Workforce Resistance in Hospital Information System Implementation: Identifying Causes and Proposing Effective Strategies for Mitigation

By
Dr. Sanjivani Sanjay Patil
PG/22/102
PGDM [Hospital and Health Management equivalent to MBA]

INTERNSHIP TRAINING
At
My Healthcare Technologies Pvt Ltd.

Under The Guidance Of
Dr. Mukesh Ravi Raushan

International Institute of Health Management Research,
New Delhi, India
2024

Dated: 25th July 2024

TO WHOM IT MAY CONCERN

This is to certify that Dr. Sanjivani Sanjay Patil, a student of IIHMR Delhi, is undergoing an internship as Management Trainee with MyHealthcare Technologies Private Limited since 4th March 2024 and she is continuing her 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 **Dr. Sanjivani Patil** student of **PGDM (Hospital & Health Management) from the International Institute of Health Management Research**, New Delhi has undergone internship training at **"My Healthcare Technologies Pvt Ltd."** from **March to June 2024.** The Candidate has successfully carried out the study designated to her during the internship training and her approach to the study has been sincere, scientific, and analytical. The Internship is in fulfilment of the course requirements.

I wish her all success in all his/her future endeavours.

Dr. Sumesh Kumar
Associate Dean, Academic and Student Affairs
IIHMR, NEW DELHI

Dr. Mukesh Ravi Raushan
Mentor
IHMR, NEW DELHI

Certificate of Approval

The following dissertation titled **"Workforce Resistance in Hospital Information System Implementation: Identifying Causes and Proposing Effective Strategies for Mitigation"** at **"Myhealthcare"** 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 thatby 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
DR. PRAVEEN KUMAR	
Dr. Nishigandha Bora	
DR. RACHU	

Certificate from Dissertation Advisory Committee

This is to certify that **Dr. Sanjivani Patil**, a graduate student of the PGDM (Hospital & Health Management) has worked under our guidance and supervision. She is submitting this dissertation titled **"Workforce Resistance in Hospital Information System Implementation: Identifying Causes and Proposing Effective Strategies for Mitigation at "My/Healthcare Technologies Pvt Ltd."** in partial fulfilment 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.

Organization Mentor
Mr. Diwakar Bhowmik
Chief Operating Officer
MyHealthcare/Pvt ltd

Institute Mentor
Dr. Mukesh Ravi Raushan
Assistant Professor
IIHMR- Delhi

INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH, NEW DELHI

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **"Workforce Resistance in Hospital Information System Implementation: Identifying Causes and Proposing Effective Strategies for Mitigation: Secondary Desk Review"** and submitted by Dr. Sanjivani Patil Enrolment No. PG/22/102 under the supervision of Dr. Mukesh Ravi Raushan for the award of PGDM (Hospital & Health Management) of the Institute carried out during the period from 04/03/2024 to 04/06/2024 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.

Signature.

Place: New Delhi, India

FEEDBACK FORM

Name of the Student: Dr. Sanjivani Patil

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 (SAISHREE HOSPITAL & SRS HOSPITAL)
2) Implementation & Post golive support to end user.
3) Requirement gathering for SAKRA HOSPITAL, BANGALORE.

Deliverables:

1) BRD sessions for SAISHREE HOSPITAL, along with demo of the HIS Software
2) Successful implementation & support for SAISHREE HOSPITAL.
3) BRD documentation for SAISHREE HOSPITAL.

Strengths:

1) Was able to work under pressure, completed all the task on time.
2) Great communication with stakeholders.

Suggestions for Improvement:

1) Need to work on the technical aspect of the software.
2) Focus on the given work, instead of working on other projects

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

1) Institute should include hospital flows so that the students have some idea.
2) Volunteering Internship to be included.

Diwakar Bhowmik
Organization Mentor (Dissertation)

Date: 24/07/24
Place: Gurgaon

INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH (IIHMR)
Plot No. 3, Sector 18A, Phase- II, Dwarka, New Delhi- 110075
Ph. +91-11-30418900, www.iihmrdelhi.edu.in

CERTIFICATE ON PLAGIARISM CHECK

Name of Student (in block letter)	Dr. Sanjivani Sanjay Patil		
Enrollment/Roll No.	PG/22/102	Batch Year	2022-2024
Course Specialization (Choose one)	Hospital Management	Health Management	Healthcare IT
Name of Guide/Supervisor	Dr. Mukesh Ravi Raushan		
Title of the Dissertation Assignment	Workforce Resistance in Hospital Information System Implementation: Identifying Causes and Proposing Effective Strategies for Mitigation		
Plagiarism detect software used	"TURNITIN"		
Similar contents acceptable (%)	Up to **15** Percent as per policy		
Total words and % of similar contents Identified	8%		
Date of validation (DD/MM/YYYY)	23/7/24		

Guide/Supervisor

Name: Dr. Mukesh Ravi Raushan

Signature:

Student

Name: Dr. Sanjivani Sanjay Patil

Signature:

Report checked by

Institute Librarian

Signature:
Date:
Library Seal

Dean (Academics and Student Affairs)

Signature:
Date: 31/7/2024
(Seal)

8

ACKNOWLEDGEMENT

Completing a dissertation is a significant opportunity for professional growth and learning. I feel fortunate to have had the opportunity to undertake my project at **MyHealthcare Technologies**. The knowledge and experience I gained from the professionals in the organization have been invaluable.

I would like to express my heartfelt gratitude to the academic fraternity at **IIHMR DELHI** for establishing such a dedicated system that provides students like me with the opportunity to pursue their areas of interest and enhance their knowledge. The support and guidance provided by the faculty and staff at IIHMR DELHI have been invaluable throughout my academic journey. Their commitment to providing quality education and fostering a learning environment has greatly contributed to my personal and professional growth. I would like to extend my sincere gratitude to my mentor **Dr. Mukesh Ravi Raushan** for his invaluable guidance, expertise, and support throughout this research project.

I am particularly thankful to **Shyatto Raha, Divya Laroyia, Diwakar Bhowmik, Umesh Parashar** for their in-depth discussions and guidance. Their timely support, inspiration, and unconditional assistance played a crucial role in shaping my study. I am immensely grateful to all of them that despite being in busy schedule, everyone made the effort to listen to me, provide feedback, and offer insightful suggestions throughout the project.

I would also like to extend my gratitude to **Varsha Prasad and Saurabh Yadav** for their active cooperation and mentoring.

I would also like to express my appreciation to my colleagues and the entire staff at MyHealthcare Technologies for their attention to my work and their assistance. Their support significantly contributed to the success of my project. I am sincerely thankful to everyone involved.

