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Collaboration modes, preconditions, and contingencies in organizational alliance: A comparative assessment

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Abstract

Collaboration indicates management intention for new competence and knowledge development by collective and inter-supportive means. From a pragmatic point of view, business organizations see collaboration as an opportunity for new competitiveness and efficiency, and public authorities also perceive collaboration as a means to prescribe unified solutions to social issues. Beyond these pragmatic views, academics' conceptions of collaboration give rise to categories of theoretic paradigms for strategic decisions. This research reviews all these perspectives.

This research also examines collaboration modes and contingencies in specific situations and assesses their association with contextual collaboration preconditions. This examination explains the association in terms of collaboration values or scopes (why), its forms or patterns (how) and its coordination, leadership and governance role (who), and its contexts (where and when). To do so, the research uses a case study of a publicly funded cross-sectoral innovation collaboration project.

The case-based propositions and the theoretic assessment cross-examine the validity with each other, resulting in a discursive method to develop the collaboration theory for practices. The research concludes with a remark on the role of conveners in directing and managing collaboration. This research contributes to an epistemological conflation in collaboration management, strategic alliances, and social innovation.

Keywords: Coordination modes; collaboration contingencies; organizational learning; social innovation; discursive theory development

1. Background

The early studies of cross-organizational alliance and cooperation strategies pay great attention to synergetic values and advantages of collaboration such as trust, common goals, mutuality, and complementary competence. These studies also examine forms of controls, governance, or organizational infrastructures for effective collaboration (Beamish & Lupton, 2015; Child & Yan, 1999; Huxham & Vangen, 2005; Rugman et al., 1995; Tallman & Shenkar, 1994). Most of these similar studies explain collaboration in phenomenal evidence, trying to provide practical implications rather than theoretic breakthrough.

In the recent decades, collaboration studies have shifted their attention toward theoretic corroboration using various paradigms. The popular paradigms include: (1) Transaction cost economics, (2) resource-based view of organizational competence, (3) resource dependence theory, (4) governance and administration for justice, and (5) knowledge development and organizational learning. For instance, Hamieda and Brey (2015), Macher and Richman (2008) and Wolter and Veloso (2008) apply the theory of transaction cost economics to justify a twofold purpose in organizational collaboration and strategic alliance: To minimize cost inefficiency and to explain prescriptively the choice for different collaboration modes (i.e., interaction forms and methods). The transaction cost economics theory treats opportunity cost as the key reason for collaboration. Arguably, this rationale cannot satisfy most of academic inquiries about motivations and outcomes of cross-organization collaboration such as vision sharing, mutuality building, and conflict resolutions (Gray, 1996).

Resource-based and resource dependence views are the other competing theoretic paradigms. They posit collaboration as an external resource to extend organizational competence, market power, or vitality (Hillman et al., 2009; Martin-Rios, 2014). Theories in social governance and knowledge management contrarily assert collaboration as an internalized

measure for management transparency, fairness, and resolving misunderstanding and misconduct across organizations and institutions (Sakarya et al., 2012). Knowledge management conceives collaboration as a means to advance knowledge collectively both at organizational and social levels (Gray, 2000). Because these research designs are theory-driven, results tend to be theory-generated. As such, the collaboration studies often corroborate different, sometimes antithetic, results in similar collaboration contexts. Skeptics so arise. Thomson and Perry (2006) attribute this skepticism to the collaboration's transient, abstruse qualities (i.e., mutuality, norms, autonomy, governance, trust, common goals, and commitment) and changes of external environment. Collaboration is still happening in a black box (Ansell & Gash, 2008; Huxham & Vangen, 2000).

This research takes Gestalt's perspective that the whole of a system is not similar to the sum of its individual parts (Woodside, 2013). Therefore, this research proposes a configurational and comparative meta-analytic framework that comprehends collaboration with its preconditions in terms of scopes, structures, and underlying belief /philosophies, and contextualizes collaboration into two coordination modes (i.e., legitimatizing collaboration and interfluent collaboration) along a spectrum of collaboration contingencies.

The configurational framework aims at predicting and harnessing collaboration in real life practices.

