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AI IN GREEN E-HEALTHCARE: FACILITATING MENTAL HEALTH THROUGH AEI (ARTIFICIAL EMOTIONAL INTELLIGENCE) USING SERVEQUAL AND MIXED METHOD APPROACH

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ABSTRACT: The increasing volume and complexity of data makes the employment of AI more relevant in the present. AI has been adopted by almost all life sciences organizations and healthcare providers. Patient involvement, data handling and storage, therapy recommendations, diagnostics, and administrative duties are all included in the main application. Although AI can be used for many more tasks, healthcare cannot be completely automated. Human contact is still essential.
Methodology: Empirical method was adopted and RFRC (reliability, factor, regression and correlation methods were adopted). Structural equation modelling was adopted for creating the validated model using SPSS software package and AMOS modelling methods.
Findings: The study research findings suggest that the artificial intelligence enabled technology helps in better sustainable healthcare provider. However, the TAM (technology adoption model) unified theory of acceptance and use of technology (UTAUT) needs to be looked into for better adoption of this technology among the patients and hospitals and doctors.
Social implications: using AI enabled technology adoption including robot enabled surgeries can hugely reduce the per cost of healthcare systems provided to the common people. This model will also enable the government to reduce the cost of expenditure and financial burden of healthcare systems and management using artificial intelligence enabled robotic systems.
Originality: Almost negligible research has been conducted in adoption of these technologies for human healthcare facilities. The present study helps to bridge these gaps for the same.
KEY WORDS: Artificial Intelligence, virtual assistant, telemedicine, Chatbots, electronic health record system,

INTRODUCTION:

A recent report on India's National Strategy for Artificial Intelligence suggests that advancements in AI-based technology could address a number of problems with community healthcare delivery (AHHM, 2017). In India, the usage of digital healthcare has increased process efficiency and patient care. The Indian healthcare industry is undergoing a transformation due to new health technologies such as wearables, virtual reality, robotics, artificial intelligence (AI), and the expansion of telemedicine (Markets, 2020). The use of AI in patient risk assessment, pharmaceutical development, radiodiagnosis, and electronic health monitoring has caused a paradigm shift in healthcare delivery (Doumbouya et al., 2014; Rahman et al., 2016; Saha & Ray, 2019). Healthcare professionals have profited from significant advancements in AI technology by receiving fundamental information on how to categorize patients into high-risk. Important advancements in AI technology have helped medical professionals by providing them with fundamental guidelines on how to categorize patients into high-risk or very-high-risk groups and calculate the appropriate course of treatment (Tyagi, 2019). As evidenced by the National e-Health Authority (NeHA, 2016), the Indian market is capable of embracing AI-driven technology. To create an AI-focused network, several companies, including Google, Microsoft, and IBM, are collaborating with Indian governments and healthcare facilities (NITI Aayog, 2016). Healthcare companies are using AI-based solutions and modern technology to communicate with patients and guide new business initiatives (Basu et al., 2021).

By 2021, the Indian healthcare industry is expected to generate $6 billion in income from AI applications, according to the Future Health Index (FHI) (FHI, 2020). Consequently, India is leading the way in the adoption of digital healthcare services, and it is anticipated to command a 20% compound annual growth rate (CAGR) in the healthcare market by the end of 2022 (AHHM, 2017). Recent estimates indicate that by 2025,

AI in healthcare Globally

The "quadruple aim" of healthcare systems can be achieved with AI by democratizing and standardizing a future of linked and AI-augmented care, precision diagnoses, precision therapies, and, eventually, precision medicine (Table 11).30 Potential applications in drug development, virtual clinical consultations, disease diagnosis, prognosis, medication management, and health monitoring (both for mental and physical health) are among the rapidly developing areas of AI research in healthcare.

