Journal Homepage: -www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/15114
DOI URL: http://dx.doi.org/10.21474/IJAR01/15114

RESEARCH ARTICLE

ATTITUDE OF MILLENNIALS AND GENERATION Z TOWARDS ARTIFICIAL INTELLIGENCE IN SURGERY

Krit Jansaenroj
King Mongkut's International Demonstration School (KMIDS), Samutprakarn, Thailand.

Manuscript Info

Manuscript History
Received: 30 May 2022
Final Accepted: 30 June 2022
Published: July 2022

Key words:-
Artificial Intelligence, Generation Z, Millennials, Surgery, Attitude

Abstract

Because of its increasing ability to turn ambiguity and complexity in data into actionable—though imperfect—clinical choices or suggestions, artificial intelligence (AI) has the potential to change health care practices. Trust is the only mechanism that influences physicians' use and adoption of AI in the growing interaction between humans and AI. Trust is a psychological process that enables people to deal with ambiguity in what they know and do not know. The purpose of this online survey was to determine the relationship between age groups, familiarity, and trustworthiness present towards AI through the question of whether particular participants would prefer a human or an AI surgeon if they had to undergo a surgery.The results showed that age groups and trustworthiness are not correlated, due to a variety of factors, and,also, familiarity is not correlated with age group.

Introduction:-

Nowadays, it is undeniable that serious problems medical staff are facing are the heavy workload in most of the areas of the health care systemand the problem of having lack of resources. Artificial Intelligence (AI)can be one of the ways to solve these problems. As more important processes are automated, medical practitioners could have more time to analyze patients and identify sickness and conditions. AI is speeding up procedures at medical facilities, allowing humans to save valuable production hours. Time is money in every industry; thus, AI has the potential to save a lot of money. The healthcare business is estimated to squander roughly $200 billion each year. Administrative burdens, such as filing, evaluating, and settling accounts, account for a large percentage of these unnecessary expenditures. Another area where there is the need for improvement is determining medical necessity.[1] To correctly establish medical necessity, hours of evaluating patients' history and information are generally required. Physicians may use new natural language processing (NLP) and deep learning (DL) algorithms to help them analyze hospital cases and prevent rejections.[10,11,12,13,14] Therefore, medical practitioners will be given more time to help and engage with patients by freeing up valuable productivity hours and resources.[1] Moreover, AI is able to help on reducing level of stress of medical staff.[1] According to a recent study, more than half of primary care doctors are pressured by deadlines and other job factors. AI aids in the streamlining of procedures, the automation of activities, the quick sharing of data, and the organization of operations, all of which can relieve medical personnel of the burden of juggling too many jobs.[1]

One of the problems on using AI in the medical fields is the trustworthy issue. Human relationships, especially those with AI, are heavily influenced by trust. Understanding the mechanics of human-AI trust is critical, especially in the realm of healthcare, where lives are on the line. A study examined the impact of trust on the dynamic interactions

Corresponding Author:- Krit Jansaenroj
Address:- King Mongkut's International Demonstration School (KMIDS), Samutprakarn, Thailand.

between AI and physicians, the fundamental aspects that govern trust relationships, and significant problems and future research areas in the health-care arena. [2] While AI systems may be used by a wide range of people, including patients and insurance companies, the focus of this study is on the domain experts in healthcare, namely physicians. The study recognized that patients and insurance providers trust relationships may differ dramatically.

Because the trust relationships differ individually, but according to theprevious paragraph, the trust issues are causedby the unfamiliarity to the technology.It seems new to the working ages(millennials) in the present, but the result would be different in the case of people aged 10-25(GenerationZ) years old, and since they were born during the era when artificial intelligence is evolving, most of them know how to use and apply it. It is inverse to millennials, as the Generation Z is more familiar with artificial intelligence, so they might have less trust conflict compared to millennials.

