

## **COORDINATING HUMANITARIAN INFORMATION: THE PROBLEM OF ORGANIZATIONAL AND TECHNICAL TRAJECTORIES**

Andrea Tapia, Edgar Maldonado, Louis-Marie Ngamassi, Carleen Maitland

### **ABSTRACT**

In this paper we examine two humanitarian information coordination bodies. The goals of both coordination bodies are the same, to find mechanisms for multiple organizations, engaged in humanitarian relief, to coordinate efforts around information technology and management. Despite the similarity in goals, each coordination body has taken a different path, one toward defining the problem and solution in a more technical sense and the other as defining the problem and solution as more organizational in nature. Our data suggest that coordination bodies that pursue problems requiring low levels of organizational change are more likely to have visible successes. Coordination bodies that pursue a more challenging agenda, one that aims for information management or management of information technology in ways that require organizational change are likely to face greater challenges and experience more failures. In a time where coordination bodies are seen as an answer to the problem of information sharing during disasters, it is essential to gain understanding concerning the success of these efforts.

### **Keywords**

Humanitarian NGOs, coordination body.

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### **INTRODUCTION**

In the hours immediately following a devastating natural disaster thousands of international relief organizations spring into action and send thousands of disaster assessment teams to the afflicted region. Each team collects data concerning rescue needs, medical needs, food, shelter and security needs. The data collected is then sent back to each organization's headquarters and is used as the primary input into a decision-making machine that outputs the needed help and supplies to the region via their own supply chain.

While these response mechanisms have served the relief community well for decades, with the simultaneous increase of disasters, response organizations and technologies, organizations and their donors are starting to significantly question their method of doing business (see Stephenson & Kehler, 2004; Stephenson, 2005).

The sad fact is that each of these thousand responders asks the same survivors the same basic situation assessment questions to store in their private in-house database to support their process. The data gathering process is not shared, the data itself is not shared and the process of making decisions and planning responses is not shared. Within the disaster zone itself, survivors suffer survey fatigue at the hands of multiple responders, too much or too little of what is needed is sent, the wrong personnel and help is sent, and both can be sent to inappropriate locations. In an already confusing time, the state of confusion is escalated because of the inability of the responders to share information across organizational boundaries. Despite efforts by the UN to coordinate assessments, there has been very limited success in avoiding duplication of assessments. Beneficiaries are frequently on the receiving end of assessment visits by as many as six separate NGOs – needs assessments that do not necessarily guarantee that those needs will be met. This current approach is both inefficient (since it wastes valuable resources) and

ineffective (since it creates resentment amongst beneficiary populations), as it does not ensure that assistance will reach the right people.

This problem of redundancy and inefficiency is already well known by the responding organizations and by their donors (see Tapia et al. 2009 and Tapia et al. 2010). There has been an outcry on the part of the United Nations and several major players to stop the madness, and learn to share data and coordinate. With the use of modern information and communication technologies, there is no reason data could not be shared at multiple points during the response process (Amin & Goldstein, 2008; Van de Walle et al., 2009). In some cases, this has been put in terms of coordinate across organizations or risk losing more human lives.

The result is the belief that information coordination and information sharing saves lives. This has been a powerful motivator for change. There have been hundreds of small-scale, bilateral coordination efforts, which have ended in some success (Goyet, 2008; Sasin, 2008; Amin, 2008). However, in the case of multi-lateral, large-scale coordination efforts around information, there have only been several very public failures. Millions of dollars have been poured into information coordination efforts, specifically on creating a common disaster assessment tool, which still has not gathered much support or use across organizations (Stephenson, 2005).

Since most of the large-scale, multi-lateral project-based efforts have ended in failure, a new tactic was engendered. Several independent donors, such as the Gates Foundation, have financially supported the creation of "Coordination Bodies" in the humanitarian relief space. These bodies are standing committees, which have members representing anywhere from seven to twenty-five different non-governmental organizations (NGOs). The coordinating body will have a focus, such as sharing information through technologies, and serve both to build a network and common capacity between organizations and to host several projects. The membership is comprised of the information technology managers from each member organization. The funding for the coordinating body is long-term, the membership is stable, and there is significant support and responses from the member organizations--three elements that address some of the reasons for failure of past project-based efforts.

In this paper we examine two of these coordination bodies, Large International NGO Coordination (LINC) and Organizational Change for Emergency Alliance (OCEA). The goals of both coordination bodies are the same, to find mechanisms for multiple organizations, engaged in humanitarian relief, to coordinate efforts around information technology and management. Despite the similarity in goals, each coordinating body has taken a different path, one toward defining the problem and solution in a more technical sense and the other as defining the problem and solution as more organizational in nature.

