Dissertation Training

at

MyHealthcare Technologies Pvt Ltd.

Assessment of the effectiveness of Hospital Information System Training in Sparsh Hospital: A case of outpatient billing department

by

Chirag Yadav
Enroll No.- PG/22/024

Under the guidance of

Dr. Anandhi Ramachandran

PGDM (Hospital and Health Management)
2022-24

International Institute of Health Management Research New Delhi

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Dated: 9th July 2024

TO WHOM IT MAY CONCERN

This is to certify that Chirag Yadav, a student of IIHMR Delhi, is undergoing an internship as Management Trainee with MyHealthcare Technologies Private Limited since 4th March 2024 and he is continuing his internship as on date.

For and on behalf of MyHealthcare Technologies

Kuntal Sinha Roy
VP - Human Resource
MyHealthcare Technologies Private Limited

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Chirag Yadav** student of PGDM (Hospital & Health Management) from International Institute of Health Management Research, New Delhi has undergone internship training at **MyHealthcare Technologies Pvt Ltd.** from 4th March 2024 to 4th June 2024.

The Candidate has successfully carried out the study designated to him during internship training and his approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements. I wish him all success in all his future endeavors.

Dr. Sumesh Kumar
Associate Dean, Academic and Student Affairs
IIHMR, New Delhi

Dr. Anandhi Ramachandran
Mentor
IIHMR, New Delhi

Certificate of Approval

The following dissertation titled "Assessment of effectiveness of HIS training in Sparsh Hospital" at "MyHealthcare Technologies" is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **PGDM (Hospital & Health Management)** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed, or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation.

Name	Signature
_____	_____
_____	_____
_____	_____

Certificate from Dissertation Advisory Committee

This is to certify that **Mr. Chirag Yadav,** a graduate student of the **PGDM (Hospital & Health Management)** has worked under our guidance and supervision. He is submitting this dissertation titled **"Assessment of Effectiveness of Hospital Information System Training in Sparsh Hospital: A Case of Outpatient Billing Department"** at **"MyHealthcare Technologies Pvt Ltd."** in partial fulfillment of the requirements for the award of the **PGDM (Hospital & Health Management).**

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.

Dr. Anandhi Ramachandran
Professor
IIHMR Delhi

Diwakar Bhowmik
Chief Operating Officer
MyHealthcare Technologies Pvt Ltd.

INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH, NEW DELHI

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled "**Assessment of the effectiveness of Hospital Information System Training in Sparsh Hospital: A case of outpatient billing department"** and submitted by **Chirag Yadav** Enrollment No. PG/22/024 under the supervision of **Dr. Anandhi Ramachandran** for award of PGDM (Hospital & Health Management) of the Institute carried out during the period from 4th March 2024 to 4th June 2024 embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Chirag Yadav

FEEDBACK FORM

Name of the Student: Chirag Yadav

Name of the Organization in Which Dissertation Has Been Completed: MyHealthcare Technologies Pvt Ltd.

Area of Dissertation: CLINICAL & NON-CLINICAL TRANSFORMATION

Attendance: 100%

Objectives achieved:

1) Pre go-live trainings of end users (SPARSH BANGALORE & RBH HOSPITAL JAIPUR)
2) Implementation & Post-golive support to end users.
3) Requirement gathering for CKB, Gurgaon.

Deliverables:

1) GAP Analysis between two HIS systems for smooth implementation.
2) Successful implementation & support for Sparsh Hospital & RBH Hospital, Jaipur
3) Documentation required for implementation.

Strengths:

1) Quick learner & good understanding of Hospital process flows.
2) Takes ownership of assigned task & completion of task in timely Manner.

Suggestions for Improvement:

1) Dedicate the work to a specific segment instead of all the modules at same time
2) Better communication with stakeholders.

Suggestions for Institute (course curriculum, industry interaction, placement, alumni):

1) Institute should include hospital flows sothat the students have some Idea.
2) Voluntary Internships to be included.

Diwakar Bhowmik
Organization Mentor (Dissertation)

Bhowmik
15/07/2024
(Gurgaon).

Acknowledgement:

This dissertation has been a rewarding journey of learning and professional development. I'm grateful for the opportunity to have conducted my research at MyHealthcare Technologies. The expertise and knowledge I gained from the professionals there have been incredibly valuable.

I'd like to express my deepest appreciation to the faculty and staff at IIHMR Delhi. Their dedication to providing a high-quality education and fostering a supportive learning environment has significantly impacted my academic journey. The opportunity to pursue my research interests and enhance my knowledge wouldn't have been possible without their commitment.

A special thanks goes to my mentor, **Dr. Anandhi Ramachandran**, for her invaluable guidance, support, and expertise throughout this project. I'm particularly thankful to **Shyatto Raha, Divya Laroyia** and **Diwakar Bhowmik** for their valuable insights. Their timely support, encouragement, and unwavering assistance were instrumental in shaping my research.

I would also like to acknowledge **Saurabh Yadav** for his mentorship and active cooperation. Finally, my appreciation goes to my colleagues and the entire staff at MyHealthcare Technologies for their support. Their contribution significantly aided the success of this project. Thank you to everyone who played a role in this journey.

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LIST OF ABBREVIATIONS

HMIS- Hospital Management Information System

OPD- Out-patient Department

IPD- In-patient Department

EMR- Electronic Medical Record

LIS- Laboratory Information System

RIS- Radiology Information System

ICD- International Classification of Disease

HIS- Hospital Information System

LASA- Look Alike Sound Alike

PACS- Picture Archiving and Communication System

SOAP- Subjective, Objective, Assessment, Plan

Scope of the Project:

The scope of this dissertation study is to assess the effectiveness of Hospital Information System (HIS) training within the outpatient billing department at Sparsh Hospital. The study will focus on evaluating the impact of HIS training programs on the proficiency and performance of staff members involved in outpatient billing processes. It will be conducted exclusively within Sparsh Hospital, concentrating on the outpatient billing department, which plays a crucial role in revenue management and patient service delivery. The project will adhere to a defined time frame for data collection, analysis, and reporting, encompassing both initial training sessions for new staff and ongoing training initiatives. Participant selection will include billing clerks, supervisors, and relevant personnel engaged in utilizing HIS for billing procedures. Evaluation methodologies will include both quantitative and qualitative approaches to measure outcomes such as billing accuracy, efficiency gains, and staff confidence levels in system usage. The study will provide practical recommendations tailored to optimize HIS training effectiveness, aiming to enhance staff competencies and departmental performance outcomes within the outpatient billing department at Sparsh Hospital.

ABOUT THE INDUSTRY:

The Hospital Management Information System (HMIS) is a comprehensive software solution designed to streamline and automate various administrative, financial, and clinical processes in healthcare organizations. It serves as a central repository for storing and managing patient information, medical records, financial data, inventory, and other critical data related to the healthcare facility.

HMIS plays a crucial role in the healthcare industry by improving operational efficiency, enhancing patient care, and facilitating better decision-making. Some key features and benefits of HMIS include:

- Patient Management: HMIS allows healthcare providers to efficiently manage patient registrations, appointments, admissions, and discharge processes. It enables easy access to patient records, medical history, and diagnostic reports, promoting better coordination and continuity of care.
- Electronic Health Records (EHR): HMIS facilitates the creation, storage, and retrieval of electronic health records, eliminating the need for paper-based records. EHRs provide a comprehensive view of patient health, including medical history, medications, allergies, and test results, enabling healthcare professionals to make informed treatment decisions.
- Clinical Decision Support: HMIS incorporates clinical decision support tools that provide healthcare providers with real-time alerts, reminders, and clinical guidelines based on evidence-based medicine. This assists in reducing medical errors, improving patient safety, and enhancing the quality of care.

