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# Information Systems Facing a Crisis: In Search of Resilience?

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## Guest Editorial Preface

# Special Issue of Information Systems Facing a Crisis: In Search of Resilience?

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### CONTEXT OF SPECIAL ISSUE

This special issue follows the 27th conference of the French academic Association in Information Systems (Association Information & Management - AIM) organized by the University of Aix-Marseille from June 6 to 8, 2022 and whose theme of the call for papers was “IS facing a crisis, in search of resilience?” Founded in 1991, AIM organizes an annual conference with the objective of fostering scientific exchange in the IS field. Affiliated Chapter of the Association for Information Systems (AIS), AIM also wishes to participate in the debates of the field at the international level. In this way, the annual conference focuses on an emerging and promising topic that is likely to echo recent research in the international IS community.

After two years in which digital was the foundation to maintain exchanges and ties among our community, the return to a face-to-face conference allowed us to get back to the basics of scientific interactions (rich and varied social interactions, spontaneity of interventions, moments of conviviality, etc.) and offered us a privileged moment to question the role of IS in the face of a crisis. Like other conferences (ICIS, ECIS, ...), the scientific committee of the AIM conference in 2022 wanted to encourage French researchers to evaluate the role of IS in the face of a crisis, their resilience, the determinants of their uses and their transformational effects. This theme was therefore at the heart of the exchanges during the conference, and we invited the best papers to be submitted to this special issue of JGIM.

### THE PARADOXICAL ROLE OF IS IN CRISIS MANAGEMENT: FROM THE FOUNDATION OF SOLUTIONS TO THE EMERGENCE OF NEW RISKS

There are moments when troubles enter organizational life, and when an entire organization can fall into a crisis situation: during social and political movements (e.g., fake news on social networks leading to the assault on the Capitol in January 2021), during a moment of insecurity (e.g., 200M twitter user data leaks in January 2023) or during an unprecedented health crisis. A crisis requires the organization to absorb a shock of internal or external origin. Crisis can be defined as an unexpected event that threatens organizational survival (Hermann, 1963, p.64). Although crisis occurrence has a low probability, its impact can be tremendous (Mitroff et al., 1988). A crisis situation introduces

'disasters', significant disruption to the organization's activities and structures (Sakurai and Chughtai, 2020; Park et al., 2015). Indeed, a crisis can lead to the collapse of sense-making, what Weick (1993, p.633) defined as a cosmology episode: "A cosmology episode occurs when people suddenly and deeply feel that the universe is no longer a rational, orderly system. What makes such an episode, so shattering is that both the sense of what is occurring and the means to rebuild that sense collapse together".

What are the roles played by IS in dealing with these sudden and potentially fatal shocks?

Among recent crises, the COVID 19 pandemic appears as an unprecedented context for analyzing the role played by IS in the crisis. Indeed, the pandemic has led to an intensification of IT and IS use. Like widespread teleworking, e-learning, telemedicine, and online sales, IS appeared to be a means of slowing down the virus transmission while ensuring a continuity of the organization's activity. IS have enabled organizations to adapt to this extreme context (Park et al. 2015; see also Fuhrer in this SI). At the same time, in health research, data (science) was at the core of pandemic management. This is illustrated, for example, by the emergence of tools such as CovidTracker: data informs, translates, helps decision-making, and influences our behavior in an uncertain and complex context. In these situations, IS seemed to be the foundation on which the crisis responses were built. However, the pandemic has also revealed risks related to the use of IS in crisis situations, by highlighting their vulnerability in light of decision-making processes (He et al. 2021), revealing societal disparities in access to the Internet and information, encouraging the explosion of fake news and the strengthening of informational bubbles (Moravec et al. 2019), and exacerbating IS security issues.

Finally, it is important not to overlook the major transformations linked to this sudden predominance of IS. The digital transformation of organizations, much mediatized, has brusquely and perhaps durably become a reality. The massive use of telework is accompanied by important individual and collective changes. The rapid development of new IS sometimes creates a significant technical debt that will need to be addressed. In the face of a crisis, IS thus seemed to play a paradoxical role: while they offered immense potential for crisis management, they in turn generated new risks and major transformations that needed to be assessed. Considering the recent crisis, how can organizations develop their resilience?

