Organizational Culture and Big Data Analysis as antecedents to Swift Trust in Civil- Military relations during National Disaster Management

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**Introduction**
Disasters are an act of natural chaos. They, although can be predicted and mitigated, yet the disaster creates an imbalance which results in complexity for disaster management teams. Disasters are the conditions necessitating swift decision-making and resource management through predictive analysis. Disaster management operations require a high level of coordination among various government departments which may have divergent organizational cultures. The response and recovery mechanism of almost countries revolves around collaboration of various state organs in form of civil-military collaborations. The collaboration necessitates the requirement of multi-directional resources to meet the challenges of disasters which cannot be mitigated by a single organization. This leads to civil-military leadership & administration to use a collective space in a most complex situation involving high standards of decision-making. There is thus a need to find a mechanism to improve ST (Swift Trust) amongst such collaborators who have a divergent organizational culture.

Researchers have tried to enumerate various conditions and combinations that are necessary for collaborative performance (CP). Currently, CP is measured by scholars using different pathways including institutional designs, incentives and big data analysis capability, as all these pathways tend to create an ST among these organizations with divergent cultures. Different scholarly models present various diverse viewpoints on collaborations, yet all seek to present conditions that are necessary for the attainment of CP (Douglas et al., 2020). Collaboration and coordination are the two terms most often interrelated. Coordination can be the sharing of data, future plans & situational awareness to achieve collaboration, which means working together to create something new (Dubey et al., 2019). Collaborations during national disasters are non-profit based and are usually hastily formed to react to chaos. This significance of the created collaboration and the incentives that each organization intends to bring into the project is empirically termed as collaborative paradox

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(Schiffling et al., 2020). This Collaboration paradox is affected by a mix of influences that generate the necessary impetus to get started with the project.

Due to the high level of unpredictability and uncertainty, disaster management has attracted a lot of attention among various disciplines of research for the importance of timely use of information for decision-making in disaster management. (Gupta, Altay, & Luo, 2019) argued that max resources being allocated for disaster management are rather wasted due to poor coordination because there is no platform for big data analysis and thus the professional relationship between the organizations becomes adverse. To bring the temporary partners together in the initial stage of collaboration, (Dubey, et al., 2019) suggests that efficient gathering, processing, analyzing and dissemination of relevant and timely information is a challenge. (Schiffling et al., 2020) also argues that interdependence and the substantial perception of uncertainty about collaborator’s organizational behavior need ST to be formulated in the earliest phases. Previous studies by management scholars on collaborations argue that organizations with formal structures are a way back in forming ST due to their non-social and non-business ties among the collaborators (Qian et al., 2020).

The collaboration performance is a hybrid of conditions and processes. Big data Analysis is a condition needed in today’s IT-centric operation environment to create ST and a control process throughout the collaborative tenure.

The objective of the paper is to present a literature review for an organizational culture-based model where two divergent organizational cultures formed the ST for collaboration during disaster management operations

Collaborative Dynamics in Disaster Management Operations

The recent research published in AMJ by Slade et al. (2020) suggested future research on collaborators with formal & informal organizational culture in a contextual environment where formal culture organization has a more salient role in the collaboration. More so, (Prakash et al., 2020) presented complexity theory as a potential research area to study disaster management. Yet scarce of the studies that have been conducted on Chaos and Complexity theory and CP.

Underpinning Theory
R.D Stacey, the guru for chaos & complexity theory used this theory to present practical insight and strategic planning to organizations management with an approach to avoid complacency. To elaborate on Stacey’s stance, Ortegón-Monroy (2003) discussed Chaos & Complexity Theory to ascribe a paradoxical role to the managers in a framework to think and develop their responses. Chaos & complexity are characterized by some of the features like, Un-predictability & non-linearity, Mutual interaction & dependence, Self- organization and Co-evolution.

According to (Klijn, 2008) the concept of self-organization can also be found in CP. This means that actors can share certain frameworks of action for interaction, collaboration and goal achievement, the ways in which different decision-making processes influence each other.

Complexity theory analyzes the multiple layers of the system with separate analysis, but also with a methodological framework that allows describing the interplay between these different layers, that is, co-evolution. Mbengue et al. (2018) concluded that the need to define such systems has created complexity theory, which collects and analyzes data at different levels of collaborators and becomes, therefore, a practical discipline for mixed methods research.
Swift Trust Among Collaborators

McLaren and Loosemore (2019) defined ST as “a unique form of collective perception and relating that is capable of managing issues of vulnerability, uncertainty, risk, and expectations”. Hastily formed networks may not necessarily have time to develop and maintain trust through the traditional activities of familiarity, shared experience and fulfilled promises. Instead, hastily formed networks, such as humanitarian relief operations, must formulate trusting relationships quickly; a concept termed as ST. ST has also been considered in the context of unexpected and dangerous situations, for example, terrorist attacks, avalanches, explosive fires or mass casualties in road traffic accidents, as those first on the scene in these instances are often strangers who have never worked together before (Schiffling et al., 2020)

Organizational Culture – (Formal & informal)

According to Dubey et al. (2019) organizational culture is a collection of shared assumptions, values, and beliefs that is reflected in its practices and goals and further helps its members understand the organizational functions. Dubey, Gunasekaran and Papadopoulos (2019) further argue that organizational culture affects how the firm responds to external events and makes strategic choices. Formal institutions are rules that are readily observable in terms of positions, such as authority or ownership. Whereas formal institutions define the “normative system designed by management” or a “blueprint for behavior,” informal institutions define the actual behavior of players (Wang, Lu, Söderlund, & Chen, 2018).

