Trust Development in Networked Environments: A Performative Account

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Abstract

We focus on trust development in dynamic, unstructured and non-commercial networked environments and conceptualize it as the process of producing a stable network ordering. We present a longitudinal, in-depth case study of the global humanitarian aid network, which is undergoing a disruptive transformation due to the emergence of digital volunteers who offer unique digital capacity for collecting and analyzing humanitarian aid data. Integrating this new actor-network into the existing global humanitarian network, comprised of formal organizations exhibits many problems that are concerned with trust. The ongoing inter-penetrating of these two networks is leading towards stabilizing into a new, qualitatively different network ordering that morphs the traditional and digital network models. We draw on sociology of translation, with its relational and performative sensibility, to analyze the network emerging and stabilizing as processes of trust development. We highlight the importance of four practices, performative of network trust: problematization, interessement, enrollment and mobilization.

1. Introduction

This article examines the development of trust in a dynamic network environment that is undergoing digital transformation. Namely, the global humanitarian aid network which is being transformed by the emergence of volunteer and technical communities (V&TCs) that are distributed communities of volunteers, operating according to collective intelligence principles [7], and collecting and analyzing social media information coming directly from the affected population. While, being a 'game changer' this digital humanitarian network comprised of V&TCs, is not being integrated in the traditional network of formal humanitarian responders because of trust issues.

Research on trust and networks in the last 20 years [e.g. 36] has grown due to new forms of digital sociability, disembodied from the local context and stretched across tracts of time-space [14,35]. Against this backdrop, the topic of trust and inter-organizational relationships has developed. Two approaches characterize our research. The first one focuses on the interpersonal interactions that lead to trust development across institutional boundaries [e.g. 32]. The second examines the institutional bases for the emergence of trust [4,22,24]. While these two approaches are rarely reconciled and can be questioned for dividing between the 'micro' and the 'macro', some trust researchers have attempted to overcome such challenges [e.g. 12,42].

Most studies view trust as either stemming from the institutional context, or as an interpersonal product of institutionalized actors. In both cases, trust is a relationship that emerges between the participants in an institutional context and connects them to facilitate exchanges. These insights might not be appropriate in unstructured and volatile institutional contexts such as humanitarian aid [31]. In addition, much of the research on inter-organizational trust development is focused on economic and commercial settings [21,40] and dyadic relationships [46]. Many argue that digital network arrangements in non-commercial settings might require a distinct approach to understanding trust development [21,23,29,46]. We understand trust as a set of practices for reducing risk and uncertainty [14,30]. We examine in a longitudinal manner the processes of re-ordering and transforming of the network, and the inter-woven processes of trust development. As trust is central to developing a stable social order [30], we explore and conceptualize the practices involved in the humanitarian network re-ordering and stabilizing as 'performative' of trust. Drawing on the relational sociology of actor-network theory, we conceptualize trust developing as not just a matter of developing connections between stable entities, but as a performative process of inter-penetrating that disrupts institutionalized practices, and entails the development of new identities and roles that leads to the emergence of a qualitatively different network ordering [9,25]. By identifying a number of important practices involved, this paper contributes to our understanding of trust development in dynamic, unstructured and non-commercial network environments.

HICSS

We first outline research on inter-organizational trust, relations and virtual networks. We then introduce a conceptual framework which can account for the changes in emergent network formations. Next, we expose our case study methods and present and analyze our findings followed by a discussion of the contributions and implications.

2. Literature Review

In contrast with the economic approach to understanding trust, which sees trust development as calculative and rational efforts [2,18], sociological sensibilities view trust as a process of reducing risk and uncertainty and a matter of social relations [14,30]. For Giddens, trust is a device for "bracketing out" potential risks and vulnerabilities that allow us to engage with others [14]. Similarly, Luhmann [30] argues that trust and distrust are strategies for dealing with situations where one must enter into risks that cannot be controlled in advance.   Trust is a set of expectations shared by all those involved in an exchange "including both 'broad social rules' and legitimately activated processes" [50:54].