TABLE OF CONTENT

LIST OF ABBREVIATIONS

HMIS-HospitalManagement Information System

OPD – Out-patient Department

IPD – In-patient Department

EMR – Electronic Medical Record

LIS – Laboratory Information System

RIS – Radiology Information System

OT – Operation Theatre

UAT – User Acceptance Testing

QA – Quality Assurance

Organization Profile

BACKGROUND

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 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, Paediatrics, Endocrinology, and Cardiology. Additional EMRs for specialties such as Obstetrics & Gynaecology, Oncology, Dentistry, Ophthalmology, and Neurology are planned to be available soon.

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.

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.

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

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.

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.

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.

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.

MYHEALTHCARE DOCTOR OPD EMR

The MyHealthcare Doctor Platform helps doctors manage their virtual consultation and OPD consultations seamlessly, from a user-friendly web or mobile platform. The MyHealthcare Doctor Platform is integrated with all clinical platforms of a hospital such as the Hospital Information System (HIS), Laboratory Information System (LIS), Radiology Information System (RIS) and Picture Archiving and Communication System (PACS). The MyHealthcare Doctor ecosystem is integrated with the MyHealthcare patient platform, MyHealthcare@Home platform, the Queue Management System and Doctor Referral platform.

The MyHealthcare Doctor Platform helps providers better manage care for patients and provide better health care by:

• Providing accurate, up-to-date, and complete information about patients at the point of care

• Enabling quick access to patient records for more coordinated, efficient care

A. Functional Features MyHealthcare EMR Doctor Platform includes:

1. My Doctor Profile (view and edit details except Doctor Registration Number, Speciality, Mobile Number and Designation)

2. Calendar view of all appointments (virtual and OPD)

3. Create new appointment for registered patients (SMS will go with payment link; appointment will be held for 30 mins and get confirmed only upon successful payment)

4. Cancel appointments (as per configurable business logic)

5. Task based user journey for patient management

MYHEALTHCARE IPD EMR

EMR for In-Patient Department (IPD) manages hospital functions for admitted patients. Integrated firmly with the hospital HIS, LIS, PACS and other integral systems of the hospital. EMR IPD systematises processes related to the treatment.

Key components of IPD- EMR are mentioned below:

1. IPD- EMR for Doctors:

a) Order Management (CPOE): Doctor can order, acknowledge result, and edit or cancel any order e.g., Lab test.

b) Order sets for easy selection & placement of clinical orders

c) Medication review – hold/ resume, stop or renew medication order

2. IPD- EMR for Nurses:

a) Order Management: Nurse can view, track, amend and even cancel the orders. Access control based.

b) Supplies: Acknowledge, ward supplies, return or approve return of drugs

c) Medication Administration Record: EMR IPD allows nurse to administer medication records and perform several activities.

MYHEALTHCARE EMERGENCY EMR

Complete management of Ambulance starting from call receiving to dispatch, real-time tracking, and in-transit management of patients from command centre.

Triage and Vitals tracking with clinical markers, clinical alerts.

Single screen ER workbench to order and monitor service status, report tracker, capture clinical notes, medicine administration, referral tracking and length of stay.

Admission request tracker starting from the point of admission advice from the practitioner till the arrival in ward, which also helps track conversion.

Abstract:

Workforce Resistance in Hospital Information System Implementation: Identifying Causes and Proposing Effective Strategies for Mitigation

Background

A hospital information system (HIS) is a complete, integrated information system that manages all elements of a hospital's business, including medical, administrative, and financial, as well as the processing of services. HIS is commonly made up of one or more software components, as well as a large number of sub-systems in various medical specialties. Hospital Management Information Systems (HMISs) have transformed the healthcare industry by streamlining operations and enhancing the quality of patient care. This research project address the implementation and acceptance of Hospital Information Systems (HISs) in the healthcare industry. HISs have become essential tools for managing administrative, clinical, and support aspects of hospitals, improving decision-making, and enhancing the quality of healthcare services. However, challenges related to training, user acceptance, and system usability hinder the successful utilization of HIS. The study aimed to Address Workforce Resistance in the Implementation of Hospital Information Systems. The research findings will help identify barriers to acceptance and to enhance implementation and user satisfaction. Hospital information systems (HIS) are commonly used to improve the quality of care as well as the efficiency and safety of medical services. However, there are a number of obstacles in the way of its successful implementation. (1)

The implementation of comprehensive information systems in health care practices has proved to be a path ridden with risks and dangers. It has become evident that there are many more failure stories to tell than there are success stories—and the more comprehensive the technology, or the wider the span of the implementation, the more difficult it appears to achieve success. (2)

It seems to be a challenging undertaking to successfully install Hospital information systems in healthcare companies. The concepts of "success" and "failure" actually are critically examined in this study, along with the challenging nature of lists of "critical success- or failure factors." Finally, three fallacies that frequently impede implementation procedures are discussed. Different perspectives are offered and supported by specific

instances. First and foremost, putting HIS into place is a process of reciprocal transformation; throughout this phase, the organization and the technology change in response to one another. HIS deployments can be carefully planned to aid in the organization's transformation when this is anticipated. Secondly, the implementation of such a procedure requires appropriate backing from both central administration and end users. The process of integrating extensive information systems into medical practices has proven to be fraught with difficulties. It's clear that there are much more failure stories than success stories to share. Moreover, success seems to be harder to come by the more extensive the technology or the longer the implementation period. Using a dual-factor model of technology usage, this study merges the literatures on resistance to change and technology adoption to propose a theoretical model of physician resistance to healthcare information technology (HIT) utilization. The interrelated and different impacts of facilitating perceptions—like perceived utility and perceived ease of use—and inhibiting perceptions—like resistance—on HIT usage intentions are explained by this model. Additionally, perceived compatibility is suggested to predict perceived usefulness, perceived threat is suggested to predict resistance, and related knowledge is suggested to predict perceived ease of use. A field survey of 129 practicing physicians at a large acute-care hospital utilizing a computerized physician order entry system provides empirical support for the resulting model.

The constant acceptance of new medical technology and the spread of creative techniques that ensure improved patient care and treatment indicate that the speed of the healthcare environment has been increasing in the last few years. As a result, it's essential to identify and deal with change resistance's causes before, during, and after healthcare reform initiatives. In order to assess 24 recognized drivers of change resistance in a change endeavor at a portion of Sentara Leigh Hospital in Norfolk, Virginia, this study used a phenomenology technique. The investigation's findings imply that there may be causes of opposition to change that are unique to the healthcare industry. This discovery is significant since it offers a basis that can be applied. (2) The management of healthcare organizations and information systems has an impact on this advancement.

Objective

To identify the reasons of healthcare workforce resistance in the implementation of HIS.

To evaluate the effectiveness of existing strategies for mitigating workforce resistance in hospital information system implementation.

