

EDITORIAL

HUMANS AND TECHNOLOGY IN MANAGING THE UNEXPECTED: AN ORGANIZATIONAL PERSPECTIVE*

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The shock of the health crisis, the subsequent lockdowns, and the outbreak of war in Europe changed the nature of our societies' economic and social problems.

Against the background of the enormous individual and collective efforts to cope with the devastating human, social, and economic impact of these events, the idea itself of managing and organizing are called into question. Traditional concepts such as effectiveness, let alone efficiency, and other primary features of management and organization as disciplines and fields of practice need to be reconceptualized to help people and organizations anticipate their future and shape their surroundings (Flyverbom & Garsten, 2021).

However, the interest in organizations and organizing as tools to face the unexpected is flourishing and gaining popularity among scholars and practitioners (e.g., Raetze et al., 2021), to the point of transforming a niche conceptualization (e.g., Tobin, 1999 and Kendra & Wachtendorf, 2003 for resilience in disaster management) into a mainstream one (e.g., Hällgren, Rouleau, & De Rond, 2018; Williams et al., 2017). The organizational communities are discussing the topic, such as during the XXIII Workshop of Italian organizational scholars (WOA 2022), organized in Brescia in May 2022, «Are we ready to manage the unexpected? Exploring antifragility, resilience and wellbeing in organizations»

The debate on managing the unexpected (Weick & Sutcliffe, 2015), exploring antifragility (Taleb, 2007), designing for resilience (Vogus & Sutcliffe, 2007), and coping with the aftermath of an extreme event (Sonnentag & Frese, 2013) have thus become central in the organizational discourse (Linnenluecke, 2017; Raetze et al., 2021). These key concepts have been conceived in various ways, either as a trait, a capacity/capability, an outcome, or a process (Linnenluecke, 2017; Raetze et al., 2021), and being analyzed at different levels, i.e., individual, dyad, teams, organization, or societal systems, also in combinations and the time horizon in which it occurs (i.e., before or after an adverse situation; Williams et al., 2017).

A few recent reviews show that resilience is a central concept in many different and disconnected streams of literature in organization studies (e.g., Linnenluecke, 2017; Raetze et al., 2021), explaining how different entities across different levels manage the unexpected derived by different types of adversity (Hällgren et al., 2018). Many recent studies claim the need to explore the context of the unforeseen/adverse events or situations in detail (Hällgren et al., 2018; Williams et al., 2017) but also the role that contextual factors specific to both the research setting and the resources, capabilities, structure, and process in place (at different levels of analysis) play in developing and enacting resilience (Linnenluecke, 2017; Raetze et al., 2021). From this literature, three under-developed themes emerge such as the dark side of

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resilience, the temporal dynamic of resilience, and, therefore, the distinct forms of resilience that can be built; and its role as a mediator or moderator in the recovery process (Raetze et al., 2021; Williams et al., 2017). Finally, the role of humans and technology in managing unexpected events emerges as a fourth issue cutting across the themes.

In this special issue, we build on this knowledge base and expand the direction of research on the management of unexpected events by focusing on this last point. The relevance of this line of inquiry is also suggested by Ciarli and colleagues (2021) in their overview of the many possible dynamic interactions between technologies and organizational processes in innovative activities. For instance, they clearly illustrate how the adoption of digital technologies, the disruption of routine, and the request for new skills can be affected by impactful events such as the recent pandemic. This example invites us to reflect on the role of technology dynamically 1) as an enabling feature transforming the constraints of time and space in working activities fostering resilience 2) as the processual assemblage of humans and nonhumans' agential endeavors in purposive actions aimed at managing unexpected or adverse events 3) as a trigger for unexpected changes adding a second layer of reflections on the meaning of technology in work activities that transform expectations on and about work.

This last aspect is especially relevant as radical advances in robotics, artificial intelligence, and digitalization are challenging organizational practices and our understanding of technology's influence on the future of work (Balliester & Elsheikhi, 2018).

