

Learning to Outsmart a Crisis: A Strategic Management View on Managing Aviation Crises with Machine Learning

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Abstract

Across strategic management and crisis communication literature, a crisis is public, unexpected, disrupts the norm, and has negative impact on organizations. Bridging the wisdom of crisis management and organizational learning research in strategic management with the practical challenges and context of crisis communication, this study leveraged machine learning to expedite and deepen organizational learning by looking at past crisis communication outcomes in the aviation industry to extrapolate recommended communication trajectories. Specifically, with pre-trained sentiment analysis models and purpose-built machine learning models, content analysis with reliable human-machine agreement (Cohen's κ above 0.85 for three separate sample groups) shortened the analysis process tremendously while the approach to quantify corporate reputation through social media comments have been increasingly accepted across academic research – these technological provisions form the foundation of the methodology for this study. Validating a crisis social media communication framework (CONSOLE; Tan et al., 2019) through a pilot experiment ($n = 50$) and incorporating it in a dashboard backed by few shot learning from social media data from past aviation crises, and recommendations drawing from large language models (LLMs), the CONSOLE-D (CONSOLE dashboard) presents the potential for practitioners and organizations to fine-tune their crisis organizational messages to achieve the tact and nuance stakeholders are looking for in an aviation crisis. With contextual learning from past data, the CONSOLE-D shows promise for organizations to outsmart crises by leveraging AI to learn from past crises and to avoid relearning lessons.

Keywords: artificial intelligence, corporate communication, corporate reputation, crisis management, organizational learning