Chapter 4
AI-Driven Predictive Safety Analytics: Enhancing Workplace Security

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ABSTRACT

In today's technology-driven era, workplace safety remains a paramount global concern. To proactively prevent accidents, mitigate risks, and ensure employee well-being, this abstract introduces the research project 'AI-Driven Predictive Safety Analytics Enhancing Workplace Security.' This initiative leverages artificial intelligence (AI) and data analytics to transform occupational safety. By harnessing historical incident data, real-time monitoring, and advanced machine learning, it aims to create a predictive safety system that identifies and pre-empts potential hazards. Anticipated outcomes include a more secure work environment, reduced accidents, improved well-being, and enhanced efficiency. Empowering decision-makers with actionable insights, this approach enables data-driven, proactive choices, setting the stage for a safer workplace future through cutting-edge technology and data-driven insights.

1. INTRODUCTION

According to Rasmussen (1998), the fundamental cause of accidents often lies in human errors committed by individuals directly involved in the unfolding events, with statistics indicating that 70-80% of industrial accidents stem from such errors. Human errors are correctable through behavioural interven-

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tions, underscoring the vital role of behaviour in safety. Guldenmund (2000) emphasizes that safety processes should consider three key domains: environment (including equipment and management systems), person (encompassing employee knowledge, skills, and motivations), and behaviour (involving compliance, recognition, communication, and active care). Behaviour emerges as the primary tool for survival, especially when other safeguards fail (Galloway, 2012). Galloway (2012) further contends that in the absence of proper tools or systems, workers rely on their behaviour for self-preservation. Therefore, enhancing workers' safety behaviours offers a promising avenue for reducing human errors and elevating safety at the organizational level. Parboteeah and Kapp (2008) highlight an overlooked connection between workplace safety and ethics, with only two studies delving into this association. In the first study by McKendall et al. (2002), they investigated how components of an ethics program, including ethical codes, communication, training, and integration into human resources practices, related to Occupational Safety and Health Act (OSH Act) violations. Surprisingly, the findings suggested that ethical compliance programs might be used to divert attention from illegal activities rather than fostering legitimate conduct. The second study by Parboteeah and Kapp (2008) introduced the novel concept that an organizational ethical climate plays a pivotal role in enhancing workplace safety, challenging the conventional contingent reward approach that relies on incentives and penalties to promote safety behaviours. This study aims to comprehensively explore how AI-Driven Predictive Safety methods are utilized within organizations and what factors influence employee engagement with these methods. It seeks to conduct a comparative analysis of these aspects across private and public sector organizations through a systematic review of existing literature. Despite a growing body of research on methods and factors enhancing AI-Driven Predictive Safety in various sectors and generations, there is a notable absence of a comprehensive synthesis and conceptualization of these findings. Therefore, this research addresses the fundamental question: What methods and factors are prevalent in the Information Systems (IS) literature for enhancing employees' AI-Driven Predictive Safety across both private and public sectors?

The document titled "OSH Indonesia, National Occupational Safety and Health Profile in Indonesia, 2018" is likely a publication by the International Labour Organization (ILO). It provides a comprehensive overview of the state of Occupational Safety and Health (OSH) in Indonesia as of 2018. This profile offers valuable insights into the country's OSH policies, regulations, and practices. It serves as a resource for understanding the OSH landscape in Indonesia and may be beneficial for policymakers, researchers, and organizations concerned with workplace safety and health in the country. [1] In B.M. Bulazar's 2016 study published in the International Journal of Occupational Safety and Health, the research explores how leadership impacts safety outcomes by examining the mediating factors of trust and safety climate, shedding light on the intricate dynamics within workplace safety culture.[2]

This paper conducts a literature review as part of an ongoing MPhil research, with a focus on strategies for enhancing workplace safety through AI-Driven Predictive Safety Analytics. It aligns with Iqbal's (2003) notion that literature reviews help identify knowledge gaps, and researchers must provide evidence of such gaps. The review encompasses ethical climates, occupational health and safety issues, the connection between AI-Driven Predictive Safety Analytics and workplace safety, as well as strategies for enhancing workplace safety through this approach. Furthermore, the paper outlines the future direction of the research. The literature survey includes journal articles, books, published and unpublished bibliographies, conference proceedings, industry reports, and various documents, employing key terms such as AI-Driven Predictive Safety Analytics, the apparel industry, occupational health and safety, and ethical behaviours for the review.