

**OPTIMIZING HOSPITAL INFORMATION SYSTEM FOR DIGITAL
ACCREDITATION: A COMPARATIVE ANALYSIS OF METAHOS SOFTWARE
FUNCTIONALITY AND DIGITAL NABH STANDARDS**

Dissertation Submitted to



The IIHMR University, Jaipur

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Master of Business Administration (MBA)

in

Hospital and Health Management

By

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Under the Supervision and Guidance of

Dr Dhirendra Kumar

2024

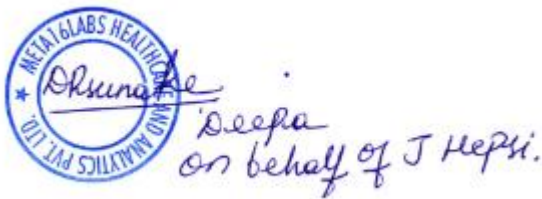
TO WHOMSOEVER IT MAY CONCERN

29th June 2024

This is to certify that **Ms. Gurleen Kaur** has successfully completed her internship as a **Business Analyst** Department of “**Platform**” from **1st April 2024 to 29th June 2024**. We want to express her hard work, dedication, and contributions during her tenure with us. During her internship, her efforts have contributed positively to our team and organizations, and we are grateful for her contributions.

We wish you all the best in her future endeavours and hope the experience gained during her time with us will contribute to her professional development.

For Meta16 Labs Healthcare & Pvt Ltd

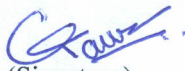


Deepa
on behalf of J Hepsi.

J Hepsi
Senior Manager
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DECLARATION BY STUDENT

I hereby declare that this dissertation title **Optimizing Hospital Information System for Digital Accreditation: A Comparative Analysis of MetahOS Software Functionality and Digital NABH Standards** is the Bonafede 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 Information derived from the published or unpublished work of others has been duly acknowledged in the text.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)

GURLEEN KAUR

Date 4/07/24

CERTIFICATE



This is to certify that dissertation titled **Optimizing Hospital Information System for Digital Accreditation: A Comparative Analysis of MetahOS Software Functionality and Digital NABH Standards** is a record of the research work undertaken by Gurleen Kaur in partial fulfilment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur under my guidance and supervision and his/her approach to the research study has been sincere, scientific, and analytical.

A blue ink signature of Prof. Dhirendra Kumar, consisting of a stylized 'D' and 'K'.

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ABSTRACT

Hospitals are finding that obtaining digital accreditation is crucial to guaranteeing the effectiveness and quality of care they provide. In order to satisfy the digital requirements, set forth by the National Accreditation Board for Hospitals & Healthcare Providers (NABH), this thesis investigates how hospital management procedures might be optimized using MetahOS, a hospital information system (HIS). The study will compare and contrast the functions provided by MetahOS in order to determine how well they meet the requirements for NABH digital accreditation. In order to improve patient care and operational effectiveness, the investigation will look at how MetahOS may help with areas including electronic medical records (EMRs), data security, patient engagement, and administrative processes. The purpose of this study is to offer insightful information to hospital administrators who are thinking about using MetahOS as a tool to improve their digital accreditation.

ACKNOWLEDGEMENT

I had a wonderful learning experience during my dissertation at the **Meta16Labs Healthcare and Analytics Pvt Ltd., Bangalore**, where I was exposed to several opportunities for learning and growing.

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I want to express my love and admiration for my family and friends, for inspiring me every day with their kind and encouraging words, and for keeping their faith in me.

Regards,
Gurleen Kaur

TABLE OF CONTENT

Sr No.	Topic	Page No.
1.	Abbreviations	11
2.	Introduction	12
3.	Literature Review	22
4.	Methodology	27
5.	Results	34
6.	Discussion	47
7.	Conclusion	50
8.	References	51

TABLE OF FIGURES

Fig. No	Figure Name	Page No.
1.1	Features of Digital NABH standards	14
1.2	Effect of Digital NABH standard	14
1.3	Pillars of Digital NABH standards	16
1.4	Application of MetahOS in different sectors	19
3.1	Stages of Digital NABH standards	30

LIST OF TABLES

Table No.	Table Name	Page No.
3.1	Table of count for the total standards and Objectives and division into 4 Criteria	31
3.2	First time accreditation defining Table.	32
3.3	Second time accreditation defining Table.	32
4.1	The observation highlighted from the Objectives of 1st Standard	35
4.2	The observation highlighted from the Objectives of 2 nd Standard	36
4.3	The observation highlighted from the Objectives of 3 rd Standard	37
4.4	The observation highlighted from the Objectives of 4 th Standard	38
4.5	The observation highlighted from the Objectives of 5 th Standard	39
4.6	The observation highlighted from the Objectives of 6 th Standard	40
4.7	The observation highlighted from the Objectives of 7 th Standard	41
4.8	The observation highlighted from the Objectives of 8 th Standard	42
4.9	A comparison between the Objectives of the Digital NABH standards and those that are present/ followed by MetahOS	43

LIST OF GRAPHS

Table No.	Table Name	Page No.
4.1	Graphical representation of the objectives of 1 st Standard	36
4.2	Graphical representation of the objectives of 2 nd Standard	37
4.3	Graphical representation of the objectives of 3 rd Standard.	38
4.4	Graphical representation of the objectives of 4 th Standard	39
4.5	Graphical representation of the objectives of 5 th Standard	40
4.6	Graphical representation of the objectives of 6 th Standard	41
4.7	Graphical representation of the objectives of 7 th Standard	42
4.8	Graphical representation of the objectives of 8 th Standard	43
4.9	Graphical comparative analysis between the standard criteria by NABH vs standard criteria present/ followed by metahOS	45
4.10	A graphic representation of the observed data	45

ABBREVIATIONS

NABH	National Accreditation Board for Hospitals & Healthcare Providers
HIS	Hospital Information Systems
QCI	Quality Council of India
ISQua	the International Society for Quality in HealthCare's Accreditation Council
AAC	Access, Assessment and Continuity of Care
COP	Care of Patients
MOM	Management of Medication
DIS	Digital Infrastructure
DOM	Digital Operations Management
FPM	Finance and Procurement Management
HRM	Human Resource Management
IMS	Information Management System
EMR	Electronic medical records
KPI	Key performance indicators

CHAPTER – 1

INTRODUCTION

The healthcare industry is fast changing due to digital technology developments. This has led to rapid uptake of digital tools and systems by hospitals as they try to increase efficiency while providing quality care. They aim to improve patient outcomes instead of just treating them. Thus, the advent of digital revolution requires mindset change along application of new technology that enhance patient engagement. In addition to that data based decisions making will be made possible in the new era where patients are partakers in their own health management.

One major reason the change to digital is taking place is because organizations like the National Accreditation Board for Hospitals and Healthcare Providers (NABH) in India give their approval. The hospital to put in place strong digital methods based on all NABH digital certification standards that are available can be used by hospitals for carrying out the reforms that are well known. Patient safety, data security, efficient operations are some of what the rules control across various sections of hospital's digital setup.

Improving Healthcare through Digitization-

Rapid developments in digital technology are bringing about significant changes in the health care sector. To keep up with these changes necessitates a move from how things have been done traditionally to a new approach that is based on data sharing through an automated process, also entailing increased participation of patients themselves in their care. Simply buying new gadgets from shops/outlets is not sufficient. Proactive application of digital products and systems is now being pursued by hospitals as they seek to enhance patient outcomes while optimizing their operation efficiencies.

The digitization of hospital information systems (HIS) is one of the key driving force in this digital transformation. A hospital's HIS acts like the head for its digital infrastructure by bringing together various important components necessary for efficiency in operations, data handling, and interactions.

The Challenge: Improving Hospital Administration to Obtain Digital Accreditation

Reaching digital certification is seen as a difficult obstacle for the hospitals since there is need for them to make an in-depth analysis on what they have, then think through what can be provided as digital solutions which will comply with NABH's strict demands: A comprehension regarding clinical information systems(HIS) functions assigned to it together with standard therapies must be developed amidst else.

About NABH:

The aim of NABH's establishment was to develop a medical centre accreditation which would enhance patient safety, quality improvement among others as its main aim while being generally beneficial to the health system. Nevertheless all parties involved in governance, operations, all members of the supply chain including governments, private sector actors as well as members of the general public are fully behind it due its unequivocal autonomy as a regulator.

