Dissertation Title

"Pharmacy Health IT Implementation in Multi-specialty chain of Hospitals: Barriers to Implementation and Business Strategies Supporting Pharmacy IT use".

A dissertation submitted in partial fulfillment of the requirements
For the award of

Post-Graduate Diploma in Health and Hospital Management

By

Sahil Maken

Roll No. PG/09/042

International Institute of Health Management Research

New Delhi -110075

November, 2010

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Under the guidance of

Mr. Chetan Prahlada
Senior Consultant
DELL Services

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A. Acknowledgement

I hereby take this opportunity to thank, Mr. Chetan Prahlada, Senior Consultant, DELL Services and Mr. Umesh Parasher, Consultant, DELL Services for their valuable guidance and advice. They inspired me greatly to work in this project. Their willingness to motivate me contributed tremendously to my project.

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My sincere acknowledgement goes to Professor Indrajit Bhattacharya and Professor Aanandhi Ramachandran for their kind assistance and support throughout my dissertation.

Finally, an honorable mention goes to my family and friends for their understanding and support on me in completing this project.

Thank You

Sahil Maken

PGDHHM,

IIHMR, New Delhi

Certificate of Internship Completion

Date:……..

TO WHOM IT MAY CONCERN

This is to certify that Mr.Sahil Maken has successfully completed his 3 months internship in our organization from February 1, 2010 to April 30, 2010. During this intern he has worked on ……. (Task performed) under the guidance of me and my team at DELL Services.

……. (Any positive/negative comment)

We wish him/her good luck for his/her future assignments

(Signature)

_____ (Name)

_____Designation

Certificate of Approval

The following dissertation titled " **Pharmacy Health IT Implementation in Multi-specialty chain of Hospitals: Barriers to Implementation and Business Strategies Supporting Pharmacy IT use.**" is hereby approved as a certified study in management carried out and presented in a manner satisfactory to warrant its acceptance as a prerequisite for the award of **Post- Graduate Diploma in Health and Hospital Management** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation

Name	Signature
_____	_____
_____	_____
_____	_____

Certificate from Dissertation Advisory Committee

This is to certify that **Mr. Sahil Maken,** a participant of the **Post- Graduate Diploma in Health and Hospital Management**, has worked under our guidance and supervision. He/She is submitting this dissertation titled " **Pharmacy Health IT Implementation in Multi-specialty chain of Hospitals: Barriers to Implementation and Business Strategies Supporting Pharmacy IT use.** " in partial fulfillment of the requirements for the award of the **Post-Graduate Diploma in Health and Hospital 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.

Prof. Indrajit Bhattacharya	Mr. Chetan Prahlada
Assistant Professor	Senior Consultant
IIHMR	DELL Services
New Delhi	Sec. 125, Noida, UP
Date	Date

Abstract

Pharmacy Health IT Implementation in Multi-specialty chain of Hospitals: Barriers to Implementation and Business Strategies Supporting Pharmacy IT use.

by

Sahil Maken

Currently the medical prescription is at the transitional stage between paper and electronic state. When adapting a traditional process to the new electronic era, unique opportunities and challenges are offered that involve the actors: patients, pharmacists, and also health care and EHR system providers and other stakeholders. New technologies may introduce new risks with the extended use of prescription information in large scale database. Patient safety has become a hot topic in research and media during recent years. The study envisages the solution to medication errors at all the levels which is possible with the use of technology. It includes the study of all the stages that has been adopted in the implementation of the Pharmacy module of the Electronic Health Records till date. The special focus would be to identify the various barriers that we come across during the different stages of Implementation and designing the various strategies to overcome such barriers. The study is mainly involved with the identification of barriers and strategies for Implementation in Pharmacies catering to the needs of chain of Multispecialty Hospitals, but the results generated can also be utilized in for Implementation in Pharmacies of Hospitals at smaller level as well as Standalone Pharmacies. Future Implementation in big Corporate Hospitals (Standalone or Chain) would also become a relatively easy task. As during the period of study, the phases of Transform and Sustain would not be covered; therefore it would not be possible to obtain the data of the barriers faced during these phases in this project from the implementers. Therefore in such cases data could be obtained only from the past experiences of the Implementer and by analyzing the various cases of EHR implementation Worldwide.

B.Table of contents

A. List of Figures

B. Acronyms / Abbreviations / Key words

- ADOPTS — ACCESS, DEFINE, OPTIMIZE, PREPARE, TRANSFORM, SUSTAIN
- CPRS — COMPUTERIZED PATIENT RECORD SYSTEM
- EHR — ELECTRONIC HEALTH RECORDS
- HIS — HOSPITAL INFORMATION SYSTEM
- CPOE — COMPUTERISED PATIENT ORDER ENTRY
- MAR — MEDICATION ADMINISTRATION RECORDS
- BCMA — BAR CODE MEDICATION ADMINISTRATION
- VistA — VETERANS HEALTH INFORMATION SYSTEMS AND TECHNOLOGY ARCHITECTURE
- ADR — ADVERSE DRUG EVENTS
- MH — MULTISPECIALITY HOSPITAL
- ME — MEDICATION ERRORS
- DOW — DATA OBJECT WORKSHEET
- CPS — CENTRAL PHARMACY STORE
- FSW — FUTURE STATE WORKSHOPS
- KT — KNOWLEDGE TRANSFER
- HL7 — HEALTH LEVEL 7

Part I:

Internship Report

1.1 Introduction to Organization

DELL Systems is an information technology services provider based in Plano, Texas, USA with the Indian office based in Greater NOIDA, NCR. Peter Altabef has served as president and chief executive officer since 2004. On September 21, 2009, Perot Systems agreed to be acquired by DELL for $3.9 billion. The acquisition resulted in a compelling combination of two iconic information-technology brands. H. Ross Perot and eight associates founded Perot Systems in June 1988 after having sold Electronic Data System (EDS) to General Motors.

The expanded Dell is better positioned for immediate and long-term growth and efficiency driven by:--

- Providing a broader range of IT services and solutions and optimizing how they're delivered.
- Extending the reach of Perot Systems' capabilities, including in the most dynamic customer segments, around the world.
- Supplying leading Dell computer systems to even more Perot Systems customers.

The DELL Systems is engaged in a number of domains ranging from both hardware and software production and services. It has a number of departments and is associated with a number of projects both at the domestic and international front [7.2].

One of the projects that DELL currently is been associated with is the Electronic Health Record (EHR) project which DELL has come into agreement with a leading chain of corporate hospitals in the country. The Corporate hospital which is one of the party of the project (the other being DELL) has a chain of eight hospitals, all in the National capital Region.

1.2 Area of engagement

The area of engagement in the organization during the internship was the EHR Project. An Electronic Health Record is an evolving concept defined as a systematic collection of electronic health information about individual patients. It is a record in digital format that is capable of being shared across different healthcare settings by being embedded in network-connected enterprise wide information systems.

For the smooth implementation of the EHR project, it is divided into a number of sub sections known as modules. The various modules include

- CPRS (Computerized Patient registration System) Module
- Radiology Module
- Laboratory Module
- Pharmacy Module
- PIMS (Patient Information Management System) Module

With my knowledge in the Pharmacy field gained during the graduation level, I was mainly associated with the Pharmacy Module of the EHR Project. However as per the requirements of the organization and my personal urge to widen the scope of my knowledge and gained versatility in this field, I was also associated with the other modules as well namely Diet, PIMS and CPRS.

The Internship involved working at both on site (Client's office) as well as off site (DELL's office). The onsite visits involved the visits to the following facilities of the client.

- Client's Hospitals – The internship involved the visits to all the eight hospitals spread across the National Capital Region. These visits were mainly done for the purpose of gathering requirements from the client site as well as mapping the workflows. Also these sites served the purpose of interaction with the end users which provided valuable information of the clinical aspect of the Pharmacy Department that has proved to be extensively useful in different stages of the project.

- Client's Corporate Office – The visits to the corporate office were mainly done to gather the information related to the financial aspect of the Pharmacy Department. The interaction with the officials at these sites provided the data regarding the Non clinical aspect of the Pharmacy Department. This information provided the base to properly and accurately integrate the clinical and non clinical areas of the Pharmacies.
- Client's Central Pharmacy Store – This area mainly provided information regarding the stock maintenance and inventory management of the Pharmacy items utilized in the various facilities of the client hospital. The various techniques utilized by the Pharmacy store officials for the management and maintenance of the inventory were observed during the visits. The various areas of improvement in this regard were also thought about and discussed with the Store officials in order to improve the efficiency of the process. Useful information was also obtained regarding the logistics as the pharmaceutical products are one of the most sensitive products used in the hospital facilities and the consequences of error in any phase of the drug i.e. from the store to the patient mount could be highly fatal.

1.3 Implementation tasks

Some of the tasks that were performed in the during the course of internship are stated as under

- Involved in Requirements Gathering (Carrying out On-Site Assessments, Personal Interviews of the Client staff, Questionnaire Survey)
- Did Workflow Mapping of Pharmacy module (Developing current and Future state Workflows)
- Did Workflow Mapping of Diet module (Developing current and Future state Workflows)
- Did Pharmacy Data Mapping (Developing Data Object Worksheets)
- Worked with the MAX Central Pharmacy Store Team in Mapping Inventory using Barcode Technology.
- Did Data Configuration for Pharmacy Module (Drugs- IP & OP, Radiopharmaceuticals, Nutraceuticals, Cosmetics etc.)

- Assisted in Carrying out Pharmacy Future State Workshops (Simulation Workshops)
- Helped in preparation of Training Modules (For End user training)
- Created MCQs for the Pharmacy users for post training assessment.
- Did Configuration of PIMS (Patient Information Management System) Module
- Did Configuration of CPRS Module (Including Reminder Dialogues, patient objects and health summaries, procedures, Consults etc.)
- CPRS VistA – Created many clinical templates on CPRS

1.4 Reflective Learning

During the entire duration of Internship, there has been a lot of learning from all the quarters' i.e. from officials at on site as well as off site. Apart from that the experience of the mentor has been very useful for knowledge transfer.

Some of the learning's during the entire internship programme is as under

- Practical issues involved in the various stages of the implementation which may result in deviations from the project plan.
- The various perceived risks and benefits among the client's staff regarding the implementation.
- The various barriers observed during the different stages of implementation and the various strategies mulled in order to remove the hindrances.
- The basic workflow followed by the client in order to carry out their processes, the shine points of the workflows as well as the limitations in the current workflows which can be sorted out.
- The Pharmacy Module of the EHR which is in the process of Implementation, the various functionalities supported by it as well as the various areas in the module which require customization as per the user requirements.
- The various techniques to handle the client are changing state of mind and to convince the client to accept the change process by informing them of the various benefits of the change process.

- The various techniques involved to ensure the end user participation throughout the implementation process so that to instill a sense of belongingness in the end user regarding the EHR. This would ensure better acceptability among the users.
- The techniques to bring the ideas of Top Management and the End users at the same table in order to ensure similarity in the two and make efforts to iron out any differences among the two.
- The different ways to gauge the level of competence of the end users in order to determine the level of training that needs to be provided to equip them of the necessary knowledge required by the end users to run the EHR efficiently. This will also help in the identification of super users or champions that could help in smooth transition to the new EHR.
- The different techniques employed by the service provider for resource planning to ensure efficient resource utilization.
- The interpersonal skills required in such big projects to ensure the continuity of operations.

Part II:

Dissertation on "Pharmacy Health IT Implementation in Multi-specialty chain of Hospitals: Barriers to Implementation and Business Strategies Supporting Pharmacy IT use".

Part A – Dissertation Overview

Introduction: - For hundreds of year's written prescription has been the method of choice for physicians to communicate decision on drug therapy, and for pharmacists to dispense medication, while at the same time being source for the patient about how to use the medication in order to maximize its benefits. Currently the medical prescription is at the transitional stage between paper and electronic state. When adapting a traditional process to the new electronic era, unique opportunities and challenges are offered that involve the actors: patients, pharmacists, and also health care and EHR system providers and other stakeholders.

New technologies may introduce new risks with the extended use of prescription information in large scale database. A mistake by a prescriber may result in incorrect medication being dispensed at the pharmacy, and also in the wrong document being recorded for future consultations. A mistake by the system programmer may also result in incorrect medication being dispensed. Future clinical decisions may be based on wrong facts and assumptions, due to poor quality of data provided. Thus quality issues are even more accentuated in the electronic world.