Literature Review:-

AI is a technology with limitless applications. In terms of surgeries, AI is becoming increasingly essential in surgical decision-making to assist surgeons and patients to forecast the effects of surgical decisions more effectively and precisely by addressing multiple sources of information such as patients' risk factors, anatomy, disease natural history, patient values, and costs.[3,4]

Analyzing individual and team behaviors, on the other hand, is a new field that employ computer vision in the operation room, particularly in team-based intricate operations like cardiothoracic surgery. Automated body position and movement tracking are already being utilized to study human nonverbal behaviors in other fields such as health and psychology. The bulk of surgical applications for this technology entails capturing surgeons' gestures and hand movements in order to acquire objective evaluations of technical psychomotor abilities.[13]A recent study, on the other hand, has looked at leveraging computer vision technologies' location and motion data to measure team dynamics and cooperation in the operating room.Lastly,surgical data science aims to collect, organize, process, and model data to improve the quality and value of interventional healthcare. Data from patients, care providers, sensors for measuring patient and procedure-related data, and domain knowledge can all contribute to complex data inside Surgical Data Science (SDS). SDS employs machine learning (ML) techniques to discover connections between data elements with little input from human modelers.[14]

Advancement of Artificial Intelligence in Surgery

First and foremost, the advancement of artificial intelligence reduces the workload for humans. Regular surgery requires a team of different roles to help one surgery case, but if AI is used in the surgery, fewer people will be required, resulting in fewer staff and lower effort costs. Aside from cost and effort, the use of AI in the medical field will save time and resources by allowing medical personnel to spend more time analyzing patients and identifying illness and ailment as more important processes are automated.[5,6,7,8]

Furthermore, when compared to humans, AI has very few errors, indicating that AI in surgeries could be safer.[15] Moreover, AI has the potential to improve patient outcomes as well as healthcare delivery productivity and efficiency. It can also improve healthcare providers' daily lives by allowing them to spend more time caring for patients, thus improving staff morale and retention. By freeing up valuable productivity hours and resources, medical practitioners are given more time to assist and interact with patients.

Familiarity and Thought toward Technology

A study statedthe Generation Z are digital natives. They were born in the age of smart phones and are accustomed to using multiple devices. As a result, they have a relatively shorter attention span and are extremely comfortable multitasking (and believe they are inefficient if they are not), and nearly half of them spend ten hours per day online, according to Goldman Sachs. They are imaginative, creative, and entrepreneurial.[16]According to a Universum Global study, 55 percent of Generation Zs worldwide want to own their own business. The youngest members of Generation Z are only seven years old, so the number is bound to rise. This is also true for millennials, more than half of whom have expressed a desire to start their own business or work for a startup. They are extremely self-sufficient, resourceful, and pragmatic. They know how to find a wide range of rich information and contents on websites and do not feel the need to take a back seat to someone just because that other person has more experiences. This is also true for younger millennials. Generation Z has grown up in an extremely complex and uncertain time, and they have adapted well by taking initiative, thriving in agile environments,and challenging the

status quo to determine if there is, in fact, a better way. Collaborative learning comes naturally to them, and social media have only increased the value of relationships.[16]

The majority of millennials (86 percent) say technology simplifies their lives and improves their personal relationships. However, they also believe that society excessively relies on technology (59 percent) and that it dehumanizes individuals (61 percent). This contradiction was found in other age groups as well, but it is especially pronounced among millennials. As the pace of technological change quickens, new strategies need to be devised to help humans quickly determine how new technologies can be cooperated in lives. Researchers discovered that older women in emerging markets (China, Brazil, and India) had the most faith in technology.[17]

Millennials believe that technology has the potential to improve education, transportation, work, and healthcare. They are more likely to believe that technology helps people become more human and strengthens relationships. It is believed that connectivity and computing will play an increasingly important role in enhancing humans' relationships. People with a higher income are more willing to share personal data, such as lab results or banking information anonymously in order to support research. Lower-income people share information only when it directly benefits them, such as lowering the cost of medicine. This is an excellent time to discuss humans' obsession with technology.[17]

