



Universiteit
Leiden
The Netherlands

Real-time foresight : preparedness for dynamic innovation networks

Weber, C.R.M.

Citation

Weber, C. R. M. (2016, December 20). *Real-time foresight : preparedness for dynamic innovation networks*. *SIKS Dissertation Series*. Retrieved from <https://hdl.handle.net/1887/45051>

Version: Not Applicable (or Unknown)

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/45051>

Note: To cite this publication please use the final published version (if applicable).

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/45051> holds various files of this Leiden University dissertation.

Author: Weber, C.R.M.

Title: Real-time foresight : preparedness for dynamic innovation networks

Issue Date: 2016-12-20

7 Preparedness to collaborate in adhocracies

This chapter provides conclusive answers to the five research questions (RQs) and the problem statement (PS) formulated in chapter 1. First, the answers to the RQs given in chapters 2 to 6 are reviewed (7.1). Next, the problem statement is addressed (7.2) by short appraisals of the pattern findings, of real-time foresight (RTF), and of the real-time evaluation tools described in chapter 6. The conclusions on the theoretical contributions of the study (7.3) for scholars and academics are then formulated, followed by the conclusions on the practical and managerial contributions (7.4). The limitations of the study are acknowledged (7.5), and the thesis closes with recommendations for future research (7.6).

7.1 Successful ad hoc collaboration as network emergence

Real-time collaboration towards the unexpected is a pitfall for public and corporate strategic management (cf. Brown & Eisenhardt, 1997; Stacey, 2007; Weber et al., 2015), at least as long as traditional management, foresight and strategic planning methods are employed (cf. Nelson, 2010). This thesis has explored the challenge of managing ad hoc collaboration in dynamic innovation processes (PS) by answering five research questions (RQs) that orbit the central PS.

In this section, the five RQs are reviewed. Guided by its research objectives, the study first reviewed management literature with the aim of finding out why traditional management hinders ad hoc collaboration (RQ 1); a research design was then outlined, to explore successful innovation processes in emerging DINs (RQ 2); the research rationale was realised and a long-term process study was conducted to detect

network governance patterns (RQ 3); next, a deeper code analysis led to the discovery of three different innovation strategies of DINs in global relief (RQ 4). Finally, a new real-time foresight (RTF) was developed from the findings in order to switch traditional management and planning into collaborative real-time modes; from this newly formulated base, the research outlines a real-time evaluation tool for DINs.

The answers given to the five research questions are summarised below (see Subsections 7.1.1 to 7.1.5).

7.1.1 *Reviewing strategic management traditions*

Ad hoc collaboration in response to complex challenges causes enormous problems for leadership - in private companies, non-profits and governmental agencies alike. Even experienced organisational and administrative actors that use technological foresight (TF) fail in ad hoc collaboration when unpredictable and fast changing ecosystems are under inspection. To investigate the conceptual background of this phenomenon, the following initial research question was formulated:

RQ 1: Why do strategic management and foresight fail in ad hoc collaboration?

Behaviourist concepts have established a strong legacy in microeconomics and from here increased central actor perspectives in strategic management: the dominant idea is one of individual and autonomous actors that compete with other actors in resource scarce environments. Clearly, ex-ante planning and initial goal setting - to gain an edge over market competitors - are the established managerial perspective, and when gaining advantages in stable markets, initial information is a strategic demand.

Thus, this study turned to collective action theories to find a more collaborative management approach for more complex environments and ad hoc collaboration. The intention was to find plurality as a better basis for successful management models for “adhocracies” (cf. Dunn, 2012) but instead there were again strong individualistic influences: the first finding came down to concepts of behaviourism and aggregated individual preferences. In a collective action tradition, the idea of homogeneous groups and formal models calculating the action prevails. In such a view, cooperation appears as a threat to individual self-fulfilment and blocks spontaneous collaboration.

Recent opposition to this potent scientific belief also came from an economic discipline: institutional economy (see, e.g., Ostrom, 1990; 2010). Studies investigated collaborative processes in various forms (cf. Kiser & Ostrom, 2000; Janssen et al., 2008) and identified the ‘working rules’ of norms and factors that contribute to collaborative success: dynamic structures were found that emerge from collective action in real-time.

