Internship Training
at

KareXpert Technologies Pvt. Ltd.

HMIS role-based user experience

Mr. Himanshu Kumar Soni

PG/20/020

Under the Guidance of
Dr. Sukesh Bhardwaj
Assistant Professor, IIHMR, New Delhi

PGDM (Hospital and Health Management)

2020-22

International Institute of Health Management Research,
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The certificate is awarded to

Himanshu Kumar Soni

in recognition of having successfully completed his internship in the department of

Product Delivery

and has successfully completed his Project on

HMIS role-based user experience

3rd Feb to 30th April 2022

KareXpert Technologies Pvt. Ltd.

He comes across as a committed, sincere & diligent person who has a strong drive & zeal for learning.

We wish him all the best for future endeavors.

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. Himanshu Kumar Soni** student of PGDM (Hospital & Health Management) from International Institute of Health Management Research, New Delhi has undergone internship training at **KareXpert Technologies Pvt. Ltd.** From **3rd Feb 22** to **30th April 22.**

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. Sukesh Bhardwaj

Assistant Professor and IT-Incharge

IIHMR, New Delhi

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Certificate of Approval

The following dissertation titled **"HMIS role-based user experience"** at **"Kare Xpert Technologies Pvt. Ltd."** 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
Dr. Sukesh Bhardwaj	
Dr. Dhananjay	

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Certificate from Dissertation Advisory Committee

This is to certify that **Mr. Himanshu Kumar Soni**, a graduate student of **the PGDM (Hospital & Health Management)** has worked under our guidance and supervision. He is submitting this dissertation titled **HMIS role-based user experience** at **KareXpert 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. Sukesh Bhardwaj
Assistant Professor and IT-Incharge
IIHMR, New Delhi

Ms. Rajni Singh
Healthcare Product Specialist
KareXpert Technologies Pvt. Ltd.

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INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH,
NEW DELHI

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled 'HMIS role-based user experience' and submitted by **Mr. Himanshu Kumar Soni** Enrollment No. PG/20/020 under the supervision of Dr. Sukesh Bhardwaj for award of PGDM (Hospital & Health Management) of the Institute carried out during the period from 3rd Feb 22 to 30th April 22 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.

Himanshu K. Soni

Signature

FEEDBACK FORM

Name of the Student: Mr. Himanshu Kumar Soni

Name of the Organisation in Which Dissertation has been completed: KareXpert Technologies Pvt. Ltd

Area of Dissertation: Product Delivery

Attendance: 100 %

Objectives achieved: 1) He has worked hard to achieve the client satisfaction.

2) Successfully handled 3 clients alone, with day-to-day technical issues and new enhancements

Deliverables: He has met all the timelines for production movement, handled all development points well.

Strengths: Leadership, Fast learner, Multitasker

Suggestions for Improvement: Make your technical part stronger in respect to the product.

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

Date: 30th September, 2022

Place: Gurugram

Ms. Rajni Singh
Senior Manager Product Delivery

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CERTIFICATE ON PLAGIARISM CHECK

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Enrollment/Roll No.	PG/20/020	Batch Year	2020-22
Course Specialization (Choose one)	Hospital Management	Health Management	Healthcare IT
Name of Guide/Supervisor	Dr./ Prof.: Sukesh Bhardwaj		
Title of the Dissertation/Summer Assignment	HMIS role-based user experience		
Plagiarism detect software used	"TURNITIN"		
Similar contents acceptable (%)	Up to 15 Percent as per policy		
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Date of validation (DD/MM/YYYY)	19/11/2022		

Guide/Supervisor
Name: Dr. Sukesh Bhardwaj
Signature:

Student Himanshu Kumar Soni
Name:
Signature: Himanshu K Soni

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Dean (Academics and Student Affairs)
Signature:
Date:
(Seal)

ACKNOWLEDGEMENT

First and foremost, I would like to thank Almighty**,** who gave me strength and courage to accomplish my dreams and kept me upright even in the deepest of my sorrows and pain.

I would like to thank by beloved father, **Sh. Rajan K. Soni**, mother, **Smt. Madhu Soni** and all my family members for their un-conditional love and immense support throughout the journey of my life.

I take immense pleasure to express my sincere and deep sense of Gratitude to my mentor **Dr. Sukesh Bhardwaj**, Assistant Professor and IT-In charge, IIHMR, New Delhi for his valuable suggestions, motivation and guidance throughout the course of my project work. Without his guidance and encouragement, it would not have been possible for me to complete this study.

I offer my gratitude to **Ms. Rajni Singh**, Senior Manager Product Delivery, KareXpert Technologies Pvt. Ltd. for her kind professional help and co-operation.

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There are many others who I might have inadvertently left out and I sincerely thank all of them for their help.

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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

OT – Operation Theatre

UAT – User Acceptance Testing

QA – Quality Assurance

ORGANIZATION BACKGROUND

The Reliance funded start-up *KareXpert* founded in 2018 provides artificial intelligence and cloud-based digital healthcare platform for hospital. Aimed at digitally transforming one lakh hospitals by 2026. Amid the COVID-19 crisis, healthcare, starting from doctor consultation and diagnostics tests to getting medicines, shifted online almost overnight. the lack of digital services for doctors, KareXpert pivoted to focus on building B2B solutions. In 2018, Nidhi launched **KareXpert**, which is aimed at digitalising hospitals by providing a **SaaS based digital healthcare platform** to fulfil its mission of digitally transforming 100,000 hospitals in India and across the world in the next five years.

Besides disruptive technology and SaaS based commercial model, KareXpert has also built the holistic Managed Services model for the Hospitals serving both onsite and offsite support needs bringing complete peace of mind to the customer

With 50+ modules and 450+ applications, KareXpert is the first Indian company to offer a most exhaustive portfolio for hospitals. The service includes advanced HIMS, EMR/EHR, LIMS, RIS/PACS, pharmacy, connected ambulance, advanced BI, MIS, e-Claim, telemedicine, inventory & SCM, queue management, counselling, and branded mobile apps as a pre-integrated stack.

Using its Patient-First and Mobile-first approach, the Digital Healthcare Platform will revolutionize the Hospital IT as it brings the speed of business with innovation using most modern software technologies at a fraction of cost. The platform is already being used in some of the top hospitals across India, helping them streamline their operations.

INTRODUCTION

A complete, integrated information system for managing a hospital's operational, financial, and clinical aspects is called the Hospital Management Information System (HMIS). The finest possible electronic data processing assistance for patient care and administration is what a hospital management information system aims to achieve. The goal of an HMIS, a subfield of medical informatics, is to provide the greatest possible assistance for patient care, outcomes, and administration by capturing data when necessary and presenting it where it is needed as a result of networked electronic data processing. The primary requirements for hospital management information systems are accurate data storage, dependable utilization, quick access to data, secure data storage, and decreased usage costs. They offer a common source of data on a patient's condition[1].

Once it has been modified and put into use, the hospital management information system (HMIS) is a stand-alone, completely self-contained system. It covers all components and functionalities in a seamless, integrated manner. In many hospitals, HMIS represents a significant step toward paperless operations. It is an enterprise-wide software that addresses every facet of hospital management and operations. Its primary goals are patient and employee pleasure, as well as the best clinical results, ideal financial performance, and other goals. According to the kind of services it provides, HMIS is generally divided into three categories: clinical, support, and back office services[2].

Large departments and units that coordinate patient care are seen in hospitals, which are incredibly complicated institutions. HMIS is a large-scale, integrated system that supports the full information needs of hospitals, including patient, clinical, ancillary, and financial management. It is meant to store, manipulate, and retrieve information of the administrative and clinical elements. The potential of HMIS to support diagnosis, management, and education for better and improved services and practices is becoming more and more important to hospitals[3].

HMIS benefits to patient:

- Reduction in wait times for registration, examination, investigations, pharmacy, and admission. Patient can enter hospital at any moment without medical records in tow. There's no need to return to get the investigation's reports.
- More in-depth clinical examination time spent by the doctor with the patient.
- Better treatment outcomes as a result of access to older electronic medical records (EMR).
- The unit chief (doctor) will have daily access to an online review of all IP patients.
- Because the EMR will be easily accessible, patients can be posted for procedures right away in case of emergencies without losing valuable time.
- Health status and current treatments can be tracked daily.
- It is possible to track patient entitlements such clean linen, national camps, meals, medications, and so forth.
- Death and birth records

HMIS benefits to the Hospital:

- Decreased manual data entry for the same patient at various hospital locations during a visit or admission.
- Access to Secured Data from Anywhere, anytime.
- Error is decreased through timely delivery of accurate information.
- Including standardized treatment recommendations in patient care.
- Easy access to patient EMRs, as most patients who lack literacy do not bring medical documents.
- Slashed the time it takes to retrieve patient investigation reports.
- An improvement in diagnosis quality as a result of the EMR's accessibility to older records.
- Ensures that nurses confirm that every Inpatient takes their regular diet.
- Drop-down menus minimize the amount of time that treating doctors must spend writing.
- Better management of the medications, consumables, and disposables inventories.

No patient entering a hospital needs to have their demographic information entered. Each module in HMIS is interconnected with other modules in terms of functionalities and data sharing. All modules can be accessed from single sign on feature[3].

The most frequent issues in using HMIS at university hospitals have to do with aspects of the human environment. Additionally, the biggest difficulties in non-academic hospitals are

human ones. To remove these obstacles and boost HMIS users' enthusiasm, it is advised to adopt certain policies and programmes, such as in-service training[4].

Customers of the HMIS are divided into internal and external categories. Internal customers are those who deal with the critical processes of a healthcare facility, such as doctors, nurses, laboratory techs, pharmacists, quality department, and others. Patients, patients' families, insurance companies, vendors, health services researchers, etc. are examples of external clients.

HMIS are crucial in delivering high-quality healthcare services while lowering costs. The HMIS deployment faces numerous challenges, including user resistance to new technology, a lack of user interaction and participation in the system's design and implementation, integration with healthcare workflow, and untrained users. The findings highlight that one of the most important elements in achieving HMIS performance is training. Untrained users resist the shift out of concern that they won't be able to handle the HMIS and will be fired. One way to lower the obstacles to implementing the HMIS is to educate users about its purpose and advantages, then include more users in its implementation and make it easier for them to do so[3].

The HMIS project should be implemented gradually so that users have time to adjust to the new system. Additionally, positions, duties, and their significance should be effectively explained to various stakeholders. Even if you are planning for a generic application, all department-specific requirements should be recorded. All of the aforementioned criteria should be taken into account for the implementation to be successful. If everyone works together to successfully adopt and use HMIS in every hospital, it will be beneficial to society[2].

When a hospital management information system is implemented, the first and most crucial aspect that benefits is patient (customer) satisfaction because waiting times are decreased. This aids in their achievement of a degree of patient satisfaction, which makes them eager to continue their care. When waiting times are shortened, the patient is automatically moved to the next stage, which is the admissions process. Future technological advancements will lead to great growth in the healthcare industry, which will lighten the load on administrators and raise patient quality and satisfaction levels[5].

Less bother in managing the client-side system is one of the many advantages of web-based applications. Due to the ease with which a web browser can access the system from a server, we do not need to install it on the client-side (web based). Due to time efficiency, this shift impacts patient health services more quickly.

HMIS must have a user-friendly interface that is as simple to operate as popular social media platforms like Facebook, Instagram, and Twitter, which are already familiar to most users[6].

MAJOR WORKFLOWS OF HMIS

1) Appointment

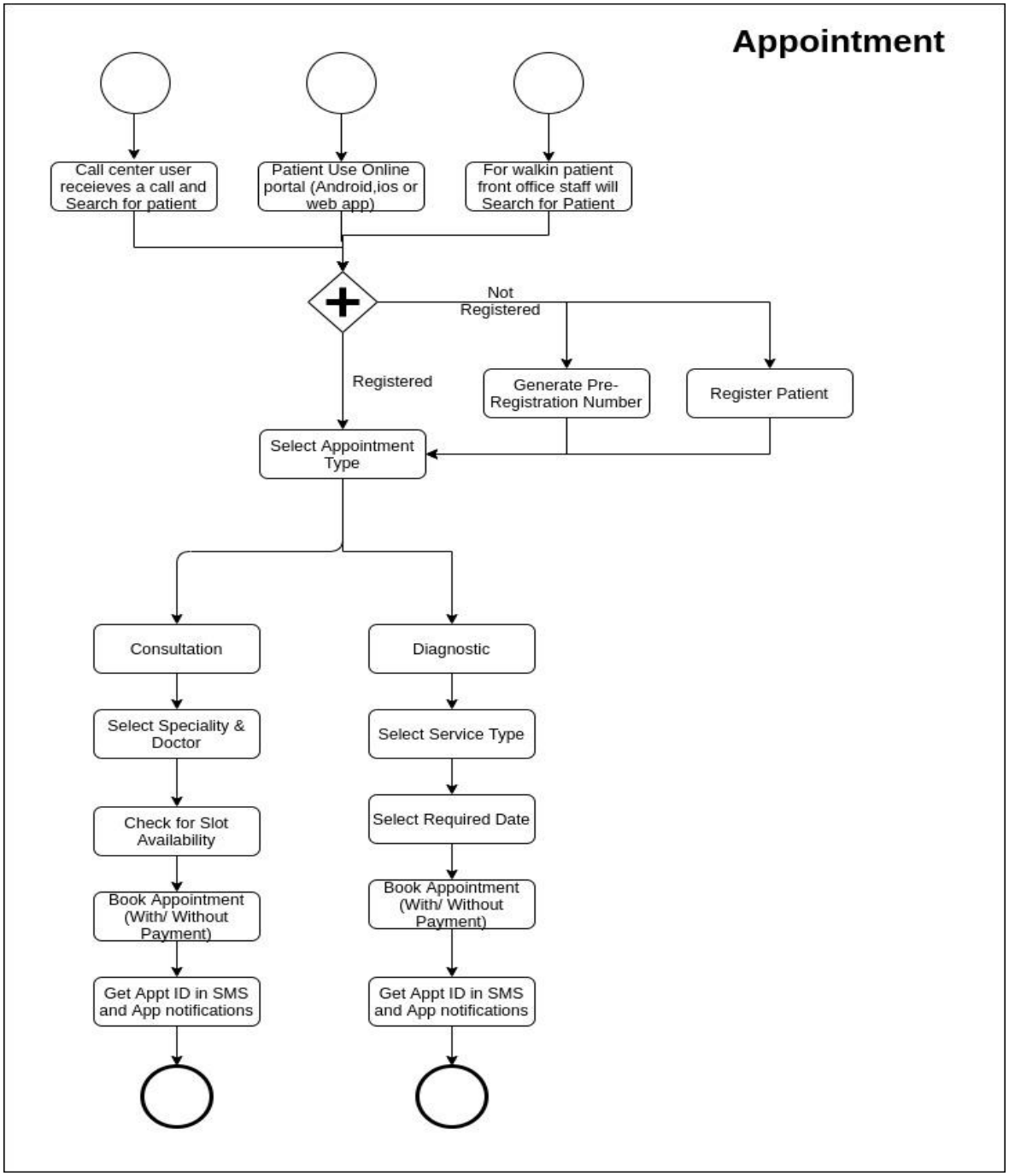

Figure 1 Appointment

2) Electronic Medical Record (EMR)