Given the desperate need for information coordination and sharing among humanitarian relief organizations and the hopes and dollars pours into coordinating bodies as a solution, our research questions are;

**RQ1: What is the process by which each coordinating body has defined its relationship to the problem and solution of humanitarian information coordination?**

**RQ2: Which of the two forms of humanitarian information coordinating bodies, technically-focused or organizationally-focused, is most likely to lead to more successful coordination and information sharing?**

There are limitations to our ability to fully answer this question. We have only examined two coordination bodies at one point in time. We cannot make claims about all coordination bodies and all information coordination efforts. However, we believe that the potential advantages of this research outweigh the limitations. First, the two coordinating bodies chosen are exemplars in the space. They are the largest, most well known, most long-lived and comprised of the largest players in the humanitarian information space. They will serve as models to those who come later. Second, there has been no research on the role of coordinating bodies in regard to the problem of humanitarian information coordination.

Lastly, in a very practical sense, millions of dollars are being thrown as coordinating bodies as a solution to a very real problem with human lives on the line. It is imperative that someone make a first attempt at examining the nature of these coordinating bodies and their impact on the problem at hand.

## **THE CONTEXT:**

### **INFORMATION COORDINATION AMONG HUMANITARIAN NGOS**

It is a challenging goal to improve the coordination of disaster relief. Organizations operate in conditions of extreme uncertainty. This uncertainty has many sources, including the sporadic nature, the lack of warning, and the wide array of actors who may or may not respond. This uncertainty increases the need for information, but at the same time the amount of operational information during a disaster can be overwhelming (Knuth, 1999). Coordination in this context means the sharing of information, resources, and responsibilities to achieve a common goal. Coordination is seen as an important strategy used by public, private, and nonprofit institutions to achieve organizational goals. Humanitarian NGOs are increasingly working together, through inter-organizational efforts such as coalitions, alliances, partnerships, and coordination bodies (Guo & Acar, 2005; Zhao et al., 2008; Donini and Thomas 1996).

Coordination efforts among NGOs are thought to function as a solution to the duplication of efforts, poor planning and implementation of relief efforts, and a lack of knowledge among humanitarian organizations on the developing situation. This NGO coordination entails developing strategies, determining objectives, planning, sharing information, dividing roles and responsibilities, and mobilizing resources. Coordination among NGOs is also concerned with synchronizing the mandates, roles and activities of the stakeholders and actors at higher organizational levels. NGOs coordination ensures that priorities are clearly defined, resources are efficiently utilized and duplication of effort minimized in order to provide coherent, effective and timely assistance to those in need (Harpviken, Millard et al., 2001).

In this paper we are examining one form of NGO coordination. While we recognize that many forms exist, we have chosen the coordination body as the unit of analysis for this study. A coordination body is a relatively new structure operating between NGOs, especially in the focus area of IT coordination (see Tapia et al. 2009 and Tapia et al. 2010). According to Bennett (1994), the general characteristics of NGOs' coordination bodies include (i) independence from government; (ii) existence of a semi-permanent secretariat; and (iii) a variety of participants sharing common ideology. NGO coordination bodies are groups of NGOs brought together with the purpose to improve coordination of their activities (Saab et al., 2008). Work on NGO coordination has been documented in both academic (Bennett, 1995; Guo & Acar, 2005; Van Brabant, 1999) and non-academic (Donini & Niland, 1994; Harpviken et al., 2001; Uvin, 1999) sources.

The development of information systems for disaster management, as well as in many other domains, is increasingly being undertaken in these inter-organizational contexts. Despite this trend, little is known about the mechanisms of coordination on information systems project processes and outcomes. Whereas such initiatives may face resistance in the for-profit sector as competitive pressures create challenges for collaborative systems, in the non-profit sector there is a great incentive for collaborative systems. The particularity of the emergency and relief sector is that although NGOs may compete for donor dollars and to offer more efficient and effective help to beneficiaries, there is a common benefit for all agencies when help is delivered.

Information is a key asset for humanitarian inter-organizational coordination. In particular, IT has been shown to play a critical role in inter-organizational disaster response (Comfort, 1990; Comfort & Kapucu, 2006; Moss & Townsend, 2006), while at the same time hindering inter-organizational coordination (e.g., Bui et al., 2000; Junglas & Ives, 2007; Miller, Granato, Feuerstein, & Ruffino, 2005; Saab et al., 2008). Inter-organizational coordination issues related to technology include technical and semantic interoperability, non-matching data formats, different presentation forms, and heterogeneous systems. Researchers have identified numerous information management related problems, including the quality

and timeliness of information (e.g., De Bruijn, 2006; Fisher & Kingma, 2001), unpredictability of required information (Longstaff, 2005), unwillingness to share (Ngamassi et al, 2008), and mismatch in location, information overload, misinterpretation of information (Bui et al., 2000; Saab et al., 2008). Also, the information issues in inter-organizational coordination are closely related to the issue of uncertainty, with higher levels of uncertainty requiring greater amounts of information to be processed by decision makers (Galbraith, 1973).