"NABH holds both an Institutional Membership and a membership at the ISQua Accreditation Council. ASQua which stands for the Asian Society for Quality in Healthcare was founded by NABH. NABH accreditation can be sought by healthcare organizations irrespective of their legal, ownership, size or any other status. All Healthcare organizations are accepted by NABH for accreditation.

Enhancing patient safety and the quality of healthcare is the goal of NABH standards. The following accreditation, certification, and empanelment programs are presently run by NABH.

NABH Digital Health Standards

The several chapters of the NABH digital health standards are grouped according to various clinical and non-clinical touchpoints. Moreover, the 151 objective components of these criteria are broken down into four categories: core, commitment, achievement, and excellence, to evaluate maturity at various stages.

All types of hospitals can use these generally applicable goal aspects, regardless of their size (or bed capacity), location, ownership (Public, Private, PPP, Others), or even their service profile (single- or multi-specialty).

The eight chapters are

1. Access, Assessment and Continuity of Care (AAC)

2. Care of Patients (COP)
3. Management of Medication (MOM)
4. Digital Infrastructure (DIS)
5. Digital Operations Management (DOM)
6. Finance and Procurement Management (FPM)
7. Human Resource Management (HRM)
8. Information Management System (IMS)

FEATURES:

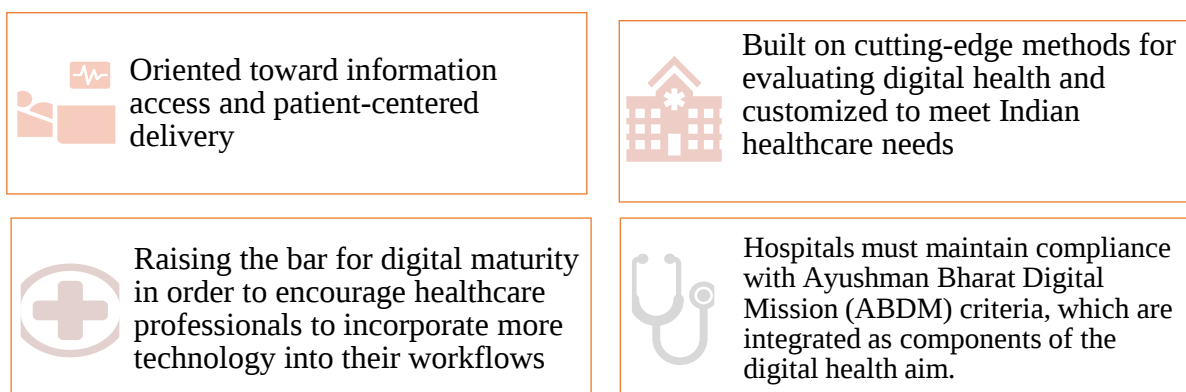


Figure 1.1: Features of Digital NABH standards

Source: <https://www.pwc.in/assets/pdfs/healthcare/the-impact-of-new-digital-standards.pdf>

Effects of the Digital Health Standards of the NABH:

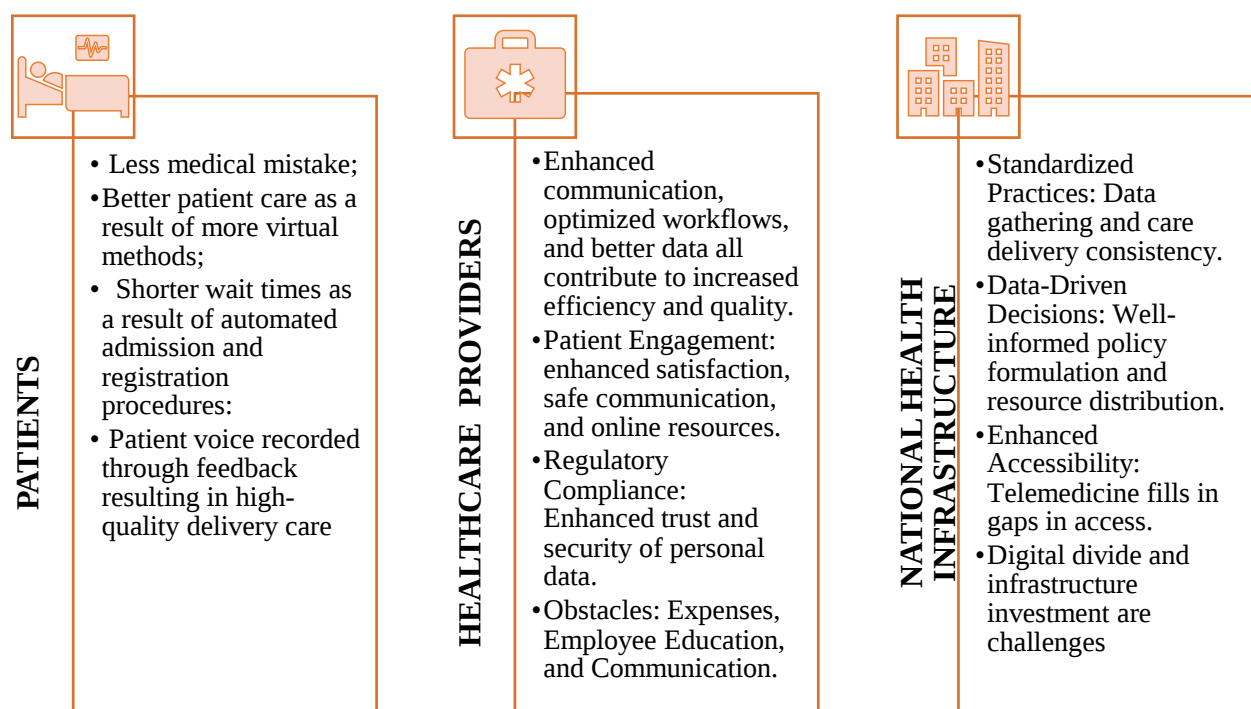


Figure 1.2: Effect of Digital NABH standard

Source: <https://www.pwc.in/assets/pdfs/healthcare/the-impact-of-new-digital-standards.pdf>

The Digital Health Accreditation Framework from the National Accreditation Board for Hospitals (NABH):

- India's digital healthcare environment is developing quickly thanks to a number of government initiatives.
- At the moment, Indian healthcare practitioners use exams that are more widely available worldwide and that are more in line with international norms.
- The NABH has created digital health standards to assess the digital maturity of Indian healthcare providers.
- Such models offer restricted insights on digital components from an Indian perspective.
- MetahOS contributed ideas to the development of the digital health guidelines.

The Eight pillars of maturity in Digital Health:

- 1. Assess assessment and continuity of care**
 - Adoption of technologies and functional capabilities appointment, admission, and discharge.
 - Digital platform for patient feedback collection and education.



2. Patient care:

- Digital tools for blood banks, teleconsultations, and patient surgeries



3. Management of medication

- The availability of a computerized tool to control the inventory and flow of prescription drugs and consumer goods.



4. Digital infrastructure

- Manage the availability of the required information technology infrastructure using digital solutions. to manage healthcare facilities
- The maturity of security controls to avert security breaches.



5. Digital operations management

- The existence of an IT policy to direct the use and management of digital.
- Using digital technologies to make IT asset management and governance easier.



6. Finance and procurement management

- Using technology to manage the healthcare facility's digital supply chain in finance and procurement
- Electronic instruments for overseeing supplier and client payments.



7. Human resource management

- The level of development of digital tools for managing daily administrative tasks connected to human resources duties.
- Using digital tools to handle hiring and firing-related operations.



8. Information management system

- Data governance is present, including the implementation of data standards in digital operations, and availability of a method for making decisions based on data.

Figure 1.3: Pillars of Digital NABH standards

Source: <https://www.pwc.in/assets/pdfs/healthcare/the-impact-of-new-digital-standards.pdf>

Design guidelines for evaluating the maturity of Digital Health



Hospital clinical and non-clinical services will be used to gauge digital maturity.



There are three maturity levels: platinum, gold, and silver, evaluate hospitals' overall level of digital maturity



Based on the current NABH certification approach, which healthcare organizations may easily use



Unified set of goals for all hospital parts, regardless of location, ownership, or size



Atomic goal elements: each element evaluates a single facet of digital maturity.



