

# Leading Organizations through Supply Chain Disruptions: An Exploratory Study of Necessary Traits

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## *Abstract*

*The recent major disasters have surfaced the long-standing discussion on the importance of leadership in managing disruptions. Hurricanes Harvey and Irma demonstrate how supply chain disruptions are complicated, surprising, and often unforgiving to mediocre decisions. Leading organizations through natural or man-made disruptions can be extremely challenging. In this paper, we offer theoretical and empirical evidence to help address the question: What type of leadership traits are best suited in handling supply chain disruptions? We identify baseline and contextual leadership traits that affect managerial decisions when facing SC disruption. These results offer further explanations on the nuances of supply chain disruptions.*

## **Introduction: What traits should a leader placed in charge of handling a major supply chain disruptions have?**

Disruptions are idiosyncratic dilemmas that defy a clear-cut or “one size fits all” approach to managing them. Diverse and contrasting leadership styles have been shown to be effective in dealing with disruptions.<sup>1,2</sup> When

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Hurricane Sandy struck New Jersey, Newark mayor Cory Booker was widely respected for his decisive and swift actions. Just minutes after the storm, hundreds of Newark residents sent pleas for help to their mayor — and many of them got a speedy response. Booker made an especially personal gesture when he invited neighbors over to his house to relax.<sup>3</sup> Booker was widely respected for his “take charge” leadership approach. In contrast, leadership at Dana-Farber Cancer Institute in Boston was admired for their transformational leadership style when several hospital patients died due to miscalculated dosages of highly toxic drugs for the women. Dana-Farber’s management’s primary focus is on acting rather than hunkering down. Leaders spoke candidly about the mistakes, suspended responsible staff, and recommitted itself to quality control and patient care.<sup>4</sup> Indeed, the recent major hurricanes in Texas and Florida show how the issue of leadership in managing crises can be confronted differently. While most leaders in Houston remained to confront the effects of Harvey as it transpired, Florida companies had more than a week warning before disruptions and, thus, most of the leaders evacuated the state.

Supply chain disruptions are unforeseen events that rupture the flow of resources across two or more organizations.<sup>5</sup> For example, after Hurricane Harvey, a third of US chemical production was disrupted, causing shortages of necessary industrial building materials.<sup>6</sup> For leaders, managing supply chain disruptions can be a challenging test of character. Today’s disruptions can be swiftly shifting events that mandate quick and accurate decisions by the leader, despite the uncertainties of the circumstances.<sup>7</sup> While they require an urgent call to action, SC disruptions can also be unforgiving to rushed decisions. Indeed, the second primary source of negative outcomes from the disruption originates from errors of commission or omission by leaders.<sup>8</sup> While strong leadership can decrease the effects of a disruption, weak leadership makes problems worse, compounding the damage.<sup>9</sup>

Nevertheless, the question remains: What traits should a leader placed in charge of handling a major supply chain disruption have? Literature in crisis leadership offers an overabundance of suggestions on the characteristics that a crisis leader should convey.<sup>10</sup> However, the majority of the leadership findings come from political, social (governmental efforts in the face of major natural disasters) or humanitarian crises literature.<sup>11</sup> What is required for business leaders in the face of supply chain disruptions is often different from that of humanitarian, governmental or political crises. Therefore, we propose that supply chain disruptions may involve a distinctive incorporation of leadership qualities.

Literature linking leadership to supply chain disruptions is limited on the research question proposed. In this article, we try to distinguish what makes

supply chain disruptions different from other disruptions. Next, based on industry insights, we identify six leadership qualities that are predominantly relevant to managing supply chain disruptions. Then, we suggest baseline and conceptual traits that are suitable for different types of supply chain disruptions that we confirm using archival and survey data from a cross-section of 286 manufacturing firms.

### **Differentiating among supply chain disruptions: Complex, Unfamiliar and Surprising Events**

Supply Chain disruptions differ from community-and humanitarian-related emergencies. The main objective for humanitarian, and community relief efforts is to decrease the damage (i.e., human loss), while supply chains leadership is focused not only on preventive the human-related suffering but also on completely re-establishing the production system to its entirely operational form. Furthermore, humanitarian, community, and social crises emphasize responding to human necessities, whether a supply chains leader not only addresses the needs of the staffs and other potentially affected people, but also is accountable for mitigating the profitability, and reputation effects on company constituents.