Generation Z has grown up with all of the new technology, making them more familiar with and trusting of technology than millennials, and millennials also believe that technology can make their lives easier; the percentage of trustworthiness could be similar, but Generation Z may have a slightly higher percentage.[17,18,19,20]

Methodology:-

The data were collected using a questionnaire among two groups of people to determine attitudes of millennials and Generation Z towards artificial intelligence in surgery.There were three sections to the questionnaire. The first section identified the age of individual survey takers, which gave an idea of the survey takers' generation, between Generation Z and millennials. The second section was to determine how familiar the survey taker was with AI and technology, which provided an idea of the correlation between age and familiarity. The third section was to determine trustworthiness, which showed how the three sections are related between the age groups, familiarity AI, and trustworthiness in AI performinga surgery. After collecting data from 40 participants, using the random sampling method,the data were analyzed with IBM SPSSStatistics to determine whether each value would be significantly related to each other.

It is important to note that the participants were made aware of the purpose of the study. They were voluntarily participating in the data collection process. Because of the pandemic, the survey was conducted online. Furthermore, the participants were informed that they have the right to withdraw the information at any time, and that the data are kept confidentially by the researcher. This information is only accessible to the researcher. Finally, all participants appear to be anonymous, with no personal identification.

Result and Discussion:-

Table 1:- Correlation between Generations and the Knowledge on Artificial Intelligence.

	Do you know what AI is?	
Generation	Yes	No
Generation Zs	90%	10%
Millennials	75%	25%
Total	82.5%	17.5%

Table 1 depicts the ideas of the correlation between generations and the understanding of what AI is. This table presents the data of 40 participants, with a 1:1 ratio of millennials to Generation Zs. While Generation Zs are people of the age between 10 and 25, Millennials are people of the age between26 and 41. The table shows that the majority of Generation Zs knew what AI is, with around 80 percent knowing what it is, and the remaining 20 percent not knowing what it is. Furthermore, the data from Millennials show that more than half of the participants knew what AI is, with 60 percent knowing and the remaining 40 percent not knowing. Overall, 75 percent of theparticipants understood what AI is. Furthermore, after entering the data into the SPSS software, using Chi-Square statistic, it was

revealed that the exact two-sided significance was at 0.065, which was greater than 0.050. As a result, there was no correlation between the generations and whether or not they knew what AI is.

Table 2:- The Use of Artificial Intelligence in Daily Life.

Generation	The Use of Artificial Intelligence in Daily Life					
	GPS	Music or Movie Recommendation	Phone Face ID	Search engine (Google and Yahoo)	Ai Assistant (Siri, Amazon Alexa,and GoogleAssistant)	Banking Account
Generation Z	75%	70%	65%	80%	65%	35%
Millennials	60%	60%	55%	65%	50%	35%

According to Table 2, the top three AI technologies that participants in the Generation Z group were familiar with were search engines (80 percent), GPS (75 percent), and music or movie recommendations (70 percent). Meanwhile, the top three technologies among millennials were the same: search engines (65 percent), GPS, and music or movie recommendations (60 percent). The table shows that Generation Zswere more accustomed to and attached to technology and AI.

Table 3:- The Correlation of Decision on AI as a Surgeon and Generations.

Generation	Preference on Surgical Procedure	
	Human Doctor	Artificial Intelligence Robot
Generation Z	60%	40%
Millennial	75%	25%
Total	68%	32%

Table 3expresses the correlation between the different generations' trustworthiness towards AI hostina surgery, with the information derived from the same group of samples as shown in Table 1, comparing knowledge on AI of millennials with that of Generation Zs. First, almost two-thirdsof the participants still had trust in humans to perform a surgery for them, as chosen by 60 percentof Generation Zs and 75 percent ofmillennials, while the rest of the participants chose AI as their surgeon (approximately 32 percent in total). It can be seen that when this study was conducted, the majority of people still did not have the trust in AI as a surgeon but still believed in the performance of human doctors more than that of AI. In addition, generationsdid not affect or alter the choice made, which can be seen from the result of the Chi-Square test produced by SPSS:the exact significant by two sides is 0.5, so the conclusion isthat age groupsdid not alter decision making and the trustworthiness, and the trustworthiness could be subject toother aspects of single individuals.