Bachman and Inkpen [5] argue that the literature has focused on the role of micro-level, process-based trust development in inter-organizational relations, and neglected the macro-level institutional context. They state that participants rely on collective rules, norms and intermediaries, and not only personal and relationships, to develop trust between unfamiliar actors [3,4]. The division between micro and macro-level of trust development has been debated in the literature [e.g. 12,36,42]. This is related to the links between trust and social order [35]. Social order is manifested in the interactions embedded in the particular institutional arrangements. Misztal [35] proposes three different kinds of trust connected with three different kinds of social order. Stable order is the kind of order in which trust is apparent as a routine background to everyday interaction. Having stable and well-recognized rules of interaction gives a sense of predictability, reliability, and legibility to social life. In cohesive order, trust is based on familiarity, bonds of friendship, and common faith. Finally, in collaborative order one needs trust to cope with the freedom of others and foster cooperation. Thus, trust functions in relation to stability, cohesion and collaboration.

Social "ordering" [28] is a source of trust and also an object of trust in manifesting particular institutional arrangements [36]. Heterogeneous actors are involved in dynamic co-production of network ordering, and we can view trust as co-constitutive of the "ordering".

Trust development is not an outcome but a process of network ordering, and trust a source and outcome of social order [35,14].

Trust is related to institutional context, but also sustained and reproduced through collective practices [36]. For example, [15] identify three main sources of trust in networks: knowledge-sharing routines; governance systems; and capabilities making expertise and rules a source of trust. A common understanding is that trust is seen to emerge out of the integration mechanisms that bring actors together [15,38].

Inter-organizational research deals with economic and commercial relations and does not involve non-public multi-partner networks [21,29]. And few studies deal with the issue of trust in digital networks and they focus mainly on dyadic relationships [21,23,46].

How trust is developed in unstructured contexts such as the digital humanitarian sector remains under-researched [31]. This paper will focus on the processes of emergence of network formation and trust development from a relational perspective, which seems particularly pertinent to such an unstructured non-commercial network.

3. Conceptual Framework

Actor-network theory (ANT) offers conceptual sensibilities for exploring the complexity and dynamics of heterogeneous networks of actors and their inter-dependences. ANT has two core principles, relationality and performativity. Relationality points out that all things in the world are relational effects, inter-connected in webs and irreducible to a single dimension [25]. Performativity means that all entities are performed in, by, and through the relationships in which they are involved: stability is the result of an effort, not an intrinsic quality of things [26,27]. The 'ordering' is therefore an effect of operations, maneuvers and processes that keep things in place and heterogeneous networks are effects of these performances.

Distributed collaboration can be understood as bringing actor-networks together in the construction of a network of interactions leading to stabilization. A key facet is the accepting of identities according to prevailing strategies of interaction [8,9]. Callon [9:204] introduces the notion of 'translation' to mean a transformation of the problems and identities involved in the construction of a network. Through this transformation an entity starts acting in a new way, thereby taking up a new role that places it in the new network of relations.

There are four phases through which translation happens [9]: problematization, interessement,

enrollment and mobilization of allies. Problematization "describes a system of alliances, or associations between entities, thereby defining their identity and what they want" [9:206]. Interessement points to the actors that are redefined in the process of problematization and who have to be interested to take up their new roles in the proposed network. Simply redefining and ascribing new roles to others are not enough, they have to be accepted: "Actions by which an entity attempts to impose and stabilize the identity of the other actors is defined through its problematization" [9:207–8]. Enrollment concerns the negotiations that are necessary to make other entities accept the definitions and roles that are ascribed to them. If these negotiations are successful this means that the actors are interested in accepting their new roles: "Interessement achieves enrollment if it is successful" [9:211]. Mobilization is about whether the preceding efforts of negotiation and forming the network by the few representatives will be accepted by the ones that didn't participate [9:214].