As the recent hurricanes have established, supply chain disruptions can vary in the level of challenge for companies and their leaders. Minor disruptions happen more frequently, and can be addressed more easily by identifying similarities among them. However, as the magnitude of disruptions grows, the probability that they are not rapidly addressed using existing guidelines and procedures increases.<sup>12</sup> For example, Hurricanes Irma and Harvey caused billions of dollars damaged to supply chain and resulted in increased rates of unemployment, damage to infrastructure, crop losses, property damage and higher fuel prices.<sup>13</sup> Handling these challenging incidents involves abilities, training and personality qualities often possessed by only selected leaders. A review of the literature demonstrates that among the supply chain disruptions can be differentiated based on (i) complicatedness, (ii) rarity and (iii) surprise.<sup>14,15</sup> Complexity arises from the communication among the numerous partners in an interwove organization.<sup>16</sup> *Complicatedness* in a supply chain disruption becomes critical when more participants in the supply chain are severed or when multiple streams of goods, information and finances are affected.<sup>17,18</sup> As complexity of disruption increases, the organizational ability to evaluate, respond and recover reduces.<sup>19</sup> During complicated event, the role of a leader becomes ever more crucial. *Rare* disruptions are exceptional since there is no experience available.<sup>20</sup> In contrast to rare disruptions, familiar disruptions exist in the company's task domains, and can be recalled, making it easier to

respond.<sup>21,22</sup> Indeed, as the Dana-Farber Cancer Institute case shared earlier demonstrated, the company did not know how to handle this rare and unusual event immediately. Finally, *surprising* disruptions are those that occur without pre-warning or that take unpredicted forms as they unfold.<sup>23</sup> Surprising disruptions are difficult since they allow no time to gather information or to get ready for the onslaught of damage that will follow.<sup>24</sup> In many surprising supply chain disruptions, by the time sufficient information about the event becomes available, there is no time remaining to complete an effective response adequately.<sup>25</sup> For instance, the largest U.S. refinery Motiva had a less than a 24-hour alert before Tropical Storm Harvey flooded the company's facilities in Port Arthur, Texas causing extensive damage to production units.<sup>26</sup> Superstorm Sandy created a similar issue for many companies in New Jersey and New York in 2012. Anne Strauss Weider, Director of Freight Planning, notes: "This was [an] abrupt and rapid disruption. We had about 24 hours' notice before Sandy hit." <sup>27</sup>

Complicatedness, rarity, and the surprising nature of a supply chain disruption make them more challenging for leaders to respond and resolve. The combination of these three characteristics underpins what is known as a major supply chain disruption.

### Leadership traits in the face of supply chain disruptions

We conducted a literature review at the intersection of crisis management, supply chain disruptions, and leadership capabilities to portray how literature has recognized the crisis leadership qualities. Over 50 publications in supply chain related academic journals including *Journal of Supply Chain Management*, *Decision Sciences*, *Journal of Business Logistics*, *Leadership Quarterly*, and other related publications were thoroughly analyzed.<sup>28</sup> Based on this investigation, leadership traits were categorized into three groups. Under each group, the major characteristics that are dominant for leaders operating during supply chain disruptions were identified. A summary of the leadership traits combined with lessons learnt from industry examples is shown in Table 1.

The first group comprises of leader's *personal attributes*. This category includes abilities associated with cognitive capacities as well as personal features such as emotional development, flexibility, and charisma.<sup>29,30,31</sup> Person attributes are often listed as initial traits for setting the stage in facilitating and leading the response to crises. The second group of crisis leadership qualities is stated as *interpersonal skills* since they include relational and social skills on how the leader cooperates with and impacts others.<sup>32,33</sup> Included in this category are traits that are critical for coordinating of actions, communicating the reconciling differences, forming mutually

amicable relationships, and persuading the others.<sup>34,35,36</sup> The last category includes *organizational leadership behaviors*. These behaviors include highly conceptual skills needed to take a systems perspective to grasp a complicated situation fully.<sup>37</sup> *Organizational leadership behaviors* can be divided into task-oriented, and people-oriented skills. Both subgroups deal with uncertainty and influence the guidance in the organization.<sup>38,39</sup>

This review of literature indicates that certain leadership traits are essential regardless of the context, while others are valuable only under certain conditions.<sup>40,41,42</sup> To reflect this finding, we distinguish leadership characteristics vital when facing supply chain disruptions into baseline traits and contextual traits. A survey was conducted to explore the relationship between leadership traits and the types of supply chain disruptions. We identified contextual and organizational factors such as industry affiliation, firm size, and geographic ownership diversification, for choosing population of the firm. Regression analysis using SPSS software was employed to study the proposed relationships.