Generation	Reasons for Choosing a Human Doctor		
	Having No Trust in AI Technology	Believing in Humans' Ability to Solve Unpredictable Problems	Being Afraid of Errors in Robot
Generation Z	40%	52%	62%
Millennials	60%	47%	37%

Table 4:- Reasons for Choosing Human as a Surgeon.

	Reasons for Choosing an AI robot		
Generation	Being Interested in AI Technology	Having Trust in AI Technology	Being Afraid of Human Errors
Generation Z	0%	33%	75%
Millennials	0%	66%	25%

Table 5:- Reasons for Choosing AI as a Surgeon.

The factors cited for choosing between a human doctor and an AI robot to perform a surgery for them were trustworthiness and belief, which can be seen from Table 4 and Table 5: more people still had faith in humans, while

also demonstrating that different age groups did not bear on the decision-making as the majority of people refused to use an AI robot in a surgery.

To improve this survey research, first, more participants would help to determine more reliable results. However, by the time the pandemic is over, the increase in the number ofsamplescould result in more accurate result reflected by the choices of different generations. With fewer samples, the accuracy may be low. Furthermore, trust issues tend to be subject to change over time; different studies conducted in different periods of time could yield distinct results, which means that in the future, people may change their minds, and the trust in AI to perform surgeries could be improved.

Conclusion:-

In conclusion, even though Generation Zswere born and raised in a technologically advanced era, and they are more familiar with technology and AI than millennials, millennials and Generation Zs, however, are the two generations that most likely to understand AI. According to collected and analyzed data, more than half of Generation Zs understand what AI is, and two-thirds of Millennials understand what AI is. As regards the relationship between generations and the trust in AI as a surgeon, more than half of the people still preferred humans to perform a surgery, despite the fact that a third of them preferred AI.It can be concluded that age group, familiarity, and trust issues are not closely correlated.Trust could increase over time as the technology appears to be more trustworthy, not just because of the interest in technology. In the future, as more AI is implemented and has more showcases in more fields, the trust in the technology to mainly perform a surgery for humans could increase.

Acknowledgement:-

I would like to thank everyone who took part in this study, especially the Generation Zs and millennials. Also, with the help of the school counselors, the survey was successfully distributed to the participants and was completed.

References:-

1. Asan, O., Bayrak, A. E., & Choudhury, A. (2020, June 19). Artificial Intelligence and human trust in healthcare: Focus on clinicians. Journal of medical Internet research. Retrieved July 11, 2022, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7334754/
2. a, n. (2021). Pros & Cons of Artificial Intelligence in medicine. College of Computing & Informatics. Retrieved July 11, 2022, from https://drexel.edu/cci/stories/artificial-intelligence-in-medicine-pros-and-cons/#:~:text=1.,optimize%20critical%20clinical%20decision-making
3. S;, E. (2020, April 20). Artificial Intelligence: The future for diabetes care. The American journal of medicine. Retrieved June 24, 2022, from https://pubmed.ncbi.nlm.nih.gov/32325045/.
4. OR;, H. D. A. R. G. R. D. M. (2018). Artificial Intelligence in surgery: Promises and perils. Annals of surgery. Retrieved June 24, 2022, from
5. T;, M. K. L. (2021). Artificial Intelligence and ophthalmic surgery. Current opinion in ophthalmology. Retrieved June 24, 2022, from https://pubmed.ncbi.nlm.nih.gov/34397576/
6. OR;, H. D. A. R. G. R. D. M. (2018). Artificial Intelligence in surgery: Promises and perils. Annals of surgery. Retrieved June 24, 2022, from https://pubmed.ncbi.nlm.nih.gov/29389679/
7. MG, U., N, P., C, H., A, E., JW, K., I, I., & PL, G. (2019). Artificial Intelligence, robotics and eye surgery: Are we overfitted? International journal of retina and vitreous. Retrieved June 24, 2022, from https://pubmed.ncbi.nlm.nih.gov/31890281/
8. Spiegeleire, S. D., Maas , M., &Sweijs, T. (2017). 2 what is Artificial Intelligence? - JSTOR. ARTIFICIAL INTELLIGENCE AND THE FUTURE OF DEFENSE:
9. STRATEGIC IMPLICATIONS FOR SMALL- AND MEDIUM-SIZED FORCE PROVIDERS. Retrieved June 24, 2022, from https://www.jstor.org/stable/resrep12564.7
10. Kalfa, D., Agrawal, S., Goldshtrom, N., LaPar, D., & Bacha, E. (2019, December 13). Wireless Monitoring and artificial intelligence: A bright future in cardiothoracic surgery. The Journal of Thoracic and Cardiovascular Surgery. Retrieved June 24, 2022, from https://www.sciencedirect.com/science/article/abs/pii/S0022522319331216.
11. Namin, A. T., Jalali, M. S., Vahdat, V., Bedair, H. S., O'Connor, M. I., Kamarthi, S., & Isaacs, J. A. (2019, March 6). Adoption of new medical technologies: The case of customized individually made knee implants. Value in Health. Retrieved June 24, 2022, from https://www.sciencedirect.com/science/article/pii/S109830151930066X.

