" Return on Investment for a case of buying Medical Imaging AI "

Author: Dr. Diya Gouchwal **Guide**: Prof. Divya Agarwal

INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT & RESEARCH , DELHI

Keywords: Artificial Intelligence, Deep Learning, Computer- Aided Detection(CAD), Chest X-rays

INTRODUCTION

There have been many claims about technologies making healthcare better or more affordable. Artificial intelligence (AI) is one of the few innovations that can deliver on both these promises.
AI can improve healthcare systems, without compromising on quality and costs. The main barrier for AI adoption in clinical practice is the limited examples of return on investment.
Healthcare providers must justify using their budget to buy an AI solution. It is also an essential step to getting any innovative tool to help patients.

The demand for improved clinical treatment quality and efficacy was a driving driver for the introduction of AI in medical imaging.

OBJECTIVE

The goal is to determine the Return on Investment in terms of monetary, efficiency, and quality gain while purchasing medical imaging AI. Furthermore, The Biggest Hospital in North India will identify impediments and facilitators to the implementation of artificial intelligence (AI) technology in clinical radiology for reporting Chest X-rays.

METHODOLOGY

Secondary Data Analysis was done to define the ROI for a case of buying Medical Imaging AI & to address the Facilitating & Hindering Factors in the Implementation of AI applications in Radiology.

SOURCES OF DATA	Secondary Data
STUDY DESIGN	Descriptive Study
DATA ANALYSIS	The data was complied, tabulated & analysed in Ms-Excel.

DEFINING & PROVING THE RETURN ON INVESTMENT FOR MEDICAL IMAGING AI

(3-STEP APPROACH)

1- Understand the incentives of the Healthcare System
2- Define the AI's benefits-
- Insight CXR by LUNIT
- Chest Eye CAD by OXIPIT
- qXR v3.0 by Qure.ai

3- Match the benefits with incentives

RETURN ON INVESTMENT

Monetary Gain | **Efficiency Gain** | **Quality Gain**

RESULTS

	MONETORY GAIN	EFFICIENCY GAIN	QUALITY GAIN
AI ALGORITHM **- Insight CXR by LUNIT** **- Chest Eye CAD by OXIPIT** **- qxr v3.0 by Qure.ai**	~No. of Radiologists reporting CXR'S have been reduced (Headcount of the radiologists reduced from 6 to 3 in no.)	~AI autoreports normal scans & Radiologist reports abnormal ~Increased no. of scans ~Triaging ~Case rating by Prioritization ~Work list Prioritization ~Autoreporting	~AI helps detects what human misses ~Reduces False Negatives

CONCLUSION

Biggest challenge in AI adoption

The lack of instances of return on investment is the biggest impediment to AI adoption in clinical practise. Healthcare providers must be able to justify spending money on an AI solution. It's also a prerequisite for obtaining any unique patient-assistance gadget.

- Another obstacle for establishing clinical value with AI is the actual technical implementation and deployment of these algorithms.
- Although many AI products have FDA clearance and CE certification, this does not ensure the increased therapeutic value.

Success of AI adoption in Healthcare

"Radiology is not a standalone" Because radiology is used in almost every area, the return on investment may not be limited to radiology.

Failure of AI adoption in Healthcare

Although AI has the potential to improve radiology's efficiency and accuracy, it also has flaws and biases.
The widespread application of AI-based intelligent and autonomous systems in radiology has the potential
to increase the danger of systemic mistakes with serious consequences, as well as raise significant ethical
and societal challenges.

BIBLIOGRAPHY

1. https://doi.org/10.1016/j.jacr.2019.07.028 (Geis, J. Raymond, et al. 'Ethics of Artificial Intelligence in Radiology: Summary of the Joint European and North American Multisociety Statement'. Journal of the American College of Radiology: JACR, vol. 16, no. 11, Nov. 2019, pp. 1516–21. PubMed
2. https://doi.org/10.1016/j.ejrad.2021.109882 (Bitencourt, Almir, et al. 'AI-Enhanced Breast Imaging: Where Are We and Where Are We Heading?' European Journal of Radiology, vol. 142, Sept. 2021, p. 109882. PubMed, https://doi.org/10.1016/j.ejrad.2021.109882)
3. https://doi.org/10.1007/s00330-020-06946-y (Strohm, Lea, et al. 'Implementation of Artificial Intelligence (AI) Applications in Radiology: Hindering and Facilitating Factors'. European Radiology, vol. 30, no. 10, 2020, pp. 5525–32. PubMed Central)