

The CRisis-OPportunity (CROP) framework: Finding Metavalue in Organizational Suboptimal Decisions through an AI Text Mining Process

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Abstract

This research paper explores the concept of bounded rationality, initially introduced by Herbert Simon in 1957, in the context of organizational decision-making in turbulent environments. It questions whether organizations, similar to individuals, operate under bounded rationality when facing challenging circumstances. Through an in-depth analysis, this research sheds light on the applicability of bounded rationality to organizations and examines how AI technologies can enhance decision-making capabilities and resilience in the face of uncertainty. By integrating Bounded Rationality with Value-Based Selling, a novel communication framework called CRisis-OPportunity (CROP) is introduced, leveraging AI text mining techniques to gather and analyze large amounts of data. The CROP framework demonstrates a strategic approach to assist organizations in finding a new organizational value (called metavalue) in comparison to information extracted from our systematic AI-based literature review. Research results from the paper's systematic literature review are limited to the period from 2020 to 2022. The paper follows a structured approach to explore the interconnectedness between Bounded Rationality and Value-Based Selling, and to introduce the CROP framework. It presents a roadmap for uncovering organizational metavalue through the application of the CROP framework. This research contributes to the understanding of decision-making processes and offers insights for decision-makers and practitioners seeking to navigate turbulent times successfully by harnessing the power of bounded rationality and AI-driven communication strategies.

Keywords: Bounded Rationality, Value-Based Selling, Decision-Making, Crisis Management, Literature Review, AI Text-mining

1. Introduction

“The capacity of the human mind for formulating and solving complex problems is very small compared with the size of the problems whose solution is required for objectively rational behavior in the real world - or even for a reasonable approximation of such objective rationality” (Simon, 1957, p.198).

Herbert Simon introduced the concept of bounded rationality in 1957 as a counterpoint to the prevailing assumption in economics that humans, portrayed as *homo economicus*, always make optimal decisions. In contrast, Simon (1957) argued that humans often make decisions in imperfect conditions, lacking complete information. Instead of striving for perfect rationality, individuals seek satisfactory solutions through suboptimal decisions (Simon, 1991). Drawing inspiration from Simon's work, this paper explores two fundamental questions. Firstly, can we extend the concept of bounded rationality to organizations operating in turbulent and crisis-prone environments? Secondly, how can Artificial Intelligence (AI) contribute to facilitating resilient decision-making within organizations?

By examining the applicability of bounded rationality to organizations amidst challenging circumstances, this research delves into the decision-making processes and constraints faced by organizational entities. It investigates whether organizations, similar to individuals, also operate under the umbrella of bounded rationality when navigating turbulent times and crisis situations. Furthermore, this paper explores the role of AI as an enabler of resilient decision-making within organizations. It examines how AI technologies can assist organizations in overcoming cognitive limitations, augmenting their decision-making capabilities, and enhancing resilience in the face of uncertainty. Through a comprehensive analysis of these topics, this research sheds light on the potential impact of bounded rationality and AI in the organizational context, offering valuable insights for decision-makers and practitioners seeking to navigate turbulent times successfully.

This research presents a fresh perspective on decision-making and value generation by introducing the CRisis-OPportunity (CROP) framework for organizational communication. Through a meticulous literature review, augmented by artificial intelligence text mining techniques, we explore the fusion of Bounded Rationality (BR) and Value-Based Selling (VBS). The integration of BR and VBS entails the amalgamation of two distinct concepts to forge a more effective communication strategy. Leveraging the power of AI, we harness its capabilities to gather and analyze vast amounts of data. On the one hand, Bounded Rationality acknowledges the limitations of human decision-making processes, offering insights into the cognitive constraints faced by individuals when making choices. On the other hand, Value-Based Selling emphasizes the significance of highlighting the value proposition of a product or service to customers. This approach centers on comprehending customer needs and effectively demonstrating how the offering surpasses any available alternatives.

By merging these two frameworks, our research introduces a compelling avenue for enhancing communication strategies, ultimately paving the way for improved decision-making and value creation in organizational contexts. Our suggested alternative value-based CROP framework follows an AI-text mining methodology to understand human's decision-making process and focuses on the creation of meta values. The integration of BR with VBS can help professionals build stronger relationships with customers by demonstrating a willingness to listen and

understand consumer needs, while also providing them with the information they need to make the best decision possible.

The paper follows a structured approach, beginning with the definition of key terms in literature and an exploration of the interconnectedness between BR (Business Resilience) and VBS (Value-Based Sustainability). Subsequently, we introduce the CROP (Communication Research in Organizational Practices) framework, which serves as the foundation for our study. The second part of the paper entails a systematic literature review where we employ advanced AI text mining techniques to extract valuable insights from a vast amount of text. This review aims to validate the efficacy of the CROP framework in the realm of organizational communication. Finally, the last section of the paper delves into a roadmap for uncovering organizational metavalue in suboptimal decisions by integrating the CROP framework with the aforementioned BR and VBS frameworks. This integrated approach offers a novel perspective on discovering hidden value within flawed choices.

2. Literature Review

2.1 Organizational Crisis

Crises can be divided into three stages: the pre-crisis phase, the crisis management phase, and the post-crisis phase (PARNELL and CRANDALL, 2017). Organizations often develop predictable mitigation strategies in response to crises that focus on managing distractions rather than prioritizing actions to address crisis situations (BOWERS et al., 2017). In fact, “[c]risis by nature is an unprecedented event which does not give us much time to prepare in advance” (BHADURI, 2019, p. 538). Strategic reinvention in turbulent times is necessary (KOTLER and CASLIONE, 2009). As a result of a crisis, it is common for people and organizations to focus on achieving short-term goals in survival mode (TAYLOR, 2019). As a result of a crisis, boundary conditions are removed, and innovative accelerators are produced (BHADURI, 2019). According to Chong (2004), procrastination and hesitation can destroy a company, but businesses should take advantage of current opportunities beyond quick fixes.

It is, indeed, hard to process information, let alone to make decisions once we find ourselves in an emotional survival mode. As KAHNEMAN (2011) notices, emotional arousal is associative, automatic, and uncontrolled, and it produces an impulse for protective action. Nevertheless, during a crisis, organizations think of one option: how to survive and control the damage. Nevertheless, a crisis can turn into an opportunity if organizations overcome the critical stage and focus on the long-term goals.

An organizational crisis is a systemic event that offers a unique, though tough, opportunity to redesign and strengthen the business. Starting from the idea that rationality is limited in turbulent times, we explore where Bounded Rationality (BR) and the Value-Based Selling (VBS) frameworks intersect.

2.2. Bounded Rationality and Value Propositions

Rationality is difficult to define but easy to recognize (BLUME and EASLEY, 2018). It involves a structured and criteria-based analysis to reach logical conclusions. Economic theory presents two views of rationality. According to choice theory, rationality is reflected in consistent choices, while tools represent different ways of encoding choice functions. Another view considers

rationality as a theory of intentional behavior based on meaningful beliefs and desires (BLUME and EASLEY, 2018). Different interpretations of rationality exist, such as strategic rationality, rational expectations, self-interest, and rational choice (SENT, 2018). Rationality cannot be divided into parts; it is indivisible, meaning one cannot be partially rational and partially irrational (MARWALA, 2013).

Rational decision-making assumes maximizing benefits and minimizing costs (SENT, 2018). Instead of being economic superhumans, we optimize decisions for success based on the current conditions. Satisfaction comes from choosing an option that fulfills needs and wants without focusing too much on other possibilities (SIMON, 1991). BR acknowledges the constraints of human knowledge and computational capabilities in decision-making (Sent, 2018) and leads to contractual incompleteness (SIMON, 1991). Predicting the execution and fulfillment of contracts becomes challenging with bounded rational actors (TERAJI, 2018). Decision-making within organizations is influenced by time and information limitations, which challenge assumptions of perfect rationality. Market type (B2B, B2C) and cultural factors also affect decision-making for maximizing positive effects. Hence, we argue that rationality is not universal but rather idiosyncratic.

Emotions play a role in the decision-making process (REN & HUANG, 2018). Rationality and emotions are not inherently contradictory; emotions can aid in making the right decisions (WENSTØP, 2005). Emotional factors hold equal importance to rational ones for industrial buyers of capital goods (ELSÄBER and WIRTZ, 2017). Decision-makers strive to benefit their organizations and redefine their corporate purpose. During crises, companies should focus on their strengths and withdraw from markets where they lack leadership (HEINONEN et al., 2013; ANG et al., 2000). Before making such decisions, managers should address essential questions regarding value creation, target audience, communication, delivery, and pricing.

Value is a well-established concept in business and human relationships. Customer value plays a significant role in sales management, and the concept of value-based selling (VBS) emphasizes quantifiable value-in-use for customers. Implementing VBS brings benefits like proactiveness, early access to the buying process, seller power, profitability, and improved selling performance. It differentiates successful firms from unsuccessful ones in B2B markets, contributing to long-term survival and success (TÖYTÄRI and RAJALA, 2015; ANDERSON et al., 2007; D'ANDREA, 2005; TERHO et al., 2015, 2017, 2012).

Customer Perceived Value (CPV) is “[t]he difference between the perceived benefits received and the perceived sacrifices made by a customer” (TÖYTÄRI and RAJALA, 2015, p. 102). As CPV affects customer future intentions (CRONIN et al., 2000) and word-of-mouth (de MATOS and ROSSI, 2008), CPV is more than just a business transaction. ULAGA and EGGERT (2006, p. 120) argue “creating superior customer value is key to a company’s long-term survival and success.” A customer perspective is adopted by KERÄNEN et al. (2020) to write that “the key issue in a crisis is often maintaining a continuous supply for critical operations while cutting back on non-critical processes and purchasing categories to reduce costs and ensure performance in core areas” (p. 389). To achieve long-term success and survival, HAAS et al. (2012) argue that organizations must create value. In terms of defining and measuring CPV, there is no single approach (ZAUNER et al., 2015). It is, however, SÁNCHEZ-FERNÁNDEZ et al. (2009) who propose a holistic concept of value that includes efficiency, quality, social, play, aesthetic, and altruistic components.

The CPV structure seems more relevant to consumer markets than to business markets, but in this paper, we identify similarities and draw extensions (Table 1). For instance, the concept of efficiency applies to both types of markets, while joy is not directly reflected in B2B contexts (VIIO and GRÖNROOS, 2014). If a consumer consciously enjoys a B2B offering in the final product, that offering is perceived as more valuable. Through the comparison of customer value components across B2C and B2B markets, we can identify the intersections of value, which could lead to the creation of metavalue.

Table 1: Components of customer value in B2C and B2B

Value component (Sánchez-Fernández et al. 2009)	Example	Consumer markets	Business markets
Efficiency	Overall benefits over total costs (time, money, effort)	X	X
Quality	Overall quality	X	X
Social	Appeal to customer's social self-concept	X	Provides value through Corporate Social Responsibility initiatives
Play	Provides joy to the customer	X	Provides value to the final customer
Aesthetic	Appeals by design	X	X
Altruistic	Reflects ethical and moral values	X	Resonates with customer's core values

Authors' elaboration.