By drawing upon these conceptual insights, this paper will attempt to develop a better understanding of the ways two distinct types of humanitarian actors attempt to collaborate by integrating their networks. The paper will focus on the practices through which network innovation emerges in the digital humanitarian network and how the collaborative difficulties such as lack of trust can be overcome through new collaborative interfacing constituted of new interdependences and identities and their underlying governing and organizing practices.

4. Methods

The study follows a longitudinal interpretive approach to exploring the process of trust and network-forming using a qualitative case methodology that aims to generate insights from the data in an inductive grounded manner [47,48]. We adopted a qualitative case study because of its flexible design [41], as it enabled us to probe a planned area of inquiry, but also be receptive to emergent themes. According to Baxter and Jack [6], this is a common approach for understanding the totality of an environment involving the social construction of an activity. The single case study approach is generally useful for "exploring a real-life, contemporary bounded system (a case) through detailed, in-depth observation involving multiple sources of information to report on the 'backstage' environment'" [11:97]. Our case study involves two networks with

embedded units of interaction: the formal and structured humanitarian aid organizations, which can be broadly represented by the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) and the Digital Humanitarian Network (DHN) which agglomerates a number of volunteer virtual and technical communities (V&TCs).

The UNOCHA is part of the United Nations Secretariat responsible for bringing together humanitarian actors to ensure a coherent response to emergencies. However, they have been seen as lagging behind in technological advances that could improve coordination among actors during a disaster. This is partly due to institutionalized practices and databases passed through hierarchies [19]. In addition, it is not uncommon for relief organizations to become isolated from one another's operations [39].

In contrast, DHN is primarily organized as an informal network of V&TCs that work to expand technical capacity during emergencies. Notable members include the *Humanitarian OpenStreetMap Team* (HOT), the *Standby Task Force* (SBTF), *GEOCAN, GISCorps* and *MapAction*, among others. Estimates suggest there are between 24-28 regular members of DHN [37]. These V&TCs provide micro-management digital maps to support aid organizations that request their help [16].

This study took place over a period of three years and was based on a range of secondary and primary data sources: websites, blogs, discussion groups that offer insights into the practices of both formal and non-traditional humanitarian networks; V&TCs meetings, conferences and discussions; industry reports; personal correspondence; face-to-face interviews; and existing transcribed interviews with key representatives from traditional humanitarian organizations and V&TCs. The latter were not conducted by the authors but originate from a study conducted by representatives of UNOCHA who were seeking to understand the difficulties of integrating V&TCs into the operations of formal organizations. These interviews had been conducted in 2011 and our own interviews (Table 1) were conducted in 2014/2015, which highlights our longitudinal engagement.

Table 1. Representative Interviewees

Formal Organizations	Virtual & Technical Communities
Andrej Verity (OCHA, IM Officer)	Heather Leson (OSM, Manager)

Yaelle Link (OCHA, IM Officer)	Helen Campbell (DHN, V&TC Coordinator)
Eric Kaslander (OCHA, IM Officer)	Neil Horning (DHN, Quakemap, Manager)
CJ Hendricks (OCHA, IM Officer)	Kate Chapman (MapAction, Manager)
Simon Alzari (OCHA, IM Officer)	Cathy Furlong (Stats, Without Borders, Coordinator)
Roxanne Moore (OCHA, DHN-Liaison)	Sara Vieweg (formerly QCRI, Expert)
Patrick Hernusi (OCHA, IM Officer)	Nathalie Chang (Internews, Expert)
Maarten van der Veen (Red Cross, IM Officer)	Andrea Tapia (Penn State University, Expert)
Lars Nissen (ACAPS, Manager)	Kenny Meesters (Delft University, Expert)
Luis Capelo (formerly OCHA, IM Officer)	

One of the co-authors spent a research secondment of five months at the Field Information Service (FIS) branch of UNOCHA which had solicited the aid of the DHN for crowdsourcing Twitter feeds to map infrastructure damage [17]. Via UNOCHA sponsorship, the researcher secured DHN contacts who were met individually and gave access to the DHN's governance board.