Method

The dissertation utilized a systematic review of literature to justify the study's objectives. The data were searched by different sites like PubMed, google scholar etc for relevant literature. Different key terms were used to identify potential sources to understand the factors supporting and barriers to adopting the Hospital Information system. (HIS) by users.(3)

Result

Workforce resistance in the Hospital Information System (HIS) implementation indicates various underlying factors and effective mitigation methods, based on secondary desk research. Change anxiety has several causes, such as worries about job security, an increase in workload, or the redefining of roles as a result of the introduction of HIS. Resistance is also influenced by an awareness that there are no benefits and a lack of confidence in the HIS's ability to improve patient care or productivity. Inadequate training and assistance for utilizing the latest technology may also cause employees to feel disappointment and fear losing their autonomy in making decisions. The challenge is made better by a lack of information regarding the advantages of HIS and the plans for its deployment, as well as by organizational culture-based reluctance to change and new technology.

Conclusion

Finally, secondary desk research shows that worker resistance to the implementation of the Hospital Information System (HIS) is extensive and arises from a variety of concerns, includes change anxiety, the idea that there are no benefits, and difficulties with communication and training. These difficulties highlight how crucial it is to implement sensible mitigation strategies so as to ensure that HIS adoption in healthcare settings is successful. Healthcare workers can feel less worried and more comfortable when they receive thorough training that is appropriate to their various jobs and are informed about the advantages of HIS. To promote adoption and integration of the HIS, it is imperative to address organizational cultural obstacles, develop structured change management strategies, and include staff in decision-making processes. Moreover, ongoing improvement and long-term acceptance depend on continuing assessment and modification in response to user input. (4)

1.1: Background

The background for secondary desk research on workforce resistance in Hospital Information System (HIS) implementation emphasizes the transformative potential of HIS in modern healthcare. HIS encompass a range of digital technologies including electronic health records (EHRs), clinical decision support systems, computerized provider order entry (CPOE), and communication platforms that collectively aim to streamline operations, enhance patient safety, and improve clinical outcomes (Al-Hazmi et al., 2018; Lorenzi et al., 2000).

Numerous studies underscore the promise of HIS in overcoming traditional paper-based systems, reducing medical errors, and enabling more efficient healthcare delivery. For instance, Al-Hazmi et al. (2018) conducted a systematic review and meta-analysis highlighting that effective implementation of electronic health records can significantly enhance healthcare quality and patient outcomes. Similarly, Lorenzi et al. (2000) emphasize the role of HIS in improving information access and decision-making processes in healthcare settings, thereby potentially reducing costs and improving efficiency.

However, despite these advantages, the adoption of HIS in hospitals often encounters resistance from healthcare professionals. Hsiao and Chen (2016) identify several key factors contributing to this resistance, including concerns over changes in job roles and workflows, inadequate training in using new technologies, and perceived threats to professional autonomy. These factors are crucial as they directly impact the acceptance and integration of HIS into daily clinical practices.

Moreover, organizational culture and leadership support play significant roles in shaping attitudes towards HIS adoption. Kukafka et al. (2003) highlight that healthcare organizations with supportive leadership and a culture that values innovation and continuous improvement are more likely to successfully implement and sustain HIS initiatives. Conversely, resistance may be heightened in organizations where there is a lack of clear communication, insufficient training programs, or where healthcare professionals perceive the technology as a disruption rather than a tool for enhancement.(5).

By addressing concerns through targeted interventions such as comprehensive training programs, involving healthcare professionals in decision-making processes, and fostering a supportive organizational culture, hospitals can mitigate resistance and optimize the integration of HIS. Ultimately, this approach not only enhances healthcare delivery efficiency but also improves patient outcomes, thereby realizing the full potential of modern healthcare technologies in improving overall patient care and organizational effectiveness.

1.2 Review of Literature

The implementation of Hospital Information Systems (HIS) promises significant improvements in the efficiency, accuracy, and quality of healthcare delivery. However, these implementations often encounter resistance from the workforce, which can hinder or even derail the successful deployment and utilization of these systems. Understanding the causes of resistance and developing strategies to mitigate it are crucial for successful HIS implementation.

Source Author (Country)	Year	Methodology (Study design & sample size)	Findings	Recommendations
Chinecherem Umezuruike, Wilson Nwankwo, Margaret Kareyo (Nigeria)	2017	Systematic secondary research was done,150 published articles were analyzed	Inadequate Information and Communication Technology facilities Knowledge Gap Lack of Trained Professionals Resistance to Change	An in-depth assessment of the infrastructure at all levels of the healthcare delivery system is required.

Winny Setyonugroho, Almira D Puspitarini Yunita C Kirana,Muhammad Ardiansyah	2020	Secondary research	The lack of training, the lack of IT support, and the lack of electricity.	HIS Implementation should be planned thoroughly and carefully, covering the aspect of hardware-software, data, users, and also policy.
Leila Ahmadian & Reza Khajouei & Simin Salehi Nejad & Maryam Ebrahimzadeh & Somayeh Ezhari Nikkar	2014	crosssectional descriptive and analytic study	Users' lack of understanding on how to work with the system, There is no evidence of the system's utility. End-users were not involved in the design process. Organizational training deficiency.	Implementing a health information system necessitates careful preparation and a significant investment of money,

				effort, and time.
Sandra hakiemafrizalaputu wurihandayanibachmad nizarhidayantobtriseryandoam eiwitabudiharsanaaevimarthaa	2019	Qualitative study	Lack of User's computer skills, Lack of planning, project management, Lack of training in IT Resistance of change,	

1.2.1 Adoption of HIS

Hospital Information Systems (HIS) are becoming an essential part of the architecture of the modern healthcare system, as a result of the need to better data management, expedite processes, and improve patient care. Studies show that a number of factors, including as organizational support, user involvement, technological readiness, and external incentives, affect the successful adoption of HIS. According to Ludwick and Doucette (2009) and Buntin et al. (2011), hospitals that have strong IT infrastructures and current technological capabilities are better positioned for HIS adoption to be effective.(6) Crucial organizational elements include a change-embracing culture and the backing of the leadership. As mentioned by Hung, Chen, and Wang (2014) and Jha et al. (2009), strong leadership and a strategic vision help propel the adoption process forward. User attributes have a big influence on acceptability, such as how easy and useful people think HIS is. In order to allay their worries and improve acceptance, Venkatesh, Sykes, and Zhang (2011) stress how crucial it is to include healthcare professionals early in the implementation process. Adler-Milstein and Jha (2017) and Furukawa et al. (2013) have explored the influence of the HITECH Act on HIS adoption in the United States, demonstrating the importance of external pressures including financial incentives and regulatory requirements. (2013). According to research by Bates et al. (2003) and Chaudhry et al. (2006), the advantages of

implementing HIS include better data analytics, increased operational efficiency, and better patient care. Adoption, however, may be hampered by obstacles like high upfront costs, reluctance to change, and compatibility problems. Also essential is ensuring compatibility across various systems, as highlighted by Jha et al. (2009) and Blumenthal (2011). As recommended by Gagnon et al. (2012) and Sheikh et al. (2011), strategies to address these issues include ensuring financial incentives, providing thorough training and assistance, and integrating users in the planning process. All things considered, a comprehensive strategy addressing organizational, technological, and user-related aspects is needed for the successful implementation of HIS. This approach must be backed by solid leadership and strategic planning.(7)

1.2.2 Factors effecting HIS Implementation

There are many advantages to implementing Hospital Information Systems (HIS), including better data management, better patient care, and increased operational efficiency. However, healthcare professionals frequently put up a strong fight against the adoption process. It is essential to comprehend the causes of this resistance in order to create mitigation techniques that work. This section, which draws on findings from a number of research studies, examines the main causes of workforce resistance.

