Information Disasters in Networked Organizations

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INTRODUCTION

Most disasters, such as wars, massacres or cultural meltdown, are generated or made worse by human acts. For thousands of years, man-made disasters have often been more destructive than those caused by nature, such as hurricanes, floods or earthquakes.

Information mismanagement is a major cause of man-made disasters. Incidents and errors are common and inevitable in any system or environment involving humans, and constitute potential threats. Nonetheless, serious damage can be prevented by providing decision-makers with key data in time or by presenting key information in a usable and useful way. In many complex socio-technical contexts and situations, optimal practical prevention is not easy. The late industrial age saw a wide range of man-made disasters, where information mismanagement was the major cause of many catastrophic events, typically produced as the result a massive and unexpected surge of energy—a conceptual framework was established by Turner (1978). In the knowledge society's information intensive organizations and environments, information disasters will be the most common and far-reaching, catalysed by a much greater degree of interconnection and a higher likelihood of situations of information overload. The results may not always be as tangible as energy, and may be as intangible as damage to an organization's prestige, for instance. The need to update the framework for man-made disasters was stressed by a number of authors in the 1990s. A summary of the efforts to update this framework and some key ideas from recent studies and bibliography are set out in the following.

BACKGROUND: INFORMATION DISASTERS AND THEIR STUDY IN THE LATE INDUSTRIAL AGE

A disaster, according to the Concise Oxford English Dictionary's is "a sudden accident or a natural catastrophe that causes great damage or loss of life." This definition is focused on the outcome, as are most others to be found in the dictionaries of European languages. As well as definitions such as that quoted, the concept of disaster is traditionally linked to certain "common sense" ideas: the "casual" coincidence of a few initial causes, which are inevitable in real-life conditions. These causes seem "minor" for such a great consequences, thus the disaster is seen to be "unfair." The disaster is deemed to have happened "by chance" or to be an "Act of God." Such opinions are summarised, though not shared by Turner (1978). Secondly, disasters are considered to be rare events, something that happens very unusually, and thus "it will not happen in our organization" or at least it will not happen in a way that could be effectively prevented. These ideas, although deeply rooted, should be thoroughly revised by providing scientific knowledge and organizational learning about such events.

The industrial age provided mankind with unparalleled capabilities to manage huge amounts of energy and other tangible resources as inputs for the mass-production of tangible and desirable products. Industrial factories, aircraft, railways, mines and other energy-intensive human inventions became part of everyday life. These involve energy management, and thus potential destruction due to mismanagement is far more widespread than ever before in human history. The late industrial age brought with it a "democratisation" of capabilities to produce disasters, as pointed out by Taylor-Adams & Kirwan (1997). In this sense, a disaster can be thought of as an undesired negative production resulting from "negative tasks," that is, incorrect organizational reactions.

Beck (1986) proposes a cause-oriented concept for human-originated disasters: "The cause of disasters is not human error, but systems which transform human error into incomprehensible destructive forces" (p. 21). A theoretical view of the system of disasters such as Beck's had been systematically developed earlier by Turner (1978). In his book "*Man-Made Disasters*," he

proposes a theoretical framework extracted from the systematic qualitative study of typical industrial era disasters (for example, railway accidents or fires) from official reports of 84 such events in Britain during the 1960s. This book establishes solid principles to bear in mind when studying man-made disasters. First, a definition is proposed, which takes into account not just the physical impact but also knowledge impact of such events: "Disaster may be considered as an event concentrated in time and space, which threatens a society or a relatively self-sufficient subdivision of a society with major unwanted consequences as a result of the collapse of precautions which had hitherto been culturally accepted as adequate. This definition has the advantage of including instances where the amount of physical damage is not great and the number of fatalities is not inordinately high, as a result of chance factors, but where the mishap which had occurred reveals a gap in defences which had hitherto been regarded as secure, so that alarm and the cultural readjustment of expectations follow" (Turner, 1997, p. 70). Secondly, with the formulation of a "disaster incubation theory," he proposes every disaster to be previously noticeable thanks to a series of signs of weakness, which may be detected but lead to no proper organizational action, whereby organizational risk perception becomes progressively and unnoticeably distant from reality, until disaster strikes. Thirdly, Turner notes some common features and similarities for man-made disasters (1997, pp. 50-55):

1. Rigidities in perception and pervasive beliefs in organizational settings, including cultural and institutional factors, which bias members' knowledge and ignorance.
2. A decoy problem that distracts attention from the casual conditions brewing beneath the surface.
3. Organizational exclusivity, which causes the organization to ignore outsiders' warnings.
4. Information difficulties:
    - Relevant information may be buried in a mass of irrelevant information.
    - Recipients may fail to attend to information because it is only presented at the moment of crisis.
    - Recipients may adopt a "passive" mode of administrative response.
    - Recipients may fail to put information together creatively.
5. Involvement of "strangers," especially in complex systems
6. Failure to comply with existing regulations
7. Minimisation of emergent danger

Most of these points are explicitly or implicitly information-related and acknowledge the importance of culture (i.e., beliefs, values and norms). They were proposed in 1978 (the first edition of the book).

The need to update study into disasters for preventive purposes was stressed by several late 20th and early 21st-century authors: Toft and Reynolds (1994), "*Man-Made Disasters*" updated edition, published after Turner's sudden death (Turner & Pidgeon, 1997), Reason (1997), Pidgeon and O'Leary (2000) and Hudson (2003). They propose a shift from disaster analysis to preventive safety culture, which must be an "informed culture," to achieve a "highly reliable organization" from a socio-technical point of view. Likewise, they stress that organizational learning must not be taken for granted. A qualitative study showed several factors to have influence over change in organizational safety philosophy when organizations were involved in disasters (Toft & Reynolds, 1994, pp. 71-72): the scale of the emotional impact on key organizational personnel, the organization's relative distance from the incident, the degree of surprise the organization is subject to, the amount of responsibility it feels towards the production of the incident, whether or not the management attributes the disaster to internal or external factors. They also introduce the concept of "isomorphism" as a facilitator of learning (pp. 55-58), implying some kind of abstraction from concrete fine-grained details of a unique event. Four types are defined: 1) "event isomorphism," where apparently different events lead to the identical hazardous situation; 2) "cross-organizational isomorphism," where separate organizations in the same industrial sector deal with identical problems and processes; 3) "common-mode isomorphism," where a similar process or product is used in different industrial sectors; 4) "self-isomorphism," where a large organization has a number of different sub-units performing the same functions. Perrow (1999) offered a different perspective basing the study of disasters involving technical systems on the structural properties of these systems. He proposed that "normal accidents" occur when systems are highly complex and tightly coupled. He emphasised technical systems design, rather than organizational learning and cultural change.