Primary data collection focused on interviewing UNOCHA information officers, some of their counterparts in DHN and other experts. We asked participants for their views on the practicalities of working together in the context of a disaster-onset, particularly focussing on trust, governance, stability, and integration of digital capacities in their routines. Multiple readings of audio recordings, transcripts, fieldnotes and project documentation formed an iterative narrative analysis. We triangulated with text data from action reports, think-briefs, guidance materials, personal correspondence and internal reports and publications. Our narrative analysis involved constantly comparing the themes emerging from the data and synthesizing them using substantive open coding which led to sensitizing concepts becoming accessible through narrative imagery.

Understanding the challenges and difficulties to integrating the V&TCs into the traditional humanitarian network was our underlying data collection question.

5. Findings

5.1. Case Context

Civic engagement has increased exponentially during recent humanitarian crises with the use of social media and mobile technologies [43]. Grassroot digital volunteerism has used open data, open-source software and geographic information [19] which has become known as 'crisis mapping'. Crisis mapping started during the Haiti earthquake in 2010 [20] through techno-humanitarian groups or V&TCs. Digital volunteers coalesced into the formalization of new actors such as the Humanitarian *OpenStreetMap* Team (HOT), *Ushahidi Inc, Humanity Road* and the *Standby Taskforce* [43]. Crisis mapping communities combine large crowdsourced volunteer support with online crisis mapping techniques. V&TCs composed of thousands of digital volunteer groups, such as the International Crisis Mappers Community, the Camp Roberts Experiments or the World Bank Crisis Camps [45] emerged onto the scene with unprecedented data-gathering digital methods (e.g. *Digital Globe*, *GeoEye)*. Crisis mapping became a staple of augmenting decision support as much of the usual spatial data for disaster-affected areas were not detailed enough to guide response efforts [43]. While, the potential and benefit offered by these new actor-networks is widely recognized, their role can be embodied only as partners of the traditional formal organizations.

The traditional humanitarian network is a diverse network of state-sponsored organizations, although much of the sector is global in scope [39]. The United Nations is a leading body of governance. It is structured into a cluster system, which is a framework that segregates roles and resources. This formal network is experiencing two inter-connected pressures: the emphasis on an evidence-based and data-driven approach to decision-making; and a push towards digitalization in order to improve informational processes. The 2010 Haiti earthquake was an important point when the spontaneously emerging grassroot V&TC phenomenon gave voice to the affected community [33]. These new actors didn't compete with the formal organizations but complemented a capacity that they are not equipped to perform. Whereas, the emergence of the V&TCs network, often seen as 'disaster relief 2.0' [19], is pushing the humanitarian network into the digital age, their engagement with the formal organizations is low and this is considered a lost opportunity [19]. It has been claimed that the main reasons for the failure to integrate their contribution are the lack of protocols, procedures and policies of the formal network to collaborate with external actor-networks. More importantly, the significant differences of these two networks point to issues of trust that cannot be

easily overcome. This difficult process is ongoing and remains a challenge.

In this study, we view the evolution of trust development between these two networks as a complex process entailing deeper transformations in the existing network structures and identities in order to stabilize into a new network. Figure 1 shows the advances in trust development represented in the current inter-penetration of these two networks:

Figure 1. Intersection between UN Humanitarian Cluster Organizations and V&TCs.
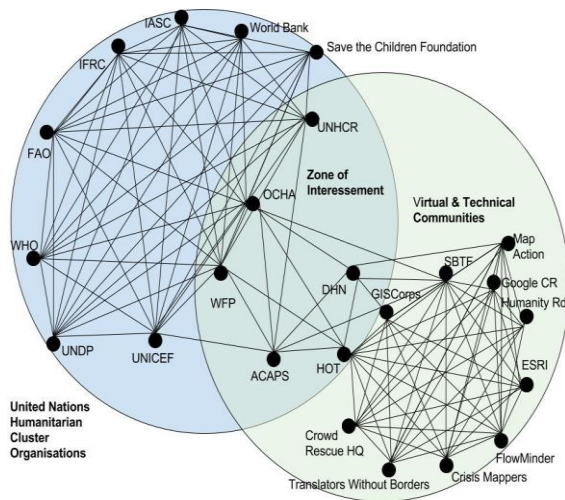
Our analysis is not focused on offering a snapshot of the current inter-penetration (Figure 1), but seeks to uncover the practices that constitute the dynamic emergence and stabilization of this new network ordering or 'network-in-the-making'. Based on our conceptual framework, we analyze our data into four overlapping performative practices that are central to these processes.