- Fear of Increased Workload and Job Changes

  The fear of increasing workload and changing job positions is one of the main causes of resistance. Implementing HIS is generally seen by healthcare personnel as increasing rather than decreasing their obligations. This is especially true when people perceive systems as being intricate and time-consuming. According to a research by Lapointe and Rivard (2005), healthcare professionals were concerned that using HIS would require more administrative work and take longer to provide patient care. Similarly, McAlearney et al. (2010) discovered that doctors were worried about the potential for greater work hours and the higher paperwork needs connected with HIS use. (8)

- Loss of Professional Autonomy

Healthcare workers in particular frequently cherish their independence while making clinical decisions. Since HIS standardizes procedures and protocols, it may be viewed as a threat to this autonomy. Physicians rejected HIS, according to research by Walter and Lopez (2008), because they believed it imposed strict procedures on their clinical practice and limited their capacity for independent decision-making. Holden (2011) shared this sentiment, observing that the established procedures and decision-support capabilities built in HIS felt restrictive to healthcare personnel.

- Lack of Involvement in the Implementation Process

  When healthcare professionals believe they are being excluded from of the HIS design and implementation process, resistance is frequently made worse. Employees may feel that the system is unimportant or not meeting their requirements when choices are made without their input. Boonstra and Broekhuis (2010) state that when users feel that the HIS isn't supporting clinical workflows enough, they may become resistant. In order to guarantee that healthcare workers' concerns are taken care of and that the system is customized to meet their needs, Callen, Braithwaite, and Westbrook (2007) stressed the significance of involving healthcare workers in the early phases of HIS deployment.

- Concerns About Data Privacy and Security

  Healthcare workers have serious concerns about data security and privacy, and the adoption of HIS frequently makes these issues worse. Experts worry that data breaches or compromised patient confidentiality could occur with technological systems. According to Angst and Agarwal (2009), healthcare professionals' worries regarding the security of sensitive patient data have been cited as a major impediment to the implementation of HIS. Menachemi et al. (2011), who discovered that worries about data breaches and unauthorized access were common among hospital professionals, provided more evidence for this.

- Resistance to Change and Comfort with Existing Systems

Workers in the healthcare industry frequently show reluctance to change, especially if they are accustomed to the current workflows and procedures. Humans naturally react with inertia to the uncertainty and disruption that come with new technologies. According to a study by Greenhalgh et al. (2009), uncertainty regarding the advantages of the new system and a preference for familiar methods were two factors contributing to resistance to HIS. Furthermore, as noted by Cresswell et al. (2016), employees may favor the ease of use of paper-based or legacy systems, which could increase resistance due to the perceived complexity and usability concerns of HIS.

Advantages of Hospital Information System (HIS) Implementation

- **Enhanced Clinical Decision-Making**
  Improving clinical decision making is one of the main advantages of HIS. Healthcare workers can instantly access extensive patient data, such as imaging studies, test findings, and medical histories, thanks to HIS. The prompt availability of information facilitates precise diagnosis and efficient treatment strategizing. Research by Chaudhry et al. (2006) and Garg et al. (2005) shows that by offering clinical recommendations and notifications for possible drug interactions as decision support tools, HIS may significantly reduce medical errors and enhance patient outcomes.

- Reduction in Medical Errors
  By assuring that correct and current information is available at the moment of service, HIS helps to lower medical mistakes. Medication errors, such as improper dosages or drug interactions, are less likely to occur when electronic prescribing systems are used in conjunction with HIS. Computerized physician order entry (CPOE) systems have been shown by Bates et al. (1998) to considerably reduce the incidence of serious pharmaceutical mistakes, improving patient safety.(10)

- Streamlined Administrative Processes

By automating procedures including patient registration, appointment scheduling, invoicing, and claims processing, HIS simplifies administrative procedures. Healthcare workers' administrative workload is lessened by this automation, freeing them up to concentrate more on patient care. Poon et al. (2006) found that HIS can increase the accuracy of administrative data, decrease paperwork, and streamline workflows.

- Improved Resource Management

  Healthcare facilities can manage their resources more effectively when HIS is implemented effectively. HIS offers resources optimization capabilities like as inventory management, personnel scheduling, and utilization tracking.

- Enhanced Data Management and Reporting

  By combining patient data into a single, easily accessible format, electronic health records, or EHRs, enhance continuity of treatment. Comprehensive EHRs, according to Hillestad et al. (2005), improve data accuracy and lessen the possibility of redundant or contradicting information.(11)

- Improved Communication with Healthcare Providers

  HIS enhance communication between patients and healthcare providers through secure messaging and telehealth capabilities.. Gagnon et al. (2016) found that telehealth integration within HIS improved patient-provider communication and access to care, particularly for patients in remote or underserved areas.(12)

- Facilitating Clinical Research

  HIS offer a wealth of data for clinical research, allowing scientists to investigate patient outcomes, illness trends, and therapy effectiveness. Large datasets are more readily available, which improves the capacity for thorough analysis and the production of evidence-based insights. According to research by Hersh et al. (2007), HIS makes accurate and easily accessible patient data available, which helps with clinical trials and observational studies.

- Supporting Public Health Initiatives

  Because HIS provide real-time data for disease surveillance, outbreak management, and population health management, they are essential to the success of public health projects. The capacity to monitor and address threats to public health is improved by the integration of HIS with public health reporting systems. (12)

Chapter 2: Data and Methods

Background:

Hospital Information Systems (HIS) are all-inclusive, cohesive systems intended to oversee the clinical, financial, and administrative facets of hospitals. Information and communication systems (HIS) are vital for improving the efficacy and efficiency of healthcare delivery because they make information sharing between multiple departments and stakeholders easier. An extensive examination of the elements, functions, advantages, difficulties, and potential developments in HIS is given in this section.

Through bettering patient care, boosting operational effectiveness, strengthening data security, and facilitating improved resource management, hospital information systems (HIS) are essential to the transformation of healthcare delivery. The advantages of HIS greatly outweigh the disadvantages, even with regard to implementation issues. Future developments in technology, including artificial intelligence (AI), telemedicine, blockchain, cloud computing, and patient-centered care, will augment the potential and influence of health information systems (HIS) and result in a healthcare system that is more patient-centered, effective, and efficient.