- Financial Management: HMIS includes modules for managing billing, invoicing, insurance claims, and financial transactions. It helps healthcare organizations streamline revenue cycles, monitor financial performance, and ensure accurate billing and reimbursement processes.
- Inventory Management: HMIS enables effective management of medical supplies, equipment, and pharmaceuticals. It tracks inventory levels, automates reordering processes, and ensures the timely availability of essential items, minimizing stockouts and reducing costs.
- Reporting and Analytics: HMIS generates comprehensive reports and analytics on various aspects of healthcare operations, including patient outcomes, resource utilization, financial performance, and quality indicators. This data-driven approach assists in identifying trends, making informed decisions, and improving overall efficiency and patient care.

HMIS (Hospital Management Information System) prevalence in India has been increasing steadily in recent years. The Indian healthcare industry has recognized the importance of adopting technology-driven solutions to improve healthcare delivery, streamline operations, and enhance patient care.

Government Initiatives:

The Government of India has taken several initiatives to promote the implementation of HMIS across healthcare facilities in the country. The National Health Mission (NHM), a flagship program of the government, has played a significant role in driving the adoption of HMIS in public healthcare facilities. Under NHM, various states and union territories have been encouraged to implement HMIS to improve health information management and monitoring systems.

Private Sector Adoption:

The private healthcare sector in India has also recognized the benefits of HMIS and has been actively implementing HMIS solutions in its facilities. Large corporate hospitals, multi-specialty clinics, and diagnostic centres have adopted HMIS to streamline their operations, enhance patient care, and improve overall efficiency.

ABOUT THE ORGANIZATION:

MyHealthcare Technologies is a digital health tech company that focuses on building an integrated, digital patient care ecosystem. The company collaborates with hospitals and clinics to create a comprehensive healthcare platform centered around patient-centric care delivery. The platform encompasses various aspects of healthcare, including doctor consultations (both physical and virtual), home diagnostics, pharmacy services, home healthcare, remote patient monitoring, preventive health, vaccination programs, and more.

One of the key goals of MyHealthcare is to bridge the gap in healthcare delivery using the latest advancements in digital technology. The company aims to create a data-driven care continuum process that enhances patient engagement and empowers individuals to manage their own healthcare needs and those of their families.

The MyHealthcare ecosystem revolves around the concept of a structured repository of a patient's clinical data and longitudinal history. It integrates all interventions and services offered through the platform, providing a comprehensive overview of the patient's healthcare journey. This approach allows for better coordination and continuity of care.

Headquartered in Gurgaon (Delhi NCR), MyHealthcare has technology centres in Bangalore and Dehradun. The company also maintains sales offices across several countries, including India, Malaysia, Thailand, Singapore, Indonesia, Philippines, Vietnam, and Hong Kong.

The digital healthcare ecosystem provided by MyHealthcare includes a 360-degree clinical management system for doctors and nurses. This system encompasses various platforms such as practice management, patient management, and electronic medical records (EMRs). EMRs are

available for different specialties, including General Physician/Internal Medicine, Pediatrics, Endocrinology, and Cardiology. Additional EMRs for specialties such as Obstetrics & Gynaecology, Oncology, Dentistry, Ophthalmology, and Neurology are planned to be available soon.

The cloud-based solution offered by MyHealthcare enables clinicians, doctors, and nurses to manage patient care through web and mobile platforms. It incorporates a built-in virtual consultation platform, allowing doctors to securely conduct video or audio consultations with their patients. The platform also facilitates remote prescription management and review of patient records. Augmented intelligence and 7 artificial intelligences are integrated into the EMR ecosystem to analyse a patient's clinical history, map diagnoses to global standards such as ICD-10 and SNOMED CT and enhance the efficiency of managing patient care.

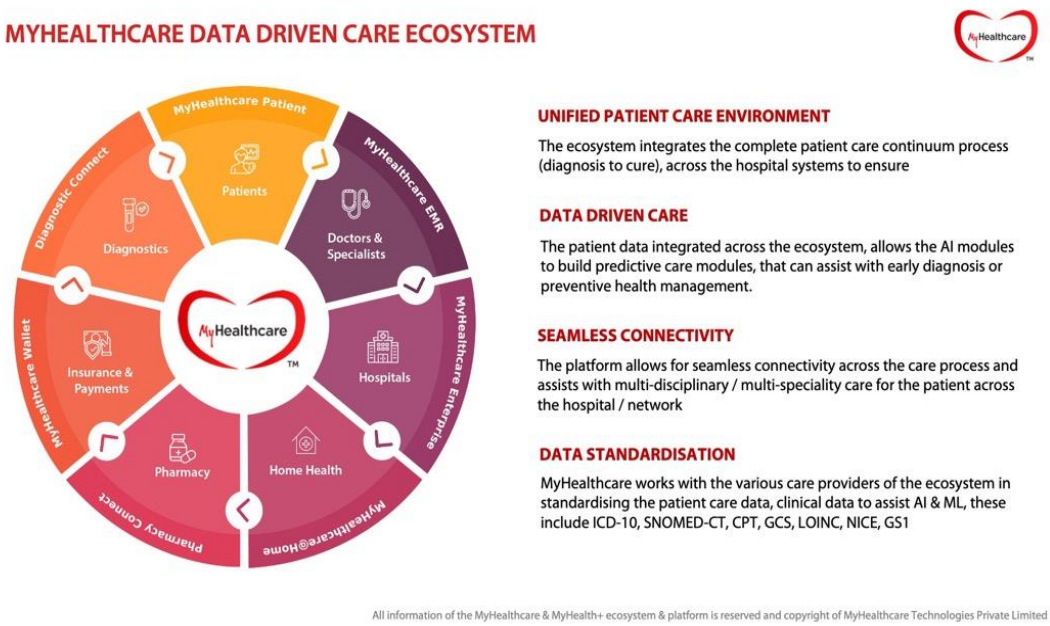
MyHealthcare ecosystem includes a comprehensive library of care protocols and encompasses attributes for over 19,000 drugs. The availability of a patient's longitudinal history helps in managing emergency care needs, while the integrated care platform aims to improve patient experience and deliver better clinical outcomes.

Furthermore, MyHealthcare offers the MyHealthcare@Home ecosystem, which provides a connected care platform for managing patients from a centralized command centre. This scalable platform enables the monitoring of a large pool of patients from a single location, including remote patient monitoring and home isolation monitoring.

MyHealthcare AI utilizes clinical data, treatment protocols, and big data generated from partner hospitals to develop augmented intelligence modules. These modules assist in diagnosing

conditions and offer complete cure process protocols, leveraging the power of artificial intelligence and data analytics.

Fig.1:



The MyHealthcare platform incorporates various core platforms and features to provide a connected care ecosystem. These include:

Patient Ecosystem (Web and Mobile): Patients can connect with doctors, seek appointments for virtual or in-person consultations, upload documents and notes, and receive post-consult prescriptions.

Hospital Portal: A patient support platform for the hospital team to manage patient related activities and information.

Doctor/Nurse EMR & Practice Management: Web, mobile, and tablet platforms for doctors and nurses to manage electronic medical records (EMRs), practice management, and patient care.

MyHealthcare@Home Command Centre: A web-based platform that enables centralized monitoring and management of patients, including remote patient monitoring and home isolation monitoring.

Homecare nursing platform: Web and mobile platforms for managing homecare nursing services. Remote patient monitoring: Web and mobile platforms for monitoring patients remotely, including vital signs and health data.

Queue Management System (mobile): A mobile application to manage patient queues and appointments efficiently.

Experience Feedback System: A system to collect and analyse patient feedback to improve the healthcare experience.

Lead Management System (CRM) - web: A web-based system to manage leads and customer relationship management for healthcare providers.

