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Leveraging Artificial Intelligence Tools and Resources in Leadership Decisions

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Abstract

Healthcare leaders are continually making choices and solving complex problems that require thoughtful and timely decisions. Traditional decisions were based on a combination of experience, professional judgment, and strategic application of decision-making techniques. While these foundational approaches remain relevant, the rapidly evolving technological landscape with the emergence of artificial intelligence (AI), is introducing new opportunities and challenges for 21st-century leadership.

To deliberately proactively lead in the 21st century, leaders must incorporate AI tools and digital resources into decision-making processes to enhance the efficiency and effectiveness of their operations. This will improve the overall quality and impact of management decisions. Leveraging AI to analyze large datasets, predict trends, and generate evidence-based recommendations will reduce human bias, promote greater equity, and make more data-driven and analytically sound choices that are timely and responsive to evolving needs.

However, the integration of AI is not without ethical complexities. Systematic errors, algorithmic biases, cost and human resources barriers, and data limitations can inadvertently perpetuate or even exacerbate existing inequalities, particularly among vulnerable populations. Leaders must cultivate a new set of leadership competencies - ones that include AI and digital literacy, critical thinking, and ethical reasoning. They must develop these skills to understand how best to harness AI transformative benefits.

The future of effective leadership lies in the ability of leaders to balance traditional wisdom with technological innovation. Moving forward, we propose the **ABC of AI-inclusive Decision-Making Process.** This process will help leaders navigate AI complexities to make informed, equitably sound, clinical outcome-oriented, and impactful decisions in an increasingly data-driven world.

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Introduction

Artificial Intelligence (AI), first conceptualized in the 1940s and formally coined in the 1950s, has undergone rapid transformation, particularly with the emergence of generative AI (GenAI) in recent years[1,2]. This evolution has significantly reshaped human interactions, decision-making processes, education, healthcare, and numerous other domains[3-11]. Clinicians leverage AI to formulate diagnoses, manage patients, document interactions, and provide precision medicine. Pathologists utilize AI to facilitate disease detection, radiologists rely on these technologies for image analysis, and educators harness AI to develop course materials, design assessments, and streamline grading[12]. While healthcare leaders and managers have begun incorporating AI into various aspects of leadership, there remains a critical need to intentionally harness the power of AI in decision-making and choice implementation.

AI-driven leadership enables data-informed insights, operational efficiencies, and more effective decision-making at unprecedented speed and accuracy. As AI's role in leadership continues to expand, its strategic integration into decision-making processes will be essential for optimizing outcomes and driving innovation. This is why healthcare organizations globally are investing substantial resources to adopt and integrate AI into their workflows in an effort to improve operational efficiency and service quality[4,13] especially in clinical documentation, patient triage, drug discovery, patient scheduling, and medical education[14-16]. In the drug discovery pathway, AI has drastically reduced the time and cost associated with developing new drugs, bringing treatments to market faster and cheaper[17]. AI robotic systems, modelling, and automation assist surgeons by providing real-time data analysis, facilitating intraoperative training, and enabling better decision-making during operations[18]. Robotic systems such as Da Vinci Surgical System utilize GenAI algorithms to improve precision and control during surgical procedures, allowing for minimally invasive techniques that reduce recovery times, improve patient outcomes, enhance precision, lessen surgeon fatigue, and improve safety while providing real-time data analysis that enables better decision-making during operations[18,19.] In Vietnam, the adoption of AI by community clinics and hospital departments has enhanced service efficiency, improved outcomes of interventions, and raised the quality of care provided by the healthcare industry[20,21]. Similarly, machine learning algorithms are in use to predict sepsis in hospitalized patients, allowing for timely interventions[22]

However, AI adoption has associated challenges, including the cost of acquisition, the need for AI-savvy personnel, ethical concerns, data and legal issues. For instance, AI outputs are not transparent nor easily explainable[23]. Various levels of cost challenges hinder essential community providers, including Federally Qualified Health Centers (FQHCs), Tribal or Urban Indian Clinics, and Community or Free Clinics that serve underserved populations in medically disadvantaged areas from adopting AI. These clinics face challenges of limited resources and health information technologies, and lower rates of deployment of advanced digital tools compared to private

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systems[24]. Cost limitations have also galvanized the increasing use of open-source AI, with limited capacity and privacy, thus restricting organizational adoption and use of AI and delaying the development of a culture of AI with associated workflow modifications.

