

# The Role of the Ecological Cognition Framework for Representing the Impact of the Internet on Organisations During the Covid-19 Crisis: A Pilot Study

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**Abstract**— This study aims to develop theory in the field of crisis communication by understanding and using a psychological framework that helps articulate the impact of the Internet on an organisation called Crocels before, during and after the Covid-19 crisis. This study therefore uses the ecological cognition framework to forward theory development in crisis communication by not investigating the use of the Internet as part of the crisis response plan, but rather understanding the framework for the impact of the Internet on the organisation before, during and after a crisis like Covid-19. It thus aims to articulate the impact that the Internet can have on an organisation in crisis, in order to contextualise the role of the Internet in a corporate crisis. The study’s findings could help organisations to determine their success or failure in managing a crisis, based on various organisational elements that affect the reputation of and costs to the business.

**Keywords:** The Internet, social communications, technology adoption, organisation learning, knowledge management, strategic management, e-organisations..

## I. INTRODUCTION

The ecological cognition framework (Figure ) provides a comprehensive lens through which to understand the multifaceted impact of the Internet on organisations during the Covid-19 crisis [1, 2]. This framework, rooted in understanding cognition as not just residing within individuals but as distributed across people (called actors), artefacts, and environments, offers a means to examine how organisations adapt and respond to complex, dynamic environments.

The pandemic has drastically shifted the information ecology—the flow, storage, and processing of information—of organisations. The Internet has become a critical infrastructure, altering where and how organisational members interact and work. Ecological cognition suggests looking at how these changes in information flows and infrastructures influence decision-making processes, collaborative work, and organisational learning.

With the shift to remote work, the distributed nature of cognition became more pronounced. The Internet facilitated the distribution of work across geographies and time zones, requiring organizations to adapt their communication and coordination tools and practices. Through the lens of ecological cognition, we can investigate how tools and technologies become extensions of organizational cognitive processes and how this affects efficiency, innovation, and adaptability.

The Covid-19 crisis demanded rapid adaptation and resilience from organisations. Ecological cognition emphasises understanding how organisations, as complex adaptive systems, interact with their environment. The Internet played a crucial role in providing real-time data, enabling virtual collaboration, and offering platforms for rapid innovation and problem-solving. Analysing how organisations leveraged these capabilities can shed light on the processes of resilience and adaptation in crisis situations.

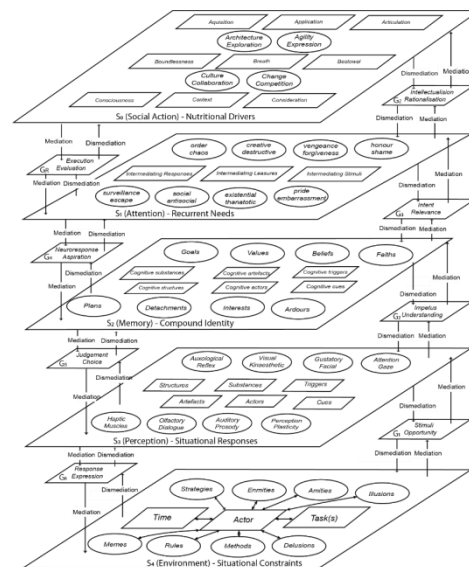


Figure 1. Ecological cognition constraints framework (Base-8)

The Internet has significantly influenced the ways organisations learn and process knowledge during the pandemic. As a medium for massive information exchange and learning, it has accelerated the diffusion of best practices, innovations, and regulatory changes. The ecological cognition framework helps in understanding the changes in organisational learning processes, knowledge management practices, and the evolution of organisational memory in the context of the crisis.

The ecological cognition framework can provide insights into how the Internet-induced changes during the Covid-19 crisis have impacted organisational culture and identity. As organisations adapted to remote work and digital interactions, it affected their social dynamics, norms, rituals, and overall culture. Understanding these changes is crucial for comprehending the long-term implications of the crisis on organisational behaviour and identity.

**II. LITERATURE REVIEW**

The role of social media in crisis communication management is substantial. The body of research in this domain has largely been oriented towards strategies aimed at safeguarding the reputation of organisations [3]. Further studies have concentrated on the use of social media for analysing stakeholder perceptions to shape crisis response strategies [4, 5]. Additionally, studies have introduced an interactive crisis communication model tailored for social media engagement during crises [6]. The effectiveness of social media analytics in crisis communication, especially during the Covid-19 pandemic, has been discussed in various scholarly works [7]. In the field of disaster management, integration of social media data with CyberGIS information has proven beneficial for acquiring a more immediate and comprehensive understanding of disasters [8]. This has led to the development of various theoretical models such as the social-mediated crisis communication (SMCC), the STREMI model, and the social media crisis management matrix/framework (SMSMF), explored in depth by the literature [9]. Despite these advancements, the primary focus of these studies remains on how social media contributes to protecting organisational reputation in times of crisis. The study in this paper on the other hand looks at how communication via all channels impact on social media and related tools such as search engines during crises such as the Covid-19 pandemic from the perspective of hybrid workers.

