20. Creating value to mitigate disaster harm: how the sharing economy can support consumers and policy makers

Lucie K. Ozanne

INTRODUCTION

Something happened in the neighborhoods around Houston, Texas during Hurricane Harvey in 2017. Neighbors reached out to neighbors to assist each other. That was not unusual. What was unusual was that during the hurricane some residents used the neighborhood sharing platform Nextdoor.com to seek rescue. Prior to the storm, the company integrated several public service agencies into the system, allowing them to post critical information on the site and to create a dialogue between citizens and the emergency service providers during the disaster (CNBC 2017). Some cities are also experimenting with the potential for sharing platforms to help build community resilience (Brown 2014).

These initiatives may become increasingly important. As the world heats up, disasters are becoming more common worldwide. For instance, researchers predict an increase in the frequency of very intense hurricanes (for example, Category 4 and 5) (Knutson et al. 2015), like Hurricane Harvey. As well as an increase in the frequency of disasters, their effects are mounting: 65 of the most costly disasters occurred in the 1990s (Eshghihi and Larson 2008). Hurricane Harvey is likely to set new records for economic, material, social, and ecological devastation (EESI 2017). However, at a time when disasters are increasing in frequency and intensity, research examining disaster service provision and delivery is lacking.

Along with disasters, we know that sharing or collaborative forms of consumption are on the rise: including toy libraries, tool sharing, peer-to-peer accommodation and transport, crowdfunding, workspace sharing, local exchange trading systems, and social media sharing sites. These peer-to-peer networks allow participants to give and receive goods, services, support, and information. These initiatives use technology and social media to connect the combined efforts of many (Brown 2014). But how can sharing platforms help public policy makers create value for consumers before, during and after a disaster?

This chapter will draw from the disaster, the sharing economy and the service value creation literature to outline a range of support that can be enabled by the sharing economy to assist consumers and public policy makers during a disaster cycle. Specifically, this chapter reveals how sharing platforms can be integrated into the four phases of the disaster cycle to enable the creation of value by consumers and by the government agencies and first-response organizations who seek to protect them.

LITERATURE REVIEW

The Sharing Economy

In the past decade there has been tremendous growth in organizations that facilitate different forms of sharing or collaborative consumption, including both commercial and non-commercial organizations. These practices are facilitated both online and offline, among geographically dispersed consumers as well as residents living in close proximity to each other. However, coming up with a precise definition of sharing or collaborative forms of consumption is difficult (Schor 2014). This chapter will adopt the definition of collaborative consumption activities put forward by Hamari et al. (2015). Their definition suggests peer-to-peer-based activity coordinated through community-based online services which can include monetary and non-monetary transactions that provide access or ownership to goods and services. Their definition would include such activities as sharing, swapping, gifting, renting, and monetary exchange.

A number of characteristics differentiate the provision of goods and services through sharing platforms that may be advantageous in a disaster context. First, as these platforms facilitate peer-to-peer exchange, they can enable the development of social networks. As Schor and Fitzmaurice (2015) argue, one of the central characteristics of sharing practices are their ability to strengthen social ties. For instance, Freecycle emphasizes the creation of a community where members both give and receive goods, and over time may develop social bonds (Nelson et al. 2007). Social networks have been shown to be critical in disaster response and recovery (Baker 2009; Riad et al. 1999). In addition, many sharing platforms facilitate the exchange of underutilized assets (Oskam and Boswijk 2016) or skills (Ozanne and Ozanne 2016), often in neighborhood settings (for example, Nextdoor, Neighborgoods, toy libraries). Again, this can foster social linkages and help to build social networks. For example, toy libraries are located in local neighborhoods and provide an opportunity for both parents and children to socialize and form informal networks (Ozanne and Ozanne 2011) during a difficult transitional time period (Pettigrew et al. 2014). Sharing platforms also rely heavily on digital technology to facilitate exchange, which may expedite transactions and information sharing (Oskam and Boswijk 2016; Schor and Fitzmaurice 2015). The ability to facilitate social networks, access a diverse range of resources and skills in a local community, and expedite transactions through technology, may be particularly helpful in a disaster situation.

