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Coping with Errors in Organizations: Challenges, Opportunities, and Frontiers for Operations Management Research

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Contents

Coping with Errors in Organizations: Challenges, Opportunities, and Frontiers for Operations Management Research

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ABSTRACT

Errors prevail in various aspect of our lives such as physical safety, organizational success, financial outcomes, and even the political arena. For this reason, errors merit study in their own right as an important phenomenon of growing theoretical and managerial significance. Although much has been written in the past few decades about product life cycles, efficiency, quality control, and learning in organizations, error research has yet to be at the center stage of organizational science and practice, and our understanding of error-coping strategies remains limited. Our aim in this monograph is to present and integrate various cutting-edge theoretical frameworks and methodologies from the operations management and organizational research literatures. By promoting a dialogue between two primary business disciplines, we hope to illuminate some promising paths for the integration of specific approaches and diverse disciplinary backgrounds. Through the development of learning exchanges within OM and between OM and organizational research methodologies,

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we strive to help managerial practitioners and policy makers to build a body of knowledge on errors that is more visible, inspectable, systematic, and influential on their daily practice. The ultimate goals are centered on reducing adverse error consequences while, also importantly, capitalizing on opportunities for positive outcomes such as innovation and learning.

Keywords: error; error management; quality; safety; lean agile; supply chain management; project management; sustainability; Industry 4.0; learning; continuous improvement.

1

Introduction

Errors in organizations are a recurring fact of organizational life and prevail in the economy, the environment, and the political arena. Errors attract much public attention when they result in product failures, service interruptions, and injuries, even loss of human lives and public threats. Consider the manufacturing errors that led to massive Toyota (Austen-Smith *et al.*, 2017) or Honda vehicle recalls, the medical errors that are responsible for thousands of deaths in U.S. hospitals each year, or the human errors that contributed to BP's oil spill in the Gulf of Mexico or the Fukushima disaster in Japan. However, errors merit some praises in their own right as an important source of feedback, learning, and innovation. For example, the roots of the philosophy of science can be traced back to the process of eliminating erroneous approaches in the sense of falsification (Frese and Keith, 2015). Award-wining innovative firms, such as 3M and IDEO, deliberately use errors as a rich source of feedback and improvement and intently explore opportunities for product innovation.

The wisdom of effectively managing and learning from errors is incontrovertible and even seems obvious. Indeed, organizational research on errors has grown tremendously over the past two decades (see Frese and

Keith, 2015; Lei *et al.*, 2016, for a review); similarly, errors themselves have become an explicit subject of interest in the operations management (OM) literature. For example, a few OM studies have analyzed the latent impact of design errors on construction projects (Parvan *et al.*, 2015). Within this line of research, Burati *et al.*, (1992) reported that design defects were responsible for 79% of total change costs and 9.5% of total project costs. Cusack (1992) showed that documentation errors increase project costs by 10%. Hanna *et al.* (2002) found that design errors led to between 38% and 50% of change orders in the projects they studied. More recently, Lopez and Love (2012) reported that the average of direct and indirect costs for design errors is about 7% of contract value.

It is, however, one (encouraging) thing to see some advances on paper in error research across different disciplines (e.g., organizational research, OM, health care), and quite another to admit that error research has yet to flourish within and across particular disciplines and that organizations constantly miss the mark of effectively mitigating errors and learning from them (Edmondson, 1996; Lei *et al.*, 2016). From the vantage point of scholarship, recent advancements in different lines of error research have largely progressed in isolation from each other and sometimes raise inconsistent or competing views. A lack of cross-fertilization between different perspectives may provide researchers and mangers with mixed guidance and confusing insights for designing and implementing effective mitigation strategies and programs. In terms of practice, consider the health care industry: the number of preventable deaths from medical errors in American hospitals remains high, with recent estimates suggesting more than 250,000 per year (Makary and Daniel, 2016), compared to the estimate of up to 98,000 per year according to the Institute of Medicine's blockbuster report in 2000 (Donaldson *et al.*, 2000).

Some researchers, policymakers, administrators, and experts believe that this less-than-satisfying outcome of overcoming error consequences and challenges, particularly in the health care sector, stems from a lack of commitment to or insufficient implementation of quality assurance practices. We, however, challenge this reasoning and suggest that a lack of organizational goodwill or the existence of implementation difficulties

are not sufficient to explain the persistent challenges of effectively coping with errors in organizations and in the public sector. Rather, we believe deeper root causes may lie in at least three key facts, namely:

(1) errors have not been at the center stage of research in most disciplines (e.g., OM, OR, health care, general management);

(2) our current knowledge about errors in organizations is insufficient and segregated; and

(3) synergy within and beyond any disciplinary field has yet to emerge.

In sum, a general lack of insights into synthesizing knowledge within disciplines and from various disciplines and multiple industry contexts (e.g., reliability-focused versus innovation-driven industries, routine operations versus nonroutine tasks) is hampering progress and breakthroughs toward mitigating errors to avoid adverse outcomes while learning from them to reap long-term benefits.

The time is ripe for broadening and integrating different ideas and practices across disciplines that use diverse methodologies in order to help organizations to excel in reliability, performance, and innovation. To achieve this goal, in this monograph we aim to present and integrate various cutting-edge theoretical frameworks and methodologies from the operations management and organizational research literatures. By promoting a dialogue between two primary business disciplines, we hope to illuminate a number of promising paths to the integration of specific approaches and diverse disciplinary backgrounds. Through the development of learning dialogues within OM and between OM and organizational research methodologies, we strive to help managerial practitioners and policy makers to build a body of knowledge on errors that is more visible, inspectable, systematic, and influential on their daily practice. The ultimate goals are centered on reducing adverse error consequences while, also importantly, capitalizing on opportunities for positive error-related outcomes such as innovation, continuous improvement, and learning.

The remainder of this monograph is organized as follows. First, we introduce the key definition of errors in organizations and its relationship with other concepts. Second, we provide a well-structured review

of the body of knowledge about errors in the OM literature. Third, by contrasting different research methodologies present in the fields of OM and organizational research, we suggest using the priority, level of analysis, and temporal lenses for a more integrative, holistic approach to errors in organizations, an approach that may allow for a learning dialogue and thus synergy between the two fields. Finally, we identify and suggest research and practical implications of the challenges, opportunities, and frontiers involved in reducing errors' negative consequences while increasing the learning and innovation possibilities they provide.

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