Title:	Strategic Sustainability: Exploring the Impact of Technological Inclusion of AI in Pakistani Health Care
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Strategic Sustainability: Exploring the Impact of Technological Inclusion of AI in Pakistani Health Care

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Abstract

Artificial intelligence (AI) is a practical strategic instrument for addressing human well-being and socio-economic development issues. This study makes use of NVivo to perform qualitative data analysis. The interviews lasted for around half an hour and consisted of both individual and group discussions with the participants. According to the findings of this study, the implementation of artificial intelligence in medical settings can now be divided into a few distinct phases. It has been found that there are four key variables that are linked to sustainability in healthcare companies. Factors to consider include sustainable process innovation, operational ability, sustainable resource upscaling, and awareness of sustainable resources. Recent development includes AI in medical treatment in Pakistan, magnetic resonance imaging (MRI), x-rays, data inventories, artificial intelligence (AI) systems, and robotics.

Keywords: Sustainability, Technology, Operations, Health, External Environment, Artificial Intelligence, Qualitative Research

1. Introduction

Technology's pervasive and potent applications have made it an integral part of modern life (Abbas, Eliyana et al., 2020; Abbas, Saud, et al., 2020; Aldabbas et al., 2020). Furthermore, artificial intelligence (AI) has arisen as an integral offshoot of technology that has altered business, leading to further technological expansion. The most compelling aspect of artificial intelligence (AI) is its ability to automate activities and integrate several hybrid resources. These attributes have eased the refinement and specialization of corporate operations on a global scale. The technology could achieve the expected outcomes. However, it has not proven significant advancements in addressing sustainability within the current economic, cultural, and environmental context. Artificial intelligence (AI) has an innate ability to enable robots to emulate human behavior and conduct activities like humans (Duan et al., 2019). The most compelling aspect of artificial intelligence (AI) is its ability to automate operations. The use of artificial intelligence in the services sector (Chassignol, Khoroshavin, Klimova, & Bilyatdinova, 2018; Dwivedi et al., 2021; Fianto & Dutahatmaja, 2023; Moreno, González, & Viedma, 2019; Noranee

& bin Othman, 2023; Ozmen Garibay et al., 2023; Reier Forradellas & Garay Gallastegui, 2021), while medical devices, is also on the verge of becoming inevitable to get along with the latest technology (Briganti & Le Moine, 2020; Hamet & Tremblay, 2017; Holzinger, Langs, Denk, Zatloukal, & Müller, 2019; Mintz & Brodie, 2019; Ramesh, Kambhampati, Monson, & Drew, 2004). This is why researchers in Pakistan cannot afford to lag behind the rest of the world in their pursuit of knowledge.

Since its start, the thinking machine has become a blessing and helpful tool for humans. Artificially educated robots and software are designed to function as independent, intelligent beings globally with various levels of independence and awareness of oneself (Hurlburt 2017). Throughout the years, numerous forecasts have arisen on the potential impact of these entities (such as chatbots and more advanced and comprehensive systems) on daily existence.

Some future scenarios predict that intelligent systems will replace humans in essential functions (Heylighen & Lenartowicz 2017; Simpson 2016). Thinking machines have appeared in science fiction novels and other forms of entertainment, often as intelligent and mobile robots. Artificial intelligence inclusion in human life eases humans and increases their abilities. Artificial intelligence (AI) has been proposed to prove the importance of sustainability in company operations. In the past two decades, sustainability has garnered significant attention from scholars, legislators, and management. The healthcare sector plays a crucial role in the economy using bioinformatics and biotechnology. The healthcare sector uses novel technology that can be categorized into two tiers: virtual and physical. This artificial intelligence (AI) application aims to reduce the adverse environmental effects commonly associated with most technology. The SDGs framework is a transparent path for nations to implement this governance model. There is an ardent desire to implement sustainable practices in businesses and enhance their overall well-being by utilizing artificial intelligence (AI) (Nishant, Kennedy, & Corbett, 2020; Ismagilova et al., 2019; Kankanhalli et al., 2019). Artificial intelligence (AI) has the potential to ease the establishment of governance for sustainability and create sustainable performance alternatives for healthcare operations (Liu et al., 2020; Pavel & Johanne, 2017; Iansiti & Lakhani, 2020; Houfani et al., 2021; Siddique, 2018).

Artificial intelligence (AI) in the past two decades, sustainability has garnered significant attention from scholars, legislators, and management. Artificial intelligence (AI) applications aim to reduce the adverse environmental effects of most technologies while enhancing productivity and speeding up delivery (Bag et al., 2020; Gupta et al., 2020; D' Eusanio et al., 2019). The 2030 development agenda titled "Transforming our world: the 2030 Agenda for Sustainable Development" was endorsed by the UN General Assembly. The member countries of the United Nations are required to implement the Sustainable Development Goals (SDGs), e.g., (Luxton, 2016; Eisenhardt & Martin, 2000; UN, 2019; Mans et al., 2016). In Pakistan, organizations face challenges in using technology to gain sustainability (Zaidi, 2021). The use of artificial intelligence is increasing day by day.