Mbengue et al. (2018) explained that collaborators also are facing a problem of predominant hierarchies, which create a strong culture of thinking hierarchically, whereas the problems are mostly horizontal in nature. The same is reflected during a crisis wherein management does away with authoritative or competitive strategies before finally turning to collaboration. There is thus a need to find mechanism to improve ST amongst such collaborators who have a divergent organizational culture.

Big Data Analysis

During collaborations, decision-making officials need to manage conflicting sensitivities and interests, eliminate hostile positions and arguments for resources and information, thereby, transforming organizational goals into collective goals. An effective decision-making process requires an adequate environment to harmonize the subjectivities, uncertainty, and inaccuracy that are always present in the decision-making process (Mbengue et al., 2018).

Use of big data analysis in an organization increases the ST and CP of the employees with the improvement in management. (Dubey, et al., 2019). The impact of big data analytic capabilities on organizational culture will further enhance the value of ST in the field of civil-military disaster management organizations (Kerdpitak et al., 2019). However, there is need for a holistic organizational culture is also a prerequisite to acquiring benefits from Big Data Analytics (BDA). Akter and Wamba (2019) argue that BDA provides all possible solutions to understand any disaster-related issues while the results from the analysis may assist in optimally deploying the limited resources.

Analysis of Chaos and Complexity in Disaster Management

Chaos & complexity theory demonstrates that a sudden/ abrupt or non-linear change in the system can produce results in an unexpected way for the management and the administration. Its main features include an explanation of Butterfly/puller sensitivity, mutual interaction and dependence under non-linear and un-predictable problems
The present study is an attempt to apply the theory of chaos & complexity to study CP.

To achieve such mutually congruent objectives, military and civilian actors have to be able to form temporarily viable structures that support or enhance inter-organizational cooperation. Such civil-military structures are, though, extremely complex, with the complexity being induced by, inter alia: the different tasks that need to be performed; differing degrees of time pressure and levels of interdependency between civilian and military co-workers; the non-routine nature of the tasks and their perceived importance; the dynamic context; differing operating cultures, views on leadership, and decision-making processes; and the amount of autonomy available at an operational level (Tatham & Rietjens, 2016).

The managements involved in disaster control operations face the complexity created by the chaos, which is non-linear. Complex problems require an approach that has the capability to play around rather to fight against the non-linear attributes of the issue. Joosse and Teisman (2020) presented complexification in management by arguing that complexity is somewhat the management get actively involves in order to manage complex issues, wherein, they do not involve policies as a process of change rather adopts an interpersonal process of increasing trust and awareness within the newly formed teams. Given the growing attention in management studies on collaborative governance networks and complex service delivery, some of the ideas from complexity theories seem to be very pertinent. For example, the concept of dynamics offers a different perspective on the decision and interaction patterns in governance networks and also generates insights on how complex integrated service delivery can be governed (Klijn, 2008).

The theory of chaos had been long affiliated with applied sciences and mathematical equations. According to Begun (1994) researchers studying organizational studies mostly teach and deal with simple and balanced systems, whereas, the practitioners on the other hand, who are the administration officials are usually committed to complex and chaotic situations. While disaster management operations revolve around civil-military collaboration, it is imperative to highlight that the politics of these relations are as prehistoric as Roman & Greeks and are still contemporary (Feaver, 2017).

Development of ST among civil-military collaborators in the initial stages is therefore a requirement that is expected to be less in countries where the military has a more influential character and societal prominence (Kalkman, Groenewegen, & Society, 2019). Pakistan is also such a country where civil-military collaboration has a lot of apparent cultural frictions. However, recent pandemics of COVID and Locust attacks were well handled by NDMA using joint operations. The apparent reason seems to be the information sharing and predictive analysis using BDA.

Prospective Research Avenues
NCOC & NLCC presented a viable working relationship model for civil & military organizations in Pakistan collaborating at the NDMA platform. Systematic Literature Review of Dubey et al. (2019), Prakash et al. (2020), Gupta et al. (2019), Akter and Wamba (2019), Gazley, Guo, and Leadership (2020), Modgil, Singh, and Foropon (2020), and Kamble and Gunasekaran (2020) also presents avenues in research to deliberate upon the moderating role of BDA and on the relationship of ST and CP during disaster management in both Formal and informal Organizational culture.
Conclusion
This study presents the inter-relational effect of BDA and ST on CP during disaster management through the lens of chaos & complexity theory for both Formal and informal Organizational cultures. The mediating effect of organizational culture on the relationship between ST and CP and the moderating effect of BDA on the relationship between ST, organizational culture and CP is presented in the resource of disaster management. This study shall also present to policymakers and Administration officials the importance of Big data analysis capability for collaborations. It shall also highlight the military & civil leadership the importance of the creation of an ST to achieve desired collaboration results.

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