**III. A STUDY INTO INFORMATION SEEKING, CRISIS AND DISTRESS DURING THE COVID-19 PANDEMIC: THE ROLE OF SOCIAL MEDIA AND SEARCH ENGINES FOR COMMUNICATION FOR HYBRID WORKERS**

In the wake of the Covid-19 pandemic, the rapid shift to hybrid working environments has prompted significant changes in information-seeking behaviours and crisis management strategies. This study explores the multifaceted

ways in which individuals engaged with digital tools and platforms to navigate their professional and personal lives during this period of unprecedented global upheaval. The research focuses particularly on employees of the nano-conglomerate Crocels, examining how different sectors within the same organisation adapted and responded to the challenges presented by the pandemic.

**A. Participants**

Two datasets were each based on triadic data sampling, each from two different populations. The first dataset drew from those working at the nano-conglomerate Crocels in either a managerial or technical capacity. The second drew from those working at Crocels in a work experience capacity, having recently entered the workforce from either university or college.

**B. Methodology**

Dataset 1 was based on an initial administration of an ‘organisational architecture questionnaire’, amalgamated with data from Google Trends and additional questions related to working during Covid-19. In terms of dataset 2, the sample was administered the ‘e-tivities satisfaction scale’ [10], which was transformed based on their working hours of 25 hours per week into a value called knol (k) representing their work productivity.

**IV. RESULTS**

The results of the study showed the importance of both the Internet and human personnel of all personalities and abilities in managing crises affecting organisations such as a pandemic like Covid-19. Crisis communication is affected by the different stages of the pandemic and the Internet plays an important part in understanding these communications.

**A. Dataset 1: Covid-19 communications and management experience**

Participants were assigned different lockdown stages depending on whether the data was collected before the Covid-19 lockdowns were announced in the UK (1) through to when they were fully lifted two to three years later (5). The data, as can be seen from **Table**, shows that the ‘stay home save the NHS’ slogans were searched for during lockdown stages 3 and 4, with a higher weighting (M=70) for the latter stage than the former (M=43). In terms of management experience, more participants had this at stages 2 and 5 (M=2) compared to other stages (min=0, max=1).

**Table 1:** Covid-19 communications and management experience (dataset 1)

Time-stamp	Lock-down Stage	Management Experience	Stay Home Save The NHS (Searc	Stay Home Save The NHS (Weig	Sex
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5/2/2020 10:19:41	1	1	0	0	0
5/4/2020 11:59:35	1	0	0	0	0
5/4/2020 13:38:44	1	0	0	0	1
5/21/2020 12:02:00	2	1	0	0	1
5/25/2020 12:27:30	2	1	0	0	1
7/7/2020 16:23:44	2	0	0	0	0
8/16/2021 13:53:06	3	0	1	43	1
8/16/2021 13:57:57	3	0	1	43	1
8/16/2021 14:16:26	3	0	1	43	0
1/10/2022 23:22:10	4	0	1	83	1
1/11/2022 19:13:19	4	0	1	87	1
8/24/2022 21:45:52	4	1	1	40	1
8/25/2022 0:56:14	5	0	0	0	1
3/12/2023 19:19:16	5	1	0	0	1
5/4/2023 12:07:59	5	1	0	0	1

In analysing these findings through the lens of crisis management, several key aspects are noteworthy. Firstly, the internet's role as a critical medium for crisis communication is evident. The search trends for key health slogans reflect the public's reliance on the internet for real-time information, which organisations can leverage to disseminate authoritative guidance and foster compliance with health advisories.

Secondly, the fluctuation in management experience, with more participants having this at stages 2 and 5, might reflect the adaptive strategies organisations adopt during crises. Early in the pandemic (stage 2), organisations might have mobilised experienced personnel to navigate the unprecedented challenges, reflecting a proactive crisis management approach. The resurgence of management experience in stage 5, as restrictions lifted, could indicate strategic shifts towards recovery and resilience building.