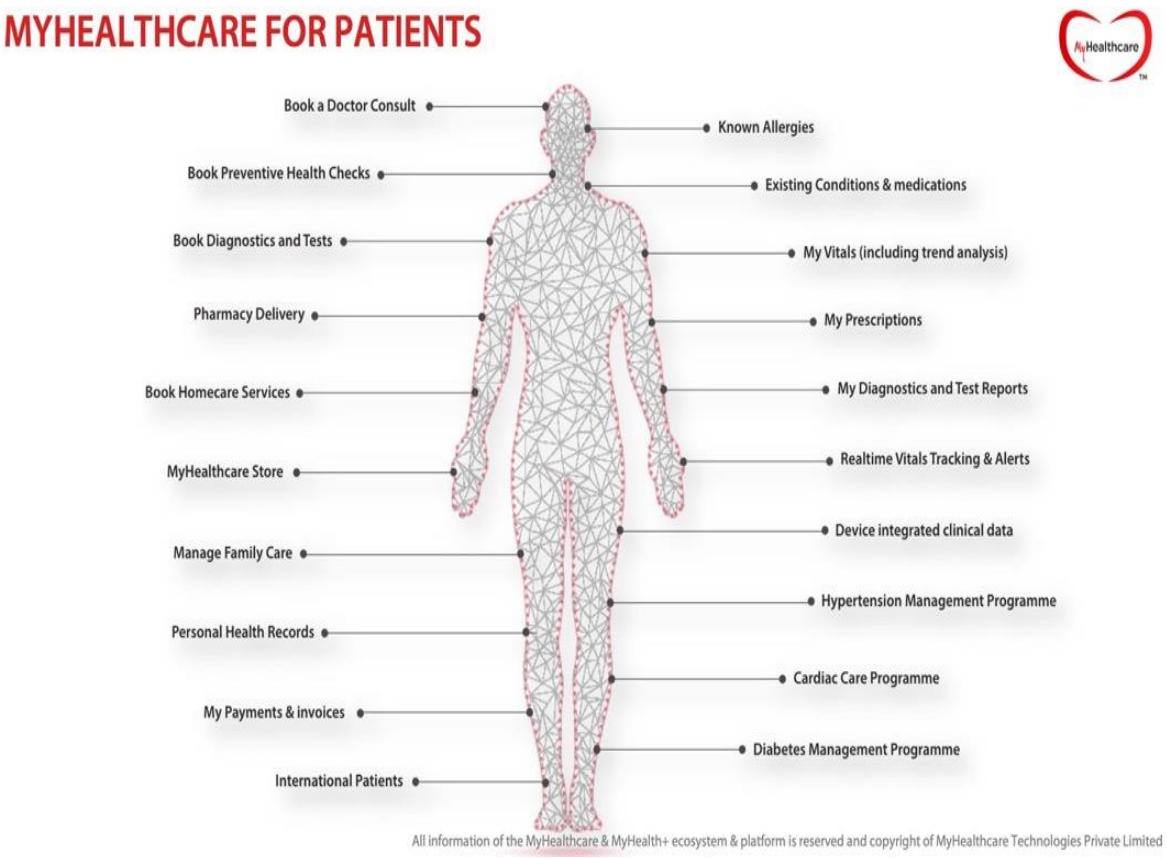
Fig.2:

The MyHealthcare Patient Platform allows patients from various regions to connect with doctors, seek appointments for virtual consultations or in-person visits, upload documents and notes,

receive prescriptions, and manage their healthcare needs. The platform supports services such as diagnostics at home, pharmacy services at home, home care, remote patient monitoring, and home isolation monitoring.

The virtual consultation platform provided by MyHealthcare ensures high levels of security and encryption. Patients access video consultations through the MyHealthcare patient mobile apps. During virtual consultations, doctors have access to the patient's complete medical records, relevant test reports, past clinical history, and real-time documents uploaded by the patient.

Fig.3:



MYHEALTHCARE PATIENT APPLICATION

The MyHealthcare Patient Application is an integrated ecosystem that allows patients and their families to manage their healthcare needs. It provides features such as patient registration, appointment booking for consultations, secure video consultations, centralized storage of prescriptions and reports, booking diagnostic tests and health check-up packages, homecare service booking, e-pharmacy orders, profile management, family member registration, online payment options, coupon codes for promotions, tracking of bookings, document uploads, management of allergies and existing conditions, patient history management, personal health records (PHR), vitals tracking, device integrations for monitoring, viewing family prescriptions, invoice delivery, and a loyalty and rewards program.

Overall, the MyHealthcare platform offers a comprehensive and user-friendly experience for patients to access healthcare services, manage their health records, and engage in virtual consultations and remote monitoring, among other features.

TITLE:

Assessment of the effectiveness of Hospital Information System Training in Sparsh Hospital: A case of outpatient billing department

- **Chirag Yadav**

Abstract:

This study investigates the impact of training programs on the successful adoption of a new Hospital Information System (HIS) called MyHealthcare Enterprise Application (MHEA) at Sparsh Hospital. MHEA is a comprehensive system designed to streamline workflows, improve operational efficiency, and enhance patient care.

The research employed a cross-sectional design with a purposive sample of 25 outpatient billing staff members. Data collection involved pre- and post-training surveys to assess changes in staff's familiarity, readiness, and confidence levels using the new HIS. Additionally, a semi-structured training feedback survey was conducted to evaluate the training program's quality.

The findings revealed positive outcomes from the HIS training program. Staff reported increased comfort levels with essential HIS tasks like patient registration, billing, and appointment management. Thematic analysis of training feedback highlighted the program's effectiveness in areas like billing and registration functionalities, interactive sessions, and trainers' expertise.

This study emphasizes the crucial role of well-designed training programs in facilitating a smooth transition to a new HIS. By identifying areas for improvement, such as the need for additional training materials and more hands-on practice, future iterations of the training program can be optimized to ensure staff preparedness and maximize the benefits of MHEA for Sparsh Hospital.

INTRODUCTION:

In the ever-evolving landscape of healthcare, the successful implementation of a new Hospital Information System (HIS) is crucial for enhancing operational efficiency and patient care delivery. Hospital Information System (HIS) can be defined as a massive, integrated system, designed to store, manipulate, retrieve information of the administrative and clinical aspects, that support the comprehensive information requirements of hospitals, including patient, clinical, ancillary and financial management. Health Information Systems (HISs) have been proposed as one solution in a multipronged organizational approach to transforming the quality of care delivered, increasing patient safety, and reducing health care costs. Sparsh Hospital, a renowned healthcare institution, recently embarked on the adoption of a new HIS to streamline its operational services. Central to this endeavor is the comprehensive training of outpatient staff to ensure seamless integration and utilization of the new system. This research aims to analyze the impact of outpatient staff training on the successful implementation of the HIS at Sparsh Hospital. By evaluating the effectiveness of training programs, assessing staff readiness and confidence levels, and identifying potential challenges, this study seeks to provide insights into the critical role of staff training in HIS adoption. Ultimately, the findings will contribute to optimizing training strategies and facilitating the smooth transition to the new HIS, thereby improving healthcare delivery and patient outcomes.

The healthcare sector has seen a rapid transformation in the past few years, propelled by technological breakthroughs and an increasing need for effective and superior patient care. Hospital Information Systems (HISs) are all-inclusive software programs created to oversee the clinical, administrative, and support facets of hospitals. Healthcare organizations now depend more and more on the deployment of HISs to improve decision-making, expedite processes, and raise the standard of care provided.

Hospital information systems (HIS) are large, integrated systems that store, process, and retrieve data related to hospital administration and clinical operations. They provide the whole information needs of hospitals, including financial operations, clinical documentation, ancillary services, and patient management. Hospitals can convert from traditional paper-based medical records to digital records, which are easier to access, handle, and process more effectively, by using HIS.