Connected/augmented care

Through the care pathway, AI could enhance patient safety, caregiver experience, and patient flow and experience. To identify and treat patients who are at danger of deteriorating, for example, AI could be utilized for remote patient monitoring (e.g., intelligent telehealth through wearables/sensors). The healthcare system's inefficiencies could be greatly decreased with artificial intelligence.

In the long term, we expect to see social care agencies, hospitals, healthcare clinics, patients, and caregivers all connected to a single, interoperable digital infrastructure through the use of passive sensors and ambient intelligence.31 Below is a list of two AI applications in connected care.

Virtual assistants and AI chatbots

AI chatbots, like as those from Babylon (www.babylonhealth.com) and Ada (https://ada.com), are being used by patients in primary care and community settings to diagnose symptoms and recommend next steps. Wearable technology, such as smartwatches, can be connected to AI chatbots to provide patients and caregivers with guidance on how to enhance behavior, sleep, and general health.

Ambient and intelligent care

Additionally, we see the emergence of ambient sensing that doesn't require any extraneous devices.

• Emerald (www.emeraldinno.com): created by Massachusetts Institute of Technology researchers and employees, Emerald is a wireless, touchless sensor and machine learning platform that allows for remote behavior, sleep, and breathing monitoring.

•Google Nest: this gadget tracks sleep disturbances like coughing using motion and sound sensors.32

• A recent article that looked at contactless heart rhythm monitoring using smart speakers. AI systems that use natural language processing (NLP) technology, such as Nuance Dragon Ambient experience (www.nuance.com/healthcare/ambient-clinical-intelligence.html), can automate administrative tasks like entering patient visits in electronic health records, streamline clinical workflow, and free up clinicians to spend more time caring for patients.

PRECISION DIAGNOSTICS

Diagnostic imaging

Automatic medical picture classification is currently the most widely used AI application. A recent analysis of AI/ML-based medical devices found that 129 (58%) of those approved in the USA and 126 (53%) of those permitted in Europe between 2015 and 2020 received CE marks or were approved for use in radiology.When it came to identifying pneumonia, a convolutional neural network trained using labeled frontal chest X-ray pictures performed better than radiologists. Research in dermatology has demonstrated that AI can perform as well as or better than human specialists in image-based diagnosis across a variety of medical specialties, such as radiology's pneumonia, pathology (where an AI algorithm was trained using whole-slide pathology images to detect lymph nodes), and dermatology.

- **DIABETIC RETINOPATHY SCREENING**

Reducing preventable, diabetes-related vision loss worldwide depends on early detection of diabetic retinopathy and prompt treatment. However, screening is costly given the high number of diabetic

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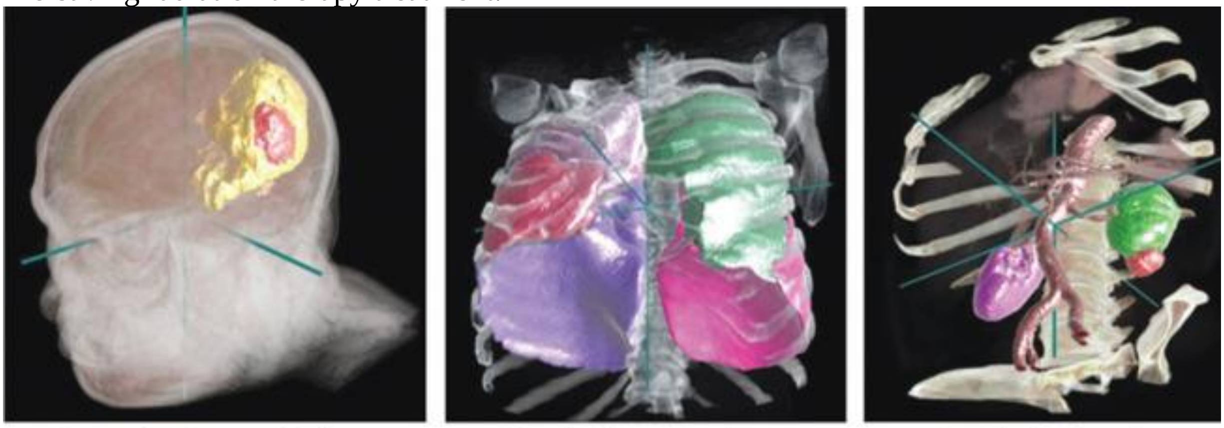
patients and the global lack of eye care professionals.Forty Research investigations on automated AI algorithms for diabetic retinopathy have been carried out in the USA, Singapore, Thailand, and India, and they have demonstrated robust diagnostic performance and cost effectiveness.41–44 Furthermore, the Food and Drug Administration-approved AI algorithm "IDx-DR," which demonstrated 90% specificity and 87% sensitivity in detecting diabetic retinopathy that was more severe than mild, was approved for use in Medicare coverage by the Centers for Medicare & Medicaid Services.