Various challenges hamper its practical implementation (Biermann, Kanie, & Kim, 2017). Pakistani contribution to sustainability research stands nowhere compared with global and regional research. For our nation's research image and advancement to keep pace with global sustainability research, anything that contributes to the present field of research would be beneficial. The following sections will cover this work's literature, theory, analysis, discussion, and conclusion.

2. Literature Review

There have been repeated projections of conflicts between humans and machines in competitive social domains, such as research. The terrains are designed to provide AI systems with an inherent advantage. AI research in recent decades has often been portrayed as achieving notable victories in specific competitions and gaming scenarios. For instance, computers programmed to play chess have been able to defeat grandmasters, as foreseen by various AI founders (Arnold and Scheutz 2016; Miller 1992). Additionally, AI systems like IBM's Watson have gained widespread recognition, partly because of their impressive performances on American game shows (Lee and Kim 2016). The notion of a cognitive machine may seem sufficiently straightforward for a broad audience to understand. However, it relies on numerous assumptions and requires extensive research and development with significant technological support. It opposes human intelligence, employing human-like thinking to enhance human intellect through training.

Technological narratives offer conceptual frameworks for addressing the implications of technology in various domains such as households, businesses, research, and public policy (Laan and Laan 2016). Assume that AI is portrayed transparently and favorably. Under such circumstances, individuals responsible for making informed choices on implementing AI systems may experience a heightened sense of authority in aiding researchers. The purpose is to teach software to support research in decision-making and minimize failures and setbacks through narratives that downplay adverse outcomes. Sustainability refers to the conscientious consideration of stakeholders' immediate requirements while maximizing the use of existing resources without compromising the well-being of future generations. Sustainability is "development that satisfies the requirements of the current generation without jeopardizing the capacity of future generations to fulfill their requirements" (United Nations General Assembly, 1987, p. 43). The 2030 Development Agenda titled "Transforming our world: the 2030 Agenda for Sustainable Development" was accepted by 193 countries of the UN General Assembly on September 25, 2015. The objective of this agenda is to incorporate the three components of sustainable development, namely economic, social, and environmental aspects.

Sustainability has grown as one of the fundamental difficulties for modern enterprises, as proved via the combined considerations concerning climate change and the environmental habitat among the business's stakeholders (Klinderfer, Singhal, & Wassenhove, 2005). The increasing concern for environmental changes has resulted in adopting green practices and legislation, leading to environmental manufacturing (Sarkis and Lai 2011). Therefore, any novel invention must be environmentally friendly and enduring for inclusion (Rao, 1999). Similarly, companies must acknowledge the behavioral patterns of their employees, as this is a crucial aspect of the answer where companies manage the influence of the environment (Chaudhary, 2019). In addition, it is essential to carry out thorough oversight of businesses' operations and supply chains in order to ensure sustainability (Hendiani, Liao, and Jabbour, 2020). It is imperative to scrutinize a company enterprise's operational procedures, considering the interdependent social, environmental, and economic dimensions (Álvarez-Rodríguez et al. 2020).

Furthermore, artificial cognitive ability and its components can improve sustainability in various sectors such as agriculture, industry, industrial processes, vehicles, healthcare, and society. Gherhes and Obrad (2018) emphasized the importance of AI in the aforementioned domain and the fundamental challenges of the future context. The poll showed an excellent feeling of artificial intelligence in society, where responders were excited about AI in the automobile, the farming industry, courier, and transport sectors. However, concerns were raised about moving industries

and interruptions in employment. Ensuring the sustainability of healthcare is the collective responsibility of various stakeholders, including industries, factories, institutions, organizations, multinational corporations (MNCs), students/researchers, libraries, government authorities, UN agencies, and environmentalists (Morelli, 2011). As mentioned above, the stakeholders play a crucial role in fostering sustainability within the healthcare sector. They can make sustainable development efforts so that every team participant can contribute to the fundamental cause.