The advantages of using HIS are numerous and encompass multiple stakeholders in healthcare organizations. HIS provides increased decision-making skills, streamlined workflows, and higher healthcare service quality to physicians and hospital administration personnel. Healthcare providers can make well-informed decisions about diagnosis, treatment, and care thanks to HIS's ability to give accurate and timely access to patient information. HIS also helps to lower costs, boost productivity, and provide high-quality healthcare services.

Nonetheless, there are a lot of obstacles in the way of HIS's effective adoption and deployment. Insufficient user training and limited understanding of HIS features frequently impede the successful application and efficient use of these systems. To effectively utilize the capabilities of the HIS and adjust to the changes brought about by its adoption, hospital staff members require thorough training. HIS might not perform to the initial expectations without the right training, producing less than ideal results.

Moreover, a key factor in the effective installation and functioning of these systems is the acceptance and adoption of HISs by healthcare personnel and specialists. The acceptability and use of HISs can be influenced by user-friendliness, computer interface familiarity, and attitudes toward technology. It is critical to identify the factors that influence users' adoption of HIS to build strategies that encourage positive reactions and enable seamless implementation.

The MyHealthcare Enterprise Application (MHEA) is a complete system for managing healthcare information that is intended to standardize operations, establish SOPs, and promote communication between departments within healthcare institutions. It acts as the central mechanism that facilitates departmental workflow optimization and guarantees smooth operation. One of the main characteristics of MHEA is its Single Screen HIMS, which gives users a single interface to carry out different tasks without having to go through a number of menus. Task completion is made easier and user productivity is increased by this design.

Healthcare organizations can actively monitor departmental operations in addition to tracking and analyzing patient data over time by deploying MHEA. By integrating best practices and SOPs across all departments, this level of monitoring helps firms reach the highest possible level of efficiency. By utilizing data and technology, maximizing resource usage, and cutting operating costs, MHEA also helps to improve patient happiness and the quality of service.

MHEA is based on open-source technology and makes use of developments in data security, process automation, and machine learning. Delivered as a cloud-based Software-as-a-Service (SaaS) platform, it helps hospitals cut operating costs by doing away with ongoing fees associated with proprietary licenses and database subscriptions.

The following are some advantages of using the MyHealthcare Enterprise Application:

- Worklist-Based Single Screen: This method allows for effective job management by giving each user access to a consolidated task list on a single screen.
- Point-of-Care Information: MHEA helps patients make educated decisions by providing precise, current, and thorough patient information at the point of care.

- Compliance with Healthcare IT Standards: MHEA complies with healthcare IT standards to guarantee smooth data transfer across various systems, facilitating a quicker and more accurate flow of information.
- Real-time Turnaround Time (TAT) Monitoring: MHEA makes it possible to track TATs in real-time, which enables patients to receive treatments more quickly.
- Improved Patient and Provider connection: MHEA makes healthcare more convenient by fostering better patient and provider connection and communication.
- Cost-cutting measures: MHEA lowers paperwork, offers quicker and simpler mobile device access to data online, and lowers overall costs.
- Workflow-Based Task Management: This improves workflow efficiency by allowing users to move between screens and handle tasks according to their roles and responsibilities.
- TAT and Escalation Alerts: To ensure that tasks are closed as soon as possible, MHEA automatically escalates activities that take longer than expected or call for quick attention.
- Notifications: Users are informed and communication is enhanced via automated alerts that are sent when a task is completed.
- Streamlined Claim Processing: MHEA makes it possible for payers and insurance companies to process claims more quickly and accurately. This leads to fewer deductions and denies payments, which eventually improves financial returns.

With its advanced technological stack and configurable workflow engine, MyHealthcare Enterprise Application (MHEA) seeks to improve operational efficiency, optimize procedures, and improve patient care inside healthcare businesses. Evaluation of training programs' effectiveness in providing end users with the abilities and information required to effectively use the Healthcare Management Information System (HMIS)

is the main goal of the research. It additionally aims to assess the impact of adding new features to the HMIS on user acceptance and satisfaction. The purpose of this article is to investigate how acceptable HIS is to hospital personnel and medical experts. Through an evaluation of their attitudes, knowledge, and training requirements, this study aims to pinpoint obstacles to HIS adoption and suggest tactics for improving implementation and user satisfaction. The project's goal is to improve the MyHealthcare System's HMIS adoption and user happiness, which will raise the standard and efficacy of the healthcare services offered overall.

Hospital information systems have the ability to significantly increase decision-making skills, streamline processes, and improve the quality of healthcare services. However, addressing the issues with user acceptability, training, and system usability is essential to ensuring successful adoption and usage. Healthcare organizations may create focused plans to maximize the advantages of these systems and eventually enhance patient care outcomes by knowing the elements driving HIS acceptance and implementation.

The project's ultimate goal is to improve the MyHealthcare System's HMIS uptake and user satisfaction. The initiative hopes to raise the organization's overall efficiency and quality of healthcare services by raising the adoption rate and satisfaction levels. The appraisal of new features and training programs will offer insightful information on HMIS’s advantages and potential areas for development. In order to better serve end users' demands as well as the goals of the healthcare organization, this input can subsequently be utilized to improve user assistance, train tactics, and further optimize the HMIS.

OP Consultation Billing Workflow:

1. **Patient Registration:** The process starts with patient registration. The patient enters their mobile number into a designated field on a website.
2. **Patient Lookup:** The system checks if the patient is already registered.

   If the patient is registered, a list of registered patients is populated, and the user can select the patient from the list. If not,

   New Patient Registration: If the patient is not registered, the system prompts the user to register the patient.
3. **OP Bill Screen:** Once the patient is selected or registered, the user clicks on an "OP Bill" button. This could be for an out-patient consultation bill.
4. **Encounter Creation:** The user then clicks on the “Create New Encounter" button. An encounter is a meeting between a healthcare provider and a patient.
5. **Practitioner Selection:** The user selects the practitioner, likely the doctor or other healthcare professional, involved in the consultation.
6. **Slot Selection:** The user selects the time slot for the consultation.
7. **Consultation:** After selecting the slot, the user clicks on a "Consult" button, which likely initiates the consultation.
8. **Payment Mode Selection:** The user can then select the mode of payment, such as cash, UPI or credit/debit card.
9. **Invoice Generation:** An invoice is then generated.

OP Service Billing Workflow:

1. **Patient Registration:** The process starts with patient registration. The patient enters their mobile number into a designated field on a website.
2. **Patient Lookup:** The system checks if the patient is already registered.

   If the patient is registered, a list of registered patients is populated, and the user can select the patient from the list. If the patient is not registered:

   New Patient Registration: If the patient is not registered, the system prompts the user to register the patient.
3. **OP Bill Screen:** Once the patient is selected or registered, the user clicks on an "OP Bill" button. This could be for an out-patient consultation bill.
4. **Select Relevant Encounter:** Select the relevant encounter or create a new encounter.
5. **Practitioner Selection:** The user selects the practitioner, likely the doctor or other healthcare professional, with respect to the service to be selected.
6. **Add Services:** Then select and add the services.
7. **Select Payment Mode:** The user can then select the mode of payment, such as cash, UPI or credit/debit card.
8. **Invoice Generation:** An invoice is then generated.
9. **Token Generation:** A lab or radiology token is then generated.

Objectives:

To assess the effectiveness of the HIS related training provided to the outpatient billing staff of Sparsh Hospital.

Research Questions:

Did the training sufficiently equip staff to carry out essential tasks within the new HIS environment?

What is the level of confidence among staff in utilizing the new system after completing the training program?

What are the staff's perceptions regarding the effectiveness of the training program, and what areas could be improved for future implementations?

