Collective Action: New Connections between Collaboration, Technology, and Organization Design

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Society faces complex problems of collective action, ranging from poverty relief, drug resistance, climate change, and disaster response, to the development of long-lived infrastructure to cope with population growth, energy crises, scarcity of potable water, rising sea water levels, and migration to cities. To succeed in meeting these societal challenges, independent organizational actors—such as governmental agencies, businesses, and nonprofit or nongovernmental organizations—are increasingly attempting to collaborate across boundaries. To achieve superordinate goals, these interorganizational collaborations must unify partners that belong to different communities of practice, and thus to overcome acute epistemic gaps and resolve differences in beliefs, interests, priorities, and even ideologies.

A common feature of these interorganizational collaborations is the absence of a unitary authority legitimized by government regulation or property rights who can dictate the terms of collaboration and resolve interorganizational conflicts. The absence of legitimate command and control structures necessitates that the intervening actors self-design alternative structures to govern and coordinate their efforts. This, in turn, raises questions germane to the central theme of the 2015 Academy of Management conference – how do these 'flat' interorganizational collaborations emerge, what innovations in design do they embody, how do they resolve differences between actors, and how can we assess their performance?

This 3-hour interdisciplinary and interactive PDW aims to bring together theoreticians and empiricists from a variety of academic traditions to explore the creation of these voluntary, consensus-oriented collaborations as they occur in a variety of distinct settings. We expect that the PDW will attract a large number of scholars and practitioners who are interested in exploring novel approaches to meet some of today's most difficult societal problems.

Theoretical Motivation for the PDW

Management scholars have noted the increasing role that voluntary, consensus-oriented interorganizational collaborations play in a host of empirical settings including: open source communities (O'Mahony & Ferraro, 2007; von Hippel & von Krogh, 2003), new business ecosystems that draw value from unconventional sources such as social networks (Baldwin &

von Hippel, 2011), co-developments of long-lived infrastructure in democratic societies (Gil and Baldwin 2013, Lundrigan, Gil, & Puranam 2014, Gil 2015), global communities of scientists (Tuertscher, Garud, & Kumaraswamy, 2014), the provision of humanitarian aid and global policy advocacy on issues of poverty, human rights, and environment (Ebrahim, Brown, & Batliwala, 2014), emergent response to disasters (Beck & Plowman, 2014), and collaborative networks formed to supply public services (Ansell and Gash 2008).

Voluntary-based interorganizational collaborations unify legally independent and heterogeneous actors under a superordinate goal. These interorganizational collaborations reflect the increasing porosity in organizational boundaries (Santos and Eisenhardt, 2005), allowing discrete organizations to tap into the resources available in their environment and thus to tackle problems which individually are beyond their reach (Adner and Kapoor, 2010).

Yet, voluntary, consensus-oriented interorganizational collaborations face a fundamental problem of governance (Phillips, Lawrence, and Hardy 2000). The involved actors often belong to heterogeneous communities of practice (Brown and Duguid, 1991) and thus their motivations and actions can be expected to be driven by different institutional logics (Scott 2001). Controversies are expected to emerge when different epistemic communities, which are likely to frame issues differently, must find a shared solution to a shared problem (Gray, 1989; Gray and Clyman, 2003; Puranam, Raveendran, and Knudsen, 2012; Weber, 2003). To resolve conflict, voluntary, consensus-oriented organizations cannot rely on an authoritative hierarchy (March and Simon, 1993) or 'system integrators' (Brusoni, Prencipe, & Pavitt, 2001) since unilateral decisions could marginalize valuable actors (Pratt & Foreman, 2000), and create risks of defection and collapse of the collaboration (Tuertscher et al., 2014).

This leads to the so-called paradox of pluralism (Garud, Gray, and Tuertcher, 2014). On the one hand, interorganizational collaborations that harness the benefits of institutional

pluralism bring many benefits (Kratz and Block 2008): they entice contributions of resources needed to resolve complex problems (Garud and Karnøe 2003); they give legitimacy to the solutions (Suchman, 1995); and they generate robust outcomes (Hargadon and Douglas 2001). On the other hand, creating effective but 'flat' interorganizational collaborations is a real challenge as actors frame situations differently and thus propose different and eventually conflicting, but equally legitimate, solutions to problems (Gray 1989; Weber 1998).