Anderson et al. (2007) argue that the value proposition (VP) must resonate with the customer in order to be effective. When improved, the VP should consist of one or two points of difference that will "deliver the greatest value for the foreseeable future" (TÖYTÄRI and RAJALA 2015, p. 105). As TERHO et al. (2012) state, VP should be agreed upon by the customer and quantified. During the process of constructing their VP, organizations should adopt the customer's perspective to find the metavalue (Payne et al., 2017). Value creation is encouraged by reference customers and success stories (TÖYTÄRI, 2015). In spite of this, PAYNE and FROW (2014) state that fewer than 10% of companies formalize the development of VPs. As professionals interact directly with customers, they can provide a company with timely and profound insights into customers' needs,

wants, and challenges. During a crisis, these insights become invaluable, as they provide the opportunity to update and improve VP in response to a dynamically changing environment.

2.3. The CRisis-OPportunity (CROP) Framework

The relationship between the components of BR (bounded rationality) and VBS (value-based selling) integration undergoes significant changes during crisis conditions. Professionals are faced with extreme circumstances that necessitate survival-oriented decisions and short-term goals. In such moments of crisis, the emotional response becomes overpowering, often overriding rational thinking and leading to impulsive and occasionally irrational behavior. Consequently, we must acknowledge the unprecedented rise in cognitive limitations resulting from a lack of reliable information and limited time.

Given the heightened complexity arising from recent organizational crises, such as the COVID-19 pandemic, as well as the collapses of Silicon Valley Bank and Swiss Bank, the utilization of AI text mining to analyze vast amounts of data and gain insights becomes even more pertinent for companies coping with the aftermath of these radical market changes. Hence, we propose the CRisis-OPportunity (CROP) framework (Table 2) as an approach to evaluating the value offered by companies through the integration of bounded rationality with the VBS approach.

Table 2: The CRisis-OPportunity (CROP) framework

Value component (Sánchez-Fernández et al. 2009)	BR and VBS Integration	CROP Framework
Efficiency	By incorporating efficiency principles, we can optimize the use of available resources and improve decision-making within these limitations.	Decision makers should make the most of the available resources, optimize decision-making processes, and achieve better outcomes within the limitations imposed by the crisis conditions.
Quality	By emphasizing quality, decision-makers strive to reduce errors, biases, and uncertainties that may arise due to cognitive limitations.	Decision makers should mitigate cognitive biases and errors, ensure decisions are based on high-quality information, and promote a culture of continuous improvement and ethical decision-making.
Social	By incorporating the social dimension, decision-makers actively seek diverse perspectives, engage in open dialogue, and consider the interests and needs of various stakeholders.	Decision makers should make decisions that are not only cognitively rational but also socially responsible and inclusive. Understand the broader social context, navigate social complexities, and make choices that consider the well-being and interests of all stakeholders involved.
Play	By integrating the element of play, decision-makers embrace a mindset of curiosity, experimentation, and imagination. They are willing to explore unconventional ideas, challenge established norms, and think outside the box. Playfulness allows for the generation of novel insights and alternative perspectives that may not emerge from strictly rational thinking alone.	Decision makers should unlock their creative potential, foster innovation, and enhance decision-making processes. They need to tap into people's imagination, embrace a flexible mindset, and discover unconventional solutions that may not be evident through purely rational approaches.

Aesthetic	By integrating aesthetics with bounded rationality, organizations can create meaningful and engaging decision-making experiences. It allows decision-makers to consider the emotional and sensory aspects of choices, enhance stakeholder satisfaction, and communicate their decisions effectively.	Decision makers should pay attention to the aesthetics of communication and storytelling. Utilize visual aids, compelling narratives, and persuasive presentations to effectively communicate their decisions and gain buy-in from stakeholders. By incorporating aesthetics into their communication, they can captivate and inspire others, making their decisions more compelling and memorable.
Altruistic	By integrating altruism with bounded rationality, organizations can make decisions that are not only cognitively rational but also socially responsible and beneficial to society. It helps decision-makers consider the impact of their choices on others, prioritize ethical considerations, and contribute to a more equitable and sustainable world.	Decision makers should foster a culture of compassion, empathy, and shared responsibility in their decision-making processes. Encourage collaboration and cooperation. Recognize the value of collective action and seek opportunities for partnerships and shared goals. Actively engage stakeholders, listen to diverse perspectives, and incorporate input from others to ensure that decisions consider a wide range of perspectives and promote inclusivity.

Authors' elaboration.

By focusing on providing value-in-use (metavalue) and building trust through value co-creation, CROP intends to strengthen mutual benefits. Therefore, business continuity requires redefining the short-term boundaries between customers and suppliers so they can focus on critical operations. Providing business continuity and building resilience through such an approach is likely to be beneficial in the long run. As identified by the CROP Framework, building resilience is a continuous process performed adaptively in a dynamic ecosystem. The next part of this paper explains the AI text mining process to validate the suggested framework's applicability in organizational communication contexts.

3. Methodology

A systematic literature review was conducted using an AI text mining process in order to verify the proposed framework. Text mining involves analyzing and extracting information from textual data, such as EBSCO's peer reviewed articles. This process can be time-consuming and labor-intensive, but AI can help to automate many of the tasks involved. AI can be used to perform tasks such as: (1) Text categorization involves grouping similar documents or texts together based on their content. AI algorithms can be trained to recognize patterns in the text and categorize them automatically, saving time and effort. (2) Sentiment analysis involves analyzing the sentiment or emotion expressed in a piece of text. AI algorithms can be trained to identify positive, negative, or neutral sentiment, which can be useful in analyzing customer feedback or social media posts. (3) Named entity recognition involves identifying and extracting named entities such as people, organizations, and locations from text. AI algorithms can be trained to recognize and extract these entities automatically, which can be useful in tasks such as social media monitoring or news analysis. (4) Text summarization involves summarizing long pieces of text into shorter, more manageable summaries. AI algorithms can be used to automatically generate summaries based on the content of the text.

There were three steps involved in the systematic review of literature. The first step was to identify scientific articles in databases. Due to its indexing of many databases of scientific sources, the EBSCO Discovery Service (EDS) database was used to search for articles. A number of articles in the scientific literature deal with similar topics. According to PAUL and RIALP-CRIADO (2020), a review article should identify key research gaps based on the types of constructs, theories, and methods that are widely used in a variety of settings and contexts. Secondly, we used the co-citation analysis (snowball effect) to identify related articles (also only from that period) so that we could examine the relationships among the articles contributing to the development of the field (ANNARELLI and NOMINO, 2016). In the third step, text mining was used to identify streams in the literature and compare them with the propositions of the CROP organizational communication framework.

To analyze textual data, it is necessary to interpret the meaning of words contained in a document. In the Latent Semantic Indexing/Analysis (LSA), a document is vectorized by the frequency of words it contains. Vectorized words are then arranged in a matrix and subjected to singular value decomposition. In effect, latent meaning (i.e., a topic that is latent in the background of a document) is uncovered. Behind the potential semantic analysis lies the distribution hypothesis of Harris (1954), which states that the interpretation of the meaning of a word is determined by the context in which the word is used (i.e., surrounding words). Consequently, words that appear in the same context have the same meaning. By using this concept, it is possible to statistically analyze the meaning of the document and determine the similarity of the document (KINTSCH 2002). Furthermore, a probabilistic latent semantic analysis (pLSA) assumes that there are multiple topics in the background of a document. Accordingly, we consider that words included in documents are generated by topic-specific probabilities for the appearance of words (i.e., words distribution). Then, pLSA is a method of estimating the original probability distribution from the collected text data using maximum likelihood.

Latent Dirichlet Allocation (LDA) is a development of pLSA as a hierarchical Bayesian model (Blei et. al. 2003) which presents several key properties. First, in pLSA, the topic mixture ratio (i.e., topic distribution) of a document is fixed, but in the latent LDA, the topic distribution is generated stochastically. Thus, LDA is a stochastic model. Second, LDA is a method of estimating

the word and topic distribution by Bayesian estimation, assuming a Dirichlet distribution (prior and posterior). Third, LDA is an unsupervised learning method, which was found to boost the performance of active learning algorithms without applying manual annotation (i.e., labeling) (MIWA et al. 2014).

Given that LDA is a stochastic model, we now delineate the nature of this model. In particular, a stochastic model that assumes a generation process by a probability distribution is collectively called a generative topic model. Since words and latent topics are discrete values, we also assume the multinomial distribution is a generative distribution. Preparation of the corpus for subsequent analysis involved storing all eligible PDF documents in a separate folder to perform content extraction. The content of articles published between 2020 and 2022 was extracted through Content ExtRactor and MINEr (CERMINE; Tkaczyk et al. 2015). CERMINE engine was developed and trained on a large data set of scholarly publishing using Support Vector Machines. Its Java distribution allows for a seamless batch processing of documents collection with a one-line instruction. In effect, this solution converts a research article into an Extensible Markup Language (XML) file, which preserves the geometrical structure of the original document. It further allows access to selected parts of the document, such as metadata (e.g., title, authors, publication date etc.), abstract, main body, and references. We wrote our own parsing script using Python to extract the main body of the documents (i.e., without references and abstract), and time-stamped them for the subsequent analysis of publishing trends.

3.1. Initial text pre-processing

With the collection of main bodies of the articles prepared, we moved on to the next stage in the process – that is, text pre-processing. This stage is highly important in any Natural Language Programming (NLP) project. In particular, a decision must be made on what should be included in the language model, and what should be removed. A typical pre-processing includes removing double spaces, empty lines, non-text characters (e.g., punctuation, digits, special characters etc.), and stop words. Decisions concerning the removal of characters and stop words depend on the research context. Stop words are typically articles, pronouns, and proper nouns. An English language stop word list was reviewed for its applicability to our study. We extended the stop words by two additional lists:

- a list of authors' names extracted from references listed in all of the articles. Importantly, we had to review the list manually in order not to include names like "Price" as a stop word. This step was done iteratively by two of the authors.
- a list of non-informative words related to sales research (e.g., "item", "researcher", "hypothesis").

In total, the curated list of stop words included 2,426 words. The removal of punctuation, non-printable characters (e.g., end of line), and non-text characters (e.g., "=", "%") further reduces the dimensionality in the dataset and improves text classification.

3.2. Tokenization and Lemmatization

In the next steps of the text preparation process, we tokenized the collection of documents and lemmatized the tokens. Specifically, the basis of the text data quantification process is to count the words that appear in a document. First, each unique word is extracted as a token (hence the name of the process). After tokenization, each document is represented as a list of words included in the document. Finally, the collection of tokens is filtered out of stop words, and the documents are represented as collections (lists) of tokens. In other words, we now have 784 lists of tokens. Lemmatization is a process of transforming words to their root form (lemma). The purpose of lemmatization is to decrease the dimensionality of the corpus by reducing the number of words in the model. For example, “study”, “studied”, “studies” denote the same concept and therefore, these words are turned into a single token: “study”.

3.3. Collocation

Identifying words’ collocations is an important step in preparing the text for analysis. A sequence of N elements with a distinct contextual meaning is called an N-gram. In sales research, we consider that there are frequently used bi-grams, such as “crisis management”. Thus, we allow for bi-grams identification in the corpus before moving to the next stage. In the LDA modeling process, three inputs must be provided: a document collection, a dictionary, and a corpus. The dictionary is a mapping file between words and their IDs. It also contains the number of documents (i.e., articles) fed into the algorithm (and each word’s frequency of appearances in the whole collection of documents).