2.1 Search Strategy

The dissertation utilizes the systematic review of literature to justify the objectives of the study. The literature was search using academic and electronic databases such as:

1. PubMed,
2. Science direct,
3. Scopus,
4. JStor,
5. Library of various universities and
6. Google Scholar.

The key terms were used to search the potential literatures to understand the factors supporting ad barriers in adopting the HIS. The following Keywords were use to search the literatures. Sometimes the combination of these keywords was also used. Those key terms were such as:

#Barcode,

#Factors affecting,

#Attitudes affecting,

#Barrier affecting,

#Evaluating affecting,

#Experience affecting,

#Opinion affecting,

#Perception affecting,

#resistance,

#acceptability,

2.2 Inclusion Criteria

1. The inclusion criteria will be those studies published in English from 2005 to 2024 which focus on examining factors affecting healthcare staff acceptance/adoptability of HIS(e.g., user interface design, training, individual characteristics), impact of HIS implementation.

2. Only full article available freely and downloadable were included in the study.

2.3 Exclusion Criteria

1. Studies not directly related to healthcare HIS other than not matching with time frame were excluded.

2. Nonpublished research articles which are not published in blind peer reviewed journal or working papers, chapters were excluded for the study.

3. The reviewed research articles were excluded from the study.

4. Duplicate references were excluded, as were references without abstracts and full text.

5. Commentary, editorial or news/presses, documentation, summary executive and report of conferences or any national/international policy and announcement and books, as well as papers described intentions to implementation, but not implementation experiences were not included.

Data Source of the Literatures:

The data sources included PubMed, National Library of Medicine (NLM), Google scholar. In each database, the search terms were searched.

2.5 Data Extraction

Relevant information, including the source of resistance, factors affecting acceptability, theoretical frameworks, and strategies, will be extracted from selected studies.

2.6 Data Analysis

Compare the findings from different studies to highlight similarities and differences for creating improvements and future research. Also ensure that data analysis is clear, concise, and logically structured.

2.7 Research Question

Q1What are the factors contributing towards staff resistance for HIS implementation within hospital setting?

Q2 How do individual characteristics associated towards to the HIS adoption?

Q3 How do different types of training and ongoing support affects the hospitals in adoption of HIS?

2.8 Objectives

To identify the reasons of healthcare workforce resistance in the implementation of HIS.

To evaluate the effectiveness of existing strategies for mitigating workforce resistance in hospital information system implementation

Chapter 3: To evaluate the effectiveness of existing strategies for mitigating workforce resistance in hospital information system implementation

---

Background

Healthcare workers frequently oppose the deployment of hospital information systems (HIS). Numerous things, such as a fear of change, a lack of technological know-how, a perception of an increase in effort, and worries about data security, might contribute to this resistance. Successful tactics to lessen this resistance are essential for the adoption and successful application of HIS. The success of current tactics to lessen labor opposition to HIS implementation is assessed in this section.

1.1. Training and Education

1.1.1 Comprehensive Training Program

Providing thorough training programs is one of the most often used tactics to reduce resistance. The goal of these programs is to give medical practitioners the abilities and information they need to use HIS efficiently. Workshops, practical instruction, and chances for ongoing education can all be included in training.

Effectiveness:

- **Positive Outcomes:** Studies by Holden et al. (2012) indicate that well-structured training programs significantly reduce resistance by enhancing users' confidence and competence in using HIS. Training helps in demystifying the technology and addressing specific concerns related to its use.
- **Challenges:** However, the effectiveness of training programs depends on their quality and relevance. Inadequate or poorly designed training can exacerbate resistance rather than mitigate it. Additionally, continuous training is necessary to keep up with system updates and new features.

1.2 Peer Training and Support

Implementing peer training programs, where experienced users train and support their colleagues, can also be effective. Peer trainers, often referred to as "super users," can provide practical insights and real-world usage tips.

Effectiveness:

- **Positive Outcomes:** Peer training leverages existing trust relationships among colleagues, making it easier for hesitant users to accept new systems.
- **Challenges:** The success of peer training depends on the selection of competent and motivated peer trainers. It also requires adequate time and resources to be effective.

1.3 Communication and Change Management

Transparent and Honest Communication

In order to mitigate resistance, effective communication tactics are important. Stakeholder alignment and uncertainty reduction can be achieved through open communication regarding the advantages, objectives, and effects of HIS.

Efficiency:

Positive Results: Research by Kotter (1996) highlights how leadership communication that is clear and consistent can greatly lower resistance. A positive attitude toward change can be fostered by informing staff members about the goals of HIS adoption, the benefits that are anticipated, and proactive measures taken to address their concerns.

Difficulties: Although communication is vital, it is frequently erratic or unclear. Disorientation and resistance may result from poor communication or an excess of information.

1.4 End Users' Involvement in Planning and Execution

End users' requirements and concerns are guaranteed to be taken care of when they are involved in the planning and implementation stages of HIS. Using a participative approach helps increase system buy-in and ownership.

Efficiency:

Positive Results: Research conducted in 2006 by Kappelman et al. demonstrates

that user interaction raises HIS acceptance and satisfaction. Involving medical experts in the system's design and testing phases guarantees that it satisfies real-world requirements and minimizes usability problems.

Challenges: Although this method works well, it can take a lot of time and may need juggling conflicting interests and points of view. Management must also genuinely commit to incorporating customer feedback.

1.5 Rewards and Incentive Plans

Both monetary and non-monetary rewards

Providing rewards and incentives can be a successful tactic to promote the adoption of HIS. These rewards might be monetary (bonuses, pay raises) or non-monetary (acknowledgment, chances for professional progression).

Efficiency:

Positive Repercussions: Healthcare personnel may be encouraged to adopt and use HIS by offering incentives. According to research by Bassi and McMurrer (2007), incentive schemes with the right structure can increase compliance and decrease resistance.

Difficulties: The perceived worth and fairness of incentives determine their efficacy. An excessive dependence on monetary rewards may result in transient compliance rather than sustained dedication. Non-monetary rewards have to have purpose and fit with each person's personal goals.

2. Infrastructure and Technical Assistance

Strong Technical Assistance

In order to swiftly handle technical issues and user concerns, it is imperative to provide strong technical assistance both during and after HIS implementation.

Efficiency:

Positive Results: By ensuring that problems are fixed promptly, efficient technical support helps lessen resistance and frustration. Research by Boonstra and Broekhuis (2010) emphasize that user confidence in HIS is increased by responsive and approachable technical support personnel.

Difficulties: The caliber and accessibility of technical assistance may differ. The user

experience can be adversely affected by resistance and insufficient help resources, as well as delayed responses.

3. User-Friendly System Architecture and Interface

The acceptability of HIS is greatly influenced by its design and usability. User satisfaction is increased and the learning curve is lowered by intuitive and user-friendly systems.

Efficiency:

Positive Results: Higher acceptance rates and lower resistance are linked to user-friendly interfaces. According to Davis's (1989) research, perceived ease of use plays a crucial role in the acceptance of technology through the Technology Acceptance Model (TAM).

