The Importance of Knowledge Management and Trust in Relation to Disaster Response

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Abstract: This article investigates the importance of Knowledge Management (KM) and trust in disaster response. In KM, a lack of trust and non-reciprocity of information can hinder the process of knowledge transfer. Similarly, a lack of KM coinciding with a disaster can lead to public distrust of those in positions of authority. In the Exxon Valdez oil spill disaster, many people were impacted by issues of trust related to the transfer of knowledge and improper KM. However, mistrust due to poor KM is not unique to the Exxon Valdez spill. This article also discusses other disaster scenarios, such as the aftermath of Hurricane Katrina and the Central Natural Gas Corporation's business disaster, which were both exacerbated by poor KM and breaks in the knowledge transfer process.

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Introduction

Trust is important in the realm of Knowledge Management (KM). A lack of trust and non-reciprocity of information can hinder the process of knowledge transfer (Chua, Kaynak, & Foo, 2007). Similarly, a lack of KM coinciding with a disaster can lead to public distrust of those in positions of authority. In the *Exxon Valdez* oil spill disaster, many people were impacted by issues of trust related to the transfer of knowledge and improper KM. Alyeska was trusted to create a contingency plan in the event of a major oil spill, yet the plan constructed was inadequate and not communicated to Exxon (Kelso & Brown, 1991). The hoarding of this information led to poor KM, which caused the public to distrust the companies.

Due to this poor KM, the Native residents of villages in Prince William Sound were unable to trust their own knowledge of the land and the animals they hunted for subsistence (Miraglia 2002), and the lack of communication and understanding between scientists and the Natives of Prince William Sound caused distrust and poor knowledge transfer. These elements of mistrust due to poor KM are not unique to the *Exxon Valdez* oil spill and are found throughout many disaster scenarios, including the aftermath of Hurricane Katrina and the Central Natural Gas Corporation's potentially devastating business disaster.

KM and Trust

KM is "the systematic strategy to collect; store; and retrieve knowledge, and then help distribute the information and knowledge to those who need it in a timely manner" (Thanurjan & Seneviratne, 2009, p. 69). Within KM, there are three different but related processes: knowledge creation, knowledge transfer, and knowledge reuse (Chua et al, 2007). Knowledge is created when existing knowledge is exchanged and combined with other data, information, or knowledge and forms new knowledge (Chua et al., 2007). Knowledge transfer occurs when knowledge flows from one part of an organization to other parts. For the purposes of this paper, trust is defined as the "assured reliance on the character, ability, strength, or truth of someone or something" (Merriam-Webster, 2010). According to Chua, Kaynak, and Foo,

> absence of trust and non-reciprocity have often been identified as hindrances to knowledge transfer… Companies that exhibited a knowledge-hoarding tendency internally were found to be characterized by a low level of trust among their staff. (2007, p. 393)

Thus, trust is an important part of the knowledge transfer process. Knowledge reuse occurs when knowledge is packaged and intended to be used and reused in the future in order for organizations to learn from previous mistakes and successes (Chua et al., 2007).

The *Exxon Valdez* Disaster

As Bowen and Power state, when an endeavour contains a lot of risk and uncertainty, "open and effective communication about the risks and responsibilities involved with all of the interested parties becomes a moral necessity" (1993, p. 97). Therefore, there should be a free transfer of knowledge, with no secrets or mistrust involved. However, prior to the spill, the Alyeska Pipeline Service Company (Alyeska), a consortium of major oil companies that own and operate the Trans-Alaska Pipeline System, had an impeccable safety record, and so there was little risk involved in the company's transport of oil to the port of Valdez (Bowen & Power, 1993). Due to Alyeska's safety record, the public had no reason to distrust the company. Alyeska had a contingency plan in the event of a spill, but when the *Exxon Valdez* spill occurred in 1989 the company was unable to enact it (Kelso & Brown, 1991). Alyeska promised to be at the site of the spill within five hours, yet they took fourteen hours to get there (Kelso & Brown, 1991). Although Alyeska was in charge of the contingency plan, their failure to enact it forced them to transfer the responsibility to Exxon, who had never reviewed Alyeska's plan; thus, Exxon had to act without any preparation (Kelso & Brown, 1991). The lack of knowledge transfer between Alyeska and Exxon proved to be disastrous. Exxon placed its trust in Alyeska to create an adequate contingency plan, and Alyeska breached that trust. However, the blame does not rest solely upon Alyeska. As evidenced by Exxon's lack of knowledge of the contingency plan, the companies lacked reciprocity in the sharing of information.