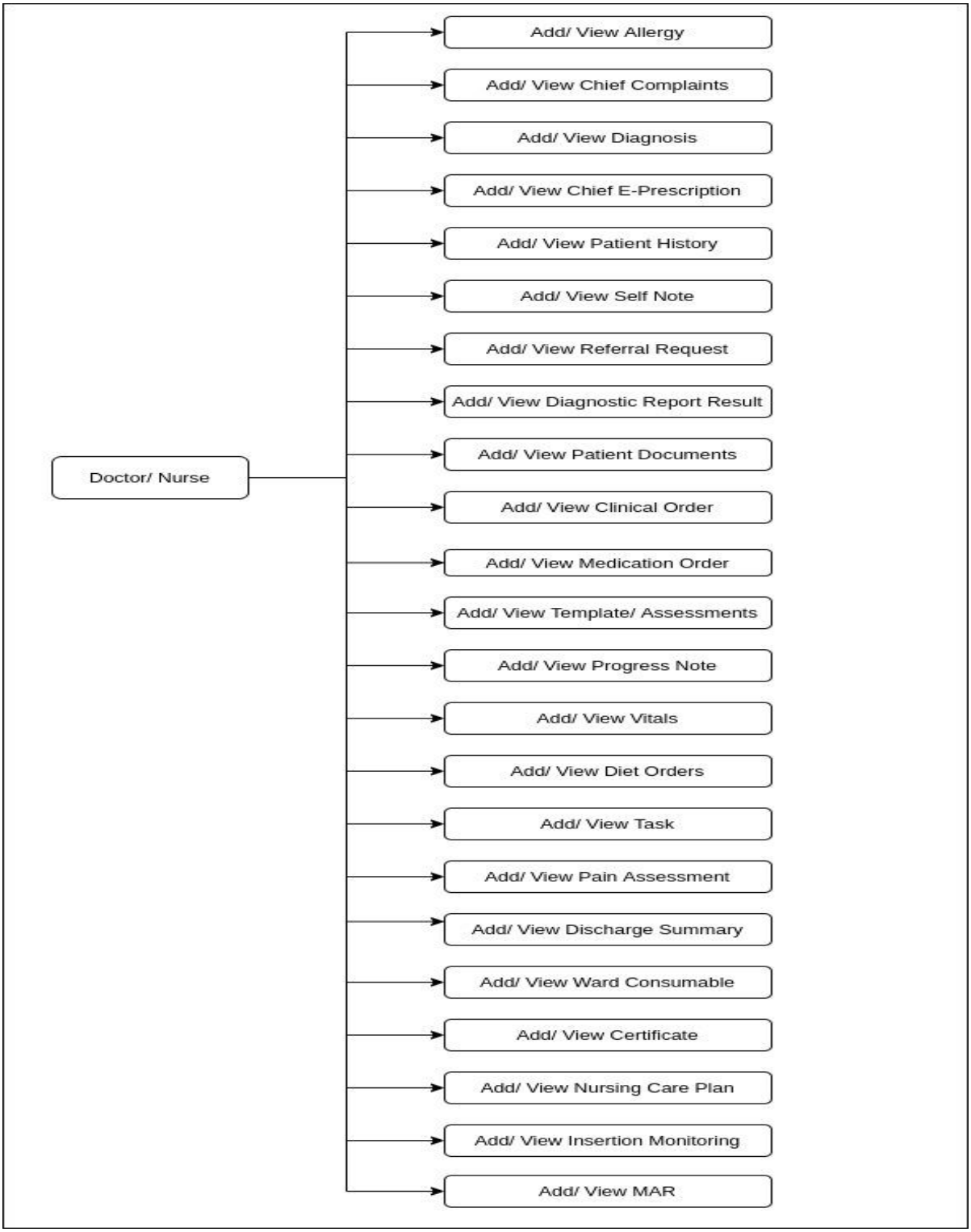

Figure 2 Electronic Medical Record

3) Inventory

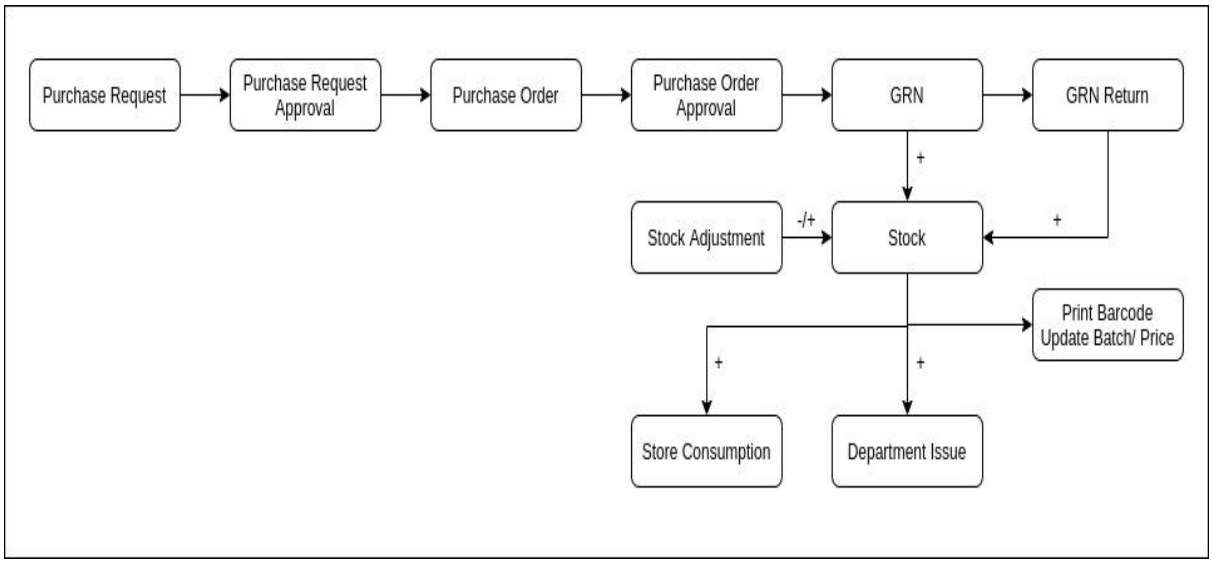

Figure-3 Inventory

4) IP Pharmacy

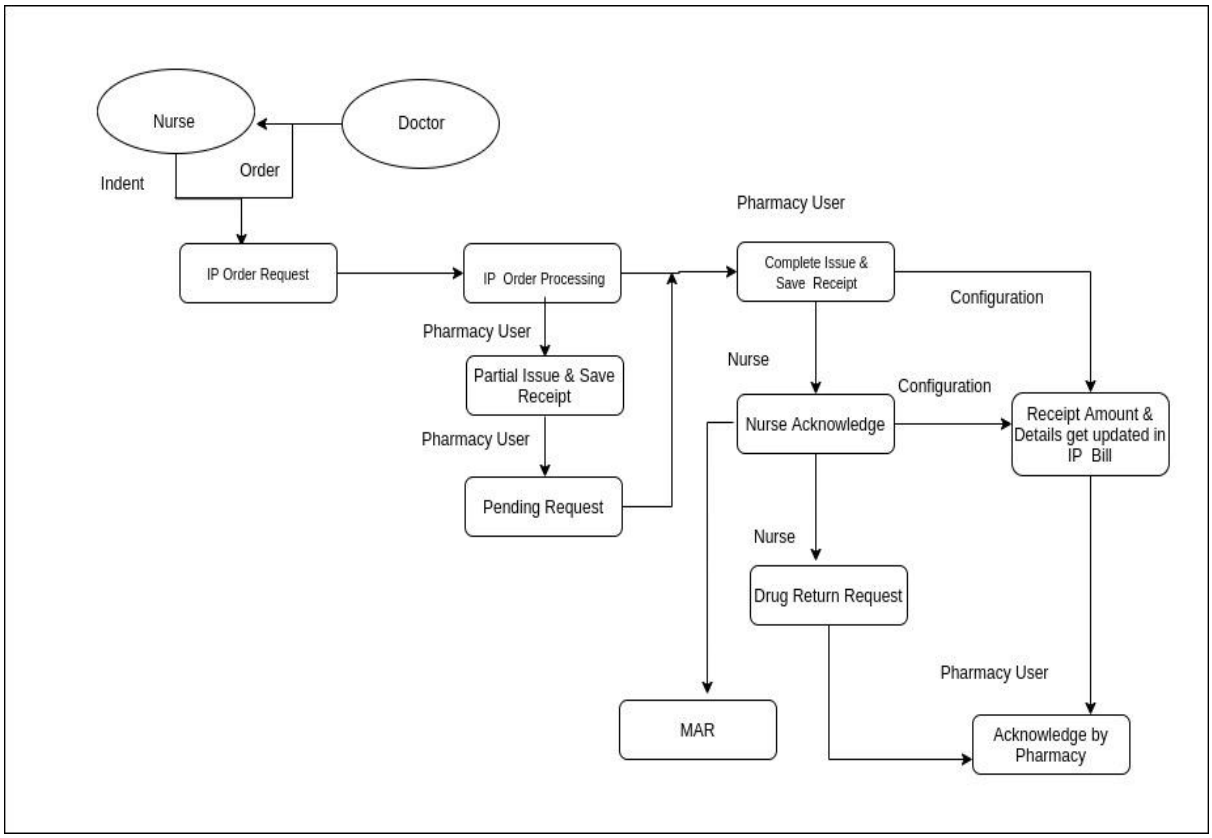

Figure-4 IP Pharmacy

5) In-patient Department (IPD)

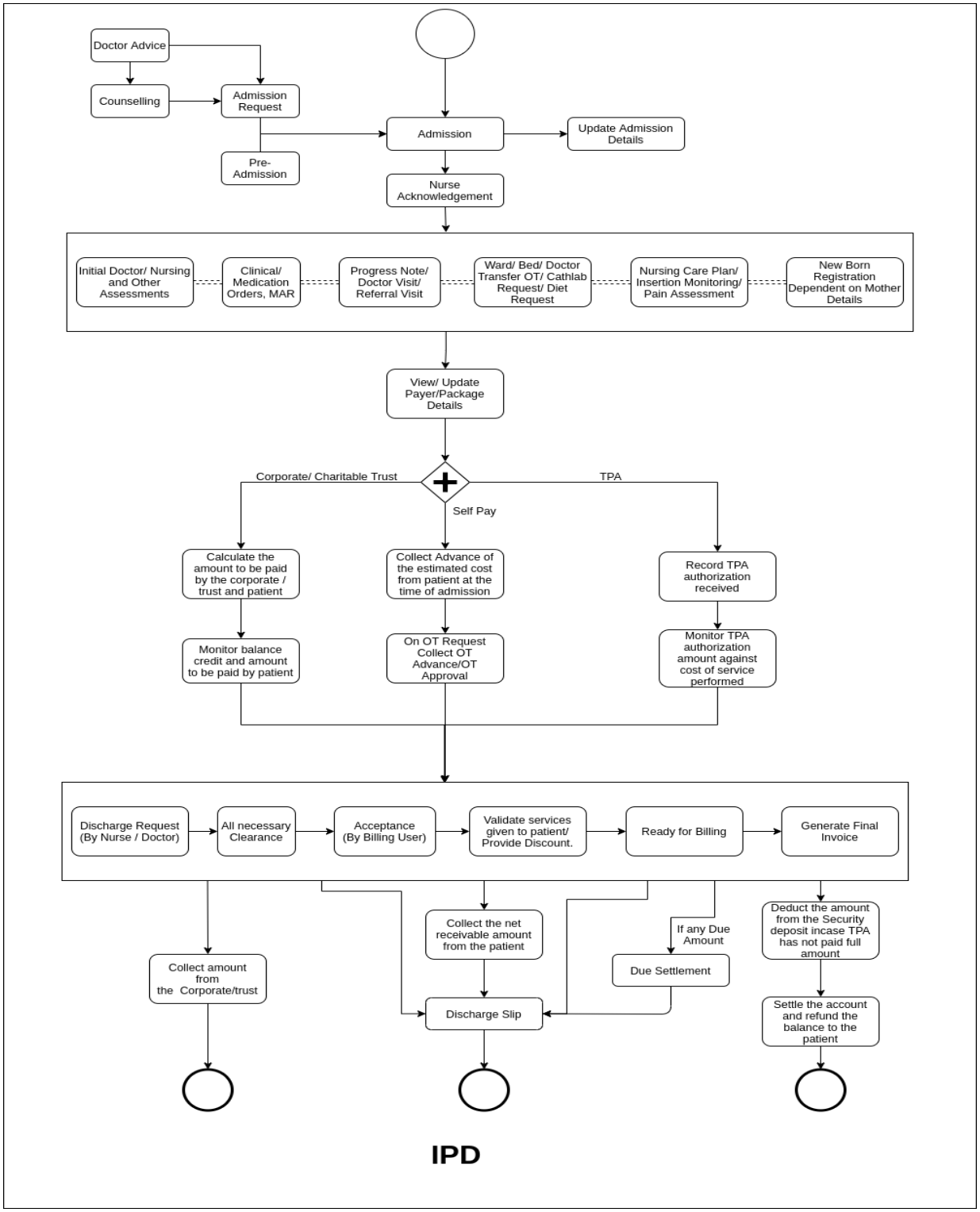

Figure 5 In-patient Department

6) Laboratory Information System (LIS)