The corpus is a representation of body text using the created dictionary. In order to classify a document, we use document-specific features (i.e., words, terms) and the value of a feature (i.e., occurrences) is represented as vectors in a vector space model. A widely used vector representation of documents is the bag of words (BOW), in which all features appearing in a document are used to create a vector. Since BOW simply puts the words in a “bag”, the information about the word order is lost. Additionally, the dimensionality of the vector increases because all available words are used in the vector. The algorithm to solve this problem and reduce the dimensionality of vectors to about 100-200, is called “Word2Vec”. With the Word2Vec algorithm, the documents are converted into a corpus with the use of a dictionary and the bag of words expression. This, however, does not prevent the loss of order of words. To overcome this limitation, we implemented the Doc2Vec algorithm, which is an extension of Word2Vec to a document level. Specifically, Doc2Vec converts documents into vectors. Finally, a text file which contains words for all articles (i.e., documents) had to be generated. At this stage, each academic article in the collection is no longer a collection of sentences, but a collection of single words and bigrams created in the previous steps. The prepared essentials are then used for our ML-based analysis.

4. Results

A scoping review of the research literature was conducted to identify articles related to the title and subject of that paper. As a consequence of the objective scope of organizational changes in the COVID-19 period, all relevant scientific articles published in the past three years (between 2020-2022) were searched. For maximizing search results, EBSCO Discovery Service (EDS) was

used as a multi search engine. Additional criteria for searching and downloading articles were: only scientific papers, full text paper online, English language. (see Appendix A).

The CROP framework can be applied in the areas of crisis management and organizational communication. This is confirmed by the result of searching for articles according to the above-mentioned criteria for “crisis management” only in the titles - which gave the number: 2.367 articles and a search for this phrase only in abstracts yielded 38.604 articles or “crisis opportunity” only in titles showed 2.239 articles. (Table 3) Our research focuses on opportunities during crisis time, especially in cooperation between organizations and correlated decisions aimed to survive crisis time, to gain successful performance. This affects the structure of the analyzed issues and thus the keywords in the search for articles.

“Crisis management” is like an umbrella term for searching within that area other articles regarding aspects of: decision-making, identification of opportunities, cooperation process, performance results, especially during Covid-19 time which was connected with increase in importance of continuity and resilience in organizations. Therefore, we adopted the path of identifying articles - only in the titles of publications, so that the articles concerned the analyzed issues as much as possible (core-set, start-set for co-citation process). Quantitative results of the paper's identification process were shown in Table 4. After reading individually downloaded articles (between 4th and 12th of January 2023) in the co-citation process we added more articles cited there (finally to the 17th of January 2023). During the co-citation process we focused on cited articles concerning the area of the title of our article. For example, in the group of searched articles “crisis management and resilience” there are many references concerning the supply chain resilience but in general about components therefore we did not include them. We focused on narrow thematic articles related to the purpose of our article. At the same time, in the co-citation process, as in the first search, we focused on the same basic criteria: only scientific papers, full text paper online, English language. Also published between 2020-2022, which nominally affected the sum of the articles obtained in the second stage of the article acquisition process.

Table 3. Number of articles obtained for text-mining analysis (Appendix B).

No.	Keywords in titles “Crisis management” AND	Number of articles EBSCO + co-citation
1.	decision*	17 + 17
2.	performance	15 + 2
3.	opportunit*	8 + 4
4.	cooperat*	2 + 2
5.	value	7 + 2
6.	continuity	7 + 4
7.	resilience	33 + 10
Summary:		89 + 41 = 130

Authors' elaboration.

Table 4. Quantitative results

Journal - used 2x and more /scimagojr.com	Number	H-index
Sustainability	7	109
Journal of Contingencies and Crisis Management	6	55
International Journal of Surgery	5	71
Journal of Management & Organization	4	38
Journal of Purchasing and Supply Management	4	91
International Journal of Environmental Research and Public Health	3	138
Journal of Business Continuity & Emergency Planning	3	12
Chemical Engineering Transactions	2	39
International Journal of Disaster Risk Reduction	2	58
Management Decision	2	106
Total	38	

Authors' elaboration.

The remaining 92 articles come from individual journals. As a result of the research process, we identified 9 thematic groups (research streams in the literature) (Appendix C) to which the analyzed articles were assigned. Ultimately, 130 articles were analyzed, published between 2020-2022 (Table 5).

Table 5. Selected Articles after AI-Text Mining

Group No.	How many articles in every group after-text mining	
1	11	8,46%
2	18	13,85%
3	20	15,38%
4	7	5,38%
5	21	16,15%
6	14	10,77%
7	20	15,38%
8	9	6,92%
9	10	7,69%
	130	100,00%

Authors' elaboration.

4.1. Core notions

The LDA model requires a predetermined number of topics as a parameter, a requirement that introduces a model selection problem. There are two main approaches to model selection in LDA modeling. The first approach, which is proposed by BEKHUIS et al. (2014), implies the use of a harmonic mean approximation for conditional probabilities of words in topics, and a Kullback-Leibler (KL) divergence to identify the number of topics. The second approach is based on topic coherence (i.e., quality of a topic) and/or perplexity (i.e., model's prediction accuracy) in the simulation runs of varying topic numbers. Here, perplexity represents the information loss for an unseen (i.e., test) document presented to a trained algorithm (BLEI 2012). Thus, the lower the perplexity, the better the model is. However, DING, NALLAPATI, AND XIANG (2018) note that perplexity-led optimization negatively affects topic coherence – that is, human interpretability. In contrast, the quality of a topic, as measured by coherence, can be thought of as how easy it is for

people to understand a topic emerging from the words. Or, in layman's terms, that the words within a topic are consistent, and people can tell what the topic is just by looking at it. Therefore, we choose coherence as an indicator of the model fit (WAWAK, ROGALA, AND DAHLGAARD-PARK 2020).

Similar to more traditional methods in the field of latent constructs (e.g., exploratory factor analysis, k-means clustering), researchers need to specify the number of topics (K) as an a-priori parameter K[2] in LDA modeling. There are no strict guidelines for determining the number of topics. For example, WAWAK, ROGALA, AND DAHLGAARD-PARK (2020) identified 45 topics in a corpus of 4,833 documents collected from 8 different journals – that is, 107.4 documents per topic. In contrast, MORO et al. (2019) modeled 8 topics based on a small collection of 239 articles (i.e., 29.9 documents per topic). With JPSSM being the single source in our study, and the resulting size of our corpus, we assumed a testing range for $K \in [5..10]$. This resulted in 13 to 26 documents per topic in the whole dataset, a result that represents a reasonable range compared to other published studies. Next, we calculated the coherence scores of models with different values of K in order to select the best fit. We obtained the highest coherence score for $K = 9$ and thus continued with the number of topics set to 9.

4.2. Thematic Groups

Nine thematic groups (research streams in the literature) were identified and titled after analysis of every article:

GROUP 1. “Macro firm performance: asset, capital, diversification”

The articles in this group take a macro-level view of many activities that affect business performance in the context of crisis management. These activities include working capital management (AKBAR et al., 2021; AKGÜN & MEMİŞ KARATAŞ, 2020), the relationship between top executives and appointment decisions (PHAM, 2022), and total quality management practices (KRIEMADIS et al., 2022). The articles also discuss topics related to the COVID-19 pandemic, such as socially responsible investments (DÍAZ et al., 2022), green supply chain management practices that help companies become more resilient (ULLAH et al., 2022), and the effectiveness of business continuity management (AZADEGAN et al., 2020).

GROUP 2. “Human resources: capability, emotions, behavior”

The overall role of people and related human resources management practices in strengthening organizational resilience is described in most of the articles in this group (C. HU et al., 2022; MA & ZHANG, 2022; GRIFFIN & GROTE, 2020; PENGNATE et al., 2020; MABERAH, 2021; KUTIESHAT & FARMANESH, 2022). Some articles also highlight the importance of entrepreneurial behaviors, talents, and activities as drivers of continuous strategic agility and innovation, which influence the level of organizational resilience (XING et al., 2020; LEE et al., 2022). Organizational resilience depends on the collective response of the top management team (TMT) (RANUCCI & WANG, 2022; SAMBA et al., 2022), and the role of crisis management teams (CMTs) should not be underestimated in the strategic decision-making process (CURNIN et al., 2022).

GROUP 3. “Decision-making process: objective & subjective aspects”

A crisis is a set of nonlinear events with a somewhat chaotic nature, a series of dynamic processes (GASPAR et al., 2021). This poses a challenge in maintaining an adequate information position to support coherent decision-making among a range of actors (TREURNIET & WOLBERS, 2021). The nature of a crisis implicates many multidirectional organizational activities in different aspects. The influence of behavioral economics on the stages of the crisis management life cycle was described by PARNELL & CRANDALL (2020). The relationship between crisis management procedures and local resilience responses was shown by CARTIER & TAYLOR (2020). GRAHAM & LOKE (2022) have “clearly highlighted the disconnect between strategic risk on the one hand and operational resilience and response on the other.”

In detail, there are many aspects of the decision-making process, such as moral decision-making, leadership, stress, and coping (BAVEL et al., 2020). The skills of a decision-maker in crisis management should not be underestimated (AL-DABBAGH, 2020a). Intuitive decision-making also contributes to effective improvisational decision-making in times of crisis (TABESH & VERA, 2020). However, decision-making in the area of crisis management also refers to a preventive perspective, but there are many obstacles to accurately predicting crisis situations (NOVEMBER et al., 2022).

GROUP 4. "Supply chain: reactive & preventive collaboration"

Every organization has suppliers in its microenvironment. The supply chain has a significant impact on the functioning of any organization, just as the immune system does for the body. The COVID-19 crisis posed significant challenges to global supply chains and exposed their vulnerability to disruption (KÜFFNER et al., 2022). Response activities in supply chains have been described in various articles (GLAS et al., 2021; CHOWDHURY et al., 2021). These activities include preventing disruptions to supplies, reacting to disruptions, and protecting the supply chain in the event of disturbances. The COVID-19 crisis has shown that these activities are essential for strengthening supply chain resilience (KÄHKÖNEN & PATRUCCO, 2022; CRAIGHEAD et al., 2020).

GROUP 5. "Health sector: leadership & organizational activities during COVID-19"

Abbas (2021) has argued that “The existing literature has paid insufficient attention to crisis management of global health challenges in the advent of epidemics and pandemics.” He also articulates that resilience is an important aspect for health. PRING et al. (2021) have indicated that “Businesses, private industry and the financial sector have been in a more precarious position regarding crisis and consequently have developed rapid response strategies employing foresight to reduce risk to assets and financial liquidity.” It is important to bring crisis management strategies into the health sector from other fields (BROOKER-THOMPSON, 2021; Correia et al., 2020; PUGLIESE & WOLFF, 2020). These strategies can be used to: Build crisis management architecture (K. H. HU et al., 2022); Design geographic information systems (BELKACEM et al., 2020); Find general parameters that can assist with the decisions of health-planning managers (FILHO et al., 2021); Enhance the index of crisis resilience (GHIYASI et al., 2022); Motivate employees to work under stressful working conditions (von EIFF et al., 2021).

