

## Synthesis of Human Factors Theories and Industry 4.0

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**Abstract :** The rapid emergence of technology observably induces disruptive effects that carry implications for internal organizational dynamics as well as external market opportunities, strategic pressures, and threats. An examination of the historical tendencies of technology innovation shows that the body of managerial knowledge for addressing such disruption is underdeveloped. Fundamentally speaking, the impacts of innovation are unique and situationally oriented. Hence, the appropriate managerial response becomes a complex function that depends on the nature of the emerging technology, the posturing of internal organizational dynamics, the rate of technological growth, and much more. This research considers a particular case of mismanagement, the BP Texas City Refinery explosion of 2005, that carries notable discrepancies on the basis of human factors principles. Moreover, this research considers the modern technological climate (shaped by Industry 4.0 technologies) and seeks to arrive at an appropriate conceptual lens by which human factors principles and Industry 4.0 may be favorably integrated. In this manner, the careful examination of these phenomena helps to better support the sustainment of human factors principles despite the disruptive impacts that are imparted by technological innovation. In essence, human factors considerations are assessed through the application of principles that stem from usability engineering, the Swiss Cheese Model of accident causation, human-automation interaction, signal detection theory, alarm design, and other factors. Notably, this stream of research supports a broader framework in seeking to guide organizations amid the uncertainties of Industry 4.0 to capture higher levels of adoption, implementation, and transparency.

**Keywords :** Industry 4.0, human factors engineering, management, case study

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