Furthermore, it has been noted and hypothesized that information technology has a considerable influence on diminishing energy consumption and enhancing the energy efficiency of various manufacturing processes (Capra, Francalanci, and Slaughter, 2012). Nevertheless, the influence of IT has been limited to sectors. Conversely, it can grow in different configurations (Kraus et al., 2021). Thus, it is crucial for people to know how GIT contributes to sustainability and to utilize it themselves (Mishra, Akman, and Mishra, 2014). Nowadays, artificial intelligence is present in almost every industry. With the help of AI, mundane administrative tasks like processing invoices, filling out forms, and entering data may be automated, allowing employees more time to focus on important tasks. Nevertheless, according to Nick (2018), artificial intelligence systems excel in executing certain high-quality activities. Nevertheless, these systems are deficient in problem-solving tasks. Intelligent machines should aid humans in augmenting their abilities rather than replacing them (Mohammad, 2018). Bibi (2019) proved that integrating Artificial Intelligence into the human resource area can enhance its efficacy by enabling innovative solutions (applications) development. Humans, on the other hand, have no substitute; both can contribute significantly to developing more effective methods of implementing HR initiatives. The marketing, management, pharmaceutical, and information technology (IT) industries are just a few more that use AI and its applications. Furthermore, Lu et al. (2017), presented a brain intelligence model, which facilitates the utilization of large amounts of data for life growth by integrating artificial intelligence and artificial life. With these models, we may address the mental/physical, symbol grounding, association function, and framework problems.

Investigations are underway into the potential for Artificial Intelligence to improve medical practices on account of its capacity to increase productivity, decrease costs, optimize resource allocation, provide convenience, and offer practical solutions. The terms health informatics and healthcare informatics have gained widespread recognition. Yang (2015) has emphasized the abundant healthcare data from many sources. Artificial intelligence holds immense potential for enhancing the management of chronic disease treatment. It clarifies which therapies to administer, decreases inaccuracies, and produces superior outcomes in clinical studies. It aids in maximizing the efficiency of the entire system. According to Miller and Brown (2017), Artificial Intelligence can enhance the effectiveness and accuracy of healthcare systems, enhancing overall well-being.

People are reluctant to embrace modern technologies, methods, and ideas. Privacy risk would reinforce the conventional narrative of rejecting modern technology (Reddy et al., 2019). Integrating artificial intelligence applications with clinical procedures has been proposed to enhance the healthcare industry, considering the rise of Artificial Intelligence (AI). Noorbakhsh-Sabetet et al. (2019) suggested that the collaboration of artificial intelligence (AI) among various professionals in the healthcare field, including specialists, ethicists, scientists, engineers, technicians, healthcare managers, and entrepreneurs, has helpful outcomes for the community. The concept is inherently satisfactory.

Nevertheless, there exists an alternative perspective that portrays risk analysis. Maddox et al. (2018) highlighted significant obstacles in integrating clinical operations with artificial

intelligence stemming from novel methodologies and breakthroughs. These problems were overcome due to the inability to evaluate the reports/information obtained from the unobservable procedures using conventional tools employed by practitioners. In his 2019 publication, Topol argued that the potential harm caused by merging artificial intelligence and healthcare apps outweighs the harm caused by a doctor's mistake in treating a patient. Verghese et al. (2017) argue that the AI-intensive approach to healthcare, which lacks human intervention, is insufficient. This could lead to a loss of essential human interaction and social customs. The integration of artificial intelligence into the healthcare sector has been a remarkable and noteworthy advancement in recent years. It bestows significant authority over a substantial portion of the healthcare industry, specifically in Europe, the Gulf, and the USA of America. Disease diagnosis is facilitated by the adoption of AI modules in the healthcare industry, such as the IBM Watson system, cloud-based CC-Cruiser, ML, and NLP (Jiang et al., 2017). Hamet and Tremblay (2017) assert that artificial intelligence (AI) is a potent instrument employed for the collection of personal data, thus making a significant contribution to the advancement of healthcare. Moreover, recently developed adaptable sensors enhance the functionality of wearable devices utilized in healthcare and artificial intelligence. In their study, Zang and Zhang (2014) investigated the capabilities of flexible pressure sensors in the context of commonplace healthcare equipment and AI systems.

They aimed to assess these sensors' benefits, convenience, and cost-effectiveness. The prospects were promising, supplying adaptability, clarity, and usefulness opportunities. These attributes confirm that employing an integrative strategy incorporating artificial intelligence (AI) advancements could enhance the suitability of healthcare in reaching Goal 3 of the Sustainable Development Goals (SDGs) by addressing cost, convenience, and transparency.

According to Miller and Brown (2017), advancements in healthcare, artificial intelligence (AI), machine learning, and intelligent gadgets have increased sophistication and productivity. The extent to which artificial systems have contributed to sustainable healthcare operations is still uncertain. Efforts are being made in Pakistan to enhance the classification and accuracy of MRI scans. Conversely, there is a scarcity of research on integrating artificial intelligence into sustainability efforts. The ongoing study converts inventory, reports, X-rays, and MRIs into digital formats. Nevertheless, artificial intelligence does not significantly contribute to the sustainability of healthcare. This primarily aims to promote sustainability, focusing on its potential benefits for the healthcare, business, and social sectors (Ahmad et al., 2021).