Disasters

Disasters are a relatively recent focus of marketing scholarship (Baker and Baker 2016; Baker et al. 2007; Guion et al. 2007; Martin et al. 2016; Ozanne and Ozanne 2016). Disasters have become increasingly important to consumer researchers and policy makers because they amplify individual and community vulnerabilities (Baker 2009; Baker and Hill 2013). Disasters are defined as natural or man-made events that negatively affect life, property, livelihood, or business, often resulting in permanent changes to societies and environments (Quarantelli 1998). Baker and Hill (2013) view disasters more broadly as socially constructed experiences that occur at the intersection of natural hazard events and social processes of recovery. Disasters can be sudden, such as the 2018 flash floods

in Texas, or they can be gradual, such as global warming and rising sea levels (Sapir and Mission 1992). The focus in this chapter is on sudden-onset disasters, or what Phipps et al. (2016) call high-velocity disasters, such as hurricanes, floods, oil spills, wildfires, and earthquakes. The speed of these events makes managing information and the coordination of aid difficult (Yates and Paquette 2011). These events can quickly overwhelm the coping capacities of households, communities, and governments to meet the many needs that emerge during the crisis. Thus these types of unexpected events call for broad resilience strategies (Allenby and Fink 2005).

Within the disaster literature, a great deal of attention is focused on community resiliency: or the ability of a community to bounce back following a disaster (Baker 2009; Longstaff 2005). Norris et al. (2008, 130) define community resilience as "a process linking a set of adaptive capacities to a positive trajectory of functioning and adaptation after a disturbance." They argue that these adaptive capacities are resources with dynamic attributes which mean that they are available and accessible for buffering or counteracting stress. Borrowing from the material sciences, they stress the adaptive nature of resources that are provided through three characteristics. A robust resource works under a wide range of circumstances or counteracts a wide variety of dangers; it is fragile if it works only under a small number of possible scenarios. Redundancy is the extent to which the resource is substitutable in the event of disruption or degradation. Resource diversity is a condition related to redundancy. Communities that are dependent on a narrow range of resources are less able to cope with change that involves the depletion of those resources. Finally, rapidity reflects how quickly the resource can be accessed and used. Manyena (2006) suggests that human resilience is the processes of enhancing human capacity to recover from a disaster within the shortest possible time with minimal outside assistance. I argue that sharing platforms may help to increase the resilience of communities, as they can enhance capacity and provide access to a diversity of resources that can be accessed more quickly as they are mediated by technology, or link residents to resources that reside in the community.

Mileti (1999) provides a four-phase model of emergency management—mitigation, preparedness, response, and recovery—that provides an organizing framework for understanding disasters. This framework depicts the various dynamics of disaster events. Guion et al. (2007) lay out the key roles and participants involved in each phase of disaster management. Martin et al. (2016) expand this approach by suggesting a more dynamic framework that provides for continuous feedback loops in the cycle. Some question whether it is the responsibility of individual consumers to prepare for natural disasters (Giesler and Veresiu 2014). Others argue for a collective response, by a diverse range of stakeholders, to diminish the impact of hazardous events on individuals and communities (Martin et al. 2016). In this chapter the four-phase model is utilized to identify the unique consumer needs during each disaster phase, the potential role of sharing platforms, and how value can be created through interactions between consumers, the sharing platform, and public policy agencies as they integrate key disaster resources (Vargo and Lusch 2006).

Value Creation

The co-creation of value has garnered considerable attention in recent years in service research, but also some confusion (Grönroos and Voima 2013). Grönroos and Voima

(2013) attempt to bring greater clarity to the concept of value creation by defining the roles of the customer and the firm, as well as the scope, locus, and nature of value and value creation. They define value as value-in-use, which is created by the user during usage of resources and processes. They argue that the customer is the key value creator, and the firm provides potential value as a facilitator of value for the customer. Further, they suggest if the firm can engage with its customers' value-creating processes during interactions, it has the opportunity to co-create value with them.