### Baseline Traits

Our analysis identified that *Decisiveness* and *Deliberative leadership* are baseline traits for leaders handling major supply chain disruptions. Decisiveness is described as the ability to make decisions quickly and effectively. Decisive leaders avoid pushing off fundamental decisions, promptly identify realistic possibilities to resolving the problem, and make a final determination without a struggle. Because of the intrinsic immediacy of the issues and the need to resolve them quickly, decisiveness is critical in the face of any disruptions.<sup>43</sup> As the extent of the damage triggered by the disruption increases, the need for a decisive and determined leader that is clear in her directives grows. For example, it is essential for police officers in charge of SWAT to reinforce and elaborate task activities and make timely decisions.<sup>44</sup> In situations where lack of decisiveness can place others' lives in danger, quickly determining how to approach the matter is critical. Related to supply chain disruption, the example of how Nokia and Ericson faced with a supplier caused disruption provides further evidence. Confronted with the same disruption, a difference in managerial decisiveness made a major difference in the recovery by these two rivals.<sup>45,46</sup> While Ericson leaders were unable to exercise swift judgment, Nokia's managers took a series of instant and proactive actions and recovered from the supply shortage. Overall, during supply chain disruptions leader's decisiveness is crucial because the situation demands swift decisions and actions.

Table 1. Lessons in Leadership in the Face of Supply Chain Disruptions

Year	Company	CEO/Leader	Disruption Description	Response Description	Key Leadership Traits Used
1993	PepsiCo	Craig Weatherup	In 1993, series of reports surfaced that syringes had been found in cans of Diet Pepsi. Three brands, PepsiCo, Taco Bell, and KFC were seriously affected by the unprecedented situation	Weatherup was confident in the company's ability to handle the issue. He appeared on television with evidence casting heavy doubts on the. This assurance set the stage for the company to structure an effective response strategy.	Self-esteem, Decisiveness, Sit. Awareness
1996	Odwalla	Greg Steltenphol	Odwalla faced a devastating blow to its brand and company financials because of contaminated juice products that led to the death of a child and to having 70 people seriously hospitalized. About 90% of the company's revenue evaporated almost overnight in the wake of the outbreak.	Mr. Steltenphol was forced to sell a controlling interest in Odwalla to private firms. However, he still managed to rally company personnel in facing a major product recall. The CEO had always been an advocate of a culture that nurtured trust and camaraderie with the firm.	Trustworthiness, Deliberativeness, Inspirational Motivation
1998	Cole Hardwood	Milton Cole	A devastating fire destroyed 8.5 million board feet of inventory, 50 percent of the company's lumber handling equipment and eleven buildings at Cole Hardwood.	The following day, Cole stood in front of all his employees and said without hesitation that the company would rebuild. Employees never went without a paycheck.	Inspirational Motivation, Deliberativeness
2000	Taco Bell	David Novak	Starlink, a GMO not approved by FDA, was found in Kraft Taco Bell taco shells sold in grocery stores. It didn't matter that GMOs were never found in Taco Bell restaurants, sales declined as customers were scared to eat at Taco Bell	The CEO set up the meeting with the franchisees, absorbed on the costs, and created a partnering relationship to respond to crises. David Novak said, "I chose the best people we had to deal with the problem, and then I let them do their job. You have to rely on your experts."	Inspirational Motivation, Deliberative leadership,
2001	Cantor Fitzgerald	Howard Lutnick	Cantor Fitzgerald's corporate headquarters in New York City office located in One World Trade Center, were destroyed during the September 11, 2001 attacks. Cantor Fitzgerald lost 68% of its workforce, which was considerably more than any of the other World Trade Center tenants.	The CEO quickly began making hard-nosed business decisions. 4 days after the attack, he cut off paychecks to the families of his employees. Later, Cantor distributed millions of dollars of the firm's profits to families of lost employees and covered health care costs for 10 years.	Decisiveness, Trustworthiness, Inspirational Motivation