These findings underscore the importance of ecological cognition as a framework for understanding organizational behaviour in crises. This perspective highlights the interaction between organisational entities and their

environment, here represented by the Internet and the evolving public discourse. It suggests that organisational crisis management strategies are not only reactive but adaptive, influenced by external information flows and internal capabilities.

**B. Dataset 2: Personality and working style**

The 'Simplex' personality type was assigned to those who identified with the statement, 'I prefer learning in a way that is simple and uncomplicated.' The 'Solitary' personality type was assigned to those who identified themselves with the statement, 'I prefer learning things I am interested in even if I do not learn with others.' As can be seen from **Table**, there was little difference between the participants in terms of their productivity (k) with participant 3 being the only one to maintain their knol of 0.64 throughout the period and participant 1 being the one that increased their knol – from 0.63 to 0.64 – since starting the study. Personality type made little difference with both types having k-scores ranging from 0.63 to 0.64. The optimal k-score is 0.81 [11], with a score of 0.98 representing the serendipity threshold at which a person feels their greatest level of sustainable creativity. A k-score of 0.50 represents the minimum required for any level of productivity and scores of between 1.118 and 2.50 represent excessive levels of productivity, found in people with significant hyperactivity such as hypergraphia or workaholism. **Table** therefore suggests that it is possible to have outputs – in this case an print and e-book volume called 'Llantrisant – A Reader' – with low productivity workers with a range of personalities.

**Table 2:** Results from productivity study investigating personality and working style (dataset 2)

Date	Month	Format	Personality	k
01-Aug-21	1	Print	Simplex	0.63
02-Aug-21	1	Print	Solitary	0.63
01-Jul-21	1	Print	Solitary	0.64
01-Sep-21	2	Print	Simplex	0.63
01-Aug-21	2	Print	Solitary	0.63
01-Aug-21	2	Print	Solitary	0.64
01-Sep-21	3	Print	Solitary	0.63
01-Oct-21	4	Print	Simplex	0.64
01-Oct-21	4	Print	Solitary	0.63
01-Oct-21	4	Print	Solitary	0.64
01-Nov-21	5	E-Book	Simplex	0.64
01-Nov-21	5	E-Book	Solitary	0.63
01-Nov-21	5	E-Book	Solitary	0.64
01-Dec-21	6	E-Book	Solitary	0.63
01-Dec-21	6	E-Book	Solitary	0.64



The findings regarding the ‘Simplex’ and ‘Solitary’ personality types, alongside their productivity metrics, offer valuable insights for organizational crisis management. Understanding individual productivity variations, as indicated by k-scores, allows organisations to tailor crisis roles and set realistic productivity expectations. Simplex individuals, who prefer simplicity, might be more effective in straightforward tasks, while Solitary individuals might excel in roles requiring independence, aiding in the optimal composition of crisis management teams. This understanding ensures that tasks are aligned with individual strengths, enhancing overall response efficiency.

Furthermore, these insights can inform targeted training and development programs, ensuring that all employees are equipped to contribute effectively during a crisis. By understanding the minimal variation in productivity across personality types and the optimal and excessive levels of productivity, organizations can prevent burnout and maintain sustainable performance. This approach is crucial, especially in high-pressure situations where prolonged efforts are required.

In terms of communication and decision-making, acknowledging the diversity in personality types allows for more inclusive and effective strategies. Clear, straightforward communication can engage Simplex individuals, while comprehensive details will satisfy Solitary individuals’ preferences. This inclusive approach ensures that all team members are adequately informed and can perform to the best of their abilities.

By integrating these nuanced understandings of personality and productivity into their crisis management strategies, organisations can enhance their preparedness and response. Instead of a one-size-fits-all solution, a more tailored approach acknowledges the complex interplay between individual characteristics, productivity, and stress, ultimately aiding in maintaining a stable organizational reputation and managing costs effectively during crises. This strategic approach not only mitigates risks but also leverages the diverse strengths of the workforce to navigate through challenging times.

## V. DISCUSSION

The ecological cognition framework is instrumental in representing the multifaceted impact of the Internet on organisations during the Covid-19 crisis. It enables a holistic view of how cognition is distributed across individuals, technologies, and environments, and provides insights into the adaptive, resilient, and transformative capacities of organizations facing unprecedented challenges.

The study's insights into internet search trends and management experience during different lockdown stages offer a nuanced understanding of crisis management dynamics in organisations. The internet emerges as a vital tool for crisis communication and public engagement, while shifts in management experience reflect organisational

adaptiveness. Future research might explore how these patterns influence long-term organisational strategies and resilience in facing public health emergencies or other crises.

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