Bowen and Power discuss the concept of the moral manager, which is "a person willing to engage in a fair and open dialogue with interested stakeholders or their representatives" (1993, p. 105). Managers are expected to make reasonable judgements, and parties involved in making decisions must have access to the best available data and consider the values and assumptions underlying the positions of other concerned stakeholders (Bowen & Power, 1993). A moral manager is forced to be a responsible participant in the dialogue, and thus must not be manipulative or deceptive, or conceal relevant information (Bowen & Power, 1993). Therefore, a moral manager is trustworthy because he or she will not hinder the free transfer of information. Questions surround the *Exxon Valdez* disaster in regards to moral managers, such as whether Alyeska knowingly misrepresented their original plans, or perhaps knowingly consented to ineffective plans (Bowen & Power, 1993). Bowen and Power state that "secrecy undermines a communicative ethic" (1993, p. 110), and this is true when viewed through a KM framework, as employees of companies that internally withhold information often distrust one another (Chua et al., 2007). A communicative ethic requires that all points of view be carefully considered and that those included in discussions are on "equal footing" (Bowen & Power, 1993, p. 110). Due to the lack of communication involved, the motives of Exxon and state and federal officials of Alaska are questioned. While Exxon's attempts to take responsibility for the spill may have been genuine, it is possible that Exxon's actions were just part of a public relations ploy (Bowen & Power, 1993). Similarly, it is possible that the Alaskan

officials were trying to protect their statuses as elected and appointed officials while they were attempting to alleviate the effects of the spreading oil (Bowen & Power, 1993).

It is vital that companies engaging in potentially risky endeavours, such as Exxon and Alyeska, create their own knowledge bank in order to properly assess potential disasters or, if prevention is impossible, enable a speedy response that can minimize the negative impacts to inhabitants, wildlife, and/or the environment. While some humanitarian assistance/disaster relief (HA/DR) agencies have their own data sources, others do not and must rely solely on their own knowledge when it comes to assisting others in the face of disaster (Zhang, Zhou, & Nunamaker, 2002). Zhang, Zhou, and Nunamaker (2002) propose that all relief agencies use a central database in which knowledge derived from various disasters in the past is kept in order to provide agencies with fast access to response plans in an effort to quickly and efficiently handle distress calls. All of the necessary disaster information would be collected from various sources and placed within this knowledge base, which would be accessible through the Internet (Zhang et al., 2002). However, there may be limitations on the data, as the participating organizations may have data that is private, and these limitations must be taken into consideration (Zhang et al., 2002). Thus, the exchange of this information requires great trust and cooperation from the HA/DR organizations in order to ensure adequate response plans and assistance during a disaster. As evidenced in the *Exxon Valdez* disaster, failure to prepare an adequate disaster/recovery plan through KM can lead to public distrust of the companies or authorities involved in the action or relief efforts.

Due to the lack of major oil spills in American waters in the 1980s prior to the *Exxon Valdez* spill, the public was not concerned about the safety and potential consequences of oil tankers in the oceans; however, once the spill occurred, public confidence in oil transport was shaken (Harrald, Marcus, & Wallace, 1990). Harrald, Marcus, and Wallace (1990) claim that this is common after a disaster. People usually have two attitudes when it comes to potential disaster situations: either they rarely think about them or consider them to be low-risk scenarios and assume that untested response plans will be sufficient, or they focus solely on the consequences of catastrophic events and maintain that even the slightest risk is too much of a threat (Harrald et al., 1990). After a disaster, such as the *Exxon Valdez* spill, most of the people who rarely considered the potential for disaster usually change their minds and agree with those who think that no risks should be taken at all (Harrald et al., 1990). Harrald et al. argue that the *Exxon Valdez* spill suffered from "inadequate planning" (1990, p. 18), such as a lack of immediately accessible response resources and lack of a proper and thorough risk reduction and contingency plan. Companies such as Alyeska and Exxon must be trusted to create a proper contingency plan and take steps toward effective risk reduction. Their failure to communicate and transfer their knowledge to one another led to a disaster and a loss of public trust. As Harrald et al. state, "Government and industry must be ready to deliver hundreds of millions of dollars worth of clean-up services anywhere in the world within hours of an incident"

(1990, p. 29). The public should be able to trust in these agencies to deliver the promised aid and, if a disaster cannot be prevented, it should be contained as much as possible.