2. Modes and contingencies in collaboration contexts

2.1. Collaboration modes

Collaboration modes concern forms, patterns, or conditions that describe and justify collaborative activity structures and control interactions among collaboration units. An organization can build on a collaboration structure through management programs,

documentation and legitimized accountability, or through technology supports. In a course of collaboration, work units should ensure adequate interaction for information, view and opinion exchange, and eventually conclude solutions. A formal mode of collaboration can regulate and assure adequate exchange and contributions among interacting work units. Such regulations and assurance legitimize duty specification and accountability. Contrarily, an informal mode takes advantages of immediate, spontaneous interaction, and emphasizes on mutual responsiveness at all phases of collaboration, rather than on formal, accountable interaction results. In some cases, management cannot judge how large a collaboration scale is, or for how long a collaboration will run. Specifying and regulating the way individuals interact likely imposes undesirable restrictions on voluntary, improvisatory contributions. An informal collaboration mode encourages a sense of group identity, involvement, and conflation of knowledge, which are key elements of social innovation that public administration and policy makers often call for.

Literature about social and public alliance treat collaboration values more on deontological grounds. This thought mainly bases on collective benefits of morality that management expects to gain during the course of collaborative work. The collaboration is less successful when interacting units cannot take the perspectives of each other or tend to disprove the other's principles and view (Henrich & Henrich, 2007; Hoang & Rothaermel, 2005). Therefore, management should attain collective goals and directions using negotiation and politicking as collaboration means. When stakeholder sizes are particularly large, like in cross-institutional projects, collaboration cannot simply adopt systematizing principles to legitimate collaboration work and process. Instead of being explicit about structures, regulations and procedures, participation in collaboration should be more liberal and spontaneous Individuals will consider balances between own interests and collective interests, compare their own

personal value concepts against collective collaboration norm, and calculate suffering in collaboration in consideration of gaining larger or future benefit in return. The collaboration mode can be patchy, interfluent, and non-predetermined. Management finds difficult to rule individuals' inclination for collaboration.

Collaboration also occurs in situations where co-working people, or groups, still perform in their own work patterns, and exercise judgment autonomously. The interactions are transient and situation-specific, likely owing to different task requirements (Beyerlein et al., 2002; Staudenmayer et al., 2005, To & Harwood, 2000). Management has to systematize collaboration within a structure with various patterns of approved connectivity. This connectivity rationalizes collaboration inputs and outputs, which in turn legitimize interactions (relationships) for collaboration progress control. Such thought commonly applies to today's organizations to reconceive known and applied knowledge for new solutions. Notably, legitimacy imposes various structural adherences to approve or disprove contributions among collaboration teams. The collaboration mode becomes more structuralistic and formalistic.

In organizations, collaboration contexts determine collaboration process and collaboration modes. A collaboration context can comprise key preconditions of its scopes or values, structures, collaborators' behavior, roles, leadership and philosophies. Table 1 contrasts the collaboration precondition characteristics in the two collaboration modes. A scrutiny of such preconditions does not simply give suggestions for planning and coordinating collaboration tasks, but also advantages for coping with different collaboration contingencies.

Table 1 here.

2.2. Managing collaboration contingencies

Collaboration contingencies refer to tactics in specific events or situations, by which a collaboration process pursues and serves its own particular purposes. Previous literature reveals

two generic contingencies for collaboration within or across organizations: (1) More market possibilities in strategic alliance studies, and (2) better collective (i.e., social) innovation for organizational/institutional development. The first contingency stems from seeking competitiveness in markets, like the access of external resources, facilities, intellectual rights (Huxham, 2005; Hoang & Rothaermel, 2005), shared risk (Beamish & Lupton, 2015; To & Ko, 2015), efficiency improvement, organization-wide learning (Benavides-Espinosa & Ribeiro-Soriano, 2014; Jiménez-Jiménez & Sanz-Valle, 2011; Pertusa-Ortega et al., 2009), and even moral imperatives (Gary, 1989, 2000; Sakarya et al., 2012).

The second contingency attains more achievements, which include appreciative planning (i.e., vision sharing), policy revisitations across generations for sakes of sustainability, changes of social hierarchy, and even shifts in resource/power distribution in institutional devolution (Crawford-Mathis et al., 2010; Ross et al., 2010). Through collaboration, the interested parties dialogue to resolve differences and/or conflicts. In the end, a collaboration process results in types of social innovation far beyond individual achievement. This contingency purports at building trust and reciprocity in collaboration environments. The contingency brings out an important collaboration implication: Increasing trust and coalescence can expand scopes of common interests and encourage acceptance to new administrative or managerial initiatives (Huxham & Vangen, 2005; Johnston et al., 2011; Kettl, 2006; Pasqueto 1991). Therefore, collaboration can bring up other values such as social reputation, that is, long-term cultural recognition and acceptance in international contexts (Vigoda-Gadot, 2003).