The thesis reviewed the technological foresight (TF) tradition as a managerial future planning method for coping with uncertainty. TF was assessed as a hierarchic procedure for governing actors’ decision making, but one that was still not valuable for management of uncertain futures by dynamic multi-stakeholder processes – at least not in forms established so far.

A traditional relational approach was revisited next, in the form of network theory. Here, dynamic network concepts, evolutionary network structures, and voluntaristic managerial perspectives were presented. It

was found that while many studies celebrate innovation networks as managerial answer to complexity, static network approaches still dominate research and dynamic approaches have so far not been connected to strategic management. From the focused literature review we saw that network governance of dynamic innovation processes still remains a black box for managerial practice.

Figure 2-2 therefore reviewed the juxtaposition of five crucial conceptual elements for traditional management and ad hoc collaboration: actor concept, orientation, managerial role, information, and planning. The assumption that successful ad hoc collaboration relates to the emergence of dynamic innovation networks (DINs) in non-linear processes was formulated. This was situated in an illustrative managerial context - global disaster management – as empirical evidence of the need for a turnaround from traditional strategic management to network governance alongside the identified opposing elements.

The study's answer to RQ 1 was that there is a need for an empirically grounded new RTF in the form of preparedness for ad hoc collaboration. The reasons were: (a) mismatch of time pressure and recent planning routines, (b) mismatch of the traditional central actor perspective and a polycentric process view, and (c) mismatch of available data and investigation frameworks for an examination of dynamic innovation processes.

7.1.2 Outlining a research design for dynamic innovation networks

To explore successful management of ad hoc collaboration and DIN emergence, global relief was chosen as the empirical context of managerial practice. In the highly dynamic context of failing or

sustainable global-local recovery and successful innovation processes, the second question was asked.

RQ 2: How is it possible to adequately explore successful ad hoc collaboration in DINs?

The chosen design for pattern detection was a constructivist research approach. Using a cross-case process analysis of successful DIN cases, *actor-network* concepts (translation process, see Chapter 2) were combined with a timeline approach, *critical incident* technique (CIT). CI coding and mapping made it possible to put contextual time stamps on the abstract network operations of ANT and so to compare the complex interaction of changing networks over time.

So the four basic operations of network formation - problematisation, intersement, enrolment and mobilisation- were used to build the skeleton of this investigation, but pattern detection was also carried out by exploring the dynamic between concrete CIs. Only the combination of both of the methods allowed the study to identify shared patterns amongst DIN processes.

Chapter 3 described conceptualisation and sampling, data collection, and coding, the complete research design in detail. Primary (interview transcripts) and voluminous secondary data (official and informal documents) were a precondition of implementing the qualitative research design. The data collection for the study covered periods from 2004-2010 (disaster management after the 2004 Tsunami).

7.1.3 *Conducting a cross-case process analysis on DINs*

Based on the new research design described in the chapter 3, dynamic patterns of successful management in ad hoc innovation collaboration were explored. The guiding research question was formulated as follows.

RQ 3: Which network patterns facilitate real-time innovation processes?

Chapter 4 presented three exemplary cases of successful real-time collaboration in global relief after Tsunami 2004 around the villages of Ayam, Keniparam, and Kanni. To explore dynamic network patterns, CIs, heterogeneous actors, and changing network dynamics were retraced in all three collaboration processes from 2004-2010.

Investigating cases, CI-charts, and codes, one case was presented in full detail – that of DIN 1 (Ayam) - from which it was possible to identify significant network dynamics. The study then looked for coherent collaboration patterns in the other two other cases and was able to confirm and consolidate those findings. Five dynamic network patterns were identified that facilitate collaborative innovation processes.