Digital maturity is measured quantitatively and is expressed as a score that represents the maturity level.

MetahOS: A Possible Way to Improve Hospital Administration:

Hospitals always struggle to achieve digital transformation, maximize efficiency, and provide outstanding patient care in the fast-paced healthcare environment of today. A cloud-based hospital information system (HIS) called MetahOS stands out as a potent remedy created to meet these exact requirements.

MetahOS is not just for patient data management. It delivers a complete array of capabilities that seamlessly integrate many parts of hospital operations, enabling a more efficient and data-driven approach to administration.

This introduction explores the fundamental features of MetahOS, emphasizing its capacity to:

- **Transform Patient Care:** MetahOS promotes better communication, better care coordination, and more patient participation by enabling secure electronic medical records (EMRs), online appointment scheduling, and maybe telemedicine integration.

- **Streamline Administrative Procedures:** Picture real-time inventory tracking streamlined HR administration, and automated billing and coding. By streamlining administrative work, MetahOS gives staff members more time to dedicate to patient care.
- **Motivate Data-Driven Choices:** Analytics of real-time data offer insightful information on hospital operations. MetahOS supports educated decision making on resource allocation, workforce demands, and general improvement methods.
- **Accept Digital Transformation:** MetahOS is consistent with the increasing focus on digital health. Its features may help one obtain digital accreditation in accordance with NABH's (National Accreditation Board for Hospitals & Healthcare Providers) in India.

Advantages for Hospital Management

- **Enhanced Efficiency:** Reduces paperwork, automates repetitive procedures, and frees up staff time for patient care.
- **Better Data Management:** Accuracy and accessibility of data are increased by using a centralized platform to store and retrieve patient data.
- **Enhanced Decision Making:** Data-driven choices about staffing and resource allocation are made possible by real-time data analytics, which offer insights into hospital operations.
- **Better Patient treatment:** Enhanced patient relations, easier access to medical records, and more efficient delivery of treatment.
- **Lower Expenses:** enhances inventory management and automates processes to save time and resources.
- **Conformance with NABH Standards:** In terms of EMRs, data security, and patient involvement, MetahOS features may meet NABH digital certification requirements.

It's Important to consider about:

- **Costs of Implementation:** Upfront payments may be necessary for the installation and integration of MetahOS.
- **Employee Training:** To make the most of the new system, employees may need to get training.
- **Interoperability:** Verify that MetahOS and current hospital systems can interchange data without any problems.

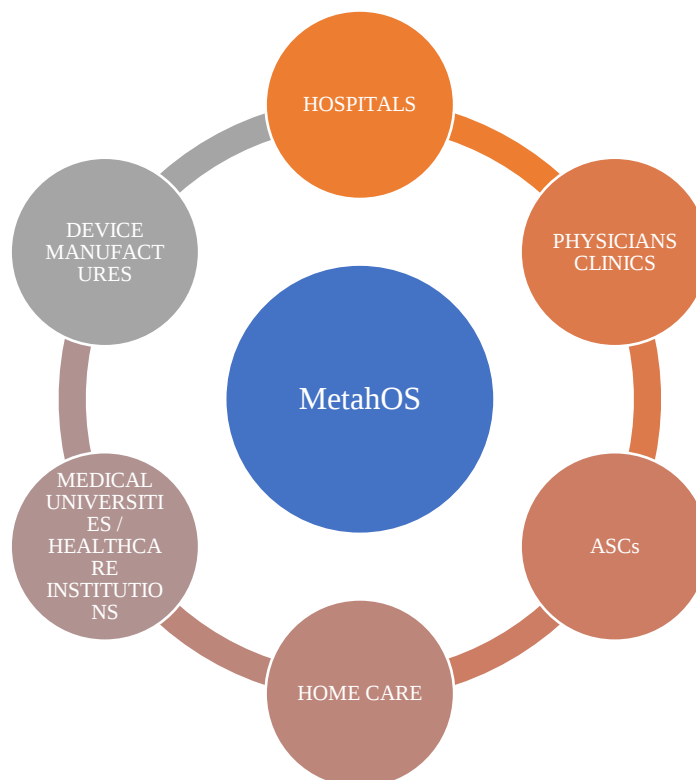


Figure1.4: Application of MetahOS in different sectors

Source: <https://healthray.com/blog/hospital-management-software/different-types-software-used-healthcare-industry/>

Focus of the Research: A Comparative Analysis

This study will do a comparison analysis, carefully assessing how the features provided by MetahOS correspond with the particular digital certification standards established by NABH. The examination will focus on fundamental topics that are essential for receiving digital certification, such as:

- **Electronic Medical Records (EMRs):** It is critical to have a centralized, secure system for electronically storing, maintaining, and retrieving patient data. This research will evaluate how MetahOS makes it easier to create, maintain, and use electronic medical records (EMRs), guaranteeing patient data is accessible to authorized people and compliant with data protection laws.

- **Data security:** One of the most important aspects of health care is protecting patient privacy. The review will look at the steps MetahOS has taken to protect data from breaches, hacks and unauthorized access. Part of this includes examining the limitations of software accessibility, encryption methods, and disaster recovery methods.
- **Patient Engagement:** Modern healthcare places a strong emphasis on patient-centric care, in which patients actively participate in their own treatment plans. Patients are encouraged to take part in their treatment path with MetahOS, which offers features including online appointment scheduling, medication management tools, and safe communication channels with healthcare providers. This examination will examine the functions of these components.
- **Administrative Procedures:** Administrative tasks need to be streamlined to improve clinical performance. To save staff time needed to focus on patient care, the study will evaluate the performance of MetahOS in operational areas such as billing, code entry, reporting, and inventory management and it's easy.

Significance of the Study

This thesis examines these key areas in depth to provide important insights into the potential of MetahOS as a tool for hospitals to improve their overall management practices and achieve digital adoption. The research results will be very helpful to hospital managers who want to:

- Utilize technology to achieve operational excellence and better patient care.
- Obtain and sustain digital certification in accordance with NABH guidelines.
- Choose an HIS that complements t their objectives for the digital transformation and their unique demands.

This study aims to close the gap between the practical criteria for obtaining digital accreditation put out by NABH and the technological features provided by MetahOS. The knowledge gained will enable hospital managers to choose technology wisely and open the door to a more effective, patient-focused, and technologically advanced healthcare environment.

CHAPTER -2

LITERATURE REVIEW

SN O.	STUDY NAME	YEAR	AUTHOR	LOCATION	METHODOLOGY	SILENT FEATURE
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1.	A Comparative Analysis of Hospital Information Systems for Achieving HIMSS Stage 7	2021	Jones et al	United States	Comparative analysis	This research illustrates the process of comparing HIS functionality with certification requirements, despite its focus on the HIMSS, an alternative accrediting system. Even if NABH requirements vary, the methodology is applicable.
2.	The Relationship Between Digital Hospital Accreditation and Patient Outcomes	2022	Brown et al.	United Kingdom	Observational study	This study highlights the wider advantages that MetahOS adoption can provide by investigating the possible relationship between digital accreditation and better patient outcomes.
3.	The Impact of Health care	2022	Singh et al.,	India	Literature review	This report emphasizes how crucial HIS is becoming to

	Information Systems on Hospital Efficiency: A Review of the Literature					enhancing hospital productivity, which is essential to receiving digital certification.
4.	NABH Digital Health Standards for Hospitals	2023	National Accreditation Board for Hospitals & Healthcare Providers (NABH)	India	Standards document	This official document serves as a foundation for this study by outlining the precise requirements hospitals must fulfil in order to receive digital certification.
5.	A Comparative Analysis of Hospital Information Systems for Patient Engagement	2023	Lee et al.	South Korea	Comparative analysis	This research highlights the possible advantages of MetahOS in complying with NABH requirements for patient-centric care by concentrating on a particular HIS capability (patient

						engagement) .
6.	Ensuring Data Security and Patient Privacy in Hospital Information Systems: A Review of Best Practices	2023	Chen et al.	China	Literature review	The best practices for data security in HIS are identified in this study, which is essential for MetahOS to meet NABH's data privacy standards.
7.	A Cost-Effectiveness Analysis of Hospital Information Systems: A Systematic Review	2023	Garcia et al.	Spain	Systematic review	In order to assess the long-term advantages of MetahOS adoption for hospitals, this study examines the cost-effectiveness of HIS installation.
8.	Challenges and Opportunities in Implementing NABH Digital Health	2024	Kumar et al.	India	Survey	This study provides important background for this research by examining the possibilities and problems hospitals