5.2. Problematization

Problematization is about (re)defining a problem that points to a new state of affairs. This process consists of framing a common problem that can align the actor-networks together as a solution and springboard to further action. V&TCs state that to "*realize the full potential of the V&TC community, it is imperative that we enter into the process as a committed partner and member of this community*" [13:16]. Traditional actors recognize that "*the ways in which people interact will change, with or without the sanction of international humanitarian organizations. Either those organizations adapt to the network age,*

or they grow increasingly out of touch with the people they were established to serve" [1:7].

Such an integration involves the emergence of new practices to align heterogeneous actors [49]. Callon [9:206] characterizes this process as "inter-definition of identities", however V&TCs have practices and identities distinct from their traditional counterparts. Traditional humanitarian networks are hierarchical, bureaucratic and conservative structures, focused on paper documents systems and V&TCs stand out as flexible, flat, fast and innovative: "*Instead of working in hierarchies, VTCs use flattened, decentralized structures with decision-making and conflict resolution mechanisms adapted from online communities like Wikipedia and open-source software development projects. As a result, the VTCs move far faster than larger players in nearly all circumstances.*" [13:3].

Problematization searches for a solution on the basis of which new identities and inter-dependences can be formed [9]: "**It has become clear over time that in order for the work of VTCs to meet its true potential, they will have to meet formal organizations halfway**" [19:45-6]. This process of 'meeting halfway' offers a route for making this collaboration work by bringing actors together. There is also an understanding that this process will resemble 'morphing' rather than 'connecting': "*One cannot for certain say how these models (VTCs and traditional networks) will evolve and morph….*" (Sanjana Hatotuwa, ICT for Peace Foundation). Callon [9] argues that innovation processes are driven by "translators-spokespersons" who are responsible for articulating the problem and enticing the disparate parties into an alliance. In the humanitarian context the heterogeneity of actors creates a multi-vocality.

5.3. Interessement

While the practice of problematization is about developing a sense for a change and its importance and offering an itinerary for reaching it, the practice of interessement is about accepting the re-definition of the identities and locking allies into place [9]. The re-definition of identities requires resisting and silencing competing interpretations and itineraries that might distance the two communities. Such competing forces come from the ideological foundation of the V&TC community that sees itself as almost a protest movement against both the institutionalized humanitarian system and the broader repressive nature of society as a whole [33]. On the other hand, traditional institutions have developed around 'best practices' in response to donors' demands that make them conservative and unsusceptible to change [10].

The practices of interessement that aim for an 'inter-definition' of identities are based on a rhetoric that doesn't completely refute the existing identities but instead highlights the benefits of potential alignment of interests. In the context of the V&TC community, the dominating rhetoric on the one hand, avoids clashing with the existing ideological motivations of volunteers, but on the other hand, sketches a future that is inevitable for the survival of the network: "*Governance and organization models [are needed] in order to prevent against the negative aspects of informal hierarchy, elitism, and hyper-politicization that occur within naturally evolving networks. This is entirely possible to do while retaining a flat organizational structure and distributed decision-making as we have seen in the Wikipedia case example*" [49].

Documents and some DHN interviewees suggest that in order to avoid problems with the traditional institutions, the V&TCs must become sustainable, better funded, reliable and professionalized and emphasize their benefits [9]. For instance, for increasing the impact of the V&TCs in the humanitarian aid field: "*Collaborating with humanitarian organizations increases the local and global impact of V&TCs. Formal humanitarian organizations have extensive experience responding to the specific needs of affected populations during crises and conflicts. Working with these organizations can potentially provide more awareness of how the skills and the passions of your volunteers can most directly meet the needs of the affected population*" [13:15–6].

