

INTERNSHIP REPORT

A Review on Artificial Intelligence and Dentistry

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Introduction

This report summarizes the internship work and research project titled "A Review on Artificial Intelligence and Dentistry". The project aimed to explore the evolving role of Artificial Intelligence (AI) in dental care, its applications across specialties, and the ethical, operational, and educational implications. As part of the MBA in Hospital Management, this internship provided the opportunity to understand AI's integration into modern dental practice through an in-depth literature-based study.

Objectives

- To analyze the applications of AI in various domains of dentistry such as diagnostics, orthodontics, prosthodontics, and endodontics.
- To review the ethical, legal, and technological challenges associated with AI in dentistry.
- To assess the impact of AI on workflow efficiency, patient outcomes, and sustainability.
- To suggest future directions and policy reforms for responsible AI integration in dental healthcare.

Methodology

- Research Design: Descriptive and exploratory, based on secondary data.
- Data Source: Peer-reviewed journals from Web of Science.
- Data Collection: Bibliographic metadata like title, authors, keywords, abstract, and citations were extracted.
- Inclusion Criteria: Focused on articles from the past 5 years discussing AI in dental diagnostics, radiography, or treatment.
- Analysis: Thematic review identifying trends, innovations, limitations, and research gaps.

Key Findings

Applications of AI in Dentistry:

- Diagnostic Imaging: CNNs demonstrated >90% accuracy in identifying caries and periodontal conditions.
- Orthodontics & Prosthodontics: AI enabled real-time treatment simulations and prosthesis design.
- Preventive Dentistry: Smart devices and mobile apps supported oral hygiene and early intervention.
- Surgical Assistance: Robotics powered by AI improved precision in implantology.

Advantages

- Improved diagnostic accuracy and reduced human error.
- Personalized care and patient-specific treatment planning.
- Enhanced dental education through simulation and training platforms.

Disadvantages & Challenges

- Data privacy concerns and algorithmic bias.
- Technological and financial barriers in resource-limited settings.
- Lack of clinician training and ethical regulation.
- Environmental impact due to high computational needs.

Discussion

The research indicated a significant transformation in dental care through AI-driven innovations. However, adoption remains inconsistent due to infrastructural, educational, and ethical concerns. The project emphasizes AI as a complementary tool rather than a replacement for human expertise. Bridging the digital divide, ensuring regulatory clarity, and training professionals were noted as essential steps for widespread AI integration.

Learning Outcomes

- Gained expertise in conducting literature reviews on technology in healthcare.
- Developed understanding of various AI models in clinical use.
- Understood the intersection of AI, ethics, and sustainability in dentistry.
- Improved skills in academic writing, thematic analysis, and critical evaluation.

Conclusion

AI has the potential to revolutionize dentistry by making treatments more efficient and patient friendly.s However, proper regulations, training, and infrastructure are essential for its safe and effective use. It is important to view AI as a helpful assistant to dental professionals, not a replacement. With continuous learning and ethical integration, AI can become a valuable part of modern dental care.