2.1 Strategic Theory as a phenomenon

One of the most valuable services that academics can supply is to describe the guiding concepts of their research. This is a challenging task for a strategic theorist.' One of the most extensively used terms in the research domain is strategy. It can refer to anything from official policy to personal preferences, hence choosing to achieve a goal, e.g., (Fenitra et al., 2022). However, this should be formally based on a rationale or strategic intent. A few understand what this phrase truly means and what it represents as a method of inquiry. It has rarely been asked to describe what underpins a strategic theory approach to studying social phenomena research. A strategy could be opted to understand, reach, and convey the phenomena to generalize understanding in the academic world. The concept of strategic Theory as an analysis method has slowly permeated academic studies over 40 years, thanks to classic strategic theorists like Thomas Schelling. It has become increasingly used and recognized to aid decision-making comprehension. Harry Yarger made one of the best statements about the utility of strategic Theory: 'Strategic theory opens the mind to all

the possibilities and forces at work, prompting us to consider the costs and risks of our decisions as well as the consequences of those of our adversaries, allies, and others.' (Yarger, 2006)

2.2 What exactly did a strategic theory open?

Questions: What is a strategic theory, and how does it aid in the mind-opening needed? It presents a concise explanation of what strategic Theory entails in its most basic, as proved in this study. It is necessary to recognize what strategic Theory is not and what it is to reach this insight. This study proves strategic Theory is a simple, sparse, yet elegant method of illuminating complexity. Strategic Theory avoids many difficulties that could have plagued research because it is related to explaining from a disciplinary standpoint. Its roots can be traced back to public choice economics. It is an analytical method that is sometimes used to explore issues and problems in research. However, it is needed to explain the phenomena, leading to misunderstanding and confusion. As a result, it is worthwhile to state quickly what strategic Theory is not. This, in and of itself, contributes to a better understanding of the nature and importance of this method. A strategic theory has universal relevance across the spectrum of human endeavor, as proved by the great Thomas Schelling, an economist by training, in most of his work (Schelling, 1984). The strategic Theory is more than just the study of force. Strategic theorists must be reminded of this from time to time, which is part of modern research. It is also discussed with a strategic culture, which is a nonsensical concept. A strategic theory consistently concerns how value systems inform and influence ends and means. If that is what people mean by the study of 'culture,' then the strategic Theory is ipso facto concerned with researching cultural factors. Analysts considered that constructivist theories had little correspondence with studying social actors. Aspiring to achieve their aims in the international system popularized strategic culture as a popular notion. Such approaches revealed a lack of grasp of both the disciplinary derivation of strategic Theory and the available academic literature on the subject (David and Smith, 2001)

2.3 Strategic Theory's Assumptions

The phrase strategy refers to the attempt to link aims to methods. In Michael Howard's words, strategic analysis is the study of the "usage of available resources to achieve any aim." (Howard,1979). In this context, the term "resources" or "means" refers not only to the tangibles of power. It can also be used to achieve goals and the many intangible factors that can impose themselves on any decision-maker. Most notably, an actor can muster political will to achieve its objectives. What are strategic theorists interested in? They primarily investigate the calculations of the individual social actor, whether a state, a sub-state entity, or any other social grouping. As a result, strategic theory analysis is concerned with characterizing an actor's options and assessing the quality of decision-making.

Understanding the actor's values and preferences requires understanding the more prominent social milieu it operates. The environment also dictates what the actors believe they know for sure and what they must deduce, if at all, from the behavior of others (Lyndsey Harris, 2006). A solitary actor must function in an environment crowded with other actors who pursue their interests and purposes. Schelling says it is a constantly reactive situation in which one player's capacity to reach his aims depends on the other's choices or actions (e.g., Schelling, 1980). Therefore, a strategic theory acknowledges that conflicts of interest arise among actors. In some instances, these results can help resolve conflicts and achieve aims. The strategic Theory is intellectually uninterested in the morality of any actor's tactics and aims. The commentary is limited to finding how effective

the chosen means are in achieving the stated goals. Strategic theory supplies a precise and consistent foundation for research analysis processes.

3. Research Methodology

The method employed is to find and rectify the observed deficiencies. This study did not involve any experimentation or use of a primary model. The two inquiries were created to understand and discover deficiencies — (1) Are organizations using artificial intelligence (AI) to achieve sustainability in their operations? (2) How can AI be used to introduce and enhance sustainability in healthcare operations? Within this framework, the study aims to fulfill two research aims: (1) to achieve sustainability in companies' business operations through the use of artificial intelligence (AI) and (2) to introduce and enhance sustainability practices within organizations by leveraging artificial intelligence (AI).