The take away from this short review of the literatures pertaining to coordination among NGOs, specifically around information, is that coordination is simultaneously viewed as essential and challenging for many reasons. Information issues and needs are prime motivators for collaboration between organizations, but this motivator also produces additional collaborative barriers. Most importantly, coordination bodies are growing as a popular solution to both coordination and information problems in the humanitarian sector.

Our goal is not to answer the question about how well does one NGO coordinate with another, nor to answer what form of coordination is better than another. Rather our goal here is to illuminate one new form of coordination, which may have implications for future NGO coordination efforts. We make no claim that the coordination body is the best form of coordination or even an effective form of coordination, we assert that it is growing in popularity and deserves scholarly attention.

## **THEORETICAL APPROACH**

For the purposes of this paper, we are interested in the process by which the agents of two coordinating bodies have, over time, created and recreated their own structural patterns. This creation can be seen as reciprocal interaction of human actors and structuring features of organizations. This is often referred to as the duality of structure in which regular, patterned behavior of individuals becomes standardized practice in organizations and institutions while at the same time these same structuring elements are drawn upon by individual actors in their ongoing interactions. These structures shape individual behavior and are shaped by individual behavior simultaneously. (Cohen, 1989; DeSanctis & Poole, 1994; Giddens, 1976, 1984, 1990; Giddens & Pierson, 1998; Held & J.B. Thompson, 1989; Orlikowski, 1992; Orlikowski & Baroudi, 1991)

The definition of structuration we employ here is the “knowledgeable actions of human agents discursively and recursively forms the sets of rules, practices and routines which, over time and space constitutes his conception of structure.” (Rose, 2002) Giddens defines structure as ‘rules and resources recursively implicated in social reproduction; institutionalized features of social systems have structuring properties in the sense that relationships are stabilized across time and space’. Structure is not an immutable or external form. Structure is what gives form and shape to social life, but it is not itself the form and shape.

Important to structuration theory is the concept of agency. Structure exists only in and through the activities of human agents (Giddens 1989, p.256). Human agency, in Giddens formulation, is the ‘capacity to make a difference’ (Giddens 1984, p.14). However, social practices are not random but ordered and stable across space and time. Actors draw upon ‘structuring properties’ (rules and resources) which are institutionalized features of societies (Clark, 1990). Agency and Structure are two concepts, which are co-dependent and recursively related within the duality of structure. ‘The structuring properties of social systems are both medium and outcome of the practices they recursively organize’ (Giddens 1984, p. 25).

Structuration theory has been used to theorize aspects of the relationship between IT and organizations (Orlikowski, 1992; Orlikowski & Robey, 1991). The ‘duality’ of technology is expressed as the social product of subjective human action within specific structuring and cultural contexts. It’s constitutive role is simultaneously an objective set of rules and resources involved in mediating (facilitating and

constraining) human action, and thus hence contributing to the creation, recreation and transformation of those contexts (Rose, 2002). Structuration theory has also been used to gain insight into an empirical situation. Scholars have employed structuration theory to examine technologies in hospitals, (Barley, 1986) and private industry (Jones & Nandhakumar, 1993; Karsten, 1995; Orlikowski & Robey, 1991). We will employ this last use of structuration theory. We will employ the basic concepts to better understand the process by which our two cases' structures have been created and maintained overtime.

## **METHODOLOGY**

We present data drawn from case studies of two collaboration bodies. The selection of case study as a methodology for conducting this research is appropriate for three reasons. First, case studies have been identified as an appropriate and important tool for the study of information and communications technologies in organizational contexts (Darke et al., 1998). Secondly, the case study is viable method for studying areas that are underdeveloped in the literature (Benbasat et al., 1987). Third, the case study method is particularly well suited for studying phenomena that cannot easily be distinguished from its context.

The two cases under consideration were selected, as at the time they were the best representative sample of the forms of IS-focused collaboration bodies within the humanitarian relief sector. In addition, the chosen cases were the most active and productive, had the strongest membership, and had existed for several years. However, it is important to note that each collaboration body was established independently of the other and had its own mission, goals, funding streams, membership, and projects. It is also important to note that data from two collaboration bodies does not constitute a representative sample and cannot truly generalize to the entire sector. The data under consideration should be treated as exploratory in nature.

Data for the two cases were collected over a period of 21 months (October 2006 through June 2008) and data sources included semi-structured interviews, direct observation, document analysis and surveys. The Large International NGO Coordination body (LINC) and the Organizational Change for Emergency Alliance (OCEA) are two international coordination initiatives for NGOs working on the emergency and relief sector.

