Journal of Human Development and Communication
Volume 13, 2024 [45-50]

HEALTHCARE TECHNOLOGY MANAGEMENT IMPLICATIONS USING ARTIFICIAL INTELLIGENCE FOR HEALTHCARE INDUSTRY

Ezekiel Anthony[1,2], Norshahrizan Nordin[1,2,3*] and Wei Chern Ang[2,4]

[1]Faculty of Business & Communication, UniMAP, Perlis, Malaysia
[2]Healthcare Management - Special Interest Group (HEm - SIG),
[3]Management of Technology and Engineering Management - Special Interest Group (MoTEm - SIG),
[4]Clinical Research Centre, Ministry of Health Malaysia, Hospital Tuanku Fauziah, Kedah Malaysia

Received 29th January 2024, Revised 8th December 2024, Accepted 27th December 2024

ABSTRAK

Penyelidikan ini direka bentuk untuk mengkaji penggunaan Kepintaraan buatan (AI) dalam Pengurusan Teknologi Penjagaan Kesihatan dan membentangkan kesannya terhadap Penglibatan Pekerja dalam kalangan pekerja penjagaan. Pertumbuhan pesat data dalam penjagaan kesihatan telah mewujudkan persekitaran yang ideal untuk pembangunan Kepintaran Buatan (AI). Pekerja penjagaan kesihatan telah mengalami anjakan paradigma yang dibawa oleh Kecerdasan Buatan, yang menjanjikan untuk meningkatkan kualiti perkhidmatan yang disediakan. ID penyelidikan ini bagi: RSCH ID-22-05617-MT2 di bawah Pendaftaran Penyelidikan Perubatan Kebangsaan di bawah protokol:Protokol UniMAP TIOHTMUAIFEE.

Kata kunci: Kepintaraan Buatan, Pengurusan Teknologi Penjagaan Kesihatan, Penglibatan Pekerja.

ABSTRACT

This research is designed to investigate the usage of Artificial Intelligence (AI) in Healthcare Technology Management and to present its impacts on Employee Engagement among healthcare workers. The fast growth of data in healthcare has created an ideal environment for the development of Artificial Intelligence (AI). Healthcare workers have experienced a paradigm shift brought on by Artificial Intelligence, which promises to increase the quality of services provided. This research ID of: RSCH ID-22-05617-MT2 under National Medical Research Registration under protocol: Protocol UniMAP TIOHTMUAIFEE.

Keywords: *Artificial Intelligence, Healthcare Technology Management, Employee Engagement.*

1.0 INTRODUCTION

The 3rd Sustainable Development Goal which is the “Good Health and Well-Being” ensures that the current tools and technologies like telemedicine, electronic medical records (EMRs), wireless health devices (wearables), mobile health (mHealth), and innovative software applications, among other digital health technologies, have the potential to transform fragile states. (Asi & Williams, 2018). Artificial Intelligence or more commonly known with the abbreviation of “AI” is known as the type of behaviour control which involves the usage of electronic guidance and supervision of an AI system, and it also includes the monitoring role of an employee's job activities to make sure they adhere to a set of work standards (Hughes et al., 2019). It is through efficient internal communication and training, where responsible AI principles can offer direction on how

Corresponding author’s e-mail: *norshahrizan@unimap.edu.my*

to run and exploit AI technologies completely, responsibly, and ethically. Gains from this engagement method will provide staff more insight on how to use AI (Wang et al., 2021). In light with this, this study attempts to investigate and identify the most related key impacts affecting employee engagement along with the use of healthcare technology management with artificial intelligence towards healthcare workers in Perlis, Malaysia

1.1 Applications of Artificial Intelligence in Healthcare Technology Management

The early detection made possible by AI can facilitate early treatment, leading to positive changes in patients and improved AI system efficiency. (Obeng, 2020; Spohrer & Banavar, 2015). Singh et al. (2023) have indicated that artificial intelligence can be utilized for diagnosing Hepatitis. According to (Srivastava, 2022), various innovative methods, particularly for diagnosis and treatment, have improved the clinical outcomes of cancer patients. Machine learning-based artificial intelligence (AI) applications have been instrumental in addressing these issues. These AI techniques can provide personalized updates to patients on their treatment procedures, progress, recovery, therapies used, dietary changes, and lifestyle patterns. In pandemics and epidemics, Artificial Intelligence is used for detection, prevention, response, and recovery. Prediction, surveillance, and information are all being used more and more frequently in prevention, especially in light of the recent COVID-19 outbreak (OECD,2019).