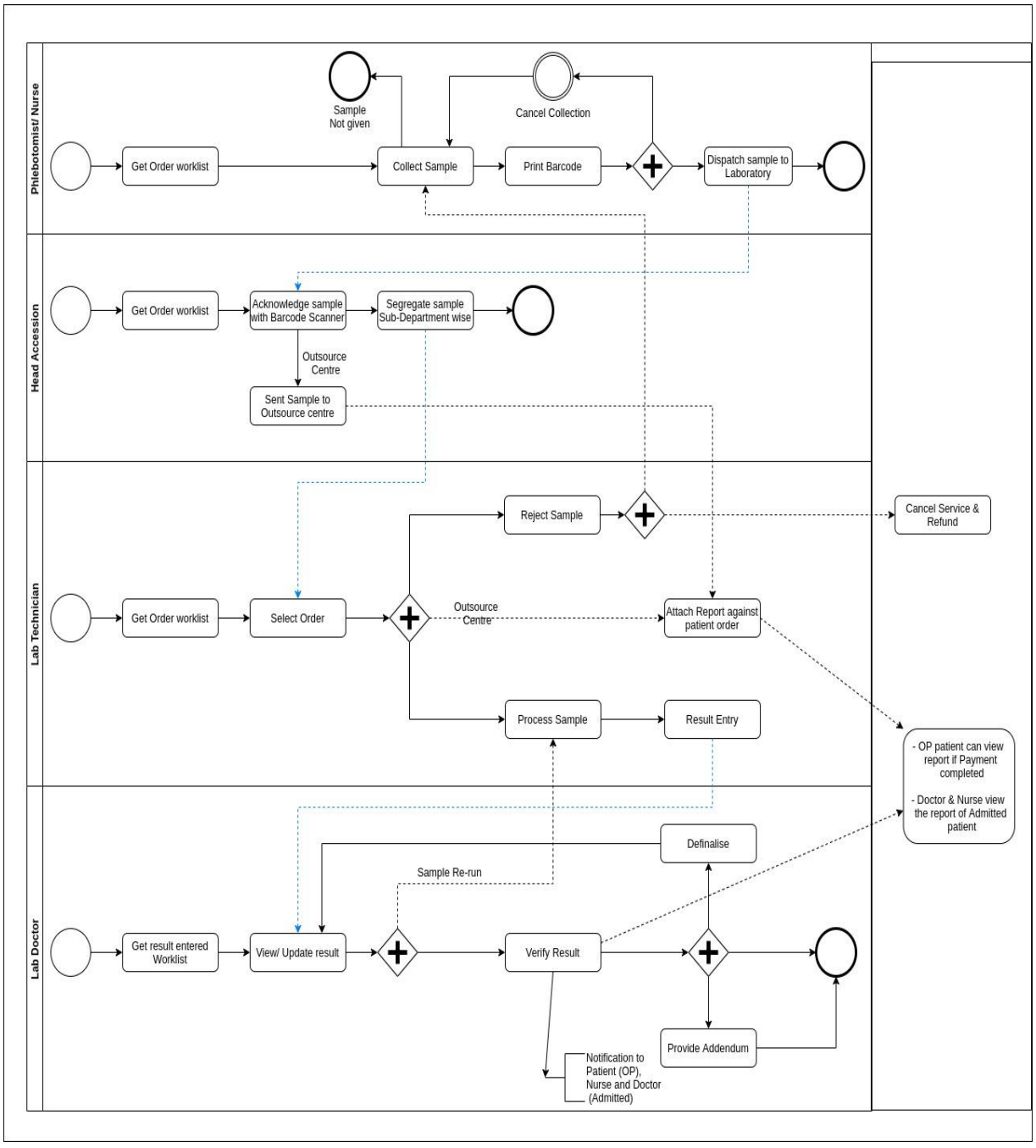

Figure 6 Laboratory Information System

7) OP Billing

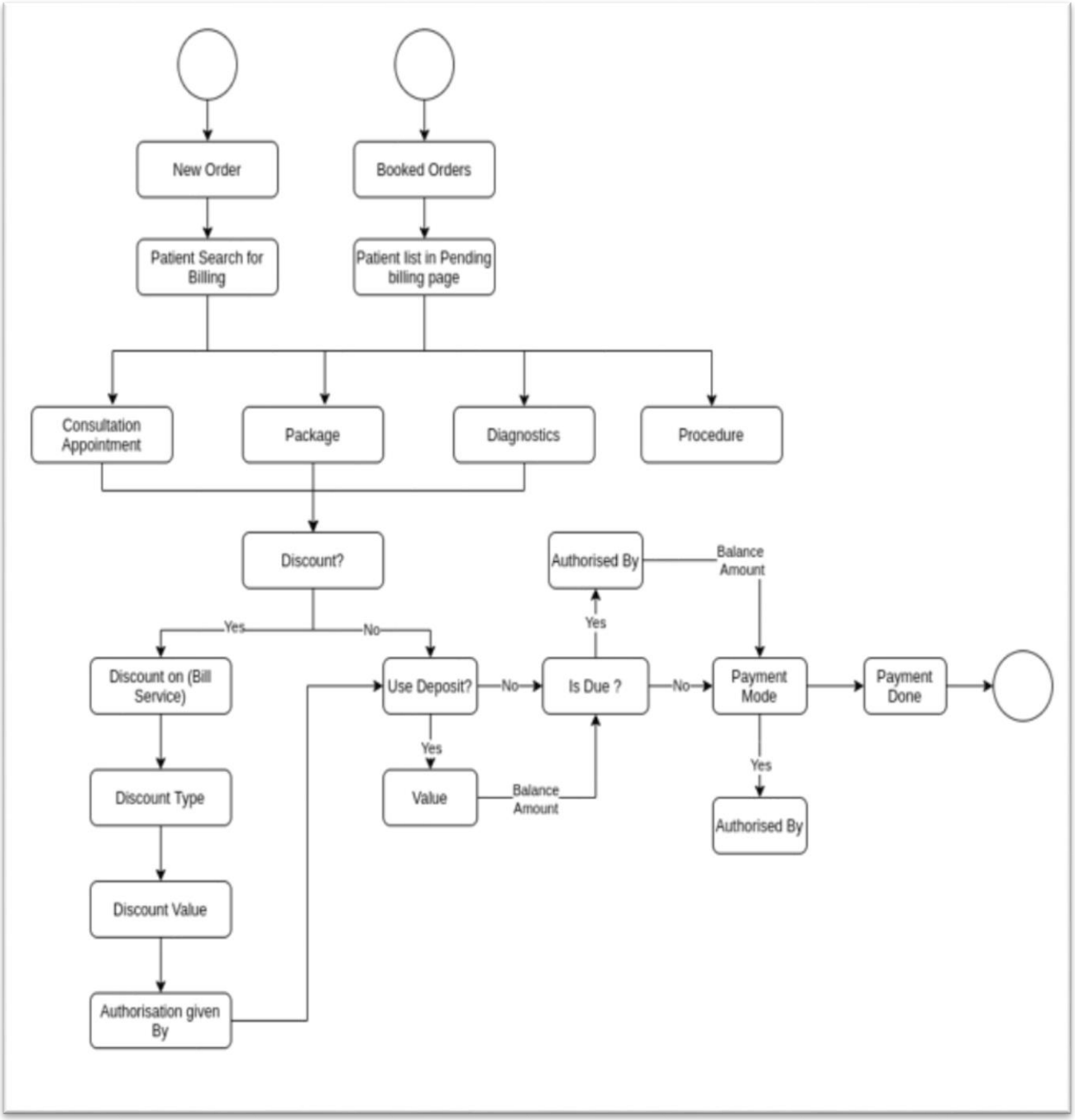

Figure 7 OP Billing

8) OP Pharmacy

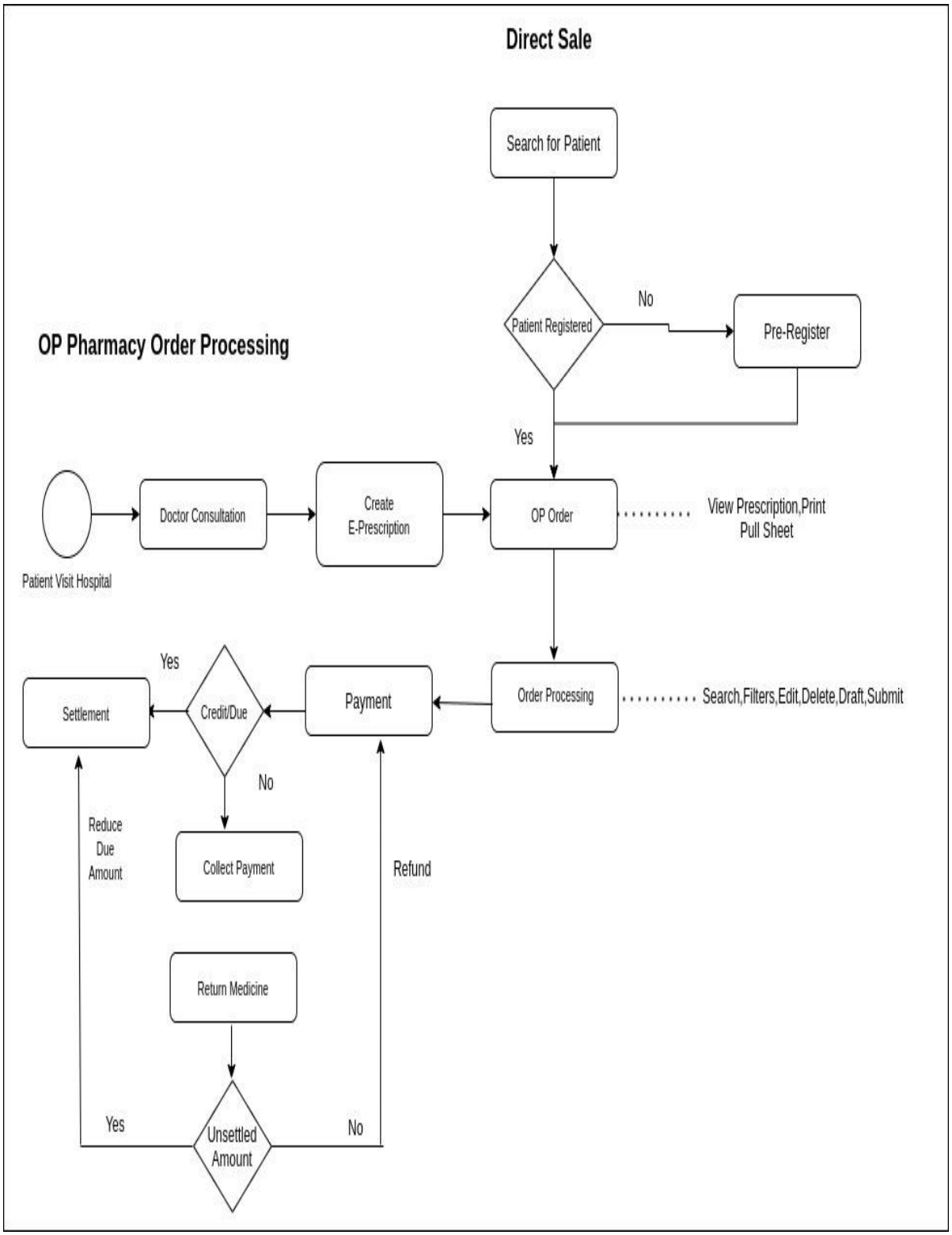

Figure 8 OP Pharmacy

9) Operation Theatre (OT)

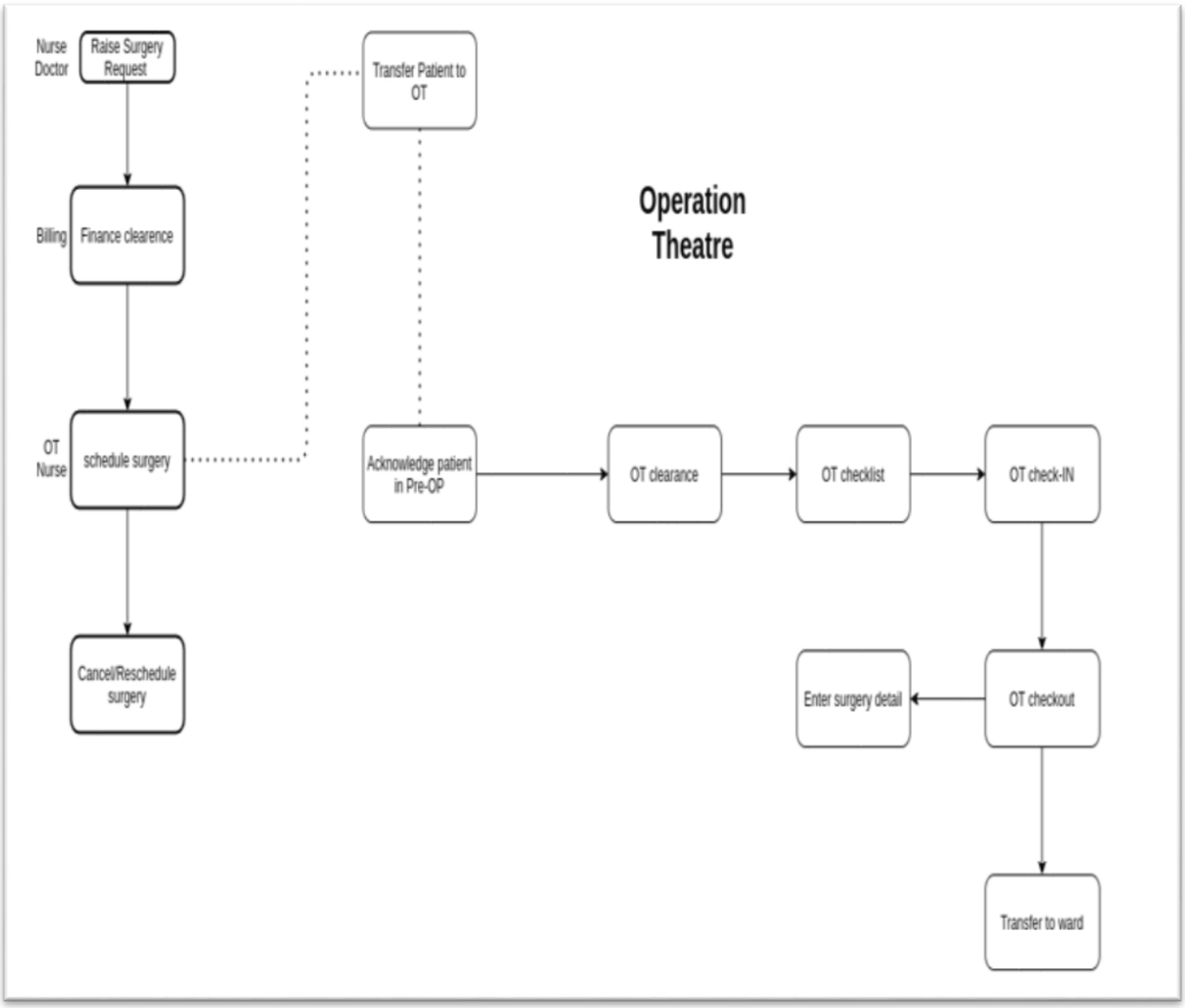

Figure 9 Operation Theatre

10) Radiology Information System (RIS)