Initial semi-structured interviews were conducted to investigate explicit knowledge and experience in artificial intelligence and healthcare. This research aims to analyze the world via the subject's perspective, elucidate the significance of individuals' experiences, and uncover the tangible reality in which they exist (Jordan, 2020; Kavale, 1996). A total of ten interviews were done, both in a panel format and individually. The sample consisted of healthcare, information technology, and computer science professionals. The sample had skills and information about evaluating the present and future use of artificial intelligence for the betterment of the community and the partial attainment of Sustainable Development Goal Three. An interview guide helped the interviewer and the participants to keep a solid connection to the core study topic. The interviews looked to understand the activities and operations conducted in the healthcare sector.

The interviews lasted around 30 minutes, involving individual and group sessions with the participants. Before the interviews, the interview guide was provided to the respondents to ensure a more suitable and targeted discussion. Furthermore, the dialogue was captured on an audio recording. The chat was then transcribed and saved as a Word document.

Following the semi-structured interviews, the data underwent analysis using a constant comparative procedure based on grounded Theory. Subsequently, NVivo (13) software was employed for further analysis. The research identified how integrating artificial intelligence in operations is specifically focused on promoting sustainability.

The given below supplies a summary of the respondents:

Table 1. Summary of Respondent

		No of Respondents
Nationality	Pakistani	10
Employment States	Employed	10
	Retired	NIL
Experience	< 10 years	07
	10 – 15 years	1
	> 15 years	2
Fields	Information Technology	1
	Health care	5
	Computer sciences	4
Total Sample Size		10

4. Data Analysis

Healthcare experts with valuable knowledge and greater AI use might build a sustainability governance framework for the sector. The research found the factors influencing the introduction of the artificial intelligence AI framework for sustainability.

Sustainable process innovation involves implementing novel and environmentally friendly strategies, plans, and arrangements to achieve lasting and beneficial changes in overall goals (Moyano-Fuentes, Maqueira-Marín, & Bruque-Cámara, 2018). In earlier literature, process innovation has been regarded as achieving excellence in manufacturing and output processes. The term "missing link" refers to the groundbreaking procedure that ensures sustainability at every life cycle stage. Dahan, Yusof, and Taib (2017) have examined process innovation through an environmental lens. They recorded technical and non-technical production procedures that tackled economic, social, and environmental factors. Sustainable Process Innovation has been identified as a crucial element for achieving sustainability in healthcare services.

Sustainable Operation Expertise refers to a comprehensive understanding of an organization's talents and their application in technical and management ability (Toffel & Toktay, 2016). To reach sustainability, businesses must implement strategies to cultivate and improve their operational ability. Organizations have undertaken efforts to eliminate environmentally harmful practices. Nevertheless, there has been a lack of initiative in enhancing the technical and non-technical elements considered crucial for reaching sustainability in operations (Da Giau et al., 2019). Sustainable operation competence encompasses using techniques, procedures, resources, and technology to foster operational sustainability. From a healthcare standpoint, these factors have not yet been adequately integrated. Furthermore, "agile practices" are essential for explaining operational ability, specifically in supply chain management. The agile techniques include market sensitivity, process alignment, technology integration, employee empowerment, and network collaboration (Gunasekaran et al., 2018; Huma & Ahmed, 2022).

Sustainable resource up-scaling refers to increasing or keeping both intangible and tangible resources to support the organization's goals, enhance productivity, and ease the achievement of its overall aims (Smith, 2014). Intangible resources can potentially enhance companies' economic and social value. Furthermore, these resources have proven their significant role in setting up a competitive edge across all areas of organizational operations. Organizations consider a prolonged competitive advantage as a crucial strategic instrument. Therefore, to achieve sustainability, organizations need to develop their competitive advantage in their intangible resources (Wahyudi, 2018). Intangible resources refer to non-physical assets obtained, cultivated, and used by human resources, manifested as innovation and services. Therefore, companies can enhance their sustainability by blending intangible and tangible resources. Over the last twenty years, intangible assets have significantly enhanced enterprises' overall performance and success.

Nevertheless, companies still have difficulties in systematically enhancing the efficiency of intangible assets (Stan et al., 2018). The effectiveness of intangible resources in promoting sustainability is unquestionable. However, expanding these resources for sustainability is widely recognized as a daunting undertaking (Veleva, 2021). Sustainable resource awareness pertains to the established interconnections in awareness that suggest enhancing performance (Wu, Tseng, Lim, and Chiu, 2019). The business sector has seen a substantial shift due to the increased recognition of sustainable practices. Service firms now have numerous options to create sustainable and commercially effective business models with a positive social impact. These