Resilience has been largely overlooked as an organizational capability, despite decades of research across multiple disciplines such as psychology, ecology, safety engineering, organization studies, and management. Holling (1996) differentiates between engineering resilience (focused on system or organizational efficiency) and ecological resilience (focused on survival), noting that resilience is only found in dynamic responses to extraordinary challenges rather than everyday adaptation of organizations. However, this everyday adaptation may hide latent resilience or a lack thereof (Fenema & Romme, 2020). Resilience has been manifested in various ways, such as the ability to bounce back to pre-event conditions (Park et al. 2015), the capacity to improvise timely strategic responses amidst external chaos (Lengnick-Hall et al. 2011) and the ability to transform to remain competitive or legitimate in a rapidly changing environment (Perrow, 2011). Organizational qualities such as mindfulness (Weick and Sutcliffe, 2001), or even employee happiness (see Durezert et al. in this SI), may also be important in coping with disruptive events. Resilience is a complex phenomenon, and terms such as agility, robustness, and anti-fragility are sometimes used interchangeably. All of these focus on responding to unpredictable Black Swan events, which may render existing strategies and organizational functionality obsolete, and make it impossible to return to the old organizational state (Grandori, 2020; Välikangas & Lewin, 2020).

## **KEY THEMES OF THE SPECIAL ISSUE**

The seven empirical studies in this special issue address three key themes of IS in the face of a crisis: (1) IT privacy, tracking and transparency issues, (2) human resources perspective of individual resilience and (3) major challenges of societal resilience.

## **Privacy, Tracking, and Transparency in Global Information Management**

In times of crisis, the adoption process of digital innovations deployed by governments to deal with it can lead to social controversies about perceived risks. Digital innovations such as contact tracing applications imply new risks regarding information privacy (Trang et al., 2020), surveillance and control (Rowe et al., 2020). Thus, social controversies can create paradoxical tensions between collective needs (e.g. protection and health of the population) and individual interests in the face of perceived adoption risk (e.g. loss of information privacy, concerns about data transparency...). Yet, a perceived risk by social actors is likely to generate a phenomenon of rejection of digital innovation. Several research studies in this field of e-government have shown that coercive measures can increase citizens' distrust of IT (Chan & Pan, 2008; Lunn et al., 2020; Rowe et al. 2020) and delegitimize public policies. Further research is needed to understand, in this singular context of crisis, the adoption determinants of e-government initiatives in considering the potential tensions between individual and collective risks.

Thenoz et al. in this special issue propose to study the determinants of contact tracing application (CTA) use in the context of Covid-19 pandemic management in France. Based on the privacy calculus theory, the authors sought to analyze how these individual and social risks and benefits influence CTA adoption and then intention to integrate the health pass into the application. The results of the quantitative study conducted with 779 French people show that three variables have a significant influence on the use of the application: perceived value, distrust of the government and personal innovation capacity. The research confirms thus the relevance of a social approach to privacy calculus when technologies involve collective risks and benefits.

Privacy issues related to digital innovation lead also to questions about the technical foundations of digital innovation chosen by the governments to manage the crisis. The choice of one technological solution over another can condition citizens' trust. In the case of CTA and other health pass applications, these choices were debated in the most western countries and considered as strategic for the success of the e-governance initiative. Nevertheless, few research directly explore the relationships between the technical components of e-government technologies and the dynamics of their adoption by citizens.

Baudet and Medina in this special issue examine the paradoxes of blockchain technologies acceptance by citizens in a turbulent situation. Based on an action research methodology, the case study deals with an e-government blockchain-based project to improve digital trust in a Swiss canton (the Republic and Canton of Jura). Research highlights counterintuitive findings regarding the barrier to the citizens' acceptance of such technologies. While the blockchain technology was selected to strengthen the digital trust, its implementation decreases instead the citizens' trust in government. The results reveal that transparent communication about the functioning of blockchain can generate misinterpretations and lead to the citizens' rejection. The authors propose some recommendations to manage these two paradoxes of trust and transparency in order to facilitate the citizens' acceptance of blockchain technologies.

