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Highlighting artificial intelligence roles in business area Amid the COVID-19 crisis

Abdellatif AZIKI^{a,*}, Moulay Hachem FADILI^b

^{a,b}Research Laboratory in Entrepreneurship, Finance and Audit (LAREFA), Ibn ZOHR University, ENCG Agadir, Morocco

Abstract

Purpose: The fast development of technology and data has fueled the use of artificial intelligence (AI) in the business area, but there has been no comprehensive review to guide and assess this evolution, especially in the context of Covid-19 crisis. Our objective is to highlight the nature and scale of AI research in the business area, during the COVID-19 Pandemic.

Methods: We performed a scoping review and searched two literature databases (Scopus and MDPI) for terms related to AI and Covid-19 by focusing on scientific papers published in the field of business. We used multiple tools (Endnote, Covidence) for titles and abstracts selection, followed by full-text screening. The studies must include research on artificial intelligence and Covid-19, and then be published in English-language, between March 2020 and March 2022.

Results: 31 studies met eligibility criteria (of 391 studies selected). Most of the published articles refer to conceptual analysis or quantitative works, the rest of the articles used a literature review except 4 articles published using a qualitative method of analysis. In addition, we observe an evolution of the total number of publications for the 31 articles included in the analysis.

Conclusions: Studying AI in the business field amid the covid-19 crisis is at an early stage of maturity, especially with the use of new AI technologies. For the field to progress, more studies are needed in the next few years.

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Keywords: Artificial intelligence, AI, Business area, Machine learning, covid-19 pandemic

* Corresponding author. Tel.: +212-673-451-072; +212-668-163-299.
E-mail address: Abdellatif.aziki@edu.uiz.ac.ma

1. Introduction and rationale

Over the past two years, we have witnessed a profound change in the manner corporations operate. (Aziki & Fadili, 2021). The COVID-19 pandemic has intensely enhanced the adoption of artificial intelligence (AI) in diverse fields. We have skilful the equal of 2 years of digital transformation compressed into only a few months. The term artificial intelligence was coined in 1956, but AI is becoming more and more popular today due to large volumes of data, advanced algorithms, and improvements in computing power and memory. Artificial Intelligence focuses on the ability of machines to demonstrate some intelligence similar to animals/humans. (Akbari, & Hopkins, 2022)

In business area, These Artificial Intelligence systems are designed to solve problems and would be able to execute tasks really well. By definition, they have narrow capabilities, like recommending a product for an e-commerce user or predicting resource requirements for companies. In fact, it is imprecise what information is available in the literature on the place and role of AI in business area, specially, Amid the COVID-19 crisis. For these reasons, a scoping review was undertaken to systematically reflect the state of research in the field and to identify existing knowledge gaps. The goal of this scoping study is to discover the existing worldwide literature in the context of AI and its uses in business area for the last two years (from March 2020 and March 2022), also, this paper tries to discover what is currently happening in the context of covid-19 crisis and outline scientific productions in this area of research. With this research, we aim to address this knowledge gap by asking and answering the following research question: What is known from the literature about artificial intelligence uses et roles in business area during Covid-19 crisis?

2. Methods

2.1. Protocol and research design

Using the scoping review methodological framework proposed by Arksey and O'Malley (2005), we aim to understand the development of the topic. This scoping review is conducted by following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) updated in 2018 by Tricco et al. The PRISMA flowchart that exemplifies the numerous steps in this scoping literature review is exposed in Figure 1.

2.2. Data Gathering

The congregation of articles relevant to the topic was carried out on two databases: Scopus, DPI. These two databases are prestigious databases recognized by their influence, their level of scientific rigor, and their credibility, which guarantees the desired quality in terms of the collection and assembly of scientific articles. The study uses Endnote, Covidence and Microsoft Excel to assist us in all stages of researching, analyzing and interpreting data, and answering research questions efficiently and accurately. Our analysis focuses on research carried out and published between March 2020 and March 2022. A period of 24 months, to examine the existing literature which corresponds to the context of the Covid-19 pandemic spread and evolution. The study focuses on a multifaceted set of corporate fields, particularly, Business, Management, Accounting, Economics, and Finance. To search the databases, we first created a data extraction sheet (Kreaus et al, 2020), covering a set of keywords interrelated to artificial intelligence and the covid-19 crisis. The objective was to gather the greatest number of relevant articles from data sets.