Objectives of the Study: - The study envisages the solution to medication errors at all the levels which is possible with the use of technology. It includes the study of all the stages that has been

adopted in the implementation of the Pharmacy module of the Electronic Health Records till date. The special focus would be to identify the various barriers that we come across during the different stages of Implementation and designing the various strategies to overcome such barriers. The barriers faced by both the client and the service providers faced during the course of Implementation would be studied and an attempt would be made to address the maximum.

Scope of the Study: - The study is mainly involved with the identification of barriers and strategies for Implementation in Pharmacies catering to the needs of chain of Multispecialty Hospitals, but the results generated can also be utilized in for Implementation in Pharmacies of Hospitals at smaller level as well as Standalone Pharmacies. Future Implementation in big Corporate Hospitals (Standalone or Chain) would also become a relatively easy task.

Need for the Study: - Patient safety has become a hot topic in research and media during recent years. Patient injuries are most commonly due to Adverse Drug Events (ADR). Many of the ADRs are caused by medication errors and are by definition preventable. These errors may occur during any stage of the medication use process including ordering, transcribing, dispensing, administering and monitoring.

Assumptions: -

- It is assumed that at the client level the various users are adept with the functional knowledge of their respective specialties.
- The department has a well established functional workflow which is adhered properly
- The service quality at the client level is of International standards
- At the service providers level it is assumed that the service providers are well equipped with the new technology and have a relatively good experience in Implementation.

Data Sources: -

- VistA Pharmacy Module
- Client Hospital Information System
- CIMS- Pharmacy database
- DELL Implementation team

Work plan: -

ID	Task Name	Start	Finish	Duration
1	Defining the problem	8/9/2010	8/27/2010	3w
2	Literature Survey	8/30/2010	9/10/2010	2w
3	Methodology adopted	9/13/2010	9/17/2010	1w
4	Data Collection	9/20/2010	10/8/2010	3w
5	Compilation Analysis	10/11/2010	10/25/2010	2w 1d
6	Documentation	10/26/2010	11/9/2010	2w 1d

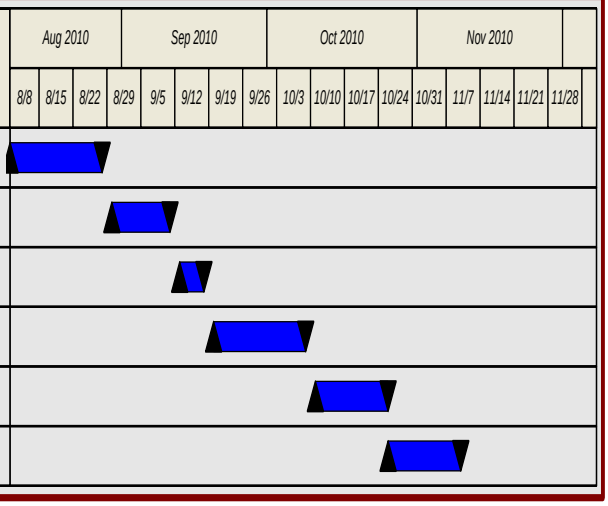

Figure 1 – Project Work plan

The study would be primarily covering the various stages of EHR Implementation being covered in Multispecialty Hospitals till date in the Data Collection and Compilation Analysis of the Work plan. The Stages include

- **Assess: -** Assessing the complete requirements of the client,
- **Design:** - Designing an existing flow and determining the gaps,
- **Optimize:** - Optimizing the workflow with realizing benefits,
- **Prepare:** - Preparing the client by imparting high level training,
- **Transform:** - Transforming the system with live implementation,
- **Sustain:** - Sustaining and providing support.

The study would involve the analysis of secondary data obtained from the artifacts present with the implementer as well as studying various other cases of implementation worldwide in order to determine the various barriers to implementation and would involve recommending various strategies that could be adopted in order to overcome the barriers.

Limitations: - As during the period of study, the phases of Transform and Sustain would not be covered; therefore it would not be possible to obtain the data of the barriers faced during these phases in this project from the implementers. Therefore in such cases data could be obtained only from the past experiences of the Implementer and by analyzing the various cases of EHR implementation Worldwide.

Part B – Project Overview

1. Introduction

For hundreds of year's written prescription has been the method of choice for physicians to communicate decision on drug therapy, and for pharmacists to dispense medication, while at the same time being source for the patient about how to use the medication in order to maximize its benefits. Currently the medical prescription is at the transitional stage between paper and electronic state. When adapting a traditional process to the new electronic era, unique opportunities and challenges are offered that involve the actors: patients, pharmacists, and also health care and EHR system providers and other stakeholders [7.6].

New technologies may introduce new risks with the extended use of prescription information in large scale database. A mistake by a prescriber may result in incorrect medication being dispensed at the pharmacy, and also in the wrong document being recorded for future consultations. A mistake by the system programmer may also result in incorrect medication being dispensed. Future clinical decisions may be based on wrong facts and assumptions, due to poor quality of data provided. Thus quality issues are even more accentuated in the electronic world [7.9].

2. Literature Survey

"Medication errors: prescribing faults and prescription errors" by Giampaolo P. Velo, Pietro Minuz1. (March 18, 2009), PubMed, 1-2. This article states that Medication errors are common in general practice and in hospitals. Both errors in the act of writing (prescription errors) and prescribing faults due to erroneous medical decisions can result in harm to patients. Any step in the prescribing process can generate errors. Slips, lapses, or mistakes are sources of errors, as in unintended omissions in the transcription of drugs. Faults in dose selection, omitted transcription, and poor handwriting are common. Inadequate knowledge or competence and incomplete information about clinical characteristics and previous treatment of individual

patients can result in prescribing faults, including the use of potentially inappropriate medications. An unsafe working environment, complex or undefined procedures, and inadequate communication among health-care personnel, particularly between doctors and nurses, have been identified as important underlying factors that contribute to prescription errors and prescribing faults [7.4].Patient safety has become a hot topic in research and media during recent years. Patient injuries are most commonly due to Adverse Drug Events (ADE). An ADE is defined as "an injury resulting from medical intervention related to a drug." Many of the ADEs are caused by medication errors and are by definition preventable. These errors may occur during any stage of the medication use process including ordering, transcribing, dispensing, administering and monitoring. The severity of the adverse drug events could be fatal, life-threatening, serious, and/or significant Studies of hospitalized patients indicate that serious adverse drug events increase the length of hospital stay and costs. Most hospitals rely on voluntary reporting which may result in the detection and reporting of only 5–10% of ADEs. Active interventions aimed at reducing prescription errors and prescribing faults are strongly recommended. These should be focused on the education and training of prescribers and the use of on-line aids. The complexity of the prescribing procedure should be reduced by introducing automated systems or uniform prescribing charts, in order to avoid transcription and omission errors. Feedback control systems and immediate review of prescriptions, which can be performed with the assistance of a hospital pharmacist, are also helpful. Audits should be performed periodically [7.3].

At the same time, the increasing availability of computerized information systems in hospitals mainly the Electronic Health records (EHR) makes it possible to develop and implement automated surveillance systems to detect ADEs. Moreover, computerized physician order entry systems reduce medication errors and may reduce adverse drug event rates [7.3].

Electronic Health Records, (2nd Edition), by Jerome Carter. (Paperback - Mar. 15, 2008) London, DP Publications Ltd. gives information about

Electronic Health Records: - An Electronic Health Record is an evolving concept defined as a systematic collection of electronic health information about individual patients. It is a record in digital format that is capable of being shared across different healthcare settings by being embedded in network-connected enterprise wide information systems [7.5].

Advantages of an Electronic Health Record

- Easy access to information
- Comprehensive and standardized documentation
- Improved quality of patient care
- Increased nursing efficiency
- Improved process communication
- Reduced medication errors
- Reduced hospital costs
- Meet various accreditation requirements
- Promote evidence based medicine
- Improved patient's experience in the hospital
- Reduced TPA denials
- Better control of Management
- Reduced pilferages
- MIS reports

The EHR currently being implemented in the Multi Chain Specialty Hospital is VistA.

Veterans Health Information Systems and Technology Architecture

(VistA)

URL:http://www.wikipedia.org/wiki/VistA talks about The Veterans Health Information Systems and Technology Architecture (VistA) is an enterprise-wide information system built around an electronic health record, used throughout the United States Department of Veterans Affairs (VA) medical system, known as the Veterans Health Administration (VHA).VistA, is an

integrated system of software applications that directly supports patient care. By 2008, the VHA was the largest single medical system in the United States, providing care to 5 million veterans, employing 180,000 medical personnel and operating 163 hospitals, over 800 clinics and 135 nursing homes. By providing electronic health records capability, VistA is thereby one of the most widely used EHRs in the world.

Features

The VistA system is public domain software, available through the Freedom of Information Act directly from the VA website, or through a growing network of distributors. The VistA software alliance is a non-profit trade organization that both promote the widespread adoption of versions of VistA for a variety of provider environments. VistA is a collection of about 100 integrated software modules. Some of the modules included in VistA which enables the user with a number of advantages are

2.2.1. Computerized Patient Record System (CPRS) Module

The most significant is a graphical user interface for clinicians known as the Computerized Patient Record System (CPRS), which was released in 1997. In addition, VistA includes computerized order entry, bar code medication administration, electronic prescribing and clinical guidelines. CPRS provides a client–server interface that allows health care providers to review and update a patient's electronic medical record. This includes the ability to place orders, including those for medications, special procedures, X-rays, nursing interventions, diets, and laboratory tests. CPRS provides flexibility in a wide variety of settings so that a consistent, event-driven, Windows-style interface is presented to a broad spectrum of health care workers. CPRS provides electronic data entry, editing, and electronic signatures for provider-patient encounters as well as provider orders. Its computer-based provider order entry (CPOE) capability is an important enabler in the migration from paper-based charting to electronic medical records (EMRs).

2.2.2. Laboratory Module

Laboratory module enables the user with Ordering of tests and procedures on both patient and non-patient specimens, Collection and Accessioning of specimens into the Laboratory database,

Processing and analysis in appropriate department or work areas, review and verification of results, Reporting of results and/or diagnoses for clinical health care treatment, Analysis and reporting of quality control data used in generating results and Providing management statistical data as well as requirements for accreditation by regulating bodies and agencies

2.2.3. Radiology Module

Radiology / Nuclear Medicine package is a comprehensive software package, designed to assist with the functions related to processing patients for imaging examinations. The Radiology / Nuclear Medicine package automates the entire range of diagnostic functions performed in imaging departments, including request entries by clinical staff, registration of patients for exams, processing of exams, recording of reports/results, verification of reports on-line, displaying/printing results for clinical staff, automatic tracking of requests/exams/reports, and generation of management statistics/reports, both recurring and ad hoc. The Radiology / Nuclear Medicine package automates many tedious tasks previously performed manually, providing faster, more efficient and accurate data entry and more timely results reporting. One of the important features provided by VistA is

VistA Imaging

The Veterans Administration has also developed VistA Imaging, a coordinated system for communicating with PACS (radiology imaging) systems and for integrating others types of image-based information, such as, pathology slides, and scanned documents, into the VistA electronic medical records system. This type of integration of information into a medical record is critical to efficient utilization.

2.2.4. Surgery Module

The Surgery package is designed to be used by Surgeons, Surgical Residents, Anesthetists, Operating Room Nurses and other surgical staff. The Surgery package is part of the patient information system that stores data on the Department of Veterans Affairs (VA) patients who have, or are about to undergo, surgical procedures. This package integrates booking, clinical, and patient data to provide a variety of administrative and clinical reports.

2.2.5. Pharmacy Module

The Pharmacy package provides a method of management, dispensing, and administration of inpatient drugs within the hospital. Hospital Medications combines clinical and patient information that allows each medical center to enter orders for patients, dispense medications by means of Pick Lists, print labels, create Medication Administration Records (MARs), and create Management Reports. Hospital Medications also interacts with the Computerized Patient Record System (CPRS) and the Bar Code Medication Administration (BCMA) packages to provide more comprehensive patient care [7.1].