Different research strands have contributed to our understanding of 'effective' governance of collective action (Hargrave and Van de Ven, 2006; Ostrom, 1990) or pluralistic enterprises (Shipilov et al. 2014). The purpose of this PDW is to create a forum to discuss the similarities and differences between these strands which we organize along three theoretical lenses:

1. Research on the role of trust and identity in interorganizational collaborations

This research stream has long posited that: i) relationships of mutual trust between stakeholders; and ii) a higher-order collective identity under which different social identities are nested, are antecedents to enabling actions that allow autonomous organizing actors to collaborate across boundaries (Gray 1989; Thomson and Perry 2006). To this purpose, creating collective action arenas, or 'trading sites' (Beunze and Stark 2002), where people meet face to face and discuss the issues is critical (Hardy and Phillips 1998, Hardy, Lawrence, and Grant 2005). Yet in many of the most challenging empirical settings, such as rapid organizing in response to an unexpected disaster or controversial developments of long-lived infrastructure, actors may have no prior history of collaboration and/or little desire to establish a long-term working relationship.

Recent work has investigated the self-organizing actions and mechanisms that can be effected to encourage the development of mutual trust and a higher-order collective identity in empirical settings that bring together actors who have only temporary relationships (Ansari,

Wijen, & Gray, 2013; Garud & Karnøe, 2003). Beck and Plowman (2014), for example, shed light on self-organizing actions through which independent actors, with little experience of co-operation, can create an institutional environment that encourages the development of mutual trust and a collective identity under which individual social identities can be nested.

2. Research on the role of knowledge and technology in interorganizational collaborations

A second research strand relevant to our understanding of interorganizational collaboration has been a growing body of literature which examines the role that technology, knowledge, and boundary organizations and infrastructures play in enabling autonomous actors to co-produce new products (Baldwin and von Hippel, 2011; Dougherty and Dunne 2011, Bowker and Star 2000; Tuertscher et al., 2014). The production of modular design structures can create transaction-free zones, and thus opportunities for voluntary, consensus-oriented collaboration between legally independent actors (Baldwin 2008).

For example, the modularity of the design structures that undergird open source communities (Baldwin & Clark, 2006), social networks, and other emergent business ecosystems (Baldwin and von Hippel, 2011) is critical to reducing interdependency between the design choices, and thus to attenuating rivalry between producers' and end-users' design preferences. Knowing that the final design can cater to heterogeneous needs in use encourages autonomous actors including lead producers, complementors, and end-users to contribute voluntarily time, knowledge, effort, and other resources to the enterprise. It also facilitates the orchestration of dynamic architectural capabilities with other dynamic capabilities as finance and product development, and thus the removal of 'bottlenecks' (Baldwin 2014) that impede the development of innovative systems that add value to users.

Furthermore, the communities within which knowledge-based enterprises emerge play critical roles in shaping their identity, problem-solving, and socio-economic value creation (O'Mahony and Lakhani, 2011). Hence if the autonomous actors have dissimilar backgrounds but do not depart from antagonistic beliefs and preferences, and have the wherewithal and can afford the time, they can search for mutually consensual solutions across organizational boundaries through engagement in cycles of knowledge exchange and transformation supported by boundary organizations (O'Mahony & Bechky, 2008) and boundary infrastructures such as models, prototypes, and working groups (Tuertscher et al., 2014).

3. Research on new forms of organizing and governing

A third strand of literature relevant to further our understanding of voluntary, consensus-oriented collaboration relates to contemporaneous conversations around organizational designs which are effective despite the absence of traditional sources of authority vested in ownership stakes and employer-employee relations (Gulati, Puranam, and Tushman, 2012). These so-called 'meta-organizations' develop governance systems which rely on alternative sources of authority and legitimacy grounded in supplier contracts, resource dependencies, technical expertise, and reputation (Blau, 1964; Gulati and Sytch, 2007; Raymond, 2001).

In the world of global non-governmental organizations, for example, Ebrahim et al. (2014) explore alternative governance structures which can be harnessed to enable autonomous local actors to tackle geographically dispersed social problems whilst ensuring that their local actions and approaches form a globally cohesive and legitimate whole. These are conditions of weak ownership, involving organizations that have no owners and whose purpose is to serve public rather than private interests. In these contexts, headquarter-subsidiary relations cannot rely on mechanisms of monitoring and financial control, but rely instead on voluntary

forms of cooperation and legitimate allocation of decision rights. Rather than constraining the decision rights of subsidiaries, these multinational actors increase the rights of subsidiaries in global decision-making to building collective commitments to common goals.