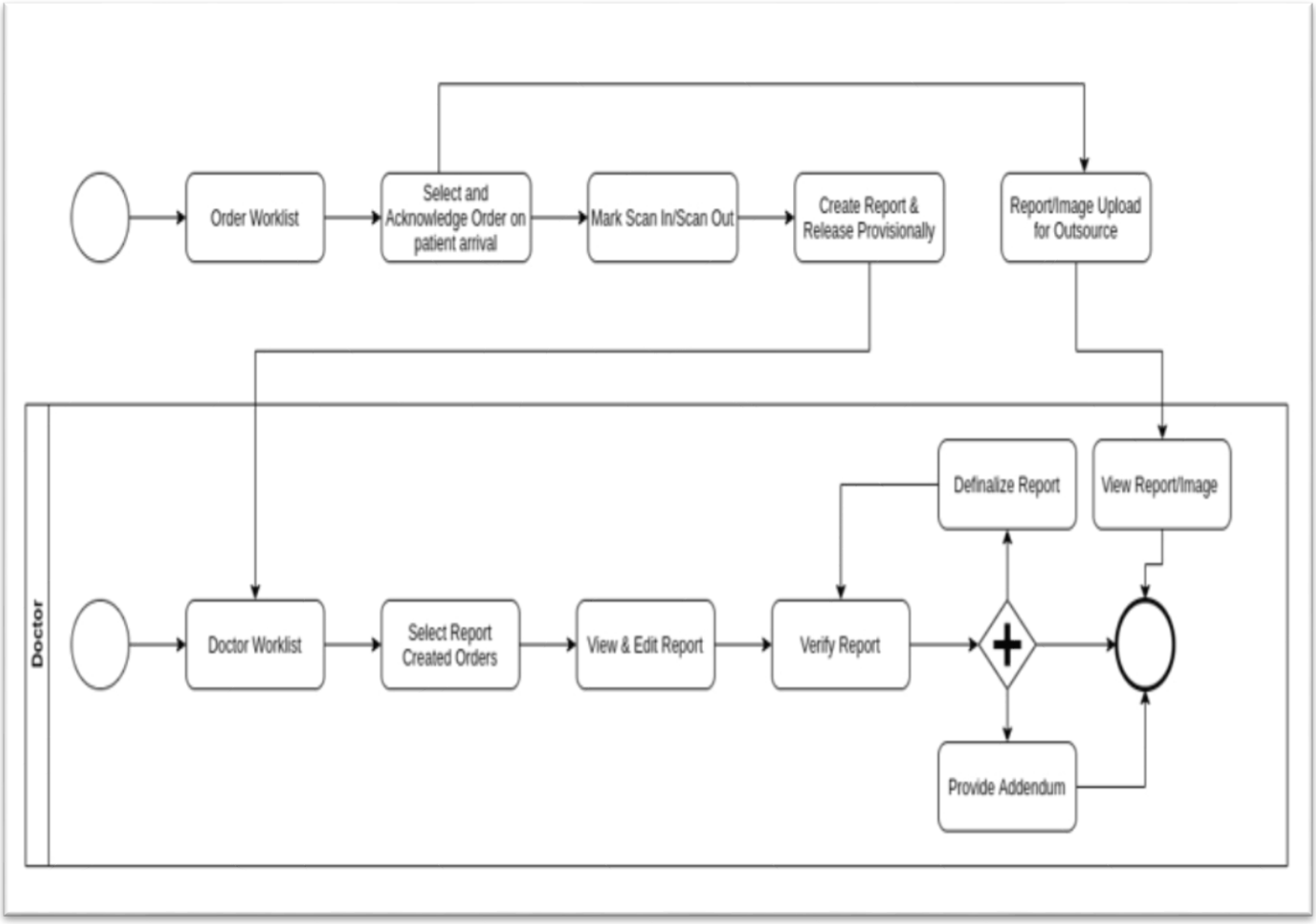

Figure 10 Radiology Information System

Need of the study:

To Enhance the Product functionality and user acceptance for the HIMS software product of the KareXpert, through end-user experiences while working in the live production environment.

Aim of the study:

The aim of the study is to understand the barriers in acceptance of the HMIS with end-users.

Objectives of the study:

1) To identify the challenges faced by the end-users in using HMIS software.
2) To understand the importance of end-user training on the HMIS.
3) To get the end-user reviews and feedback for the HMIS software in production environment.

REVIEW OF LITERATURE

A 2012 study about training and the success of hospital management information systems (HMIS) was undertaken by Sima Ajami et al. The purpose of this study was to demonstrate the value of user training for effective HMIS. This review study was not systematic. With the use of a library, books, conference proceedings, data bank, and search engines like Google Scholar, the literature on training and its effects on user satisfaction and HMIS effectiveness was looked up. The results of this study demonstrated that there are various significant aspects

that affect both user happiness and the success or failure of HMIS. The findings highlight that one of the most important elements in achieving HMIS performance is training. Untrained consumers are afraid of losing their[3].

In order to improve the quality of healthcare services, Rully Sumarlin did a study in 2018 titled The Review of User Experience and User Interface Design of Hospital Information System. The goal of the study was to make the most of the Hospital Information System software, which helps doctors and hospital management employees to provide better healthcare. The Dewi Sri Hospital in Karawang, one of the city's oldest hospitals, hosted this study. It was built in 1997. Dewi Sri must continually enhance every part of its services due to the large number of patients in Karawang who want medical attention. The study's quality research methodology is based on user interviews regarding the hospital information system and observations of how it is implemented and impacts Dewi Sri Hospital Karawang Health Service as a whole[6].

In 2014, B. K. Murthy et al. published research titled "A Case Study of PGIMER, Chandigarh: Implementation Challenges of Hospital Information System in Super Specialty Hospital." Despite efficient planning and phased implementation, there is still worry about the difficulties in using and implementing HIS. Technical issues such data security, unauthorized access, secret information, and the integration of medical software to prevent double entry are included here, as well administrative challenges like stakeholder involvement, user acceptance, lack of ownership, etc. This can be reduced by using data entry operators or via offline and duplicate entries, however these implementations fall short of the HIS's goals. The difficulties

encountered when implementing HIS in a super specialty hospital are discussed in this research[2].

Researchers Leila Ahmadian et al. compared academic and non-academic hospitals in their study, "Challenges of Using Hospital Information Systems by Nurses." 2015 saw the completion of this cross-sectional investigation. The nurses who worked at Kerman's academic and non-academic hospitals made up the study's statistical population. Two portions of a questionnaire were utilised. The participants' demographic data made up the first segment, and the second component included 34 questions about the difficulties in using HIS. Using the SPSS 19 programme, the data were analysed using descriptive and statistical methods (t-test and ANOVA). In university hospitals, human environment issues, notably "negative attitude of society about employing HIS," were the most prevalent and significant problems[4].

Information systems in Hospitals: A Review Article from a Nursing Management Perspective was the focus of a 2013 study by Helja Laine et al. This literature review's objective was to outline the information and communication resources that hospital nurse managers may use to aid in decision-making. Strategic, tactical, and operational decisions are made by managers. The main conclusions were that a variety of information and communication systems had been developed to assist nurse managers in managing their information, but that these systems primarily supported strategic and tactical decision-making without providing real-time information support, and that operational decision-making was only marginally supported.

Additionally, there was a dearth of studies examining how the current platforms assist nurse supervisors in making decisions[7].

RESEARCH METHODOLOGY

Study Design – Cross-sectional study design

Sample population size – 50

Sampling technique – Convenience sampling

Targeted population size – 122

Data collection tool – Microsoft Forms

Questionnaire circulation tool – WhatsApp instant messaging service

Inclusion criteria

- **On role staff and active end-users of the health facility.**
- **End-users utilizing KareXpert's HMIS software.**

Exclusion criteria

- **Contractual staff and inactive end-users of the health facility**
- **KareXpert's employees**

DATA COLLECTION PROCEDURE

User Consent: I am conducting research on HMIS (Hospital Management Information System) role-based user experience. Through this questionnaire, we will be able to get the real-time feedback of the end-users and this will help us in improving our product services. The reported information will be used for research purpose only and will be kept confidential.

The questionnaire was filled on voluntary basis by the HMIS end-users of the hospitals and the purpose of circulating the questionnaire was explained to them.

Questionnaire data collection tool comprised of 15 questions to perform the study. It included the demographic questions of the end-users (Q1-Q4) and the remaining questions (Q5-Q15) were the major questions that focused on the end-user experience for HMIS.

The questionnaire was circulated with the help of WhatsApp instant messaging service in the health care facilities under me and colleagues' portfolios in which the SPOC persons of 7 healthcare facilities forwarded the questionnaire among the hospital staff. There was total 122 active end-users out of which 50 users responded to the questionnaire.

Given below is the URL for the questionnaire which was circulated among the HMIS users – https://forms.office.com/r/REFzpf3k8J