3. Methodology: -

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3.1 Assumptions: -

- It is assumed that at the client level the various users are adept with the functional knowledge of their respective specialties.
- The department has a well established functional workflow which is adhered properly
- The service quality at the client level is of International standards
- At the service providers level it is assumed that the service providers are well equipped with the new technology and have a relatively good experience in Implementation.

3.2 Illustration: -

ID	Task Name	Start	Finish	Duration
1	**Defining the Problem**	**8/9/2010**	**8/27/2010**	**3w**
2	Study Implementation Project Details	8/9/2010	8/12/2010	.8w
3	Studied Worldwide Implementation aticles	8/13/2010	8/18/2010	.8w
4	Discussion with mentor	8/19/2010	8/20/2010	.4w
5	Finalizing the Dissertation Topic	8/23/2010	8/27/2010	1w
6	**Literature Survey**	**8/30/2010**	**9/10/2010**	**2w**
7	Finding Articles/ Manuals	8/30/2010	9/1/2010	.6w
8	Sorting Articles/ Manuals	9/2/2010	9/3/2010	.4w
9	Reading Articles/ Manuals	9/6/2010	9/10/2010	1w
10	**Methodology Adopted**	**9/13/2010**	**9/17/2010**	**1w**
11	Studying Various Project Methodologies	9/13/2010	9/14/2010	.4w
12	Discussion with Mentors About Methodology	9/15/2010	9/16/2010	.4w
13	Finalizing Methodology	9/17/2010	9/17/2010	.2w
14	**Data Collection**	**9/20/2010**	**10/8/2010**	**3w**
15	Client site visit	9/20/2010	10/1/2010	2w
16	Client Staff Interview	9/21/2010	10/1/2010	1.8w
17	Implementers Interview	10/4/2010	10/8/2010	1w
18	**Compilation Analysis**	**10/11/2010**	**10/25/2010**	**2.2w**
19	Data Compilation	10/11/2010	10/13/2010	.6w
20	Data Analysis	10/14/2010	10/22/2010	1.4w
21	Reviewing Analysis to Mentor	10/25/2010	10/25/2010	.2w
22	**Documentation**	**10/26/2010**	**11/9/2010**	**2.2w**
23	First Draft Preparation	10/26/2010	11/3/2010	1.4w
24	First Draft Review	11/4/2010	11/5/2010	.4w
25	Final Draft Preparation	11/8/2010	11/8/2010	.2w
26	Report Finalized	11/9/2010	11/9/2010	.2w

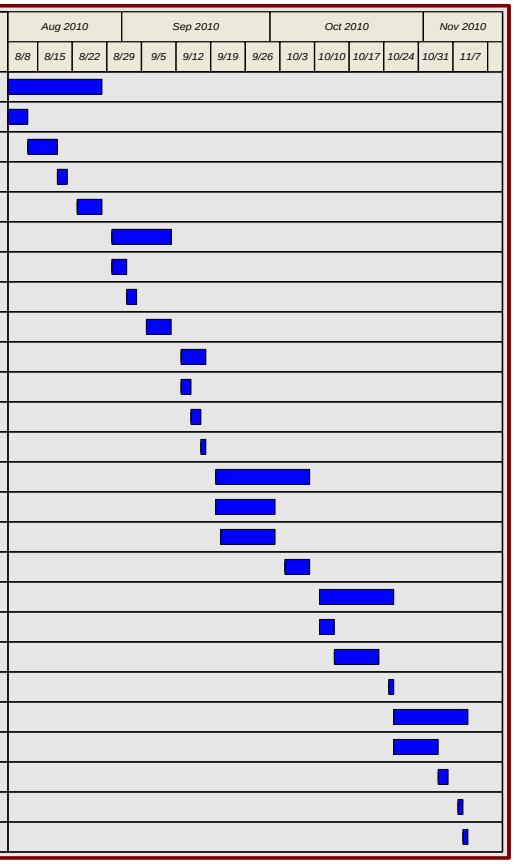

Figure 2 - Work break down Structure

The study would be primarily covering the various stages of EHR Implementation being covered in Multispecialty Hospitals till date in the Data Collection and Compilation Analysis of the Work plan. The study would involve the analysis of secondary data obtained from the artifacts present with the implementer as well as studying various other cases of implementation worldwide in order to determine the various barriers to implementation and would involve recommending various strategies that could be adopted in order to overcome the barriers. The various stages involve a compilation of methodologies, tools, processes and best practices called the ADOPTS framework:

ADOPTS (Assess, Define, Optimize, Prepare, Transform and Sustain).

The ADOPTS framework represents an integrated framework that signifies the integration of advanced clinical practices and clinical systems, which is one of the first in the healthcare industry. It enables to truly affect healthy outcomes and patient safety. The ADOPTS framework establishes specific goals and objectives to ensure the clinical transformation support process will:

- Reduce fragmentation in the approach to operational improvements and clinical transformation, while allowing flexibility to deploy any component of the program based on organizational needs.
- Provide the end user with tools to facilitate and sustain process changes, while reducing conflicts and overlap between departments and processes.
- Improve the quality of project management, change design, outcomes measurement and tracking.
- Involve stakeholders, including clinicians and physicians, in the requirements and decision making.
- Advance the rigor used in measurement of change through advanced benefits realization program implementation and use of selected Six Sigma and Lean methodologies.
- Promote patient care quality and advanced training programs, while moving the organization towards a learning organizational culture [7.2].

Each of the six major components of the ADOPTS framework is highlighted as follows

3.2.1 Assess: - Assess is the first component of the ADOPTS framework. This step gives the organization the opportunity to carefully examine its current state, clinician needs and readiness for a cultural and organizational change that will lead to future success. This process highly engages all of the stakeholders, including physicians, clinicians and support workers, and is aligned with the organization's overall business strategy. The various steps involved in this process include.

3.2.1.1 Requirement Gathering

Requirement gathering is usually the first part of any software product. This stage starts while thinking about developing software. This phase, involves meeting customers or prospective customers, analyzing market requirements and features that are in demand.

In this stage, people who have direct contact with the customers do most of the work. These people talk to these customers and try to understand what they need. A comprehensive understanding of the customers' needs and writing down features of the proposed software product are the keys to success in this phase [7.8].

In the client's hospital, during the requirement gathering phase two types of information were gathered as follows:

- Functional - The Functional category comprises of Business / End User Related information
- Non Functional- The Non Functional category comprises of Technology Related information

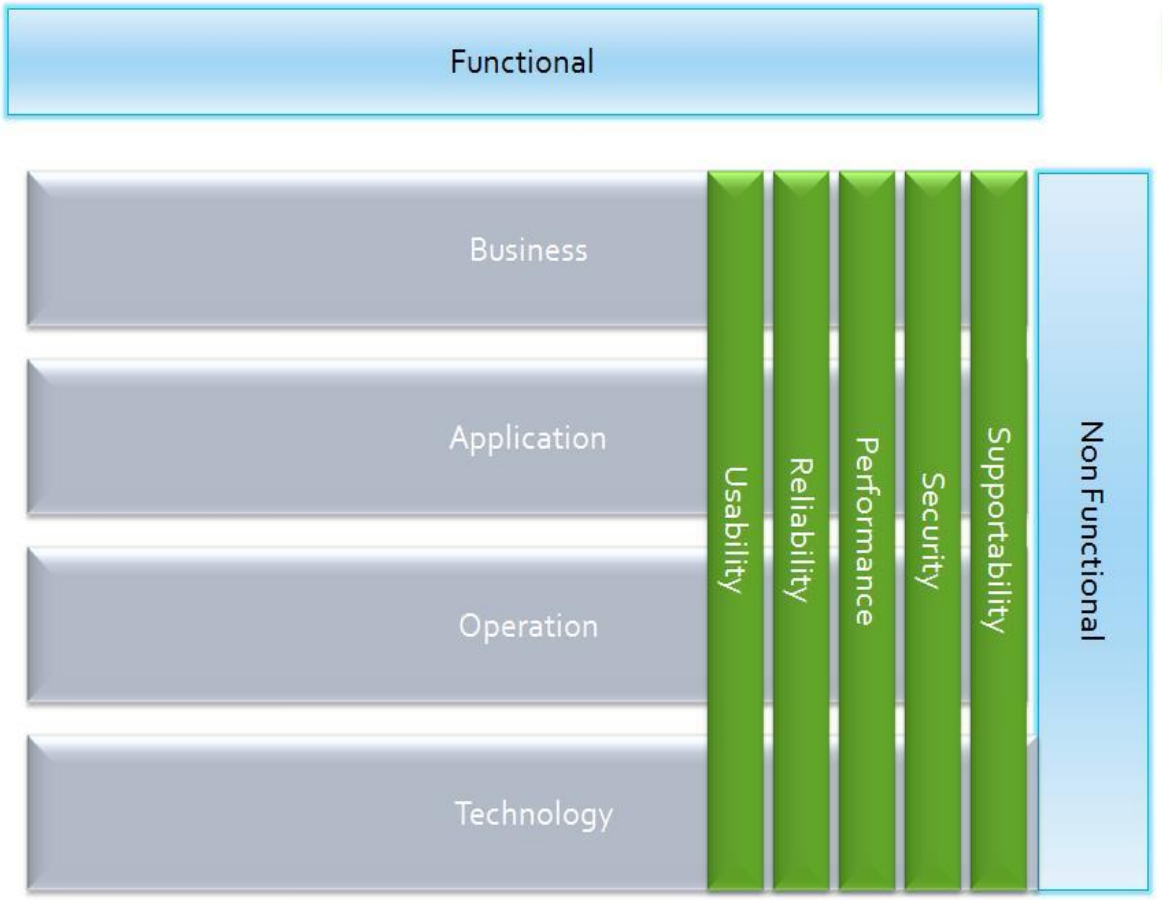

Figure. 3-Requirement Categories

Each category has its own importance and it is needed to make sure to get all the information required for each of the category

Functional

- Business –It describes the high-level goals, objectives, products and services
- Application –It includes the Services & Functionality that link to users of different skills to achieve business objective
- Operation – The operations category describes what the organization needs to know to run its business processes and operations. This category includes standard data models, data management policies, and descriptions of the patterns of information consumption and production in the business

- Technology – The technology category defines the technical services needed to perform and support the business mission, including the topologies, development environments, application programming interfaces (APIs), security, network services, database management system (DBMS) services, technical specifications, hardware tiers, operating systems, and more

Non Functional

- Supportability – Information related to future requirements like nice to have or information related to future expectations on the requirement
- Security – Information related to data security.
- Performance –Information related to response times of business and navigations
- Reliability – This category defines the ability of the System to make Reliable transactions without any issue.
- Usability – This category defines the System User Interface and Navigations

There are many ways to gather and many sources from which the information related to each requirement was gathered as depicted in Figure 3

WAYS TO GATHER	SHADOWING
	INTERVIEWING
	FOCUS GROUP
	SURVEYS
	USER INSTRUCTIONS
	PROTOTYPING

Figure 4- Ways to Gather Information

- Shadowing –It includes observing the end user and understanding about the manual process of how they are doing in their environment

- Interviewing –It includes interviewing the end user or business owner with a set of Question?
- Focus Group –It involves involving Everyone in a Meeting to discuss on requirements
- Surveys –It involves Conducting a Survey with a set of questions and options and set it to end user or clients and analyze the information from it
- User Instruction - You will do the work that an end user is doing and follow his instructions to complete the task
- Prototyping - Create a prototype of requirements or information in the form of Photos or physical thing

Out of the above stated ways the first four ways were used to gather information from the client.

A screenshot depicting the questionnaire that was used for gathering the requirements from the end user is given below

	Design Option Question
2	What Pharmacy services do you offer?
3	What are the locations, hours and staffing of your OP Pharmacy?
4	What specialities do you offer at this facility?
5	What patients do you serve - adult, peds, neonates, geriatrics, etc?
6	Does your Pharmacy offer consult services?
7	What types of Pharmacy consults are offered? Voluntary or mandatory?
8	What inpatient services do you offer?
9	How is your Pharmacy covered if not staffed 24/7?
10	How are patients identified?
11	What is the makeup of your Pharmacy staff-techs, pharmacists, clerks, clinical pharmacists, managers?
12	Are your pharmacy staff assigned to one pharmacy area or do they rotate?
13	Can you provide a list of your pharmacy users by function, title, role or job description?
14	What pharmacy policies and procedures are in place and can you provide copies?
15	What hospital policies and procedures are in place and can you provide copies?
16	Do you have a drug formulary or a list of approved medications for use?
17	Is there a Pharmacy and Therapeutics Committee (or similar) to make medication-related decisions?