This research analyses an ethnographic case study about an innovation project in a publicly funded organization. The innovation project illustrates a typology of collaboration contingencies, namely for (1) application of known techniques and know-how for new purposes or performance functions, (2) conveyance of ideas into new, innovative domains, (3)

provision of new shared meaning, and (4) creation of social (collective) innovation. The following sections further elaborate these contingencies. The analysis introduces a new assessment perspective for monitoring collaboration. The analysis also examines the contextual relationship among collaboration modes, contingencies, and preconditions for collaboration.

3. Research design

3.1. A cross-sectoral collaboration case study

Hong Kong textile industry emphasizes large production and distribution scales, which inflicts serious pollution problems. Although the sector now mostly operates in near provinces in Chinese mainland, environmental threats are still imperative in the whole Pearl River Delta area. Hong Kong locates at the low-lying area of Pearl River Estuary, where the river flows into the South China Sea. The area is one of the most densely urbanized megalopolis in China, accommodating 57 million people. The area supplies land, utilities, and labor to 70 thousand Hong Kong factories at the end of 2013 (Deuskar et al., 2015). Owing to the scale of the area, conventional waste disposal methods are hazardous: Toxic chemicals, heavy metals, and organic agents often flow into the branches of Pearl River, polluting the whole area and the South China Sea. The public authorities in both Hong Kong and Guangdong show much concern about potential large-scaled hazardous accidents from factories. One of the research initiatives is to assure sufficient monitoring of daily cross-border operations and to report any emergence for necessary, real-time measures. Public authorities also propose a collaboration project to establish an international program for utility consumption and waste disposal management.

These years, textiles firms with significant production scales manage to comply with the environmental and health standards (i.e., ISO14000 and ISO50000). Without appropriate

analysis of daily electricity, water, steam, and gas consumption, and monitoring of waste management for toxic chemicals and carbon emissions, firms in this sector might not obtain approvals from local authorities or certifications for production from international sourcing companies. As such, the planning and monitoring of utility consumption and waste disposal status become an imperative challenge both to the administrative and operations management. Common practices treat almost all the figures of consumption levels, recycling performance, and disposal status as overheads in manufacturing book ledgers.

3.2. *Innovation and cross-organizational/sectoral collaboration possibility*

This project is an innovation for the industry signifying administration and management implications for private-public collaboration: Public agents comply with efficiency standards and disposal regulations, and private firms automatize the operational and environmental data recording and share such data with each other. Working with international partners and consultants, private firms could specify the scope and structure of data that can meet social and environmentally compliance standards. At the final planning stages of collaboration, all the stakeholders consent to an innovative solution concerning a new monitoring system, which analyzes all the data of the utility consumption and waste disposal processes, and to allows to capture, update, and send data to the concerning stakeholders.

The new system aims at unifying all utility measurements and reports down to the lowest levels in all processing consoles. In this project, the monitoring system should allow large, uninterrupted data transmission and backup. The system should also be useful for all kinds of factories and machinery in both indoor and outdoor areas. Furthermore, the system provides first-hand information and alerts in emergency cases to central monitoring servers. In the course of the system development, an innovation research center acts as a convener to

regulate and monitor the inter-organizational communication and interaction, and controls how many resources go to the collaboration process. Often, the project revises rules and interaction requirements, and redesigns the respective procedures for collaboration.

Nevertheless, the research examines how public-private collaboration takes place in the complex innovation contingency contexts, how the differences in collaborative contextual factors affect interacting units' performance and results, and how the collaboration characterizes assessment orientation and methods. More importantly, the research examines how collaboration can be a means of programming knowledge breakthrough and promoting new shared meaning in society (Klievink & Janssen, 2014).