Interviews were conducted with members of both coordination bodies. The subjects were all IT managers from large, international humanitarian and relief organizations such as Care, Save the Children, Mercy Corps, etc. Nineteen telephone interviews were conducted with LINC staff and representatives of member organizations. Twelve telephone and face-to-face interviews were conducted with OCEA representatives. More significantly, each case includes data gathered through extensive observational and participatory data collection techniques. Two researchers attended face-to-face meetings for each case. Supplementary data was collected by participation in numerous conference calls for each case.

For this study we used a form of analytic induction, a mixture of deductive and inductive approaches, for our analysis (Epstein & Martin, 2004). First, we developed a set of deductive codes based on insight we had gained from the larger research, previous studies and the core interview questions. During the coding process we also let some inductive codes emerge from the data. The inductive approach reflects frequently reported patterns used in qualitative data analysis. The process of coding was iterative and cyclical based on the framework developed by Seidel (1998).

In the section below we describe the choices and process in which each collaboration body has engaged during their existence in regards to defining the problem and themselves. We have chosen one illustrative quote for each point. The quote is intended to provide a qualitative example of the voices of our subjects, giving the reader a feel for the subject matter, our data and our evidence.

## CASES

### Case 1: The Large International NGO Coordination body (LINC)

LINC is a coordination body of humanitarian NGOs. With help from initiators, the organization sought to pool NGOs' demand for IT donations, but quickly took on a range of other activities including coordinating information and communication technologies (ICTs), both during disaster response and development activities. LINC membership grew from 7 organizations in 2001 to 22 in 2008. The organization's administration and projects are funded through a combination of grants and membership dues. LINC is wholly autonomous, having established itself as a non-profit organization. LINC's activities initially focused on the headquarters level of its member organizations, which allowed for collective bargaining with vendors, to provide ICT services such as satellite telecommunications, coordination of ICT policies and practices, and more. Within LINC, project involvement is voluntary and funded by participating organizations. The consensus surrounding projects has been fairly easily achieved because participation is voluntary and thus those uninterested are unlikely to stand in the way of others for whom the projects are a priority.

With regards to activities, LINC develops and implements tools which provides data and voice connectivity in a small, transportable suitcase allowing its members to quickly establish a short-term communications solution in the event of a disaster or emergency. LINC tests and manages the deployment of communications infrastructure to provide its members with access to the Internet at remote project sites where relief and development operations are carried out. LINC provides forums for member organizations to document and share their field experiences regarding the effectiveness of their telecommunication technology and to suggest ways to improve future delivery of services. LINC provides its members with ICT skills capacity building to improve emergency response.

### Case 2: The Organizational Change for Emergency Alliance (OCEA)

The Organizational Change for Emergency Alliance (OCEA) is a coordination body consisting of seven agencies and was funded by a large foundation. Its goal was to improve preparedness for relief efforts of NGOs over a two-year period. In particular, it focused on four specific areas: Staff Capacity Development (Initiative 1); Accountability and Impact Measurement (Initiative 2); Disaster Risk Reduction (Initiative 3); and Information and Technology Requirements (Initiative 4). OCEA had a decentralized project management structure that coordinated the implementation of its activities for its planned two-year program. OCEA4, the last initiative of OCEA focusing specifically on ICTs, is the one discussed in this paper. The main activity of the OCEA4 was to conduct an assessment of how information is managed in emergency response and what tools and resources are available for these activities.

Members commit themselves with human resources and time to the group, but there is no direct contribution made by the member organizations. All funding sources are external. Under external funding, members find it easier to engage on strategic initiatives that are not going to impact their internal reports. Usually, NGOs look to participate on programs that can have a significant positive outcome from a donor perspective. Therefore, there is a sense of freedom among OCEA members in relation to what kind of projects can be proposed.

### LINC and OCEA Divergence in Structure

In accord with our theoretical lens of structuration, we focused on the structurizing processes that each of the coordinating bodies employed to structure themselves as solving either technical or organizational problems. The main difference between LINC and the OCEA is the focus of each organization. One of the subjects put it in the following words:

*LINC in my mind is an IT specific collaborations. Whereas OCEA is more emergency-coordinated.  
(OCEA Subject #4)*

One of the subjects explained how some of the activities of OCEA and LINC overlapped, but were still separate.

*The tension comes from LINC in that it is primarily focused on technology, and OCEA is primarily focused on organizational change. It is sort of a Venn Diagram, and in the middle is this big overlapping space. The question is who runs that space and where does that space fit in and who manages that space is key. (OCEA Subject #2)*

OCEA is focused on organizational change.