Figure 5- Information Gathering Questionnaire

For remaining part of the questionnaire look at the appendix

The information was gathered from the following set of sources as depicted in Figure 4

SOURCES	PEOPLE
	ARTIFACTS
	SYSTEM

Figure 6- Sources of Information

- People – These were the primary source from where the information was obtained. This includes End User, Business Owners, and SMEs etc...
- Artifacts - Documents/Manuals of business work flows or details of existing system or process
- System - Existing application and its functionality and behavior / code [7.8].

Barriers

The Barriers faced during the stage of Requirements Gathering using the above tools are as follows

- Identifying the correct personals from whom the requirements are to be gathered.
- Distinction between the true requirements and wishes of the end user.
- Time constraints- As the Pharmacy department officials work on a real time schedule, therefore dedicating appropriate time in providing the true requirements is a tough task to manage both for the requirements giver as well as requirements gatherer.
- As the Pharmacy department employs large number of personals, each with a distinct functionality and a different set of requirements, therefore in order to gather the requirements of the entire Pharmacy department, all the different minds is to be brought on the same table which is also an uphill task
- As the requirements are to be gathered for the Electronic Health Record implementation only, therefore this requires informing the users of the various aspects of the EHR so that they could provide EHR specific requirements only.
- Differences among the Top Management and End users could also play a spoilsport in the requirement gathering process.

- Proper freezing of the requirements if not done could be a disadvantage for the service provider as the client could change its stance in the future

Strategies

The various strategies employed in order to overcome the barriers and to ensure a smooth Requirement gathering process is given as under

- The first step would involve the limiting the scope of the project up to the appropriate level which would ensure the required information is gathered i.e. neither less nor more, as the process of requirement gathering employs a large amount of resource which has financial implications to it.
- The next step would involve identification of the key users from whom the requirements need to be gathered. This step is of great importance as the information provided from the identified users would form the base of the project.
- Before gathering information, a consensus should be developed between the top management and end users as both are an important part of the client organization which would be affected by the project implementation.
- Before gathering the requirements, the key users should be made aware of the of the various functionalities of the EHR, so that they could give requirements specific to that purpose.
- Proper coordination should be developed, so that the requirement gathering process should not hinder with the usual functioning of the Pharmacy Department.
- The requirements obtained from the end users should be sieved to separate the true requirements from user's wishes.
- The requirements gathered should be verified and validated from the proper authorities of the client and should be freeze before proceeding to any further steps.

3.2.1.2 Data Mapping

Pharmacy data is different from many other clinical terminology domains in that clinical drug concepts can be readily defined by a limited set of attributes. This allows for a more rigorous terminology model whereby a clinical drug can be defined as having ingredient, strength, form,

and route as core attributes. In addition, drugs have many brand names, abbreviations, synonyms, and packaging information that sometimes need to be taken into account for unique identification. This enforces mapping consistency by removing human variability due to case-by-case judgment calls. After the requirements were gathered from the client, the data obtained was mapped according to the VistA requirements. Some of the important information related to the drugs that need to be captured during this process is given below in the following screenshots of the worksheets containing the required information known as Data Object Worksheet (DOW) [7.7]

Brand	Strength	Form	DEA, SPECIAL HDLG	LOCAL POSSIBLE DOSAGE	SYNONYM(Generic Name)	Synonym(BARCODE)	DISPENSE UNIT	MED ROUTE	SCHEDULE TYI	SCHEDULE
Dilgard XL 180 mg Capsules	180□mg	Cap	6- Legend	90,120,180 MG	DILTIAZEM	CAP0045	Cap	PO - by Mouth	PRN	OD,BID,TID
Gla 120 mg Capsules	120□mg	Cap	6- Legend	120 MG	GAMMA LINOLENIC ACID	CAP0074	Cap	PO - by Mouth	PRN	
Nomigrain 10 mg Capsules	10□mg	Cap	6- Legend	5,10 MG	FLUNARIZINE	CAP0098	Cap	PO - by Mouth	PRN	OD
Nomigrain 5 mg Capsules	5□mg	Cap	6- Legend	5,10 MG	FLUNARIZINE	CAP0099	Cap	PO - by Mouth	PRN	OD
Obestat 5 mg Capsules	5□mg	Cap	6- Legend	5,10 MG	SIBUTRAMINE HYDROCHLOR	CAP0104	Cap	PO - by Mouth	PRN	OD
Ribavin 100mg cap	100□mg	Cap	6- Legend	100,200 MG	RIBAVIRIN	CAP0124	Cap	PO - by Mouth	PRN	BID
Contramol 50 mg Capsules	50□mg	Cap	6- Legend		TRAMADOL	CAP0160	Cap	PO - by Mouth	PRN	
Cartigen Cap	□	Cap	6- Legend	500 MG	GLUCOSAMINE POLYGLYCAN	CAP0162	Cap	PO - by Mouth	PRN	TID,QID
Zaplon 10 mg Capsules	10□mg	Cap	6- Legend	5,10 MG	ZALEPLON	CAP0169	Cap	PO - by Mouth	PRN	OD
Aldinir 300mg Cap	300□mg	Cap	6- Legend	300 MG	CEFDINIR	CAP0182	Cap	PO - by Mouth	PRN	OD,BID
Ensules Capsules 400.000 I.U	400□I.u	Cap	6- Legend	200,400 IU	TOCOPHEROL (VITE)	CAP0190	Cap	PO - by Mouth	PRN	OD
Hopace 5 mg Capsules	5□mg	Cap	6- Legend	1.25,2.5,5,10 MG	RAMIPRIL	CAP0191	Cap	PO - by Mouth	PRN	OD,BID
Lynx 250 mg Capsules	250□mg	Cap	6- Legend	250,500 MG	LINCOMYCIN	CAP0222	Cap	PO - by Mouth	PRN	TID,QID
Moxif 400 mg Capsules	□	Cap	6- Legend		MOXIFLOXACIN	CAP0224	Cap	PO - by Mouth	PRN	
Minoz 50mg Tab	□	Cap	6- Legend	50,100 MG	MINOCYCLINE	CAP0227	Cap	PO - by Mouth	PRN	OD,BID,QID
A to Z Tab	100□mg	Cap	6- Legend		MANGANESE (SALTS)	CAP0233	Cap	PO - by Mouth	PRN	
Alpha D3 1 mcg Capsules	1□mcg	Cap	6- Legend	0.25,1 MCG	ALFACALCIDOL	CAP0234	Cap	PO - by Mouth	PRN	OD
Alpha D3 0.25 mcg Capsule	0.25□mcg	Cap	6- Legend	0.25,1 MCG	ALFACALCIDOL	CAP0235	Cap	PO - by Mouth	PRN	OD
Amantral 100 mg Capsules	100□mg	Cap	6- Legend	100 MG	AMANTADINE	CAP0237	Cap	PO - by Mouth	PRN	BID
Angispan - TR 6.5 mg Capsul	6.5□mg	Cap	6- Legend	2.5.6.5 MG	GLYCERYL TRINITRATE	CAP0239	Cap	PO - by Mouth	PRN	TID
Asthalin Rotacaps 200 mcg C	200□mcg	Cap	6- Legend	200 MCG	SALBUTAMOL	CAP0243	Cap	PO - by Mouth	PRN	BID,TID,QID
Benadryl Capsules	25□mg	Cap	6- Legend	25 MG	DIPHENHYDRAMINE	CAP0249	Cap	PO - by Mouth	PRN	BID,QID
Betacap -TR 40 mg Capsules	40□mg	Cap	6- Legend	40,80 MG	PROPRANOLOL	CAP0250	Cap	PO - by Mouth	PRN	OD,BID,TID,QI
Biocillin 500 mg Capsules	500□mg	Cap	6- Legend		AMPICILLIN	CAP0251	Cap	PO - by Mouth	PRN	
Bio - E 400 mg Capsules	200□I.u	Cap	6- Legend		TOCOPHEROL (VITE)	CAP0252	Cap	PO - by Mouth	PRN	

Figure 7 Data Object Worksheet

Barriers

The Barriers faced during the stage of Data Mapping are as follows

- Authentication of the data obtained from the client cannot be established as the data is very old and continuous updating hasn't been carried out on part of the client.

- Drug formulary of the client is in the .pdf format which for the Data mapping purpose is not useful, hence the entire data is to be entered in the excel format for its proper utilization in the implementation process.
- Freezing of the total number and type of data that needs to be mapped by the proper authorities, if not done could need to differences in the future, which may endanger the success of the project.
- Addition and deletion in the drug formulary is not updated by the client, and the data is present in different versions, hence a compiled data sheet has to be developed before mapping the data.
- As the drug formulary of the different hospitals of the chain of Multi Specialty hospitals is different, therefore mapping is to be done for each of the hospital included in the chain.
- As the client drug formulary is not updated, therefore references needs to be taken from the other sources as well, the acceptability of other sources by the client also needs to be established.
- Delaying of the validation of the mapped data file by the client would result in the delay of operation on the implementer side.

Strategies

The various strategies employed in order to overcome the barriers and to ensure a smooth Data Mapping process is given as under

- The type of data that needs to be collected should be verified in consultation with the designated officials on the client side.
- The data should be collected personally from all the client facilities, wherever the data is supposed to be present, so that a firsthand knowledge of the exact number available with the client is obtained.
- Wherever possible the data should be verified from primary sources. e.g. in case of drugs, the various information related to a drug product should be verified by looking at the product itself.
- The most appropriate facility for obtaining data in case of Pharmacy Department is the Central Pharmacy Store (CPS) from where supply to all other facilities is being carried

out, therefore collection of data should be primarily done from the CPS, so that probability of the correctness of the data increases.

- It should be established from the drug formulary developer of their reference point in developing the Client drug formulary, and if possible the same reference should be taken, so that no collusion occurs.
- Before mapping the drug data, the information of the Added as well as discontinued drugs should be obtained and the data should be updated in the client's drug file.
- For validation of the DOWs by the client, instead of giving the entire consolidated list to the client at once, the DOWs can be given in smaller parts, which would reduce the workload of the client and decrease the time taken by them in validating the mapped data.

3.2.2 Design: - Design the ideal solution and determine how the environment can support a change in the business and clinical processes of the enterprise. The work products produced during the Assess phase of ADOPTS are instrumental in the delivery of the high-level functions that are part of the Design component of clinical transformation. An initial step is to conduct a high-level current state workflows analysis to identify and document pre-existing process patterns. These current state workflows are then used to identify areas of potential process improvement that could result from the initiative. If existing workflows have already been documented, these processes are validated through a series of workshops to gain consensus on a multidisciplinary basis. In broader terms the design phase mainly involves the development of the workflow that the client would follow in the future. The phase in which this designed workflow is introduced to the client is known as a Future Sate Workshop (FSW). A future state workflow of the client's hospital for outpatient department developed while considering the various requirements of the end users is shown below. Apart from this the future state workflows of other departments were also developed and the client was made aware of them during the future state workshops.

The workflow shown in figure is one of the first level workflow i.e. the simplest form involving minimum number of actors, the abbreviations used stands for the following

V= VistA, the EHR currently being implemented in the multi chain hospitals

H= HIS (Hospital Information System), the Information system already been established in the multi chain hospitals.

M= Manual Operations. i.e. those areas where presently Automation is not present, but future considerations are always left open.