The *Exxon Valdez* oil spill greatly impacted the Native populations of villages that comprise Prince William Sound (Miraglia, 2002). The people of Chenega Bay are subsistence hunters who live off the land in order to survive (Miraglia, 2002). When the oil spill occurred, local hunters and harvesters were unsure if their foods were still safe. They were faced with a threat that was completely new and unfamiliar to them, and they could no longer trust their own instincts when it came to subsistence living; thus, they needed to seek answers from the scientists who were studying the impact of the spill (Miraglia, 2002). The people of Chenega Bay were hesitant to place their trust in the scientists, but they felt that they had to because they could no longer trust their land (Miraglia, 2002). They had several reasons to doubt the scientists, including the fact that tests done on food, such as chitons with white lesions on them, were inconclusive; they were told by scientists that animals sick due to the oil are still safe to eat, which contradicts the Chugach belief that it is dangerous for one to eat a sick animal. The scientists were outsiders to the locals of Chenega Bay, and as a result their motives were suspect, and the oil remained in the environment longer than anticipated (Miraglia, 2002). While there was plenty of information and knowledge surrounding the spill, the mistrust of the scientists by the locals of Chenega Bay shows that there was a hindrance in the transfer of that knowledge from the scientists to the locals. Similarly, the scientists were unable to adequately receive knowledge from the locals pertaining to their customs and traditions, as shown by the scientists' lack of understanding of what is and is not acceptable when it comes to the condition of the food. The failure of the contingency plan and cleanup efforts also led to distrust, as it would have been difficult for the people of Chenega Bay to trust those responsible for spoiling their land and livelihood.

Hurricane Katrina

The previous examples show how important trust is to effectively responding to disasters. A lack of trust within the knowledge transfer process of KM hinders that transfer, and successful KM is blocked and unsuccessful. This situation not unique to the aftermath of the *Exxon Valdez* oil spill, but is common to all disaster scenarios. According to Wickramasinghe, Bali, and Naguib (2006), if one studies recent natural disasters, one can see that countries and regions are never as prepared for the disaster as they could have been through proper KM. Once the disaster strikes, it is too late to formulate a plan that will properly handle the aftermath (Wickramasinghe, Bali, & Naguib, 2006). The inability to properly plan for and contend with a natural disaster can lead to the public distrusting their government or those responsible for disaster prevention or recovery. This happened with Hurricane Katrina, "the most destructive and costliest urban disaster in the history of the U.S." (Chua et al.,2007, p. 396). Ironically, data warning about the potential hurricane threat to the Gulf coast had been collected, analyzed, and published years before Katrina hit, but this knowledge was not

"translated into tangible actions" (Chua et al., 2007, p. 400). While people were warned in advance that Katrina was heading their way, "the knowledge transfer processes among the agencies in directing the relief and rescue operations was found wanting" (Chua et al., 2007, p. 400). Although it is impossible to prevent a natural disaster such as Katrina, after the disaster strikes government bodies and relief agencies must acquire knowledge quickly and distribute this knowledge to one another and the public. They must also discuss and coordinate disaster response operations, "such as damage assessment, perimeter control, and evacuation and relief procedures based on such available knowledge" (Chua et al., 2007, p. 393). If knowledge is managed correctly by government bodies and relief agencies, people in the affected areas will be able to resume their lives as quickly as possible, and the disaster may not be as devastating (Chua et al., 2007). Knowledge transfer is intended to enable a "faster, freer, and more reliable flow of knowledge" (Chua et al., 2007, p. 394) both within and between other agencies. While it is important to establish clear lines of control when exchanging information with other sources, trust is an essential part of knowledge transfer. Relief agencies and government officials must ensure that trust flows along with the information in order for the knowledge gained to be credible and the relief efforts successful. This is important during the preparation phase before disaster strikes and also during the response phase afterward, when it is vital that rescue and relief operations are implemented quickly and efficiently (Chua et al., 2007).

However, the relief effort after Hurricane Katrina was not quick and efficient. According to Chua et al., Katrina was "a 'crisis in a crisis': a disastrous response during a natural catastrophe" (2007. p. 399-400), and this disastrous response was due to poor KM. Some critics have argued that race and class were reasons for the US government's slow response to the relief effort after Katrina devastated New Orleans, as the victims were "disproportionately black and poor" (Chua et al., 2007, p. 392). Thus, poor KM in this situation led to distrust of the Government's motives during a time of crisis. As Chua et al. state, "[m]any organizational successes and failures can largely be attributed to the manner in which knowledge is managed" (2007, p. 392).