Improving the precision and reducing waiting timings for radiotherapy planning

One important use of AI is to assist physicians with radiation cancer treatment planning and image production. Currently, an oncologist manually segments the images using software that is specifically designed to draw contours around the areas of interest. This method is laborious and time-consuming. The AI-based InnerEye open-source technology can reduce this preparation time for head and neck and prostate cancer by up to 90% (Fig. 22), greatly reducing the waiting periods for starting potentially life-saving radiation therapy treatment.



Quantitative radiology — Radiation oncology — Surgical planning

Precision therapeutics

If precision medicine is to become a reality, we must significantly improve our understanding of disease. Researchers from all over the world are exploring the cellular and molecular causes of disease, gathering a range of multimodal data that could lead to biological and digital markers for diagnosis, progression, and severity. Two important potential applications of AI are immunomics/synthetic biology and drug development.

- **Immunomics and synthetic biology**

By using AI tools on multimodal datasets and learning more about the cellular basis of disease and the clustering of diseases and patient populations, we may be able to provide more specialized preventive strategies in the future, such as using immunomics to diagnose and more accurately predict care and treatment options. Many standards of care will be revolutionized by this, particularly in the fields of rare diseases, cancer, and neurological conditions, where it will enable a more personalized experience for the patient.

- **AI-driven drug discovery**

Artificial Intelligence will significantly improve clinical trial design and expedite pharmaceutical manufacturing. In fact, AI has the potential to replace any combinatorial optimization method used in the medical industry. The most recent developments from DeepMind and AlphaFold have given us the first indications of this. This makes it possible to anticipate protein structures, better understand disease processes, and develop more specialized treatments (for both common and uncommon ailments; see Fig. Fig33).

Precision medicine

New curative therapies for mental health

Synthetic biology has yielded a number of innovations in the last decade, including customized cancer therapies and CRISPR gene editing. Even However, the process of creating such cutting-edge medications is still exceedingly costly and inefficient.

Future advancements in data access (genomic, proteomic, glycomic, metabolomics, and bioinformatics) will enable artificial intelligence (AI) to handle a far greater level of systematic complexity. This will change how we think about, contribute to, and impact biology. By assisting in the early prediction of which agents are more likely to be effective and in the better anticipation of adverse drug effects, which have frequently prevented the further development of otherwise effective drugs at an expensive late stage, this will increase the efficiency of the drug discovery process.

AI empowered healthcare professionals enabling e-healthcare facilities

In the long run, healthcare professionals will employ AI to enhance the quality of care they provide, enabling them to provide safer, more standardized, and more effective care while also meeting the highest legal approval standards. For example, doctors could use a "AI digital consult" to review "digital twin" models of their patients—a truly "digital and biomedical" version of the patient—in order to "test" the efficacy, safety, and experience of an intervention (such as a cancer drug) in a virtual setting before implementing it on a real-world patient.