Difficulties: Creating user-friendly systems involves a large amount of testing and design work. It can be difficult to strike a balance between simplicity and functionality, particularly in complicated healthcare systems.

4. Organizational Culture and Leadership

Dedicated Leadership

Overcoming objections and advancing HIS implementation require a strong commitment from the leadership. It is imperative for leaders to proactively endorse and uphold the system, showcasing its significance to the company.

Efficiency:

Positive Results: A culture of acceptance and confidence can be fostered by a leadership commitment. Transformational leadership, according to Kotter (1996), can successfully promote change and lessen resistance.

Challenges: A leader's capacity to engage stakeholders, express a vision, and respond to issues determines how effective they are. Leadership that is erratic or incompetent might sabotage attempts to reduce opposition.

5. Encouraging the Innovation Culture

Countering opposition to HIS can be accomplished by cultivating a culture that values innovation and ongoing development. Change can be facilitated by promoting experimentation, learning from mistakes, and rewarding achievements.

4.1 Background

Conclusion

S.No.	Types of Challenges	Remarks	Solutions
1	Human Challenges	Shortage of health IT professionals who are well capable of implementing the techniques. Lack of in-depth knowledge for execution of HIS Users are reluctant to attend the training sessions timely	Recruitment of personnel who can resolve the issues at ground level. Regular hands-on training sessions should be held in the organization. Reminder/alerts can be sent to the users to remind them before starting the training sessions.
2	Technical Challenges	Recurrent of the same requirements. Lack of extensive testing of software before implementation	Emphasis should be given in documentation Automation testing can be incorporated
3	Managerial Challenges	Lack of Master data management. Negligible investments on automation in some hospital settings. Time lag in software execution.	Sharing of Master data amongst the hospital setting should be encouraged. Cost benefit analysis should be carried out to make them aware that the automation of the hospitals is beneficial and worthy. Routine debugging should be encouraged so that the project can be closed timely.

In conclusion, evaluating the effectiveness of strategies for mitigating workforce resistance in the implementation of Hospital Information Systems (HIS) underscores the complexity and interdependence of these approaches. Addressing resistance effectively requires a comprehensive and nuanced approach, integrating multiple strategies to achieve successful HIS adoption.(14)

Comprehensive Training Programs: Comprehensive training is fundamental in preparing healthcare professionals to use HIS effectively. These programs equip users with the necessary skills and knowledge to navigate the system confidently. The success of training programs is closely linked to their quality and relevance. Well-designed training sessions that are tailored to the specific needs of different user groups tend to be more effective. Continuous education and refresher courses are also crucial as they help users stay updated with system upgrades and new features. However, training alone is not a panacea; it must be supplemented with adequate support to address any emerging issues or difficulties experienced by users.

Peer Training and Support: Peer training leverages the influence and trust that experienced users have within their teams to facilitate the adoption of HIS. Peer trainers, or "super users," provide practical, on-the-ground support that can ease the transition for their colleagues. This approach fosters a supportive learning environment and can significantly reduce resistance by addressing user concerns in a relatable and accessible manner. The effectiveness of this strategy depends on selecting competent and motivated peer trainers who can effectively support their peers. Ensuring that these trainers have adequate resources and time to fulfill their roles is also crucial for the success of peer training initiatives.

Transparent Communication: Transparent and consistent communication is vital for aligning stakeholders and managing expectations throughout the HIS implementation process. Effective communication helps to clarify the goals, benefits, and impacts of the HIS, thereby reducing uncertainty and fostering a positive attitude towards the system. Clear communication from leadership about the reasons for implementation, anticipated changes, and the support available can mitigate resistance. However, communication efforts must be carefully managed to avoid information overload and ensure that messages

are clear and actionable. Engaging in regular, open dialogue with staff can help address concerns promptly and maintain a positive atmosphere.

End-User Involvement: Involving end-users in the planning, design, and implementation phases of HIS ensures that their needs and preferences are considered. This participatory approach helps in tailoring the system to meet practical requirements, leading to higher satisfaction and acceptance. When users feel that their input is valued and that the system has been designed with their needs in mind, they are more likely to embrace it. However, this approach requires careful management to balance diverse opinions and integrate feedback effectively into the final system design.

Incentives: Offering incentives, both financial and non-financial, can be an effective way to motivate staff to adopt HIS. Financial incentives such as bonuses or salary adjustments can drive immediate compliance, while non-financial rewards, such as recognition or career advancement opportunities, can foster long-term engagement. The effectiveness of incentives depends on their perceived value and fairness. Incentives must be designed to address the intrinsic and extrinsic motivations of staff to be truly effective. Over-reliance on financial incentives can lead to short-term compliance without addressing underlying concerns, so they should be complemented by other strategies.

Robust Technical Support: Technical support is crucial for addressing issues and resolving problems that arise during HIS implementation. Adequate technical support ensures that users receive prompt assistance, which helps in maintaining user satisfaction and confidence in the system. The effectiveness of technical support depends on its accessibility, responsiveness, and the availability of skilled support staff. Investing in a well-resourced support team can prevent minor issues from escalating and reduce overall resistance.

Leadership Commitment and Organizational Culture: Strong leadership commitment is essential for driving HIS implementation and overcoming resistance. Leaders who actively advocate for the HIS, communicate its importance, and demonstrate a commitment to supporting staff can significantly influence acceptance. A culture that embraces innovation and change further supports HIS adoption by creating an environment where new

technologies are welcomed and integrated into daily practice. This cultural shift requires consistent reinforcement and a willingness to adapt to new ways of working.

Ultimately, the effectiveness of strategies to mitigate workforce resistance in HIS implementation hinges on their integration and alignment with the specific context and needs of the healthcare organization. Combining these strategies in a coordinated manner, while remaining flexible and responsive to the evolving needs of users, is key to overcoming resistance and achieving successful HIS implementation. A holistic approach that addresses training, support, communication, involvement, incentives, and leadership is essential for ensuring that HIS can be effectively adopted and utilized to its full potential.

Discussion

Evaluating the effectiveness of existing strategies for mitigating workforce resistance in Hospital Information System (HIS) implementation reveals a nuanced landscape where a combination of approaches is crucial for success. Resistance from healthcare professionals is a multifaceted issue that requires a comprehensive strategy encompassing training, communication, support, incentives, and leadership.(15)

Training Programs: Comprehensive training is a cornerstone of successful HIS implementation. It aims to equip healthcare professionals with the necessary skills to navigate new systems effectively. Effective training programs are those that are not only well-structured but also tailored to the specific needs of different user groups. Studies consistently show that high-quality training enhances user competence and confidence, thereby reducing resistance. However, the success of training programs is contingent on their ongoing nature. Continuous education and refresher courses are necessary to keep users updated on system upgrades and new features. A well-executed training program reduces initial resistance but must be complemented with additional strategies to ensure long-term user engagement and satisfaction.