The customer's value creation process is also influenced by a wider customer network (Voima et al. 2011). "Services are increasingly designed, produced and consumed in networked constellations involving actors other than just buyers and sellers" (Ostrom et al. 2015, 135). There are increasing calls for research to include the network perspective in the study of services (Tax et al. 2013). For instance, there is growing acceptance of the need to move away from a dyadic firm–customer perspective to a broader view that potentially includes multiple actors (Mars et al. 2012), which may include other firms or customers (Tax et al. 2013). Lusch (2011) argues for the importance of the network concept that he refers to as a service ecosystem. The service ecosystem is comprised of primarily weak ties which enable seemingly unrelated organizational networks to form a larger macrostructure that can be more fluid, agile, and adaptable (Lusch et al. 2010). These characteristics may make service ecosystems or networks more effective in turbulent environments and, potentially, disaster situations. For instance, research finds that networks in which disaster social services agencies have numerous weak links to each other have a stronger basis for network coordination. Coordination and information flows among disaster response organizations are critical for an effective response and timely provision of services, especially to provide service to vulnerable populations (Zakour and Harrell 2008). Thus, sharing platforms that foster networks of consumers, first responders, and others may facilitate value creation in disaster settings.

I now turn to examining and providing examples of how sharing platforms can be facilitators of potential value and assist public policy makers during the four phases of a disaster to support consumers.

FACILITATING VALUE FOR CONSUMERS IN DISASTERS

Mitigation Phase

During the mitigation phase, the primary focus of emergency management is on preventive measures that can minimize harm from future events. This involves investment in infrastructure and other capacity-building activities that can build future resilience. As Guion et al. (2007) explain, these are long-range activities, initiated well in advance of a specific disaster or in response to a known risk. Citizens tend to be passive during the mitigation phase (Martin et al. 2016). Consumers may be unaware of the need to invest time and resources in preparedness and capacity building. I refer to consumer needs during this phase as latent (see Table 20.1). Thus policy makers play a critical role during this phase. Research finds that social networks are critical to building community resilience to unexpected shocks (Dynes 2005; Chamlee-Wright and Storr 2011). Thus, this phase is a key time for policy makers to focus on helping communities build social networks, as resiliency needs to be built before disaster strikes.

Table 20.1 Disaster phase and role of sharing platforms

	Disaster phase			
	Mitigation	Preparedness	Response	Recovery
Type of consumer need	*Latent* Consumers unaware of needs related to disaster preparedness	*Identified* Consumers prepare for a disaster threat	*Emergent* Consumers are faced with needs that emerge from the disaster	*Enduring* Consumers are faced with ongoing needs from the disaster
Examples of consumer needs	Creating links to neighbors, social and government organizations	Family evacuation and contact plans, preparedness kit including water, first aid and food, home preparations	Immediate needs for shelter, food and water, emotional support, evacuation, clean-up and critical repairs, first aid	Ongoing needs for food and water, housing, repair of homes, physical and psychological care, replacement of possessions
Role of sharing platform	Facilitate links between community members Develop community capacities Map community assets and vulnerabilities	Dissemination of warnings, information, and preparation instructions	Link members to those who can provide critical resources and aid, incorporate spontaneous volunteers	Guide individual and collective behavior to assist the affected community
Value-enabling activity	Establishes the infrastructure and enables the network	Bridges structural holes to other organizations to gain access to diverse resources and information	Activates or enables horizontal and vertical linkages in the network	Provides coordination among outside groups and network members to provide ongoing aid and service
Key challenge	Fostering vertical and horizontal linkages to government and other organizations	Reliance on technology, which may not reach all geographic areas or consumer groups	Need for flexible bureaucracy to enable sharing platforms to innovate Need for sharing platforms to gain legitimacy and access Coordination of multiple actors Information technology may be susceptible to failure during a disaster (e.g., loss of electricity)	Need for sharing platforms to gain legitimacy and access