Conversely, for formal organizations, not allying with V&TCs is presented as a threat of losing relevance: "*If formal humanitarian organizations do not develop the systems and tools needed to manage the influx of information from affected populations and the VTCs, they risk irrelevance*" [10].

The practices of interessement involve 'luring' by using an attractive rhetoric for the suggested itineraries of the actor-networks. Focusing on the positive dimension of change tends to bracket the anxieties and suspicion that can give rise to resistance. These practices have a distributed nature and are performed through different pundits in reports, public media and developing safe enclaves of discussing and envisaging the collective future.

Rhetoric, however, is not sufficient for making these transformations happen. The hopelessness during disasters was a mechanism for overcoming resistance: "*Bureaucratic delays and impediments, old thinking, senior management that is excited by the prospect of working with VTCs yet don't sign off on the institutional resources necessary to foster such*

collaboration, overcome information overload and a sense of hopelessness driven by the inability to analyze this flood" (Sanjana Hattotuwa, ICT for Peace Foundation).

5.4. Enrollment

There has to be enrollment in the practices through which the actors are being redefined into a new network of relations to accept the transformations and the new roles [9]. While, enrollment can happen gradually through co-participation in disasters, there are also active efforts of introducing the required changes in these actor-networks so that they co-emerge into a stable ordering.

We find two modes of enrollment that often work in combination with each other: bottom-up and local; top-down and centralized. The first is a 'learning by doing' approach that is based on in situ collaborations and developing of inter-personal trust. This is partially orchestrated by providing guidelines on how the traditional humanitarian and V&TCs can collaborate with each other [10]. They set out a route for developing successful collaboration that can help the emergence of the network, not through centrally concerted activities of negotiation but through developing local relationships of trust. These documents aim to increase awareness of how these two actor-networks operate, but also involve recommendations for new practices or organizational re-structuring that can be interpreted as more profound transformations.

The second approach is structured and centralized and is about co-participation in a dialogue with a view of establishing "*a formal channel for these groups to engage in a dialogue about the underlying problems of information management*" [19:13]. There have been different suggestions for these arrangements: "'*intermediary,' 'interface,' or 'board,' to act as a connection between the two sides*" [34]. For instance, the conception of the DHN serves the purpose of facilitating the needed transformation and integration: "*The bureaucracy, the larger governance and lack of interest in embracing VTC models and frameworks. It seems like some organizations don't even know how and if we fit in and who we are. I hope that the new initiative, DHN, would alleviate the latter problem*" (Shoreh Elhami, GISCorps). Centralizing the dialogue aims to formalize the processes of supporting, mediating, encouraging the interactions and integrating the two networks. According to the Harvard Humanitarian Institute [19:9], the development of different initiatives such as 'neutral fora', 'innovation spaces', or 'research and training' consortia can provide a

space and mediate the discussions about common problems, experimenting and sharing tools and practices. Such a dialogue is seen as leading to a clear operational interface that outlines agreed upon communication practices, standards, protocols, roles and priorities.

These two approaches can co-exist and complement each other. The generic, local and transcending approach would not obstruct the more centralized, mediated and traversing dialogue. Both approaches introduce forms of enrollment by providing different itineraries of engagement.

According to Callon [9] enrollment is a matter of introducing 'tricks' and 'devices' that take different forms in order to persuade and gain consent. While traditional organizations tend to be persuaded and enrolled through formal and centralized devices, some UNOCHA individuals have also acted peripherally to create spaces for establishing links between the two networks.

These devices and practices can be organized into the following groups. First, mediators and focal points are instrumental in developing bottom-up a relational infrastructure that spans the two networks: "*Every organization is made up of people. It's about knowing a lot of people, and caring about what they do*" (Willow Brugh, Geeks Without Bounds). Some individuals have become translators or 'boundary spanners' [44] and have opened a space for the emergence of informal interfacing between representatives from both communities. For instance, DHN was partly founded by a UNOCHA information manager, Andrej Verity.

