

Metaverse – A digital transformation in healthcare Industry

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MBA - Pharmaceutical Management

by
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Under the Supervision and Guidance of

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Management

2023

DECLARATION BY STUDENT

I hereby declare that this dissertation, titled "STUDY ON METAVERSE: A DIGITAL TRANSFORMATION IN THE HEALTHCARE INDUSTRY," is the bona fide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

(Signature)

Satakshi Pathak

Certification

This is to certify that the dissertation titled Metaverse – “A digital transformation in healthcare industry “and submitted by Satakshi Pathak, Enrolment No. 0338 under the supervision of Dr. Sudhinder chowhan for award of MBA in Pharmaceutical Management at University carried out during the period from 1stApril, 2023 to 30th may, 2023 embodies my original work and has not shaped the idea for the award of any degree, fellowship, titles during this or the other institute or other similar establishment of upper learning.

CERTIFICATE

This is to certify that Satakshi Pathak in partial fulfilment of the requirements for the award of the degree of MBA (Pharmaceutical Management) from the IIHMR University, Jaipur has completed his at IIHMR University during February 20- May 19, 2023.

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Thankyou

Satakshi Pathak

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Abstract: -

The study aimed to understand the potential of metaverse in healthcare industry. A self-administrative form was distributed among the healthcare professional, medical student, medical representation, patients virtually. In the questionnaire, different type of question which could be regarding metaverse use to healthcare professionals, patients, medical - students, medical representative, its potential, challenges, its positive effect on the industry and conjointly the physician knowledge, student and patient knowledge towards the use and potential challenges of metaverse in healthcare industry which plays a major role to understand about transformation metaverse can bring to the industry. Through metaverse Users can communicate with one another and digital objects in a virtual environment with immersive, growing technology—the metaverse.

The healthcare industry has recognized the potential of the Metaverse as a transformative technology that can improve patient care, enhance medical education and training, and streamline healthcare operations. The idea of metaverse has now become more accessible like never before and healthcare is one the sector to make a best use of it. Therefore, more and more industries is approaching to the benefits metaverse technology.

According to the global reports of metaverse in healthcare till 2022 is growing by 40.2%CAGR from 2022 to 2033.It creates virtual space to the patient, stakeholders and professional to interact with each other by sitting in any part of the world. By analysing case studies and conducting interviews with healthcare professionals and technology experts, this research aims to provide insights into the potential of the Metaverse to transform the healthcare industry and contribute to the ongoing digital transformation of healthcare.

Keyword – Metaverse, augmented reality ,Healthcare industry

Introduction: -

Metaverse – A virtual space where user can interact with the augmented world, universe that merges physical and digital realities. This research aims to explore the current and potential use cases of the Metaverse in healthcare, including virtual consultations, medical simulations, and remote patient monitoring.

Life science and healthcare industry is facing various challenges such as privacy and security, affordability, inclusivity, and accessibility, which restrict its potential to provide equitable and comprehensive care. The metaverse however, holds enormous potential to overcome this issue and help to revolutionize the healthcare industry which ultimately contribute to the ongoing digital transformation of healthcare.

Due to metaverse. Healthcare experts can go beyond the boundaries and interact smoothly, by empowering the professionals to exchange knowledge on global scale. Healthcare professionals can practise complex operations and improve their abilities in a risk-free environment thanks to virtual environments that enable realistic simulations. Patients may also gain from telemedicine services, virtual support groups, and immersive health education, which will increase access to high-quality care for marginalised communities.

Metaverse is creating new possibilities for personalized treatment and patient-centred care are opened up by the metaverse's integration of augmented reality, artificial intelligence and virtual reality. Healthcare physician may give customised treatment approaches, remotely monitor chronic illness, and more accurately anticipate health outcomes by utilising patient data and modern analytics.

The study will add to the corpus of information on the usage of the Metaverse in healthcare and offer helpful advice for healthcare professionals and policymakers on how to leverage this technology to improve healthcare delivery.

This study starts with objective of potential of metaverse in healthcare industry. However, the question arise people are ready for metaverse in healthcare? Is it the boom in healthcare industry or not.