From one perspective, much research explains the 'transformative' (Mørk et al., 2012) and 'augmenting' effects of technologies on human capabilities (Brynjolfsson & McAfee, 2014; Varian, 2014). These studies are consistent with decades of research in organization studies, economics, economic history, and sociology, explaining how organizational actions and decisions shape the adoption of technology toward efficiency and prosperity. One recent example is how business organizations have taken advantage of digital technologies and faced Covid-related restrictions by adopting remote working arrangements to keep their activities alive (Leonardi, 2021). Also, technology has been vital to healthcare organizations, schools, and other organizations in the educational sector during the pandemic. Moreover, these changes have expanded collaborative spaces in work and organizing.

However, while technology has clearly supported individuals and organizations in facing the challenges and coping with the uncertainty of the pandemic, the increasing use of digital technologies has also brought many negative consequences, such as the growing difficulties of workers in managing work-life balance and the enlarged scope of technostress. These studies echo an extended stream of research exploring the dark and unexpected sides of technology and digitalization (Trittin-Ulbrich et al., 2021).

From an organizational perspective, several interesting research questions focus on the role of humans and technology in managing the unexpected: how do organizations transform their structure to face unexpected events, and what is the part played by humans and technologies in the change process? Does the adoption of digital technologies highlight or overshadow the role of human skills in performing

new work activities? What role is technology playing in the development of routine and learning capabilities dedicated to anticipating adversities? Is remote work here to stay? Are any lasting effects on employment and organizing already clear from the data?

The articles included in this special issue discuss these questions and offer several insights into the relationship between conceptualizations of times of crises and the interplay of humans and technology in facing them.

In the remainder of this editorial, we offer a conceptual map to situate the Authors' contributions along the process of managing the unexpected and a summary of each contribution. In proposing this analysis, we will adopt a simplified Buchanan and Denyer's (2012) ideal-typical temporal sequence (see figure 1) for describing the phases of any crisis management intervention as a symbolic event in the life of any organization.

Figure n. 1 – A conceptualization of the papers of the special issue: time and technology in facing unexpected events

	E v e n t		
Unintended		Pre-crisis incubation	Crisis response management
	o c c u r r e n c e	Petrolo et al.: why family firms are more resilient	Napolitano et al. + Shaba: unexpected events turned into organizational responses with unintended consequences
Unexpected		Montefusco & Borreani: preparedness to unexpected	Klaser et al. : adaptation through redesign
			Implementation of lessons learned
			Razzoli & Scapolan: legacy of reactions to the unexpected Cantoni et al.: resilience as designed inefficiency

Source: Authors' elaboration from Buchanan and Denyer (2012).

This conceptualization identifies four main phases.

Pre-crisis incubation refers to the ways, methods, and techniques organizations can adopt to prepare for an event and to deploy sensors to help the organization perceive the event before its actual occurrence. The articles by Montefusco and Borreani, and Petrolo and colleagues are devoted, by and large, to the concept of preparedness in two very different scenarios. While Petrolo and colleagues look at the specific features of family businesses as resilient organizations, Montefusco and Borreani explore the interplay between human preparedness and technological artifacts in shaping the practices of high-reliability organizations facing extreme events.

The *occurrence of the adverse event*, while not being the focus of any of the papers, represents the fundamental divide between the exploration of preparedness and any *crisis response management* initiative.

The article by Klaser and colleagues looks at crisis management through the lens of Socio-Technical systems. Technology plays a crucial role in enabling the

organization to cope with an unexpected event (the COVID-19 emergency, in the specific case), as long as it is managed coherently with the social relationships implied by the organizational structure and wisely incorporated in the organizational design. Looking at the same process with a different outlook on technology represents the added value of the articles by Napolitano and colleagues and Shaba. Looking at different critical events and from different perspectives, they reach similar analytical results. Even when technology helps mitigate the consequences of unexpected events, its adoption often transforms the initial, exogenous problem into a different situation. The disturbing event, thus, is produced by missteps in the practices associated with the adopted technology. We call this phenomenon an *unintended event*, an event that has damaging consequences and which is generated by the organization in its effort to mitigate the effects of the initial unexpected event.

We then summarize, under the general label *implementation of lessons learned*, the three steps identified by Buchanan and Denyer as representing the long-term aftermath of an unexpected crisis (investigation, organizational learning, implementation). Two articles explore in depth the issue of the long-term consequences of the unexpected event. Specifically, Cantoni and colleagues look at the structural conditions that enable resilience, identifying in redundancy (designed inefficiency) a key ingredient; Razzoli and Scapolan, by contrast, concentrate on the value of the legacy of actions undertaken to overcome the adverse consequences of the event. They identify such a value in the reflections stimulated by re-reading the technology deployed during the emergency.