High level workflows were also developed involving more complex situations, which are illustrated in the appendices

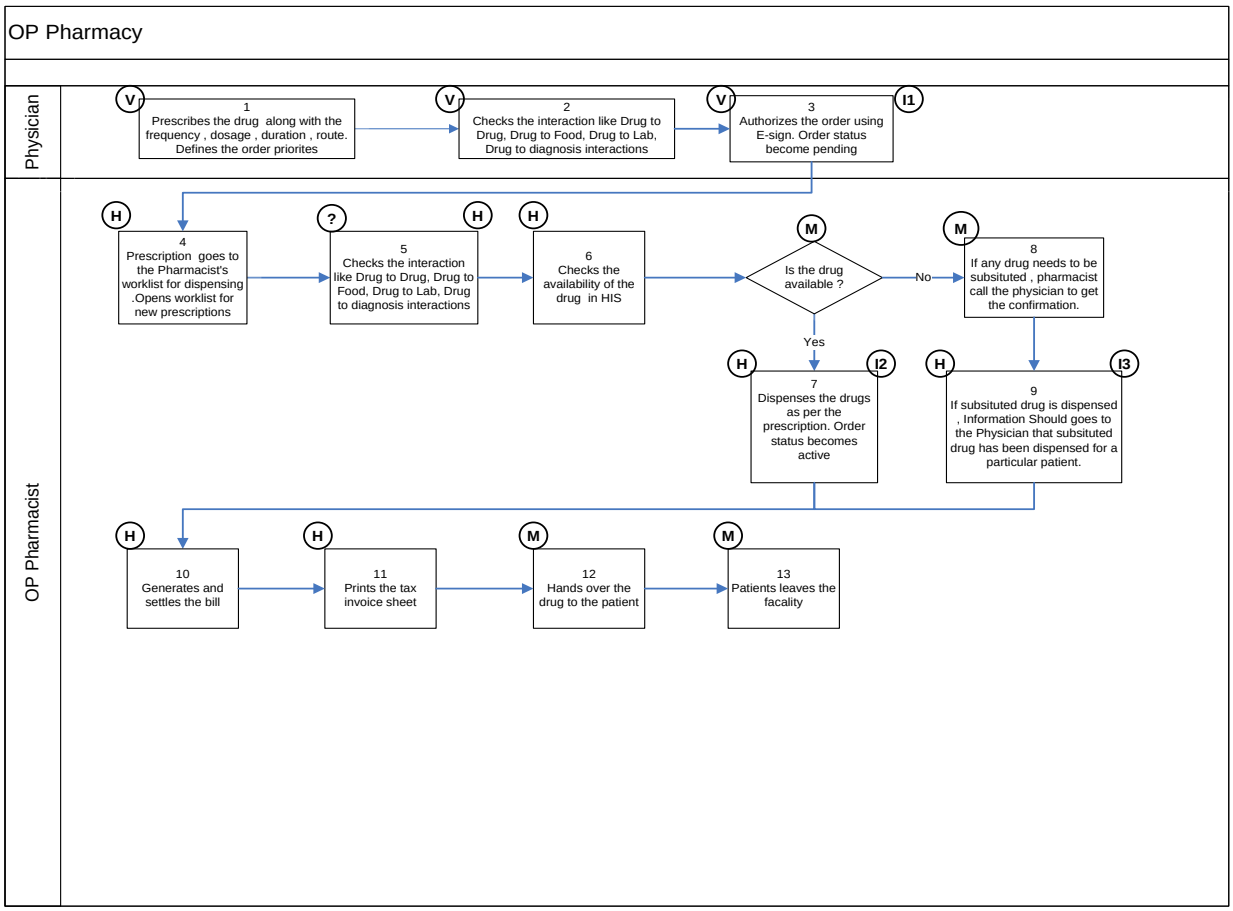

Figure 8 First Level Workflow

3.2.2.1 Future State Workshops

One of the most important aspects of the design phase of the project is known as the Future State Workshops. It is the point where the client is made aware of the results of the implementation, so that they get aware of the changes that the EHR would bring in their functioning. This stage

mainly involves carrying out simulation workshops of the future scenario where all the actors and the system are made to use in the same way as they are supposed to be used in the future. As this stage makes the client aware of the changes that they have to face in the future, therefore this stage is marked with possibly the largest number of barriers from the client side.

Barriers

The Barriers faced during the Carrying out of the Future State Workshops are as follows

- As these workshops are meant to showcase the changes that the EHR would bring in the future functioning of the Pharmacy Department, therefore each and every person associated with the department needs to be included, this however is not an easy task, taking into consideration the tight schedule of the department officials.
- There are meant to be certain actors who would always resist changes, and hence convincing such people is one tough task that needs to be carried out.
- Differences of opinions among the client officials at different levels are ought to happen. Also opinions of the implementer and the client would differ in large number of aspects.
- The workshops would involve a lot of questioning which would test the skills of the workshop conductor to the fullest extent.
- As the workshops are to be conducted over a period of time, therefore the interest level of the attendees may go down. Such scenarios should also be taken into consideration while designing the course of the workshops
- A sense of belongingness of the newly to be introduced EHR may go missing, if the workshops are not conducted properly.

Strategies

The various strategies employed in order to overcome the barriers and to ensure a smooth conduction of Future State Workshops (FSW) are given as under.

- Proper coordination among the different officials of the pharmacy department should be done before carrying out the Future State workshops, in order to ensure maximum participation in all the Workshops. Also refresh workshops should be carried out to maintain the interest level among the users.

- The simulation workshops should be carried out involving the participation of the end users themselves. By this way a sense of belongingness would develop among the end users.
- Involving the end users would ensure rendering them with the first hand experience of the future system which would result in dealing with the various practical issues of the new EHR.
- In order to ensure the success of the new EHR, it is advisable to ensure the participation of officials of all the levels of the department so that differences of opinions between them could be reduced.
- The users most resistant to change should be identified and if possible should be encouraged to participate as an actor in the workshop. This may decrease the level of resistance among the specific user.
- It should be ensured that all the questions arising during the FSW should be addressed as these workshops ultimately decides the acceptability of the product.
- The conductor of the workshop should be a champion of the product, so that he could answer all the questions arising during the FSW at that point only.

3.2.3 Optimize

Optimize is the third component in the ADOPTS framework. Optimize the solution design by considering the design within the context of the technology or change required to meet the business and clinical needs of the enterprise. It is the phase where the design is brought from the drawing table to the real world. As this phase involves the actual creation of the real life scenarios therefore utmost care should be taken as any shortcomings introduced during this phase would be depicted in the real time system some of the components of this phase may include:

3.2.3.1 Configuration

Configuration identification is the process of identifying the attributes that define every aspect of a configuration item. A configuration item is a product (hardware and/or software) that has an end-user purpose. These attributes are recorded in configuration documentation and base lined.

In VistA various things can be configured in different modules from a hospital perspective. We can configure the following things in the patient information module starting from an institution, location, division, ward, clinic, patient, user etc. In laboratory module we can configure the following things like creating lab tests, placing a lab order etc. In pharmacy module we can configure the various drugs with their generic and trade names, schedules, route of administration, dosage form, dose, packing, item code, packing bar code etc. The following screenshot of the DOW is a depiction of the various information captured in order to form a base of the configuration process.

Brand	Strength	Form	DEA, SPECIAL HDLG	LOCAL POSSIBLE DOSAGE	SYNONYM(Generic Name)	Synonym(BARCODE)	DISPENSE UNIT	MED ROUTE	SCHEDULE TY	SCHEDULE
Dilgard XL 180 mg Capsules	180mg	Cap	6- Legend	90,120,180 MG	DILTIAZEM	CAP0045	Cap	PO - by Mouth	PRN	OD,BID,TID
Gla 120 mg Capsules	120mg	Cap	6- Legend	120 MG	GAMMA LINOLENIC ACID	CAP0074	Cap	PO - by Mouth	PRN	
Nomigrain 10 mg Capsules	10mg	Cap	6- Legend	5,10 MG	FLUNARIZINE	CAP0098	Cap	PO - by Mouth	PRN	OD
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Ribavin 100mg cap	100mg	Cap	6- Legend	100,200 MG	RIBAVIRIN	CAP0124	Cap	PO - by Mouth	PRN	BID
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Zaplon 10 mg Capsules	10mg	Cap	6- Legend	5,10 MG	ZALEPLON	CAP0169	Cap	PO - by Mouth	PRN	OD
Aldinir 300mg Cap	300mg	Cap	6- Legend	300 MG	CEFDINIR	CAP0182	Cap	PO - by Mouth	PRN	OD,BID
Ensules Capsules 400.000 I.U	400I.u	Cap	6- Legend	200,400 IU	TOCOPHEROL (VITE)	CAP0190	Cap	PO - by Mouth	PRN	OD
Hopace 5 mg Capsules	5mg	Cap	6- Legend	1.25,2.5,5,10 MG	RAMIPRIL	CAP0191	Cap	PO - by Mouth	PRN	OD,BID
Lynx 250 mg Capsules	250mg	Cap	6- Legend	250,500 MG	LINCOMYCIN	CAP0222	Cap	PO - by Mouth	PRN	TID,QID
Moxif 400 mg Capsules		Cap	6- Legend		MOXIFLOXACIN	CAP0224	Cap	PO - by Mouth	PRN	
Minoz 50mg Tab		Cap	6- Legend	50,100 MG	MINOCYCLINE	CAP0227	Cap	PO - by Mouth	PRN	OD,BID,QID
A to Z Tab	100mg	Cap	6- Legend		MANGANESE (SALTS)	CAP0233	Cap	PO - by Mouth	PRN	
Alpha D3 1 mcg Capsules	1mcg	Cap	6- Legend	0.25,1 MCG	ALFACALCIDOL	CAP0234	Cap	PO - by Mouth	PRN	OD
Alpha D3 0.25 mcg Capsule	0.25mcg	Cap	6- Legend	0.25,1 MCG	ALFACALCIDOL	CAP0235	Cap	PO - by Mouth	PRN	OD
Amantral 100 mg Capsules	100mg	Cap	6- Legend	100 MG	AMANTADINE	CAP0237	Cap	PO - by Mouth	PRN	BID
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Betacap -TR 40 mg Capsules	40mg	Cap	6- Legend	40,80 MG	PROPRANOLOL	CAP0250	Cap	PO - by Mouth	PRN	OD,BID,TID,QI
Biocillin 500 mg Capsules	500mg	Cap	6- Legend		AMPICILLIN	CAP0251	Cap	PO - by Mouth	PRN	
Bio - E 400 mg Capsules	200I.u	Cap	6- Legend		TOCOPHEROL (VITE)	CAP0252	Cap	PO - by Mouth	PRN	

Figure 9 DOW Information

After the DOW of the entire data has been made and validated from the client, then only the configuration part is carried out.

Barriers

The Barriers faced during the Configuration phase are as follows

- As the authenticity of the data configured depends upon the credibility of the data in the DCW, therefore any deviations in the DCW from reality are bound to be depicted in the product of this phase.
- The various changes that the client data has undergone in terms of addition or deletion from the time of data collection to configuration is bound to cause mistakes in the product of this stage.
- As the configuration involves the use of the software therefore untrained professionals may end up configuring the data wrong.
- Improper or no monitoring of the configured product in a timely manner may lead to no detection of any flaws during the configuration stage which ultimately may pile up in the end.
- In the configuration phase improper coordination among the configuration team may lead to duplication of work, and for every duplication extra resources is to be employed in order to rectify it.
- Improper, incorrect, incomplete, non validated or non verified data would result in difficulty in configuration as well as the product obtained would not be correct, which would result in wastage of resources, both while configuring as well as while correcting.

Strategies

The various strategies employed in order to overcome the barriers and to ensure a smooth configuration are given as under.

- Before beginning of the configuration phase, it should be made sure that the DCWs are validated and verified and finally freeze by the client, therefore the responsibility of the authentication of the content on the DCW should lie on the client rather than on the implementer.
- The changes in the client data from the time of data collection to the Configuration stage i.e. addition, deletion or modification should be incorporated in the DCWs and validated and verified by the client before carrying out the configuration.
- Proper training to the configuration team should be imparted before beginning the configuration and all the problems that could be faced by the team should be completely addressed.

- As this phase requires coordination among the configuration team, therefore proper team building should be done.
- Continuous verification of the data in the DCW should be carried out during the course of configuration to ensure correctness of the data configured. If required on site assessment should also be carried out during this phase.
- Continuous verification of the product of configuration should also be done by the team themselves as well as it should be shown to the client as well, so that inputs from all sides could be gathered and incorporated during the stage of configuration itself if necessary.

3.2.3.2 Benefits Realization

A Benefits Realization meeting is scheduled, and an agenda is created. Case study examples are presented, as are vendor-specific benefits. Negotiated Future State process workflows are presented so that the identity of benefits can begin, and the benefits identified during the "Assess" and "Design" portion of "Optimize" are validated.