Along these lines, Gil and Baldwin (2013) explore the use of commons theory to interrogate consensus-oriented collaborative developments that bring together heterogeneous actors and unfold under highly-constrained conditions. Building upon Elinor Ostrom's (1990) work on governing shared natural resources, this line of research seeks to understand how a collective of autonomous actors unified by a superordinate goal can create a set of self-enforcing governing rules to manage a shared resource under highly constrained conditions.

Ostrom's work (1990) is grounded in the world of natural resources and deals with common-pool resources, that is, resources that are available to many claimants but are subtractable such that one's use of the resource deprives others from similar benefits. Ostrom posits that for large pools of shared resources polycentric governance can be effective to encourage autonomous actors to develop social norms of co-operation equity, trust, and reciprocity. This approach consists of a structure of multiple nested centers of power and decision-making, which allows for bottom-up creation of rules to structure the claimants' interactions and reward or sanction their behaviour. Gil and Baldwin (2013) argue that distributed systems of production, with scarce resources and design structures with limited decomposability hold qualities which reflect Ostrom's notion of a common-pool resource.

In summary, the unifying theme of the PDW is the contribution of these three research streams—on trust and identify, knowledge and technology, and news forms of organizing and governing—to advance our understanding of collective action arenas, a mainstay of modern society.

Why should this PDW be of interest to the Academy's theme on Opening Governance?

This PDW looks to bring together academics from across the globe and from different research traditions to discuss the creation and design of interorganizational collaborations. It draws upon distinct but related bodies of management literature. We are interested in the role of "governance" by which we mean ''the structures, processes, and institutions within'' but also ''around organizations that allocate power and resource control among participants'' (Davis 2005: 143). Such governance may take the form of innovations in the distribution of decision rights, formal and informal organizing structures, and practices that give organizations legitimate authority in the absence of ownership stakes. We are also responding to Tihanyi, Graffin, and George's (2014) recent call for management studies to look into different units of analysis of governance beyond the corporation. We consider projects or time-bound organizations created to accomplish specific superordinate goals, as well as meta-organizations and multi-unit organizations in the absence of ownership structures. Furthermore, we are interesting in exploring the interplay of governance structures with technology and social norms of collaboration in collective action arenas.

We believe our interdisciplinary approach will illuminate complementary approaches to a relevant conceptual problem central to the grand challenges faced by society, and thus empirically instantiated across a variety of settings, whilst highlighting the conceptual differences inherent in each body of literature. Creating such conversation between literatures often siloed in their own scholarly communities will aid ongoing theoretical debates in management and organization theory, and in particular to the domains of interorganizational collaboration, innovation studies of new business ecosystems, the management of operations in collective action arenas, the management of collaborative networks in public administration, and the management of public and non-profit enterprises.

Clearly, the PDW is relevant for management and organization theorists as well as for those with an interest in challenging empirical settings where there is no common ownership of a societal problem, but where solutions require developing a sense of collective purpose and the design of structures and processes effective for collective action. The PDW will allow us to raise pertinent questions relating to this year's conference theme on "opening governance" such as: How do pluralist interorganizational collaborations ensure that the capabilities and knowledge bases of individual members are harnessed to address a common problem? How can such collaborations be designed with respect to organizational roles, incentives, and accountability mechanisms? In entering this discussion, our panellists will illuminate the processes, actions, and mechanisms through which organizations have effectively overcome barriers to collaboration, and succeeded in creating superordinate goals that unify voluntarily individual actors despite differences in capabilities, beliefs, interests, and preferences. This in turn will allow us to consider different mechanisms through which voluntary, consensus-oriented collaborations seek to build a sense of collective identity and mutual trust, and resolve effectively the controversies that are endemic to interorganizational collaboration.

Another core question that the PDW seeks to address is how organizations can create an inclusive and equitable form of governance that ensures that individual actors are not marginalized in the debate. Here the role of polycentric commons governance may shed some light as to how organizations can create rules and nested layers of power and decision-making to ensure that participative modes of governance do not descend into anarchy and chaos.