2.3. Applying inclusion and exclusion criteria

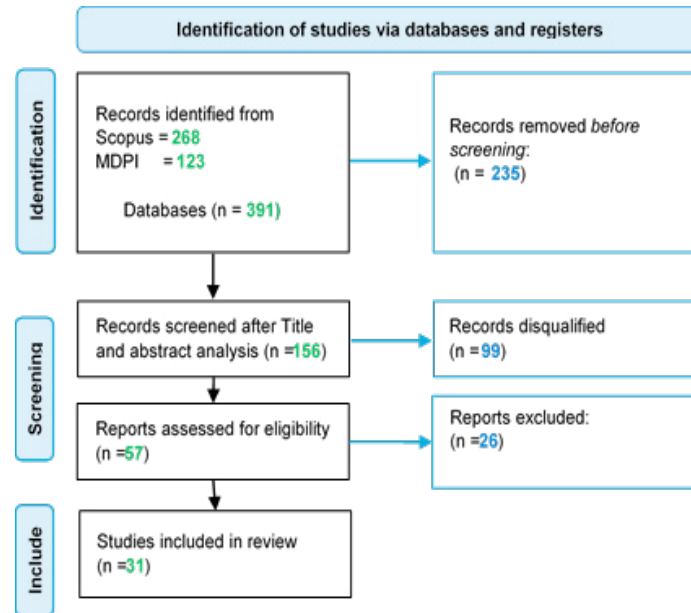
Table 1. inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Our review involved studies that: Focused on the AI roles, uses, in the covid-19 context; Contains keywords related to the AI field concerning the covid-19 crisis; Articles published in the field of business and management; Published between March 2020 and March 2022.	Articles were excluded: If they were not published in the English language; If they are duplicates; If they are published outside the set number of years; If they are irrelevant; If they are published outside of business area.

At this level, we were able to include a total number of 391 articles distributed over the databases as follows: 268 items included on Scopus, and 123 articles included on MDPI.

2.4. Screening and data abstraction

Title and abstract screening help to decide whether or not a study is eligible by looking at its title and abstract only. This first pass narrows down the list of potentially eligible studies to consider in the next step, full-text screening. At the end of this phase, we were able to keep a total number of 156 studies. The full-text review inspects in detail the studies that were not excluded at the first stage. In the end, we were able to keep for our study a total



number of 57 articles.

Fig. 1. PRISMA-ScR flow diagram of the study, processed results

3. Results

3.1. Descriptive results

The findings illustrate the scope and variety of research on AI amid covid-19 context in business area. Interest in this topic from Business and management researchers has increased exponentially over the evolution of the covid-19 crisis. The studies were carried out in 18 different countries and published in 27 different journals. A wide variety of theories and methods has been adopted. To illustrate the evolution of scientific production on the focal topics, we plotted the cumulative frequency of the published documents. We note that the first scientific productions published on the subject date back to May 2020 by Zeng, Chen & Lew (2020) under the title "From high-touch to high-tech: COVID-19 drives robotics adoption". The AI issues amid covid-19 has experienced remarkable evolution over the

last 2 years. 57% of the documents in our data set were published in 2021 while 29% were published in 2020, besides, in 2022, the percentage represents 14% covering the first three months of the year. One of the main objectives of our research is to provide a clear picture of the current research and the journals that have published the highest number of articles on AI amid the covid-19 crisis. The data set extracted from the two databases shows that 31 relevant academic studies were published in 27 different journals until March 2022. The journals that published the most studies (Top 4) are : the International Journal of Information Management (2 studies), International Journal of Contemporary Hospitality Management (2 studies), and Operations Management Research (2 studies), The Journal of Technology in Society (2 studies). One more observation is that most of the published articles refer to quantitative analysis (32%) or conceptual study (32%), and the rest of the articles used a literature review (23%), except for 4 articles published using a qualitative study (13%). Additional observation is that most of the research are based in three countries (Top 3): India (5 studies), United Kingdom (4 studies), Bangladesh (3 studies).

3.2. Content Analysis Results

Our analysis brings out several observations, which seem interesting to us in their interpretation. Among these observations, we can underline the subjects or the key words, which are the most, treated in relation to AI in time of crisis. Among the most discussed topics at this level are presented in Figure 2.