Literature Review

- 1) Jane Thomason from university college of London research on blockchain technology and said that the pandemic has accelerated medical innovation in the digital age and highlighted new business models and opportunities. Beyond secure data sharing, supply chain management, remote monitoring, and healthcare, non-fungible tokens (NFTs) and blockchain technology have made major strides. These improvements are crucial for value exchange on a decentralised network. Researchers in technology and the future are looking at various domains where the metaverse can be useful. This commentary aims to look at how the metaverse may be used in the future to change, enhance, and possibly transform health care. The five subjects covered are collaborative working, education, clinical care, wellness, and monetization.
- 2) According to an Accenture research from 2022 on the future of the metaverse in healthcare, which was conducted among 3000 health executives across the US, Canada, and the UK, declared that 81% of respondents believe the metaverse will have a beneficial influence on the health and life science industries. Their research revealed that patient education, care delivery, and connectivity—such as meeting up with friends and family who are far away while in the hospital—are the use cases that people are most interested in.
- 3) In accordance with Oh Se-hoon's idea for Seoul Vision 2030. The Seoul Metropolitan Government (SMG) announced on Monday that Seoul will be the first major metropolis to enter the metaverse. It is currently referred to as "Metaverse Seoul" and seeks to create a virtual communication environment for all parts of its municipal administration. This would include economic, cultural, tourism, educational, and civic service in three phases beginning the next year.

AIM AND OBJECTIVE

OBJECTIVE OF STUDY

The major goals of the investigation are as follows:

1. To study the awareness of the metaverse in the healthcare industry
2. To review the necessity of the metaverse within the HPC, the patient and medical representative
3. To study additional correlates impacts of metaverse on employment.

SIGNIFICANCE OF THE STUDY

In recent years, researchers have given the potential usage of Metaverse in healthcare. A majority of studies were released in 2021. With this expanding tendency, it appears that in the upcoming years, this revolutionary technology will be used more frequently in the healthcare industry. The idea of the Metaverse was gaining popularity as of my understanding in September 2021, but its application in the healthcare sector was still in its infant stages. However, there were few major areas of research and evaluation of potential of metaverse technology in healthcare like medical training/education, pain management, telemedicine and remote healthcare. This study gives important data on awareness of metaverse and future effect. This study and other studies are being compared to assess knowledge and evaluate ethical consideration, patient understanding and application of metaverse technologies among professional, medical representatives, medical student. In addition, data is evaluated in terms of profession, age and awareness level. During this investigation, we focuses on both the benefits and challenges of emerging metaverse technology in healthcare industry, also this study aims to explore other possible application on metaverse.

Research Method:

Introduction:

Study on assessment of metaverse – a “digital transformation of metaverse in healthcare industry “is the study topic, and this methodology describes the processes done to gather and analyse the data. The study seeks to determine transformation metaverse can bring to the healthcare industry. The findings of this study will help to identify the future challenges metaverse can face in the healthcare. A survey of people including healthcare professionals, medical students, medical representatives, patients are part of the quantitative research methodology.

Research Design:

This study employed a cross-sectional survey as its research methodology. It is done to achieve the study's goal of figuring out how much people know about metaverse technology and how important it is to the healthcare sector. The poll will question participants, including HCPs, medical students, patients, and MRs, for information regarding their acquaintance with the metaverse, its potential advantages, and its potential challenges. The demographic data will reveal the participant's attributes, including age and role (employment status). Question-based data will help achieve the objective.

Sample Selection:

The sample population for this study includes individuals who are employed by HCPS, medical students, patients, healthcare consumers, or who work in other MRs that are linked to healthcare. The sample group includes friends, family members, and other customers. A convenience sampling technique will be used to choose the sample population. Picking volunteers to participate in the study is known as convenience sampling. We'll use email invites, personal networks, and social networking sites to find new employees. No matter the kind or function of the pharmaceutical product, patients who have used it and are stakeholders will be allowed to participate in the research. To guarantee a diverse group of volunteers, the study will attempt to enlist individuals from a range of age groups, from 20 and above, genders, ethnicities, and socioeconomic backgrounds. Although this method might not be representative of the full population, it will nevertheless yield useful information for the study.