## **HR Perspectives for Individual Resilience: The Path to Addiction or Happiness**

Resilience can be considered from an individual perspective. Resilience is then a process of human transformation that allows us to see failures or crises as opportunities. This individual process assumes that certain conditions are met. These include criteria from psychological analysis and human resource approaches (Yu et al., 2022). Outside of work, it is important to have a balanced and serene life, to take care of the quality of one's relationships (Pellerin, 2021), to sleep well and to practice a sport (Clayton et al., 2021). In a work situation, the stakes are different. The freedom is not the same and the individual is much more sensitive to the meaning he gives to what he does. This was particularly strong during the Covid 19 pandemic. In this context, where the individual was physically separated from his or her work colleagues, the ability to make sense of the situation and to project oneself into the future was decisive (Gröschke et al., 2022).

As shown by Fuhrer in this special issue through a quantitative study of 1,299 managers, telework does not play the same role if one focuses on individual resilience or collective resilience. On an individual level, resilience is measured by the personal ability to maintain one's goals while facing turbulent times (Walker & Salt, 2012). It should be noted that individual resilience is more easily expressed in a family context, whereas collective resilience is more easily observed in a work environment. Both types of resilience are, however, to be considered in a coupled manner. In any case, the situation at work is characterized by a more developed and richer digital environment.

Thus, in order to cope with adversity, individuals were largely dependent on the tools at their disposal thanks to their employer. From then on, vulnerabilities were revealed. Some workers have taken refuge in an immoderate use of information and communication technologies. To maintain social contact or to appear productive in times of crisis, these individuals have overused the devices at their disposal: computers, tablets, smartphones. As shown by Rowe et al. in this special issue, the compulsive use of smartphones has led to paradoxical situations of addictive pleasure in the workplace, showing a real addiction. Indeed, the authors explored the relationships between addictive pleasure at work, the development of a mobile Personal Information Systems, and problematic smartphone dependency (PSD). Their results showed that addictive pleasure at work and work enjoyment had a negative correlation with PSD, suggesting that it can help protect workers from becoming addicted to their smartphones. The study also confirmed the protective role of dispositional mindfulness regarding smartphone addiction. To help reduce PSD, the study suggested strengthening mindfulness through long-term employee awareness programs and minimizing social network use.

However, these situations are not systematic. As shown by Duzert et al. in this special issue, research work also reveals that a good digital environment can induce happiness (out of any addiction) and positive emotions in professional situations. An analysis based on multiple cases shows the diversity of situations while pointing out certain common features. In particular, it shows that a positive emotional climate is a determining factor for the success of a digital transformation. The difference between the two options - addiction and happiness - is entailed by the capacity of organizations to lead the change and to realize an individual accompaniment within the framework of a change management.

## **Societal Resilience and Grand Challenges**

2023 has seen the rise of Artificial Intelligence (AI). AI is more and more impacting the way people interact with IS by making it easier to access, interpret, and generate data. AI-driven technologies such as natural language processing and machine learning based analysis can be used in multiple organizational contexts (customer service, marketing and sales, recruitment processes, fraud detection, forecasting, predictive analytics, etc). However, the use of AI is not without significant drawbacks: AI models can be trained on datasets that contain unequal representations of genders (gender bias), disproportionate representation of different racial groups (racial bias), or erroneous data (algorithmic bias) leading to inaccurate predictions and decisions, which may ultimately result in organizational crisis. Arguably one of the most prominent cases of AI bias leading to a disastrous media crisis was the COMPAS (Correctional Offender Management Profiling for Alternative Sanctions) algorithm used by US courts to predict the likelihood of recidivism amongst defendants. The data used, the model chosen, and the process of creating the algorithm resulted in the model predicting twice as many false positives for recidivism for black offenders (45%) than white offenders (23%). Harfouche et al. in this special issue, proposed a human-centric approach to mitigating biases in AI by implementing a human-in-the-loop informed design process and usage architecture that aggregates AI and human. The proposed framework offers advantages such as integrating human knowledge into the design and training of AI, providing humans with an understandable explanation of AI predictions, and driving the advent of an augmented intelligence that can counterbalance human and AI biases for increased organizational resilience.