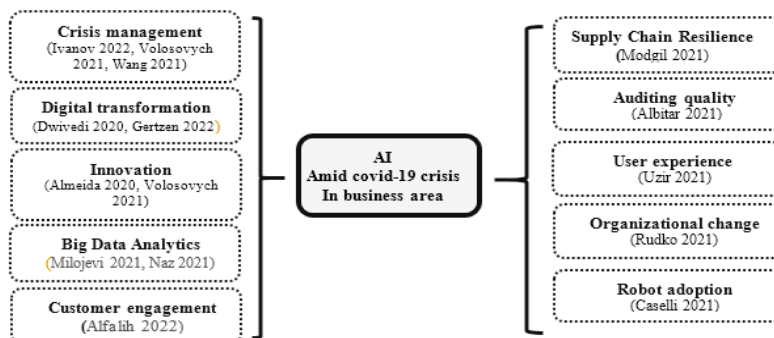


Fig. 2. Topics related to the study subject

Table 2. Examples of Theories and models cited in the articles

Theoretical perspective	Theory's Name	Authors Name
IT acceptance and adoption perspective	Innovation diffusion theory	E.M. Rogers in 1962
	IT culture	(Walsh, 2014)
	Technology Acceptance Model	Davis (1989)
	Artificially Intelligent Device Use Acceptance model (AIDUA model)	Gursoy et al. 2019
Behavioral and Psychological perspective	Word choice and verbal tone theory	Campbell & Pennebaker, 2003
	Social exchange theory	George Homans (1958)
	Stimulus-Organism-Response (S-O-R) theory	Ivan Pavlov (1927)
	The Cognitive Appraisal Theory	Lazarus 1991
	The theory of planned behavior model	Icek Ajzen (1985, 1991)
Marketing Perspective	Expectation disconfirmation theory	Oliver (1980)
	Psychological value marketing	Gottschalk & Glaser, 1969
	Situational crisis communication theory	Coombs (2007)
	The Commitment-Trust Theory of Relationship Marketing	Morgan and Hunt (1994)
Organizational perspective	Organizational information processing	Jay Galbraith, 1973
	Structuration Theory	Giddens, A. (1981)
	The Contingency Theory of Organization	Lex Donaldson, 2001
	The stakeholder theory	Freeman, 2004, 2010
Strategic perspective	Dynamic capability view theory	Teece et al. (1997)
	Resource-based view	Barney, 1991, Wernerfelt, 1984
	Value chain analysis	Porter, 1985

In another side, Most of the articles deal with the subject of AI in a context of the Covid crisis by targeting all types of companies apart from the sectors of activity in which they operate, nevertheless observing that some research has focused more on sectors of specific activities such as: Hospitality sector (Chiang 2020, Romero 2021, Seyitoglo 2020), Tourism sector (Ribeiro 2022, Zeng 2020, Ivanov 2022, Gaur 2021), Healthcare sector (Wang 2021, Ali 2021, Uzir 2021), Industrial sector (Sung-Eun Kang et al 2021), Audit Profession (Albitar 2021), Insurance area (Volosovych 2021).

The articles retained in our study are rich in terms of theoretical references and basic theoretical models. These elements bring added value to this research, according to the study perspective followed by the authors of these articles. The table 2 includes the most developed theories in the articles taken in our study.

3.3. Limitations and Opportunities for Future Research

Like any research work, our research may have some weaknesses. Among which, there are those which are generated by the choices made by the authors. Our choices in terms of inclusion and exclusion criteria may have certain limitations, for example, taking into consideration that articles published in English limits access to interesting scientific resources to analyze, especially in French, Spanish or even Chinese.

Thus, the research question did not include keywords related to very specific types, dimensions or practices related to AI. Therefore, we likely missed some studies that used these terms in their title and abstract instead of the terms we used. However, apparently, and according to the importance of the results found. This helps readers speculate on how AI is being exploited amid the global health crisis specifically in business area. In addition, the study minimized selection bias by having two independent reviewers responsible for study selection and data extraction, with very high agreement in both processes.

Regarding the opportunities opened up by this study, it will open up an interesting line of research, based on a profound examination by carrying out a systematic or making more targeted empirical studies.

4. conclusion

Following the scoping literature review methodology, this article analyzed and structured 31 articles published between March 2020 and March 2022. The research idea is immersed to evaluate the scientific works on AI in relation to the crisis context. The main results reveal that several studies have discussed the changes caused by covid-19 and the different roles of AI. In addition, a significant gap still exists in the studies, especially when the majority of them have addressed the immediate effects of the crisis, while it can have long-term impacts on the life of companies and their stakeholders.

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