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Year	Company	CEO/ Leader	Disruption Description	Response Description	Key Leadership Traits Used
2005	Coast Guard	Admiral Thad Allen	Hurricane Katrina slammed into the United States Gulf Coast early on August 28, 2005 killing almost 2,000 people and causing \$81 billion in damages. US Coast Guard received widespread praise for its response.	The Coast Guard rescued well over 30,000 people immediately following the storm. The Coast Guard response to Hurricane Katrina was one of determination, spirit, and resolve.	Decisiveness, Trustworthiness, Deliberativeness
			2012	Corey Booker	One of the deadliest and most destructive hurricanes, Hurricane Sandy struck New Jersey. Over two million households in the state lost power in the storm, 346,000 homes were damaged, and 37 people were killed.
2014	General Motors	Mary Barra	GM recalled 1.7 million cars with ignition switch defects. The situation worsened when media found out that company personnel may have known about the issue since 2005, but had hidden it from the public eye.	For over a year, Ms. Barra was GM's front face of the crisis management effort, facing tough questions on Capitol Hill, apologizing repeatedly for putting lives at risk, or firing employees responsible for the delay in fixing the problem.	Self-esteem, Deliberativeness, Decisiveness
2015	Chipotle	Steve Ellis	The foodborne illness outbreaks devastated W/A and OR locations. At least 22 people were sickened because of the E. coli bacteria. Chipotle closed 43 restaurants, many more than those linked to the outbreak.	Chipotle CEO responded quickly, decisively and with an abundance of caution. He cooperated fully with health agencies and investigators and took specific steps to address the issue. Also, he communicated these actions boldly/clearly.	Decisiveness, Situational Awareness
2017	Samsung	Kwon Oh-hyun	In 2017, Samsung Electronics recalled more than 200,000 Galaxy Note 7 smartphones that were found to be defected in two sets of batteries that made the devices prone to catch fire. This crisis resulted in billions of dollars loses for the company.	After an independent investigation, Samsung was able to resolve the crisis. Chief Executive addressed the employees with inspiring statement and suggested to use this crisis as a chance to make another leap by re-examining and thoroughly improving how the company works.	Inspirational Motivation, Deliberative leadership

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*Deliberative leadership* is the other baseline characteristics of leadership notably stated in the literature. Deliberativeness involves a constant consideration of possible options and tactics. Deliberative leaders are capable of re-examining assumptions, cautiously seeking diverse views, and advocating for innovative ways to resolving the issues. However, while external collaboration and well-thought-out decisions are critical during routine processes, they can frequently be unproductive and even harmful during disruptions.<sup>47</sup> First, unnecessary contemplation can decrease the speed of decision-making, making it more complicated to manage the threats posed by the supply chain disruption. For instance, during the response to Hurricane Katrina, managers and officials conducted a prolonged exploration and extensive communication that postponed the distribution of much-needed aid for victims.<sup>48</sup> Second, deliberative decision making is often perceived to reflect leader's uncertainty and hesitation. Undoubtedly, in the face of disruptions, the pressure is on reaction and manager's failure to make a decision can produce a negative perception of a leader.<sup>49</sup>

Our findings suggest that moderation is the best policy for leaders facing SC disruptions. Leaders that avoid extremes—be they in hasty decisiveness, or cautious deliberativeness—seem to help their organizations decrease the damaging effects of SC disruptions.<sup>50</sup> Leaders that simultaneously consider the need for quick decision alongside thoughtfully deliberate the potential ramification of their actions across the supply chain, seem most effective in the handling SC disruptions. These findings fall in line with that from a few studies in similar contexts.<sup>51</sup> Related to supply chains, neither autocratic nor participative leadership styles are more efficient than the other.<sup>52</sup> Instead, leaders whose key approach is adaptable are shown to be effective. Thus, optimal skill sets for supply chain leaders are those that are emblematic of adaptiveness.<sup>53</sup>

### Conceptual traits

*Trustworthiness.* Surprising disruptions are challenging because leaders do not have time to collect information and to prepare for the damage.<sup>54</sup> Without much warning, by the time sufficient details about the event becomes available, there is no time remaining to adequately complete an effective response. For instance, during Hurricane Katrina, all supply chain members were trapped up by "surprise," that completely paralyzed the response system, and created more disorder, confusion, and surprises of its own.<sup>55</sup>

Under the absence of reliable information, a trustworthy leader is likely to be the most suited feature to bond the organization.<sup>56</sup> By definition, a "trustworthy leader" is somebody that the company can rely on assured that



the trust would not be deceived. A “trustworthy” leader is believed to fulfill her assigned responsibility - and as an extension, to not let down company expectations – despite the unexpected and unusual nature of the situation.<sup>57</sup> The empirical evidence supports this proposition. Our analysis shows that leadership trust is suitable when handling surprising SC disruptions. The results are in line with previous findings. For example, the study of 82 major crises including epidemics, environmental disasters, and natural disasters, indicated that a higher level of trust demonstrated by the leaders is related to a better internal coordination with the organization’s stakeholders.<sup>58</sup>

Managers who have established a trusting relationship with the members of their organization are in a better position to be able to ask for them to face the unknown, regarding of shocking the situation is. For example, in 1996, Odwalla suffered a devastating disruption when bacteria were found in juice products resulting in hospitalization of over 70 consumers.<sup>59</sup> The CEO of Odwalla, Greg Steltenpohl, managed to rally company personnel in facing a major product contamination. The entire organization gathered behind its leader because they entrusted in him. Greg Steltenpohl was always an advocate of a culture that nurtured trust and camaraderie with the firm and was viewed as a well-meaning CEO who cared about corporate social responsibility.<sup>60</sup>