Data Collection:

Participants will be given access to an online survey form through the recruiting channels, which will include questions regarding demographics and consumer perception, affordability, and pricing. The demographics section will ask participants

age- and role-related questions. the influence of metaverse technology on the healthcare sector, its need in the next years, applications, and difficulties.

Data Analysis:

In this study, descriptive statistics were used to analyse the data. Descriptive statistics will be used to summarise the data based on the questions and the demographic information. Microsoft Excel will be used to summarise the data. Bar charts, pie charts, and column charts are just a few of the graphs that will be used to analyse and represent the data.

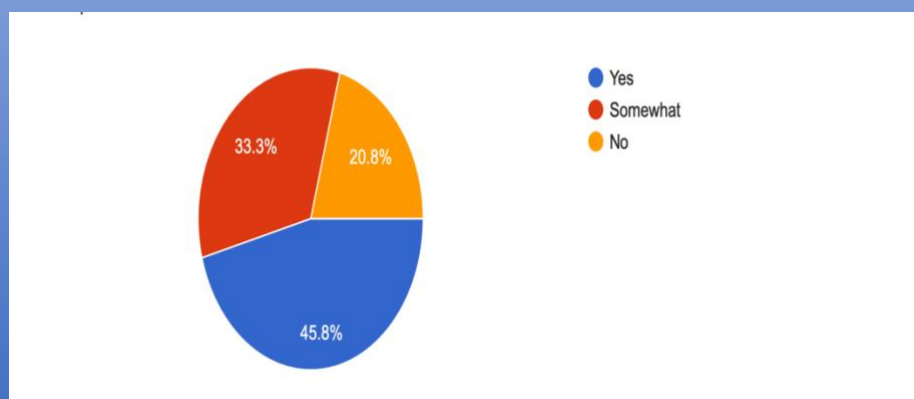
Ethical Considerations:

Everyone will be required to provide informed permission before to participating in the study, and the inquiry will follow all ethical guidelines for research involving human beings. Participants will be informed of the voluntary nature of the study, their ability to revoke their participation at any time, and the confidentiality of their personal data. The collected data will be securely stored, and only the project's participating researchers will have access to it.

Results: -

I looked at patient evaluation information on the necessity and awareness of the metaverse in the health sector with various healthcare professionals. The research's findings are as follows: These results were obtained by asking the population of physicians regarding their familiarity with the metaverse and its benefit in virtual monitoring of patients, of which 45.5% say they are knowledgeable about the subject, 100% say it will have utility in the healthcare industry in the upcoming years, and 34.8% say that it will be a plus for medical representatives while training. 43.5% strongly agree that virtual stimulation can immerse the learning experience of medical students; 50% of people prefer conducting lab tests when using nutraceuticals; and 39% agree that medical professionals are still not ready for the metaverse to be implemented.

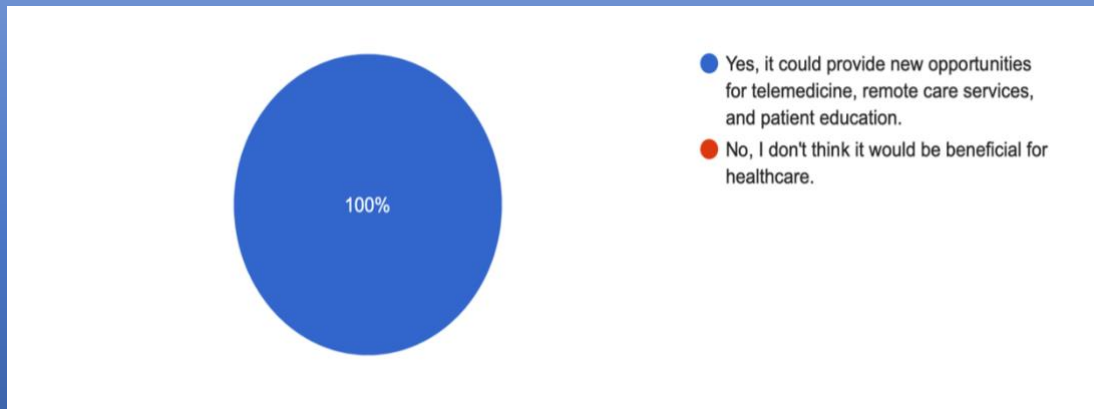
Are you familiar with the concept of a metaverse?