GROUP 6. "Crisis management: micro & macro aspects of learning process"

The content of the articles in this group could be summarized as pointing to important issues of knowledge management at the level of crisis management in many industries and organization's

levels. In crisis management, it is important to plan based on knowledge from past events (HE & HARRIS, 2020; STEWART-HARAWIRA, 2020), especially there is a need to take into account the management and business implications of COVID-19 (LIU et al., 2020; OSMANAGIĆ BEDENIK, 2020). As part of the business continuity management concept (RANF et al., 2021), it is important to recognize crisis as an opportunity (Bridgman & Liwa, 2021). Currently, data science and cloud computing play an important role in strengthening organizational resilience (MATHEUS et al., 2020; LINDGREEN et al., 2012). WISETSRI et al. (2022) examine what impacts performance management during crises.

GROUP 7. “Crisis management: institutional & international level”

After analyzing the articles in this group, it is noticeable that the issues covered under the umbrella called "CM" are multi-subject at the institutional and international level. These articles can be grouped into two collections: activities undertaken during a crisis and activities to strengthen organizational resilience in times of peace. The first subgroup includes articles on coordination of crisis management between various governments (SCHNABEL & HEGELE, 2021; CHRISTENSEN & MA, 2020) or institutions in one country (KUHLMANN & FRANZKE, 2022) or in the EU (ALEMANNO, 2020). The second subgroup focuses on the concept of resilience: the role it plays in flood crisis management at the municipal level (STEEN & MORSUT, 2020), resilience building during the management of the COVID-19 crisis in Lithuania (NAKROŠIS & BORTKEVIČIŪTĖ, 2022), a systemic perspective on crisis management and resilience in Germany (BEHNKE & ECKHARD, 2022; TERRY, 2020), and improving U.S. local governments' crisis resilience (PARK et al., 2022).

GROUP 8. “Crisis response: innovation & leadership”

In a crisis, there is a general and urgent need to find ingenious solutions to ensure the continuity of business (HAMOUCHE, 2021). SUK and KIM (2021) provided a comprehensive understanding of both internally and externally generated airline response strategies by examining business practices for crisis management. Identifying new opportunities that a crisis brings is very important in the process of coping with crises (ADRIAN, 2020). It is especially important during a crisis to not only continue but also strengthen performance management to communicate a firm's strategic direction (AGUINIS & BURGI-TIAN, 2021), where the CEO plays an important role (MUBEEN et al., 2020). Employee engagement is crucial for the success of crisis management (both top management and workers) (RODRIGUEZ-SANCHEZ et al., 2021).

GROUP 9. “Crisis management: education & training in different industries”

The last group of articles focuses on the importance of education and exercises in the prevention of crisis management in various industries: military operations (PIHLAINEN et al., 2020), marine accidents (APRIN et al., 2022), power crisis (PAN & LI, 2022), and the context of the circular economy (MANEA et al., 2021). Always and everywhere, a people's approach is essential in taking these preventive actions: for effective teamwork (DURAN & MCIVOR, 2021; TRACHSLER & JONG, 2020), competences of decision makers (NIEMIEC et al., 2021; KENNETH & NARASIMHA, 2022).

As already indicated in this article, the CROP framework is located in the area of crisis management and organizational communication. Both areas are thematically wide and refer to macroeconomic and microeconomic issues, in various industries. All nine groups of articles present various aspects of crisis management and the multidisciplinary nature of the crisis management subject. Core notions in the literature have been associated with the paper's suggested CROP framework (Table 6).

Table 6: Validating the CRisis-OPportunity (CROP) framework

CROP Framework	Core notions in the literature
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<p>To enhance organizational effectiveness, it is crucial to integrate efficiency and technology into the decision-making process. Humans have limitations in processing information and making optimal choices. By incorporating efficiency principles and AI technologies, we can optimize the use of available resources and improve decision-making within these limitations.</p>	<p>The immediate consequence of the crisis is the challenge of cash flow, as highlighted by AKGÜN and MEMİŞ KARATAŞ (2020). It is essential to identify how the crisis impacts organizational effectiveness and mitigate negative outcomes. Understanding the context of the crisis (as explored in articles from group no. 1) and comprehending the circumstances surrounding it (articles in group no. 6 and 7) are crucial steps. However, the persisting challenge lies in addressing cognitive limitations arising from a dearth of reliable information and time constraints.</p>
<p>Decision-makers learn from past experiences, gather feedback, and make adjustments to enhance the quality of their decision-making over time. They embrace a culture of learning and adaptation, recognizing that ongoing evaluation and refinement are essential for achieving high-quality outcomes. AI could be a driving factor in enriching organizational learning.</p>	<p>The concept of "crisis as opportunity" takes on practical significance during the actual moment of crisis, rather than being solely relevant for preventive actions (LIU et al., 2020) (OSMANAGIĆ BEDENIK, 2020). In such times, organizations are focused on survival, necessitating cooperation among individuals within the organization and in the microenvironment encompassing customers and suppliers. As emphasized by LUCA & MODREGO (2021), the idea of "we are stronger together" holds true. Crisis management hinges on effective coordination, which presents challenges in combining centrally controlled crisis management with sector and local coordination (CHRISTENSEN & MA, 2020). The decision-making process during a crisis is multifaceted, with numerous issues identified in articles from group no. 3.</p>
<p>When social factors are integrated with bounded rationality, decision-makers consider the influence of social norms, cultural values, and interpersonal dynamics on their choices. They recognize that individuals' behavior and decision-making can be influenced by social pressures, group dynamics, and the desire for social acceptance or approval.</p>	<p>Regardless of the level of crisis management (whether at the company, city, or country level), people are the most crucial asset in effectively handling crises (NODEZ et al., 2022) (de WECK et al., 2020) (XING et al., 2020). This holds true both during the reactive phase of crisis management and in proactive preparatory measures. The psychological resilience of individuals serves as the foundation for organizational resilience (MABERAH, 2021). Additionally, emotions can significantly influence the outcomes of decision-making during a crisis, either positively or</p>

	<p>negatively (BIAN et al., 2021). These findings are consistent with the articles categorized in group no. 2.</p>
<p>Decision-makers take into account the broader impact of their choices, including ecological sustainability and the preservation of resources for future generations. They aim to make decisions that are environmentally responsible and promote a more sustainable future.</p>	<p>When faced with a crisis, determining the priorities and actions to take becomes crucial. The primary and immediate objective is to swiftly find creative solutions that guarantee business continuity (HAMOUCHE, 2021). The literature identifies crisis response leadership and innovation as vital elements for the survival of organizations, constituting a distinct area of study (group no. 8). Ensuring effective leadership and fostering innovative approaches are imperative during crisis response to navigate the challenges and secure the organization's future.</p>
<p>Altruism brings a sense of social responsibility and ethical consideration to decision-making processes. Decision-makers should consider the potential impact of their choices on various stakeholders and society as a whole and recognize that decisions should contribute to the greater good while promoting the well-being of others.</p>	<p>Deep co-creation and cooperation are integral to successful supply chain management. The supply chain comprises a network of organizations, activities, and assets, all working towards the common goal of delivering products and/or services (articles in group no. 4).</p>

<p>Harvest only when your crops are ready. Deepen co-creation & cooperation – Identify rapidly changing conditions of functioning in a crisis and adapt present activities to the current situation.</p>	<p>The interplay between assets, time, and decision-making in the context of bounded rationality highlights the critical role of information in effective business management (TREURNIET & WOLBERS, 2021). Information plays a significant role across various levels, including the organizational, industry, and national contexts, as evident in the articles from groups no. 1, 5, and 7. Irrespective of the phase of crisis management—before, during, or after a crisis—education and appropriate training are essential requirements (group of articles no. 9). This emphasizes the need for ongoing learning and skill development to effectively navigate crisis situations and ensure optimal outcomes.</p>
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Authors' elaboration.

5. Conclusions

In times of crisis, it is necessary to make quick decisions and take actions that, without prior preparation, may be ineffective in the long term. During crisis situations, there is a big role for intuitive and improvisational decision-making (TABESH & VERA, 2020). This relates to bounded rationality and applications from behavioral economics along the three stages of the crisis management life cycle—crisis preparation, crisis action, and post-crisis. It is crucial to understand the mechanism and effects of activities on performance (Parnell & Crandall, 2020), especially under stressful working conditions (von Eiff et al., 2021). Using AI-text mining, this study identifies a roadmap with three key elements in successful crisis management: learning, resilience, and continuity.

1. Learning

We should learn from past crises and take some preventive actions (ZATTONI & PUGLIESE, 2021). A preventive approach to crisis management is important (ALZOUBI & JAAFFAR, 2020). COVID-19 has opened the door to opportunities that organizations should be aware of in order to properly direct their future actions in human resource management (HAMOUCHE, 2021). The role of top management in building organizational culture and, indirectly, organizational resilience is important (LEHMBERG & TANGPONG, 2020).

2. Resilience

A preventive approach to crisis management is crucial for success in a real crisis situation (NARJABADIFAM et al., 2021). Resilience is a fundamental organizational ability that is directed toward organizational advancement (DUCHEK, 2020). With heightened attention on the long-term effects of economic crises, we contribute to scholarship and practice by demonstrating that a future focus within executive teams impacts their organization's resilience (RANUCCI & WANG, 2022). The pandemic has modified crisis and business continuity thinking, and organizations are actively reviewing and changing their strategic approach to resilience (GRAHAM & LOKE, 2022).

3. Continuity

Business continuity management is important. This means that preventive and systemic actions are important in strengthening organizational resilience (AZADEGAN et al., 2020). Business continuity management can be treated as a technical part of organizational resilience, a way to make systemic actions, for example by implementing a BCMS system according to the requirements shown in the ISO 22301 standard. In this process, it is important to focus on the supply chain—as a basis for searching for threats and opportunities and planning preventive activities and building resilience (El Baz & Ruel, 2021; Craighead et al., 2020; Kano et al., 2020). This paper shows in practice how AI can significantly contribute to facilitating resilient decision-making within organizations by leveraging its capabilities in data analysis, pattern recognition, and predictive modeling. AI can process vast amounts of data from various sources, both structured and unstructured, to extract meaningful insights. By analyzing historical data, market trends, customer preferences, and external factors, AI can provide decision-makers with valuable information for informed decision-making in dynamic and uncertain environments. Also, AI algorithms can identify potential risks and vulnerabilities within an organization's operations and supply chain. By analyzing data patterns, AI can detect early warning signs and provide proactive risk mitigation strategies, enabling decision-makers to anticipate and mitigate potential disruptions before they occur.

AI-powered tools simulate different scenarios and predict the potential outcomes of various decision options. These simulations can help decision makers to evaluate the resilience of different strategies, assess the potential impact of decisions under different conditions, and make more informed choices that are better aligned with organizational goals and values. AI systems can continuously monitor data streams, social media, news feeds, and other sources to detect signals of emerging issues or crises. By providing real-time insights, AI can help decision-makers identify and respond to rapidly evolving situations promptly and effectively, reducing response time and minimizing the impact of disruptions. Finally, AI systems can learn from past decisions, outcomes, and feedback, continuously improving their decision-making capabilities over time. Through machine learning and adaptive algorithms, AI can adapt to changing circumstances, refine decision models, and incorporate new data and insights, enabling organizations to make more resilient decisions in the face of evolving challenges.