Another dark side of AI may be related to its unbounded generativity. AI is indeed enabling fake news creation and diffusion, making it easier to generate realistic looking but false stories... or even

deep faked content. AI can also be used to analyze social media behaviors, learning from the patterns in the way people react to fake news, for improved targeting and spreading of false information. AI will empower misinformation and fake news generation, and this will undoubtedly contribute to organizational damages (distrust, decline in sales, a loss of customers, a decrease in employee morale, and a decrease in investor confidence, etc). Fake news can be used as a way to enact a pump and dump scheme (see Galena Biopharma scandal in 2015) or damage a company's reputation (fake Tesla self-driving car crash video in January 2019, impacting stock price). Shirish and Kotwal in this special issue examined the impact of human and economic development on fake news propensity during the COVID-19 crisis by analyzing a dataset from 104 countries. The results showed that a higher level of economic development curbed fake news propensity, while a level of human development had no effect. This research contributes to increasing societal resilience. Indeed, it informs governments and policy makers in the design of future crisis-proof policies to tackle fake news.

## **CONCLUSION AND AREAS FOR FUTURE RESEARCH**

The implications of this special issue are threefold. First, it provides an in-depth exploration of the role of information systems in responding to a crisis, how organizations can develop resilience, and the implications of privacy, tracking, and transparency in global information management. Second, it also examines how individuals can become more resilient, highlighting the potential pitfalls of digital technologies such as addiction or happiness. Finally, it provides insight into the potential of AI to both help and hinder organizational resilience; and it explores economic and human development impacts of fake news propensity during the COVID-19 crisis, which can inform future crisis-proof policies to tackle fake news.

There are many academic works drawing on societal resilience in times of crisis. Such literature aims to prevent crisis and to think about the revival of institutions after disasters (Shoukat & Tunio, 2023). Because the COVID-19 pandemic left turmoil in every facet of the society, there is consensus to admit that it played a major role in deep social transformations (Abdrabo & Galaby, 2022), in the ICT sector (Théron & Bologna, 2013) and through IS (Rahman, 2022).

But there is scarce literature about the role of crisis in the intensification, sudden predominance, massive use of IT and its consequences on societal resilience. Thus, one area for future research would be to analyze this phenomenon more closely through the concept of digital resilience (Boh et al., 2023; Liu et al. 2023) and to analyze how this massive use had positive and negative side-effects. This could include topics such as how organizations can use information systems (1) to increase their agility and anti-fragility, (2) to create an environment of individual resilience and happiness and (3) to reinforce transparency in an ever-connected world. Indeed, future research could discuss how organizations can use tracking technologies in a responsible manner and how to ensure transparency and reinforce privacy in global information management. Research into digital resilience should focus on the design, implementation, and evaluation of technologies for collaboration and value creation (from AI, to blockchain, through contact tracing apps). Preparedness to crisis is also an organizational challenge: new research could explore how to plan for absorption, adaptation, and transformation during a crisis (and hence build digital resilience capabilities).

While this special issue provides valuable recommendations for governments and policy makers, more research is needed at the boundaries of public management and IS. Such research could discuss for instance the impact of AI on societal resilience and the potential risks associated with the use of AI in crisis situations.

More importantly, future research should address more closely governance, regulatory issues, and the dark sides of these technologies, their negative impact on societal and individual resilience (from complot theories to individual additions, through cybercrimes). We believe IS research has a role to play in societal Grand Challenges: contributing to effective governance and policy reform to address (digital) disparities, digital divides, and move beyond the 'digital first' paradigm (Baskerville et al., 2020).

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