1.2 Malaysia's Perspective of Healthcare Technology

As reported by Healthcare IT news, Malaysia's implementation of Connected Care by Subang Jaya Medical Center provides services in six care categories, starting with: HomeConnect provides nursing care, TeleConnect, a telemedicine service for scheduling appointments and making medical enquiries; and SeniorConnect is a senior patient remote monitoring service. In the near future, Connected Care will introduce three additional services: GPConnect is a service that connects general practitioners with specialist cardiologists for diseases relating to the heart, ICUConnect is a remote patient monitoring service provided by ICU nurses; and Post-discharge monitoring service provided by HospitalConnect, all of which that uses Healthcare Technology and indirectly uses Artificial Intelligence. Having such tools can certainly boost healthcare practitioners' engagement**.**

2.0 LITERATURE REVIEW

2.1 Artificial Intelligence and Employee Engagement in Healthcare

According to the findings of several recent research, Artificial Intelligence (AI) is a rapidly developing sector that is technologically enabling and is a primary driver of digital transformation in businesses and organisations (Kraus et al. 2021). Healthcare Technology Management systems offers a template for building up a successful system in healthcare facilities and provider settings. It also encourages a fresh perspective on hospital organisation for technology-related decision-making (Vilcahuamán & Rivas, 2017).In 1990, Kahn (as cited in Sahni,2021), defined engagement as the harnessing of organizational members. In any engagement, people tend to employ themselves as well as express the way they are physically, cognitively, and emotionally during a role performance. Also, the safety is posited, whereby meaningfulness and availability are the main reasons that reason out on why individuals engage themselves in the workplace beforehand. In many healthcare settings, including hospitals, labs, and research centres, artificial intelligence is being used. In 1992, Shapiro as cited in (Turki Al-Sabhan et al., 2020), says clinical practitioners and health service organizations now have access to opportunities that were previously unavailable or ignored thanks to artificial intelligence technologies that use machines to sense and analyze data like people. Healthcare administration,

clinical decision support, patient monitoring, and healthcare interventions are the key applications of artificial intelligence in the provision of healthcare (Turki Al-Sabhan et al., 2020). Bhatt, V., & Chakraborty, S. (2023) says that with real-time data accessibility guarantees knowledge pervasiveness, which in turn encourages improved physician-patient orientation and empowered involvement and engagement. A rising number of organisations in many industries, including healthcare, have high engagement as a strategic goal. Employees that are engaged are dedicated to their company, content with their work, and eager to put forth extra effort to further the organization's objectives. (Lowe,2012). Furthermore, with the presence of Artificial Intelligence in Healthcare Technology Management now, as per Paul, P., & Singh, B. (2023), the Internet accelerates and improves life and work. The Internet of Things (IoT) is a recent interconnection system that includes distinctive identifiers. Employees can create competent and anticipatory services and solutions for human resource (HR) practises thanks to advancements in Artificial Intelligence.

2.2 Social Cognitive Theory

The social environment has a crucial impact on motivation, learning, and self-regulation, according to social cognitive theory, a psychological perspective on human functioning (Schunk & Usher, 2019). According to Social Cognitive Theory, one's behaviour is influenced and managed by their own cognition as well as external factors. Social Cognitive Theory, which Bandura developed in 1997, stresses how personal cognition in a social environment shape and regulates human behaviour. In addition, Bandura identifies two categories of expectation beliefs, including self-efficacy and result expectations, as the two main cognitive processes that will influence a person's conduct.

2.3 Theoretical Framework

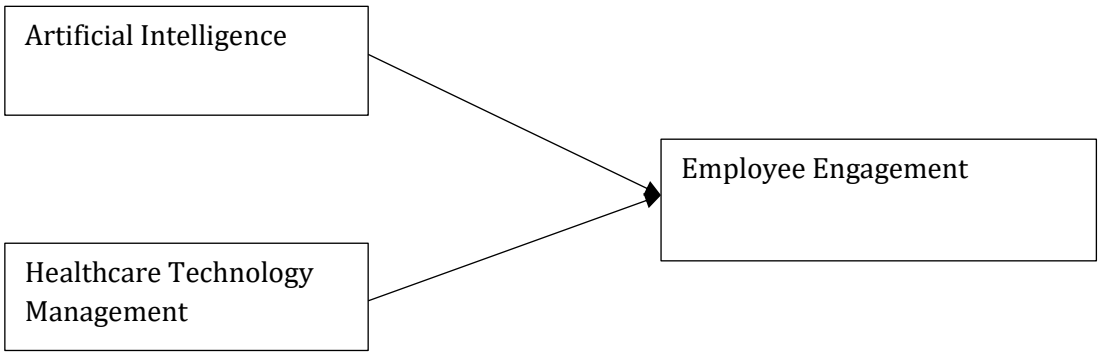

Figure 1: Conceptual Framework

3.0 RESEARCH METHODOLOGY

With the Research Onion by Saunders (2017) as reference, this research applies a quantitative approach whereby it follows a positivism philosophy as the methodology and followed by deductive approaches. In terms of survey, the respondent's response is all measured statistically via questionnaires findings. All data are then run for various analysis using SPSS software.

