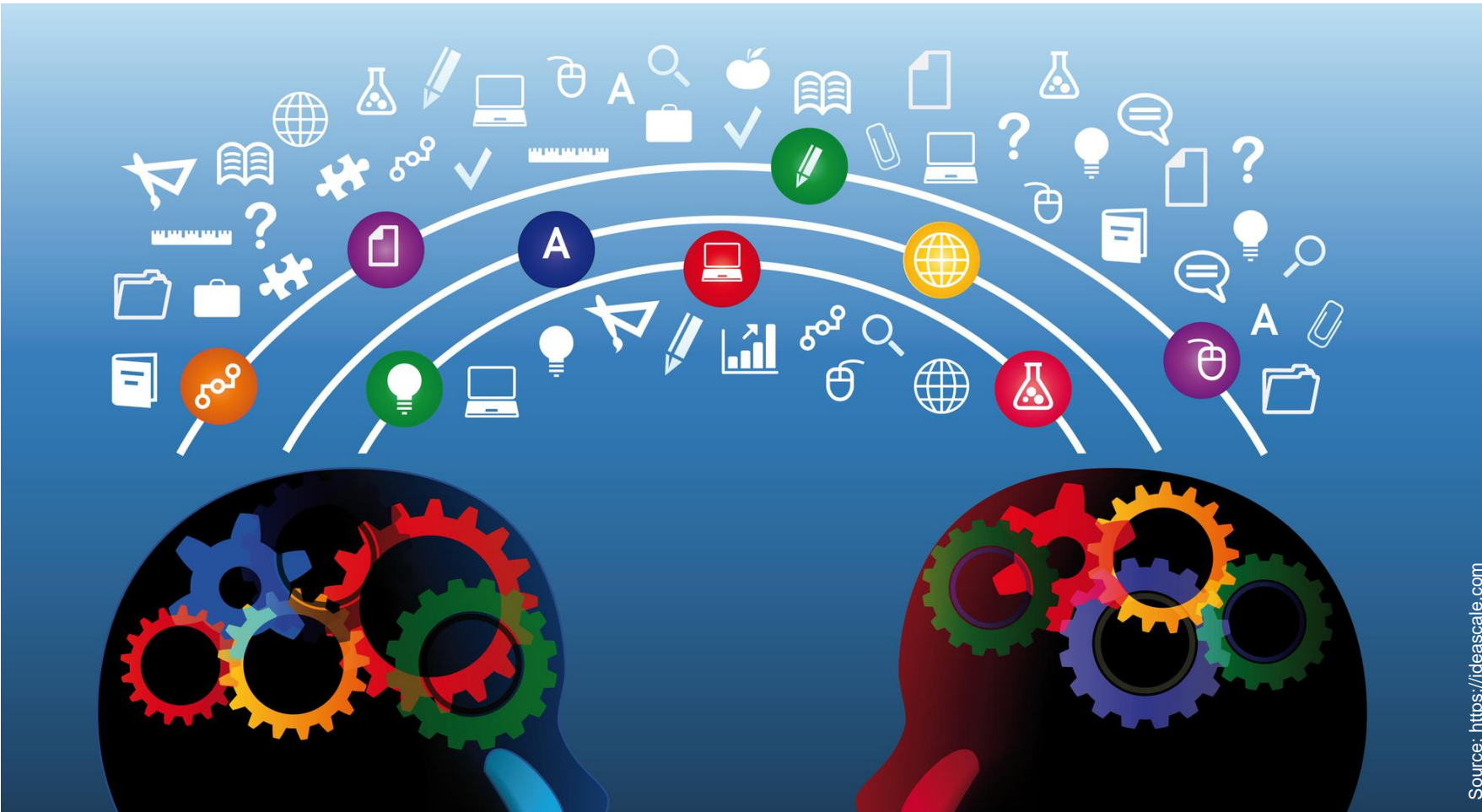
**Make it more tangible for management research and practitioners**

- ▶ include **qualitative and descriptive analysis** of the specific design aspects for securing value capture and their effect on social capital, i.e. extreme case sampling

**Further examine sustainable platform design and governance structures for OI intermediary services** (e.g., Alstyne et al., 2017; Randhawa et al., 2018), **and investigate OI ecosystems for knowledge sharing from a social capital perspective** (Rass, Dumbach et al., 2013; Padilla-Meléndez, Del Aguila-Obra & Lockett, 2013; Wu, Chang & Chen, 2008).

# QUESTIONS AND DISCUSSION

Thank you for your attention!