Second, inscriptions, reports, memoranda, documents, survey results, scientific papers, materials and money, or more generally physical and social resources, have spanned some of the network boundaries and served to *"amplify the voices"* [9:27] for integrating and aligning the two networks. To assist with this, FIS and DHN have delivered protocols for coordinating resources and information activities: *"the development of 'hubs' or 'nodes' plays a crucial role in the robustness of the network... bridging the many small communities of clusters into a single, integrated network"* [34] Guidelines [49] acknowledge that brokers have to engage in interessement and relationship-building to create a new social order across the two networks. Meetings and conferences have provided fora for discussion and developing awareness and dialogue for engaging the two networks. Various events, capacity and data hubs have been set up to consolidate trust. DHN has become a major vehicle for enrolling VTC actor-networks: "*We inform humanitarian organizations that VTCs like DHN*

have established formal and predictable procedures for engagement and activation" (Patrick Meir, iRevolution).

Both types of enrollment practices have brought and encouraged the two actor-networks to inter-penetrate. In a subtle manner this process has introduced deeper transformations and let them embody and embrace their new identities. The bottom-up engagements have not only increased the familiarity and social capital on the local level but have also triggered the emergence of new collaborative practices of mutual adaptation. For instance, the growing number of local collaborations between V&TCs and formal organizations demonstrates the emergence of predictability and collaborative order that infuses the network with trust from the bottom-up. The top-down approach similarly has improved the reputation of DHN and made it a representative to interface better with the formal organizations which have opened up to new digital practices as a result.

While a DHN governance committee was established, parallel efforts were made within UNOCHA especially FIS which deals with the coordination of information management activities. FIS has had a leading influence in developing the framework for collaborative protocols between DHN and UNOCHA.

As expected, however, changes towards flattening and becoming more digitally savvy happen at a slower rate at UNOCHA despite the dominating rhetoric: *"There lots of talk about being a flat organization. Being more dynamic. Being more flexible with staff. I see very little of it. The section that we're involved with now is probably the flatter one that I've ever been part of, or that when I look across OCHA I've seen lots of them are very, very rigid. I've seen cases where for example, a P2 is not allowed to speak externally without the permission from a P4"* (Andrej Verity, UNOCHA).

Despite their identification with the horizontal and decentralized structure of open-source communities such as Wikipedia and Occupy, VTCs have recognized that in order to be sustainable, they must professionalize their activities. A disregard for governance structures can result in a hyper-political and detrimental power structure within a leaderless entity. DHN has established means for organizing leadership and coordination across the diverse VTCs since the Haiti earthquake. Notable evidence of the transformation towards professionalization and formalization of the V&TCs is that: "*a majority of them are legal entities, even some of the ones that started out in some way from wanting to be staunch 'volunteers forever' have legalized."* (Andrej Verity, UNOCHA).

This points to the depth of transformations that are taking place in integrating V&TCs that will ultimately produce a stable network ordering. Despite accomplishments in this process of mutual transformations and inter-penetration toward a stable ordering, it is ongoing and goes back and forth, reaches temporary closure and it is unclear whether it will reach a uniformity of humanitarian aid practices.

It is important to be cautious of 'connectivist' accounts of trust development that focus only on inter-personal trust development. We acknowledge the relevance of this approach, but we suggest that trust development is tightly related with the stabilizing of the network ordering that entails change in identities, roles and practices of both actor-networks. As pointed out by Sandra Sudhoff (CarteONG), trust development in networks has to rely on more than just personal connections: *"...it also unfolds with personal relations, once the interlocutors change, even if the collaboration was good, it's not a given that this collaboration will continue…. Just because you speak to one person, does not mean that the rest of the organization will get to know your V&TC. This certainly holds, the bigger the organization you collaborate with."*

5.5. Mobilization

Together with the practices of problematization, interessement and enrollment that concern a limited number of actor-networks, there has to be a process that stretches beyond the few focal actors and reaches a wider audience [9:214–16].