Graph.1(Familiarity of metaverse in healthcare industry)

The outcomes of the research showed that a significant majority of participants (45%) had thorough knowledge about the phrase "metaverse." A small percentage of answers (33.3%) gave the response "Maybe," reflecting some skepticism or limited understanding. Last but not least, just 20.8% of those surveyed said "no," demonstrating their lack of expertise or unfamiliarity with the idea of metaverse technology.

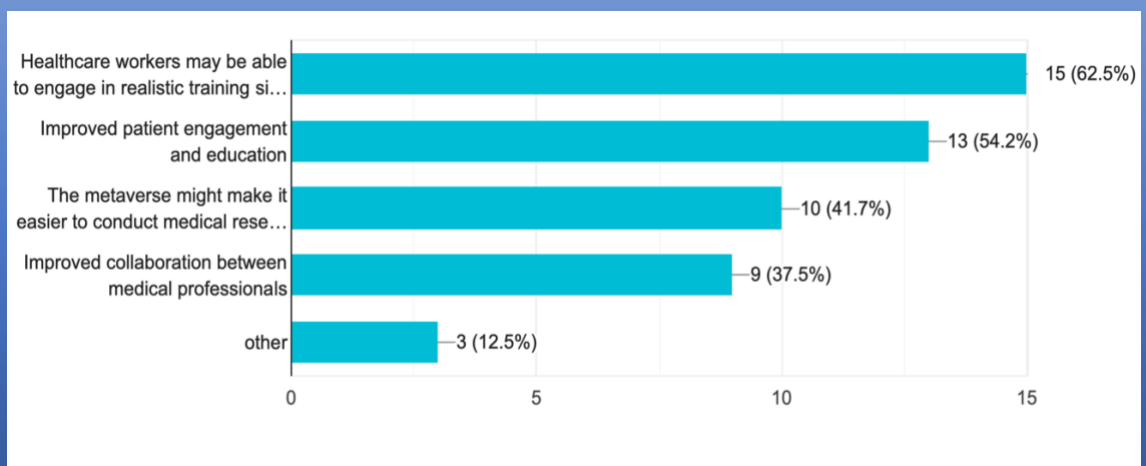
Do you believe the use of metaverse in the healthcare sector will be beneficial?



Graph 2(Benefit of using metaverse in healthcare industry)

The findings from the above data show that 100% of respondents think that the metaverse can provide new opportunities for telemedicine, remote care services, and education as well.

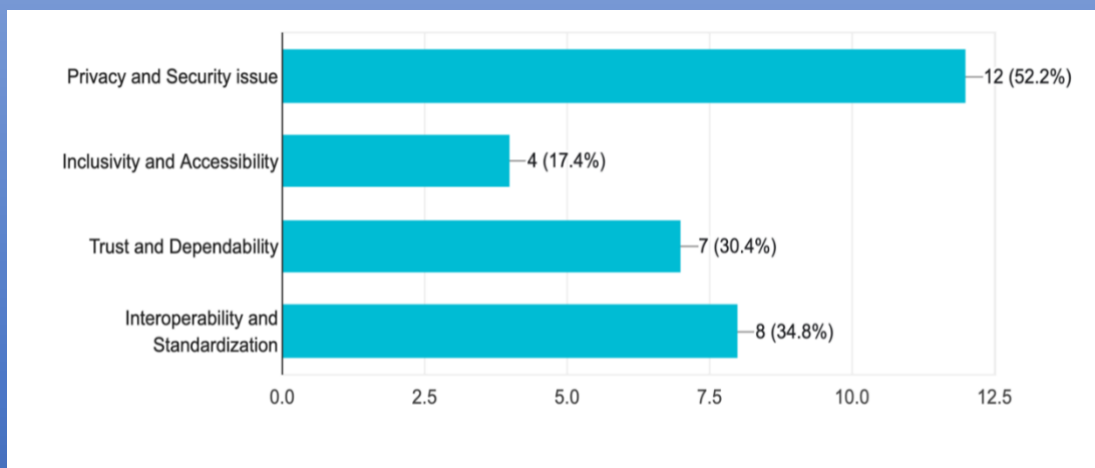
What possible advantage do you think the metaverse might bring to the medical field?