References

- ABBAS, J. (2021), Crisis management, transnational healthcare challenges and opportunities: The intersection of COVID-19 pandemic and global mental health. *Research in Globalization*, 3(December 2020), 100037. <https://doi.org/10.1016/j.resglo.2021.100037>
- ADRIAN, M. (2020), Crisis Management and Resilience for Restaurants in Romania during the COVID-19 Pandemic. *Management Dynamics in the Knowledge Economy*, 8(4), 435–449. <https://doi.org/10.2478/mdke-2020-0028>.
- AGUINIS, H., & BURGI-TIAN, J. (2021), Measuring performance during crises and beyond: The Performance Promoter Score. *Business Horizons*, 64(1), 149–160. <https://doi.org/10.1016/j.bushor.2020.09.001>.
- AKBAR, M., AKBAR, A., & DRAZ, M. U. (2021). Global Financial Crisis, Working Capital Management, and Firm Performance: Evidence from an Islamic Market Index. *SAGE Open*, 11(2). <https://doi.org/10.1177/21582440211015705>.
- AKGÜN, A. İ., & MEMİŞ KARATAŞ, A. (2020), Investigating the relationship between working capital management and business performance: evidence from the 2008 financial crisis of EU-28. *International Journal of Managerial Finance*, 17(4), 545–567. <https://doi.org/10.1108/IJMF-08-2019-0294>
- AL-DABBAGH, Z. S. (2020). The Role of Decision-maker in Crisis Management: A qualitative Study Using Grounded Theory (COVID-19 Pandemic Crisis as A Model). *Journal of Public Affairs*, May, 1–11. <https://doi.org/10.1002/pa.2186>
- ALEMANNI, A. (2020). The European response to CoviD-19: From regulatory emulation to regulatory coordination? *European Journal of Risk Regulation*, 11(2), 307–316. <https://doi.org/10.1017/err.2020.44>
- ALZOUBI, R. H., & JAAFFAR, A. H. (2020), The mediating effect of crisis management on leadership styles and hotel performance in Jordan. *International Journal of Financial Research*, 11(4), 384–397. <https://doi.org/10.5430/ijfr.v11n4p384>
- ANDERSON, J.C., KUMAR, N. and NARUS, J.A. (2007), Value merchants: Demonstrating and documenting superior value in business markets. Boston, Mass.: Harvard Business School Press.
- ANG, S.H., LEONG, S.M. and KOTLER, P. (2000). The Asian apocalypse: Crisis marketing for consumers and businesses. *Long Range Planning*, 33(1), pp.97–119.
- APRIN, L., COTTE, L., & Le FLOCH, S. (2022), Tackling the Behaviour of Vegetable Oil Fire in Case of Maritime Accident: Towards a Crisis Management Decision Support System. *Chemical Engineering Transactions*, 90(March), 25–30. <https://doi.org/10.3303/CET2290005>
- AZADEGAN, A., SYED, T. A., BLOME, C., & TAJEDDINI, K. (2020), Supply chain involvement in business continuity management: effects on reputational and operational damage containment from supply chain disruptions. *Supply Chain Management*, 25(6), 747–772. <https://doi.org/10.1108/SCM-08-2019-0304>
- BAVEL, J. J. V., BAICKER, K., BOGGIO, P. S., CAPRARO, V., CICHOCKA, A., CIKARA, M., CROCKETT, M. J., CRUM, A. J., DOUGLAS, K. M., DRUCKMAN, J. N., DRURY, J., DUBE, O., ELLEMERS, N., FINKEL, E. J., FOWLER, J. H., GELFAND, M., HAN, S., HASLAM, S. A., JETTEN, J., ... WILLER, R. (2020), Using social and behavioural science to support COVID-19 pandemic response. *Nature Human Behaviour*, 4(5), 460–471. <https://doi.org/10.1038/s41562-020-0884-z>

- BEHNKE, N., & ECKHARD, S. (2022), A systemic perspective on crisis management and resilience in Germany. *Dms – Der Moderne Staat – Zeitschrift Für Public Policy, Recht Und Management*, 15(1–2022), 3–19. <https://doi.org/10.3224/dms.v15i1.11>
- BELKACEM, L., HADDA, D., & AHMED, A. (2020). A Gis-based Multicriteria Spatial Decision Support System Model to Handle Health Facilities Resources. Case of Crisis Management in Batna, Algeria. *Geographia Technica*, 15(1), 173–186. <https://doi.org/10.21163/GT>
- BHADURI, R. M. (2019), Leveraging culture and leadership in crisis management. *European Journal of Training and Development*, 43(5/6), pp.554–569.
- BIAN, Q., ZHANG, X., & MAO, Q. (2021), The more actions, the higher the performance evaluation? Evidence from the crisis management of COVID-19 in China. *International Journal of Disaster Risk Reduction*, 60(October 2020), 102281. <https://doi.org/10.1016/j.ijdrr.2021.102281>.
- BLUME, L.E. AND EASLEY, D. (2018), Rationality. In: Macmillan Publishers Ltd., ed., *The New Palgrave Dictionary of Economics* (3rd ed.). pp.11275–11287.
- BOWERS, M.R., HALL, J.R. and SRINIVASAN, M.M. (2017). Organizational culture and leadership style: The missing combination for selecting the right leader for effective crisis management. *Business Horizons*, 60(4), pp.551–563.
- BRIDGMAN, T., & ŚLIWA, M. (2021), Management Learning in a time of crisis and opportunity. *Management Learning*, 52(1), 3–5. <https://doi.org/10.1177/1350507620975218>
- BROOKER-THOMPSON, C. (2021), A commentary on “Crisis management for surgical teams and their leaders, lessons from the COVID-19 pandemic; a structured approach to developing resilience or natural organisational responses.” *International Journal of Surgery*, 95(October), 106145. <https://doi.org/10.1016/j.ijssu.2021.106145>
- CARTIER, E. A., & TAYLOR, L. L. (2020), Living in a wildfire: The relationship between crisis management and community resilience in a tourism-based destination. *Tourism Management Perspectives*, 34(November 2019), 100635. <https://doi.org/10.1016/j.tmp.2020.100635>
- CHONG, J.K.S. (2004). Six steps to better crisis management. *Journal of Business Strategy*, 25(2), pp.43–46.
- CHOWDHURY, P., PAUL, S. K., KAISAR, S., & MOKTADIR, M. A. (2021), COVID-19 pandemic related supply chain studies: A systematic review. *Transportation Research Part E: Logistics and Transportation Review*, 148(February), 102271. <https://doi.org/10.1016/j.tre.2021.102271>
- CHRISTENSEN, T., & MA, L. (2020), Coordination Structures and Mechanisms for Crisis Management in China: Challenges of Complexity. *Public Organization Review*, 20(1), 19–36. <https://doi.org/10.1007/s11115-018-0423-9>
- CORREIA, P. M. A. R., MENDES, I. DE O., PEREIRA, S. P. M., & SUBTIL, I. (2020), The combat against covid-19 in Portugal, part ii: How governance reinforces some organizational values and contributes to the sustainability of crisis management. *Sustainability (Switzerland)*, 12(20), 1–13. <https://doi.org/10.3390/su12208715>
- Craighead, C. W., Ketchen, D. J., & Darby, J. L. (2020), Pandemics and Supply Chain Management Research: Toward a Theoretical Toolbox*. *Decision Sciences*, 51(4), 838–866. <https://doi.org/10.1111/dec.12468>
- CRONIN, J.J., BRADY, M.K. AND HULT, G.T.M. (2000), Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments. *Journal of Retailing*, 76(2), pp.193–218.

- CURNIN, S., BROOKS, B., OWEN, C., & BROOKS, O. (2022), Perceptions of strategic decision-making by crisis management teams during exercising: Establishing key dimensions. *Journal of Contingencies and Crisis Management*, March, 1–15. <https://doi.org/10.1111/1468-5973.12442>
- de MATOS, C.A. AND ROSSI, C.A.V. (2008), Word-of-mouth communications in marketing: A meta-analytic review of the antecedents and moderators. *Journal of the Academy of Marketing Science*, [online] 36(4), pp.578–596.
- de WECK, O., KROB, D., LEFEI, L., LUI, P. C., RAUZY, A., & ZHANG, X. (2020), *Handling the COVID-19 Crisis: Towards an Agile Model-Based Systems Approach*. July, 1–21. <https://doi.org/10.1002/sys.21557>
- DÍAZ, A., ESPARCIA, C., & LÓPEZ, R. (2022), The diversifying role of socially responsible investments during the COVID-19 crisis: A risk management and portfolio performance analysis. *Economic Analysis and Policy*, 75, 39–60. <https://doi.org/10.1016/j.eap.2022.05.001>
- DUCHEK, S. (2020), Organizational resilience: a capability-based conceptualization. *Business Research*, 13(1), 215–246. <https://doi.org/10.1007/s40685-019-0085-7>
- DURAN, H. T., & MCIVOR, W. (2021). Simulation Training for Crisis Management: Demonstrating Impact and Value. *Advances in Anesthesia*, 39, 241–257. <https://doi.org/10.1016/j.aan.2021.08.002>
- EL BAZ, J., & RUEL, S. (2021), Can supply chain risk management practices mitigate the disruption impacts on supply chains' resilience and robustness? Evidence from an empirical survey in a COVID-19 outbreak era. *International Journal of Production Economics*, 233(June 2020). <https://doi.org/10.1016/j.ijpe.2020.107972>
- ELSÄBER, M. AND WIRTZ, B.W. (2017), Rational and emotional factors of customer satisfaction and brand loyalty in a business-to-business setting. *Journal of Business & Industrial Marketing*, 32(1), pp.138–152.
- FILHO, S. Á., ÁVILA, J. S., MRUGALSKA, B., DE SOUZA, N. F., GOMES DE CARVALHO, A. P. M., & GONÇALVES, L. R. (2021), Decision making in health management during crisis: A case study based on epidemiological curves of China and Italy against COVID-19. *International Journal of Environmental Research and Public Health*, 18(15). <https://doi.org/10.3390/ijerph18158078>
- GASPAR, R., DOMINGOS, S., BRITO, D., LEIRAS, G., FILIPE, J., RAPOSO, B., & TELO DE ARRIAGA, M. (2021), Striving for crisis resolution or crisis resilience? The crisis layers and thresholds model and Information and Communication Technology-mediated social sensing for evidence-based crisis management and communication. *Human Behavior and Emerging Technologies*, 3(1), 40–52. <https://doi.org/10.1002/hbe2.241>
- GHIYASI, S., VERDI BAGHDADI, F., HASHEMZADEH, F., & SOLTANZADEH, A. (2022), Resilience Analysis of Crisis in Medical Environments: A Structural Equation Modeling based on Crisis Management Components. *International Journal of Occupational Hygiene*. <https://doi.org/10.18502/ijoh.v13i2.8367>
- GLAS, A. H., MEYER, M. M., & EBIG, M. (2021), Covid-19 attacks the body of purchasing and supply management: A medical check of the immune system. *Journal of Purchasing and Supply Management*, 27(4). <https://doi.org/10.1016/j.pursup.2021.100716>
- GRAHAM, J., & LOKE, H. Y. (2022), Theory rewritten: Business Continuity and Crisis Management in the wake of the Covid-19 pandemic. *Journal of Contingencies and Crisis Management*, 30(3), 231–233. <https://doi.org/10.1111/1468-5973.12415>