In the following, we present each article in more detail, highlighting their contributions and logical connections within the framework we just illustrated.

«*A framework for evolving human-technology practices in startling times*» by Andrea Montefusco and Ubaldo Borreani proposes an original conceptual framework aimed at coping with conflicting organizational design and evolution purposes associated with managing unexpected events. The study's theoretical framework combines Degani and Wiener's approach to practices, Feldman's dual role of routines, and mixed results from decision-making and organizational learning studies. The article considers the role of technology and humans in managing the unexpected. It recognizes how technology typically simplifies complex reality and increases the predictability of organizational outcomes. At the same time, it focuses on the many issues concerned with the increasing machine internal complexity of digital processes and how this prevents intelligibility of the complex connection between human/technological actions, choices, contexts, and their impacts on the outcomes. This contribution calls the reader for a novel reflection on fundamental questions such as: what is automation? What is the actual ability of a machine? Who controls the final results if the machine can make decisions autonomously? The framework proposed by the Authors sheds new light on these issues. It emphasizes that under complexity constraints, actions are never simple applications of procedures, nor is decision-making merely choosing between options to maximize utility. Additionally, it shows how the notion of practice helps clarify how individuals, teams, and organizations cooperate through and with technology to manage uncertainty,

ambiguity, and complexity, therefore, describing the role of technology in developing routine and learning capabilities dedicated to the anticipation of adversities.

«*Le fonti della resilienza organizzativa nelle imprese familiari: uno studio esplorativo [The sources of organizational resilience in family firms: an Italian exploratory study]*» by Damiano Petrolo, Chiara Morelli, and Lucrezia Songini explore the sources of organizational resilience in family firms by way of a qualitative multiple case study approach based on three Italian family firms. The theoretical background of the study combines foundational perspectives on resilience in management studies and more recent approaches to 'family firms' resilience' seen as 'the unique bundle of resources a particular firm has because of the system's interaction between the family, its members, and the business' (Habbershon e Williams, 1999, p. 11). The article focuses on technology, external stakeholders, and owners' beliefs and entrepreneurial traits showing the role of three main factors in developing organizational resilience of family firms: owners' entrepreneurial beliefs and characteristics (family harmony, relationship with employees, material and immaterial resources of the entrepreneur and their family); relationships with external and local stakeholders; and organizational resources (technology, managerial mechanisms and professional managers). While the Authors adopt a traditional posture on the resilience topic, they hold a strong view on the inherent qualities of family firms as a buffer for the unexpected. Indeed, the readers are stimulated to either question such a view or to further dig into the interplay and boundary conditions differentiating the family firms from one another.

«*Remote work in the United States: a micro-survey on organizational transformation after Covid-19*» by Klaudijo Klaser, Roberta Cuel, and Paolo Casari explores the transformation of work arrangements within a sample of American organizations that adopted remote work during the pandemic. The study tries to understand whether and how the aura of skepticism surrounding remote work for decades might have been scratched by the recent extensive Covid-19-related forced adoption and on what terms remote work may be integrated as a common practice in the long run. By adopting a Socio-Technical theoretical perspective and collecting data from 504 American workers, the research reveals both the technical and social dimensions of change of organizational structures within the employer organizations of the sampled workers. The study considered space, time, and contract flexibility. It argued that introducing new roles and responsibilities associated with remote work during the pandemic, such as managing and coordinating remote workers, promoting workers' work-life balance, and active psychological support, might be relevant drivers for adopting remote work in the long run. This article offers a nuanced understanding of the organizational conditions that support the structural integration of remote work in the long run and how unexpected events trigger different strategic responses. Technology may act as a neutral factor or enabler of change, becoming effective only in combination with individual and organizational choices that reflect and construct the organization's culture.