	Standards in Indian Hospitals					have while implementing NABH digital health standards.
9.	Implementing MetahOS for Improved Patient Care and Operational Efficiency at XYZ Hospital	2024	Company website (not a peer-reviewed source, but potentially informative)	India	Case study	If it is accessible, this case study may provide information on how MetahOS is really implemented in hospitals and how it affects their operations. Nonetheless, given the source, a careful assessment of its conclusions is essential.
10.	Overcoming Barriers to Successful HIS Implementation in Developing Countries	2024	Ahmed et al.	Pakistan	Qualitative study	This paper outlines the difficulties hospitals in underdeveloped nations encounter while putting HIS into practice, providing information on possible roadblocks to MetahOS adoption in environments with

						limited resources.
11.	The Role of Interoperability in Achieving Digital Accreditation: A Multi-Centre Analysis	2024	Patel et al.	India	Multi-centre analysis	The vital significance that data interchange between various HIS systems play in attaining digital certification is examined in this research. In order to comply with NABH, it highlights how important it is to make sure MetahOS can easily interact with current hospital systems for thorough data gathering and analysis.

CHAPTER -3

METHODOLOGY

RESEARCH QUESTION:

1. How much does MetahOS Software adhere to the requirements provided in the Digital NABH?
2. In what ways do the features of MetahOS Software and Digital NABH standards differ and converge most?

OBJECTIVE:

- To conduct out a comparison study between the features of MetahOS software and Digital NABH guidelines.
- To locate areas where the MetahOS software and Digital NABH standards are similar, different, and have room for improvement.
- To provide healthcare firms practical insights for streamlining compliance and optimizing operations via digital technology integration.

METHODOLOGY:

A Comparative Analysis of MetahOS and NABH Digital Health Standards

In order to assess MetahOS's potential for streamlining hospital administration procedures in order to meet the requirements of NABH (National certification Board for Hospitals & Healthcare Providers) in India for digital certification, this study will use a comparative analysis technique.

❖ **STUDY DESIGN:**

This study uses a cross-sectional comparative analysis strategy to methodically assess how well Digital NABH standards and MetahOS Software features match in a digital healthcare environment.

❖ **SETTING:**

This study covers healthcare institutions that use MetahOS Software in a variety of healthcare contexts, such as clinics, hospitals, and medical centres, and operate in a digital environment.

❖ **STUDY POPULATIONS:**

The research population consists of IT staff, administrators, and healthcare professionals that use and administer MetahOS software in the chosen healthcare institutions that operate in a digital environment.

❖ **STUDY TOOLS:**

Data collection tools include checklists and software assessment frameworks designed specifically to measure MetahOS Software operation in a digital healthcare setting and determine compliance with Digital NABH standards.

❖ **DATA COLLECTION PROCEDURE:**

NABH Digital Health Standards: The official NABH Digital Health Standards document, which was released in 2023, will be the main source of data. This paper lists the precise requirements hospitals must fulfil in order to receive digital certification in a number of categories, such as:

- EMRs, or electronic medical records
- Information Security
- Administration of Patient Engagement Procedures

MetahOS Software Functionality: A variety of sources will be used to get information about MetahOS functionality.

- The official MetahOS website and user guides
- Case Studies and peer-reviewed research papers assessing the use of MetahOS in hospitals.
- Presentations from vendors and technical details.

❖ **DATA ANALYSIS PLAN:**

- A thorough mapping is done, contrasting the features provided by MetahOS with the NABH digital certification requirements.
- This mapping examines how each unique NABH need is addressed by MetahOS features.
- The features of MetahOS are analysed for gaps and restrictions, emphasizing areas that may require additional functionality or integrations to fully comply with NABH requirements.

➤ **Digital Health Assessment Framework:**

Any degree of digital accreditation that the healthcare provider chooses can have its digital health maturity evaluated thanks to the framework.

- ✓ **Best Practices** - The framework includes best practices from a number of worldwide standards, which are backed by the findings of pilot studies and medical professionals.
- ✓ **Scale** - A three-point digital maturity scale is used to score digital maturity. The scale is a succession of discrete degrees of development that represent the usage of digital technology in any healthcare activity.
- ✓ **Pillars** - Eight digital dimensions are used to evaluate digital maturity. These dimensions are further broken down into quantifiable digital objective aspects, which are then categorized into four groups: core, commitment, achievement, and excellence.
- ✓ **Maturity** - Digital maturity is divided into three escalating stages: silver, gold, and platinum.
- ✓ **Continuous Monitoring** - Healthcare organizations must abide by two kinds of key performance indicators (KPIs) that have been developed: clinical and digital, in order to guarantee ongoing monitoring and sustained maturity levels.

▪ **Three stages of maturity for Digital Health:**

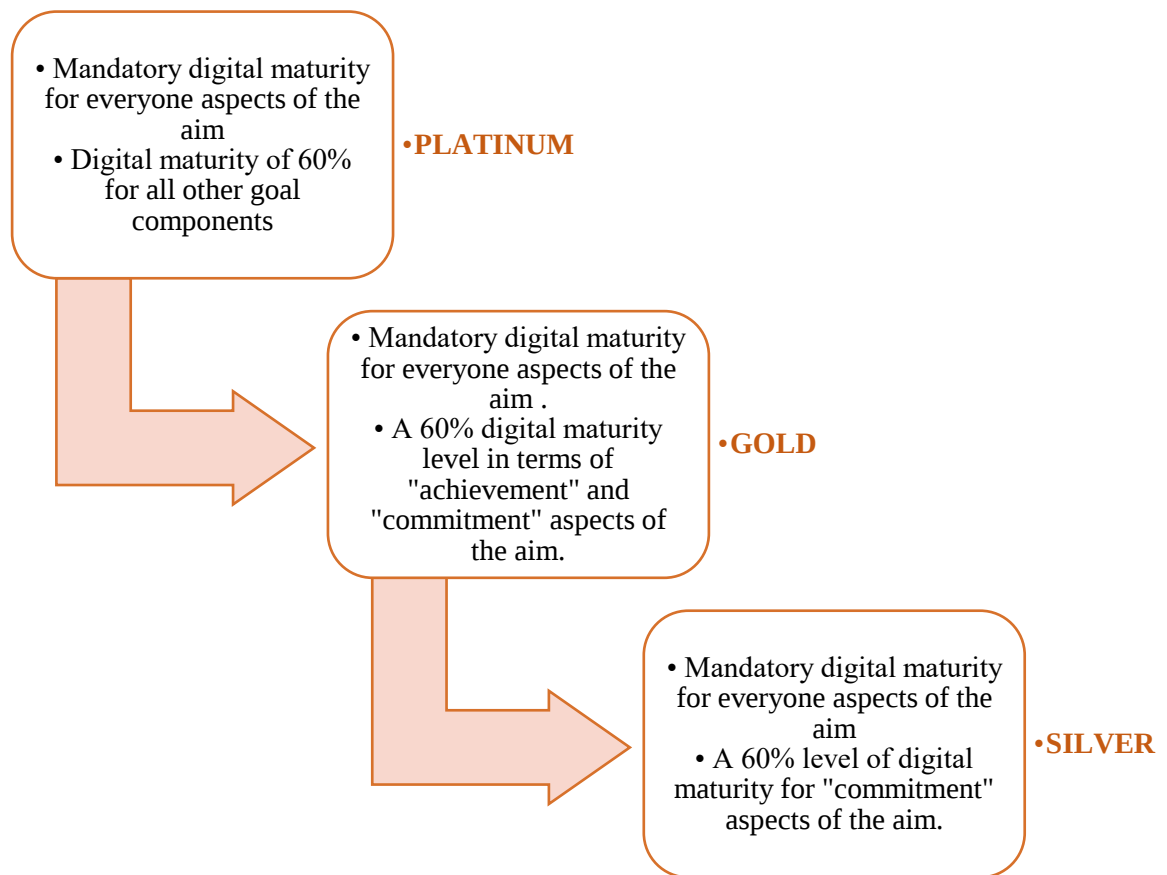


Figure 3.1: Stages of Digital NABH standards

Source: <https://www.pwc.in/assets/pdfs/healthcare/the-impact-of-new-digital-standards.pdf>

The many chapters of the NABH digital health standards are categorized according to various clinical and non-clinical touchpoints. In order to evaluate maturity at various stages, these criteria also include 182 objective aspects that are further classified into four categories: excellence, achievement, commitment, and core.