Graph.3(Advantage of metaverse)

The outcome of the research study indicated that a significant proportion of participants (62.5%) held the opinion that healthcare staff would be able to participate in realistic training through the metaverse. 54% of responses were supportive of patient education and involvement. Only 10% of respondents believe it has a benefit in health care research and development, to wrap things up.

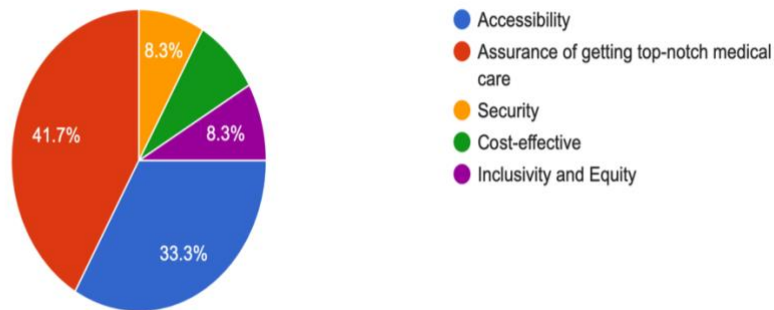
According to you, what obstacles or worries could arise from the use of the metaverse in healthcare?



Graph.4(Obstacles in metaverse in coming years)

According to the aforementioned graph, a significant percentage of participants (52.2%) agree that privacy and security in the metaverse can serve as obstacles in the healthcare industry. The rest of the 30% selected challenges with technology's dependability and trustworthiness. Inclusion and accessibility were mentioned by a smaller majority (17.4%), demonstrating a physical barrier and cognitive impairment, where as interoperability was referred by the remaining respondents (34.8%) as a potential barrier.

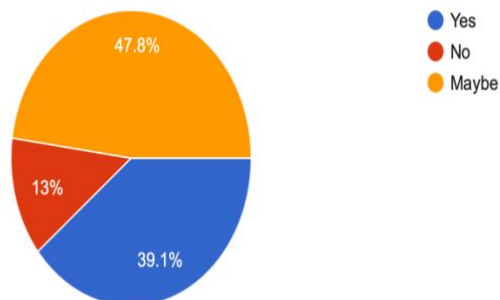
Factors that would influence your decision to use healthcare services delivered through the metaverse?



Graph.5(influensive factor to use metaverse)

A substantial majority of respondents (41.7%) believe that the metaverse will guarantee first-rate medical treatment. Accessibility was cited by 33.3% of respondents as the most important reason to use metaverse in healthcare, while the remaining respondents cited security, cost-effectiveness, and equity as motivating considerations.

Would you be comfortable seeing your client in a virtual or metaverse setting as a healthcare professional?



Graph.6 (virtual stimulation)

Majority of participants (39.1%) felt comfortable seeing their clients virtually. A smaller responded with "Maybe," indicating that they had yet to make the

Discussion-

This study was carried out to evaluate patient awareness and understanding of Awareness and necessity of metaverse technology in healthcare industry. The healthcare system is currently investigating the possibilities of the metaverse thanks to the tremendous evolution of technology.

As we discovered, healthcare is moving towards digital transformation. Social connections have been drastically altered by the COVID-19 epidemic. Electronic communication mediation has grown on an unprecedented scale as a result of policies that promote social isolation, lockdowns, and mandated quarantines. Work in an office, going to school, and attending conferences are just a few of the physical activities that have moved online as a result of social networking sites, the Metaverse, or smartphones. Healthcare workers' 3D avatars will be able to have face-to-face meetings without the use of sophisticated conferencing gear in the Metaverse and interact utilising tools like digital whiteboards. Machines, systems, and processes will be thoroughly evaluated utilising digital twins to identify faults and vulnerabilities before being employed in a real environment.

This study also demonstrated the application of augmented reality (AR) in providing students with possibilities for hands-on learning, such as simulating patient and surgical experiences to help medical students observe and put fresh techniques to use. So that students may do the process as if they were the surgeons themselves, more lifelike simulations of actual procedures might be offered to them.