- GRIFFIN, M. A., & GROTE, G. (2020), When is more uncertainty better? A model of uncertainty regulation and effectiveness. *Academy of Management Review*, 45(4), 745–765. <https://doi.org/10.5465/AMR.2018.0271>
- HAAS, A., SNEHOTA, I. AND CORSARO, D. (2012), Creating value in business relationships: The role of sales. *Industrial Marketing Management*, 41(1), pp.94–105.
- HAMOUCHE, S. (2021). Human resource management and the COVID-19 crisis: Implications, challenges, opportunities, and future organizational directions. *Journal of Management and Organization*, 1–16. <https://doi.org/10.1017/jmo.2021.15>
- HE, H., & HARRIS, L. (2020), The impact of Covid-19 pandemic on corporate social responsibility and marketing philosophy. *Journal of Business Research*, 116(May), 176–182. <https://doi.org/10.1016/j.jbusres.2020.05.030>
- HEINONEN, K., STRANDVIK, T. AND VOIMA, P. (2013), Customer dominant value formation in service. *European Business Review*, 25(2), pp.104–123.
- HU, C., YUN, K. H., SU, Z., & XI, C. (2022). Effective Crisis Management during Adversity: Organizing Resilience Capabilities of Firms and Sustainable Performance during COVID-19. *Sustainability (Switzerland)*, 14(20). <https://doi.org/10.3390/su142013664>
- HU, K. H., DONG, C., CHEN, F. H., LIN, S. J., & HUNG, M. C. (2022), A Fusion Decision-Making Architecture for COVID-19 Crisis Analysis and Management. *Electronics (Switzerland)*, 11(11), 1–19. <https://doi.org/10.3390/electronics11111793>
- KÄHKÖNEN, A. K., & PATRUCCO, A. S. (2022), Guest Editorial: A purchasing and supply management view of supply resilience for better crisis response. *Journal of Purchasing and Supply Management*, 28(5). <https://doi.org/10.1016/j.pursup.2022.100803>
- KANO, L., TSANG, E. W. K., & YEUNG, CHUNG, H. W. (2020), Global value chains: A review of the multi-disciplinary literature. *Journal of International Business Studies*, 51(4), 577–622. <https://doi.org/10.1057/s41267-020-00304-2>
- KENNETH, S., & NARASIMHA, V. (2022), Testing risk management decision making competency of project managers in a crisis. *Journal of Modern PM*, 10(1).
- KERÄNEN, J., SALONEN, A. AND TERHO, H. (2020), Opportunities for value-based selling in an economic crisis: Managerial insights from a firm boundary theory. *Industrial Marketing Management*, 88, pp.389–395.
- KOTLER, P. AND CASLIONE, J.A. (2009), *Chaotics: The Business of Managing and Marketing in the Age of Turbulence*. New York American Management Association, C.
- KRIEMADIS, A., SAINIS, G., & HARITOS, G. (2022), The impact of quality management systems on financial performance under crisis conditions: evidence from SMEs. *Total Quality Management and Business Excellence*, 33(15–16), 1846–1871. <https://doi.org/10.1080/14783363.2021.2005461>
- KÜFFNER, C., MÜNCH, C., HÄHNER, S., & HARTMANN, E. (2022), Getting back into the swing of things: The adaptive path of purchasing and supply management in enhancing supply chain resilience. *Journal of Purchasing and Supply Management*, 28(5). <https://doi.org/10.1016/j.pursup.2022.100802>
- KUHLMANN, S., & FRANZKE, J. (2022), Multi-level responses to COVID-19: crisis coordination in Germany from an intergovernmental perspective. *Local Government Studies*, 48(2), 312–334. <https://doi.org/10.1080/03003930.2021.1904398>
- KUTIESHAT, R., & FARMANESH, P. (2022), The Impact of New Human Resource Management Practices on Innovation Performance during the COVID 19 Crisis: A New

- Perception on Enhancing the Educational Sector. *Sustainability (Switzerland)*, 14(5). <https://doi.org/10.3390/su14052872>
- LEE, J. Y., YAHIAOUI, D., LEE, K. P., & COOKE, F. L. (2022), Global talent management and multinational subsidiaries' resilience in the Covid-19 crisis: Moderating roles of regional headquarters' support and headquarters–subsidiary friction. *Human Resource Management*, 61(3), 355–372. <https://doi.org/10.1002/hrm.22100>
- LEHMBERG, D., & TANGPONG, C. (2020), Do top management performance attribution patterns matter to subsequent organizational outcomes? A two-country study of attribution in economic crisis. *Journal of Management and Organization*, 26(5), 736–755. <https://doi.org/10.1017/jmo.2018.32>
- LINDGREEN, A., XU, Y., MAON, F., & WILCOCK, J. (2012), Corporate social responsibility brand leadership: A multiple case study. *European Journal of Marketing*, 46(7), 965–993. <https://doi.org/10.1108/03090561211230142>
- LINDSTRÖM, J. (2016), A Model for value-based selling: Enabling corporations to transition from products and services towards further complex business models. *Journal of Multi Business Model Innovation and Technology*, 2(1), pp.67–98.
- LIU, Y., LEE, J. M., & LEE, C. (2020), The challenges and opportunities of a global health crisis: the management and business implications of COVID-19 from an Asian perspective. *Asian Business and Management*, 19(3), 277–297. <https://doi.org/10.1057/s41291-020-00119-x>
- LUCA, D., & MODREGO, F. (2021), Stronger together? Assessing the causal effect of inter-municipal cooperation on the efficiency of small Italian municipalities. *Journal of Regional Science*, 61(1), 261–293. <https://doi.org/10.1111/jors.12509>
- MA, B., & ZHANG, J. (2022), Tie strength, organizational resilience and enterprise crisis management: An empirical study in pandemic time. *International Journal of Disaster Risk Reduction*, 81(September 2021), 103240. <https://doi.org/10.1016/j.ijdr.2022.103240>
- MABERAH, S. M. (2021), Psychological Resilience and Its Relationship to Crisis Management In Light of The Corona Pandemic Among Public School Principals in Liwa' Qasabat Irbid from The Teachers' Viewpoint. *Turkish Online Journal of Qualitative Inquiry (TOJQI)*, 12(5), 4372–4389.
- MANEA, C., IGNAT, G., & SEMENESCU, A. (2021), Perspectives on the Management And Financial Performance Of Smes In The Context Of The Circular Economy And The Crisis Generated By Covid-19 In The European Union. *Review of Management and Economic Engineering*, 20(82), 2360–2155.
- MARWALA, T. (2013), Flexibly-bounded rationality and marginalization of irrationality theories for decision making. arXiv:1306.2025 [cs]. [online] Available at: <https://arxiv.org/abs/1306.2025> [Accessed 26 Jun. 2020].
- MATHEUS, R., JANSSEN, M., & MAHESHWARI, D. (2020), Data science empowering the public: Data-driven dashboards for transparent and accountable decision-making in smart cities. *Government Information Quarterly*, 37(3), 101284. <https://doi.org/10.1016/j.giq.2018.01.006>
- MUBEEN, R., HAN, D., ABBAS, J., & HUSSAIN, I. (2020), The effects of market competition, capital structure, and CEO duality on firm performance: A mediation analysis by incorporating the GMM model technique. *Sustainability (Switzerland)*, 12(8). <https://doi.org/10.3390/SU12083480>
- NAKROŠIS, V., & BORTKEVIČIŪTĖ, R. (2022), Resilience building during the management of the COVID-19 crisis in Lithuania: Major breakthroughs and incremental change. *Journal of*

- Contingencies and Crisis Management*, 30(3), 295–306. <https://doi.org/10.1111/1468-5973.12420>.
- NARJABADIFAM, P., HOSEINPOUR, R., NOORI, M., & ALTABEY, W. (2021), Practical seismic resilience evaluation and crisis management planning through GIS-based vulnerability assessment of buildings. *Earthquake Engineering and Engineering Vibration*, 20(1), 25–37. <https://doi.org/10.1007/s11803-021-2003-1>.
- NIEMIEC, M., GORSKA-ROZEJ, K., & KRZESZOWSKI, W. (2021), Determinants of Managerial Competencies of Crisis Management Team Chairpersons in the Context of Building Resilience to Threats at the Local Level. *European Research Studies Journal*, XXIV(Issue 4B), 369–381. <https://doi.org/10.35808/ersj/2662>.
- NODEZ, A. S., YAGHOUBI, N. M., & KEIKHA, A. (2022), The effect of community-based crisis management on the resilience to disasters with the mediating role of social capital. *International Journal of Human Capital in Urban Management*, 7(2), 205–216. <https://doi.org/10.22034/IJHCUM.2022.02.05>.
- NOVEMBER, V., WINTER, T., AZÉMAR, A., CANOVAS, I., CHEVILLOT-MIOT, E., & LECACHEUX, S. (2022), A new approach for crisis management analysis: Considering the anticipation/decision making pair as a continuum. *Journal of Contingencies and Crisis Management*, October 2021, 1–11. <https://doi.org/10.1111/1468-5973.12440>.
- OSMANAGIĆ BEDENIK, N. (2020). Pandemic crisis management. *The Holistic Approach to Environment*, 10(4), 109–123. <https://doi.org/10.33765/thate.10.4.3>
- PAN, W., & LI, Y. (2022), Improving Power Grid Resilience Under Extreme Weather Conditions with Proper Regulation and Management of DERs—Experiences Learned From the 2021 Texas Power Crisis. *Frontiers in Energy Research*, 10(July), 1–10. <https://doi.org/10.3389/fenrg.2022.921335>.
- PARK, S., GRAHAM, M., & FOSTER, E. A. (2022), Improving Local Government Resilience: Highlighting the Role of Internal Resources in Crisis Management. *Sustainability (Switzerland)*, 14(6), 1–13. <https://doi.org/10.3390/su14063214>
- PARNELL, J. A., & CRANDALL, W. (2020), The contribution of behavioral economics to crisis management decision-making. *Journal of Management and Organization*, 26(4), 585–600. <https://doi.org/10.1017/jmo.2017.60>.
- PARNELL, J.A. AND CRANDALL, W. (2017), The contribution of behavioral economics to crisis management decision-making. *Journal of Management & Organization*, pp.1–16.
- PAYNE, A. AND FROW, P. (2014). Developing superior value propositions: A strategic marketing imperative. *Journal of Service Management*, 25(2), pp.213–227.
- PAYNE, A., FROW, P. AND EGGERT, A. (2017), The customer value proposition: Evolution, development, and application in marketing. *Journal of the Academy of Marketing Science*, 45(4), pp.467–489.
- PENGNATE, S. (FONE), LEHMBERG, D. G., & TANGPONG, C. (2020), Top management’s communication in economic crisis and the firm’s subsequent performance: sentiment analysis approach. *Corporate Communications*, 25(2), 187–205. <https://doi.org/10.1108/CCIJ-07-2019-0094>.
- PHAM, M. D. (MARTY) (2022), Management connection and firm performance: Evidence from Global Financial Crisis. *Journal of Behavioral and Experimental Finance*, 34, 100636. <https://doi.org/10.1016/j.jbef.2022.100636>.