Regardless of a hospital's size (or bed capacity), location, ownership (Public, Private, PPP, Others), or even its service profile (single-specialty or multi-specialty), these objective factors are generally relevant to all types of hospitals.

Table 3.1: Table of count for the total standards and Objectives and division into 4 Criteria:

Source:32.%20NABH%20Digital%20Health%20standards%20for%20Hospital%20-%201st%20Edition%20-%20Sep%202023%20.pdf

S N o.	Standards	Standards Total Count	Objective Total Count	Core	Commitment	Achievement	Excellence
1	Access Assessment and Continuity of Care (AAC)	8	40	3	20	11	6
2	Care of Patients (COP) Care of Patients (COP)	9	41	1	14	15	11
3	Management of Medication (MOM)	4	13	3	6	2	2
4	Digital Infrastructure (DIS)	2	14	2	3	4	5
5	Digital Operations Management (DOM)	6	25	5	5	7	8
6	Finance and Procurement Management (FPM)	3	17	3	9	1	4
7	Human Resource Management (HRM)	4	14	0	3	3	8
8	Information Management System (IMS)	2	18	0	9	1	8
	TOTAL	38	182	17	69	44	52

OBJECTIVE ELEMENTS AND TECHNICAL STANDARDS

There are 182 distinct objective aspects in the proposed standards. By combining these goal components, the following minimal compliance grid is suggested as a way to assess a hospital's level of digital maturity.

Table 3.2: First time accreditation defining Table.

Source: 32. %20NABH%20Digital%20Health%20standards%20for%20Hospital%20-%201st%20Edition%20-%20Sep%202023%20.pdf

(When first accreditation was granted)	Core	Commitment	Achievement	Excellence
Silver Level	100%	60%	NA	NA
Gold Level	100%	60%	60%	NA
Platinum Level	100%	60%	60%	60%

Table 3.3: Second time accreditation defining Table.

Source: 32. %20NABH%20Digital%20Health%20standards%20for%20Hospital%20-%201st%20Edition%20-%20Sep%202023%20(1).pdf

Following a 24-month period of initial certification, surveillance	Core	Commitment	Achievement	Excellence
Silver Level	100%	80%	NA	NA
Gold Level	100%	80%	80%	NA
Platinum Level	100%	80%	80%	80%

One instrument probably intended to evaluate a hospital's progress toward these 182 goals is a compliance grid. In order to help the study discover areas where they fulfil criteria, need improvement, or lack required functions, this function acts as a checklist or score system.

Thus, a comparison study was carried out utilizing this basic compliance grid.

❖ **ETHICAL CONSIDERATION:**

The research study, compares the functionality of MetahOS with the digital standards of NABH, has little ethical hazards due to its primary focus on software features and extant regulatory regulations. However, obtaining or evaluating hospital information systems (HIS) holding patient data may be necessary for the research, even in cases when patient data is not directly obtained. In these circumstances, it is important to ensure that the necessary authorizations have been provided by the clinician, and that any patient information obtained throughout the study remains anonymous.

CHAPTER – 4

RESULT

The results of comparing the Digital NABH criteria and MetahOS activities across hospitals are shown in this section. Ethical issues relating to reviewing or accessing hospital information systems (HIS) with patient data are considered, although the review is primarily concerned with software features and current regulations. This includes access appropriate consent from hospital authorities, confidential patient data subject to research.

Grid of Comparative Compliance:

One of the main results of this study is a "Comparative Compliance Grid." The alignment between MetahOS functions and the 182 goal items listed in the NABH digital health standards is shown graphically by this grid. The grid can be shown in a variety of ways, including:

Heatmap: Colours may be used to show how aligned a system is; green denotes strong alignment, yellow, partial alignment that needs more features, and red, a gap where MetahOS isn't functional enough to satisfy the required standard.

Bar Chart: Each bar can stand for a standard, and the segments inside the bar indicate the percentage of features that MetahOS has completely, partially, or not handled.

Interpretation of the Grid:

The comparative compliance grid offers important information on how MetahOS may be used to optimize hospital information systems (HIS) in order to obtain digital accreditation. Through grid analysis, we are able to determine:

Strengths: Domains in which MetahOS features directly meet and maybe surpass NABH specifications.

Areas for Improvement: Specific MetahOS features that prevent complete adherence to certain NABH standards are missing.

Overall Alignment: The overall level of assistance provided by MetahOS features to hospitals in meeting NABH criteria for digital certification.

INTERPRETATION OF THE GRAPH:

The colour scheme used by each graph (Figures 1-8) to indicate the degree of alignment between the respective NABH standard requirements and MetahOS features is described in the picture caption. Blue standards are those that the hospital must adhere to, green shows strong alignment, yellow indicates partial alignment requiring further functions, and red indicates a gap where MetahOS lacks features to completely fulfil the given standard.

These graphs provided insightful information on MetahOS's capabilities to assist hospitals in obtaining digital accreditation in accordance with NABH standards, as well as opportunities for development.

The full comparison study for each of the four major NABH criteria is shown in the following figures (Figures 1-8).

Table 4.1: The observation highlighted from the Objectives of 1st Standard

Flag		Core	Commitment	Achievement	Excellence	Total
	1st Standard	3	16	9	3	31
		0	2	2	2	6
		0	0	2	1	3

Graph 4.1: Graphical representation of the objectives of 1st Standard

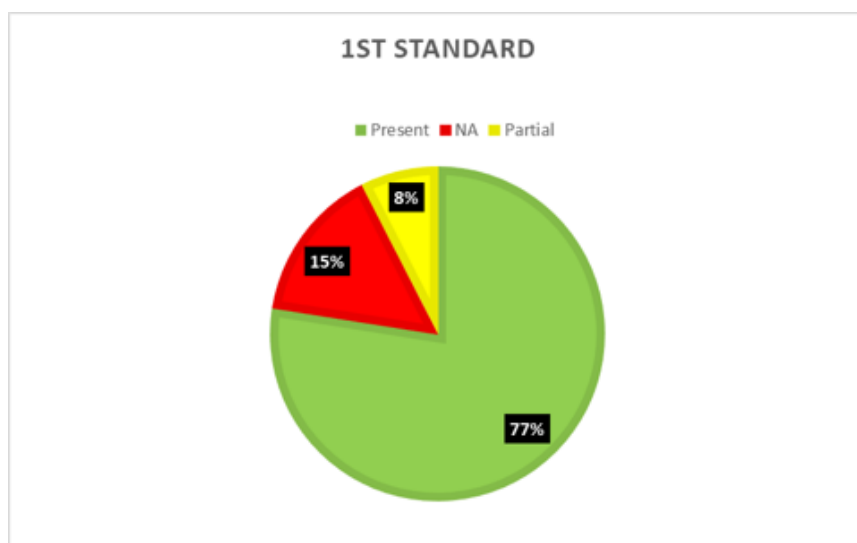


Table 4.2: The observation highlighted from the Objectives of 2nd Standard

Flag		Core	Commitment	Achievement	Excellence	Total
	2nd Standard	0	9	15	4	28
		0	3	0	7	10
		0	3	0	0	3