«*Limits of inclusion: multimodal action-nets and the challenge of communication technologies for disability*» by Domenico Napolitano, Vito Lasala, and Silvio Ripetta explores the effects of extensive use of communication technologies fostered by the

pandemic on organizational inclusion. The study offers theoretical reflections supported by field data and journalistic reports of disabled people's experience of communication technologies and assistive devices. It contributes to the contemporary debate on the connection between the constructs of inclusion and resilience in organization studies. The article claims that communication technologies and assistive devices are not inclusive *per se*, as they can also produce errors, malfunctions, frustrations, and inaccuracies. From these considerations, the article proposes a relational approach to inclusion as a dynamic process of multimodal action nets composed of multiple socio-material agents and nodes, both human and nonhuman. This framework emphasizes the complex interdependencies between individuals, public and private organizations, technological artifacts, design, IT services, data processing, hiring policies, knowledge, and narratives. It highlights the fruitful connection between inclusion and resilience, not in the adoption of single accessibility devices nor of specific policies in HR management. But instead, It stresses that communication technologies are part of a socio-material assemblage in which meanings of disability and inclusion acquire their sense through multimodal action nets. This article offers new insights into the effect that the adoption of digital technologies can have in enabling or shadowing the role of human skills in performing work activities. More interestingly, it allows the reader to reason about the unintended consequences that unexpected events generate through their organizational responses as an understudied phenomenon.

«Is collaboration during video-conferencing encounters a meaningful experience? An 'embodied' affordance approach to explore challenges and opportunities,» by Emanuela Shaba, examines how virtual work during the pandemic has affected the relational aspects of collaboration, such as formal and informal communication and interaction structures, affections, feelings, motivation to share and social interaction processes. The study adopts a critical posthumanist theoretical approach and focuses on the materiality of the 'space between' humans and technology through which the situated practices of virtual work become inherently meaningful. The empirical material was collected at the Italian subsidiary of the world's third-largest asset management bank, headquartered in Boston, USA, using nonparticipant observation methods. The article enquires about the emerging experience of the human (body)-technology relationship and its implications for relational aspects of collaboration. The paper shows how virtual meetings were, on one side, effective and efficient because members came prepared and kept their contributions brief and to the point. However, due to the lack of resonance of bodily movements to the things it attended, workers experienced weakened intrinsic temporal dimensions of conversation in the virtual space, conducive to frustration and lack of trust in the technology. The higher level of distraction and disengagement that followed affected two main antecedents of sharing and collaboration, such as 'triggered attendance' and spontaneous initiation of social interaction. Findings enrich knowledge on the body-emotions-technology relations of remote work arrangements while disentangling implications of this relationship for two main aspects of sharing and collaboration: the level of awareness, an antecedent to the motivation to share, and the rate of social interaction. This article offers an additional reflection on the ambivalent nature of technology when we

consider the experience of the human-technology relationship through the lens of embodiment and affection. In doing so, the paper offers insights into one of the many potential unintended consequences that organizational responses to unexpected events generate at the individual, meso, and macro levels.

«*Learning from chaos. Resilience factors and organizational suggestions for hospitals under extraordinary stress*», written by Franca Cantoni, Paolo Gaetano Bisogni, Elisa Mori, and Elena Zuffada, focuses on the resilience factors that can curb or accelerate the rebooting phase for hospitals under Covid-19 stress. Their research enriches the existing literature on the organizational antecedents of crisis management endeavors in the healthcare sector. By studying how the six major hospitals in the Lombardy area tackled the pandemic, the study identifies seven areas of resilience for the hospitals: sources of supply and storage, layout redesign and reconfiguration of assets, organizational structure, strategic decision-making, HRs, development of protocols and information flows. Following March's pioneering work on Exploration and exploitation in organizational learning, the article focuses on learning ambidexterity as the hospitals' capacity to simultaneously achieve excellence in daily operations and the ability to innovate and change in response to the changing demands in the environment. From this perspective, resilience emerged as an organizational competency and process that can be nurtured, improved, and consolidated through continuous learning. The technology resulted as an activator of change, working as a booster in the rebooting phase of the resilient process and then as a powertrain on exploration and exploitation mechanisms. Technology also revealed itself as a trigger for unexpected changes transforming expectations on and about work by supporting hospitals in learning, networking, breaking and creating organizational routines, orienting behaviors, and spreading values. This paper contributes to a better understanding of how organizations adapt their structure to the emerging contextual situation while describing the role humans and technologies have played in the change process. This work offers insight into the implementation of the lesson learned during and after one of the most recent unexpected crisis events, such as the Covid-19 pandemic outburst.