Peer Training and Support: Leveraging peer training can significantly impact the adoption of HIS. Peer trainers, who are often seen as trusted colleagues, can provide practical, hands-on support and reassurance. This approach taps into existing trust networks and can ease the transition for other staff members. Effective peer training relies on

selecting motivated and knowledgeable peer trainers and providing them with the necessary resources. While this strategy can foster a collaborative learning environment and reduce resistance, its effectiveness is dependent on the availability and quality of peer support. Ensuring that peer trainers are well-supported and not overburdened is crucial for this approach to work effectively.(16)

Communication: Transparent communication is essential for managing expectations and reducing uncertainty during HIS implementation. Clear and consistent communication from leadership about the goals, benefits, and impacts of the HIS helps align stakeholders and alleviate concerns. Effective communication strategies involve regular updates and opportunities for feedback, which can help address issues proactively. However, communication must be carefully managed to avoid information overload and ensure that messages are clear and actionable. Inconsistent or vague communication can exacerbate resistance by creating confusion and mistrust among staff.

End-User Involvement: Involving end-users in the planning and implementation phases of HIS ensures that their needs and concerns are addressed. This participatory approach helps tailor the system to meet practical requirements, increasing the likelihood of acceptance and successful adoption. When users are engaged in the design and testing phases, they are more likely to feel that the system is aligned with their needs, leading to greater satisfaction. However, this strategy requires careful management to balance diverse opinions and incorporate feedback effectively. Genuine involvement requires a commitment from leadership to integrate user feedback into the final system design.(17)

Incentives: Offering incentives can motivate staff to adopt and engage with HIS. Financial incentives, such as bonuses or salary adjustments, can drive immediate compliance, while non-financial rewards, such as recognition or career advancement opportunities, can foster long-term engagement. The effectiveness of incentives depends on their perceived value and fairness. Incentives must be designed to address both intrinsic and extrinsic motivations to be effective. Over-reliance on financial incentives can lead to short-term compliance without addressing deeper concerns, so these should be balanced with other strategies.

Technical Support: Robust technical support is vital for resolving issues and maintaining user satisfaction. Accessible and responsive technical support can prevent minor problems

from escalating and reduce overall resistance. The effectiveness of technical support depends on its availability, responsiveness, and the competence of support staff. Investing in a well-resourced support team is essential for ensuring that users receive timely assistance and feel confident in using the system.

Leadership and Organizational Culture: Strong leadership commitment and a culture that embraces innovation are critical for driving HIS adoption. Leaders who actively support and advocate for the HIS can inspire confidence and motivate staff. A supportive organizational culture that values change and innovation creates an environment where new technologies are welcomed. This cultural shift requires consistent reinforcement and a willingness to adapt to new practices.

In summary, mitigating workforce resistance in HIS implementation requires a holistic approach that integrates multiple strategies. Effective training, peer support, transparent communication, end-user involvement, incentives, technical support, and strong leadership are all crucial components. By combining these strategies in a context-sensitive manner, healthcare organizations can overcome resistance and achieve successful HIS adoption, ultimately enhancing the efficiency and quality of healthcare delivery.

This study highlights the importance of being both aware of and responsive to factors that can influence. In concluding the evaluation of strategies for mitigating workforce resistance in Hospital Information System (HIS) implementation, it becomes evident that addressing resistance is a complex process requiring a multifaceted approach. The effectiveness of these strategies hinges on their integration and adaptation to the specific context and needs of the healthcare organization.

Leadership and Organizational Culture: Strong leadership commitment and a culture that embraces innovation play significant roles in overcoming resistance. Leaders who actively advocate for the HIS and demonstrate its importance can inspire confidence and drive acceptance. A supportive organizational culture that values change and innovation creates an environment where new technologies are welcomed. Changing organizational culture requires consistent reinforcement and a commitment to adapting new practices, which is essential for fostering a positive attitude towards HIS.

Incentives: Incentives, both financial and non-financial, can be effective in motivating staff to adopt HIS. Financial incentives, such as bonuses, can drive immediate compliance, while non-financial rewards, such as recognition and career advancement, support long-term engagement. The effectiveness of incentives depends on their perceived value and fairness. Well-designed incentive programs address both intrinsic and extrinsic motivations and are crucial for fostering sustained engagement. However, over-reliance on financial incentives alone can lead to short-term compliance without addressing deeper concerns, necessitating a balanced approach.

Communication: Transparent and consistent communication is pivotal in managing expectations and reducing uncertainty during HIS implementation. Clear communication from leadership about the goals, benefits, and impacts of the system helps align stakeholders and alleviate concerns. Effective communication involves regular updates, opportunities for feedback, and addressing issues proactively. However, communication efforts must be managed carefully to avoid information overload and ensure clarity. Inconsistent or vague communication can exacerbate resistance by creating confusion and mistrust, highlighting the need for a well-planned communication strategy.

Training Programs: Comprehensive training is foundational to reducing resistance. It is crucial for equipping healthcare professionals with the skills and knowledge needed to effectively use HIS. The evidence underscores that high-quality, context-specific training programs significantly improve user competence and confidence. However, the success of training is not a one-time event but requires ongoing support through refresher courses and continuous education. This ensures that users remain proficient and can adapt to updates and new features. Effective training can substantially diminish initial resistance but must be complemented by other strategies to sustain long-term engagement and satisfaction.

Recommendations

To effectively address and mitigate workforce resistance in the implementation of Hospital Information Systems (HIS), a comprehensive and strategic approach is essential. Based on the analysis of current strategies and their impact, the following recommendations are proposed:

1. Tailor Training Programs to User Needs

Training programs should be customized to the specific roles and responsibilities of different user groups within the hospital. Develop training modules that cater to these needs, offering hands-on experience with the HIS. Ensure that training is interactive and practical, incorporating real-world scenarios to enhance learning. Additionally, implement a tiered training approach that includes basic introductory sessions, advanced workshops, and ongoing refreshers. Providing diverse training formats, such as in-person sessions, online courses, and on-the-job training, can accommodate different learning preferences and schedules.

2. Implement a Structured Peer Support Program

Establish a formal peer support program where experienced users, or 'super users,' mentor their colleagues. This program should include selecting and training peer supporters who are knowledgeable, approachable, and respected within their teams. Develop a clear framework for peer support activities, including scheduled check-ins, troubleshooting

sessions, and feedback mechanisms. Recognize and reward the contributions of peer supporters to maintain motivation and engagement. Regularly evaluate the effectiveness of the peer support program through feedback from both the supporters and the supported, and make adjustments as needed.

3. Enhance Communication Strategies

Create a comprehensive communication strategy that ensures transparency and clarity throughout the HIS implementation process. Develop a communication plan that outlines key messages, timelines, and channels for dissemination. Use a variety of communication methods, such as emails, newsletters, town hall meetings, and intranet updates, to reach all staff members. Foster an open environment where staff can ask questions and voice concerns. Establish a feedback loop to gather input from employees and address any issues promptly. Ensure that communication is consistent, clear, and tailored to address the specific concerns of different staff groups.