*As you know OCEA is all about the collaboration within the agencies. If we are talking about for example people implementing proper email policy that is not an OCEA project. That is for each individual organization to look at and identify what is a proper email policy and to implement it. OCEA might be able to provide support to that but it's not something where people can really collaborate together on. (OCEA Subject #2)*

The OCEA group changes organizational procedures and practices that impact on the efficiency of the NGOs performance as a whole. Some of the initiatives have a technological aspect, but the main goal is "building links within the differences [sic] units and the different agencies" (OCEA Subject #2).

In our examination of the coordinating bodies the majority of coordination activities took place through project related activities. The projects help to develop trust and bilateral relations among members, while building systems and processes that foster coordination. In the context of our larger research we have come to find that the project is a primary method of coordination within these humanitarian NGO coordinating bodies. (see Maldonado, et.al, 2009; Tapia, et.al, 2009; Maitland, et.al. 2007; Maitland, et.al. 2009; Saab, et.al., 2008). Information technology (technically-focused) projects are defined as projects that encompasses computerized and auxiliary automated information handling, information storage and retrieval, data transmission, and related interactions between people and machines. An information organization project (organizationally-focused) is one in which the focus of change is on the organization and on the information and on the relationship between the two, rather than on the systems or devices themselves.

### **LINC: Project Examples-Down a Technological Path**

LINC was created to deal with specific technological problems. Therefore, the members of LINC are not focused on solving organizational issues. Once a specific problem related to connection or acquisition of new technology emerged, the coordination body focused on solving it. One of the members of LINC described this behavior in the following way:

*[...]if you have a common problem, the only difference that can be is the scale of that problem. Some organizations are talking about the connectivity of 5 users, while some are talking of 5000. These different views can actually give you a much wider solution instead of a specific very organizational centric solution that cannot be implemented later on (LINC Subject #13).*

The connectivity initiatives are important for LINC and are related to the deployment of satellite technology in remote areas. One of the subjects emphasized the potential candidates for members of LINC should be aware of that.

*The thing that brought us all together was the common need for connectivity[...] For NGOs that do not see connectivity as a big problem, [they] do not see a benefit in joining LINC.(LINC Subject #20)*

One of the earliest projects of LINC was to facilitate shared access to VSAT (Very Short Aperture Terminal) services. VSAT technology is particularly useful when terrestrial infrastructure has been destroyed, and as such provides a powerful tool to mitigate damage incurred by disasters. One possibility

for NGOs to somewhat lower the costs for VSAT deployment is to bundle forces and cooperate to deploy VSAT technology; i.e. to jointly order, install and maintain VSAT. This could be achieved by making a collective agreement with a satellite provider that, through increased business opportunities by LINC members, would provide attractive prices. The LINC-VSAT project is operational across 10 out of the 23 LINC member NGOs. The master contract was negotiated by the project leaders across these 10 organizations and made available to all other LINC members. The VSAT project was primarily a collective technology investment.

A second project of LINC has been their Portable Connectivity Kit (PCK). The PCK provides data and voice connectivity in a ruggedized suitcase. A technology vendor developed the PCK with input from the LINC members. It was scheduled for early field tests in Africa, when a tsunami struck. Through the teamwork of LINC members operating across the globe, the PCK trial units were hand-delivered from the USA to the neediest sites to support relief workers. The PCK provided a critical near-term solution until longer-term communications could be rebuilt. The team response was possible because LINC coordinated daily conference calls among members to share information about technology needs and strategies for implementing solutions, avoiding duplicated effort.

### **OCEA: Project Examples-Down an Organizational-Change Path**

OCEA is focused on generating a change in information management and sharing rather than simply changing technology:

*OCEA is about putting the IT departments in more close alignments with the programs with the people who are actually carrying out the response. (OCEA Subject 2)*

The group chooses their projects by taking into account the long-term impact and an organizational point of view. In 2006, OCEA initiated the latest in a series of projects that have tried to identify a core set of information that is common to all agencies engaged in humanitarian relief and disaster response. OCEA attempted to create a Common Assessment Tool. A common assessment platform is a tool that can be used by all of the member organizations in the initial stages of an emergency response. Despite careful planning and what appeared to be an ideal organizational environment, the project failed to implement the joint assessment. Previous failures have been attributed to the strategic nature of the information.