LITERATURE REVIEW

The concern that artificial intelligence (AI) may lead to substantial job automation and human displacement has generated a lot of conversation, according to Thomas Davenport (2019). No healthcare employment has been lost as a result of AI. AI's delayed market adoption thus far and the difficulties in integrating AI into clinical procedures and EHR systems have contributed to the limited impact on employment.

Pradeep Kumar, Yogesh k. Dwivedi, and Ambuj Anand (2021) claim that the relationship between ethical AI and value creation and market success in the healthcare sector is moderated by the
Conitive participation of the patients

In their study on the definition, complexity, and future of the subject, Philipp A. Rauchnabel et al. identify a four-brick structure for augmented reality marketing. A comprehensive strategy to AR is currently lacking, and AR marketing requires creating marketing tools specifically for a given company.

According to a study by E.C. Sung et al. on consumer engagement via interactive artificial intelligence and mixed reality, the degree of AI (voice recognition and synthesis using machine learning) connected to an augmented object enhances consumer perceptions of novel experiences, MR enjoyment, and MR immersion related to spatial immersion. Collectively, these increase consumer interactions and positively influence behavioral reactions, including inclinations to buy and share experiences with others. All things considered, the results of this study show that interactive AI and MR technologies create new opportunities to encourage customer involvement.

According to Joachim Scholz and Andrew N. Smith, there is a dearth of information about augmented reality (AR) and how to successfully execute AR campaigns in the real world, despite the fact that AR may be a helpful tool in integrated marketing initiatives. They develop eight useful recommendations that marketing managers may use to produce engaging augmented reality experiences that maximize consumer engagement using the term ENTANGLE. O.O. Bilio et al.'s study, "Revisiting the consumer Brand engagement concept,"

Their study attempts to re-evaluate the CBE scale's validity, which was initially introduced by Hollebeek, Glynn, and Brodie in 2014. O.O. Bilio et al. offer a novel engagement paradigm by fusing viewpoints from marketing practice and research. They evaluate the CBE scale via this new conceptualization and find that, although it is a credible and trustworthy tool, it falls short in capturing the engagement concept. Lastly, they present and validate a new tool that better encapsulates the engagement idea. They evaluate the CBE scale and find that, although it is a legitimate and trustworthy tool, it falls short in capturing the idea of engagement.

Luo Meiling Margaret, Chen Ja-Shen.Russell According to K.H. Ching b & Chu-Chi Liu, virtual experiential marketing influences online browsing, shopping orientation (economic, convenient, and IT usage), and VEM characteristics (Sense, Interaction, Pleasure, Flow, and Community relationship).Factors like the intention to make an online purchase have an impact on customer loyalty.

Saeed Shobeiria, Ebrahim Mazaherib, and Michel Larochec claim that focusing on customer ROI, service excellence, aesthetics, and playfulness of the website can improve user engagement.

In their paper "Setting the future of digital and social media marketing research: Perspectives and research propositions," Yogesh K. Dwivedi et al. state that social media platforms, both new and established, are dynami, that B2B research is necessary, and that there is no appropriate measurement scale for digital experiential marketing.

Orel, F. D., & Kara, A. claim that consumer satisfaction, which in turn fosters customer loyalty, is positively and significantly correlated with the quality of self-checkout services. However, it is imperative that SCS providers evaluate these technologies and examine the experiences of their clients. They should identify the factors that influence customers' satisfaction or discontent rather than providing something merely because everyone else is doing it.

In their study, Gao, L., and Bai, X. use the S-O-R paradigm to investigate the associations among flow state, purchase intention, satisfaction, and web ambient cues (defined as site entertainment, site efficacy, and site informativeness). The results validate that there is a directional relationship between the variables in the model.