The important benefits realized by implementation of EHR Pharmacy module are

- Standardization of Pharmacy prescription.
- Accountability of all the actions relating to drug prescribing to the patient.
- Better inventory and stock management which would result in reduction in pilferages.
- Proper utilization of available resources.
- Reduction in ADE
- Reduction in duration of patient stay which enhances in case of ADE therefore increased bed turnover.
- Reduction in Medico legal claims (MLC) on the hospital.
- Reduction in Cost to the client due to reduction in pilferages.
- Increase in revenue margin of the client due to reduction in cost and increase in bed turnover.

During the Benefit Realization, the new way of client functioning is shown to the client. One such example is the depiction of provider prescription screen [7.8].

A screenshot of the same is shown below

It mainly involves all the information with the required choices needed for drug prescription. It includes

- Drug Brand Name
- Dosage
- Schedule
- Route of Administration
- Comments
- Number of Day(s) the drug is to be supplied
- Quantity of the drug to be supplied
- Refills
- The prescribed drug pick up point
- Priority of the prescription

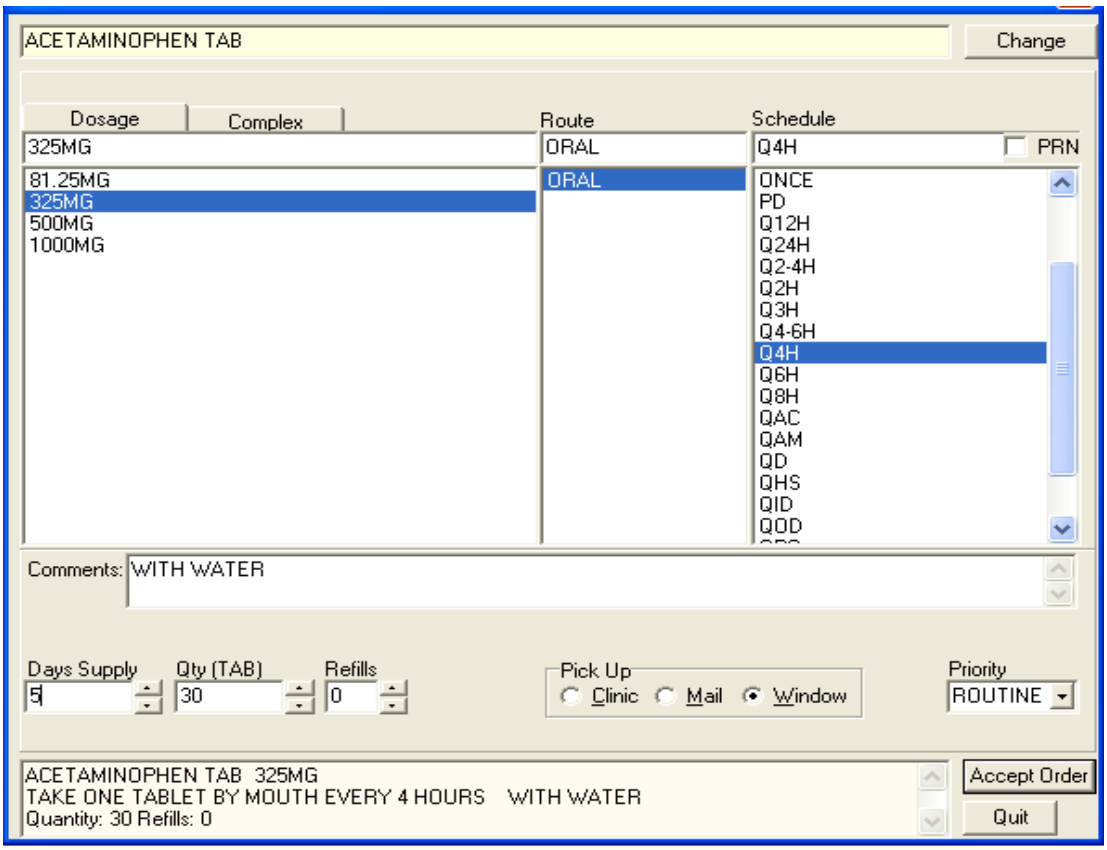

Figure 10 Provider Prescription Screen

As all the information is already configured in the system, therefore the user has just to select the appropriate response. After filling the above prescription, a print out can be taken for the patient purpose which could act similarly as a normal paper prescription minus all the flaws of the paper prescription.

3.2.4 Prepare:

It is the component of the clinical transformation process where the organization prepares for a successful deployment of the solution by educating and supporting knowledge workers.

Some of the functions associated with this phase-

3.2.4.1. Identification and Timing of Training Resources-

Resource requirements for training are identified. A plan for training is formulated as mentioned in the following steps:

- Staff analysis- to know the kind of work done by Pharmacists.
- Development of 'Data specification document' for the Pharmacy module.
- Shift analysis- To find out the shift timings of the Pharmacists so that training slots can be designed accordingly.
- Preparation of training material: PowerPoint presentations, Sharable Content Object Reference Model (SCORM) package, Test MCQs and feedback forms for the Pharmacy module.
- Preparation of training plan for the users.

An example of MCQs for the pharmacy module (See Annexure 2) is given in Figure 10

Instructions		MCQs- Single answer									
PY-1	::	Which one would you choose to get a list of possible answers	? {	=	???	~	?	~	??	~	None of these
PY-2	::	The message window in list manager entertains which of the signs	? {	=	Both (+) & (-)	~	(+)	~	(-)	~	(=)
PY-3	::	What does 'e' sign at the right of prescription number in the list manager screen indicates	? {	=	Electronic third party billable	~	Emergency order	~	Electronic issued order	~	Executed order
PY-4	::	What does the synonym [>] indicates	? {	=	Shift view to right	~	Last screen	~	Next screen	~	Move the line right
PY-5	::	Action 'DIN' displays available drug restriction/guideline information for the dispensed drug and orderable item associated with the selected medication order	? {	=	TRUE	~	FALSE	~	wrong ans	~	wrong ans
PY-6	::	Speed action can be applied to only one action at a time	? {	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
PY-7	::	How many options are there on the archiving menu	? {	=	8	~	6	~	7	~	
PY-8	::	For each prescription identified using Pso Archive FIND, what appears on the screen	? {	=	Dot	~	Number	~	Found	~	Syntax
PY-9	::	Using PSO AUTOCANCEL1, prescriptions of patients who were admitted ___ days previous are cancelled	? {	=	3	~	2	~	4	~	
PY-10	::	Which of the synonym is present in the Unit Dose Order Entry profile	? {	=	RN	~	UD	~	EX	~	MD
PY-11	::	Within the inpatient medication package, by how many ways a pharmacist can enter a new unit dose orderor take action on an existing order	? {	=	3	~	2	~	1	~	
PY-12	::	In Word group sort option (^OTHER), the pharmacist doesn't have which option to choose while choosing a profile for the patient	? {	=	Moderate	~	Short	~	Long	~	No option

Figure 11 – Pharmacy MCQs

3.2.4.2. Change Agent Training-

Training includes an "Adapting to Change" class for individuals from the organization designated as change agents. Change agents are taught techniques needed to realize change. Techniques include skills needed on how to facilitate discussions, handle resistance and manage the change process [7.8].

Barriers

The Barriers faced during the Prepare phase are as follows

- Incorrect identification of the user which is to be made a super user could dwarf the whole motive of the Prepare phase
- As the Pharmacy department works on a real time basis therefore Non availability of the users to be trained could be a major spoilsport during the training phase.

- Non motivated users i.e. those who are not willing to adopt any changes may play a spoilsport during the prepare phase.
- Non user friendly modules designed for Knowledge Transfer (KT) to the user may also result in low acceptance of the EHR by the users.
- Improper Teaching methodology adopted may also dwarf this phase.
- Unfavorable teaching capability of the trainer may also dwarf this phase.

Strategies

The various strategies employed in order to overcome the barriers and to ensure a smooth sailing of the Prepare phase are given as under.

- Preparation of this Phase should be done well in advance with proper research should be done in preparing the module, so that the modules are prepared as exhaustive as possible.
- The language of the module should be kept as simple as possible and it should be tried to impart the knowledge by providing as little stress to the trainees as possible.
- The shift timings of the users to be trained should be documented well in advance and an appropriate training slot should be scheduled taking into consideration of the convenience of the persons involved.
- Identification of Super users should be done very carefully by scrutinizing the possible clients thoroughly.
- The various tools of motivation should be employed during the KT so that the users remain motivated and eager to learn throughout.
- The trainer should be well prepared for the sessions and if necessary a mock run should be carried out by the trainer in front of the implementing team, in order to assess the various questions that could arise.

3.2.5. Transform

At this stage, the organization is ready to begin implementing systems and transforming workflows that will deploy the negotiated future state. Therefore it is very significant to include the "right" people and hence effectively manage the change. The focus is not just “system” oriented. Two of the major activities in this phase are as follows:

3.2.5.1. Technical CIS Build

It is critical for the technical build to be interoperable since all of the "moving parts" should interact as planned; thus, avoiding any technical issue. The functional requirements which we collected in the ASSESS stage will not be performed as desired, if the new application i.e. VistA EHR., legacy system i.e. HIS, networks, desktops and devices like analyzers do not interact as planned. Since the Design decisions made about any application can impact the way other applications function therefore Dell will integrate the legacy system and EHR by utilizing Health Level 7 (HL7). A continuous review of all design decisions must take place regularly to avoid application build rework or unanticipated testing results.

3.2.5.2. Go-Live Support Plan

The go-live support plan includes developing a physician support schedule, reviewing training and conversion support requirements, refining issue monitoring tools and initiating a process activation plan concurrent with the vendor plan, an implementation notice and a cut-over plan. The time commitment of support by the vendor and design team for facility-employed and non-employed clinicians or physicians is one of the key elements affecting the cost and Return on Investment (ROI) in any clinical implementation [7.8].

Barriers

The Barriers which the Implementation team may face during the Transform phase are as follows

- The technical requirements if not taken properly may result in resource loss as either overfull filing of the requirements may occur or requirements may be under fulfilled.
- The incomplete integration may ruin the entire process till now; hence the integration should be developed properly.
- Also if the response time of the new integrated system is not up to the real time mark, this may also result is less acceptance of the new system.
- The resistance among the users is observed at the maximum level in this phase of implementation as this phase involves the application of change in reality.
- Comparison between the old system and the new system is bound to happen which may sometimes result in negative publicity for the new EHR.

- Improper coordination among the implementers of different modules may also dampen the implementation, as this phase involves immense coordination at all levels.

Strategies

The various strategies employed in order to overcome the barriers and to ensure a smooth sailing of the Transform Phase are given as under.

- The technical infrastructure should be well established in advance and all new components to be introduced should be thoroughly tested to ensure their smooth functioning.
- A proper testing module should be prepared and all the key information and directions for testing should be included in that.
- The testing for technical acceptability and functioning should be done at all levels, starting at the lowest level of use to the highest level of use.
- As this phase involve high level of coordination among all module implementers, therefore a suitable time schedule should be prepared making all the implementers part of it.
- To overcome comparison negativity, the limitations of the old system to which the new system overcomes as well as features of the new system should be publicized.
- As there are some problems that may arise during the implementation, therefore patience need to be maintained during the entire Go Live phase.

3.2.6. Sustain

The Sustain component of clinical transformation really teaches and helps the organization "maintain the gain." During this phase, the focus is on anchoring change with ongoing benefits realization via metrics. Following are examples of activities completed during this phase.

3.2.6.1. External Networking

External networking is the involvement of the organization in vendor or solution user groups related to solution use, best practices and other solution-focused considerations. It is important

for a core team from the organization to remain connected to the clinical transformation initiative on an ongoing process, as well as to continue to measure and evaluate workflow processes.

3.2.6.2. Compliance Review

Compliance with the changes that have occurred is continually reviewed and observed. Any outliers are identified, and modifications are made accordingly.

3.2.6.3. System Maintenance Plan

The system maintenance plan is developed as a mechanism for prioritizing system upgrades and schedules. Mapping of current issues, upgrades or fixes is determined, and a process is devised for decision making and approval of upgrades.

3.2.6.4. Ongoing Communication Plan

The communication plan is continually refined, and communication strategies are defined throughout the project on an ongoing basis. New information from publications or vendor solutions is added to the communication plan, and the revisions are submitted to the Cluster Service Group (CSG) for approval.