In 2006 OCEA decided to fund a project set out to address two perceived needs of ICT professionals working in emergency response: A “knowledge base” or central repository for the sharing of technical information about various types of emergency-appropriate hardware, software and telecommunications solutions. An “emergency response center” or space dedicated to specific emergencies as they arise, where ICT professionals that are responding can share technical information about ICT activities and availability in the affected area. Through this project, OCEA attempted to tackle the broader issue of information sharing. The collaboration body identified a project to develop a portal through which the agencies could share information. One organization took the lead and established the portal’s structure and began to populate it with information. The *IT Emergency Website* project did not get the kind of adoption that was necessary for its long-term success. The execution was consistent with the original project plan but like many attempts at innovation, it may have misunderstood the requirements of its target user group. For example, the “emergency response center” did not achieve the original uptake goals because members wanted to be candid about their emergency response work and challenges, but did not want potentially sensitive information available in a public forum such as the *IT Emergency Website*. In recognition of this, the decision was made to fold the ER centers into the OCEA intranet, to which access is limited to members only.

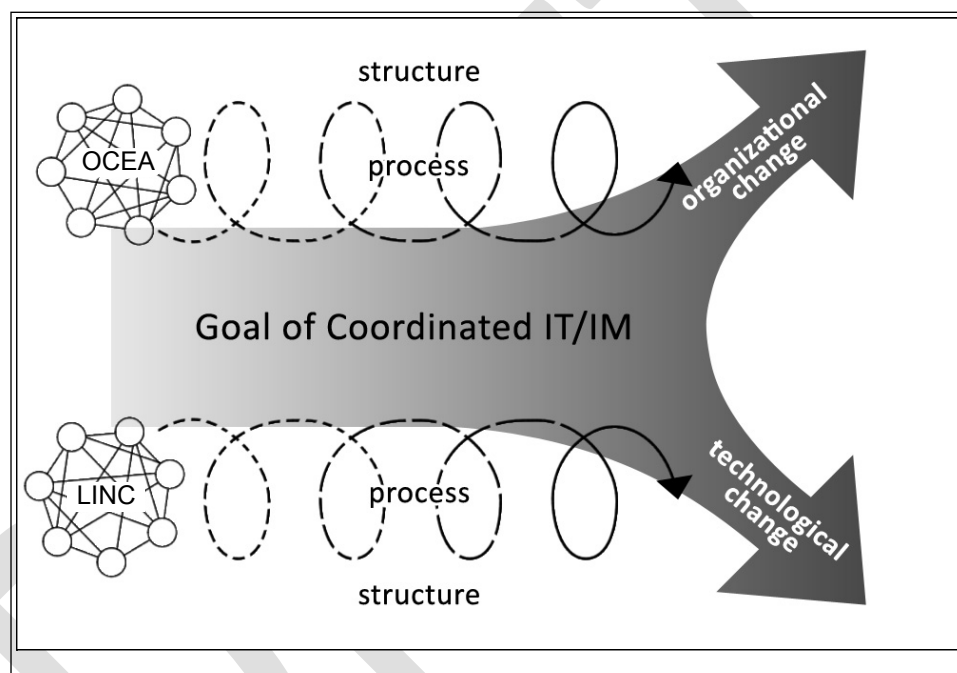
### **ANALYSIS**

In this paper we discuss the structural development process of two coordinating bodies. Both coordinating bodies began within a few years of one another (2002-2004). Both were created for nearly the same purpose, to encourage the coordination of IT across organizations engaged in humanitarian endeavors.



Both had overlapping individual and organizational membership. The memberships were small and through invitation only. For most viewers, these two coordinating bodies began traveling on the same trajectory from nearly the same point. Yet, their trajectories diverged dramatically. Because of this divergence we ask the question, what is the process by which each of these coordinating bodies diverged, specialized and focused in such different ways?

While this environment is interesting and drove both coordinating bodies to a particular process, we can say that it can be held constant because both coordinating bodies were exposed to and originated within the same environment. What is interesting is the structural development process that was unique to each. We believe that elements of the structural development process are important in that they often act deterministically on the trajectory for an organization. At the moment when each of these coordinating bodies was established all possible structural development trajectories were open to them. However, once a first set of choices was made, the process began, and future choices were limited. Each choice limited all futures choices. The coordinating body began to solidify into a particular pattern of behavior, choices, problems, possible projects and types of choices. See Figure 1 below.



**Figure 1 Process**

According to Structuration theory, there are three types of structures in social systems, signification, legitimation, and domination (Giddens, 1984). Signification is about producing common meaning, often through the act of definition. Thinking theoretically, each coordination body defined the humanitarian information problem differently. LINC defined the problem as a technical problem in which technical solutions were appropriate. This definition led them to suggest technical cross-organization collaborative projects in which connectivity was collectively purchased or devices were built. These projects were well defined, well staffed and well funded. They had a clear scope and outcome. Most of the technical projects engaged in by LINC met with success. This led LINC to learn from their success and select more technical projects. Since the outcomes of the solutions can be evaluated more easily on practical projects, a feedback process encourages members' further participation, and the decision-making processes becomes simplified and streamlined since the coordination body will only be engaging technical problems. These elements reinforce the other structural development process of the LINC initiative.