From the findings, a new RTF was developed, and alongside it, two real-time evaluation tools (see Chapter 6). For the sake of completeness, the identified collaborative patterns are repeated below:

1. Early identification and alignment of heterogeneous interests (OPP)
2. Early development of a shared vision
3. Mindful use of boundary objects
4. Punctual directedness and distance amongst implementing actors
5. Double sided network-role of focal actors

7.1.4 *Identifying DIN innovation strategies in global relief*

In all explored cases, innovative activities were part of successful relief. Rather varied focal actor (LNGO) profiles were observed in the network processes, and divergent network strategies were adopted to achieve them. To find out about the different DIN innovation strategies in long-term relief, RQ 4 was formulated.

RQ 4: Which network strategies are used by DINs in global relief?

To answer this question, the study revisited a classic strategic management definition (Mintzberg, 1987) and adapted individual strategies to create collaborative and emergent network strategies.

Based on the double-sided focal actor pattern finding (see Subsection 4.5.5) the coded data was analysed using central codes for focal actor profiles⁶⁴ and the collaborative network pattern⁶⁵ of each DIN. The subsequent use of ATLAS.ti for computer assisted data analysis revealed three very different innovation strategies:

1. Protective networking (Ayam)
2. Capacity building networking (Keniparam)
3. Global advocacy networking (Kanni)

From networked innovation strategies used in the three case network sample, two polar dimensions of the observed LNGO profiles turned out

⁶⁴ Code: DIMA-interest; CI; NGO-STRAT.

⁶⁵ Code: INNOACT; NETDYN; ACT.

to play significant roles in successful real-time collaboration. These portrayed organisational characteristics that do not change in ad hoc situations. The dimensions are:

- (a) media usage, and
- (b) readiness to scale up.

The partnership between global and local NGO is asymmetric in global relief and potentially successful when it fits in with the respective dimensions. It leads to the development of shared innovation and real-time collaboration strategies. The resulting matching tool presented is not limited to rapid real-time and virtual matching, but also applicable as a taxonomic process management tool for orientation in long-term collaboration processes.

7.1.5 Developing real-time foresight and outlining real-time evaluation

Chapter 6 transformed the central finding of the process exploration, using and carrying forward the five dynamic innovation patterns to address the last research question:

RQ 5: How should a well-qualified management team plan and manage dynamic innovation processes?

Here the thesis proposes a novel foresight approach (RTF); a turnaround from traditional planning to preparedness in ad hoc innovation processes. For this, the five dynamic network patterns had to be transformed into organisational process management principles. They are repeated briefly below.

- (1) First the *alert* principle: to be aware of the significance of initial periods in a networked situation; to signal one's own position and to identify relevant socio-technical actors for collaboration.
- (2) Second the *strict* principle: early development of a shared vision that aligns the heterogeneous interests of all actors. It is a central managerial foresight element, replaces initial goal setting and determines long-term success.
- (3) Third the *continuous* principle: boundary objects need to be found or created to mobilise commitment and communication in different aspects of a network. The greater the number of actors in a DIN, the more the use of boundary objects is necessary.
- (4) The fourth principle is *adaptive*: leadership has to prepare for time-outs taken by particular network-actors. In dynamic long-term processes, non-visibility and temporal passivity of actors must be tolerable. Intermediary actors (see Chapter 4.) can be included as network support.
- (5) The fifth principle requires a *coherent* orientation of activities with the focal actors' profile. In long-term network processes and collaborative innovation, the focal actor role can change over time.

The five principles were first presented as an agenda for contexts of public and for corporate foresight. Then the RTF agenda was put back into the real-time collaboration context of global relief, addressing both governmental and non-governmental actors (TNGOs).

7.2 The turnaround from planning to preparedness

The thesis contributes a new foresight method and instruments to measure dynamic innovation networks (DINs). Real-time foresight offers an alternative to traditional planning: preparedness for an unknown collaboration is a foresight method that reduces uncertainty, but instead of being part of a technical planning process, it confers readiness to act. The method is a substitute for traditional management when it comes to collaborative adhocracies (cf. Mendonça et al., 2007; Dunn, 2012), namely, in complex mass and real-time collaboration, on networked global markets and in innovation processes without initial goals. We asked in the problem statement:

PS: How is it possible to collaborate for successful dynamic innovation processes?