Lubitz, Beakley, and Patricelli state that the

> absence of uncompromised access to data, information, and pertinent knowledge…at the ground, mid, and executive levels of the response effort was among the principal contributors to the series of failures in management of the recent national and international "mega-disasters." (2008, p. 563)

However, it is of the utmost importance that this information and knowledge is of high quality and not false (Lubitz, Beakley, & Patricelli, 2008). Not only is this important to ensure adequate relief and response efforts after a disaster, but it is also important in retaining the trust of the public. If those in positions of authority state and repeat information that is incorrect or intentionally distorted, the public may believe this misinformation to be true and, when it is

revealed that it is not true, trust in those authorities is lost (Lubitz et al., 2008). This occurred during Katrina when the media reports claimed that everything was all right in New Orleans following the hurricane when, in fact, it was just the opposite (Chua et al., 2007). Thus, it is vital that data and information is gathered from several diverse and independent sources and that that data and information is firmly verified before it "is to serve as a reliable operational basis" (Lubitz et al., 2008, p. 564). Through the use of KM in disaster situations, rumours can be identified, contained, and eliminated, and reliable knowledge can be created from data and information that has been properly sorted (Lubitz et al., 2008). As a result, truthful and relevant facts can be distributed to "all members of the response chain, the media, and the public" (Lubitz et al., 2008, p. 566).

Central Natural Gas Company

KM is important in disaster situations in which the environment or the lives of humans or wildlife are at stake, but it is also important in the realm of business disasters. According to Wang and Belardo (2009), Central Natural Gas Company (CNGC) was unable to obtain customers in Whale Industrial Park (WIP), even though a risk assessment showed that there was little risk and great opportunity in that area. A market survey showed that companies in the area were hesitant to switch to natural gas because of cost-effectiveness and security (Wang & Belardo, 2009). As a result, CNGC was unable to obtain a return on its investment in time and had to "declare a cumulative investment loss of approximately US$ 1.7 million" (Wang & Belardo, 2009, p. 644). The business was in trouble, and the president of the company took responsibility and stepped down from his position by declaring early retirement. In an effort to solve the problem, and thus save the business, the employees of CNGC re-examined all of their documents and sought advice from personal and business friends in order to improve their knowledge (Wang & Belardo, 2009). By trusting outside sources, CNGC was able to reduce the costs of constructing the pipeline, ensure safety by improving its natural gas facilities, and lower the installation cost for customers. Through these means, CNGC's equipment was made safer and less expensive, and, as a result, the company was able to attract new clients in the WIP. Impressed with the company's "sincerity in reducing the cost of using natural gas" (p. 644), CNGC was able to gain the trust of its potential clients, and thus was able to gain new customers (Wang & Belardo, 2009). Due to its success in WIP, CNGC began to gain new business elsewhere and was able to recoup its initial investment. By exchanging knowledge and information with experts in other organizations, CNGC was able to respond to its financial disaster and recover from it successfully (Wang & Belardo, 2009). Through incorporating KM into its practices, and trusting outsiders in the knowledge transfer, CNGC not only gained new knowledge that it can use in future endeavours, but it also gained the trust of the public, which was vital to the company's success.

Conclusion

Trust is vital to the success of KM during a disaster situation. A lack of trust between the parties involved in the transfer of knowledge can prevent the success of the operation; similarly, a lack of trust in government officials and relief agencies can indicate that KM has failed. During man-made and natural disasters, such as the *Exxon Valdez* oil spill, Hurricane Katrina, and even the near failure of CNGC, trust is vital to ensure successful recovery. Trust must be maintained during the transfer of knowledge between two parties or organizations to guarantee that the information is correct and will ensure the success of the response plan. Successful implementation of KM is necessary to ensure that the public will continue to place their trust in those in positions of authority who are supposed to be taking care of relief efforts. Finally, information distributed must be correct and accurate in order for those in authority to maintain the trust of the people during a time of crisis. Successful KM is the key to maintaining these aspects of trust, and it is the responsibility of moral managers to ensure that successful KM is carried out within their companies and organizations.

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