Initial consumer resistance to autonomous medical artificial intelligence-based technologies: a health perspective

Zied Mani* and **Inès Chouk****

*Laboratoire CEROS, Université Paris Nanterre – IUT de Ville d'Avray/Saint-Cloud/Nanterre (France)
**Laboratoire THEMA, UMR CNRS 8184, CY Cergy Paris Université (France)

Abstract

- *Purpose*

While the success of medical artificial intelligence (MAI) is dependent on understanding the mechanisms inhibiting its acceptability for potential users, relatively few studies have adopted a resistance-oriented perspective. The aim of this study is to examine the impact of individual health concerns (1), healthcare technology concerns (2) and contextual factors (3) on initial consumer resistance to autonomous MAI based technologies.

- *Methodology*

Data were collected through an online questionnaire. A quantitative study was conducted with a representative sample of the French population (N= 245). Structural equation modeling was used for the analysis (AMOS).

- *Results*

Our study proposed and validated a multi-level model of drivers of resistance to autonomous MAI-based technologies. The findings show that initial resistance to autonomous medical artificial intelligence is impacted by: perceived MAI health risk, perceived neglect of patient uniqueness and perceived liability issues. Moreover, our results highlight the role of structural assurances in alleviating consumer resistance to autonomous MAI based technologies.

- *Managerial implications*

The development of MAI technologies should be based on a collaborative R&D model that incorporates all relevant stakeholders: medical personnel, developers, institutional actors, patients, etc.

Organizations providing AI-based technologies for consultations should display "labels" to ensure the ethical and responsible utilization of these technologies for patients.

Manufacturers of AI-based technologies can develop offers combining MAI-based technologies with other tools collecting data on patients (AI health applications, IoT devices, etc.).

- *Originality*

The originality of this research is threefold: 1) Studying the initial reaction of consumers to a technological innovation in the acceptability stage. 2) Developing and testing a comprehensive multi-level model of

To contact the authors: zmani@parisnanterre.fr ; ines.chouk@cyu.fr

drivers of consumer resistance from a health perspective. 3) Identifying a new type of resistance factors to technological innovation: factors related to the organizational and the regulatory context.

- **Keywords:** Resistance, innovation, medical artificial intelligence, structural assurances, patient uniqueness, liability issues.

As predicted by Issel (2019, p.195), "the 'smart' health care organizations of the near future will fully utilize both the internet of medical things and artificial intelligence in their various forms and applications". Robots for example are now capable of performing surgery and algorithms can analyze a patient's symptoms and propose a diagnosis and treatment. This is what is now known as medical artificial intelligence (MAI), with technologies beginning to be employed in healthcare organizations to provide medical care and manage patient interactions (Yun et al., 2021). In healthcare, AI refers to the ability of algorithms to understand, analyze, interpret, and reason in order to draw medical conclusions, make autonomous decisions, and learn on their own (Jiang et al., 2017) (Box 1).

However, while MAI offers many opportunities for the healthcare ecosystem, patients may be reluctant to use medical care provided by MAI (compared to a human doctor) (Longoni et al., 2019; Yun et al., 2021), or even become resistant to the idea of dealing with this healthcare technology. This initial resistance in the acceptability stage could lead to the failure of MAI since resistance is recognized in innovation marketing literature as a factor contributing to the failure of new products or technologies in the market (Mani & Chouk, 2018). For MAI companies, the challenge is to identify the mechanisms and factors that lead to the initial resistance. For public authorities, guaranteeing the success of the MAI could be a response to the current tensions in the health system (lack of doctors, saturation of certain hospital services, medical deserts, etc.). Likewise, healthcare staff need to understand the potential factors of resistance, in order to adapt their care practices and to assist patients in embracing these new technologies. These practical challenges are even more important in the context of fully autonomous MAI operating without human intervention. Many expect that new technologies will be able to perform medical procedures autonomously, such as diagnosing pathology and prescribing treatment (PWC, 2019). Insofar as the medical act is a very sensitive service for each individual, involving an "autonomous machine" in its delivery is a major change and can potentially become a source of resistance.

On a theoretical level, three gaps can be identified in the current marketing literature. Firstly, while the success of MAI-based technology is dependent on understanding the mechanisms inhibiting its acceptability for potential users (Longoni et al., 2019; Yun et al., 2021), relatively few studies have adopted a resistance-oriented perspective to understand patient reaction to MAI. However, it is widely acknowledged that resistance to innovation can be a "major barrier to diffusing radical innovation into mainstream markets" (Casidy et al., 2021, p.1101). Resistance to innovation is generally seen as an initial negative reaction in order to maintain a satisfactory status quo (Heidenreich et al., 2016). This reaction is expressed in the