3.3. Method: Comparative analysis of collaboration contexts

Besides taking part in the consultancy advice for technological aspects, this research also explores the collaboration initiatives' academic value. In the various stages of the three years of the collaboration project, the research designed and regulated short exercises in retreat meetings, and invited all the super-ordinates in the private firms, institutional officials, contracted consultants, and urban councilors to participate in these exercises. The exercises projected a number of practical or foreseeable collaboration problems relating to the aspects of administrative dissimilarity, unstandardized production and technological systems, personal issues, organizational restrictions for data disclosure, etc. The participants responded with possible solutions and projected subsequent challenges deriving from these solutions. In different stages, participants could review and adjust their opinion and suggestions on the value of cross-organizational collaboration to resolve all sorts of challenges in the project. The research also drew on theories from the literature and debated how understanding different theories could help to enhance the collaboration process. This research recorded the debates

and conclusions. The research collected and analyzed data using types of diagramming techniques and elicitation methods in interviewing and direct observations. The research transcribed the recorded data and represented the conclusions comparatively.

Early collaboration studies conduct surveys about collaboration motivation, advantages, and determinant dimensions in collaboration process. The objectives are to give empirical implications for collaboration management. However, the results conclude with discussions of a large number of causal factors). Therefore, research analysis shifts its orientation toward theoretic building, managing to give reflections for managerial planning and prescriptions for strategic actions. Thus, management can plan its actions. Academics so often struggle between the two conceptualization approaches.

This research adopts a midway approach, neither relying on inductive methods to develop explanation to observations and data, nor setting hypotheses and proving their validity to arrive to specific conclusions. In the case study, the research examined the contents of various collaboration requirements, process control, and corresponding efficacies in the debate exercises. The participants shared and concluded the underlying preconditions for, and hurdles against, collaboration performance. Using the discussion scripts, the research differentiates the precondition's characteristics in different categories of collaboration contingencies and modes. Afterward, the research transcribed the insights as preliminary theoretic structures and propositions. As such, all the participants discussed and corroborated the theory ideas in a recurrent approach. The resulting theory eventually emerged from the respondents' inherent theories. The research method builds on a sense-making process from piles of discursive concepts of practices and theories as well. The research corroborates the analysis and results in the following three steps: (1) A scrutiny of wide-ranging phenomenally generated theories; (2)

a refinement of these theories using practitioners' experiential insights in a controlled research context; (3) a development of final theory that is comparative and epistemologically logic.

This research recorded views and experience of 46 managers, engineers, scholars, consultants, and officials in public agents. The following sections present the research's theoretic analysis and results regarding different collaboration contingencies.

4. Comparative analysis of collaboration contingency: A discursive theory development

Drawing on case study results, this research proposes a corroboration frame that comprises both phenomenal and theoretic evidence in different collaboration contingencies. The research concludes the collaboration contingencies concerning four collective motivations for (1) extension of existing, applied knowledge, (2) conveyance of ideas into new, innovative domains, (3) provision of new shared meaning, and (4) creation of social innovation. The following sections present the four conclusive contingencies and the respective propositional statements.

Table 2 summarizes these four collaboration contingencies and their respective preconditions and idiosyncrasies, which characterize collaboration tactically both at organizational and sectoral levels.

Table 2 here.

4.1. Applied collaboration contingency

In the project case, the public agents establish a collaboration-convening center to plan and schedule the collaborating partners' interactions. Basically, the interactions give rise to an orderly flow path structure to resolve types of difficulties in a communication system. In the

course of project, the work units disseminate their resources, or informational outputs, as new inputs toward their collaborating units. Without such inputs, the collaborating units cannot start or continue working. As such, interactions among collaboration units build up a network of sequential or overlapping process chains. The collaborating units should well know the network structure for interaction sakes. Such structuralist explanation often appears in the areas of operations research, and decision and systems science (Clark & Fujimoto, 1991; Puranam et al., 2012). In this structuralist perspective, management desires coherent resource and knowledge exchanges at the least level of uncertainty and unpredictability.

Proposition 1: In the collaboration contingency of extending existing, applied knowledge, the collaboration limits its interaction to a hierarchical order. In systems perspectives, operational and authority legitimacies govern interaction patterns and intensities. Explicit roles and relationships among collaboration teams are necessary, giving rise to an additional source of circumscribing task commitment to both individual and organizations. Collaboration design builds on a principle of coherence across organizations, that is, one collaboration unit's performance and contribution depend on its precedent ones.