The answer is that we have to prepare for real-time collaboration, not by formulating plans, but by pro-actively adopting a dynamic network collaboration mode in both crisis management and innovation processes.

7.2.1 *Real-time foresight*

Real-time foresight (RTF) for successful ad hoc collaboration is based on the five dynamic network principles listed in the subsection 7.1.5. They compose a strategic agenda.

Implementing this agenda of dynamic innovation processes in an organisational context has impacts for the identified (Chapter 2) crucial managerial elements of (1) actor concept, (2) orientation, (3) managerial role, (4) information, and (5) planning. In a turnaround from traditional

strategic management, the identification, protection, and support of emerging DINs will gain priority.

7.2.2 *Real-time evaluation*

The newly formulated base of dynamic network patterns enabled the study to answer the PS with two more tools for improving and assessing dynamic innovation networks: two real-time evaluation tools (RTETs) composed of indicator questions for (1) identifying and (2) assessing DINs.

These evaluation tools are described in the second part of chapter 6. The instruments allow the identification of DINs while entrepreneurial networks emerge. In this, they complement existing evaluation tools for end-of-pipe evaluation in (a) flexible business incubation or nonprofit incubators and (b) global disaster management. Real-time evaluation can be applied before failures are irreversible, and this saves time and provides real-time process feedback. Both instruments enable leadership to identify, select and support sustainable entrepreneurial collaboration while it happens.

7.3 Theoretical contributions

The findings of this thesis contribute to literature of different academic disciplines. They (1) advance concepts of dynamic innovation networks; (2) contribute a new collaborative perspective to strategic management debates; (3) offer a new foresight method (RTF).

(1) The conceptual basis of the study is ANT. The process study confirmed the assumption that there is no magical ad hoc collaboration,

but instead, the emergence of dynamic innovation networks (DINs) from initial contacts and then emerging mutually ‘respected’ network patterns. Real-time collaboration works where innovation processes develop in co-evolution with network formation: if the underlying dynamic network patterns are respected and not spoilt by hierarchic management of command and control.

As dynamic network approaches, ANT and SNA offer complementary concepts. The findings of this actor-network study invite further empirical research that uses quantitative designs to test the new patterns and categories of real-time collaboration on more voluminous samples (see also Section 7.6).

(2) A collective management investigation finds paradigmatic opposition of two popular collective action approaches. Nobel-laureate Ostrom (Ostrom et al., 1992) brought institutional economics into a position against the seminal “zero contribution thesis” of Hardin and Olson’s famous prisoner dilemma (Ostrom, 2000; Ostrom, 2010). Individual choice traditions inherited from behaviourist concepts contradict the collected empirical evidence of worldwide practices of collective action without external coercion. The thesis contributes to empirical research on real-time and real-world processes, but instead of finding out about the evolution of social norms, it aims at finding out about the *dynamics* between heterogeneous network-actors. Contextualisation in time and space thus is a common feature of case study and process research.

(3) The contribution of the study to foresight literature was appreciated from the beginning. Foresight as an expert-based process of ‘arranged’ audiences is established in many political and corporate

arenas. However, resource intensity and central actor perspective make the method inappropriate for the challenge of ad hoc collaboration. As collaborative real-time foresight (RTF), the method can switch management from planning to preparedness. It is the author's proposition, for complex and unpredictable collaboration situations, to build institutional structures that *are* able to take a network perspective rapidly. Preparedness to start collaborative innovation is the method elaborated here to continue foresight traditions.

7.4 Managerial implications for dynamic innovation processes

The results of this thesis beyond RTF also contribute to practical issues and have implications for the management of ad hoc collaboration in dynamic innovation processes. In the following subsections, two managerial recommendations are provided first for dynamic innovation processes in business incubation (7.4.1) and then for the specific field of sustainable and innovative global relief (7.4.2).

7.4.1 *Business incubation*

The thesis provided new instruments for identifying and evaluating collaborative innovation networks for business incubation and startup support (elaborated as RTET in Chapter 6).