Traditional Decision-Making Process

Before the advent of AI, leaders have used various frameworks, tools and techniques to support the decision-making process, including, but not limited to rational decision-making technique, bounded rationality, prospect theory, OODA (Observe, Orient, Decide, Act) loop, Vroom-Yetton Decision Model, SWOT analyses (strengths, weaknesses, opportunities, threats), cost-benefit analyses (CBA), Rest model, etc[11, 25-35]. Other frameworks and techniques used were brainstorming, nominal group techniques (NGT), PESTLE analyses (political, economic, social, technological, legal, environmental), decision trees, pareto analyses (80/20 rule), six thinking hats, consensus decision-making, scenario planning, game theories, balanced scorecards, force field analyses, star-busting, Delphi methodology, TARES (Truthfulness, Authenticity, Respect, Equity, and Social Responsibility) test, utilitarian approaches, and intuition-based decision-making[36-42]. Although these tools have their characteristics, strengths, and weaknesses, they have improved the quality and timeliness of decisions made by leaders over the years, despite their associated weaknesses, as shown in **Figure 1.** Identified limitations restricted the usefulness and effectiveness of these frameworks, thus the need for AI adoption.

Deliberately Leveraging AI in Modern-Day Leadership Decisions

Leaders across industries are rapidly adopting and applying AI tools and resources (e.g., predictive analytics, natural language processing (NLP), AI chatbots, and decision support systems) in decisions and management processes. IBM Watson for Oncology[43], PathAI[44], Aidoc[45], AlphaFold (DeepMind)[46] BlueDot[47] CDC's Epi Info™ with AI Plugins, SAP BusinessObjects with Predictive Analytics, Zest AI, Kensho (by S&P Global), etc., are in use to influence various decision-making processes[48-52]. While a growing number of healthcare leaders are beginning to utilize AI to inform their decisions, many remain unaware of its vast potential. The 2024 American Medical Association (AMA) study highlighted that although a growing majority of physicians recognize AI's benefits, with 68% in 2024 reporting at least some advantage in patient care (up from 63% in 2023) and 36% of physicians feeling more excited than concerned about AI (up from 30% in 2023), there remained a critical need to build trust in AI applications as physicians emphasized the necessity for feedback loops, data privacy assurances, seamless workflow integration, and adequate training as essential factors for AI adoption[53]. This gap underscores the urgent need to help leaders deliberately, intentionally, and systematically incorporate AI into their decision-making processes – an approach referred to as **AI-inclusive decision-making strategy.** This is critical as emerging AI technologies like predictive analytics and NLP are revolutionizing how leadership decisions are conceptualized and executed. For instance, predictive analytics empower

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leaders to anticipate market shifts, manage risks, and make proactive, evidence-based decisions[54,55]. Similarly, NLP enables the analysis of customer sentiment, streamlines communication, and enhances stakeholder engagement and satisfaction[56,57] By embracing these tools, leaders will unlock deeper insights, respond more effectively to dynamic environments, and ultimately drive better outcomes using existing frameworks as shown in **Figure 2**[24].

ABC of AI-inclusive Decision-Making Process

An AI-inclusive decision-making process begins with (A) a clear definition of the decision to be made and what framework to use, (B) the effective use of AI tools to gather relevant facts, identify key themes, suggest potential strategies, evaluate alternatives, and compare the merits and drawbacks of each option; and (C) decision making process by the leading using the data, insights, and analyses provided by AI coupled with experience and relevant frameworks and techniques. Integrating AI using this ABC approach will significantly improve decision-making efficiency, offer real-time feedback, enhance talent and resource management, and increase the accuracy and reliability of the outcomes[49-52]

Adopting an AI-inclusive Decision-Making Process requires adequate and appropriate human-AI collaboration. Humans must be kept in the loop for oversight and ethics, regularly testing algorithms for fairness and transparency. Leaders should also use interpretable models where possible and establish clear AI ethics guidelines and accountability. Appropriate ethical guidelines should adopt (with appropriate modification) the World Health Organization (WHO) comprehensive guidance to support member states' responsible regulation of AI technologies in healthcare, the FUTURE-AI initiative international consensus guidelines to ensure the trustworthiness of AI in clinical practice, the United States Food and Drug Administration AI/ML-Based Software as a Medical Device (SaMD) Action Plan, US White House AI Bill of Rights, and the European Union's proposed Artificial Intelligence Act[59-63]