RESULTS

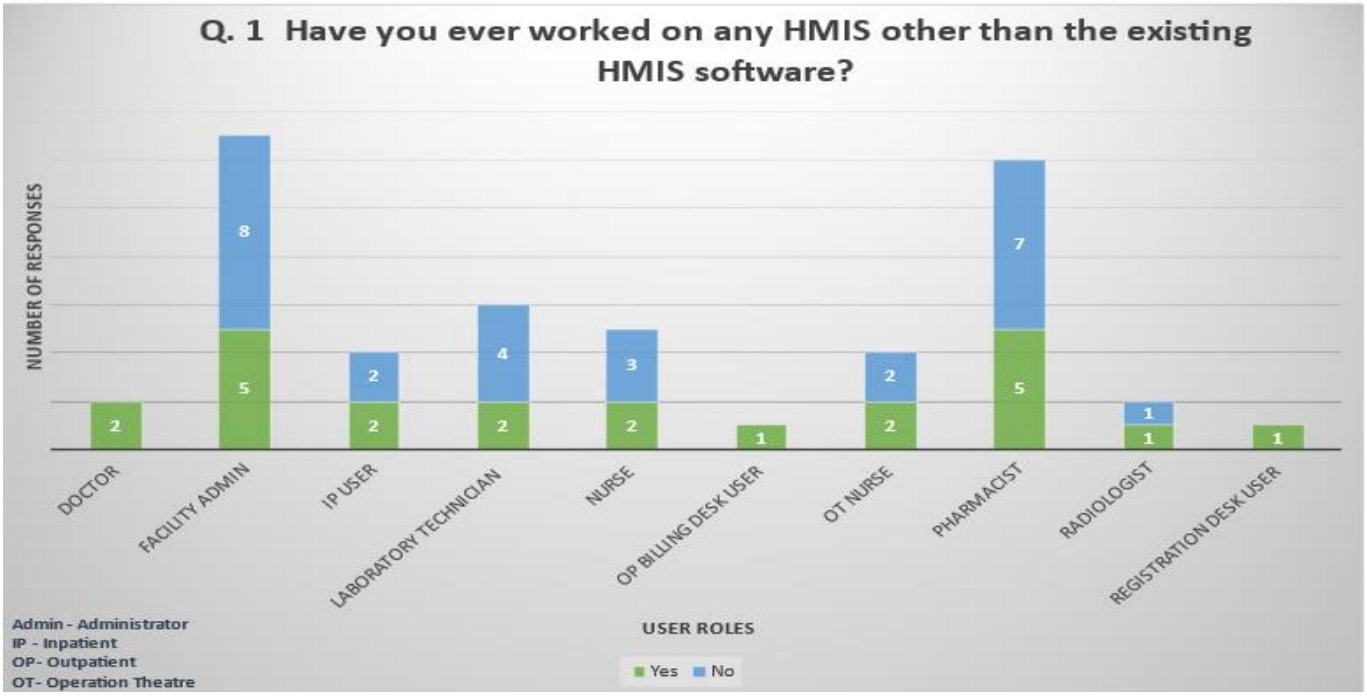

Figure 11 Graph Q.1

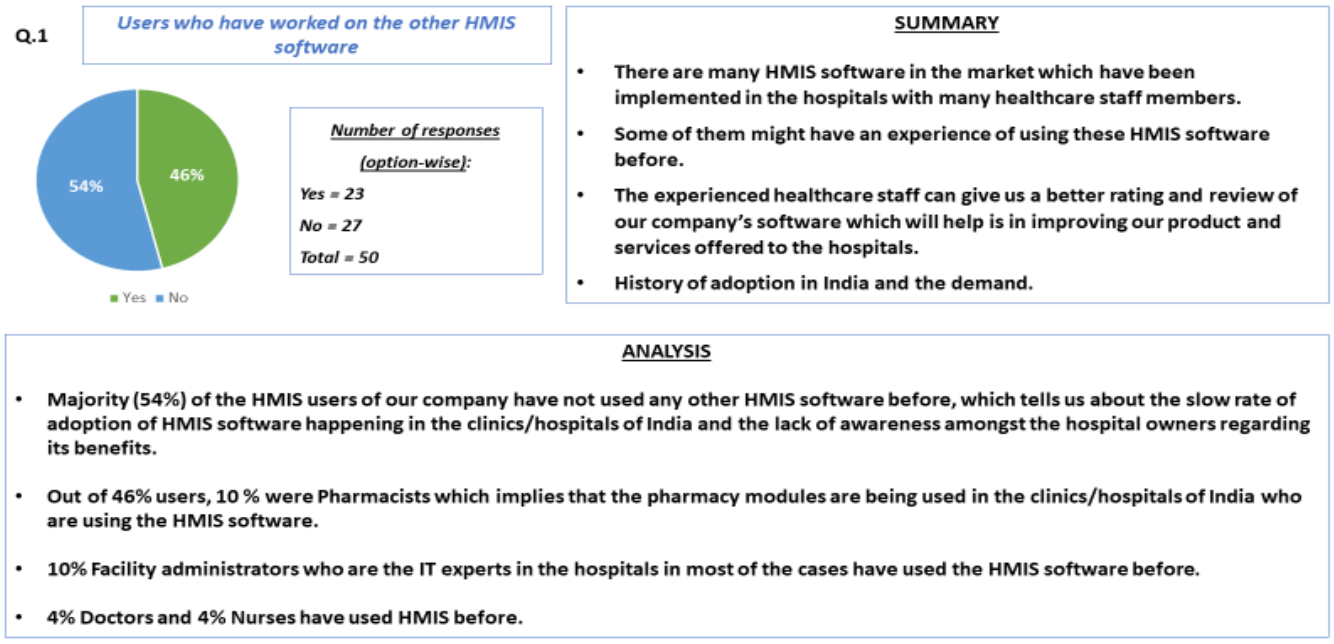

Figure 12 Analysis Q.1

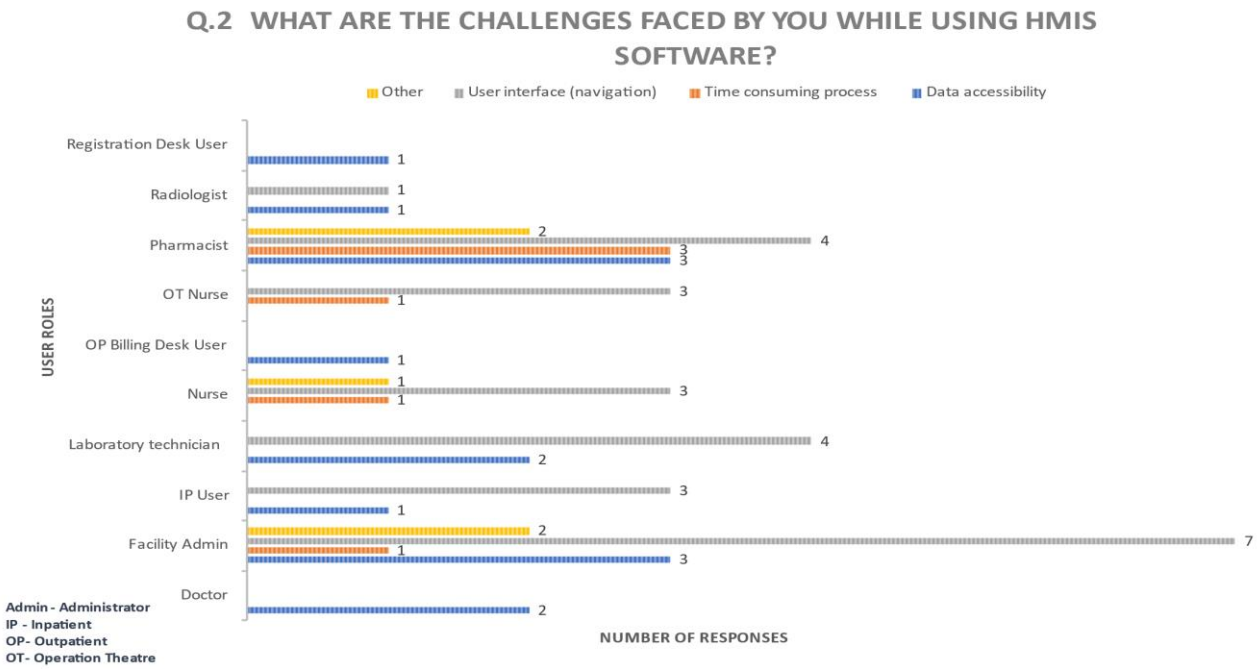

Figure 13 Graph Q.2

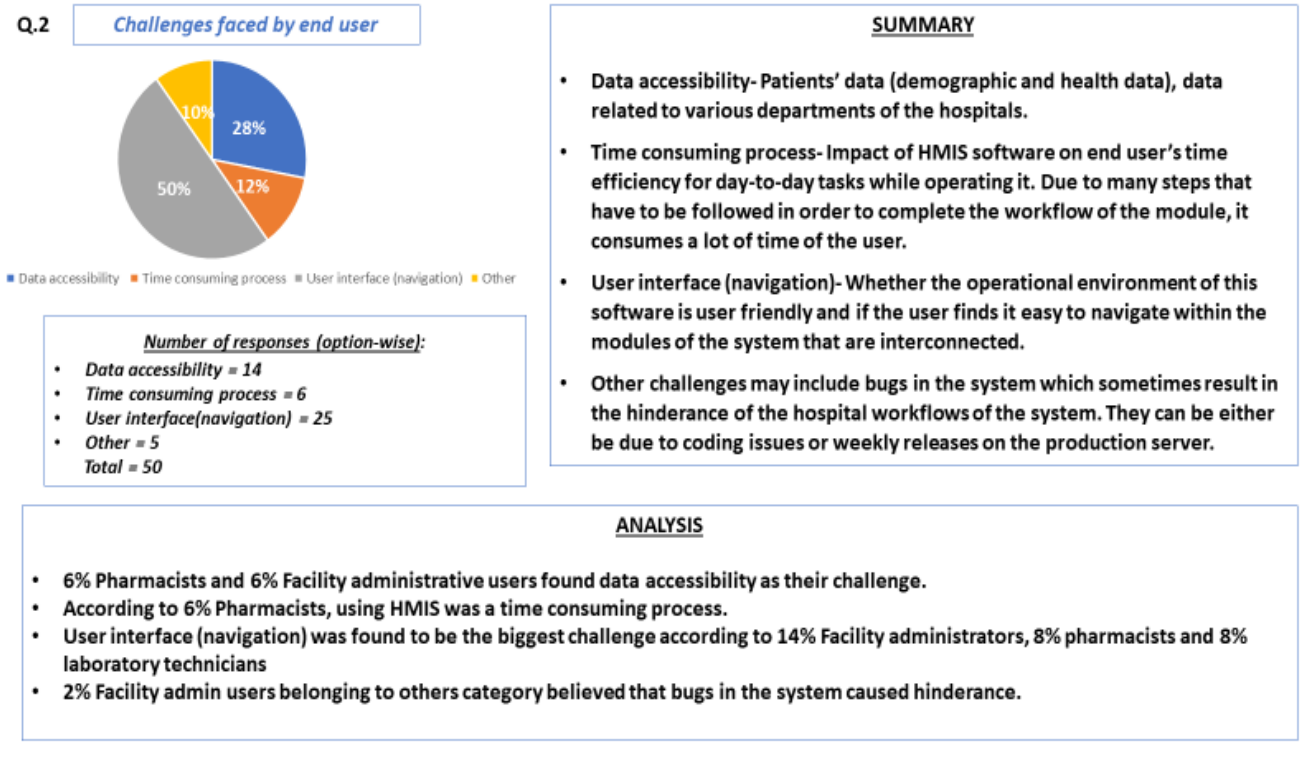

Figure 14 Analysis Q.2

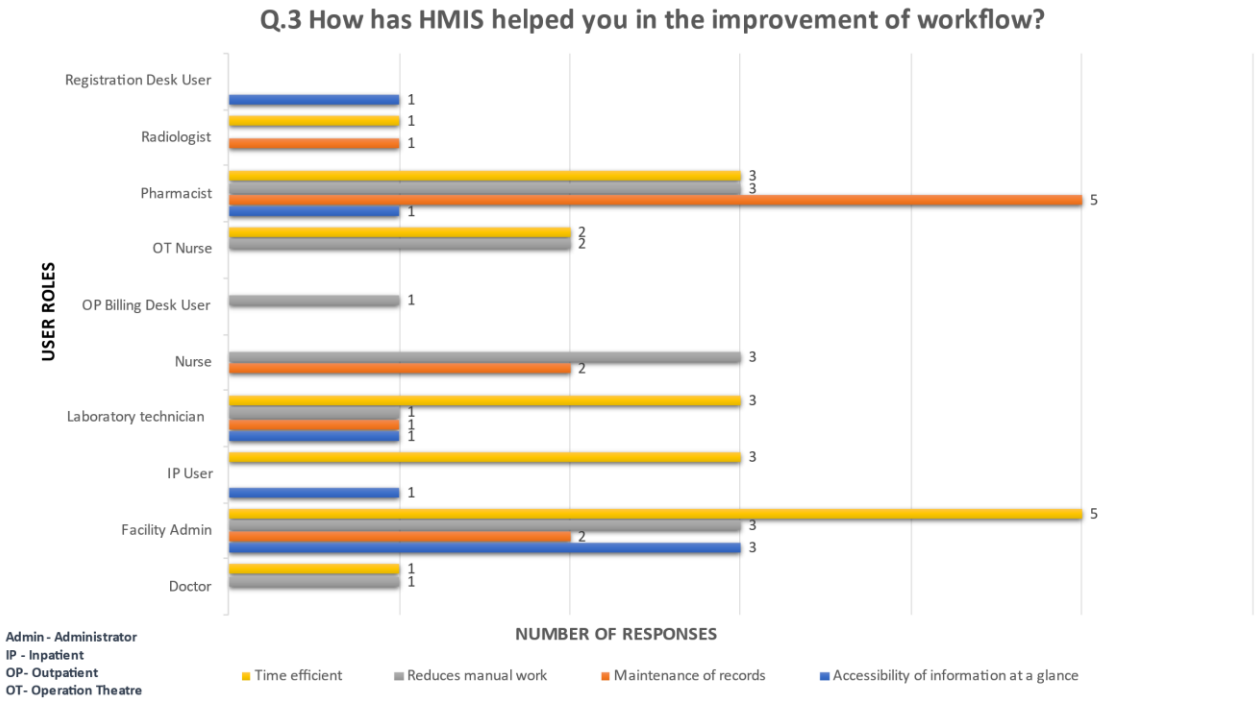

Figure 15 Graph Q.3

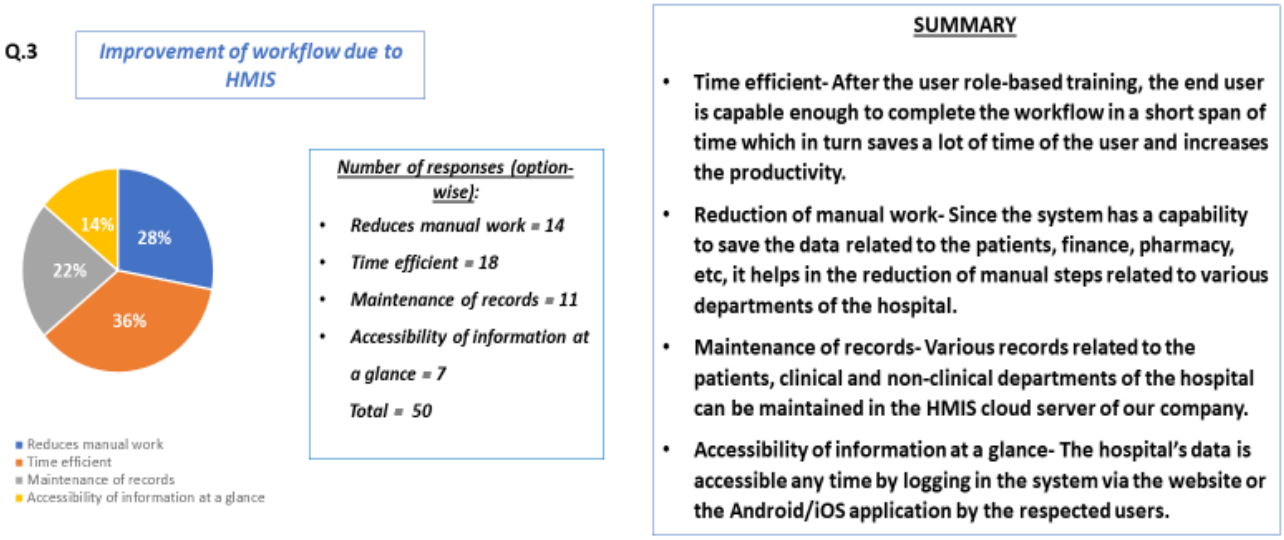

Figure 16 Analysis Q.3

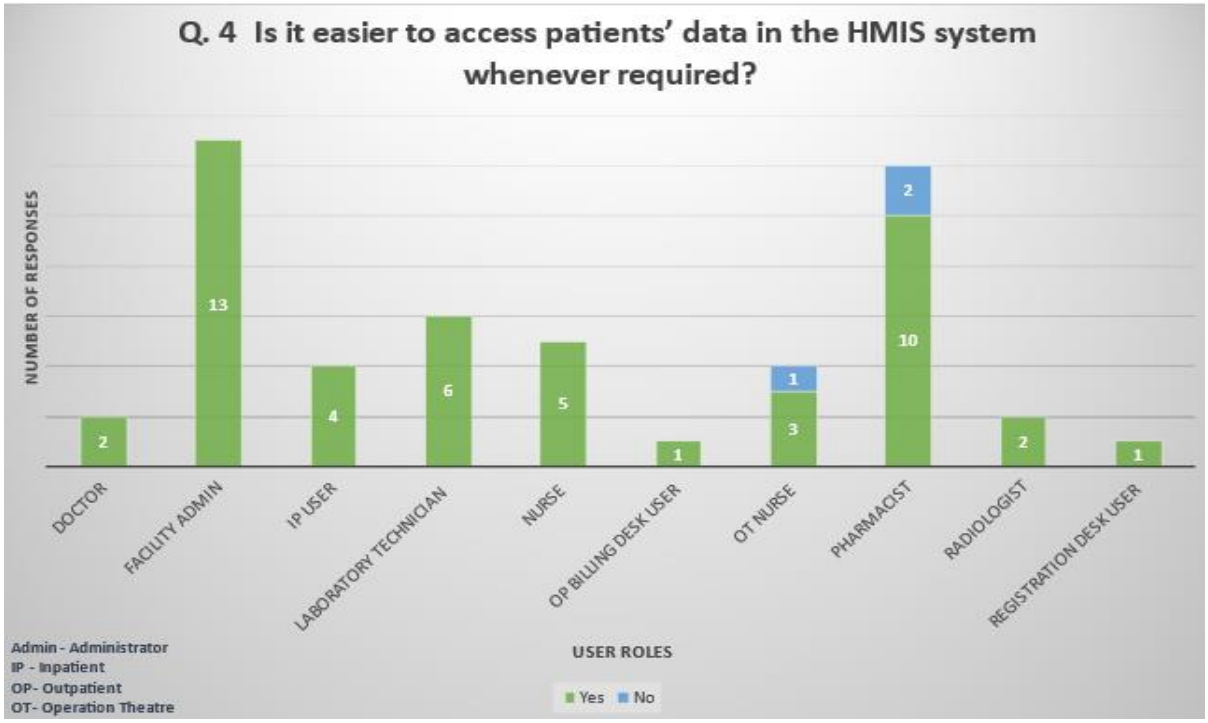

Figure 17 Graph Q.4

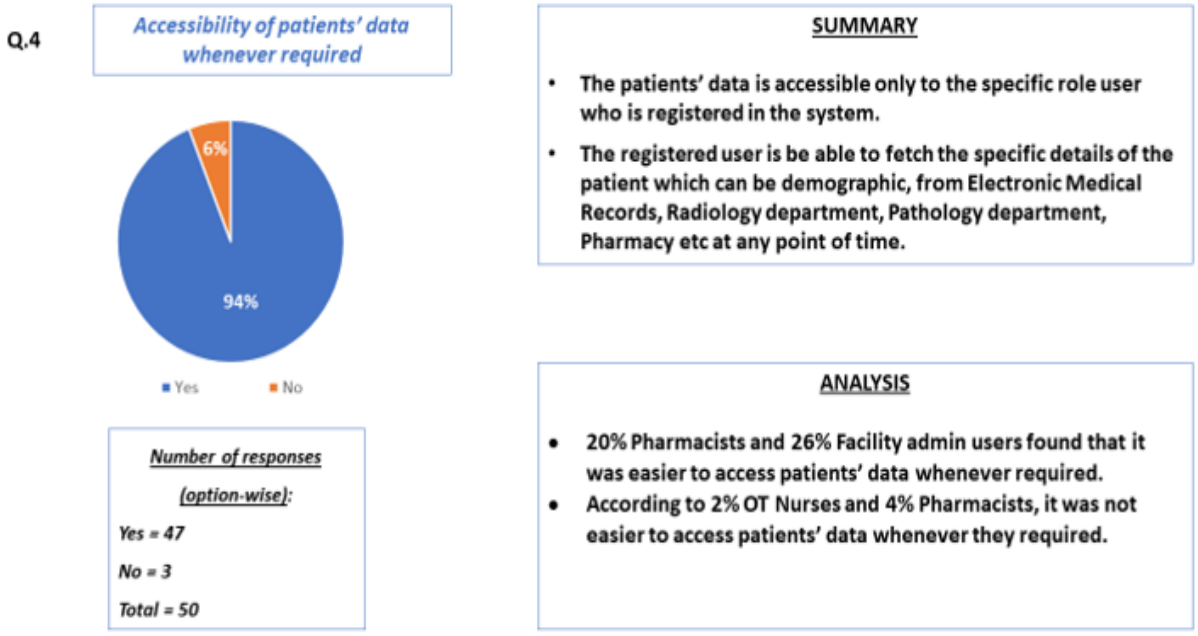

Figure 18 Analysis Q.4

Figure 19 Graph Q.5

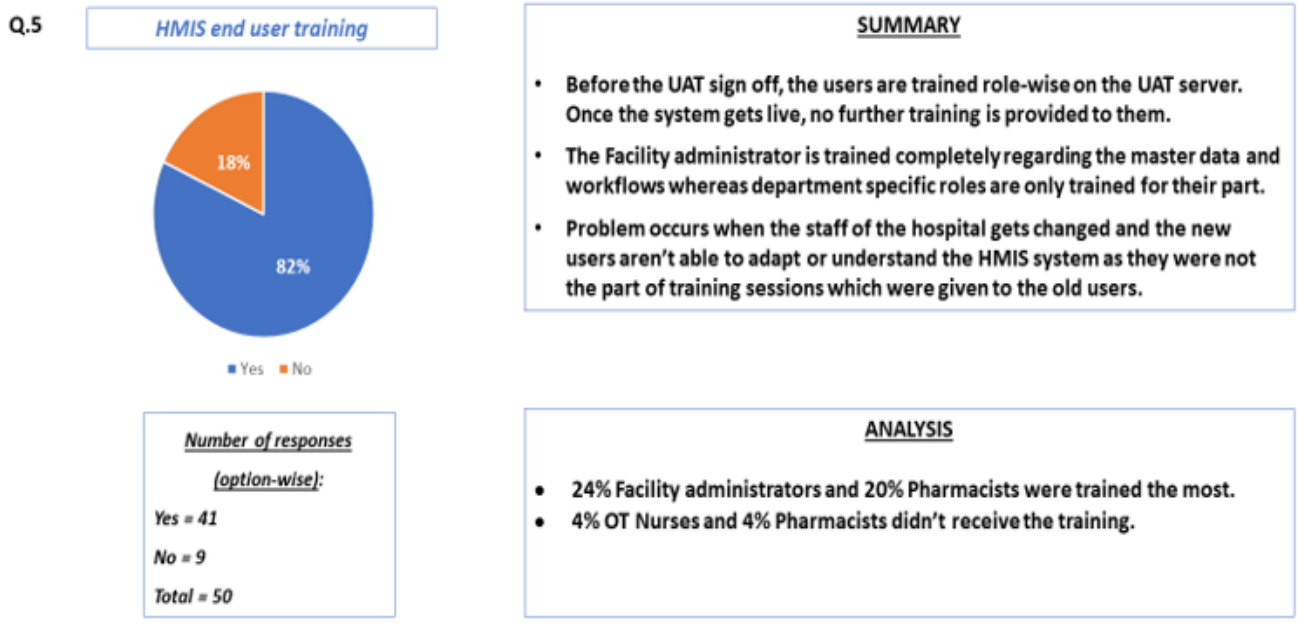

Figure 20 Analysis Q.5

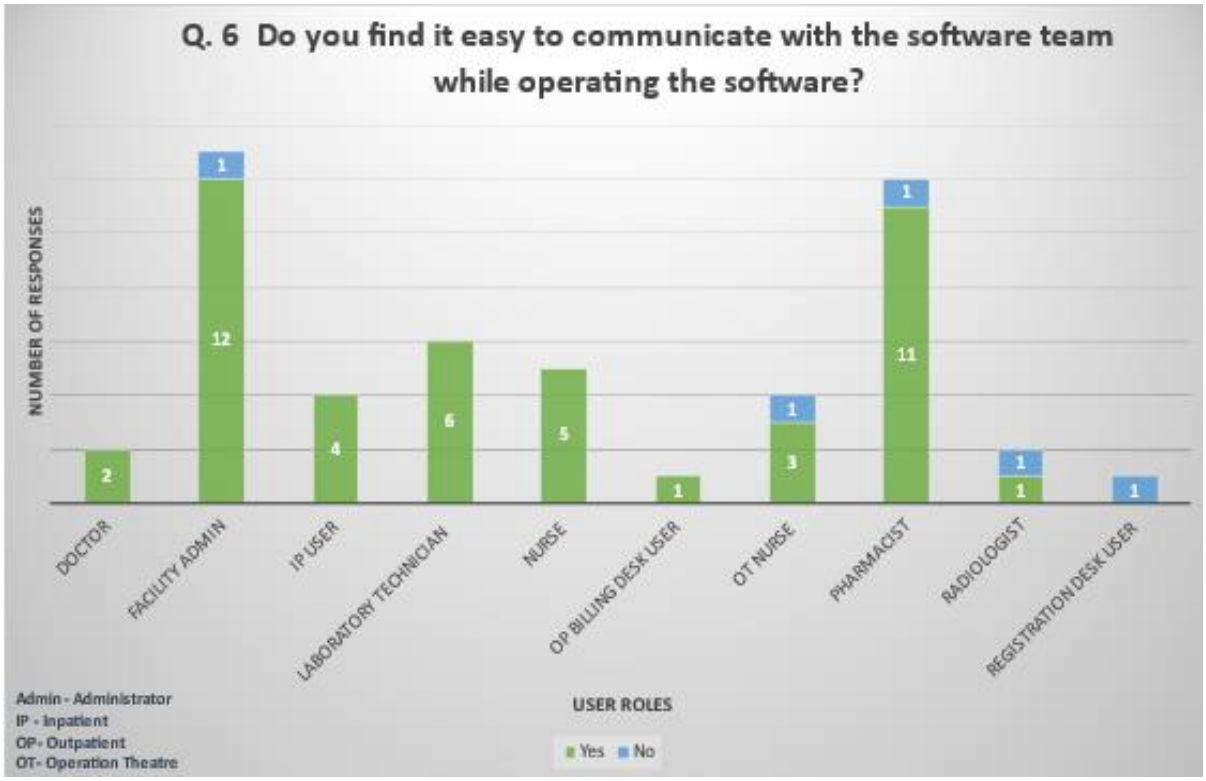

Figure 21 Graph Q.6

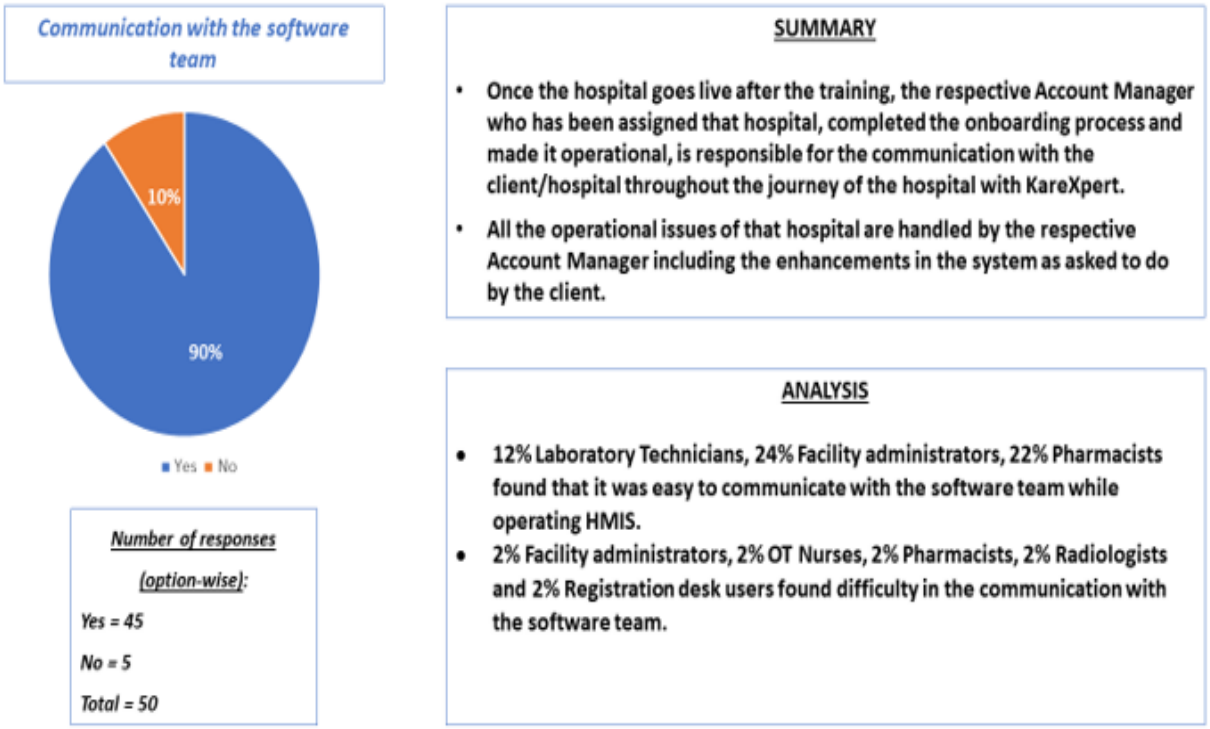

Figure 22 Analysis Q.6

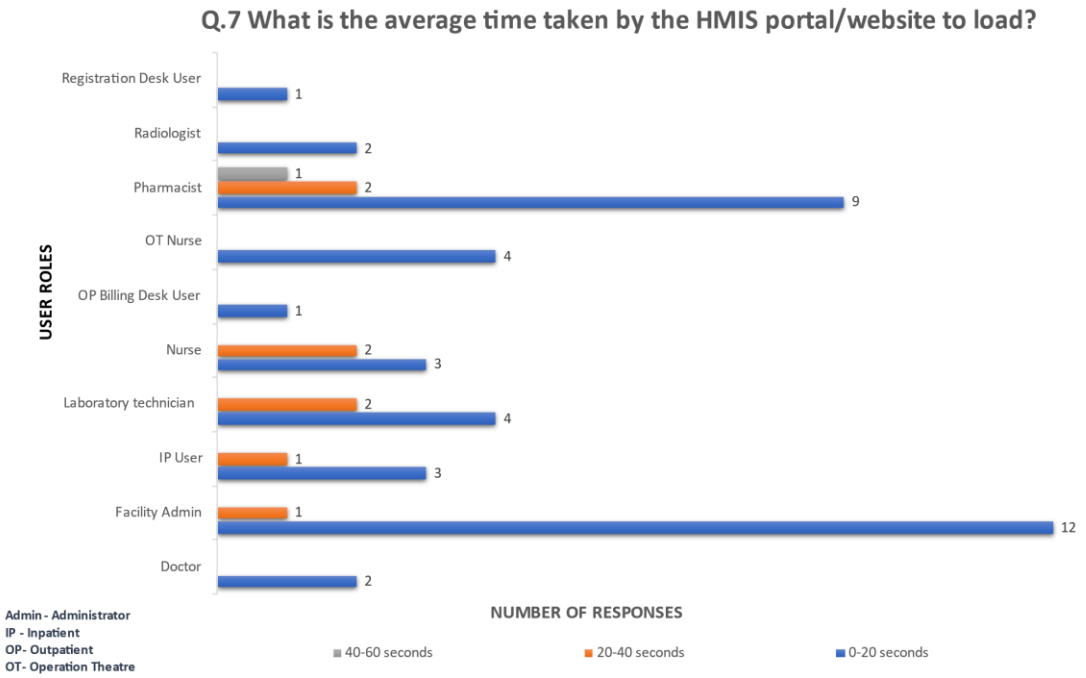

Figure 23 Graph Q.7

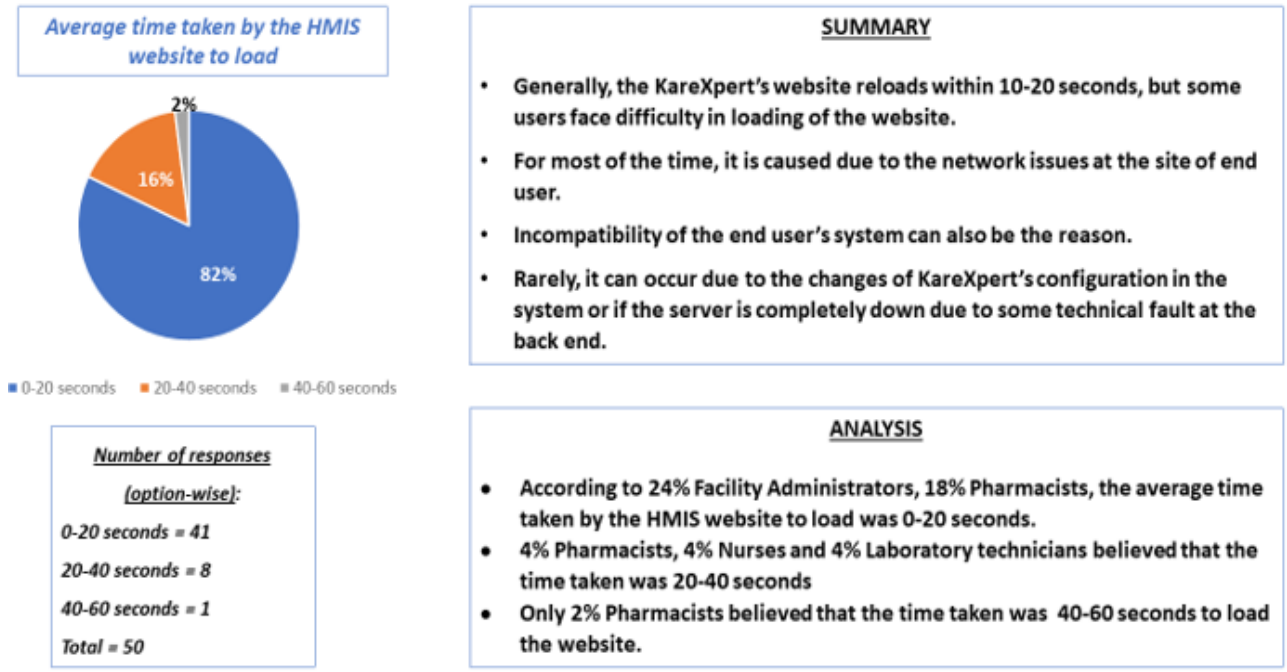

Figure 24 Analysis Q.7

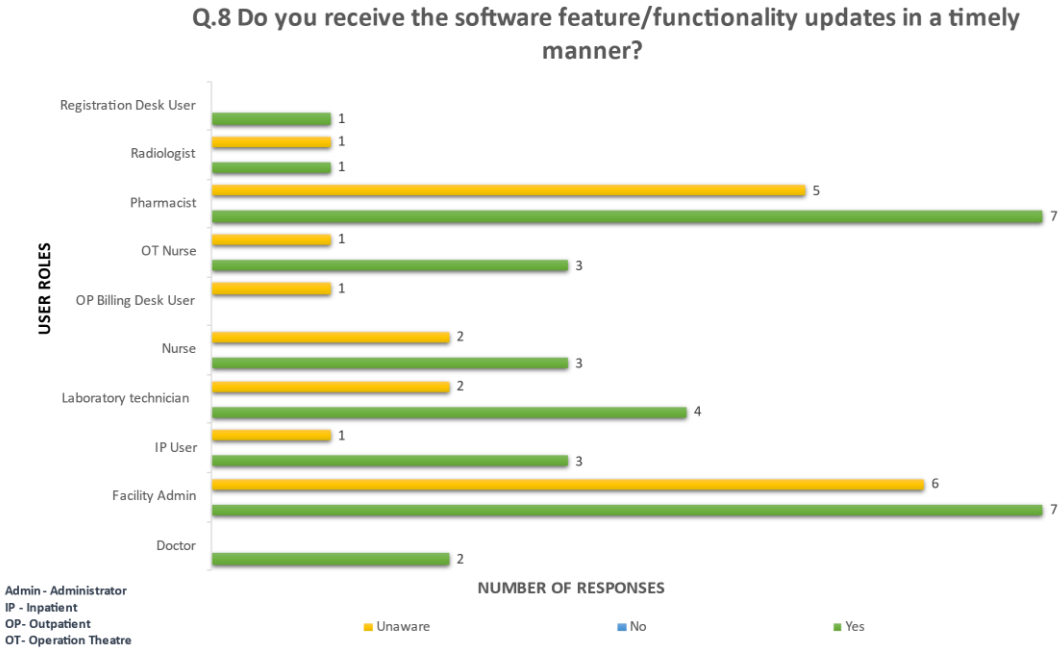

Figure 25 Graph Q.8

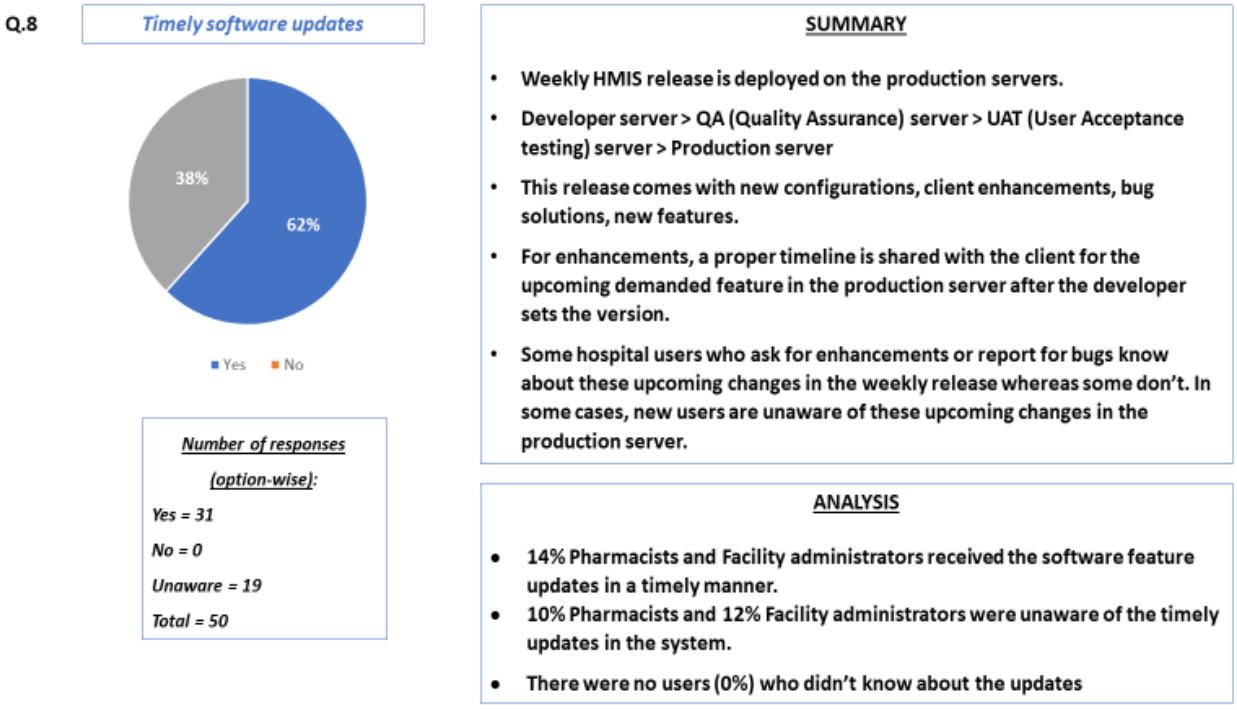

Figure 26 Analysis Q.8

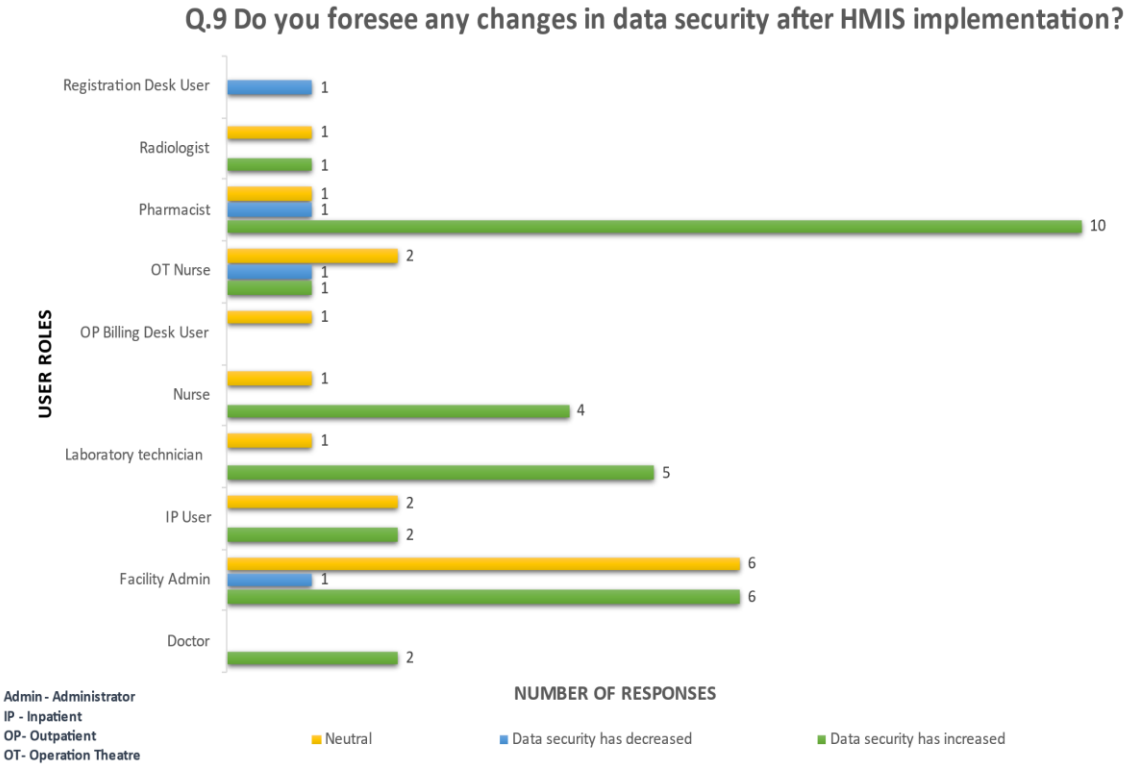

Figure 27 Graph Q.9

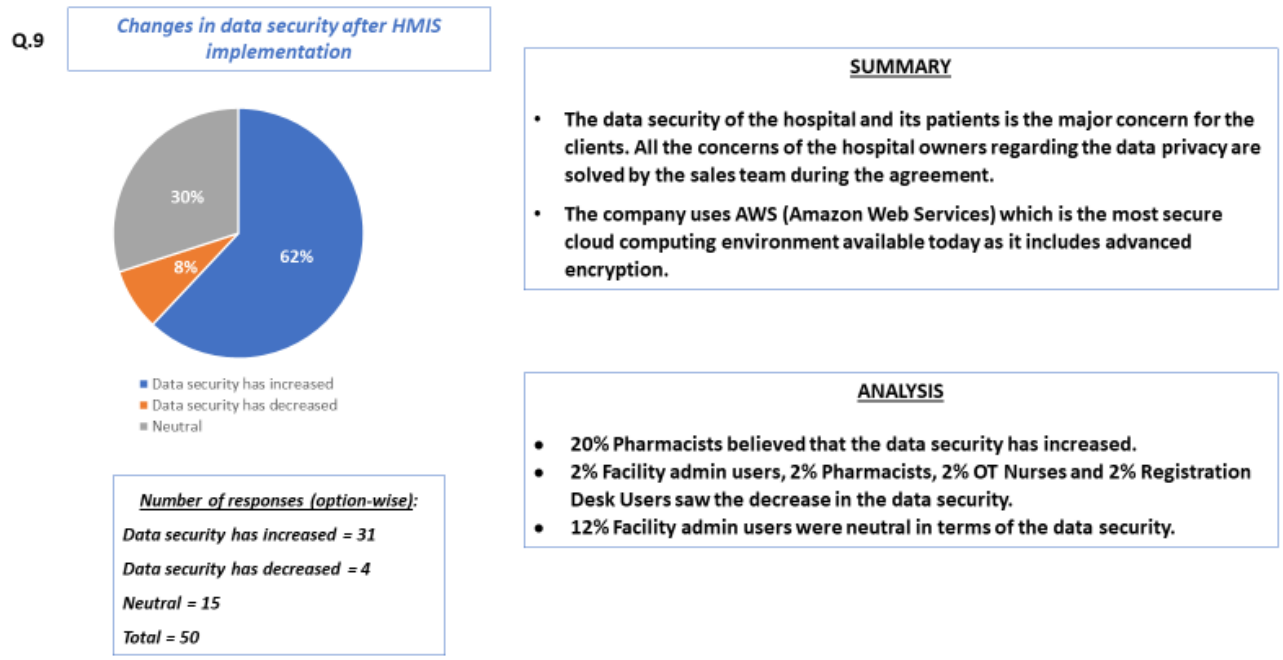

Figure 28 Analysis Q.9

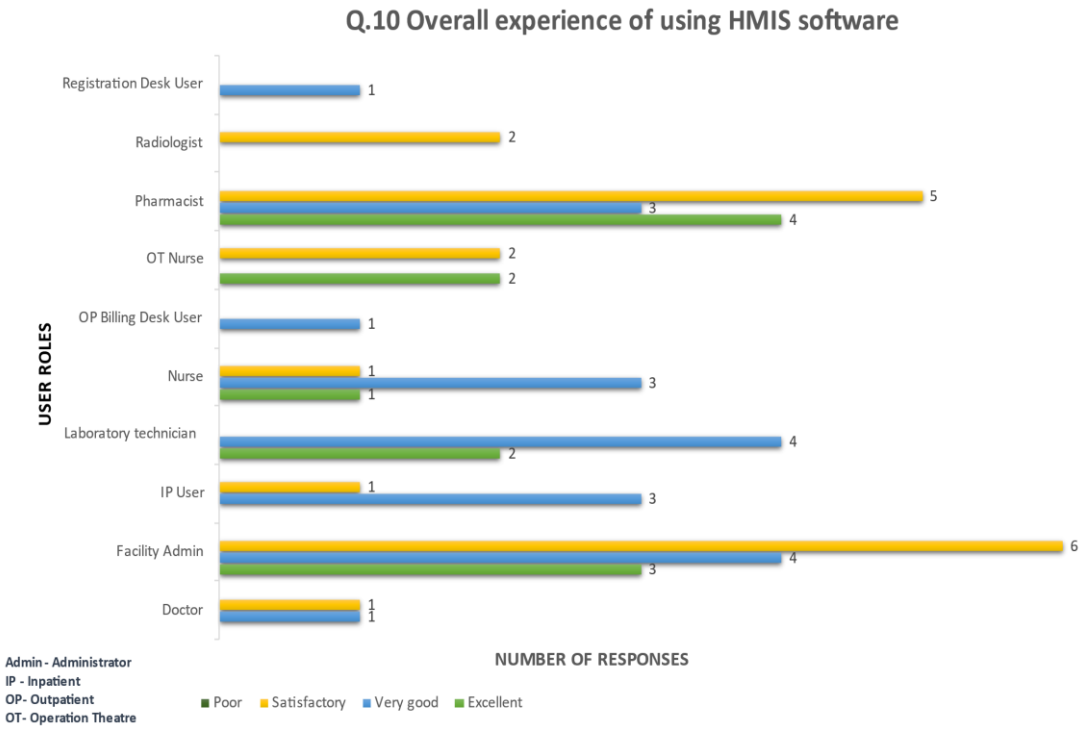

Figure 29 Graph Q.10

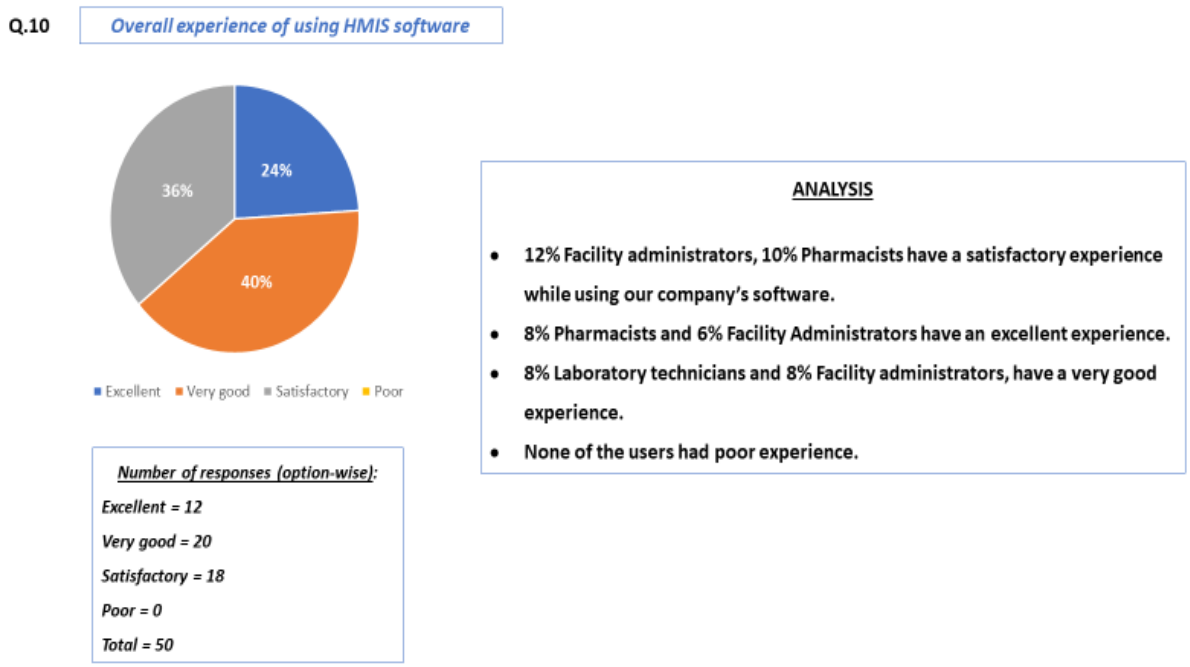

Figure 30 Analysis Q.10

The following feedbacks/ suggestions were received from some of the HMIS users and their explanation -

- **Re-training (End user) required-** Whenever the new staff member joins the hospital and is allotted the user role in HMIS, he/she needs training as he/she has never got training from the old hospital staff or the Facility administrator. This causes problem for the new user while working on the HMIS software.
- **Change in the workflow design of the modules according to the hospital-** There is a common workflow structure of KareXpert's HMIS software that is implemented in all the hospitals (from small to large). Only the configurations are done according to needs of the client. There are other changes like prints or the hospital's logo which are also done according to the client's need. Unfortunately, the design and workflows of the KareXpert's HMIS software can't be changed exactly the way client wants as it may affect the other clients as the main server 'System admin' is common for all the clients of our company to which all of the production accounts are linked.
- **Reduction in the steps of the modules-** There are many stages in the modules that can be configured according to the hospital's workflow. We can do it by making the particular stage of the workflow inactive and the sequence can be set accordingly by us. We can only make changes in the stages of the workflows. If the client requests for such a new feature, then we discuss with our developers team and if is possible according to them, then we consider it as an Enhancement and give the client the estimated time of arrival of that feature in the production server.