The first recommendation is related to government interventions that aim to foster an innovation culture in national, European, or other regional economic systems. Different policy levels (municipal, regional,

European, and global) would profit from real-time evaluation and feedback on DIN emergence. The increasing financial support should reach the most capable networks. This study contributes to real-time collaboration in heterogeneous, virtual and highly flexible startup teams: DINs are powerful alliances for flexible temporal and spatial frames, and more resilient than individual innovators. It is recommended that startup hubs and co-incubation units of both public and private origin use the real-time feedback facilitated by the tool developed in this study to evaluate the emergence of innovation teams. By identification of DIN emergence, further investments could be channeled to the best performing teams. The evaluation of dynamic innovation networks could be undertaken by the different actors involved, or by investors.

The second recommendation relates to corporate management. With regard to co-incubation in businesses, the challenge of innovation team autonomy has recently been highlighted (cf. Gard, 2015; Sailer, Wannags, & Weber, 2016). Corporate management in SMEs is challenged to find the right levels of autonomy for flexible business incubation, always between control and laissez-faire. Here, the dynamic structures of DINs can offer a third governance mode. The evaluation of flexible business incubation teams could be facilitated by the new tool.

7.4.2 *Disaster management*

A process study on innovative and sustainable real-time collaboration in relief certainly has implications for disaster management research and policies. The findings of the study address recent debates on structures

and activities⁶⁶ of the humanitarian community (see, e.g., Donini, 2012). Some observers criticise the established transnational market-like structure of NGOs, and its failure to impact local societies in vulnerable regions. At the same time, there is a global increase in migration and security issues and humanitarian aid sadly reached record levels in 2016.

The study's first recommendation is that misfits between global players and small local NGOs have been neglected for too long. They need to be tackled in the conceptualisation of responsible rehabilitation instead of continuing a technical aid that remains blind for the differences between the partners. A more rapid and simply better matching of global and local partners for local sustainable outcomes will be essential in future.

The second recommendation is that disaster research has to deliver more managerial guidance. In particular, the identified critical incidents (CIs) invite further research. Testing them in different rehabilitation contexts would confirm the evidence. As they validate crisis management findings (cf. Kapucu, 2005; Comfort, 2007), they (1) enlarge the base of managerial knowledge and (2) provide new data on long-term relief. The concrete CI finding is a new advancement in an increasing stream of emergency literature, and offers valuable categories for an IT enabled and improved disaster management in the field.

The same holds for other codes of the elaborated code book (see Appendix D). The new category system elaborated from the study sample invites further employment. In ATLAS.ti, for example, many more data

⁶⁶ See GHA report 2011 at http://www.un.org/en/ecosoc/julyhls/pdf11/has_gha_report_2011-event_flyer.pdf

operations are feasible but would have exceeded the scope of this study. However, it is time for empirical crisis studies that use existing social media data bases. Blogs, videos, chats and newsticker have the potential to produce ‘big data’ in the field. The categories identified for dynamic collaboration and innovation offer a useful first scheme for deeper exploration of innovative and sustainable global relief. In the author’s opinion, this is a research task for the Leiden Centre of Data Science (LCDS) and future experts of international collaboration.

7.5 Limitations

While reasonable precautions were taken to ensure the appropriateness, validity, and conformability of the results of this research, the generalisability of the findings of explorative research is limited mainly due to the following two aspects: limitations of sample and data collection (7.5.1), and of the chosen methodology (7.5.2).

7.5.1 *Sample and data collection*

The limitations of the process analysis are first related to its sample. The study is based on a small sample of N=3 emerging DINs in global relief. These successful DINs were selected for their sustainable relief outcomes eight years after the disaster. However, from literature, expert discussions and close observation of too many failed relief projects, an understanding of failed processes was gained. Within the available limited frame, rich heterogeneity of the sample was sought to ensure methodological rigour. In this, the study does not claim to have shown a totality of DIN facilitating patterns, but does claim to have identified the most

important ones. The author advises careful generalisation and invites further testing of the five DIN patterns in many other contexts of real-time collaboration to overcome the sample limitations.