Very often, such type of collaboration is so conceivable, insofar as the units can anticipate collaboration goals with known, applied knowledge. Management invites collaboration mainly in accordance with units' functional and technical roles, rather than the underlying collaboration purposes per se. These roles legitimatize collaboration units' actions and behavior. The well-predefined functional roles and interactions among collaboration units become necessary information to specify individual units' task and time commitment and performance requirements Individual creativity and enthusiasm are not a priority. Very often in the case study, the collaboration center regards the duties of managing collaboration environment as a type of stewardship, intervening only when necessary. Paradoxically,

intervention may weaken the legitimacy of such collaboration performance. How to impose changes on a structuralized collaboration is seemingly a matter of improvisation.

4.2. *Ideational collaboration contingency*

Very often, cross-organizational or cross-sectoral public collaboration activities cope with challenges, or look for genuine breakthrough through collective efforts. The project case seeks to standardize the industry's utility consumption and waste disposal management. Eventually the collaboration can use real time data and communication platform. Corresponding administrative and technological requirements are complex and indiscernible at certain stages of collaboration. Numbers of work units and cross-organizational parties also reach an immense scale. Collaboration administrators and teams cannot assure progress through explicit regulations of interaction. Work units need to exercise personal judgment and adjust their views and actions in response to likely challenges ahead of them. Collaboration is prudent and cautious for mutual learning time after time. Collaboration does not work as in stepwise programs, but as cohesive efforts holistically to resolve challenges. In an attempt for genuine knowledge breakthrough, stakeholders expect themselves to synchronize their work, outputs, with each other, even though they have differences in terms of expertise, work patterns, and codes of practice.

Proposition 2: Collaboration conveners are necessary in complex, ill-defined collaboration courses. Collaboration allows work units to see things from each other's perspectives, rather than to follow a specific set of rules. Collaboration builds on holistic co-work progress. Most likely, an authoritative convener takes a role of assuring maximum collective collaboration values, with reasonable sacrifice of some individual interests. Adherent teams move in beat, with respect to each other. Cohesiveness is a root of collective efforts and

results.

Cohesive collaboration, however, reveals an issue of inter-dragging among collaborating units for project progress. Cohesiveness provides inter-supportive, collective efforts, but also requests inter-monitoring of work directions and performance. Each unit cannot draw a clear line away from the others and propose directions without any consideration of the collaborating units. Very often, an authoritative convener needs to unify collaborating teams to review and compromise diverse principles and professional views. Management arranges all collaborative interactions cohesively toward a few central points; for instance, strategic resource and authority sharing, politicking, and mutual learning are means to legitimatize the collaboration progress and results.

4.3. New shared meaning collaboration contingencies

Organization network theorists (Chiesa, 2000; Granovetter, 1985; Gulati & Singh, 1998; Lenox, 2002) argue that cross-organization relationships are competitive. Yet, contingent co-operations among competitive organizations can allow extemporary, synergetic gains through competence and resource sharing. Divergence in views and expertise is an important asset instead of a problem. However, collaboration units often do not know to what extent their decisions or actions can benefit, or impinge on, each other (Doz & Baburoglu, 2000; Gray, 2000). In this project case, participants manage to understand what the other co-work units want to achieve. At the early stages of collaboration, this understanding was difficult owing to weak acquaintance and trust. Particularly when collaborating units have different conceptions about their collaboration subjects, a broader understanding of interdependence, or new shared value meaning, becomes a prerequisite for synergetic, congruent actions.

Proposition 3: New shared meaning originates from a joint management manifestation

for empathizing and interfluent collaboration. Unlike structuralist collaboration, new shared meaning collaboration does not accentuate rules to assure adequate and sufficient knowledge interchanges among interacting teams. Instead, collaboration needs co-work teams aware of innovation contexts. Collaborating units commit themselves to identifying a common ground.

Hence, no standardized tactic and operational procedures can govern collaboration (Henrich & Henrich, 2007). Most practitioners can only conceive approximate approaches to ensure the collaboration sufficiency. Governing collaboration relies on learn-then-adjust strategy, with an expectation to gain a broader, more inclusive shared meaning. Collaboration pursues an expanding scope of collaboration goals to outweigh the initial conflicting interests and perspectives. For example, eliminating environment pollution and reducing waste are more prominent than immediate financial returns.