This selection process reaffirmed the definition of the problem as a technical one and established the organization as having a technical trajectory. OCEA, on the other hand, sought out the most challenging problems to the field, those which required the most organizational commitment and change from each home organization. While the problems were noteworthy, OCEA did not meet with much success in tackling these problems. OCEA defined the humanitarian information problem as a social-organizational problem and thus had to change organizations and structures and functions, rather than systems and devices. OCEA attempted to take on the problems that “mattered” not the problems that they could handle. They met with failure on almost all fronts.

The second form of structure is domination, which can be seen as the use of power often in the form of controlling resources and making decisions for the group. Each coordinating body selected projects into which they placed their funds and efforts. Over the two-year period of time in which both LINC and OCEA were observed by the research team, both carried out several projects. LINC engaged in information technology related projects. These projects are easier to solve in many ways. First, information technology-based barriers to coordination can to some degree be associated with technological layers (e.g. the OSI model or TCP/IP stack) giving managers across organizations and common frame of reference. Further, information technology managers typically occupy a particular position on an organizational chart and hence it is easier to identify partners for coordination.

For OCEA, they engaged in strategic, organizational, information management problems. In the resolution of information management barriers there is no common frame of reference and the problems are more diffuse, nor is there often an established organizational unit to which one can propose solutions. Information management issues typically require higher levels of organizational change. This is a far more extensive adjustment than is typically required by the adoption of a new platform or piece of software. The various projects undertaken or recommended by the coordination bodies require different levels of organizational change. Those that require high levels of change also typically represent significant coordination barriers that when overcome will bring significant coordination-related benefits (greater efficiency and effectiveness). It is noteworthy that those projects that attempted implementation but failed in general require higher levels of organizational change than the successful projects.

The third form of structure, according to Giddens (1984), is legitimation, which can be seen as standards, norms and order. In this case legitimation can be seen through funding and membership practices which led to legitimation structuring. OCEA was funded externally for a finite period of time while LINC was funded by membership dues. This difference impacted the coordinating bodies significantly. The membership dues paid by the LINC members produced individual members who actively participated and sought return on their investment. The members often needed to justify the expenditure of the membership dues by demonstrating a savings of dollars through a coordinated activity. This demand for a visible and quick return on investment led the membership to choose projects which were easy to solve, which were highly visible, and which had a clear bottom line for savings to the member organization. These projects ended up being very hands-on, technologically-focused and low-end operational. The projects chosen by LINC were safe, practical and low risk. LINC resulted in more measurable success for each effort because of this.

For OCEA, each member organization committed only time. The problems that OCEA members chose required each member organization to change itself in some way, like collect common data, rather than make common technological purchases. The funding for OCEA was also limited in time. This drove the members to act quickly and tackle big problems. The limitations on time spurred OCEA on to take on big, complex problems and become more risky with their project choices. OCEA struggled to define success for any of its projects, yet found at the end they had achieved some form of coordination.

In the case of LINC the membership was augmented via invitation only. Each member organization sent a representative to LINC events, meetings and workshops. These individual representatives tended to be highly technical employees of large NGOs, in the middle of the organizational hierarchy. This produced a

very homogeneous membership in LINC. During the interviews the members of LINC often talked about how easy it was making decisions with the other LINC members since they were all straightforward, technical thinkers. They talked about how nice it was to be around other NGO IT staff, just like themselves. This homogeneity of IT staff members as LINC representatives also led to a homogeneity of technical projects being chosen and technological solutions being chosen to all posed problems.

With OCEA, the prestige of belonging to such an elite group and the noteworthy external funding, individual representatives chosen to participate in OCEA were not typically IT staff people. These members were high-level administrators, including several CIOs of large international NGOs. Their backgrounds were also varied in that some had some IT training, some had administrative training, and others had come up the ranks of NGOs from other areas. The membership of OCEA was far more heterogeneous than that of LINC. The membership of OCEA was also focused on their home organization. The membership was far less technically oriented and far more knowledgeable about the entire NGO and its needs, issues and capacities. Because of these differences, the OCEA membership took on projects that focused on information, rather than on technology, that were strategic rather than operational, and that were complex and required each home organization to change in some way in order to make the projects successful.

Instead of looking at an artifact, object or outcome, we focus on the process of development, design or creation of a structural system. Williams and Edge (1996) describe the process of structural innovation as reciprocal, iterative, non-linear and spiraling. Inherent to a focus on process is a focus on choices that were made by the relevant groups along the way. Williams and Edge describe these choices as a “garden of forking paths” in which choices lead to very different structural outcomes (p. 866). Thomas (1994) believes the study of choice in the structural process is key to understanding the shape of the system.