Importantly, leaders must remain fully aware of the specific role AI plays within their decision-making processes and its limitations, maintain accountability for the outcomes, and use AI to enhance both the quality and the scope of their decisions. As AI is not designed to replace the leader's judgment or ownership of decisions, leaders will always be responsible for their decisions, with or without AI adoption and use as leaders cannot cognitively offload the decision-making process to AI tools, but appropriately, responsively, and ethically use AI as an aid to ensure decisions are equitable, inclusive, and contextually suitable. This intentional partnership between human judgment and machine intelligence can help dismantle existing structural and systemic barriers by addressing diverse forms of bias, improving generalizability, promoting fairness, and broadening the perspectives considered in each decision[64,65]. With consistent engagement over time, AI will strengthen leaders' decision-making capacity as each well-informed decision builds upon previous ones, fostering a culture of continuous improvement.

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Integrating AI into Deliberate Proactive Leadership

Deliberate and proactive leadership must intentionally leverage AI to enhance the sensitivity, specificity, and inclusiveness of decisions[33-35]. By integrating AI tools into healthcare leadership workflows, leaders will help reduce AI-embedded historical, sampling, labeling, algorithmic, interaction, measurement, confirmation, cultural/societal, survivorship, and automation biases by ensuring better model training with more inclusive datasets that are representative of the population served[30-32]. Furthermore, addressing issues such as data privacy, security, and ownership that are currently prevalent will significantly improve equity as leaders make data-driven decisions that are more responsive and analytically sound.

To achieve this, leaders must adopt the described frameworks and guidelines that enforce ethical use of AI[59-63], and where none exist, develop and enforce new but succinct guidelines for the responsible, ethical, and effective use of AI in their organizations. Leadership, defined as "*the art and science of influencing, motivating, galvanizing, and inspiring people to effectively and efficiently utilize scarce resources to achieve health objectives that ensure sustainable health and well-being of the community across a defined area of jurisdiction"*[33,34] must remain fundamentally human-centered, with the understanding that over-reliance on AI risks depersonalizing leadership, eroding empathy, and undermining the relational aspects of decision-making. A thoughtful balance that combines technological insights with emotional intelligence, empathy, and ethical reasoning must be maintained. Leaders should see AI an enabler and a support that is designed to aid, assist, and augment a leader's experience and skills, and never to replace them.

Furthermore, integrating AI into leadership decisions must align with the strategic organizational vision. This will result in the use of modified workflows and change management processes that include AI tools and processes. This is already in play in banking and finance, where major financial institutions such as HDFC Bank, State Bank of India, and Wells Fargo and JB Morgan Chase are adopting agentic AI to streamline operational workflows, reduce manual intervention, and increase accuracy[69,70]. Also, XperiencOps (XOPS) automated repetitive IT tasks to alleviate pressure on IT departments and save millions using AI-powered bots[71]. As AI-driven data analytics can make change management more agile and transparent, at IBM, AI is being used to predict resistance and impact through advanced analytics and employee sentiment analysis. AI is also used to handle FAQs, deliver training, and aid collaboration, thus personalizing change journeys for different roles or individual employees. In addition, it is involved in automating documentation, scheduling, and tracking progress; and enabling real-time feedback loops and adaptive strategy adjustments[72]. To maximize AI in health, leaders must build a community of continuous learning to keep up with the rapidly developing AI world.

These communities of continuous learning will help health leaders cultivate relevant skills and competencies required to effectively understand, interpret, and apply AI-generated insights.

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Building these capabilities will involve targeted training across multiple dimensions of leadership, including change management, AI adoption, and organizational integration. Reputable institutions - such as Harvard Medical School, which offers the AI in Health: From Strategies to Implementation course[73] - provide certificate, diploma, and graduate-level programs in AI integration. In parallel, leaders should strengthen their change management expertise by mastering frameworks such as John Kotter's eight-step process and Lewin's three-step model[11,38,39]. A wide range of online platforms also deliver specialized training, from AI coding fundamentals to advanced technical skills. The overarching objective is to ensure universal AI literacy among health leaders, empowering them to champion AI adoption, lead seamless integration, and embed an AI-driven culture within their organizations. This will ensure that AI integration into the leadership decision-making process harnesses its benefits while preserving vital human qualities, thus shaping a more adaptable and sustainable future for leadership[51]. To achieve this, AI must be seen as a catalyst for more inclusive, informed, and impactful leadership decisions[52].