Finally, the PDW offers an opportunity to examine novel organizational structures which have emerged in response to opportunities created by the emergence of new information and communication technologies, or in response to problems endemic to geographically-dispersed organizations. A unifying feature of these novel structures is the absence of traditional sources of centralised authority and control to get things done. The PDW also offers an

opportunity to reflect on the mechanisms that encourage voluntary contributions of resources in new business ecosystems such as social networks, crowd sourcing, and open sourcing that benefit from non-decomposable design structures, and thus higher-levels of independence in choices.

In summary, our aim in the PDW is to foster synergies across distinct streams of management theory which, when viewed as a whole, can provide valuable insight into the common problem of making interorganizational collaborations work. Our focus is not collaborations supported by formal or informal contracts where a buyer actor 'buys' collaboration from a supplier. Rather, our focus is on collective action arenas where centralized hierarchical control by government or the private firm is non-existent, and thus the collaboration relies on voluntary contributions of resources and is perforce consensus-oriented. With this focus, we hope that this professional development workshop will help us advance our understanding of a problem which has far reaching relevance for scholars interested both in distributed methods of production, and the challenge of governing multi-faceted social problems.

The Structure of the PDW

To host this PDW we have assembled a group of eminent theorists and empiricists who each have attempted to tackle the common problem of making collective action work. Each of our panelists have grounded their research in different empirical settings and draw from distinct, yet often complementary, bodies of knowledge. By sharing their insight into contemporaneous developments in theory we hope to uncover theoretical overlaps which will help to improve the predictability of our theories. The structure of the PDW is as follows:

<u>Introduction</u> (15 min) Colm LUNDRIGAN, University of Manchester

<u>Five Presentations</u> (60min): Our panelists (biographies included in the end) are:

Dr. Tammy BECK, University of Nebraska–Lincoln (12min) Tammy's recent work on temporary, emergent interorganizational collaboration offers an alternate view on how trust and collective identity may form within consensus-based collaborations; initial operating conditions and actions by participating members may play important roles in this formation. These findings are extended by considering the characteristics and risks of operating within these types of collaborations.

Professor Alnoor EBRAHIM, Harvard Business School (12 min). Alnoor will speak about his work with ten international nongovernmental organizations (INGOs) that have redesigned their organizational and governance structures in order to better coordinate their global policy networks. His research examines the allocation of decision rights through governance design in order to build commitment to shared goals, and the efforts by headquarters to legitimate its authority under conditions of weak ownership.

Professor Nuno GIL, Manchester Business School (12 min). Nuno will present current work that explores the extent Ostrom's polycentric approach to commons governance can be advantageous for producing long-lived infrastructure systems, and other mechanisms necessary for sustaining the highly-constrained, voluntary, consensus-oriented collaborations that are central to enable these large collective developments in democratic societies.

Professor Ann MAJCHRZAK, Marshall School of Business (12 min) Ann will speak about her research on using collaborative crowdsourcing to foster collective-based collaboration between independent organizations on such cross-organizational policy issues as New Zealand pest control. Collaborative crowdsourcing fosters interorganizational collaboration through anonymity, a minimalist creativity-enabling structure for the interaction, and open access. Through this process, Ostrom-like collective action principles

emerge such as social norms, identification of common goals, and appreciation of differences. A case analysis is presented to describe this process in more detail.

Professor Philipp TUERTSCHER, VU University Amsterdam (12min) Philipp will speak about his research on a large-scale scientific collaboration at CERN's Large Hadron Collider. This scientific collaboration involves more than 3,200 scientists and engineers from 177 institutions in 38 different countries. The members of this collaboration have developed organizational mechanisms that allow them to harness the controversies that arise when actors with different perspectives engage with one another to solve complex issues. Unlike many approaches to deal with controversies in traditional organizations, the mechanisms used by these collaborations do not lead to a homogenization of perspectives, a unification of norms, or a transition to a structure with concentrated decision rights. Instead, the organization capitalizes on pluralism to find appropriate solutions to each controversy, and refreshes rather than reduces pluralism in all of its forms.

Break (15min)

<u>Discussion</u> (30min)

Our two discussants -- Barbara Gray (Penn State) and Andrea Prencipe (LUISS Guido Carli University) -- have been asked to kick off the period of discussion. They will have been given an opportunity to read the papers and the arguments presented in the first part of the session. Their task, admittedly challenging, is to help us make sense of potential commonalities across the different focal problems and arguments that were presented. They have also been asked to reflect about complementarities and tricky overlaps between different research strands, and ways to address them with a view to produce convincing arguments and refutable theory.