3.2.6.5. Strategic Goals Reevaluation

Reevaluation of the projects budget and strategic goals is conducted, and realignments are made, as applicable. Review of the gap closure plan for changing priorities also occurs.

Solutions are added to the communication plan, and the revisions are submitted to the Cluster Service Group (CSG) for approval.

Benefits realization tracking, communication, and continual commit to performance improvements are what which, ultimately, determine the success of an organization’s clinical transformation efforts.

Barriers

Some of the Barriers which may hinder with the Sustain phase are as follows

- As a considerable time is required for adoption of change, which may act as a damper in the acceptance of the change as the time resource is very precious and individuals are not comfortable in devoting such time.
- With the change in the functioning, there is ought to be a decrease in productivity, which may decrease the morale of the client's management.
- Loss of motivation among the users may also take place and things wouldn't be going as smoothly in the beginning as they were earlier used to be.
- Frustration among the users may also creep in the beginning which may act as a damper to the change.
- Attrition level of those employees who are not acceptable to the change may also tend to rise.

Strategies

The various strategies employed in order to overcome the barriers and to ensure a smooth sailing of the Sustain Phase are given as under.

- The users should be informed about the time required for the complete change to take place and should be motivated to keep patience in the beginning.
- The management of the client should be informed regarding the difficulties that would be faced by the users, and they should be taken into confidence so that they also play a part in motivating their employees.
- The management should be motivated to be risk averse and flexible enough to accept some kind of decrease in productivity at the beginning.
- As some of the employees may become frustrated due to this change, therefore regular counseling of all the employees is a must to ensure the success of the project.
- During the beginning as a lot of queries would be generated as the users begin to use the new system; therefore a high level of support is to be provided.

3.3 Limitations

As during the period of study, the phases of Transform and Sustain would not be covered; therefore it would not be possible to obtain the data of the barriers faced during these phases in this project from the implementers. Therefore in such cases data could be obtained only from the past experiences of the Implementer and by analyzing the various cases of EHR implementation Worldwide. Another limitation of this study is that generalisibility cannot be achieved for the entire implementation project only from the information generated in this project, as this project covers only one set of hospitals that belongs to a single brand with a same set of top management. Owing to the complexity of each institution and their heterogeneity, a success-story with a system in a specific hospital cannot be considered to be a sufficient guarantee for a safe implementation in another one. Moreover, many different commercial and home-made systems are available, and each of them needs to be carefully evaluated. To increase the chance of successful implementation, the development of evaluation and certification methods is highly desirable and mechanisms for feedback and continuous improvements should be in place.

4. Discussion: -

Amongst the multitude of reasons driving healthcare pharmacy automation, these can be broadly classified as internal and external drivers. Internal drivers are those emanating from within the organization as a response to operational challenges, quality initiatives and organizational drive. External drivers come about as a result of market competition, customer expectations and regulatory requirements.

Quality pushes the adoption of information systems for reasons like parameterization, data acquisition, aggregation and analysis, performance measurement and monitoring. Parameters like time of action, reasons for delay in discharge process are measured at the point of action and analyzed over a period of time to uncover the process & operational inefficiencies and then be able to optimize it.

Monitoring of operational cost is mandatory for any organization to be able to survive in the competitive environment. This requires an Information System to be in place to support a secure way of handling transactions, store data and present information in an analyzable format. Audits (accounting, process, clinical etc.) depend on this data for assessing the state of affairs and finding gaps or loopholes, with an opportunity to improve the systems & processes.

Efficient utilization of organizational resources is promoted through resource planning which is brought about by the visibility of enterprise wide process and information. Trawling through the information systems, the operational reports capture the slackness in the processes and allow for constant monitoring. Once this information becomes available, the decision makers are empowered to take objective & informed decisions, thereby resulting in measurable performance improvement.

Healthcare today finds itself at crossroads facing three major moving targets:

- Cost
- Access
- Quality

For healthcare to be sustainable and be able to meet the patient's requirements, it has to be cost efficient & provide access to quality care. Increasingly the Information Systems are called upon to support these objectives. The benefit of Information Systems adoption in achieving these objectives flows from the following

- Time - Real time flow of information
- Place - Remote dissemination of information
- Standardization - Processes & Workflows
- Coordination -Among care providers
- Decision support – Clinical knowledgebase, Clinical pathways & protocols
- Retrospective analysis – Trends, audits, outcomes
- Predictive analysis – What-if, simulation & modeling

Hence with the implementation of VistA EHR the client will be able to meet its said objectives to a larger extent and be self sufficient in carrying out its operations.

5. Conclusion: -

With the implementation of VistA EHR, the Multi Chain Hospital would gain in the following arenas

- Better management control
- Standardization of operations and functioning
- Decrease in cost
- Reduce errors and corresponding litigations
- Better quality of service
- Development of a good brand image
- Higher growth prospects

However to achieve all this it is required for the VistA implementers

- To completely fulfill the client's requirements
- To customize the product according to the client's needs
- To implement the product in such a way so that it can be embedded without making much alterations in the client's workflow
- To train the hospital staff completely and thoroughly about the new product and make them familiar with its usage
- To provide continual support to the client for maintaining a lifelong relationship

6. Recommendations: -

It is recommended that Multi chain hospital should implement Vista EHR to override the existing legacy system– HIS as it being an open source application it does not increase the expense for the organization but at the same time enhance the quality by improving the processes such as making all clinical documentation electronic thus decreasing duplicity to a great extent, save time and cost to patient since the patient record can be accessed from any of the Multi Chain Hospital locations rather than the one patient consulted in the previous visit, it will help the Management to keep a strict control over functioning of the organization and thus help spread a good word of mouth for the Multi Chain Hospital brand.

With respect to the Pharmacy System of the hospital in general one approach would be to significantly improve incident reporting of medical errors. Health care providers need to be trained to recognize changes in a patient's medical condition that may indicate an ADE and encouraged to report them promptly. Also, health care institutions need to create an environment that encourages the reporting of medication errors and investigation of system features that contributed to the error. Another promising approach is to more fully incorporate clinical pharmacists into the provision of patient care. Also new error types that were specific to Electronic Prescribing also need to be highlighted. These mainly involved selection of the incorrect product dose or frequency from a menu, and inappropriate use or selection of default doses. While the system reduced straightforward errors in medication order writing, both prescribers and ward pharmacists need to be aware of these new types of error so that they can be identified and rectified, and so that system changes can be made to prevent them.

Also there is a scope to widen the use of EHR in the pharmaceutical industry outside the hospitals as the pharmaceutical industry is a consumer of healthcare data throughout the different functions needed for the research, development, and safety monitoring of medicines. The pharmaceutical industry could more effectively research, develop, and monitor safety of medicines by utilizing such clinical databases that are made possible by the growing adoption of EHRs in healthcare institutions as EHRs can clearly provide some support to the pharmaceutical industry for data re-use. Particularly in the areas of drug safety surveillance, clinical trial recruitment, and in observational studies, the EHR vendors can partner with the pharmaceutical

industry to help satisfy regulatory requirements in order to bring life-saving drugs to patients faster [7.6].

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8. Annexure

8.1. Annexure-1. Design Option Questions

2	What Pharmacy services do you offer?
3	What are the locations, hours and staffing of your OP Pharmacy?
4	What specialities do you offer at this facility?
5	What patients do you serve - adult, peds, neonates, geriatrics, etc?
6	Does your Pharmacy offer consult services?
7	What types of Pharmacy consults are offered? Voluntary or mandatory?
8	What inpatient services do you offer?
9	How is your Pharmacy covered if not staffed 24/7?
10	How are patients identified?
11	What is the makeup of your Pharmacy staff-techs, pharmacists, clerks, clinical pharmacists, managers?
12	Are your pharmacy staff assigned to one pharmacy area or do they rotate?
13	Can you provide a list of your pharmacy users by function, title, role or job description?
14	What pharmacy policies and procedures are in place and can you provide copies?
15	What hospital policies and procedures are in place and can you provide copies?
16	Do you have a drug formulary or a list of approved medications for use?
17	Is there a Pharmacy and Therapeutics Committee (or similar) to make medication-related decisions?

18	Are drug synonyms used?
19	Do you have a list of commonly used drug synonyms?
20	Do you have a therapeutic substitution policy
21	Would you provide a copy of your therapeutic substitution list?
22	How are medications ordered?
23	If ordered by brand name, is generic dispensing and labeling acceptable?
24	Are there any restrictions on which medications can be ordered or who can order them (a restricted list)?
25	What computer experience does your staff have?
26	Do they use computers for order processing now?
27	Who do you purchase medications from as your drug supplier?
28	Is there one vendor from which you purchase medications?
29	Is there an electronic invoice with NDC numbers available from your vendor?
30	How are your medications currently packaged?
31	Are electronic signatures acceptable-local facility policy or legally by state/nation?
32	In general, how are your medications received?
33	Do you inventory your medication supply now? How?
34	Do you have any special language requirements?
35	Who would you suggest as a contact if we need additional information after the site assessment?
36	How would you describe your inpatient workflow?

37	How are inpatient orders received?
38	How are inpatient orders processed?
39	How are inpatient orders dispensed?
40	How are unused medications returned?
41	How do you bill for inpatient medications?
42	How is nursing stock/floor stock ordered now?
43	Do you provide floor stock medications to other areas of the hospital?
44	Can you provide a list of floor stock areas and the medications stocked in each one?
45	Do you have any automated dispensing equipment? (Pyxis, Omnicell)
46	Do you prepack medications into UD packaging if not purchased that way?
47	Do you prepack any liquids or other dosage forms?
48	What pre-packing equipment do you use?
49	How are medications documented as given?
50	Does pharmacy and nursing share a medication administration record (MAR)?
51	How do Pharmacy and Nursing communicate regarding medications or medication-related problems?
52	Does Pharmacy review all medication orders before they are administered?
53	How are pharmacy services billed?
54	Can you provide a copy of any pharmacy-related forms?
55	What are the standard administration times used for your facility?

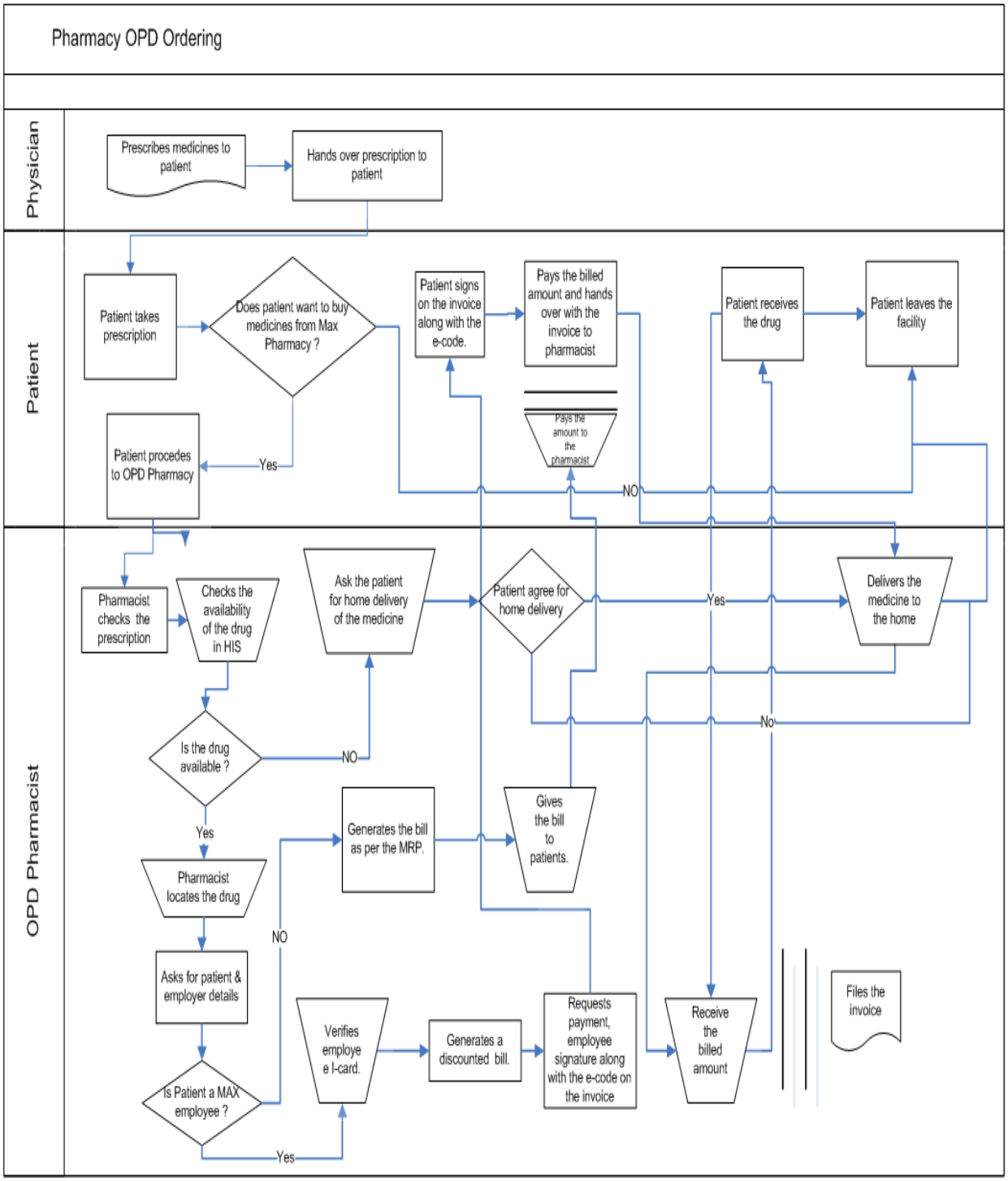
56	Are the standard times used on all floors and all areas?
57	Can you provide a copy of the standard administration times?
58	Does your facility have a list of approved abbreviations?
59	What if abbreviations are used that are not approved? Is there a policy?
60	Can you provide a copy of your approved abbreviation policy?
61	Can you provide a list of patient areas and their bed assignments?
62	Are the floors assigned to specialty treating teams also?
63	Can you provide a listing of treating specialties by floor or bed assignment?
64	Does Pharmacy supply all of a patient's needed medications?
65	Are any of the patient's own meds used as an inpatient?
66	How are these "non-facility" medications documented and used now?
67	What is your procedure for out-of-stock medications for inpatients and outpatients?
68	What do you advise patients if you are out-of-stock?
69	How would you assess your pharmacy's space needs?
70	Do you have space for desktop computers and printers in your pharmacy areas?
71	How would you assess your pharmacy's staffing needs?