4.4. *New social innovation collaboration contingency*

For collaborations in whatever scales, organizations and public institutions manage to incubate a group of new knowledge co-workers, interdependently wading through sets of technical, administrative, and social difficulties. Organizations treasure gains and new values by continually expanding their knowledge . These concepts of collaboration are not new in the socio-administration literature (Ferragina, 2012; Klievink & Janssen, 2014; Nahapiet & Ghoshal, 1998; Shapiro, 1987). In the study case, project participants have different collaboration preferences, especially at the sectoral level. Most of participants' contributions are autonomous and voluntary. Nonetheless, individual project participants have to search new competences and knowledge beyond their own intellectual limits, while excelling at perceiving the whole work context within which each could learn and challenge one another constructively.

Collaboration is, therefore, a perceived organizational/social asset that consorts with individualistic qualities.

Proposition 4: In social innovation, management maintains an intensive, but balanced, interaction among collaboration units. This interactionism evolves competence adaptively. Detached collaboration units will make overall innovation results detrimental. Contrarily, concordant effort is pre-essential for successful innovation. Mutual learning and empowering are the underlying drivers for the largest scope of private-public collaboration.

In competence theories, organizations continuously perfect existing competences (Doz & Baburoglu, 2000). Applying knowledge as new competence inevitably brings up the question of how to break down the existing knowledge and how to reorganize this knowledge to form new, meaningful knowledge. Such divergence-convergence process is an unremitting learning process. Collaboration empowers actors' individual excellence and keeps them concordant and abreast with one another (Van Vactor, 2012).

In this project, the collaboration for a sector-wide real time monitoring system is difficult. The system comprises massive data sources that associate with discursive knowledge solutions from very diverse groups of textiles engineers, chemists, health and safety compliance consultants, data analysts, information systems designers, etc. Yet, these groups do not accommodate each other dependently (Rockhart & Short, 1991; Verhoest et al., 2004). Concordance is, therefore, the central issue of planning and facilitating the collaboration. This research shares a similar view and posits that concordant collaboration can support and execute cross-sectoral/ organizational innovation in an integrative manner.

5. Discussion and conclusions: Conflation of theories into practice

In interfluent collaboration contingencies, collaborating units are often uncompromising and have diverse interests, views, and ways of understanding the collaboration process and the results. Attaining congruous collaboration needs a broader definition of common, shared interests. Such a broader definition of new collective values can set standards to govern individual co-work units' autonomy without going ahead or beneath the others. Lagging, dawdling, and even hasty individuals likely restrain collaboration and innovation progress. . Congruous collaboration encourages sharing and learning, through which so that individuals are sensitive, and empathetic toward each other. Frequent coordination and interaction are essential to develop such sensitivity and empathy.

Collaborative concordance deals with segregation. Concordance stands for an act of collaboration that a group of highly independent, and even unacquainted actors attain harmonic results. Their acts are exclusive, segregated; yet the contributions and consequences are concordant. In concordant collaboration, the groups' performance much depends on the performance of those in charge. In the large-scale collaboration practices, administration should be aware of this subtlety. Collaboration is a participatory and reflective learning in which understanding other specific fields of knowledge can help individuals to understand more of their own knowledge. Particularly in social, civic development, public agents manage such learning practices, which can establish sustainable innovation for social benefit. The collaboration eventually combines all fields of knowledge to achieve its goals.

The analysis is longitudinal and comparative. The research cross-examines the relationship between the utility and waste measurements and the propositions of this study, and treats the analysis through a discursive method (Huxman & Vangen, 2005). This study has two main parts: (1) Propositions that build on literature theories and emphasize theoretic explanations of the nature of collaboration in different contingencies. Prudent proof and

reorganization of these discursive propositions results in management implications for collaboration practices. (2) Comparative analysis of collaboration behavior and preconditions in different contingency environments provides an instrument to revise the propositions. Both steps cross-examine each other and assure sufficient and complete theory-practice arguments.

The results of the analysis show that concordance seems to be the subtlest, most elusive collaboration behavior requirement, which much demands the co-existence of systematizing and empathizing power to catalyze collaboration success. Concordance lays the foundation for mutual understanding and further mutual trust between collaboration organizations. Concordance is a social bonding value. Without concordance, organizations and societies seemingly suffer from inharmonic “neuro-disorder” and individuals are incapable to put social values and identities before individual interests and preferences. Very often, when the number of cooperating units grows, such concordance is not easy to maintain. In collaboration projects, individuals depend very much on the actions of other individuals and the actions of their management.