- **Bugs-** Due to coding issues from the side of developers, there are chances that workflow's stages may not get complete. An error message is reported by the system itself whenever this happens and doesn't let the user proceed further and the flow remains incomplete.
- **Screen log out time –** Due to security reasons, the screen logout time is kept less (half hour to one hour) to avoid any data breach.
- **System slowness –** This is a rare issue which occurs from the side of our company. The reason for this can be server maintenance, software release. The client is informed prior to this if this is likely to happen. This slowness can be due to the client's poor internet connection also.

Figure 31 Feedback for the improvement of HMIS software

DISCUSSION

To the best of our knowledge, this is the first study done on KareXpert Technologies which gave us the real-time feedback of the HMIS end-users in the production environment.

The user interface of the KareXpert's HMIS software was the biggest challenge faced by the users as due to complexity and vastness in the system, it was hard for the users to navigate through the software. There are various modules that interconnected. Even after proper module training to the end-users, they are not able to cope up with the this and causes problem to them in navigating between one screen to another. There are a lot of steps in some workflows of the modules which consumes a lot of time of the end-users as they end-up getting confused in the multiple steps.

According to a survey, the biggest obstacles to implementing these systems are "network failure" and hardware issues. One of the primary obstacles in the category of hardware issues was the absence of computers in hospitals. This flaw makes it more difficult for nurses to access HIS, which has an impact on information entry and patient care time. Additionally, this results in nurses being less motivated to use these technologies[4].

Although the majority of the end-users had got the module-wise training of HMIS before the system went live, the problem comes when the new members of the healthcare facility join and they are unaware about the workflows of the system and no one from the healthcare facility takes responsibility to train them properly.

There is no re-training policy of KareXpert due to which it is not possible to re-train the client or healthcare facility whenever demanded. The Account Managers who train the hospital staff are already occupied with the other projects. Only in some special cases, when the matter escalates and the behavior of the client becomes improper, the company then decides to train the client as if not done, the client might discontinue using the software.