The authors of the article, Madhu B. and Deepak Verma, agree that digital marketing tactics, which are gaining popularity in our rapidly changing technological landscape, can be advantageous to companies. These tactics include e-commerce marketing, campaign marketing, social media marketing, e-mail direct marketing, display advertising, e-books, optical disks, gaming, content marketing, influencer marketing, content automation, and SEO. Secondary data from published publications and online sources forms the basis of the study.

e-healthcare enablement using AI

Kawaf, F.; Tagg, S. The construction of the online purchasing experience: This study explores how consumers define the online shopping experience according to their own criteria using a repertory grid technique. Kelly's (1955) personal construct theory (PCT) is applied to 23 repertory grid interviews, and multi-coder qualitative content analysis is employed for analysis. The findings highlight the fluidity and emotional, perceptual, situational, and behavioral construction of experience. Rita, P., Oliveira, T., and Farisa, A.'s analytical findings indicate that three e-service quality dimensions—website design, security/privacy, and fulfillment—have an impact on overall e-service quality. However, the overall quality of e-services is not much impacted by customer service. A statistically significant correlation exists between customer behavior and the overall quality of e-services.

Yoganathan, V., Osburg, V.S., and Akhtar, P. believe that rational consumption requires sensory stimulation and provide multimodal marketing as a way to e-tail ethical companies. It is believed that multisensory marketing is a successful tactic for enhancing the client experience. Three components are the focus of Wu, I.L., Chen, K.W., and Chiu, M.L. These include buyer psychology, e-store design, and perceived risk related to online impulse buying. Numerous studies have demonstrated a cyclical link between contentment and flow state. Their methodology uses flow theory to examine how design features impact e-store usage. Reports indicate that satisfaction with online encounters is negatively correlated with perceived danger.

According to a survey by Elliot and Fowell, 70% of customers said that their expectations for more product options, individualized service, and convenience were satisfied. However, consumer concerns about security, usability, service quality, and overall cost significantly impede growth. A more comprehensive approach to Internet shopping research is suggested in light of the findings.

Research by Jing, X.; Nadine, W.; and Cleff, T. Even though they don't have the same physical presence as a store, they can nevertheless generate a virtual brand experience using interactive, visual, audio, gaming, or community-based aspects, as explained in the impact of online brand experiences on brand loyalty. In addition to promoting behavioral and attitudinal brand loyalty, this can improve a brand's reputation.
Research by M. Rostami, M. Sheikhmohammady, and A. Ghahtarani When knowledge sharing is considered in the context of social commerce, the effect of social capital and social interaction on customers' purchase intentions demonstrates that customers' purchase intentions are positively impacted by structural capital, cognitive capital, relational capital, interpersonal interactions, perceived benefits, and information/knowledge sharing behavior. Vikas, A., Justin, P., and Deepa, S. talked about. Digital footprints can be utilized as digital assets to enhance brand experiences through remarketing. Perceived utility, enjoyment, and social pressure are elements that influence consumers' intention to continue making purchases online, according to research by Al-Maghrabi, T.; Dennis, C.
The subjective operations that consumers attempt to fully immerse themselves in the consumption experience are introduced and developed in this study by Caru, A., & Cova, B. (2006). The results suggest that immersion in a consumption experience is not an instantaneous process, but rather a progressive one. To support this progressive process, more attention must be paid to the management of service components that will impact the so-called operations of appropriation.
P.A. Rauschnabel, R. Felix, and C. Hinsch are researchers who study augmented reality marketing to find out more. How brands can be improved by taking inspiration from smartphone augmented reality apps. They assert that online merchants can use their knowledge of machine learning to create personalized promos that are based on customer loyalty, experience, and perceived motivation. Gupta, P., Yadav, M. S., & Varadarajan, R. (2009) state that the development of trust in the online marketplace is problematic. According to their research, factors that influence people's perceptions of trust include things like site design and navigability.
Based on the above literature review, the following gaps have been identified:
There are many review articles in the fields of digital marketing that are progressively more popular, attracting great attention due to their several benefits to the consumers.