models have arisen in company operations due to increased knowledge of environmental degradation, climate change, and other societal issues. As a result, there have been enhancements made to the information technology, supply chain, quality management, marketing, and financial strategies (Veleva and Bodkin, 2018). By bolstering natural, social, and economic capital, operations guided by a sustainable resource consciousness generate value for stakeholders (Schaltegger et al., 2016). Sustainable resource awareness encompasses understanding the interconnected and cooperative approach that guarantees the participation of various stakeholders (Keenan, 2018). A study on building sustainable resource awareness has found that it integrates essential practices, ability, knowledge, information, and opportunities (Iturriza et al., 2020).
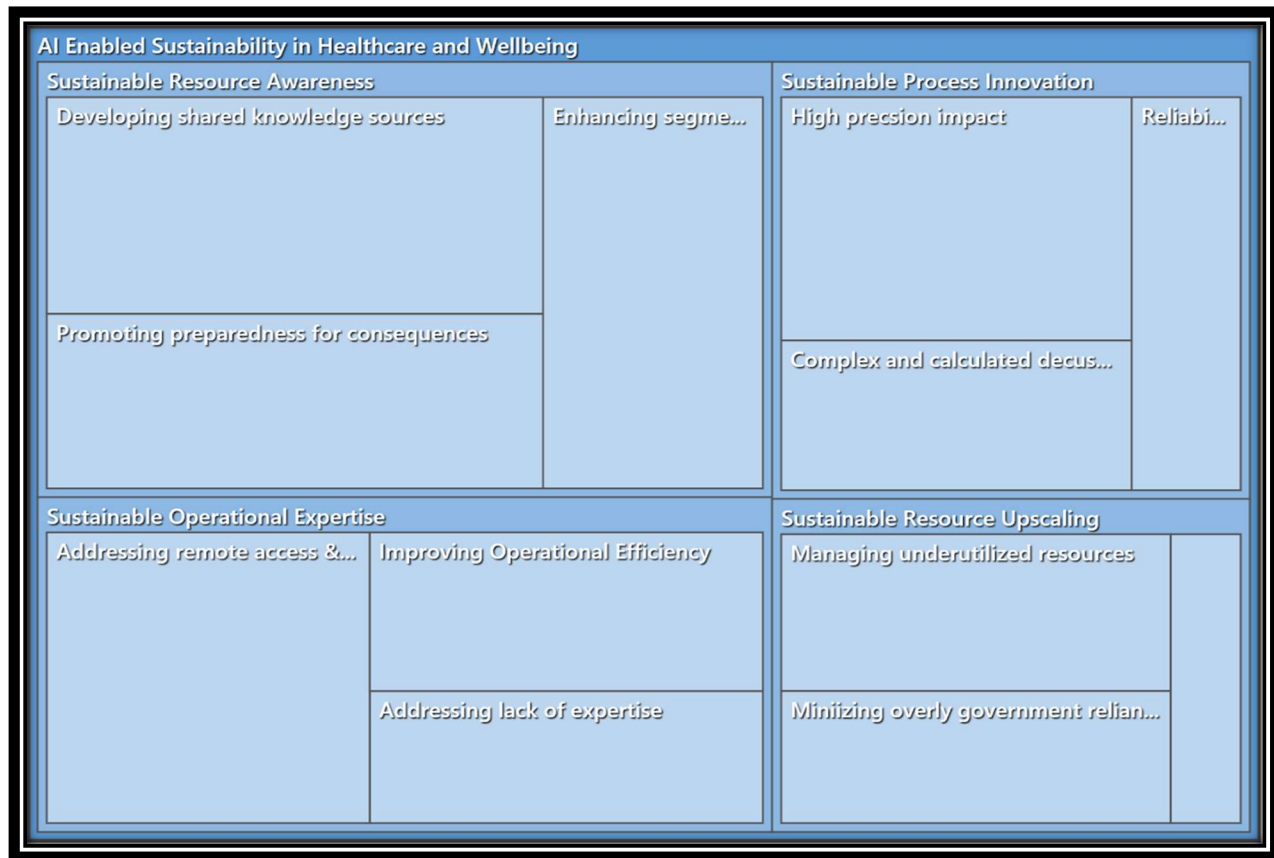
Figure 1. Nodes Compared by Coding References (self-sourced)