According to a study, untrained users resist change out of a fear that they won't be able to handle the HIS and would lose their jobs. One way to lower the barriers to implementing the HMIS is to first train users to become more familiar with its purpose and advantages, then involve more users in its implementation and ease the needs of the HIS, acting as a safeguard against complaints in the future. In order to teach individuals how to use the system, address attitudes, and foster passion for doing so, hospitals must regularly conduct training programs[3].

Some of the modules like Operation Theatre, In-patient department etc contain a lot of steps in their workflows which are actually not possible to implement in a small hospital properly which creates problem for the client in completing the process efficiently.

Talking about the user experience, majority of users found it to be in a “very good” which is a good indication for KareXpert’s bright future.

According to a study, two major factors—the advancement of technology and the demands of users to adapt their complicated and dynamic services in light of prior experiences—are driving the creation and transformation of hospital information systems. In order to meet these objectives and improve the service, new interface designs can be developed[6.]

Due to weekly releases which are common for all accounts, the prints and configurations of the system are majorly affected which increases extra manual efforts of the Account Managers as this increases workload to a greater extent due to testing of the points and implementation work of new projects. A minor coding error in the system can affect any workflow in the system which can be either clinical or non-clinical. Sometimes, doing the root cause analysis of the bug consumes a lot of time and results in the piling up of the issues from the client.

CONCLUSION

This study identified the challenges faced by the HMIS end-users using HMIS software of KareXpert. Majority (50%) of the challenges were related to the User interface (navigation). It also gave us an idea about the importance of training among the HMIS end-users and concluded that there were 18% of the end-users who didn't get the HMIS training. It gave us the end-user reviews and feedback for the HMIS software in production environment. The feedback given by the end-users were related to their re-training, change in the workflows of the modules, bugs in the production server, screen log-out time and system slowness.

RECOMMENDATIONS

1. The software release/update can be done in two cycles (One cycle per week). The blocker points should be taken care of in every weekly release so that it doesn't affect the revenue of the company. The first week's release should only focus on the major and critical points. The enhancements asked by the

clients should be a part of the second week's release. This will result in the smooth operations of the company.