Review of Literature:

Authors (Year)	Study Location	Salient Features
Sima Ajami and Zohreh Mohammadi-Bertiani (2012)		The study identified inadequate training as a major cause of HIS failure. Literature searches across libraries, databases, and search engines identified relevant articles focusing on training's impact on user satisfaction and HIS success. From over 75 results, 41 articles were selected for analysis. The findings emphasized user training as a key factor for HIS adoption and highlighted the challenges of user resistance due to job insecurity from lack of training. The study suggests that involving users in HIS design and implementation can be a solution to overcome these challenges.
Leila Ahmadian, Nafise Dorosti, Reza Khajouei and Sadrieh Hajesmaeel Gohari (2017)	Kerman, Iran (Hospitals - both academic and non-academic)	According to the survey, the most common and important issues facing university hospitals had to do with the surrounding human environment, specifically the "negative attitude of society about employing HIS, lack of incentive to use system." Recommendations like- Implement strategies to address human environment and human factors (e.g., in-service training, incentives), Increase user motivation and satisfaction with HIS were proposed.
Rully Sumarlin (2018)	Dewi Sri Hospital Karawang, Indonesia	The aim of the study was to improve the quality of medical treatment delivered by physicians and hospital staff. In order to evaluate the system's installation and effect on the entire delivery of health services at Dewi Sri Hospital, the study included user interviews and observations. The goal of the research was to pinpoint areas in need of development and raise the system's efficiency in assisting in the delivery of high-quality healthcare.

B. K. Murthy, P. K. Srivastava, A. S. Cheema (2014)	PGIMER, Chandigarh	Even with effective planning and staggered implementation, there is still concern about the challenges associated with using and implementing HIS. This includes administrative obstacles including lack of ownership, user acceptance, stakeholder involvement, and technical issues like data security, unauthorized access, secret information, and the integration of medical software to prevent double entry. Although these approaches don't fully achieve the objectives of the HIS, they can lessen this by using data entry operators or offline and duplicate entries. This study discusses the challenges faced during the implementation of HIS in a super specialty hospital.

Research Methodology:

Type of Study: Cross-sectional Design

This study employs a cross-sectional design. Data will be collected from a specific sample of outpatient billing (OPD) staff at Sparsh Hospital at a single point in time. This design is particularly suited to investigate the immediate impact of the new Hospital Information System (HIS) training program on staff's familiarity, readiness, and perceived confidence level.

Study Population: Billing Staff of the OPD

The target population for this study comprises all full-time and part-time billing staff members at Sparsh Hospital who will be utilizing the new HIS in their daily tasks.

Sample Size and Selection: Purposive Sample (n=25)

A purposive sampling technique will be employed to recruit a sample size of 25 participants. This method ensures the selection of individuals who best represent the target population – in this case, all OP billing staff who will be directly affected by and working with the new HIS.

Inclusion Criteria:

All full-time and part-time outpatient billing staff members at Sparsh Hospital who will be using the new HIS.

Staff members scheduled to attend the HIS training program.

Staff members who have completed the training program.

Exclusion Criteria:

Staff members who will not be using the new HIS in their daily tasks will be excluded to ensure the data collected reflects the experiences of those directly impacted by the training program. Staff members who are on leave or unavailable during the data collection period will be excluded to minimize participation bias and ensure data integrity.

Data Collection Method & Tool: Mixed Methods Approach

This study will utilize a mixed methods approach, combining quantitative and qualitative data collection methods to gain a more comprehensive understanding of the impact of the HIS training program.

A. Pre- and Post-Training Surveys:

Quantitative Tool: A structured questionnaire will be employed for both the pre- and post-training surveys. This questionnaire will utilize a standardized format with closed-ended questions to assess participants' self-reported:

- Familiarity with the new HIS: Questions will gauge participants' prior knowledge and experience with similar HIS systems or related software.
- Readiness to utilize the system: This section will assess participants' perceived preparedness to confidently apply the new HIS in their daily tasks after the training program.
- Perceived confidence level: The survey will measure participants' self-reported level of confidence in using the new HIS effectively to complete their billing tasks.

Implementation and Training Delivery:

- To establish a baseline understanding, an initial demonstration of the HIS will be provided before implementing the system.
- This will be followed by a comprehensive training program focused on the key features and functionalities of the new HIS relevant to the OP billing staff's workflow.

Pre-Training Survey: The pre-training survey will be administered to all participants before they commence the HIS training program. This will capture their baseline knowledge, readiness, and confidence levels regarding the new system.

Post-Training Survey: The identical survey will be administered again approximately two weeks after the HIS implementation. This timeframe allows participants to gain initial hands-on experience with the system following the training program. The post-training survey results will be compared to the pre-training data to assess the effectiveness of the training program in improving participants' familiarity, readiness, and perceived confidence level in using the new HIS.

B. Training Feedback Survey:

Qualitative Tool: A semi-structured questionnaire will be used to collect feedback from participants immediately after the HIS training program. This survey will include a combination of closed-ended and open-ended questions to gather insights on:

- Content: The clarity, comprehensiveness, and relevance of the training content to the OP billing staff's needs.
- Delivery: The effectiveness of the training delivery methods (e.g., instructor

presentation, hands-on exercises) in facilitating learning.

- Overall Satisfaction: Participants' general impressions and satisfaction level with the training program.

The open-ended questions in the training feedback survey will allow participants to elaborate on their experiences and provide valuable qualitative data beyond the pre- and post-training quantitative results. This comprehensive approach using mixed methods will provide a richer understanding of the training program's impact on the OP billing staff.

Results:

The study interviewed a total of 25 participants. All the participants agreed that the training they attended was important for them and the objectives of the training session were clearly indicated. Out of all the participants, 19 got the training for registration module, 20 got the training for billing module, 16 got the training for appointment module and 10 of them got the training for the complete HIS.

When asked about the effectiveness of the training, 72% agreed that the training was very effective, 28% stated that the training was somewhat effective and none of the participants felt that the training was ineffective. There was 100% agreement to the statement that the training program improved their understanding and confidence in using the platform. 92% of them agreed that they have acquired necessary skills to influence the improvement of HIS data and the remaining 8% were not so sure about it.

When asked about the follow-up support after the training, 96% agreed that they did receive the follow-up support after the training and only 4% said that they did not receive the follow-up support.

When the participants were asked to rate how optimistic are you about the upcoming HIS system, 52% of them rated level 5 which was the highest level, 40% rated level 4 and the remaining 8% rated level 3 and there were no responses for level 2 and level 1.

56% of the total participants strongly agreed to the statement that the training program adequately prepared them to use the new HIS for their daily tasks, 40% of them agreed and the remaining 4% were neutral about it. No participant disagreed with the statement.

Results:

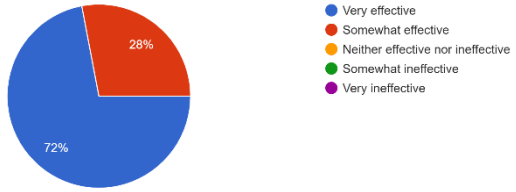
Table 1: Feedback Questionnaire

S.no	Questions	Responses	n= 25	n(%)
1	Do you feel the training you attended was important?	Yes	25	100
		No	0	0
2	Were the objectives of the training session clearly indicated?	Yes	25	100
		No	0	0
3	Which modules were you provided training for? (Multiple selection allowed)	Registration	19	76
		Billing	20	80
		Appointment	16	64
		Complete HIS	10	40
4	How effective was the training in helping you understand and use the HIS platform?	Very effective	18	72
		Somewhat effective	7	28
		Neither effective nor ineffective	0	0
		Somewhat ineffective	0	0
		Very ineffective	0	0
5	Did the training program improve your understanding and confidence in using the platform?	Yes	25	100
		No	0	0
		Maybe	0	0
6	Do you feel you have acquired necessary skills to influence the improvement of HIS data?	Yes	23	92
		No	0	0
		Maybe	2	8
7	Did you receive any follow-up support after the training whenever required?	Yes	24	96
		No	1	4
8	Overall, how optimistic are you about the upcoming HIS system? (Rate on a scale of 1 to 5).	Level 5	13	52
		Level 4	10	40
		Level 3	2	8
		Level 2	0	0
		Level 1	0	0
9	To what extent do you agree with the following statement: "The training program adequately prepared me to use the new HIS for my daily tasks."	Strongly agree	14	56
		Agree	10	40
		Neutral	1	4
		Disagree	0	0
		Strongly disagree	0	0

Fig.4:

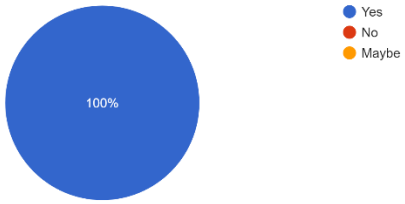
How effective was the training in helping you understand and use the HIS platform?

