

# Chapter 6

## Ethics, Bias Mitigation, and Model Risk Management

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### ABSTRACT

*Contemporary risk management must evolve beyond reactive frameworks to adapt to changing economic, technical, and environmental ecosystems. The chapter discusses AI-driven risk intelligence and its transformation of predictive governance and strategic decision-making. AI systems rely on ML, DL, NLP, and real-time analytics. These tools allow businesses to monitor financial, operational, cybersecurity, supply chain, and climatic sectors for early warning signals, assess multidimensional risk exposures, and simulate impact scenarios. This chapter covers system designs, analytical methods, industry-specific applications, data quality, model bias, inter-*

DOI: 10.4018/979-8-3373-6851-1.ch006

*pretability, and regulatory compliance. AI-driven risk intelligence in uncertain and fast-changing environments improves organisational resilience, agility, and long-term sustainability. Technological innovation, ethical governance, and model risk management are highlighted.*

## **1. INTRODUCTION**

A new era of industrialization has begun. There is a mistreated or used electronic equipment around every corner. People are utilising their brains to an unprecedented degree (while neglecting their bodies, frequently to disastrous effects), and we can hardly imagine modern work without digital systems. Additionally, we appear to be inseparable from our mobile gadgets. Almost every aspect of our lives is becoming more computerised and “smart,” including but not limited to: transportation, communication, workplaces, relationships, intelligence gathering, murderous drones, “deep fakes,” and personal information (Dameski, 2020).

The lines between the digital and the analogue, the virtual and the real, are blurring at an exponential rate, and the majority of people aren't even keeping up with the rapid pace of change, let alone contributing to it. As a result, people are left to fend for themselves, fearing for their future livelihood, less agency, privacy, and autonomy, and an overall sense of isolation. Along with all this, we are hurriedly working on computer systems that can take on more and more complicated duties with less and less human oversight. Currently, the phrase “artificial intelligence” (henceforth: AI) refers to a collection of technologies and tools that humans use to carry out jobs that are either too tedious, expensive, or out of date for them to do alone.

On occasion, they are created and put into action just for the thrill of intellectual challenge, without considering the potentially disastrous and unforeseen outcomes that may result. The goal is to supplant humans with machines that are more resolute, less expensive, more efficient, and frequently less intelligent. Where does this lead? The good and the bad are inherent in every change. Perhaps, with varying degrees of success, humans have been attempting, from the beginning of our species onwards, to control or eliminate the negative while maximising the positive. There are “varying degrees of success” because there are instances when we are unable to identify the true nature of the problem or when we are unable to come up with satisfactory remedies to existing issues.

Possibly even more perilous than the first is the second. The fact that experts in the field of artificial intelligence can't even agree on a common definition of the term “artificial intelligence” suggests that we have no idea what kinds of problems, if any, will arise as a result of societal adoption of AI and automation. Countless individuals from various walks of life, including those in academia and government,

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