Like the garden metaphor, Thomas also sees the process of developing structural systems to involve a series of choices. Each choice represents the interests and power of those making the choices. One particular choice is the ability to define the problem as a technological problem. Thomas argues that there are several key choice points along the development progress in which the relevant social groups exert power to define problems, solutions and methods that shape the outcome (1994, p.13). Once several choices have been made along a particular path, it has been argued that there is a certain amount of irreversibility (Collingridge 1992, Callon, 1993) as earlier technological choices pattern subsequent development. Each past technological choice has the potential to limit all future choices.

Each step along the path took LINC and OCEA further away from each other. Each project that was chosen and successfully completed, led to the selection of similar projects. For LINC this led to the selection of more and more technically focused projects. For OCEA no projects can be seen as truly completed or successful, except for perhaps the first “assessment of the field” project.

## **CONCLUSIONS AND IMPLICATIONS**

After such major disasters as the South East Asian Tsunami, Hurricane Katrina and the Pakistan, Haitian and Chilean Earthquake, the providers of humanitarian and disaster relief identified response problems as, in part, informational problems. Simultaneously, the donors and leaders of international NGOs also demanded increased levels of accountability in terms of dollars spent, services provided and goods delivered. This was also framed as an informational problem.

The response to this informational problem and other collaborative issues was to create collaboration bodies across large international NGOs focused on the topic of addressing informational problems in the humanitarian and disaster response sector. We believe that collaborative multi-organizational projects will dominate the initiatives in the humanitarian and disaster information management sector in the future. Despite this trend, little is known about the mechanisms of coordination on information systems project processes and outcomes.

These outcomes have varied and nuanced implications. For LINC, the take away message is that technical coordination across NGOs is possible and potentially profitable for organizations that engage in it. Most NGOs in the industry have a sense that coordination is worthwhile, necessary and perhaps lifesaving, but continue to struggle with ways to measure impacts of such coordination. In a small way, the success that LINC has had points to one small measure of that coordination. While there is still no evidence that this coordination impacts the beneficiaries of goods and services in times of disaster, it does show evidence that organizations can work together to more efficiently use their technological power. On the other hand, it sends the message that small, technological problems are the only problems truly possible to solve via coordination bodies.

For OCEA, the take away message is that the largest international NGOs agree on what the major problems are across the field of humanitarian relief and information management. However, coordination through a high-level coordinating body is not enough to truly tackle these core and substantial problems

In the long run, LINC will have more success in promoting continued collaboration over time. Success, even small success, will likely lead to another attempt to coordinate. The warning we insert here is that with traditional structural development processes, patterns tend to become institutionalized over time. If LINC continues to have success in small, technical projects, it will continue to choose small, technical projects on which to coordinate. The agency of individual members of the coordinating body must be increased, through resources and control of resources, to slowly nudge the trajectory and momentum of LINC to adopt a more strategic focus over time. As LINC gains members, more successful projects, and some significant notoriety in the industry, its momentum may carry with it the potential to tackle some of the original unsuccessful projects attempted by OCEA.

Our research focuses on IT between NGOs, in other words, the instrumental use of IT as a mechanism by which NGOs collaborate. IT collaboration is often the first form of collaboration entered into by NGOs. Organizational coordination between NGOs is often perceived as difficult, if not impossible, especially when NGOs must change some of their basic operations, procedures or come to significantly depend on others for key elements of their operations. IT is different. From our research, IT collaboration is perceived as easier to accomplish, less risky, and poised for success. In addition, donors also support these collaborative IT efforts in that they often have the goals of increased accountability, visibility, and efficiency. Whether many of these IT joint system developments actually result in successful collaboration is beside the point (most fail). The NGOs, and their donors, strongly believe that the first step in collaboration is through IT.

Our data suggest that coordination bodies that pursue problems requiring low levels of organizational change are more likely to have visible successes. This is due in part to a higher likelihood of success of the project as well as such projects are likely to involve a greater number of members as they want to undertake projects that can succeed. Coordination bodies that pursue a more challenging agenda, one that aims for information management or management of information technology in ways that require organizational change are likely to face greater challenges and experience more failures.

Hence, coordination bodies may choose to pursue a staged approach to addressing coordination barriers. At the outset a coordination body might pursue projects requiring little organizational change in its members, but then progressively transition to more ambitious projects over time. For coordination bodies in which projects are primarily through grass roots initiatives, this may require intervention by the coordination body staff to push members to reach beyond their comfort zone.

While improved coordination is a noble goal itself, the real aim is to improve relief services. To date it is unclear just how much improvement in relief services result from improved coordination in the IT realm. While anecdotal evidence of benefits exists to ignite efforts, a more systematic analysis of the IT coordination benefits is called for.

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