As discussed previously, sharing platforms can be an effective tool to foster social networks and hence enable consumers to access potential value in the network. For instance, Ozanne and Ozanne (2016) show how a timebank created a rich social network composed of diverse ties through which a variety of resources flowed. The timebank linked residents of the community but also, importantly, linked horizontally to various organizations in the community (for example, schools, medical center), and vertically to first-response organizations (that is, police) and the local government. In addition, through regular trading which enabled value creation, the timebank built a variety of capacities that fostered resilience and enabled the community to respond effectively to a series of earthquakes. The authors argue that the capacities built through trading in the timebank (that is, communication, cultural, social, and community competency) were redundant, robust, and could be quickly deployed in the emergency. They also argue that the timebank enabled the community to map potential vulnerabilities, as many of the organizational members supported vulnerable groups and many trades focused on those who needed support (that is, children and the elderly). In addition, as members offered their tradeable skills in the timebank network, community assets were identified.

Along with timebanks, other types of sharing platforms may be able to facilitate social networks and foster community capacity building, and should be facilitated by policy makers during the mitigation phase. For instance, Local Exchange Trading Systems (LETS) that facilitate trading physical products, or community currency systems such as Ithaca Dollars, may assist in the development of community resilience through the building of social networks and help to mitigate harm from future events.

Preparedness Phase

During the preparedness phase, emphasis focuses on reducing the negative consequences of a disaster and communicating the necessary actions citizens should take to get prepared. Policy makers focus on disseminating messages aimed at encouraging people to make choices about protective behaviors (Guion et al. 2007). Citizens may identify the need to prepare an evacuation plan or locate shelter, update emergency supplies, or prepare their home (for example, put up storm shutters). During this stage, information is an important shared asset and people rely on trusted sources (Longstaff 2005). However, given the high-velocity nature of these events it may be difficult for citizens to quickly find all needed information.

Sharing platforms can be the link to key information to guide individuals through the preparation process (Martin et al. 2016). The sharing platform may facilitate value creation by bridging structural holes and linking members to institutions with key resources (Burt 2001). For instance, prior to Cyclone Yasi, which occurred in Queensland, Australia in 2011, a Facebook Update page was quickly launched, the Cyclone Yasi Update. The page created an information hub that brought together official information, from many sources, but also enabled two-way communication with people in the affected areas. "In doing so, they were able to provide a single initial trusted point of contact for people who needed to prioritise their activities to protect themselves, rather than spend time searching for information" (Taylor et al. 2012, 22). This communication network is likely a robust resource that could be used in future cyclones or other crisis situations (for example, wildfires). However, because sharing platforms rely heavily on technology, internet or

mobile communication, this also creates challenges as some geographic areas or segments of the population may not have adequate access to these communication services (Huang et al. 2010).

Policy makers may also choose to work with sharing platforms such as Nextdoor.com or Neighborgoods.com to disseminate emergency preparedness information prior to a disaster. The sites' messaging and blogging tools make it easy for residents to find a babysitter. But they can also be utilized to facilitate value when emergency planners want to notify residents at short notice of an impending crisis, and communicate how to get prepared. In this phase, sharing platforms provide the rapidity that enables information to be quickly accessed and utilized allowing citizens to get prepared.

Response Phase

During the response phase, emergency management focuses on immediate, local efforts to provide short-term disaster relief, to facilitate the rescue of victims, and to provide shelter (Guion et al. 2007). Citizen needs often include rescue, evacuation, shelter, food, water, emotional support, and immediate clean-up. As an example, in the immediate aftermath of the Christchurch, New Zealand earthquakes of 2011, many homeowners needed their damaged chimneys to be dismantled before an impeding storm. However, new unanticipated needs often emerge that require creativity and innovate solutions. As Kendra and Wachtendorf (2006) explain, improvisation is often necessary because the ambiguous and dynamic conditions of a disaster often mean that not every need has been anticipated or accounted for. Thus, needs during the response phase are referred to as emergent.