Panel (**60 mins**). Two moderators -- Nelson Phillips (Imperial) and Phanish Puranam (INSEAD) -- will join our discussants and presenters for an open panel to share their experiences and insights on the core themes of the PDW:

1. Role of trust and identity in interorganizational collaborations

2. Role of knowledge and technology in interorganizational collaborations

3. Role of new forms of organizing and governing for interorganizational collaboration

The aim of this panel is to create a collective action arena where we will try to walk the talk, and thus collectively do our best to harness the benefits of pluralism, a notorious difficult job. The membership of the panel will include various scholars coming from very different research traditions that by and large have remained disparate. The main task of the two moderators – who will also have received the presented papers in advance -- is to provide steering to the panel so as to try to make the sum of the parts bigger than the whole.

The aim of the panel is therefore not to cohere the different arguments and research optics, but rather explore how they interplay and complement each other, and how they collectively can further our understanding of collection action problems. This assumes that different research strands work as interdependent resources without which we could not achieve our goal. Specifically, the superordinate goal that unifies the panel, and thus motivates the members of the panel to contribute voluntarily their time, effort, and knowledge to the PDW, as well as to seek consensus around the issues, is to advance society's understanding as to how collective action arenas work.

If theoretical predictions apply, we can expect that this superordinate goal will contribute to develop a higher-order shared identity under which the different research strands, and corresponding individual contributions, can nest without losing their distinctiveness. For sure, this is the goal that motivated us to put together this proposal. And if the theory applies, with

a shared identity and an inclusive structure, we can expect the panel to develop the social norms of trust, equity, and co-operation central to effective collaboration in collective action.

After initial interventions by the two moderators, we will open the debate to the audience in the plenary, and invite them to share common themes, insights, and emerging questions. The moderators, discussants, and presenters will field questions from the audience.

Short bios of the Participants (by alphabetical order)

Dr. Tammy E. BECK, University of Nebraska–Lincoln. Tammy is an Associate Professor of Management and Associate Dean for Academic Programs at the University of Nebraska – Lincoln. Her research interests focus on multiple topics related to interorganizational collaboration – antecedents, process mechanisms, structural features, and collaboration types. Beck's recent work suggests the theoretical and practical value in conceptualizing collaborations based on the intention used to form the collaboration and the time span for which the collaboration endures. Beck is also exploring the means by which interorganizational collaboration fosters organizational resilience for participating members.

Professor Alnoor EBRAHIM, Harvard Business School (PDW Organizer). Alnoor is an Associate Professor in the Social Enterprise Initiative at HBS. His research examines the pressures for accountability facing social sector organizations, and their implications for organizational performance. This work focuses on three dilemmas confronting organizational actors: a) how to prioritize among the competing, and sometimes incommensurable, demands for accountability from different principals and stakeholders; b) how to measure performance when social outcomes are achieved by collective action rather than by individual organizations; and, c) how to design governance structures and systems under conditions of weak ownership and formal authority.

Professor Nuno GIL, Manchester Business School (PDW Organizer). Nuno is a Professor of New Infrastructure Development at MBS. His research focuses on how societies produce long-lived infrastructure, and how the development processes are shaped by the environment notably the legal and political institutions. Nuno's work frames the design-in-the-making for a new infrastructure as a shared resource since it conflates low excludability (from participation in the design process) with high rivalry (in preferred design choices). Nuno's recent work explores Ostrom's approach to polycentric commons governance for producing infrastructure, and other mechanisms for sustaining the highly-constrained, voluntary, consensus-oriented collaborations central to developing infrastructure in democratic societies.

Professor Barbara GRAY, Pennsylvania State Univerity. Barbara is Emerita Professor of Organizational Behavior and Program Faculty Fellow at the Smeal College of Business Administration. She has published five books and has over 70 publications including work in *Administrative Sciences Quarterly, Academy of Management Review, Academy of Management Journal, Organization Science, Human Relations, Journal of Applied Behavioral Science, Journal of management* and *Journal of Management Inquiry.* Her research interests include interorganizational relations, multiparty collaborative alliances, organizational and environmental conflict, team dynamics and sensemaking.