Limitations are also seen in the data collection. Metric data would have allowed for advanced modelling of the five dynamic principles identified. A dynamic systems approach or agent-based simulations could elaborate the more time-sensitive dynamics of the five innovation network principles, namely of the patterns 4 and 5, which deal with coupled and coherent dynamic interaction pattern. Limitations on the level of measurement of data in the sample do not allow for further operationalisation. However, this study profits from exceptional data access, data triangulation and in-depth interviews on long-term relief, which was, until now, a neglected innovation field that is marked by data scarcity.

7.5.2 *Research methodology*

A final short remark concerns the limits of CIT, as an interview methodology. The resulting quota of positive CIs was much smaller than expected (see CI success and compare CI-charts in Appendices C1, C2 and C3). As the term *critical* is meant to equally denote positive *and* negative incidents in theory, this result was a little surprising. In the author's opinion, this can be interpreted in a number of ways: (1) as problematic, indicating interviewer or interviewee effects; (2) as pure information, namely on how the human memory works - negative events are easily recalled, (3) as an instructive part of the findings on disaster management that bears so much more difficulties than actually discussed, or (4) as a weakness of the method, regarding the meaning of a central term in interviewing people. The author interprets the result of predominantly negative CIs as fol-

lows: first, they indicate a surprisingly high frequency of change and disruptions to (over-) planned relief collaboration; and second, they tell how global disaster management in the 2004 Tsunami was a traumatic event for leadership of smaller Indian LNGOs, the focused expert group in the sample.

7.6 Future research

The thesis opens up, at least four interesting novel areas for future research: (1) consolidation of the pattern findings; (2) further elaboration and testing of indicators in real-time evaluation of DIN emergence, (3) further investigation of CIs in disaster management, and (4) further discussion of real-time foresight (RTF) as a new collaborative and dynamic management concept that complements traditional management and planning approaches.

(1) First, successful management of DINs might follow more underlying network patterns than have been detected in the study sample. It is suggested that the research design should be applied to a larger real-time collaboration sample to test and enlarge the set of principles. Future studies should ground empirical research in various real-time collaboration fields.

(2) Second, the five identified DIN patterns invite further research. Studies could (a) focus on the changing roles of focal network-actors in the course of network evolution (quantitative study); (b) explore the probably difficult creation of shared visions at later moments of the dynamic innovation process (qualitative studies); (c) find out more about the need for punctual directedness and distance in network communication (quantitative and qualitative studies).

(3) *Third*, since 2004, process data on relief has become abundant and gradually more accessible today as we live in a digital society. In most institutions, however, the exponential growth has still to be used for research into process dynamics and CIs. The elaborated CI families are candidates for topics of most relevant management research on social media data and corporate data sources: namely the code families (a) CI net-dyn, (b) CI psysoc, and (c) CI temp (see Appendix E).

(4) *Fourth*, the study looked at RTF as a new dynamic and collaborative management method. The dynamic capabilities approach (cf. Teece et al., 1997; Eisenhardt & Martin, 2000; Barreto, 2010) already addresses flexible capabilities to excel in fast changing environments and markets with unfamiliar problems. Path-dependent dynamic capabilities are recognised in this approach as assets to defeat market competitors in ad hoc processes (Ritala, Heimann, & Hurmelinna-Laukkanen, 2016) but these dynamic capabilities still relate to individual organisational actors. There was a turn to collaborative capabilities (cf. Blomqvist & Levy, 2006), but even here, dynamic capabilities are seen as *one* actor's capabilities to take part in a collaboration. This study's RTF concept, in contrast, contributes a relational perspective and can enhance a research discussion on the approach, as it grounds collaborative capabilities *precisely not* in individual but in plural conditions and in shared practices, the 'working dynamics' of DINs.

The thesis closes our research with a final remark. The research on process dynamics confirms the need for more awareness and greater network dynamics literacy in a digital society. This study invites further research into the digital field of collaborative management and the patterns of innovative adhocracies in a blended virtual real-world, our world.