- PIHLAINEN, K., HÄKKINEN, K., SANTTILA, M., RAITANEN, J., & KYRÖLÄINEN, H. (2020), Differences in Training Adaptations of Endurance Performance during Combined Strength and Endurance Training in a 6-Month Crisis Management Operation. *International Journal of Environmental Research and Public Health*, 17(5). <https://doi.org/10.3390/ijerph17051688>.
- PRING, E. T., MALIETZIS, G., KENDALL, S. W. H., JENKINS, J. T., & ATHANASIOU, T. (2021), Crisis management for surgical teams and their leaders, lessons from the COVID-19 pandemic; A structured approach to developing resilience or natural organisational responses. *International Journal of Surgery*, 91(June), 105987. <https://doi.org/10.1016/j.ijso.2021.105987>.
- PUGLIESE, M., & WOLFF, A. (2020), The Value of Communication, Education, and Self-Management in Providing Guideline-Based Care: Lessons Learned from Musculoskeletal Telerehabilitation During the COVID-19 Crisis. *HSS Journal*, 16, 160–163. <https://doi.org/10.1007/s11420-020-09784-2>.
- RANF, D. E., MĂNESCU, G., & BADEA, D. (2021), Specific Business Continuity Management Practices During the Covid-19 Pandemic Crisis. *Land Forces Academy Review*, 26(1), 62–68. <https://doi.org/10.2478/raft-2021-0010>.
- RANUCCI, R., & WANG, S. (2022), Resilience in Top Management Teams: Responding to crisis by focusing on the future. *Long Range Planning*, September, 102268. <https://doi.org/10.1016/j.lrp.2022.102268>.
- REN, H. AND HUANG, T. (2018), Modeling customer bounded rationality in operations management: A review and research opportunities. *Computers & Operations Research*, 91, pp.48–58.
- RODRIGUEZ-SANCHEZ, A., GUINOT, J., CHIVA, R., & LOPEZ-CABRALES, A. (2021), How to emerge stronger: Antecedents and consequences of organizational resilience. *Journal of Management and Organization*, 27(3), 442–459. <https://doi.org/10.1017/jmo.2019.5>.
- SAMBA, C., WILLIAMS, D. W., & FULLER, R. M. (2022), The forms and use of intuition in top management teams. *Leadership Quarterly*, 33(3), 101349. <https://doi.org/10.1016/j.leaqua.2019.101349>.
- SÁNCHEZ-FERNÁNDEZ, R., INIESTA-BONILLO, M.Á. AND HOLBROOK, M.B. (2009), The conceptualization and measurement of consumer value in services. *International Journal of Market Research*, 51(1), pp.1–17.
- SCHNABEL, J., & HEGELE, Y. (2021), Explaining intergovernmental coordination during the COVID-19 pandemic: Responses in Australia, Canada, Germany, and Switzerland. *Publius*, 51(4), 537–569. <https://doi.org/10.1093/publius/pjab011>.
- SENT, E.-M. (2018), Rationality and bounded rationality: You can't have one without the other. *The European Journal of the History of Economic Thought*, 25(6), pp.1370–1386.
- SIMON, H.A. (1957), *Models of Man: Social and Rational- Mathematical Essays on Rational Human Behavior in a Social Setting*. New York: John Wiley.
- SIMON, H.A. (1991), Bounded rationality and organizational learning. *Organization Science*, 2(1), pp.125–134.
- STEEN, R., & MORSUT, C. (2020), Resilience in Crisis Management at the Municipal Level: The Synne Storm in Norway. *Risk, Hazards and Crisis in Public Policy*, 11(1), 35–60. <https://doi.org/10.1002/rhc3.12178>
- STEWART-HARAWIRA, M. W. (2020), Troubled waters: Maori values and ethics for freshwater management and New Zealand's freshwater crisis. *Wiley Interdisciplinary Reviews: Water*, 7(5), 1–19. <https://doi.org/10.1002/wat2.1464>

- SUK, M., & KIM, W. (2021), COVID-19 and the airline industry: crisis management and resilience. *Tourism Review*, 76(4), 984–998. <https://doi.org/10.1108/TR-07-2020-0348>
- TABESH, P., & VERA, D. M. (2020). Top managers' improvisational decision-making in crisis: a paradox perspective. *Management Decision*, 58(10), 2235–2256. <https://doi.org/10.1108/MD-08-2020-1060>.
- TAYLOR, J. (2019), *How to Survive and Thrive When Bad Things Happen: 9 Steps to Cultivating an Opportunity Mindset in a Crisis*. London: Rowman & Littlefield Publishers.
- TERAJI, S. (2018), *Why Bounded Rationality? The Cognitive Basis of Institutions*, pp.137–168.
- TERHO, H., EGGERT, A., HAAS, A. AND ULAGA, W. (2015), How sales strategy translates into performance: The role of salesperson customer orientation and value-based selling. *Industrial Marketing Management*, 45, pp.12–21.
- TERHO, H., EGGERT, A., ULAGA, W., HAAS, A. AND BÖHM, E. (2017), Selling value in business markets: Individual and organizational factors for turning the idea into action. *Industrial Marketing Management*, 66, pp.42–55.
- TERHO, H., HAAS, A., EGGERT, A. AND ULAGA, W. (2012), 'It's almost like taking the sales out of selling': Towards a conceptualization of value-based selling in business markets. *Industrial Marketing Management*, 41(1), pp.174–185.
- TERRY, P. C. R. (2020), To fight a new coronavirus: Crisis management and international cooperation from a local perspective in Germany. *Chinese Journal of International Law*, 19(2), 215–220. <https://doi.org/10.1093/chinesejil/jmaa017>.
- TÖYTÄRI, P. (2015), Assessing value co-creation and value capture potential in services: a management framework. *Benchmarking: An International Journal*, 22(2), pp.254–274.
- TÖYTÄRI, P. AND RAJALA, R. (2015). Value-based selling: An organizational capability perspective. *Industrial Marketing Management*, 45, pp.101–112.
- TRACHSLER, T., & JONG, W. (2020), Crisis management in times of COVID-19: Game, set or match? *Journal of Contingencies and Crisis Management*, 28(4), 485–486. <https://doi.org/10.1111/1468-5973.12306>.
- TREURNIET, W., & WOLBERS, J. (2021), Codifying a crisis: Progressing from information sharing to distributed decision-making. *Journal of Contingencies and Crisis Management*, 29(1), 23–35. <https://doi.org/10.1111/1468-5973.12323>.
- ULAGA, W. AND EGGERT, A. (2006), Value-based differentiation in business relationships: Gaining and sustaining key supplier status. *Journal of Marketing*, 70(1), pp.119–136.
- ULLAH, M., ZAHID, M., ALL-E-RAZA RIZVI, S. M., QURESHI, Q. G. M., & ALI, F. (2022), Do green supply chain management practices improve organizational resilience during the COVID-19 crisis? A survival analysis of global firms. *Economics Letters*, 219, 110802. <https://doi.org/10.1016/j.econlet.2022.110802>
- VARGO, S.L. AND LUSCH, R.F. (2004), Evolving to a New Dominant Logic for Marketing. *Journal of Marketing*, [online] 68(1), pp.1–17. Available at: <http://courses.ischool.berkeley.edu/i210/f07/readings/VargoLusch.pdf> [Accessed 26 Jun. 2020].
- VIIIO, P. and GRÖNROOS, C. (2014), Value-based sales process adaptation in business relationships. *Industrial Marketing Management*, 43(6), pp.1085–1095.
- von EIFF, M. C., von EIFF, W., & GHANEM, M. (2021), Value-based leadership in turbulent times: lessons from the Corona crisis and recommendations for post-pandemic management in the health sector. *Leadership, Education, Personality: An Interdisciplinary Journal*, 3(2), 157–169. <https://doi.org/10.1365/s42681-022-00029-w>.

WENSTØP, F. (2005), Mindsets, rationality and emotion in Multi-criteria Decision Analysis. *Journal of Multi-Criteria Decision Analysis*, 13(4), pp.161–172.

WISETSRI, W., FRANKLIN JOHN, S., PRASAD, A. B., GARG, S., KHAJA MOHIDDIN, M., & BHASKAR, B. (2022), Analysing the importance and impact of cloud computing on organization's performance management during economic crises. *Materials Today: Proceedings*, 56, 2217–2220. <https://doi.org/10.1016/j.matpr.2021.11.550>

XING, Y., LIU, Y., BOOJIHAWON, D. K., & TARBA, S. (2020). Entrepreneurial team and strategic agility: A conceptual framework and research agenda. *Human Resource Management Review*, 30(1), 100696. <https://doi.org/10.1016/j.hrmr.2019.100696>

ZATTONI, A., & PUGLIESE, A. (2021). Corporate Governance Research in the Wake of a Systemic Crisis: Lessons and Opportunities from the COVID-19 Pandemic. *Journal of Management Studies*, 58(5), 1405–1410. <https://doi.org/10.1111/joms.12693>

ZAUNER, A., KOLLER, M. AND HATAK, I. (2015), Customer Perceived value: Conceptualization and Avenues for Future Research. *Cogent Psychology*, [online] 2(1). Available at:

https://ris.utwente.nl/ws/portalfiles/portal/6553501/ZaunerKollerHatak2015_CogentPsychology.pdf [Accessed 21 Apr. 2020].

Appendix A

Criteria for searching and downloading articles

In Titles: „Crisis management” AND decision*:

<http://han3.ue.poznan.pl/han/ebSCO/search-1ebSCOhost-1com-100002bwn1bec.han3.ue.poznan.pl/login.aspx?direct=true&bquery=TI+crisis+management+AND+TI+decision&cli0=FT&clv0=Y&cli1=DT1&clv1=202001-202212&lang=pl&type=1&searchMode=And&site=eds-live>

In Titles: „Crisis management” AND performance:

<http://han3.ue.poznan.pl/han/ebSCO/search-1ebSCOhost-1com-100002bwn2053.han3.ue.poznan.pl/login.aspx?direct=true&bquery=TI+crisis+management+AND+TI+performance&cli0=DT1&clv0=202001-202212&lang=pl&type=1&searchMode=And&site=eds-live>

In Titles: „Crisis management” AND opportunit*:

<http://han3.ue.poznan.pl/han/ebSCO/search-1ebSCOhost-1com-100002bwn1a55.han3.ue.poznan.pl/login.aspx?direct=true&bquery=TI+crisis+management+AND+TI+opportunity&cli0=FT&clv0=Y&cli1=DT1&clv1=202001-202212&lang=pl&type=1&searchMode=And&site=eds-live>

In Titles: „Crisis management” AND cooperation:

<http://han3.ue.poznan.pl/han/ebSCO/search-1ebSCOhost-1com-100002bwn1a55.han3.ue.poznan.pl/login.aspx?direct=true&bquery=TI+crisis+management+AND+TI+cooperation&cli0=FT&clv0=Y&cli1=DT1&clv1=202001-202212&lang=pl&type=1&searchMode=And&site=eds-live>

In Titles: „Crisis management” AND value:

<http://han3.ue.poznan.pl/han/ebSCO/search-1ebSCOhost-1com-100002bwn1be4.han3.ue.poznan.pl/login.aspx?direct=true&bquery=TI+crisis+management+AND+TI+value&cli0=FT&clv0=Y&cli1=DT1&clv1=202001-202212&lang=pl&type=1&searchMode=And&site=eds-live>

In Titles: „Crisis management” AND continuity:

<http://han3.ue.poznan.pl/han/ebSCO/search-1ebSCOhost-1com-100002bwn1be2.han3.ue.poznan.pl/login.aspx?direct=true&bquery=TI+crisis+management+AND+TI+continuity&cli0=FT&clv0=Y&cli1=DT1&clv1=202001-202212&lang=pl&type=1&searchMode=And&site=eds-live>

In Titles: „Crisis management” AND resilience:

<http://han3.ue.poznan.pl/han/ebSCO/search-1ebSCOhost-1com-100002bwn1f5f.han3.ue.poznan.pl/login.aspx?direct=true&bquery=TI+crisis+management+AND+TI+resilience&cli0=FT&clv0=Y&cli1=DT1&clv1=202001-202212&lang=pl&type=1&searchMode=And&site=eds-live>

Appendix B

Number of articles obtained for text-mining analysis.