*Inspirational Motivation.* As complexity increases, it is harder for supply chain members to evaluate what is the right move to make. Thus, leaders need to be a source of inspiration to employees.<sup>61</sup> Previous research shows that when the leaders act selflessly, caring more about the group than themselves, workers are more trusting, supportive, devoted, dedicated, collegial, and committed.<sup>62</sup> As the levels of complexity increase, supply chain interdependency becomes more predominant.<sup>63</sup> When a situation is desperate and complicated, everyone is anxious, leaders must help employees stay engaged, focused and motivated. For example, after the failure of fire-prone tablet, Kwon Oh-Hyun, Samsung's Chief Executive, addressed the personnel with the inspiring statement and advocated to use this situation to re-examine and systematically improve the way the company operates.<sup>64</sup> Even though the literature review and companies’ examples illustrated the importance of inspirational motivation during complicated supply chain disruptions, the analysis of results did not support the proposition.

*Situational Awareness.* Situational awareness deals with evaluating events within the given context subject to time limitations.<sup>65</sup> Situational awareness is critical for a leader faced with crisis because it defines the capability of understanding an ambiguous, fast moving and overwhelming situation. Furthermore, leaders who are aware of the conditions are able to picture the

difficulty of actions taken by the corporation. Naturally, a lack of situational awareness by the leader can worsen the disaster since incorrectly judged circumstances may lead to executing unsuitable actions. For instance, the analysis of American coast guards discovered that about 40% of all disruptions regarding faulty navigation at ocean was triggered by the lack of situational awareness. Ship captains were incapable of “processing” the full outcome of their actions into their decision-making model.<sup>66</sup>

Our analysis shows that situational awareness is significant during *surprising* disruptions. The results show that leaders need a reasonably clear mental model of the situation to assist in handling unexpected events. During the time pressure and uncertainty related to surprising disruptions, supply chain members depend on the situational awareness of their leader.

*Self-esteem.* Self-esteem is described as being confident in your own actions and abilities. Self-esteem is based on leaders’ ability to identify that individuals have faith in them, that they are trusted by others and can make a valuable contribution to facilitating response and recovery. Confident leaders are particularly critical in handling rare disruptions as they allow others to become at ease with questions and doubts about the unexperienced situations. Previous research established that the lack of familiarity decreases the company’s confidence to efficiently resolve the crises.<sup>67</sup> Effective leaders diagnose the need to compensate for this intrinsic lack of organizational confidence with their self-esteem.<sup>68</sup> For example, when a series of reports surfaced that syringes were found in cans of Diet Pepsi, the company’s CEO, Craig Weatherup, was confident in himself as well as in the company’s ability to handle the situation. After several extensive meetings, he was able to provide visual evidence that cast substantial doubts on the reports.<sup>69</sup> Self-confidence also allowed Mary Barra to face the daunting task of leading General Motors in the face of a rare product recalls in 2005. For over a year, Ms. Barra was facing rough questions on Capitol Hill and continually apologizing for putting lives at risk. Barra’s self-confidence in being able to handle the disruption was essential for managing the crisis.<sup>70</sup> Even though the literature review and companies’ examples illustrated the importance of self-esteem during rare supply chain disruptions, the analysis of results did not support the proposition.

### Conclusions

Results of our study carry some fascinating findings to share. We provide a rigorous and multi-step approach that explores leadership skills and attributes that are particularly promising in handling supply chain disruptions. First, the balance between decisiveness and deliberative leadership improves supply chain disruptions performance. The clear

message offered from these results is that major supply chain disruptions are occasions for re-examining assumptions as well as quickly and efficiently deciding on a plan of actions. Second, we highlight leadership characteristics that play a critical role in handling complicated, surprising, and unfamiliar supply chain disruptions. For example, in the face of disruptions with limited warning, leader *trustworthiness and situational awareness* play a significant role.

Overall, we try to restructure the process of choosing individuals for directing company response and recovery efforts in handling supply chain disruptions. In recent years, as supply chains have become longer and more complex, it is clear that supply chains operations must be reshaped. While the severity and frequency of supply chain disruptions seems to be increasing, the need for leaders that can manage business interruptions becomes a fundamental facet of maintaining company's competitiveness. Our findings highlight particular characteristics that should be valuable to handle such disruptions. Whereas organizations are attacked with an excessive amount of advice based on soft evidence, this article provides hard data grounded in statistical analyses and credible peer-reviewed examination. The results should support business decision makers to confidently choose more efficient leaders take responsibility and control in times of crises.

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