Mobilization is mostly a matter of developing guidelines, informal focal points and power hubs. DHN has developed a level of credibility and legitimacy across VTCs. An important aspect has been the association and integration of some of the informal power hubs developed around influential individuals and communities who have become ready to accept standards, communication and activation protocols and procedures: *"I would have to emphasize the DHN role. The VTCs landscape seems too cluttered at this time and having a centralized body that clarifies each player's role and credentials will convince traditional organizations, to call on us and "trust" us. DHN can also provide a platform for showcasing each VTC's strength and areas of interest and also become a vehicle to connect the members internally to boost the network's overall capacity and portfolio"* (Shoreh Elhami, GISCorps).

Eventually, UN information officers learned from VTCs they can distribute information directly to the public through social media, bypassing mass media

and incorporating new verification methods.

6. Discussion and Conclusion

This paper offered an account of trust-producing practices in a dynamic, unstructured and non-commercial network environment. Our processual account presented network trust as the outcome of performative network ordering practices. Social order suggests routines and predictability upon which trust can grow. Network forming implies an emergent social order, and trust is not just something happening to predetermined and stable actors; as shown through our actor-network analysis it is performed through producing new types of actors, and trust and network development are intertwined in emergent networks.

Callon [9]'s four practices were a valuable sensitizing device to understanding the inter-penetrating endeavors of both networks towards a new network. These practices expand in important ways our understanding of trust in networks. The practice of problematization points to the rhetoric that motivates the need of a new network ordering. While, in an institutionalized and commercial context this practice might be irrelevant, in the case of a dynamic, unstructured and non-economic network environment, it points to the need for a negotiated articulation of a problem that can trigger the embracing of change and this also leads to new identities and roles. The practice of interessement shows that integration and change don't happen in a vacuum and there needs to be persuading and luring of actors to gain trust and participate. This also shows that enrollment involves integration processes and practices, which can be both bottom up and top-down. Finally, mobilization is scaling up the new social ordering. In all phases, actors also rely on many activities, events, documents, and technical artefacts. Our analysis is far removed from a 'rationalist' perspective that reduces trust development to making rational decisions about network connections [14]. Trust in emergent networks is not so much about having a particular expectation about another's actions, but is about feeling less vulnerable about embracing change, which will lead to a new ordering.

This paper contributes to the emerging literature on trust in networked environments [21,23,31,46]. In particular, the study aligns with the claims that trust in such complex network settings emerges out of integration mechanisms that bring actors together [15,38], but our processual orientation furthers these insights by highlighting the practices that constitute these processes. In addition, our conceptualization of trust, inspired by the sociology of translation [9,26], and underpinned by relational and performative

ontologies, avoids the division between 'micro' and 'macro' levels of trust, and instead focuses on the trust-producing and network building practices. In other words, our focus is not on the sources of trust, but on the practices through which the network is becoming performed into social ordering. In this way our notion of trust is also anthropomorphized, which points to the crucial role of various artifacts that enable or emerge around these practices.

While such global networks always preserve an element of continuous 'becoming', we envisage that a stable network ordering will exhibit predictability and bracket risks and uncertainty eventually, which will also reduce the importance of interpersonal relations. This state of network stabilization shares some characteristics with the institutional and economic context typical for inter-organizational trust research, where collective rules and norms and intermediaries allow for unfamiliar to actors work together [3,4].

Our longitudinal engagement with the process of network re-ordering and stabilizing shows that this process will inevitably entail the emergence of new practices and network positions that will fundamentally re-configure the image and identity of the humanitarian aid organizations. Another reading for this fundamental change is the role of social media and mobile technology as being the disruptive affordances to the affected populations in humanitarian crisis. According to such a view, the force of the digital disruption works through the emergence of V&TCs that by integrating with the formal network of humanitarian organizations will also introduce new 'digitalized' practices of humanitarian aid, and along this change many unintended consequences will emerge.

7. References

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