The participant's word frequency analysis was conducted using NVivo software. The analysis yielded the participants' findings from interviews on artificial intelligence (AI) in healthcare services. Furthermore, this research supplies substantial insight into the participants' views and experiences and employs a comparative contrast method. The frequent use of certain words allowed the researcher to understand how artificial intelligence (AI) is used in operations and how it is connected to sustainability.
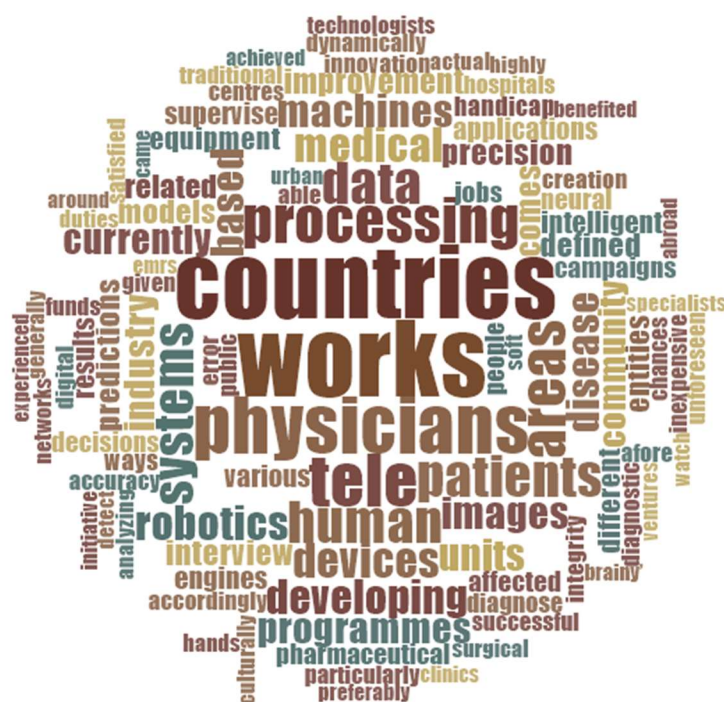
Figure 2. Keywords (word count)

5. Discussion

A semi-structured interview was carried out in accordance with a custom-designed interview guide. During the interview, no confidential inquiries or requests for demographic information were made. The subjects enumerated were of utmost importance and purpose. The inquiries were organized in a sequential fashion that demonstrates an increase in difficulty as they progressed. Following the first niceties, the conversation began with a broad inquiry: 'Based on your expertise and understanding, how would you characterize Artificial Intelligence and Sustainability?' In a similar manner, the field of medical equipment reached the point where artificial intelligence will be required to stay aligned with the most recent technological developments. Therefore, to maintain one's relevance at the global platform and to keep up with the ever-advancing technology, it is necessary to synchronize the most recent advancements in the field of literature. Everyone will have uniformity and be able to make progress in a timely and effective manner. (Chassignol, Khoroshavin, Klimova, & Bilyatdinova, 2018; Dwivedi et al., 2021; Fianto & Dutahatmaja, 2023; Moreno, González, & Viedma, 2019; Noranee & bin Othman, 2023).

Similarly, the talks progressed in the intended direction when the later topic was 'What is the application of artificial intelligence in the healthcare industry.' What is their position? After recording the general conversation about the respondents' overall understanding, the later phase shifted the focus of the discussions toward Pakistan's setting. The dialogue centered on the current state of artificial intelligence and its implementation within the regional milieu. Following that, the participants were queried regarding general information pertaining to artificial intelligence. As an illustration, the inquiry posed was as follows: "To what degree has artificial intelligence advanced in the past few years, and what impact has it had on the healthcare industry?" Following a broad overview of artificial intelligence, the conversations focused on distinguishing between

telemedicine, e-health, m-health, and health apps and evaluating their efficacy in promoting well-being and good health, specifically in Pakistan. The ongoing discourse over the segmentation of the healthcare sector for e-health purposes has prompted a shift in the topic of the community's level of acceptance and the rate at which it is changing. Moreover, it explores the profound transformations artificial intelligence could bring to the healthcare industry.

Later, more targeted conversations took place. For example, the following questions were posed: What is the satisfaction level among AI recipients in healthcare? Furthermore, how do respondents perceive the existing system's good (positive) effects on the community's well-being? This conversation intends to explore the practical advantages of integrating artificial intelligence into the healthcare sector and assess the level of satisfaction or dissatisfaction among stakeholders over this new development.

Finally, the conversation shifted to the potential ramifications of using artificial intelligence in operations and the respondents' feedback encounters. In addition, the participants were allowed to supply any comments they wished to make about the subject, primarily based on their extensive ability or knowledge.