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Table 1. Comparison of key collaboration preconditions in two collaboration modes

Phenomenal collaboration preconditions:	Collaboration mode	
	Systematizing	Interfluent
Clear scope of collaboration	✓	ambiguous
Organized structure and connectivity	✓	×
Mutuality behavior	partial	✓
Formal (functional) roles	✓	×
Convener-ship	Intervening	Influencing
Philosophy behind co-work	Consistence	Empathizing
	Coherence	Empowering

Table 2. Configurational and comparative analysis in collaboration

Collaboration preconditions	Collaboration modes			
	Collaboration contingencies :	Legitimatizing	Interfluent	
		Applied	Ideational (Original)	New Shared Meaning	New Social Innovation (Capital)
Scope	- Collaborating units re-conceive known and applied knowledge into innovative solutions. Knowledge still be effective even if the scale of collaboration is large (i.e., involving a large number of interacting teams). - Function determines the scope of the collaboration.	- Units co-work new ideas beyond known knowledge boundary. - Management procedure and governance for collaboration is necessary, especially under tight resource and time constraints	- Collaboration itself is ad hoc, but also a contingent means for collective efforts from well-partitioned professional groups. - The extent of collaborative involvement is subject to their experience, resources, and skills.	- Complex, ill-defined work requirements demand collaborating units to explore collaboration difficulties and results beyond their understanding and vision. - Collaboration seeks the inclusion of diverse, new social values, rather than simply instant collaboration gains.
Structure and connectivity	- Tasks form as modules in a structure of orderly, hierarchical flow-path systems.	- Units' expertise determine their collaboration duties and involvement. They influence each other; a change or new proposal from one unit will propagate its repercussive effect to interacting units.	- Teams become more diverse in terms of their contribution and commitment. Participants are empathetic.	- No pre-defined collaboration structure; - Participants even have ambiguous identities in collaboration work.
Behavior	- Operational legitimacy and authority drive well-configured interactions for work progress sakes. - Teams pass their outputs as new inputs to collaborating teams.	- The interactions tend to be iterative, owing to the uncertainty of responses among interacting teams to new ideas	- Formal organizational or interacting structure is a hurdle for teams to share, digest, and compromise new knowledge. Collaboration tends to be more "liberal," and believe collaboration can come up with larger individual interests	Tasks are diverse; teams are often nomadic, but need to exercise "reflective" practices through sense-making and consideration of alternatives

Roles	- Predefining roles and relationships among collaboration teams can give rise to an additional source of circumscribing task commitment to individual teams.	- Participants often decide their own actions right after the consensus with collaborating teams. - Teams manage to learn from the each other through interaction and collaboration procedure.	- Individual teams often adjust their work, with a high standard of mutuality. Teams put collective interest and value before their own.	- Teams perceive their empathizing roles. Work and collaboration build on deontological commitment. Individual teams accept suffering because collaboration can result in larger collective gain.
Convener-ship	- Formal, intervenient and responsive. Stewardship-type monitoring.	- Likely, authoritative leaders can advise teams for reviewing and compromising their own principles and views.	- Convener-ship is informal, but profound. Acquaintanceship is perhaps an analogous term.	- Collaboration draws on a sense of trust and social dependence. Detached teams tend to make overall results detrimental; contrarily, Orchestrating team efforts is necessary to explore and develop new knowledge in sustainable manner. Conveners address the issues of isolation and act to solve these issues.
Philosophies	- Systemizing; teams are “in mesh”. Collaboration stems from “coherent contribution” from teams to teams	- Unifying; teams are adherent, ensuring maximum responsiveness in collaboration. Collaboration stems from “cohesive contribution” from interacting teams.	- Empathizing and unifying team behavior. Individuals lagging the team can restrain collaboration and progress. - Collaboration stems from “congruous contributions” from teams to ensure work progress.	- Empowering; Teams reinforce individual identity and values through collaboration. Collaboration stems from “concordant contribution” among teams. - Experience of concordance emerges from mutual learning and further mutual trust between collaborating teams.