This study also demonstrated that during a one-on-one, hands-on medical encounter, clinicians are able to recognise both physical and emotional reactions. Despite this, the pandemic has sped up the development of remote care technologies. For instance, by 2020, 95% of healthcare facilities—up from 43% before the pandemic—will be ready to offer telemedicine. While the poll mentioned in this article indicates that 39.1% of doctors are at ease seeing their patients online.

Conclusion:-

The potential uses of the metaverse to alter, improve, and potentially transform health care are discussed in this discussion. Collaborative working, education, medical representative training, virtual client Even with the risks, there are several opportunities. The notion of empowering young, digitally savvy individuals to manage their own health care and be inspired to study, practise wellness practises, and mentor their peers in a safe social virtual environment is attractive. Innovative thinkers are turning health education into interesting micromodules that can be taught online to anybody, anywhere. There is potential to alleviate the shortage of healthcare personnel thanks to the precision options for physicians, who can collaborate internationally and use augmented reality to their advantage.

When the community, patients, and experts are paid for their efforts to promote health, an entirely new economy and set of job opportunities open up.

As these designers of new metaverses reveal more about this brand-new, continually changing cosmos to us, Health leaders must take part in creating a paradigm for healthcare that is affordable and long-lasting. It's time to get started and consider all of the possibilities.

Sample questionnaire (Unfilled)

Questionnaire

Understanding Perspectives on the Metaverse in
Healthcare: A Survey"

satakshipathak99@gmail.com [Switch account](#)

 Not shared



Age

- ☐ 16-25
- ☐ 26-35
- ☐ 36-50

Name

Your answer

Select your role

- ☐ Healthcare professionals
- ☐ Patient or healthcare consumer
- ☐ Medical representative
- ☐ Student in a healthcare-related field
- ☐ Healthcare manager
- ☐ Other

Are you familiar with the concept of a metaverse?

- ☐ Yes
- ☐ Somewhat
- ☐ No

How would you define the metaverse?

- ☐ "Metaverse" refers to a virtual reality arena in which users can interact in real-time with a computer-generated environment and other users
- ☐ A concept that I'm not familiar with



Do you think the healthcare industry could benefit from utilising the metaverse?

- ☐ Yes, it could provide new opportunities for telemedicine, remote care services, and patient education.
- ☐ No, I don't think it would be beneficial for healthcare.

What possible advantages do you think the metaverse might bring to the medical field?

- ☐ Healthcare workers may be able to engage in realistic training simulations in the metaverse.
- ☐ Improved patient engagement and education
- ☐ The metaverse might make it easier to conduct medical research and development.
- ☐ Improved collaboration between medical professionals
- ☐ other

According to you, what obstacles or worries could arise from the use of the metaverse in healthcare?

- ☐ Privacy and Security issue
- ☐ Inclusivity and Accessibility
- ☐ Trust and Dependability
- ☐ Interoperability and Standardization

How likely are you to use medical services that are delivered through the metaverse?

very likely

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

very unlikely

Rank the factor where the metaverse has the biggest impact when it comes to the metaverse.

- ☐ Access to Specialized Care
- ☐ Personalized Treatment
- ☐ Health Education and Empowerment
- ☐ Diagnosis
- ☐ Other

According to you, does the metaverse have the potential to improve the medical representative's experience?

- ☐ Strongly agree
- ☐ Agree
- ☐ Neither agree nor disagree
- ☐ Disagree
- ☐ Strongly disagree

What are the potential areas where the metaverse could influence medical education?

- ☐ Virtual stimulation can give students an immersive learning experience.
- ☐ Interpersonal education
- ☐ Exposure to a wide range of cases and expertise
- ☐ Other

What are the biggest barriers to implementing the metaverse in the healthcare industry?

- ☐ Technological Infrastructure
- ☐ Funding
- ☐ Cyber security/Data security
- ☐ Interoperability
- ☐ Cost and Return on Investment
- ☐ Patient adoption
- ☐ other



☐ Patient adoption

☐ other

According to you, medical professionals are prepared for the Metaverse.

Strongly agree

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

strongly disagree

Submit

Clear form

Reference :-

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