«*Dancing in the digitalization: a case study on the socio-material platformization of creative organizations*» by Damiano Razzoli and Anna Chiara Scapolan explores the digitization of cultural organizations and how the acceleration of this process due to the pandemic has affected the production of creative content and the organization of artistic work. To explore these issues in an empirical setting, the authors adopted a socio-material theoretical framework and carried out a qualitative study of a screendance production performed, produced, and distributed at a distance during the 2020 lockdown by the Italian contemporary dance company "Fondazione Nazionale della Danza Aterballetto." The study offers a multifaceted portrayal of the organizational implications of 'moving' artistic work from its traditional physical premises to digital platforms. It addresses the technological and social dimensions of the platformization of creative organizations, illustrating the material/immaterial, physical/digital, and individual/social transformations involved in the process. The article reveals socio-material relationships between three aggregated dimensions of the human/nonhuman assemblages characterizing the transition of the artistic work

towards the screendance: the means of production (i.e., bodies; video cameras; platforms), the practice sites (domestic sites; screens; external spaces); and organizational culture (attitudes; beliefs; conventions). The research suggests that the platformization of performances gave performing arts organizations the opportunity to renew reciprocal adaptation between humans, sites/sights of production, and digital means, also contributing to revitalizing organizational purpose and identity. This article parallels Shaba's contribution by offering new and exciting arguments to further reflect on the importance of the body and the space within the socio-material process of creative work faced with unexpected events. Additionally, the article explores the legacy of the actions implemented as a reaction toward unexpected events potentially affecting the very nature of the company in terms of its identity and strategy.

Overall, the articles in this Special Issue offer an original and interesting portrayal of how managing unexpected events require a reliable understanding of the organizational background and implications of humans and technology enactments in managing the unexpected. The Authors use a wide array of theoretical approaches and methods, exploring different organizational contexts such as hospitals, cultural organizations, family firms, and asset management companies. Even though the unexpected event in the background is the same for most of them, namely the Covid-19 pandemic, the diversity of theoretical approaches and methodologies adopted by the Authors enriches our understanding of the phenomenon. When we read the articles in perspective, a theoretical and methodological dialogue emerges between different interpretations of unexpected events and the human/technology interplay. Even the articulation between unexpected events and unintended consequences of designed reactions to unforeseen events reflect the opposition between socio-material and socio-technical approaches adopted in some of the analyses you will read in this issue of IPEJM.

However, many conclusions of the research presented in this Special Issue naturally lead to more empirical and theoretical puzzles, directly and indirectly calling for novel inquiries in future research ventures. For instance, the reflections on the long-term consequences of unexpected events open the debate between the need for more design (e.g., the need to contemplate the affective dimension of the interplay of humans and technology) or for less design when facing unexpected events (e.g., increasing the amount of slack in resources that can be more promptly deployed in case of need). Moreover, the affective dimension is evoked both as a dimension of human agency when interacting with artifacts and as a specific feature of human agency in family businesses that help explain their peculiar level of resilience. Yet this topic is seldom prominent in research on unexpected events. Future research might want to engage in this interesting line of work.

We suggest that future research on the management of the unexpected expand on the lines of inquiry embraced by the articles included in this Special Issue and on the other questions raised by extant organizational literature on resilience and the management of the unexpected, such as exploring the contextual domain and contextual factors of unexpected events; the dark side of resilience; the temporal

dynamic of resilience (Hällgren et al., 2018; Williams et al., 2017; Linnenluecke, 2017; Raetze et al., 2021).

Even the topic of human and technology in managing the unexpected deserve more empirical and theoretical elaborations. For instance, it would probably be interesting to enlarge the research bases provided by the articles included in this Special Issue by adopting theoretical approaches that challenge the traditional academic reference that surrounds the understanding of humans and technology in the organizational action, namely that humans and technology are 'entities' entangled in a reciprocal interplay. From this perspective, socio-material, posthuman, and process-oriented theories would probably offer interesting theoretical frameworks to accomplish this task, given their orientation to question the theoretical separation between humans, nonhumans, work, organization, and technology.

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