25 responses



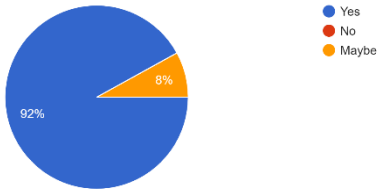
Did the training program improve your understanding and confidence in using the platform?

25 responses



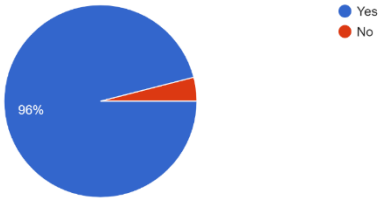
Do you feel you have acquired necessary skills to influence the improvement of HIS data?

25 responses



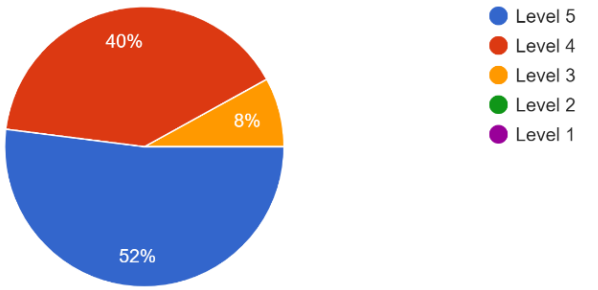
Did you receive any follow-up support after the training whenever required?

25 responses



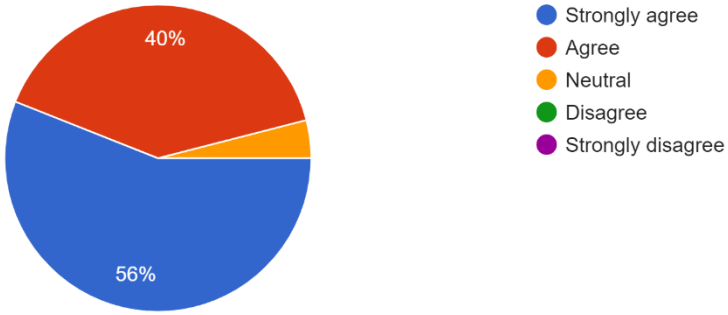
Overall, how optimistic are you about the upcoming HIS system? (Rate on a scale of 1 to 5).

25 responses



To what extent do you agree with the following statement: "The training program adequately prepared me to use the new HIS for my daily tasks."

25 responses



Results:

The survey responses reveal that 60% of the participants found it extremely easy to log in to the HMIS platform, 28% found it somewhat easy to log in and the remaining 12% were neutral to it. No participant found it difficult to login to the HMIS platform. When asked about task related questions most of the respondents feel very comfortable (64% to 56%) with tasks such as registering patients and booking consultations, viewing and printing past bills, and searching for payment advances and refunds. However, there is less comfort with tasks like giving discounts (40% very comfortable) and refund/bill cancellation (48% very comfortable), indicating these areas may require additional training or system improvements. Overall, the HIS appears to perform well for basic functions like patient registration and bill management but may benefit from enhancements in more complex functionalities like financial transactions and scheduling changes.

When asked the questions to check your understanding about the software like-

In the "manage appointments" screen, the most commonly available functionalities reported by users include rescheduling and cancellation of appointments (48%) which was the correct answer, followed by booking appointments (32%).

For the Document Management System (DMS), an overwhelming majority (84%) indicated that various patient documents such as IDs and licenses, etc. can be managed which was the correct answer and the remaining 12% answered only medical records which was wrong answer and 4% said none of the above which was also wrong answer.

The Handle with Care (HWC) Marking feature is reported to allow users to flag patients with specific medical conditions (40%) which is the correct answer. The other 36% responded that it assigns a special category to patients for personalized care and the remaining 24% responded that

it marks patients as high priority for treatment.

A significant majority of users (96%) have used the pin screen feature and 92% of the users found it helpful for quickly accessing frequently used items, indicating its effectiveness in enhancing user efficiency.

The responses indicate a positive impact of the MyHealthcare HIS platform on work efficiency among respondents, with 88% reporting noticeable improvements.

The survey responses reveal that 36% of users encounter challenges related to the user interface and navigation when using HIS software. A smaller proportion (4%) find the software to be time-consuming. Additionally, 20% of respondents experience challenges encompassing both user interface issues and time-consuming processes, while a majority (40%) report no specific challenges with the HIS software.

The survey indicates high satisfaction with the usability of the system, with 64% of users rating it as a 5 (very satisfied) and an additional 28% rating it as a 4 (satisfied). This totals to 92% of respondents expressing satisfaction with the system's usability. Only a small percentage provided lower ratings, with 8% rating it as a 3.

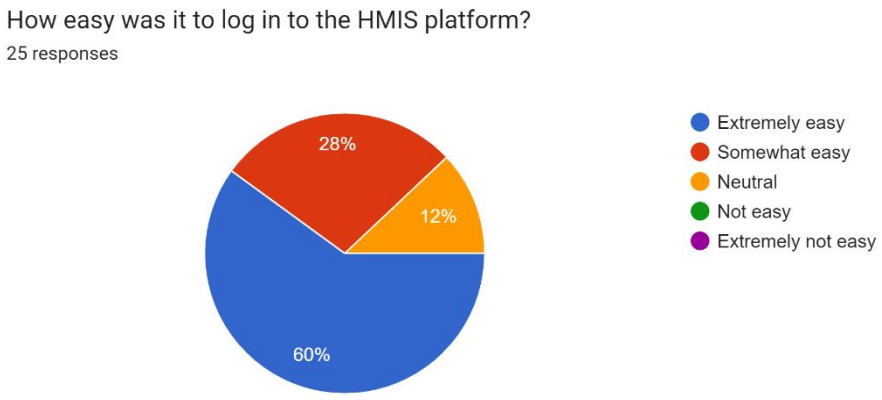
According to the survey responses, all users (100%) find it easy to communicate with the software team while operating the software. This high percentage indicates effective communication channels between users and the software team, facilitating efficient support and potentially contributing to user satisfaction with the software's usability and functionality.