- In the papers, researchers focus mostly on use of AI in Disease diagnosis, early diagnosis of fatal blood diseases, treatment of rare diseases, Customer Service Chatbots, Virtual Health Assistants, Automation of Redundant Healthcare Tasks, Management of Medical Records Robot-assisted Surgery, Automated Image Diagnosis, Clinical Trial Participation, Development of New Medicines, still it is a new, lesser explored area
- Future research may examine this in relation to a specific industry, as the current study is not industry specific (Kashif Abrari et al., 2017; Smink et al., 2020; S. Chintalpati et al., 2022; Nadine Zing, 2018).
- There is still a lack of a holistic approach to AR. (A Rauschnabel, Babin, Jung 2022), (Luo, Chen Liu 2011), (Yganathan, Akhtar 2019), (Rochanbel Felix 2019), (Sperndin, Sauer 2014), (Sung Et Al,2021), (Scholz Smith), (Monika Dhawan, 2022), Resources Hub 2016.
- The absence of well-established marketing resources in a particular sector (Kashif Abrari et al., 2017), (O Petit, C. Valesco C. Spense, 2019); (F.D. Orel, A. Kara 2014); (PRita, Oliveira 2019).

As per the gaps identified above, the paper aims to achieve the following objectives:
1) Examine the effective experiential determinants that enhance patient’s involvement
using AI and SERVEQUAL
2) Study a specific industry i.e. healthcare sector which is absent in the existing
Literature using UTUAT model
3) The current use of AI by Healthcare Professionals and future use as suggested by them by enhancing AEI

RESEARCH METHODOLOGY

The empirical study concentrating on the elements impacting the healthcare industry's adoption of AI is part of the methodology. Primary data was used in the study, and respondents were chosen at random. An online questionnaire, containing the input variable items from the conceptual frame work will be used in google form format. A pilot questionnaire having 27 questions and covering various items have been made see the viability of the study.

The sampling technique included simple random sampling. And the sample size was 140 respondents.

The Measurement Scale

SERVQUAL is used in the study (Parashuraman et al., 1998). The amount of items for assessing each variable, their sources, and the recent research that have validated these scales are listed in Table 1. 5 point Likert scale indicating: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree.

Qualitative survey

Mixed method was adopted for the study in detail. An exploratory qualitative study is also conducted with in-depth interviews. To increase the possibility that healthcare experts (senior medical officers, senior nursing staff, and technical officers) will share their knowledge of the components of artificial intelligence in healthcare, a purposive sampling technique is employed. The criteria for the interviewees is experience in and knowledge of Emotion AI. The exploratory interviews will emphasize the participants' perception of AI and their views as to the constituents and consequences of AI.

DATA ANALYSIS

Empirical data analysis was used for analyzing the AI in Healthcare using CRM software and its feedback analysis. The research methodology used the SPSS method. Data analysis given below:

Table 1: Reliability Statistics

Cronbach's Alpha	N of Items
.959	52

The table 1 shows that the reliability of the total sample was 0.959 which is more than 0.5. As per the norms, this is acceptable.

Table 2: Case Processing Summary

		N	%
Cases	Valid	148	100.0
	Excluded[a]	0	.0
	Total	148	100.0

a. Listwise deletion based on all variables in the procedure.

The above Table 2. shows that the reliability of the total items is 0.959 which is accepted as per Nunally (1995) which shows that if the reliability of the questionnaire is more than 0.5 and as above, it is acceptable.