Source: <https://ideascale.com>



# Back Up

# Theoretical background | Social capital

- Social capital theory provides a comprehensive framework for **examining the nature of social connections** through its focus on both structural networks and interpersonal relationships.
- Impact on **performance measurement for management science**, e.g.:
  - Interpersonal knowledge exchange (Chiu et al., 2006), and access to more diverse sources of information, enhances information relevance, quality and timeliness.
  - Solidarity, reciprocity, cooperation and increased value creation (Coleman, 1988).
  - Higher commitment, lower monitoring costs. Increases trust in reciprocity for future performance (Rost, 2011).
- Established three-dimensional framework utilized to investigate relationship between social capital and **organizational phenomena across research fields and industries** (e.g. Bolino et al., 2002; Yang & Farn, 2009; Chang & Chuang, 2011; Carey, Lawson & Krause, 2011).



**Social Capital**

- 1. Structural:** Social **interaction**, extent to which people are connected.
- 2. Relational:** **Trust**, nature and quality of the connection.
- 3. Cognitive:** Extent to which people develop a **common understanding**

# Definitions | Survey items and references

<b>Structural Social Capital</b>		
1	Solvers frequently and easily get into direct contact with our clients (seekers).	Wang et al (2013), Chang & Chuang (2011)
2	To what extent do project members (seeker, solver, intermediary) interact with each other in a non-project specific context (e.g. networking events, forum discussions, social media)?	Wang et al (2013)
3	During a project, our clients (seekers) and contributing solvers get to know each other very well.	Yli-Renko et al. (2001)
<b>Relational Social Capital</b>		
1	All project members (seeker, solver, intermediary) place a high level of trust in each other.	Chang & Chuang (2011)
2	We care about that our clients and solvers trust in each other's decisions.	Chang & Chuang (2011)
3	We are confident that all participants' interests are fully valued and protected.	Wang et al (2013)
4	During a project, our clients and solvers work towards the same objective.	Chang & Chuang (2011)
<b>Cognitive Social Capital</b>		
1	All project members (seeker, solver, intermediary) use the same technical language or terminologies	Chang & Chuang (2011)
2	In a typical project, our clients are very familiar with the technologies, ideas, solutions etc. provided by contributing solvers.	Chang & Chuang (2011)
3	During a project, we are aware that occurring problems are a joint responsibility of all participants.	Wang et al. (2013)
<b>Securing Value Capture for the Crowd</b>		
1	In order to capture value for all participants, we put emphasis on... ...providing feedback to project members to foster learning after the project ended.	Dessart et al. (2015)
2	...continuously giving recognition to the crowd.	Kohler (2016)
3	...wealth sharing through graduated prizes [e.g. rewards for second, third (...) ranked contributions.	Alstynne, DiDiore, Schneider (2017)
4	We make sure that contributors gain value from interacting with each other, not only from winning (a reward/contract/etc.).	Alstynne, DiDiore, Schneider (2017)

# Descriptive Statistics

	Min.	Max.	Mean	Std.dev	1	2	3	4	5	6	7	8	9	10	11
1 Social Capital (SC)	0.353	0.953	0.617	0.141	1										
2 Decentral Control	0.000	0.667	0.445	0.176	,538**	1									
3 Value Capture	0.022	1.000	0.694	0.198	,493**	,350**	1								
4 Firm Age	0.00	59.00	11.15	10.06	0.045	0.045	-0.059	1							
5 Env. Dynamism	0.241	0.881	0.579	0.136	0.101	-0.044	0.101	-0.133	1						
6 Crowdsourcing	0.000	1.000	0.393	0.493	-0.109	0.087	0.067	-,338**	-0.051	1					
7 Consulting	0.000	1.000	0.344	0.479	0.015	-0.112	0.055	,259*	-0.048	-,584**	1				
8 SaS	0.000	1.000	0.197	0.401	0.097	-0.068	-0.090	-0.020	0.092	-,399**	-,359**	1			
9 Data Analysis	0.000	1.000	0.066	0.250	0.031	0.151	-0.093	0.202	0.045	-0.213	-0.192	-0.131	1		
10 Structural SC	0.000	0.939	0.505	0.255	,871**	,587**	,500**	0.115	0.189	-0.207	0.058	0.137	0.077	1	
11 Relational SC	0.236	1.000	0.769	0.169	,532**	0.088	,356**	-0.044	-0.022	-0.002	0.035	-0.065	0.041	0.191	1
12 Cognitive SC	0.010	0.919	0.577	0.159	,708**	,402**	0.137	-0.017	-0.011	0.042	-0.089	0.107	-0.085	,518**	0.055

\*\* the correlation is at the niveau of 0,01 (2-sided) significant. \* the correlation is at the niveau of 0,05 (2-sided) significant.