Table 2: Pre- Post Test Questions

S.no	Questions	Responses	n= 25	n(%)
1	How easy was it to log in to the HMIS platform?	Extremely easy	15	60
		Somewhat easy	7	28
		Neutral	3	12
		Not easy	0	0
		Extremely not easy	0	0
2	How comfortable are you using the new HIS to perform the following tasks?			
2.1	Task 1: Register patient and book consultations	Not comfortable at all	0	0
		Somewhat comfortable	3	12
		Comfortable	6	24
		Very comfortable	16	64
2.2	Task 2: Giving Discounts	Not comfortable at all	1	4
		Somewhat comfortable	4	16
		Comfortable	10	40
		Very comfortable	10	40
2.3	Task 3: View and print past bills of the patients	Not comfortable at all	0	0
		Somewhat comfortable	1	4
		Comfortable	10	40
		Very comfortable	14	56
2.4	Task 4: Searching for the payment advances and payment refunds	Not comfortable at all	1	4
		Somewhat comfortable	1	4
		Comfortable	11	44
		Very comfortable	12	48
2.5	Task 5: Rescheduling/ cancelling the consultations	Not comfortable at all	1	4
		Somewhat comfortable	4	16
		Comfortable	8	32
		Very comfortable	12	48
2.6	Task 6: Refund and bill cancellation	Not comfortable at all	1	4
		Somewhat comfortable	6	24
		Comfortable	6	24
		Very comfortable	12	48
3	What functionalities are available in "manage appointments" screen?	Booking appointments	8	32
		Rescheduling and cancellation of appointments	12	48
		Appointment billing	2	8
		Booking and prescription generation	3	12
4	What types of documents can be managed using the Document Management System (DMS)?	Only medical records	3	12
		Only financial documents	0	0

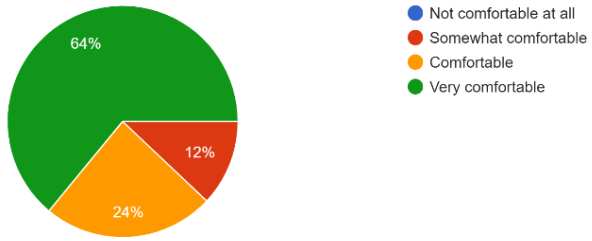
		Various patient documents like IDs,licenses, etc	21	84
		None of the above	1	4
5	What does the Handle with Care (HWC) Marking feature allow users to do?	Mark patients as high priority for treatment	6	24
		Assign a special category to patients for personalized care	9	36
		Flag patients with specific medical conditions	10	40
		None of the above	0	0
6	Have you used the pin screen feature of the HMIS platform?	Yes	24	96
		No	1	4
7	Did the pin screen feature help you quickly access frequently used items?	Yes	23	92
		No	2	8
8	Have you noticed any improvements in your work efficiency since using the MyHealthcare HIS platform?	Yes	22	88
		No	1	4
		Maybe	2	8
9	What are the challenges faced by you while using HIS software?	User interface (navigation)	9	36
		Time consuming process	1	4
		Both	5	20
		None	10	40
10	How much are you satisfied with usability of the system?	Rating 5	16	64
		Rating 4	7	28
		Rating 3	2	8
		Rating 2	0	0
		Rating 1	0	0
11	Do you find it easy to communicate with the software team while operating the software?	Yes	25	100
		No	0	0

Fig.5:



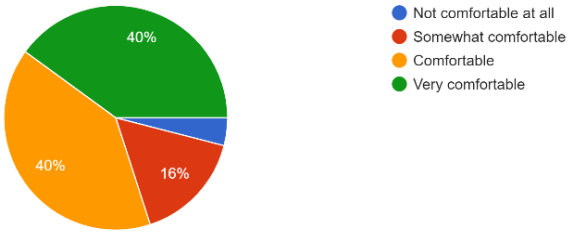
Task 1: Register patient and book consultations

25 responses



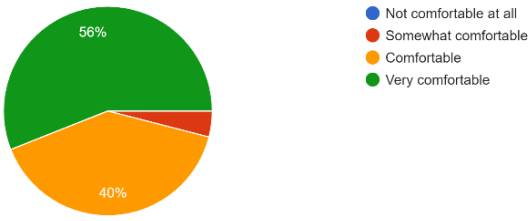
Task 2: Giving Discounts

25 responses



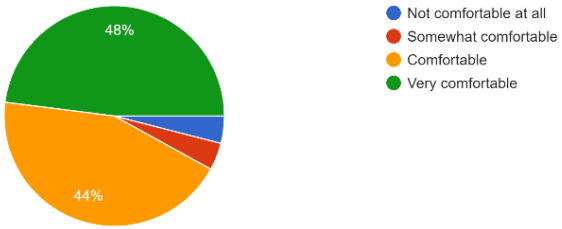
Task 3: View and print past bills of the patients

25 responses



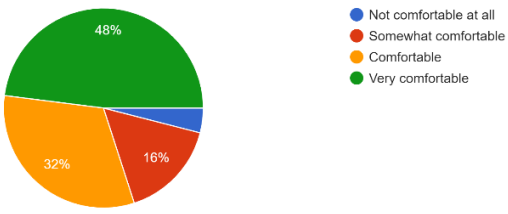
Task 4: Searching for the payment advances and payment refunds

25 responses



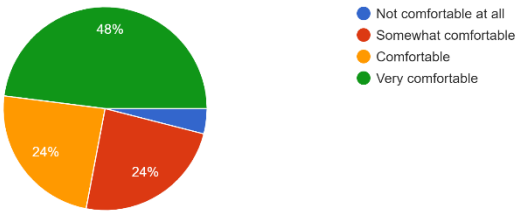
Task 5: Rescheduling/ cancelling the consultations

25 responses



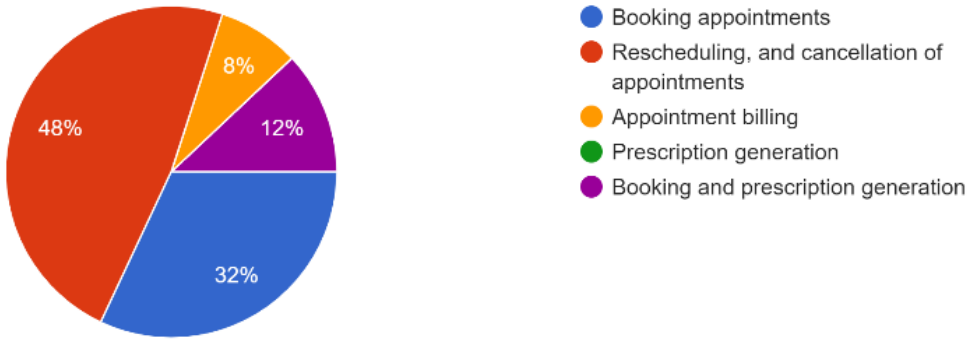
Task 6: Refund and bill cancellation

25 responses



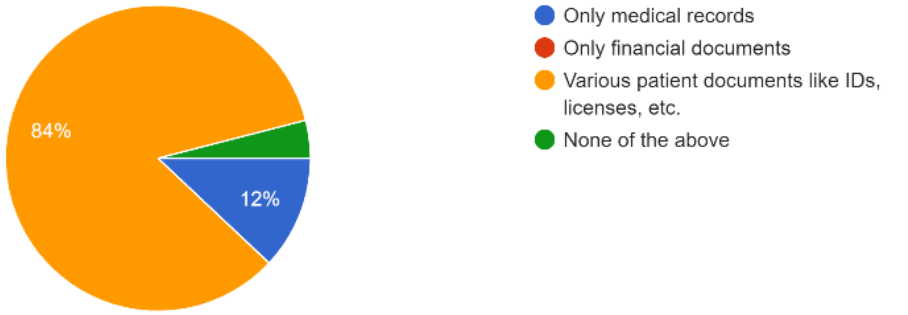
What functionalities are available in "manage appointments" screen?

25 responses



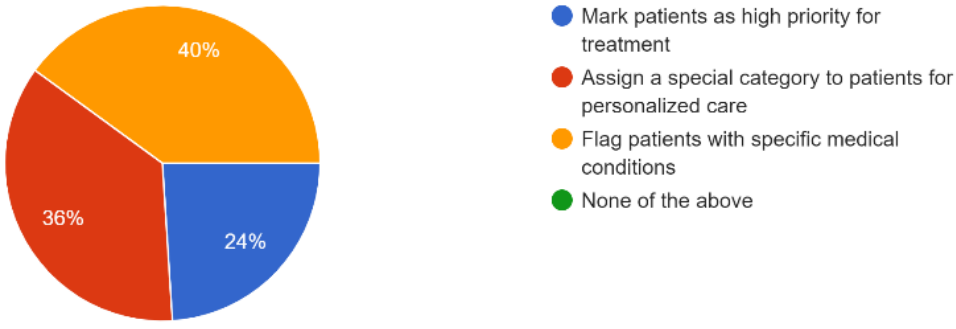
What types of documents can be managed using the Document Management System (DMS)?