Table 3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.884
Bartlett's Test of Sphericity	Approx. Chi-Square	5592.647
	df	1326
	Sig.	.000

Table 4: ANOVAa

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.669	9	.963	1.227	.283[b]
	Residual	108.324	138	.785		
	Total	116.993	147			

a. Dependent Variable: reg_health_check
b. Predictors: (Constant), tech_red_time_serv, real_in_person_records, virtual_clinic, tests_ral_mach, inf_ai_diagnosis, diag_inperson, diagnosis_real_doc, comfort_real_clinic, real_doctor_checkup

Table 5: Coefficientsa

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.806	.542		3.331	.001
	real_in_person_records	-.008	.105	-.008	-.077	.939
	real_doctor_checkup	-.050	.142	-.051	-.354	.724
	diagnosis_real_doc	-.026	.125	-.027	-.204	.839
	tests_ral_mach	.071	.142	.073	.498	.619
	diag_inperson	-.156	.110	-.162	-1.409	.161
	comfort_real_clinic	.046	.119	.050	.388	.699
	inf_ai_diagnosis	.209	.108	.180	1.936	.055
	virtual_clinic	.157	.095	.153	1.664	.098
	tech_red_time_serv	-.145	.111	-.119	-1.313	.191

a. Dependent Variable: reg_health_check

FINDINGS AND DISCUSSIONS:

In-depth interviews are used to conduct an exploratory qualitative study. A purposive sample technique is used to ensure that healthcare professionals (senior medical officers, senior nursing staff, and technical officers) are likely to communicate their understanding of the components of AI in healthcare. Interviewers must be knowledgeable about and have experience using Emotion AI. The participants' perspectives of artificial intelligence (AI) and their thoughts on its elements and impacts will be the main topics of the exploratory interviews.

A questionnaire was distributed to 30 medical experts (nurses, doctors) to gather their opinions on the application of AI in the healthcare industry.

90% of respondents who were asked how they believed AI had changed their field of medicine or medicine overall stated that it had improved the ability to diagnose illnesses early.

While 40% of respondents were concerned that some healthcare professionals may eventually be supplanted by AI tools

70% of respondents believed that advancements in AI make medical practice more exciting.

Nearly 80% of respondents believed that the quality of healthcare has increased as a result of intelligent data extraction and processing using AI methods.

According to 80% of the respondents, AI can make a substantial contribution in the following areas: diagnostic imaging, strategy recommendations based on a doctor-validated diagnosis, prescription review, and lifestyle modifications (diet, physical activity) based on symptoms and test results.

Eighty percent of respondents believed AI had particular benefits, such as making routine chores easier and simplifying patient care, and facilitating access to healthcare for groups that are remote or have trouble accessing health systems.
However, 95% of respondents believed that the main drawbacks of implementing AI in healthcare would be the dehumanization of the process, the increase in distance from patients as a result of low health and digital literacy, the increased uncertainty surrounding the risks associated with this technology, and the increased risk of privacy invasion and security breaches of health information.
Approximately 98% of respondents thought AI may be helpful in their clinical practice, although they preferred it to be utilized mostly for gathering medical history and helping them with day-to-day professional tasks.
Nearly all of them felt uneasy about assigning clinical tasks to AI tools.

Challenges

We recognize that there will be significant challenges in broader AI integration into healthcare systems. These difficulties include, but are not limited to, organizational capacity, technology infrastructure, ethical and responsible behaviours, data quality and availability, and safety and regulatory concerns. Some of these subjects are outside the scope of this article, while others have already been covered.

CONCLUSION AND DISCUSSIONS

AI developments could revolutionize a number of healthcare-related areas and pave the way for a more individualized, accurate, predictive, and portable future.
• The usage of virtual assistants, who can offer patients individualized information and support, is one innovation that is anticipated to pick up speed.
• As AI technology develops, healthcare institutions can employ predictive analytics to even more precisely anticipate the needs and preferences of their patients.
• Healthcare organizations can use predictive analytics to even more accurately predict the requirements and preferences of their patients as AI technology advances.
•Potential challenges to consider. For example, if virtual assistants become more common, concerns about patient privacy and data security may increase.
•Despite these challenges, AI has significant potential benefits for healthcare marketing. By applying AI
Healthcare marketing will see increasingly innovative and practical applications of AI as it advances.AI could be a key instrument for improving health equity around the world (Bhardwaj, et. al., 2023).

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