Colm LUNDRIGAN, Manchester Business School (PDW Lead Organizer). Colm is a final-year doctoral candidate at the Manchester Business School. His current research focuses on strategic decision making, organizational design, and inter-organizational collaboration in the context of major infrastructure developments.

Professor Ann MAJCHRZAK. Ann is the USC Associates Chaired Professor of Business Administration for the Marshall School of Business at the University of Southern California. She is a Senior Scholar and a Fellow of the Association for Information Systems, awarded for

"making an outstanding contribution to the I.S. discipline in research, teaching, and service". She has been a member of 3 National Research Council Committees. She is the longest running Senior Editor for Organization Science, and has served as senior editor (twice) for Management Information Systems Quarterly. Her research interests focus on understanding how affordances of technology can support worker agility and ingenuity within collaborative settings. She was the 2011 Recipient of Emerald Citation of Excellence in Research Impact as one of top 50 articles from the top 300 management publications worldwide that have had proven impact since their publication, as well as won the best paper award from the Academy of Management Organization Communication and Information Systems Division in 2012

Professor Nelson PHILLIPS. Nelson is a Professor of Strategy and Organizational Behaviour at Imperial. Professor Phillips has published more than 100 academic articles and book chapters including articles in the *Academy of Management Journal, Academy of Management Review, Management Science, Sloan Management Review, Organization Science, Journal of Management Studies, Strategic Organization, Organizational Research Methods,* and *Organization Studies*. He has also written four books: one with Cynthia Hardy (Melbourne) entitled *Discourse Analysis* published in 2002; a second, *Power in Organisations*, with Stewart Clegg (University of Technology Sydney) and David Courpasson (EM-Lyon) for the Sage Fundamentals of Organization Science series in 2006; a third, *Technology and Organization*, with Dorothy Griffith (Imperial) and Graham Sewell (Melbourne) that was published in 2010; and the *Oxford Handbook of Innovation Management* co-authored with David Gann (Imperial) and Mark Dodgson (U of Queensland) published in 2014. He is currently working on a book on the use of linguistic research methods in management that will be published in 2015.

Professor Andrea PRENCIPE. Andrea – PhD, SPRU, University of Sussex – is a Full Professor of Organization Innovation at LUISS Guido Carli University – Rome. Andrea has

held academic positions at SPRU, INSEAD (F), and University G. d'Annunzio (I). Andrea pursues three parallel research streams: the division and coordination of knowledge and labour in multi-technology contexts; learning, memory, and routines in project-based contexts, such as engineering and emergency projects; and the relationships between regional social capital and firms' innovation performance. He has published articles on this subject in management journals – e.g. *Administrative Science Quarterly* and *Organization Science* – as well as in major innovation journals – e.g. *Research Policy, Industrial and Corporate Change,* and *Journal of Product Innovation Management.* Andrea is an associate editor of *Industrial and Corporate Change*, Advisory Editor to *Research Policy*, and sits on the editorial board of *Organization Science, Strategic Management Journal, International Journal of Project Management, Long Range Planning,* and *IEEE Transactions on Technology and Engineering Management.* A member of the Academy of Management since 1998, Andrea has been representative-at-large for the Technology and Innovation Management Division between 2009 and 2011.

Professor Phanish PURANAM. Phanish is the Roland Berger Chair Professor of Strategy & Organization Design at INSEAD. He is also Academic Director of INSEAD's PhD programme. Professor Puranam studies the design and management of collaboration structures within corporations (i.e. between divisions or departments) as well as between corporations (i.e. alliances and acquisitions). He has published his research in internationally reputed academic journals, and has served in senior editorial roles in such journals. His research has won international awards and competitive grants awarded across the social and natural sciences. He is currently working on a book, Organizing Collaboration: the micro-structural approach to organization design to be published by Oxford University Press. His book on the prospects for India to

emerge as a global hub for innovation, "India Inside" (co-authored with Nirmalya Kumar) was published by Harvard Business Review Press in 2012.

Professor Philipp TUERTSCHER. Philipp is Assistant Professor of Technology and Innovation and member of the Knowledge, Information, and Networks research group at the VU University Amsterdam. Philipp's research explores organizational mechanisms and social practices for collaborative innovation in a variety of settings. Besides studying large-scale scientific collaborations at CERN, Philipp has been studying innovation processes in collaborative crowdsourcing initiatives and collaborative communities such as *Linux* and *Wikipedia*.

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