25 responses



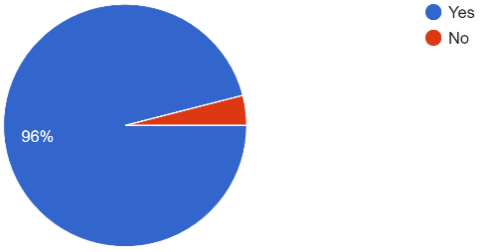
What does the Handle with Care (HWC) Marking feature allow users to do?

25 responses



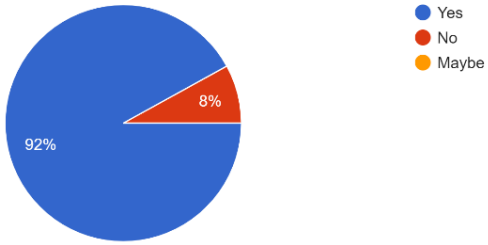
Have you used the pin screen feature of the HMIS platform?

25 responses



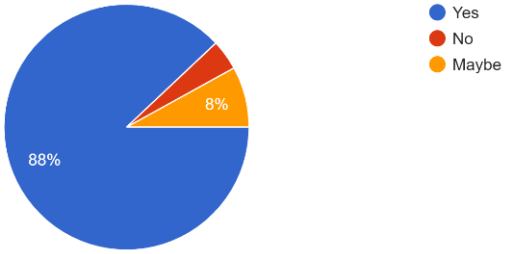
Did the pin screen feature help you quickly access frequently used items?

25 responses



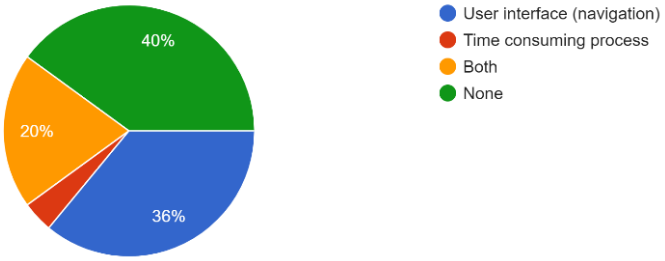
Have you noticed any improvements in your work efficiency since using the MyHealthcare HIS platform?

25 responses



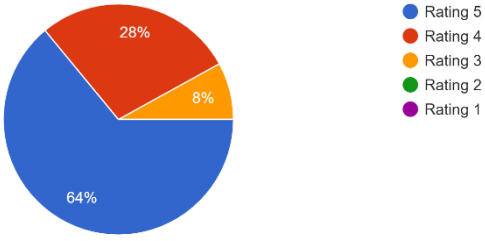
What are the challenges faced by you while using HIS software?

25 responses



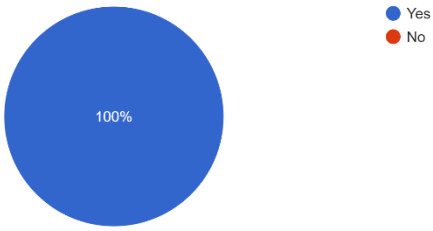
How much are you satisfied with usability of the system?

25 responses



Do you find it easy to communicate with the software team while operating the software?

25 responses



Thematic Analysis

Table 3:

Themes	Sub-themes	Codes
Aspects of HMIS Training Found Most Useful	Billing features	Billing Co-pay Claim Management Applying Discount Easy Billing Options OP Bill
	Registration Process	Registration Process Registration Token System
	MIS Reports and Dashboards	MIS Reports, Dashboards
	Overall Usability	Everything Whole Process User-Friendly Environment
Perception of Training Materials	Usefulness and Quality	Good Sufficient Helpfu Useful Intermediate Very Helpful Very Effective Supportive Informative
	Areas for Improvement	Require More Material Better Than Last HIS Cash Refund Tough
Conduct of Training Sessions	Interactivity	Interactive Allowed to Ask Questions Clarification Round
	Organization and Structure	Well Organized

		Time for Practice Hands-On Training
Perception of Training Resources	Trainer Knowledge and Clarity	Well Knowledgeable Clear Concepts Clarity in Speech Explained All Functionalities
	Trainer Friendliness and Support	Friendly Helpful Fruitful User-Friendly Manner
Overall Satisfaction with HIS Training	Satisfaction Level	Satisfied
	Preparedness and Benefits	Prepared to Handle HIS Benefit to Self-Learning and Development Organizational Benefit Intent to Receive Additional Training

Billing and Registration Features: Users predominantly found the billing and registration features most useful. These functionalities, including co-pay, claim management, and the ease of applying discounts, were critical in enhancing efficiency and reducing administrative burdens.

Training Materials: The training materials were generally well received, with many users finding them useful and sufficient. However, there were suggestions for additional materials, especially concerning specific complex features like cash refunds.

Training Sessions: The training sessions were praised for their interactivity and organization. Users appreciated the hands-on practice time and the opportunity to ask questions, which helped in clarifying doubts and reinforcing learning.

Trainer Effectiveness: The trainers were commended for their knowledge and clarity. Their ability to explain concepts clearly and their supportive approach contributed significantly to the positive training experience.

Overall Satisfaction: The overall satisfaction with the HIS training was high. Users felt well-prepared to handle the new system and recognized the training's benefits for their personal and organizational development. The willingness to undergo additional training reflects a commitment to continuous improvement and adaptation.

Conclusion:

The findings of this study demonstrate the overall effectiveness of the MyHealthcare HIS platform implementation. Users reported high satisfaction with the system's usability and functionality, with appreciation for its ability to streamline tasks like patient registration, billing management, and document storage. The training program played a crucial role in this success, with users commending the clarity of the materials, the interactivity of the sessions, and the expertise of the trainers. These factors contributed significantly to user confidence and preparedness in using the new HIS.

While the core functionalities received positive feedback, some areas for improvement were identified. User interface navigation and specific functionalities like handling complex financial transactions could benefit from further refinement. The positive response to the pin screen feature suggests that incorporating more user-customizable features could enhance overall user experience.

Going forward, focusing on addressing these identified challenges alongside continued user communication and support will be vital in maximizing the long-term success of the MyHealthcare HIS platform. The positive user perception and willingness to undergo further training provide a strong foundation for future enhancements and continued system adoption.

Limitations:

While the study provides valuable insights, the findings should be interpreted within the context of its limitations. The relatively small sample size of 25 participants may not fully capture the experiences of the entire outpatient billing staff at Sparsh Hospital. This raises the possibility that the reported positive experiences or identified needs might not be representative of the whole population. Future research involving a larger sample size could enhance the generalizability of the results and provide a more comprehensive picture of staff perceptions and training needs.

Recommendations:

The HIS training program was a success, but there's always room for improvement. Here are some ideas to make it even better in the future:

- More training materials: Create additional resources like cheat sheets or video tutorials for complex tasks like cash refunds. This will give staff different ways to learn and remember how to do things.
- More practice time: Let staff practice using the new system more during training. This will help them feel more confident using it on their own.
- Break down complex tasks: Make difficult tasks easier to learn by explaining them step-by-step.
- Ongoing support: Create a knowledge base or online forum where staff can find answers to their questions after the training is over. This way, they can get help whenever they

need it.

- Keep improving: Ask staff for feedback throughout the training and after they start using the new system. This will help identify areas where the training can be improved in the future.

By following these recommendations, the HIS training program can be even more effective in helping staff learn how to use the new system. This will make things run smoother in the future.

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