During the response phase, affected community members are often dependent on the immediate aid of family, friends, neighbors, and local community groups to provide services (Kendra and Wachtendorf 2006; Palen and Liu 2007). Residents often leverage their own social networks to find and provide information and resources outside the official response effort (Mileti et al. 2006). Given their network structure, sharing platforms may be able to quickly innovate to create or mobilize their network to respond to these emergent needs and enable consumers to access value. For example, during Hurricane Sandy in the United States (US), in 2012, Airbnb innovated a new system to mobilize their network of hosts to offer their homes after hosts spontaneously offered accommodation to disaster victims. In the same event, Waze, a crowdsourcing mapping tool, opened up access to the feedback users were providing about which gas stations were open for people looking to refuel (Brown 2014). In another example, Hurricane Harvey victims utilized the Nextdoor.com network to request rescue from their neighbors who were also members of the sharing platform (Homsey and Aldrich 2017). In the 2016 floods in Louisiana, residents who needed rescue contacted a Facebook group, the Cajun Navy: members then used their own private boats, smartphone apps, such as the Global Positioning System (GPS) app Glympse and the walkie-talkie app Zello, to coordinate rescue of people, pets, and livestock (Boyd 2016). Veer et al. (2016) report how victims utilized social media and online websites in order to share their immediate experience of a disaster and mobilize emotional support from others in those networks. All of these examples illustrate how these sharing platforms are being utilized in a manner not originally intended, as improvisation occurs to meet emergent needs.

However, research suggests that many emergency managers subscribe to the command-and-control model of disaster management (Drabek and McEntire 2003), and a belief that ad hoc emergent behavior is counterproductive (Neal and Phillips 1995). During New Zealand's largest maritime disaster, the grounding of the *Rena* and subsequent oil spill in October 2011, youth utilized Facebook and other social media to link spontaneous volunteers for clean-up efforts outside the official efforts. Social media also facilitated connectivity to local businesses to facilitate a relief program and deliver food to both official and unofficial responders (for example, Rena Kai Run). They organized in this manner because of an inability to meet the structured demands of the official volunteer process, and a perception that official responders were failing to meet community needs (Lockwood 2016). Thus, mechanisms are needed by policy makers to recognize the legitimacy of multiple actors, such as those organized by sharing platforms, and to harness their skills and expertise and value-enabling potential. Coordination of multiple actors is a critical aspect of ensuring that needs are met as quickly and effectively as possible during this phase (Guion et al. 2007). For instance, the US Federal Emergency Management Agency (FEMA) has developed a new system that allows disaster victims to secure housing through Aibnb, which was previously not possible (Brown 2014). And FEMA has standardized hashtags (for example, #PowerLineDown) to enable citizens to report important emergency information.

Recovery Phase

During the recovery stage, the focus is now on long-term adaptation to community devastation or change (Baker 2009). Public organizations take on the task of restoring social systems and rebuilding physical environments (Guion et al. 2007). Citizens are faced with ongoing or enduring needs from the disaster situation. These may include long-term housing, health or psychological care, replacement of possessions, and housing repairs, among others.

Sharing platforms may enable policy makers to tap volunteers, resources, and information that can create value for residents during the recovery phase. In Christchurch, students utilized Facebook, Twitter, and GoogleMaps to create a network of 24 000 of their classmates and other volunteers, the Student Volunteer Army (SVA), to assist residents after the earthquakes (Hayward 2013). As Johnson (2012) explains, the main advantages of social media were its speed and broad reach. The SVA helped to clear 260 000 tons of silt, deliver 21 000 chemical toilets, and distribute more than 500 000 information leaflets, as well as laying sandbags and engaging in numerous other community projects (Lewis 2016). The SVA sought to fill a gap by helping residents in low-risk areas. But the New Zealand Army sought to bar them for risk concerns, and then bureaucratic procedures of logging in were so cumbersome as to obliterate the time available for volunteering. The SVA had to innovate a swipe card procedure to get around this bureaucracy and participate (Johnson 2012).