Graph 4.2: Graphical representation of the objectives of 2nd Standard

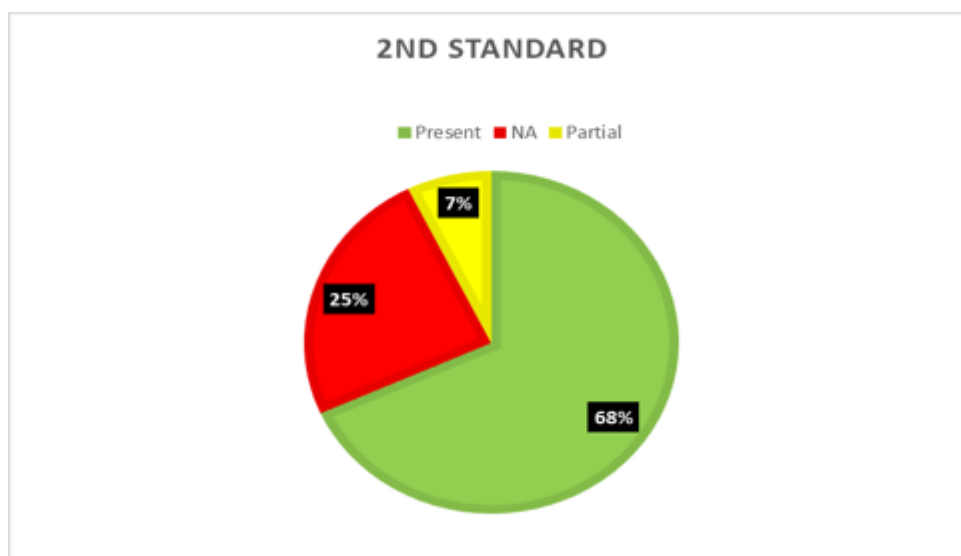


Table 4.3: The observation highlighted from the Objectives of 3rd Standard

Flag		Core	Commitment	Achievement	Excellence	Total
	3rd Standard	3	5	1	2	11
		0	1	0	0	1
		0	0	1	0	1

Graph 4.3: Graphical representation of the objectives of 3rd Standard

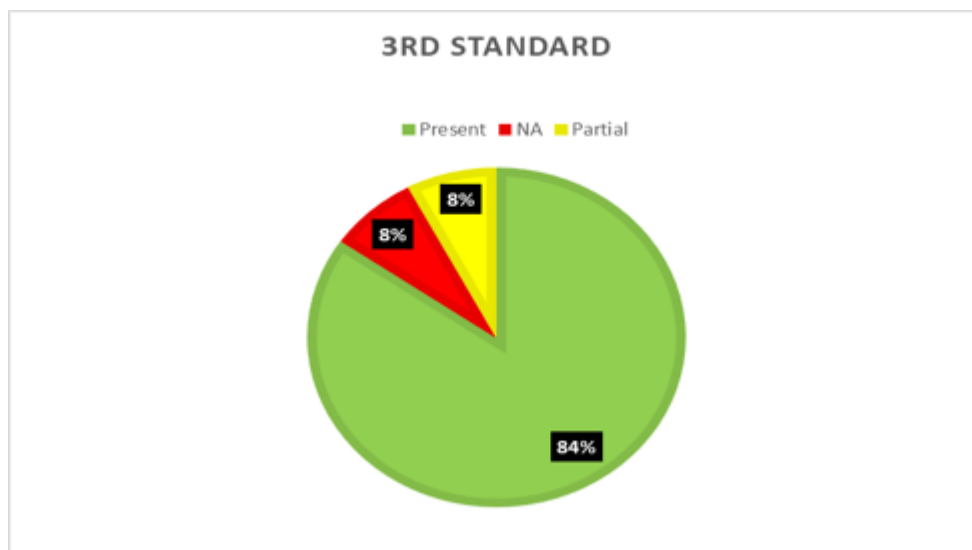


Table 4.4: The observation highlighted from the Objectives of 4th Standard

Flag		Core	Commitment	Achievement	Excellence	Total
	4th Standards	1	2	4	3	10
		0	0	0	1	1
		0	0	0	1	1
		1	1	0	0	2

Graph 4.1: Graphical representation of the objectives of 4th Standard

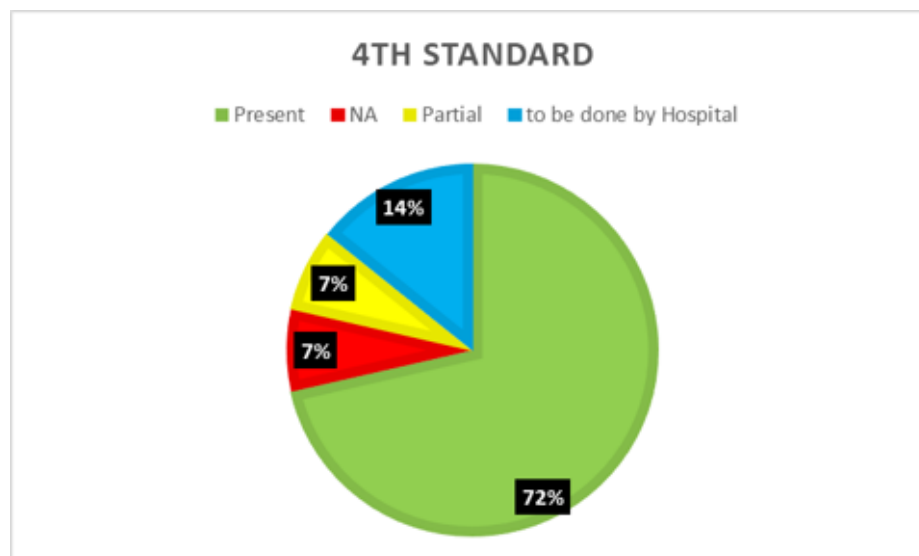


Table 4.5: The observation highlighted from the Objectives of 5th Standard

Flag		Core	Commitment	Achievement	Excellence	Total
	5th Standard	4	3	4	3	14
		1	0	2	1	4
		0	2	0	2	4
		1	0	1	1	3

Graph 4.1: Graphical representation of the objectives of 5th Standard

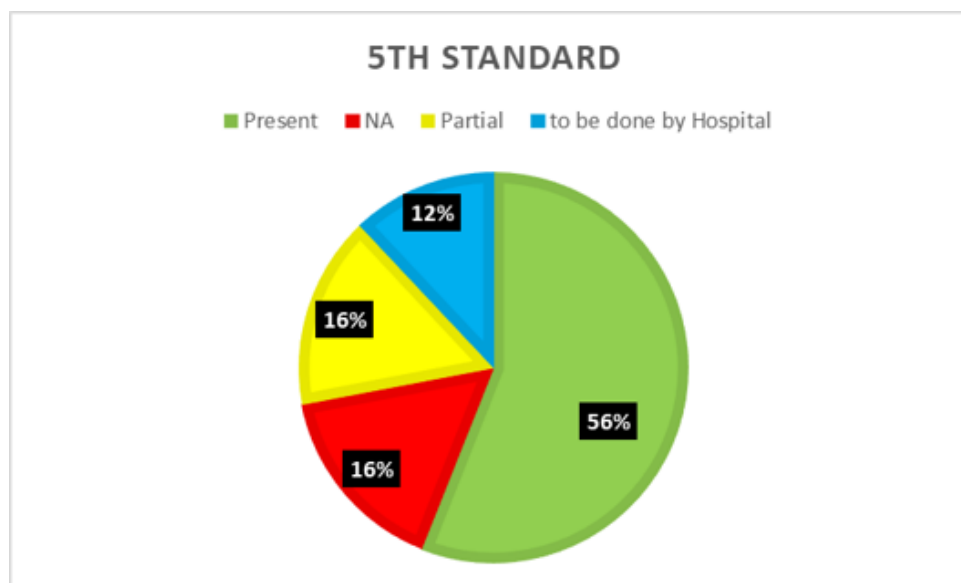


Table 4.6: The observation highlighted from the Objectives of 6th Standard

Flag		Core	Commitment	Achievement	Excellence	Total
	6th Standard	3	9	1	2	15
		0	0	0	2	2
		0	0	0	0	0