The study examined the potential of artificial intelligence to promote sustainability in operational processes. The escalating global crises have prompted experts to focus significantly on sustainability. The significance of sustainability lies in its ability to guarantee the preservation and continuity of natural environments (Oliveira & Silvestre, 2017). Furthermore, corporations are expected to assume responsibility for setting up a sustainable environment to preserve natural flora. However, the corporations have failed to implement a sustainable method that could have contributed long-lasting value to society and the environment.
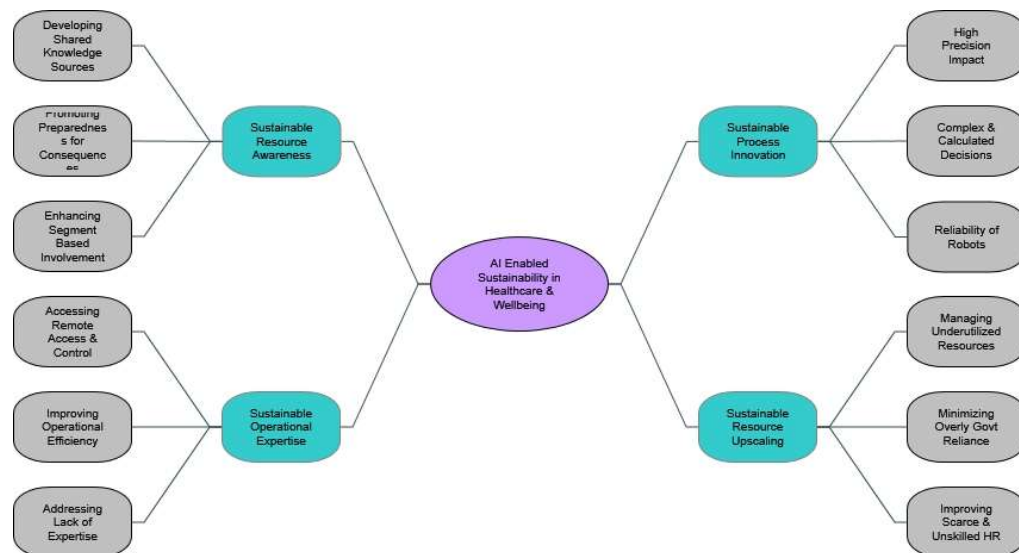
Figure 3. The framework study (Author's concept)

Pagell and Wu (2009) highlighted the importance of sustainability in the management and operations of supply chains. This study approached the grounded theory aspect to explore the operational aspects of organizations in the healthcare sector. This idea elucidated the core factors that can help firms enhance their operational efficiency for long-term viability. The study concurrently examined the approaches that could offer a governance framework for the health

industry (Nishant, Kennedy, and Cornett, 2020). Artificial Intelligence is seen as a critical factor in promoting sustainability. Sustainable process innovation, sustainable operational ability, sustainable resource upscaling, and sustainable resource awareness are four crucial components that the study has identified as being very persuasive in improving operational sustainability. These four variables suggest using artificial intelligence in healthcare operations can lead to sustainability. However, widespread obstacles in the healthcare sector hinder the effective use of talents and experience, the implementation of quality process innovation, resource management, and the understanding and adoption of technology.

5.1 Practical Implications

Pakistan's researchers should consider the possibility of using artificial intelligence in the country's healthcare system. Researchers should consider the strategic importance of artificial intelligence in healthcare as a strategic tool. The healthcare industry is making serious efforts to address the environmental impact for sustainable growth. The mainstream stakeholder must consider this issue critical for the future growth of the country. The current study has significantly attempted to explore the key aspects of sustainability using artificial intelligence as a strategic tool.

The study is instrumental for industrialists, manufacturers, and entrepreneurs to review their current practices to become efficient and effective in ensuring initiatives contribute to the ongoing environmental cause. Organizations from public and private sectors are required to enhance their efforts for sustainable growth. To further aid the healthcare sector and promote sustainability, technology parks may be set up to mimic the accepted systems and boost indigenous research on the functions of AI.

5.2 Limitations and future directions

A total of ten (10) experts were approached and interviewed in this study. It would have been possible to improve the results if the number of interviewees had been increased. There is a possibility to extend the current study for future new dimensions by adding quantitative aspects. Human attitudes and behavior must be studied further, and advanced AI systems must be adopted for well-being and healthcare. A country's demographic and cultural differences may also be examined. Studying how highly sophisticated AI-based treatments could lead to operations sustainability can further enrich the study. As well as tearing down the fears surrounding AI, it is equally important to create awareness in the community that AI helps them. One of the biggest fears is that AI systems will eventually control everything, especially the tasks of technical officials. However, artificial intelligence's functional capabilities may create more jobs in the healthcare field.

5.3 Conclusion

Achieving sustainable socio-economic development requires the achievement of sustainability in healthcare. Four crucial variables of the sustainable governance structure were examined as part of the study. Sustainable resource awareness, sustainable resource upscaling, sustainable operation expertise, and sustainable process innovation are the variables. These factors are directly tied to the effective application of technology, particularly AI, which is anticipated to improve healthcare operations' sustainability. These variables have also been recognized as components of a capacity-building initiative, which can potentially contribute to sustainability. AI in the healthcare industry can be categorized into three distinct phases: There are currently ongoing activities related to AI

in healthcare in Pakistan. Technology such as MRIs, X-rays, data management, AI systems, applications, and robotics are used in these activities. There is a limited potential for this existing technique to deliver solely precise results. Further, local AI applications and their use are constantly being developed. AI applications and systems are intended to enhance precision and streamline field operations in healthcare institutions, departments, and pharmaceutical companies.

Acknowledgement

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