GROUP No. 1

In Titles: Crisis management AND decision* Start set (DOI or PMID/URL)	co-citation set (DOI or PMID/URL)
<u>10.29119/1641-3466.2020.149.24</u>	-
<u>10.1007/s11115-022-00635-8</u>	10.1093/PUBLIUS/PJAB011 10.1016/j.giq.2018.01.006 10.1007/s13194-021-00416-y 10.1080/03003930.2021.1904398 10.1371/journal.pone.0257363 10.1080/13501763.2021.1942155
<u>10.1111/1468-5973.12442</u>	10.5937/EKOPRE2008545L 10.1016/j.leaqua.2019.101349 10.1108/MD-08-2020-1060 10.1111/1468-5973.12306
<u>10.1111/1468-5973.12440</u>	10.1111/1468-5973.12323
10.3303/CET2290005 Unfortunately the same what no. 16	-
10.1108/MD-08-2020-1088	10.1136/leader-2020-000246 10.5465/amr.2018.0271
10.1002/pa.2186	-
10.1155/2021/5944828	-
10.5604/01.3001.0015.6539	-
10.1017/jmo.2017.60	-
10.21163/GT_2020.151.16	-
10.3390/electronics11111793	10.1108/IHR-08-2020-0044 10.1016/j.ijpe.2020.107972 10.3233/JIFS-200322
10.19255/JMPM02904	-
PMID: 35190021	-

10.3390/ijerph18158078	10.3390/ijerph18136948
10.3303/CET2290005 Unfortunately the same what no. 5	-
10.1017/cts.2021.492	-

GROUP No. 2

In Titles: Crisis management AND performance Start set (DOI or PMID/URL)	co-citation set (DOI or PMID/URL)
10.1016/j.jbef.2022.100636	-
10.1016/j.matpr.2021.11.550	-
10.2478/picbe-2021-0067	-
10.1080/14783363.2021.2005461	-
10.3390/su14052872	10.5430/ijfr.v11n4p3 84 10.1111/radm.12447
10.3390/ijerph17051688	-
10.1177/21582440211015705	-
10.1111/disa.12506	-
10.1108/CCIJ-07-2019-0094	-
10.1017/jmo.2018.32	-
<a href="http://rmee.org/abstracturi/82/06_Articol_619_Articol%20C.%20Man
ea%20-%20RMEE.pdf">http://rmee.org/abstracturi/82/06_Articol_619_Articol%20C.%20Man ea%20-%20RMEE.pdf	-
10.1108/IJMF-08-2019-0294	-
10.1007/s11135-020-01026-1	-
10.1016/j.eap.2022.05.001	-
10.1016/j.ijdr.2021.102281	-

GROUP No. 3

In Titles: Crisis management AND opportunit* Start set (DOI or PMID/URL)	co-citation set (DOI or PMID/URL)
10.1016/j.resglo.2021.100037	10.3390/su12083480
10.1136/tsaco-2021-000862	-
10.1177/1350507620975218	-
10.1017/jmo.2021.15	10.1016/j.bushor.2020.09.001
<i>10.33765/thate.10.4.3</i>	-
10.17345/rio28.7-34	-
10.1057/s41291-020-00119-x	10.1016/j.hrmr.2019.100696 10.1057/s41267-020-00304-2
https://www.cairn-int.info/journal-gestion-et-management-public-2021-4-page-161.htm	-

GROUP No. 4

In Titles: Crisis management AND cooperat* Start set (DOI or PMID/URL)	co-citation set (DOI or PMID/URL)
10.3112/erdkunde.2022.02.06	10.1111/jors.12509 10.1080/00343404.2020.1750580
10.1093/chinesejil/jmaa017	-

GROUP No. 5

In Titles: Crisis management AND value Start set (DOI or PMID/URL)	co-citation set (DOI or PMID/URL)
10.3390/su141610244	-
10.1016/j.aan.2021.08.002	-
10.1365/s42681-022-00029-w	-
10.1007/s11420-020-09784-2	-
10.3390/su12208715	10.1016/j.ijsu.2020.02.034

	10.1002/jmv.25750
10.5339/jemtac.2022.19	-
10.1002/wat2.1464	-

GROUP No. 6

In Titles: Crisis management AND continuity Start set (DOI or PMID/URL)	co-citation set (DOI or PMID/URL)
10.34659/eis.2022.80.1.422	10.31014/aior.1992.03.02.241 10.1108/SCM-08-2019-0304]
10.1111/1468-5973.12415	-
10.1111/ropr.12455	10.1007/s11115-018-0423-9 10.1017/err.2020.44
10.1080/10528008.2020.1837633	-
10.2478/raft-2021-0010	-
PMID: 32847653	-
PMID: 35190014	-

GROUP No. 7

In Titles: Crisis management AND resilience Start set (DOI or PMID/URL)	co-citation set (DOI or PMID/URL)
10.1016/j.pursup.2022.100803	10.1016/j.pursup.2021.100716 10.1111/dec.12468
10.1016/j.ijdr.2022.103240	10.1017/jmo.2019.5 10.3389/fpsyg.2021.766528
10.3390/su142013664	10.1111/joms.12693 10.1108/IJCHM-04-2020-0325 10.1007/s40685-019-0085-7
10.54055/ejtr.v31i.2748	-
10.5814/j.issn.1674-764x.2022.04.013	-
10.1016/j.econlet.2022.110802	-

10.22034/IJHCUM.2022.02.05	-
https://ersj.eu/journal/2662/download	-
10.3390/su14063214	-
10.1016/j.ijsu.2021.105987 Unfortunately the same what no. 30	-
<u>10.1111/1468-5973.12420</u>	-
10.30519/ahtr.929800	-
10.1016/j.tmp.2020.100635	-
<u>10.1016/j.lrp.2022.102268</u>	-
10.1108/TR-07-2020-0348	-
10.1002/hbe2.241	10.1038/s41562-020-0884-z
10.1007/s11803-021-2003-1	-
10.2478/mdke-2020-0028	-
10.18502/ijoh.v13i2.8367	-
10.7906/indecs.18.4.1	-
10.1515/jhsem-2020-0079	-
www.tojqi.net/index.php/journal/article/view/3595	-
10.1007/s10669-020-09775-y	-
10.1002/rhc3.12178	-
10.1016/j.pursup.2022.100748	-
10.3389/fenrg.2022.921335	-
10.3390/su14074144	-
10.1016/j.ijsu.2021.106064	-
10.1016/j.ijsu.2021.106145	-
10.1016/j.ijsu.2021.105987	-

Unfortunately the same what no. 10	
10.1016/j.pursup.2022.100802	10.1016/j.tre.2021.102271
<u>10.1002/hrm.22100</u>	10.1111/ijmr.12237
10.3224/dms.v15i1.11	-

Appendix C

Topics after text-mining – results from AI and titles after papers’ analysis

1 GROUP “Macro firm performance: asset, capital, diversification”

'0.042*"firm" + 0.023*"capital" + 0.014*"sample" + 0.013*"firm_performance" + ' + 0.013*"asset" + 0.011*"ratio" + 0.009*"regression" + 0.009*"return" + ' + 0.008*"average" + 0.008*"correlation" + 0.008*"survey" + 0.008*"hypothesis" + ' + 0.008*"investment" + 0.008*"measured" + 0.008*"vulnerability")',

2 GROUP “Human resources: capability, emotions, behavior”

'0.043*"firm" + 0.017*"capability" + 0.008*"dimension" + ' + 0.008*"firm_performance" + 0.008*"construct" + 0.008*"sample" + ' + 0.007*"innovation" + 0.006*"leadership" + 0.006*"hypothesis" + ' + 0.006*"school" + 0.005*"behavior" + 0.005*"employee" + 0.005*"item" + ' + 0.005*"scholar" + 0.005*"educational")',

3 GROUP “Decision-making process: objective & subjective aspects”

'0.019*"tourism" + 0.013*"community" + 0.011*"decisionmaking" + ' + 0.010*"disaster" + 0.009*"social_medium" + 0.008*"decisionmakers" + ' + 0.008*"alternative" + 0.008*"public_health" + ' + 0.007*"decisionmaking_process" + 0.006*"building" + 0.006*"scientific" + ' + 0.006*"interview" + 0.005*"perceived" + 0.005*"perception" + ' + 0.005*"science")',

4 GROUP "Supply chain: reactive & preventive collaboration"

'0.100*"supply_chain" + 0.044*"disruption" + 0.034*"supplier" + ' + 0.029*"supply" + 0.015*"network" + 0.012*"article" + 0.011*"capability" + ' + 0.011*"product" + 0.011*"production" + 0.009*"hospital" + 0.006*"logistics" + ' + 0.006*"customer" + 0.006*"partner" + 0.006*"collaboration" + ' + 0.006*"material")',

5 GROUP “Health sector: leadership & organizational activities during COVID-19”

'0.025*"patient" + 0.015*"hospital" + 0.012*"medical" + 0.011*"criterion" + ' + 0.010*"healthcare" + 0.010*"leader" + 0.009*"leadership" + 0.009*"care" + ' + 0.008*"organisation" + 0.007*"fig" + 0.007*"death" + 0.006*"china" + ' +

'0.006*"option" + 0.006*"day" + 0.006*"treatment"'),

6 GROUP “Crisis management: micro & macro aspects of learning process”

'0.017*"regional" + 0.013*"chain" + 0.012*"governance" + 0.011*"china" + '
'0.011*"economy" + 0.010*"water" + 0.010*"region" + 0.010*"journal" + '
'0.008*"network" + 0.008*"city" + 0.007*"citizen" + 0.007*"institutional" + '
'0.006*"political" + 0.006*"transparency" + 0.006*"principle"'),

7 GROUP “Crisis management: institutional & international level”

'0.026*"coordination" + 0.019*"local_government" + 0.017*"organisation" + '
'0.012*"public_health" + 0.012*"phase" + 0.010*"authority" + '
'0.009*"political" + 0.009*"disaster" + 0.008*"germany" + 0.007*"central" + '
'0.007*"preparedness" + 0.007*"staff" + 0.006*"actor" + 0.006*"agency" + '
'0.006*"federal"'),

8 GROUP “Crisis response: innovation & leadership”

'0.077*"employee" + 0.034*"firm_performance" + 0.018*"human_resource" + '
'0.017*"innovation" + 0.010*"job" + 0.010*"firm" + 0.007*"innovative" + '
'0.007*"culture" + 0.007*"remote" + 0.007*"leader" + 0.006*"customer" + '
'0.006*"unit" + 0.005*"measurement" + 0.005*"staff" + 0.005*"virus"'),

9 GROUP “Crisis management: education & training in different industries”

'0.042*"project" + 0.029*"training" + 0.021*"participant" + '
'0.017*"education" + 0.015*"respondent" + 0.012*"dependent_variable" + '
'0.011*"skill" + 0.009*"bias" + 0.009*"program" + 0.009*"competency" + '
'0.009*"power" + 0.007*"physical" + 0.007*"generation" + 0.007*"age" + '
'0.006*"performed"')]