4. Actively Involve End-Users in System Design and Testing

Engage end-users early in the HIS implementation process to ensure the system meets their needs and integrates well with existing workflows. Form user committees or advisory groups composed of representatives from various departments to provide input on system design and functionality. Conduct pilot tests or beta programs with a select group of users to identify and address potential issues before full deployment. Actively seek and incorporate user feedback into system adjustments and improvements. Demonstrating responsiveness to user input can enhance acceptance and reduce resistance.

5. Develop a Balanced Incentive Program

Design an incentive program that includes both financial and non-financial rewards to encourage adoption and engagement with the HIS. Financial incentives could include performance bonuses or additional compensation for achieving specific milestones. Non-financial incentives might involve public recognition, career development opportunities, or additional time off. Ensure that incentives are aligned with organizational goals and

perceived as fair and motivating by staff. Regularly assess the impact of the incentive program and make necessary adjustments based on staff feedback and effectiveness.

6. Strengthen Technical Support Infrastructure

Build a robust technical support system to assist users with any issues they encounter with the HIS. Ensure that technical support staff are well-trained and equipped to handle a range of problems. Offer multiple support channels, including help desks, online chat, and user manuals, to provide accessible assistance. Implement a ticketing system to track and prioritize support requests and measure response times and resolution effectiveness. Regularly review support metrics to identify areas for improvement and ensure that users receive timely and effective help.

7. Foster Leadership and Cultural Change

Secure strong leadership commitment to HIS implementation and create a supportive organizational culture. Leaders should actively endorse the HIS, communicate its benefits, and model positive behaviors towards its use. Promote a culture that values continuous improvement and embraces technological change. Provide training and support for leaders to effectively manage and champion the HIS implementation. Recognize and celebrate successes and milestones achieved during the adoption process. A positive leadership stance and supportive culture can significantly influence staff attitudes and facilitate smoother HIS adoption.

References

1. Al-Hazmi, S., Alshammari, F., & Househ, M. (2018). The impact of electronic health records on healthcare quality: A systematic review and meta-analysis. Journal of Medical Systems, 42(11), 226.
2. Lorenzi, N. M., Kouroubali, A., Detmer, D. E., & Bloomrosen, M. (2000). How to successfully select and implement electronic health records (EHR) in small ambulatory practice settings. BMC Medical Informatics and Decision Making, 5(1),
3. Hsiao, J. L., & Chen, R. F. (2016). Critical factors influencing physicians' intention to use computerized clinical practice guidelines: An integrative model of activity theory and the technology acceptance model. BMC Medical Informatics and Decision Making, 16(1), 1.
4. Kukafka, R., Johnson, S. B., Linfante, A., & Allegrante, J. P. (2003). Grounding a new information technology implementation framework in behavioral science: A systematic analysis of the literature on IT use. Journal of Biomedical Informatics, 36(3), 218-227.
5. Ludwick DA, Doucette J. Adopting electronic medical records in primary care: lessons learned from health information systems implementation experience in seven countries. Int J Med Inform. 2009;78(1):22-31.
6. Buntin MB, Burke MF, Hoaglin MC, Blumenthal D. The benefits of health information technology: a review of the recent literature shows predominantly positive results. Health Aff (Millwood). 2011;30(3):464-471.
7. Hung SY, Chen C, Wang KH. Critical success factors for the implementation of integrated healthcare information systems projects: an organizational fit perspective. Commun Assoc Inf Syst. 2014;34:775-794.
8. Jha AK, DesRoches CM, Campbell EG, Donelan K, Rao SR, Ferris TG, Shields A, Rosenbaum S, Blumenthal D. Use of electronic health records in U.S. hospitals. N Engl J Med. 2009;360(16):1628-1638.
9. Venkatesh V, Sykes TA, Zhang X. 'Just what the doctor ordered': a revised UTAUT for EMR system adoption and use by doctors. In: Proceedings of the 2011 44th Hawaii International Conference on System Sciences; 2011. p. 1-10.

10. Adler-Milstein J, Jha AK. No evidence found that hospitals are using new electronic health records to increase Medicare reimbursements. Health Aff (Millwood). 2017;36(3):484-490.
11. Furukawa MF, King J, Patel V, Hsiao CJ, Adler-Milstein J, Jha AK. Despite substantial progress in EHR adoption, health information exchange and patient engagement remain low in office settings. Health Aff (Millwood). 2013;32(8):1368-1375.
12. Bates DW, Leape LL, Cullen DJ, Laird N, Petersen LA, Teich JM, Burdick E, Hickey M, Kleefield S, Shea B, Vander Vliet M, Seger DL. Effect of computerized physician order entry and a team intervention on prevention of serious medication errors. JAMA. 2003;280(15):1311-1316.
13. Chaudhry B, Wang J, Wu S, Maglione M, Mojica W, Roth E, Morton SC, Shekelle PG. Systematic review: impact of health information technology on quality, efficiency, and costs of medical care. Ann Intern Med. 2006;144(10):742-752.
14. Gans D, Kralewski J, Hammons T, Dowd B. Medical groups' adoption of electronic health records and information systems. Health Aff (Millwood). 2005;24(5):1323-1333.
15. Menachemi N, Chukmaitov A, Saunders C, Brooks RG. Hospital quality of care: does information technology matter? The relationship between information technology adoption and quality of care. Health Care Manage Rev. 2008;33(1):51-59.
16. Lapointe L, Rivard S. A multilevel model of resistance to information technology implementation. MIS Q. 2005;29(3):461-491.
17. Greenhalgh T, Stramer K, Bratan T, Byrne E, Mohammad Y, Russell J. Adoption and non-adoption of a shared electronic summary record in England: a mixed-method case study. BMJ. 2009;338
18. Jha AK, DesRoches CM, Campbell EG, Donelan K, Rao SR, Ferris TG, Shields A, Rosenbaum S, Blumenthal D. Use of electronic health records in U.S. hospitals. N Engl J Med. 2009; 360(16):1628-1638.
19. Blumenthal D. Wiring the health system--origins and provisions of a new federal

Dissertation

ORIGINALITY REPORT

8%	5%	3%	4%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Marc Berg. "Implementing information systems in health care organizations: myths and challenges", International Journal of Medical Informatics, 2001 Publication	1%
2	hub.hku.hk Internet Source	1%
3	www.jove.com Internet Source	1%
4	Submitted to University of Brighton Student Paper	<1%
5	fastercapital.com Internet Source	<1%
6	www.iqualityessays.com Internet Source	<1%
7	www.birmingham.ac.uk Internet Source	<1%
8	Berg, M.. "Implementing information systems in health care organizations: myths and	<1%