Conclusion

The integration of AI into leadership decision-making processes presents a truly transformative opportunity for leaders and organizations. By fully embracing the current capabilities and future potentials of AI while addressing its challenges, leaders can enhance the efficiency and effectiveness of their organizations to drive their organizations toward a more innovative and efficient future.

And as leaders become more proficient in using AI – developing communities of continuous learning and what can be described as AI literacy or AI-savviness – decision makers will be increasingly empowered to make timely, sensitive, inclusive, and people-centered decisions that respond effectively to evolving organizational and societal needs. First, we call on leaders to adopt the Deliberate Proactive Leadership (DPL) principles of think, plan, prepare, provide, and communicate ahead as they drive the AI revolution in health[33-35]. This approach will enhance leaders' self-efficacy, improve their self-control, empower and encourage them to navigate the AI adoption and inclusion journey, resulting in self-fulfillment following the realization of more effective and efficient systems[33]. Also, leaders should develop AI-inclusive policies, decision workflows, and training curriculum to effectively and ethically adopt, integrate, and maximize AI potentials in health. Finally, they should work with bioengineers to codesign, cocreate, codevelop and co-deploy tailored AI tools and resources for healthcare[74].

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Appendix

Figure 1

Framework	Characteristics & Strengths	Weaknesses	References
Rational Decision-Making Model	• Logical, step-by-step • Systematic, data-driven • Reduces bias	• Time-consuming • Assumes complete information • Not ideal for urgency	Bazerman & Moore (2013)[25].
Bounded Rationality	• Recognizes cognitive limits • Satisficing over optimizing • Efficient	• May yield suboptimal results • Susceptible to bias	Simon (2013)[26].
Prospect Theory	• Decisions under risk • Accounts for loss aversion and framing	• Descriptive, not prescriptive • Hard to apply systematically	Kahneman & Tversky (1984)[27].
OODA (Observe, Orient, Decide, and Act) Loop	• Adaptive and iterative • Fast and responsive in dynamic settings	• Requires expertise • Less effective for strategic planning	Boyd (2018)[28], Silvander & Angelin (2019)[29].
Vroom-Yetton Decision Model	• Context-based participation	• Complex to use	Vroom & Yetton (1973)[30]

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	• Enhances group cohesion	• Needs an accurate assessment	
SWOT Analysis	• Strategic planning tool Simple and communicable	• Subjective interpretation • No direct solutions	Olden & Erwin, (2023)[11]
Cost-Benefit Analysis (CBA)	• Quantifies pros and cons • Financially grounded decisions	• Hard to quantify intangibles • May ignore ethical issues	Vining & Boardman (2024)[31]
Ethical Decision-Making	• Focus on moral dimensions • Encourages integrity	• Hard to operationalize • May conflict with goals	Rest (1994)[32]
Deliberate Proactive Model	• Strategic and evidence-based • Quality decisions	• Requires thinking and planning, resources, and good lead time	Oleribe et al (2022)[33] Oleribe (2019, 2025)[34, 25]

Figure 2

Framework	AI Enhancement Area	Key Benefit
Rational Model	Data analysis, outcome simulation	Faster and more accurate choices
Bounded Rationality	Recommender systems, heuristic optimization	Efficient “good-enough” decisions

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Prospect Theory	Behavior prediction, frame analysis	Personalized risk framing
OODA Loop	Real-time analytics, autonomous agents	Ultra-fast, responsive decisions
Vroom-Yetton	Situation modeling, team analytics	Adaptive leadership decisions
SWOT Analysis	Trend mining, internal diagnostics	Objective and real-time strategic insight
Cost-Benefit Analysis	Big data valuation, future impact modeling	Broader, more robust economic evaluation
Ethical Decision-Making	Risk flags, moral simulation	More informed and inclusive ethical reflection
Deliberate Proactive Model	Data analysis, outcome prediction	Better decision outcomes

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