12. Zhang, M., Zhang, Z., Wang, X., Yu, H., Xia, Y., Tan, K., Wang, X., & Wang, F.-Y. (2021, May 26). From AR to AI: Augmentation Technology for Intelligent Surgery and medical treatments. IFAC-PapersOnLine. Retrieved June 24, 2022, from https://www.sciencedirect.com/science/article/pii/S2405896321003165.
13. Assen, M. van, &Cecco, C. N. de. (2020). Table of contents page: European Journal of Radiology. Artificial intelligence in cardiothoracic imaging: A game changer. Retrieved June 24, 2022, from https://www.ejradiology.com/issue/S0720-048X(20)X0013-1
14. MA;, D. R. D. S. J. A. Z. (2020). Artificial Intelligence in cardiothoracic surgery. Minerva cardioangiologica. Retrieved June 24, 2022, from https://pubmed.ncbi.nlm.nih.gov/32989966/
15. a, n. (2021). Pros & Cons of Artificial Intelligence in medicine. College of Computing & Informatics. Retrieved June 24, 2022, from https://drexel.edu/cci/stories/artificial-intelligence-in-medicine-pros-and-cons/.
16. a, n. (2021). Millennials Are Tech Savvy. gen Z's are Tech native. Millennials are tech savvy. Gen Z's are tech native. Retrieved July 13, 2022, from https://www.top-employers.com/en/insights/talent-strategy/millennials-are-tech-savvy.-gen-zs-are-tech-native/
17. Steve Power Brown, I. (2015, August 7). Are millennials falling out of love with technology? Wired. Retrieved July 18, 2022, from https://www.wired.com/insights/2013/11/are-millennials-falling-out-of-love-with-technology/
18. Bhatia, D. (2021, February 23). Gen Z: New perspectives on growing up with Tech. LinkedIn. Retrieved July 23, 2022, from https://www.linkedin.com/pulse/gen-z-new-perspectives-growing-up-tech-dilip-bhatia#:~:text=Gen%20Z%20Are%20Touch-first%20Digital%20Natives&text=They%20have%20literally%20grown%20up,content%20options%20at%20their%20fingertips.
19. Seymour, E. (2019, August 25). Gen Z: Born to be Digital. VOA. Retrieved July 23, 2022, from https://www.voanews.com/a/student-union_gen-z-born-be-digital/6174519.html
20. Meola, A. (2022, January 5). Generation Z: Latest gen Z news, research, facts. Insider Intelligence. Retrieved July 23, 2022, from https://www.insiderintelligence.com/insights/generation-z-facts.