Graph 4.1: Graphical representation of the objectives of 6th Standard

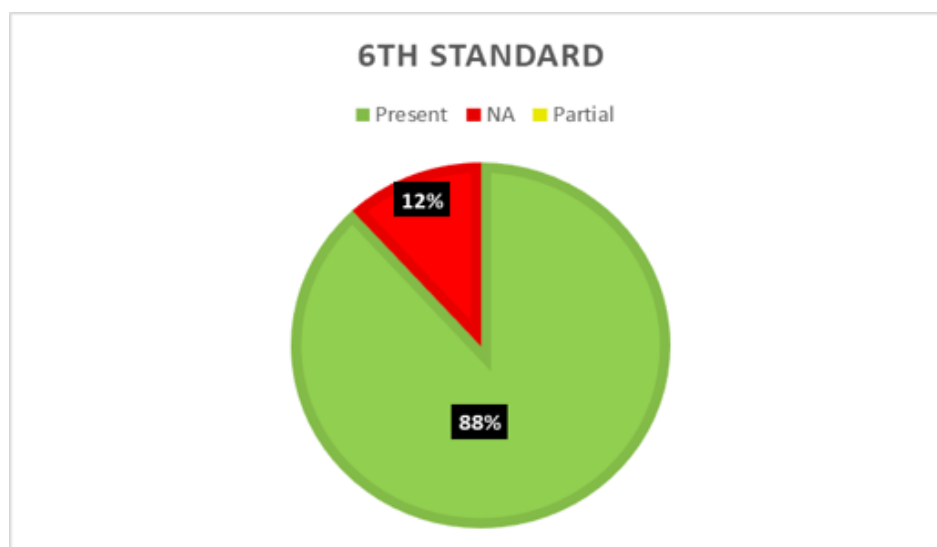


Table 4.7: The observation highlighted from the Objectives of 7th Standard

Flag		Core	Commitment	Achievement	Excellence	Total
	7th Standard	0	2	1	3	6
		0	0	0	4	4
		0	1	2	1	4

Graph 4.7: Graphical representation of the objectives of 7th Standard

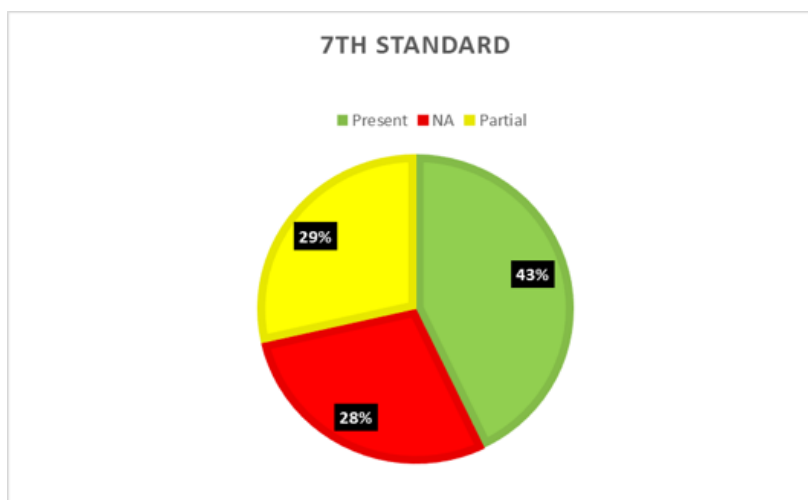


Table 4.8: The observation highlighted from the Objectives of 8th Standard

Flag		Core	Commitment	Achievement	Excellence	Total
	8th Standard	0	6	1	4	11
		0	3	0	3	6
		0	0	0	1	1

Graph 4.8: Graphical representation of the objectives of 8th Standard

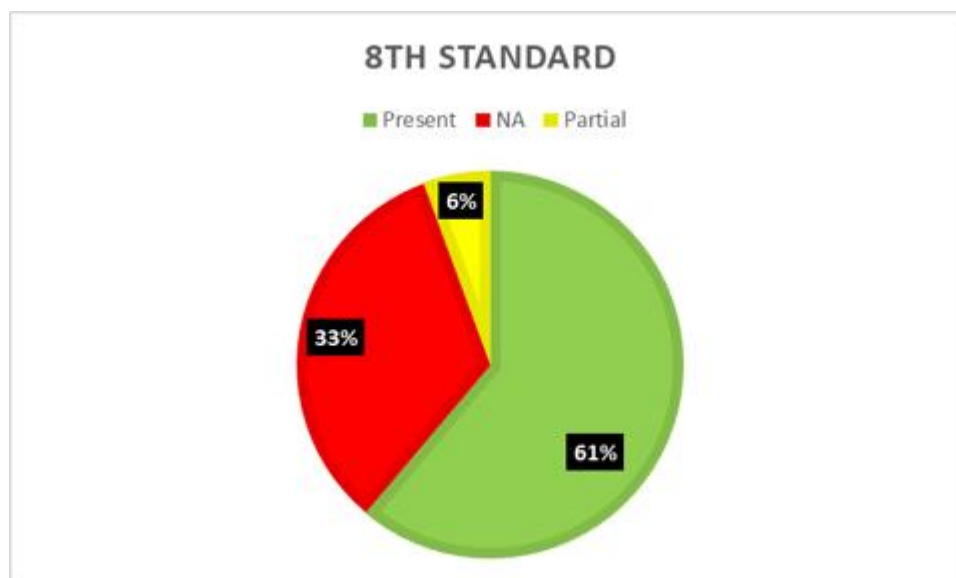


Table 4.9: A comparison between the Objectives of the Digital NABH standards and those that are present/ followed by MetahOS

STANDARD CRITERIA	CORE	COMMITMENT	ACHIEVEMENT	EXCELLENCE	TOTAL
TOTAL	17	68	46	51	182
Present/Followed	14	52	36	24	126
COMPLIANCE GRID	82.35294118	76.47058824	78.26086957	47.05882353	69.23076923

- The results of the comparison between the Digital NABH standards for hospitals and MetahOS functions are shown below in the table. It concentrates on the 182 unique objective components that the NABH standards provide.

Rows:

TOTAL: The number of objective items in each of the four major NABH criteria that were examined is shown in the Row.

Present/Followed : The number of objective aspects in each criterion that MetahOS features either now address or seem to follow is displayed in the row.

COMPLIANCE GRID: Using the following formula, the row shows the computed percentage of compliance for each criterion:

$$(\text{Followed/Present}) / (\text{TOTAL}) * 100$$

Columns:

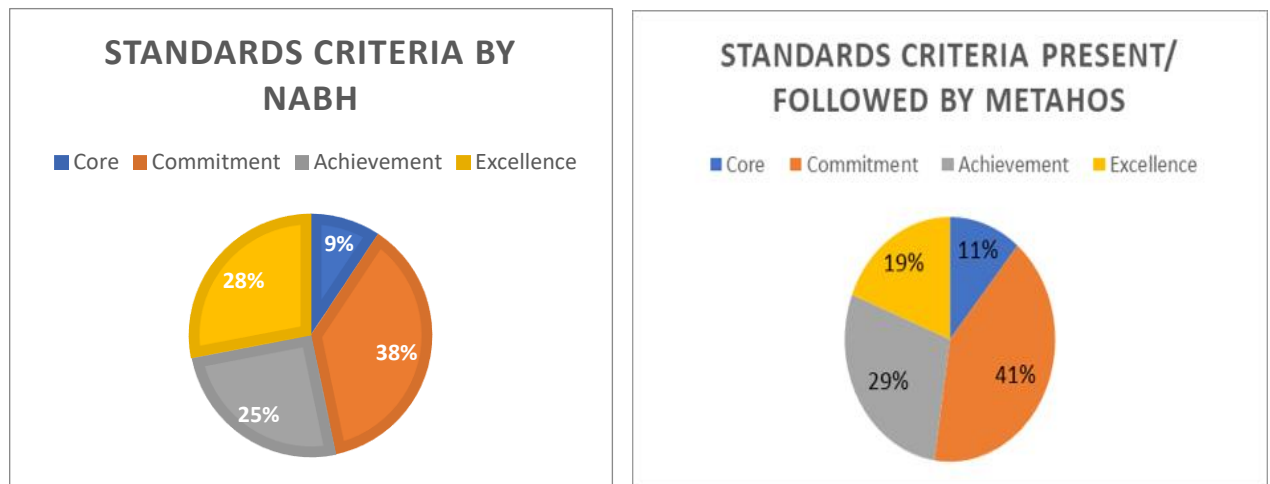
Every column denotes one of the four major NABH criteria that were examined: Core, Commitment, Achievement, Excellence

Key Findings:

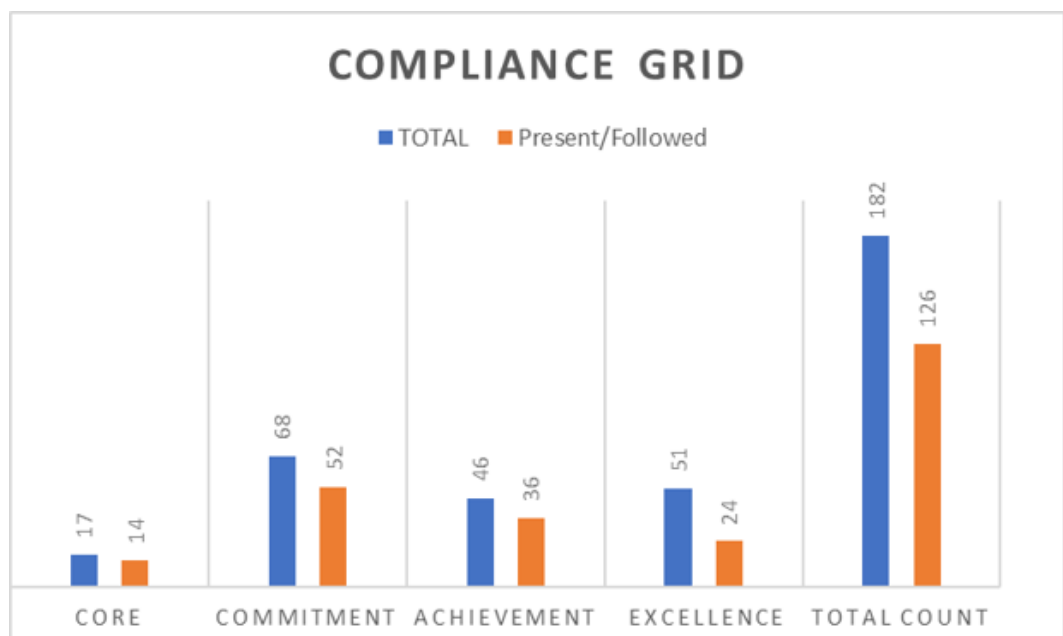
According to the total compliance grid score, MetahOS features meet 69.23% of the examined NABH requirements for each of the four major categories.

- Core (82.35%): This column shows the portion of Electronic Medical Records' (EMRs') target aspects that MetahOS features presently handle or seem to follow. EMRs are regarded as a fundamental component of digital healthcare and serve as its basis.
- Commitment (76.47%): The proportion of Data Security goal items that MetahOS features now address is shown in this column. Any healthcare company must make a commitment to data security.
- Achievement (78.26%): The proportion of Administrative Process goal items that MetahOS features now handle is shown in this column. Efficiency is increased when administrative procedures are made more efficient.
- Excellence (47.06%): The proportion of Patient Engagement objective components that are now addressed by MetahOS features is shown in this column. Healthcare aims to be the best in the field of patient involvement.

Graph 4.9: Graphical comparative analysis between the standard criteria by NABH vs standard criteria present/ followed by metahOS



- Comprehending the components in each domain where deficiencies are present can direct subsequent investigations and advancements pertaining to MetahOS. Hospitals thinking about using MetahOS may also utilize this data to evaluate possible areas where more features or integrations could be required in order to comply fully with digital accreditation standards.



Graph 4.10: A graphic representation of the observed data

Overall consensus: The statistics suggest a considerable degree of agreement between MetahOS features and the NABH digital health standards (the total of "Present/Followed" is 126). For a more accurate proportion, we may compute a compliance ratio of around $(126 / \text{total number of standards}) * 100$.

The information in this table on MetahOS's advantages and shortcomings in terms of helping hospitals obtain digital accreditation in accordance with NABH guidelines is quite helpful. Although MetahOS exhibits a notable level of congruence in fundamental features such as electronic medical records and data protection, there exists opportunities for enhancement in terms of promoting patient involvement and streamlining administrative procedures.

CHAPTER-5

DISCUSSION

Highlighting the Main Results:

- Research Question: We looked at the characteristics of MetahOS software and how well they converge and diverge with respect to the requirements specified in the Digital NABH standards (RQ1).
- Analysis of Compliance Grid: Overall Alignment About 69.23% of the 182 objective characteristics listed in the NABH standards were covered by MetahOS features. This indicates that there is a moderate to good overall alignment between the functionality of the program and the certification standards for digital health.

Advantages by Type:

- Essential Features (82.35%): Digital healthcare's cornerstone, electronic medical records, had the best compatibility with NABH standards. This shows that MetahOS covers essential features required for certification in an efficient manner.
- Data Security (76.47%): MetahOS's dedication to data security is evident in its high alignment, which is important for any healthcare firm.
- Administrative Procedures (78.26%): Using MetahOS capabilities to streamline administrative procedures is in line with NABH guidelines and might boost hospital productivity.
- Area for Improvement: Patient Engagement (47.06%): The lowest alignment was seen in this area, indicating that MetahOS features may not have all the functionality needed to effectively support NABH-recommended patient engagement activities.

Analysing the Results:

- **Alignment with Current Research:** Our results are consistent with previous research highlighting the significance of HIS characteristics like as EMRs, data security, and effective administrative procedures in attaining accreditation for digital health. These features are frequently seen as necessary for more efficient workflows and better healthcare provision.
- **Advantages of MetahOS:** Hospitals looking to obtain digital accreditation may find MetahOS to be a useful tool due to the high degree of alignment in its basic features. Meeting NABH criteria can be greatly aided by streamlining essential procedures like data security and EMR administration.
- **Meeting NABH standards:** Although MetahOS covers a large amount of NABH standards, there is still a functional gap that needs to be taken into account for patient involvement. To properly support patient engagement activities, hospitals striving for comprehensive digital health certification may need to investigate new functions or linkages.
- **Compliance Grid's limitations:** Although useful, the compliance grid technique might not fully capture all the nuances included in the NABH standards. The weighting and particular criteria applied to each category may not be entirely represented in the grid. Additionally, generalizability is limited by a concentration on MetahOS alone. It is not guaranteed that alternative HIS solutions would exhibit the same alignment patterns as MetahOS.

Importance of the Research:

- **Effect on Hospitals:** Hospitals thinking about using MetahOS to obtain digital health certification will benefit greatly from the insightful information this study offers. Hospitals may use the information to:
 - Determine which aspects of MetahOS performance are best and how it helps hospitals become ready for accreditation (core functionality, data security, administrative procedures).
 - To completely adhere to NABH requirements, identify any gaps in patient interaction features and look for alternative options.

- Learn more about how HIS features fit within the standards of digital health certification so that you may choose or use HIS solutions with confidence.
- **Gaining a Better Understanding of HIS Adoption:** Our study advances our knowledge of how HIS features help meet digital health requirements. It emphasizes how crucial certain features, including as data security, administrative process management, and electronic medical records, are to the achievement of accreditation. It also highlights how important patient interaction elements are becoming in reaching universal digital health standards.

Limitations:

- If indicated in the whole thesis, the investigation was restricted to MetahOS and healthcare facilities in a certain area. To present a more complete picture, additional study may examine a larger range of HIS solutions and healthcare facilities across different geographic regions.
- As was previously said, the compliance grid technique has drawbacks despite its value. Subsequent research endeavours may investigate distinct techniques for assessing HIS conformity with digital health standards, maybe integrating professional evaluations or actual implementation data.

CHAPTER-6

CONCLUSION

Implementing a compliance grid, a comparative analysis technique was used to evaluate how well MetahOS features matched to the 182 objective components of the NABH digital health standards. In addition to pertinent research articles and case studies, data was gathered from official MetahOS and NABH sources. Throughout the investigation, ethical issues were addressed, especially with regard to accessing hospital computer systems that house patient data.

For hospitals considering using MetahOS for digital health accreditation, this study provides insightful information. They may use these results to pinpoint MetahOS's strong points and spot any holes that could need more work. Additionally, the study advances our knowledge of how HIS characteristics might support the achievement of digital health standards. Along with the increasing relevance of patient interaction features in reaching comprehensive digital health goals, the necessity of certain functionality for certification success is emphasized.

The analysis concludes that there is a moderate to good compatibility between the digital health criteria set by NABH and the features of MetahOS. Hospitals striving for full digital health certification must overcome the gap in patient interaction features, even while MetahOS excels in basic functions and data security. The study opens the door for more investigation into how HIS adoption affects patient outcomes and accreditation success rates by highlighting the importance of HIS features in meeting digital health requirements.

CHAPTER -7

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