2. The company should try to make every enhancement that requires more man-days as a paid enhancement which will help in the revenue generation for the company.
3. Re-training of the client should be made as a paid service by the company whenever the client demands. It can also be done on a fortnightly subscription basis. The client should bear the cost of the travel of the KareXpert's SPOC person's visit to their health facility which doesn't happen in the present scenario.
4. Training on special features should also be made as a paid service for the client.
5. The company should mail the updated workflow charts of the required modules to the clients on a monthly basis so that they can refer to them. This will result in less issues related to the incompleteness of the steps of workflow by the client or the end-users of the respective healthcare facilities.

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SUPPLEMENTARY

QUESTIONNAIRE

HMIS role-based user experience

1. Name of the user _____
2. Age _____
3. Email ID _____
4. Role of the user _____
5. Have you ever worked on any HMIS other than the existing HMIS software?
   - Yes
   - No
6. What are the challenges faced by you while using HMIS software?
   - User interface (navigation)
   - Data accessibility
   - Time consuming process
   - Other_____
7. How has HMIS helped you in the improvement of workflow?
   - Reduces manual work
   - Time efficient
   - Maintenance of records
   - Accessibility of information at a glance
8. Is it easier to access patients' data in the HMIS system whenever required?
   - Yes
   - No
9. Have you received any training for using this system?
   - Yes
   - No
10. Do you find it easy to communicate with the software team while operating the software?
    - Yes
    - No
11. What is the average time taken by the HMIS portal/website to load?
    - 0-20 seconds
    - 20-40 seconds
    - 40-60 seconds
12. Do you receive the software feature/functionality updates in a timely manner?
    - Yes
    - No
    - Unaware
13. Do you foresee any changes in data security after HMIS implementation?
    - Data security has increased
    - Data security has decreased
    - Neutral

14. Overall experience of using HMIS software
    - Excellent
    - Very good
    - Satisfactory
    - Poor
15. Do you have any feedbacks/ suggestions for the improvement in HMIS software?

    _____

Role of HMIS

ORIGINALITY REPORT

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

PRIMARY SOURCES

1	Murthy, B. K., P. K. Srivastava, and A. S. Cheema. "Implementation challenges of hospital information system in super specialty hospital "A case study of PGIMER, Chandigarh"", 2014 IEEE Global Humanitarian Technology Conference - South Asia Satellite (GHTC-SAS), 2014. Publication	2%
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