Healthcare workers in Perlis are chosen for this study. This covers Jabatan Kesihatan Negeri, Hospital, Pejabat Kesihatan Daerah and Klinik Kesihatan as shown in Table 1.

Table 1: Total Number of Facility in Perlis

No	Facility	Total
1	Jabatan Kesihatan Negeri	1
2	Hospital	1
3	Pejabat Kesihatan Daerah	1
4	Klinik Kesihatan	12

The sample size is 30 and the questionnaire has been distributed to answer the impact of Artificial Intelligence in Healthcare Technology Management for Employee Engagement. In this sampling selection, the researcher has obtained several data sets to be referred to and uses the table of size effect to determine the sample size.

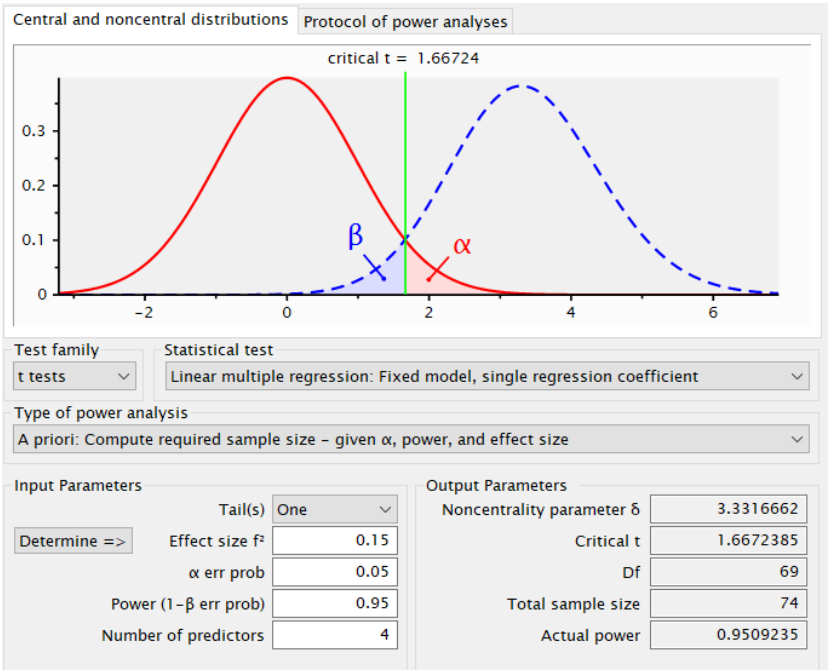

Figure 2: The Calculation of The Total Minimum Sample Size Using G-Power

Table 2: The Effect for The Sample Size from Patrick Dattalo,2008

	P A=0.05 Power=0.95	
High Effect Size **= F Squared**	**=0.35**	⇨ **N=30**
Medium High Effect Size **=F Squared**	**=0.25**	⇨ **N=40**
Medium Effect Size **=F Squared**	**=0.15**	⇨ **N=65**
Medium Low Effect Size **=F Squared**	**=0.12**	⇨ **N=80**

Hence, as the last step, in order to determine the minimum, the total number of minimum sample size, the researcher uses the effect size as well as G-Power software.

4.0 RESULTS AND DISCUSSION

Table 3: Demographics

Demographics	Frequency	Percent	Valid Percent	Cumulative Percent
Male	9	36.0	36.0	36.0
Female	16	64.0	64.0	100.0
Total	25	100.0	100.0	
20-29 years old	3	12.0	12.0	12.0
30-39 years old	14	56.0	56.0	68.0
40-49 years old	4	16.0	16.0	84.0
50-59 years old	2	8.0	8.0	92.0
More than 60 years old	2	8.0	8.0	100.0
Total	25	100.0	100.0	
Less than 1 year	2	8.0	8.0	8.0
1-5 years	5	20.0	20.0	28.0
More than 5 years	18	72.0	72.0	100.0
Total	25	100.0	100.0	

Table 4: Results of Reliability Tests

Variables	No. Of Item	Cronbach's Alpha	Indications
EE	10	0.619	Acceptable

Note: EE: Employee Engagement

Table 5: Mean and Standard Deviation Tables

Variables	N	Mean	Standard Deviation
EE	25	4.01	0.44

Note: EE: Employee Engagement

5.0 CONCLUSION

The development of artificial intelligence technology in healthcare is thought to have lagged behind other fields despite the rapid advancement of AI across all industries. The slow progress of healthcare is due to a variety of causes, including financial, ethical, and social ones (Turki Al-Sabhan et al., 2020), despite this, it is clear that the advancement of Artificial Intelligence in the healthcare sector in the state of Perlis is indeed upcoming and in the developing stages.

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