In another example, the American Red Cross coordinated a network of more than 1700 online volunteers to crowdsource 4.5 million edits, or roughly three to four years of mapping data, to map the damage caused by Typhoon Haiyan that hit the Philippines in 2013 (American Red Cross n.d.). The result was a map of the region and a database of building damage contributed by volunteers eager to provide operationally useful data.

SeeClickFix has devised a similar system to help generate actionable data regarding the condition of infrastructure after a disaster (Brown 2014). To help flood victims in South Louisiana, a sharing platform, LAFloodBud.org, was created to connect people who need supplies with those who want to donate them. This was achieved through a series of Facebook groups that specialize in particular supplies, such as school supplies for children, food for pets, and even physical labor for repairs (RStreet 2016). TaskRabbit has announced that it will provide an online portal so that relief organizations can access a network of more than 20 000 vetted workers, and Appallicious has launched a similar portal to provide access to skills and equipment post-disaster (Brown 2014). Ozanne and Ozanne (2016) suggest that, as relief organizations exit the community, a timebank can be a mechanism for residents to continue to access support as they trade with their neighbors. All of these examples illustrate how affected residents are able to access potential value through the skills, labor, or resources from a diversity of network members, meaning that there is redundancy provided by the sharing network, which is important in the recovery phase.

CONCLUSIONS

Disasters are on the rise. Emergency managers and policy makers will increasingly need to support residents to access support and services during the disaster cycle. They will need to help communities to build resilience, prepare for the disaster, survive the event, and rebuild the community. Sharing platforms provide an innovative approach to enable residents to access various types of value and thus should be encouraged by policy makers. As the examples in this chapter illustrate, these platforms can enable residents to connect to food, water, labor and skills, housing, transport, and information. As Martin et al. (2016) argue, these networks have a very important role in strengthening and expanding the resiliency of communities by enhancing the ways in which interactions take place and value is created.

However, policy makers need to work with sharing platforms before disaster strikes (Brown 2014), and challenges will need to be overcome. The very nature of sharing platforms—low governance, flexibility, and reliance on technology—which makes them very appealing for peer-to-peer interactions, also presents challenges to policy makers in trying to integrate such platforms into disaster mitigation and response:

> Sustaining effective collaborative governance in the sharing economy is particularly challenging because the practice of sharing is by nature a distributed and comparatively open system that not only involves numerous stakeholders, especially "the crowd", but also generates collaborative dynamics that may constantly challenge or reconfigure socio-economic relationships in a society. (Ma et al. 2018, 357)

Governance, in the disaster field, looks at how decision-making unfolds when a multitude of stakeholders or actors is involved, requiring coordination and possibly reconciliation between a profusion of roles, perspectives, goals, and activities (Ammann 2006). Ma et al. (2018) suggest a collaborative governance framework that involves principled engagement, shared motivation, and joint actions in the sharing economy that can be put in place to deal with the sharing economy stressors proactively rather than reactively.

The examples provided in this chapter illustrate the unique characteristics provided by sharing platforms that make them useful in enabling value creation in disaster settings. Because of the use of technology, especially social media, the platforms have the potential to enable a real-time delivery system for emergency alerts, crowdsourced information and crisis maps, and evacuation. In essence, these systems provide speed and rapidity, as stressed by Norris et al. (2008). These systems may also be useful across various types of events, making them robust. Sharing platforms may also link citizens to a diversity of value-creating resources making the systems redundant. In addition, sharing platforms foster social networks which are critical to disaster response and recovery. Citizens have always reached out to their neighbors when faced with crisis. However, when they practice sharing skills and resources prior to an event, they build the social links and the capacities necessary for survival and recovery.

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