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Analysis of the 'News Divine' stampede disaster

Jaime Santos-Reyes [a,*], Samuel Olmos-Peña [b]

[a] Grupo de Investigación SARACS, ESIME, ZAC, Instituto Politécnico Nacional, México D.F. 07738, Mexico
[b] Centro Universitario UAEM Valle Chalco, Estado de México, Mexico

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ABSTRACT

The paper presents the results of an analysis of the 'News Divine' human stampede which occurred on 20th June 2008 in Mexico City. As a consequence of the disaster, twelve people were killed and dozens were left injured. The approach has been the application of the Management Oversight Risk Tree (MORT) technique and the FIST (Force, Information, Space, Time) model. The MORT is intended to look at various organizational failures that have led to an accident; the FIST model, on the other hand, addresses the causes of crowd disasters. The analysis has highlighted a number of causal factors leading to the disaster. Effectively, the stampede could have been prevented. Some potential recommendations have also been identified. It is hoped that by conducting analysis such as this may be prove beneficial for a better understanding of crowd management.

1. Introduction

According to recent global population projections, the total world population is likely to increase from its current 7 billion to 8–10 billion by 2050 (Lutz and Samir, 2010). According to the authors, virtually, all the increase will happen in the developing world. The increase of the number of human beings will certainly have an impact, *inter alia*, on the health risks associated with crowds or mass gatherings. Such gatherings can result in higher rates of morbidity and mortality from communicable and non-communicable diseases, injury, and terrorist attacks (Steffen et al., 2012).

Le Bon (2002), one of the pioneers to study the psychology of crowds, defined crowd as "a gathering of individuals of whatever nationality, profession or gender and whatever circumstances have brought them together". Crowds are common in modern society; for example, they can be found in the mass underground transport systems, transport terminals, religious gatherings, major sport events, entertainment events, shopping centres. However, a combination of a number of factors, such as deficiencies in the facilities design, deficiencies in crowd management and a real or perceived threat by the crowd, a stampede can occur (Fruin, 1993; Ngai et al., 2009). A number of human stampede disasters have occurred worldwide resulting in commercial and human losses, and usually have been reported in the mass media (Freeman and Akkoc, 2015; The New York Times, 2010; Daily Mail, 2015; BBC, 2004, 2006, 2015; Chauhan, 2008; Torres-Benayas, 2012); however, there is little evidence in the scientific literature on these events (Ngai et al., 2009; Burkle and Hsu, 2011).

Stampede disasters have highlighted the need to understand crowds. Researchers have addressed several aspects of crowd management (Fruin, 1993; HSE, 1999; Springett, 2000; Chin-Pin et al., 2011; Reicher, 1984; Beene, 2009). For example, Fruin (1993) has proposed the FIST model intended to help to gain an understanding of the causes of crowd disasters. FIST is an acronym for Force, Information, Space and Time. (See the Discussion section for details about the model). Pedestrian dynamics has been one of the subjects of great interest since the 70s (Kirchner et al., 2003; Schadschneider, 2002); simulation has also been conducted in order to understand crowd behaviour (Helbing and Molnar, 1995; Burstedde et al., 2001). Similarly, experimental studies have been conducted in order to improve the physical models on crowds (Smith, 1995; Helbing et al., 2007; Zhang et al., 2013; Jianfeng et al., 2015). In recent years, a number of studies have been conducted on 'visual tracking and automatic vision systems' (Johansson et al., 2008; Sugimura et al., 2009; Krausz and Bauckhage, 2012) and sensing networks (Ramesh et al., 2014) on pedestrians in crowd facilities. Research on collective escape behaviour of ants and mice has also been conducted (Saloma et al., 2003; Dias et al., 2013).

However, there is little evidence in the literature concerning the analysis of past human stampede disasters. In an attempt to fill this gap, the paper presents the results of an analysis of the 'News Divine' stampede that occurred in Mexico City on 20 June 2008, where twelve people were killed (CDHDF, 2008; PGJDF, 2008;

* Corresponding author.
E-mail address: jrsantosr@hotmail.com (J. Santos-Reyes).

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NDT, 2008). The approach has been the application of the Management Over-sight Risk Three (MORT) method (Kingston et al., 2002; Johnson, 2003). The MORT offers a detailed 'road map' to examine all possible causal factors; e.g., specific control factors and management system factors (Kingston et al., 2002). In general, the MORT technique has been applied extensively to the analysis of accidents occurring in socio-technical systems. However, it may be argued that it can be applied to the analysis of the failure of 'human activity systems' (Santos-Reyes et al., 2009; Ferjencik, 2012). Further, two 'generic accident prevention' models have been employed to identify recommendations once the causal analysis has been conducted (Johnson, 2003; Haddon, 1973; Kjellen, 2000).

The paper gives an account of an analysis of the stampede and is organized as follows: Section 2 presents a brief overview of the 'News Divine' human stampede disaster. A brief description of the MORT method, the FIST and the 'two generic accident prevention' models are described in Section 3. The results, discussion and potential recommendations are presented in Section 4. Finally, the conclusions are presented in Section 5.

2. The 'News Divine' human stampede

The 'News Divine' stampede occurred in Mexico City on 20th June 2008 (CDHDF, 2008; PGJDF, 2008; NDT, 2008). The fatal stampede occurred when the police raided the nightclub to inspect that drugs and alcohol were being sold to the underage. The key organizations involved in the inspection operation were the following: (a) the preventive police forces (it is believed that they were about 123) and all were members of the Secretary of Public Safety (SSP) (PGJDF, 2008); (b) the local government officials (inspectors); (c) the judicial police (6 policemen); and (d) four members of the public prosecutor. The total amount of people involved in the whole operation was about 138 (PGJDF, 2008). The head of the inspection operation was also the coordinator of the so called UNIPOL (Federal District Police Coordination System) (PGJDF, 2008).

The inspection operation started at about 17.00 h and the convoy consisting of members of the key organizations mentioned above arrived at the 'News Divine' club at about 18.00 h. It is believed that there were about 500–550 youngsters celebrating the end of the school year in the club at the time (CDHDF, 2008; PGJDF, 2008). At about 18.10 h the inspectors entered the Club and the clubbers started to complain because the police forces started to incite violence and verbally abusing them and at the same time pushing them towards the only exit door (Fig. 1a and c). As soon as the music was turned off, so was the ventilation system; however, the normal lights were still on. Between 18.23 and 18.27 h, the clubbers were pushed towards the exit door

Fig. 1. (a) The main entrance of the 'News Divine' club; (b) clubbers boarding a coach to be taken to the police headquarters for questioning; (c) clubbers pushing towards the only exit door, see (a); (d) policemen blocking the small exit door outside the club, see (a); (e) clubbers assisting the injured; and (f) an ambulance arrived at the scene. NDT (2008).