72	Do you have any recruitment or retention issues regarding staffing?
73	Explain your Outpatient Pharmacy workflow.
74	Do you have more than one Outpatient Pharmacy?
75	What hours are your Outpatient Pharmacy available?
76	What coverage is available once Outpatient Pharmacy closes?
77	How are Outpatient medications dispensed (bulk, pre-pack, individual count, other)? Check for samples to verify.
78	How do you receive outpatient orders?
79	Are there any quantity limits or refill limits?
80	Do you have the same level of charges for all patients?
81	How do patients pay for Outpatient Pharmacy services?
82	Can patients pick up medication and pay later?
83	Do you dispense medications to patients being discharged from Inpatient status?
84	Can discharged patients take their orders and have them filled elsewhere?
85	If filled outside the facility, how is the patient's medications tracked?
86	Would you provide some samples of your current pharmacy labels?
87	What is the workflow of your IV area?
88	Do you staff your IV area 24/7?
89	Who mixes your IV's? Is this the same for all shifts?
90	What shifts are standard in this facility?

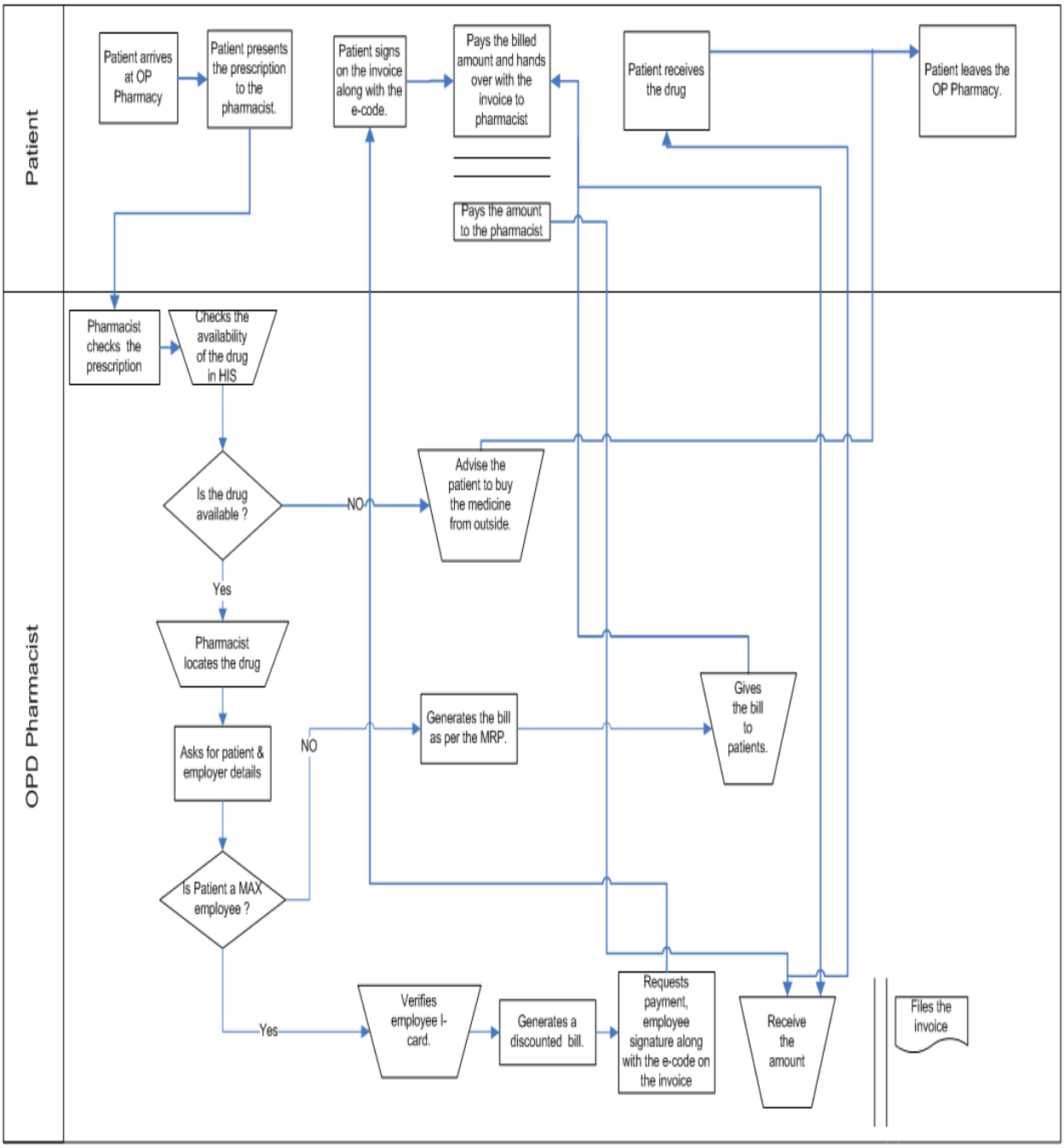
91	Are any IV's mixed by nurses on the floor? All or what circumstances?
92	Do you use IV minibags?
93	If mixed on the floor, what procedures do the nurses follow?
94	Do you mix your IV orders using a batch process?
95	What are the hours covered by batch processing?
96	Do you use any pre-mixed IV's?
97	Do you prepare chemotherapy?
98	Do you prepare TPN?
99	Do you prepare piggyback medications?
100	Are there any specialy IV products used that require mixing?
101	What is your process for returned IV's? Do you recycle? How do you track?
102	Do you label all IV's with the patient's name or only if mixed by the IV room?
103	Do your IV staff work in other areas of the Pharmacy?
104	Would you provide a copy of your IV labels currently used?
105	Do you use any log sheets or other forms in the IV room?
106	Do you have a Controlled Substance vault?
107	Do you have more than one vault? Locations and areas served?
108	Would you provide a copy of your Controlled Substance policies and procedures?

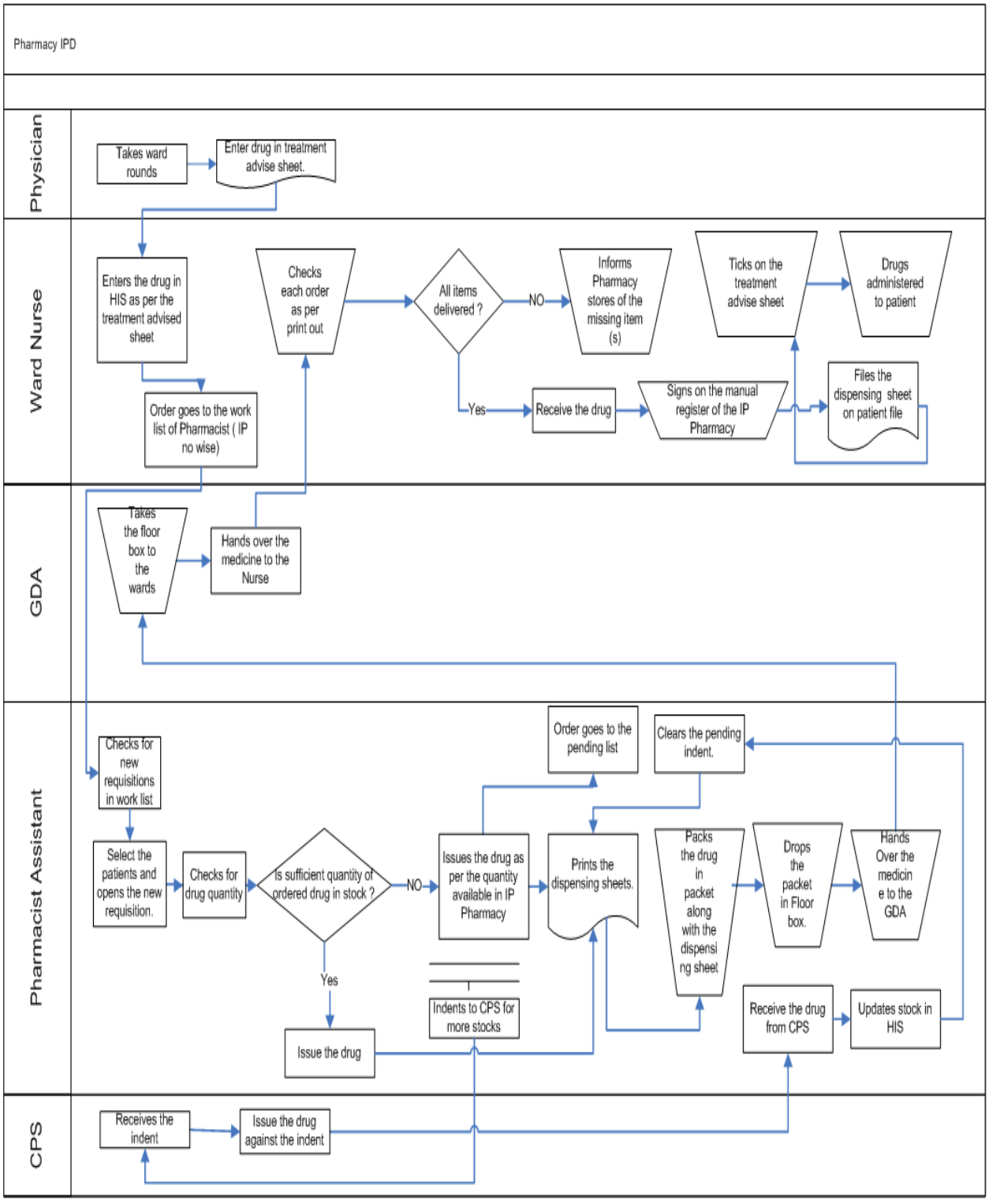
109	Does your state or nation have specific Controlled Substances regulations that you follow?
110	Request copy of Controlled Substance state/nation regulations.
111	What is the workflow for Controlled Substances?
112	How are Controlled Substances requested by the Pharmacy?
113	What inventory process do you use to monitor them?
114	How are patients' orders for Controlled Substances received?
115	How are Controlled Substances dispensed to floor stock areas?
116	What is the process for monitoring floor stock Controlled Substances?
117	What is the process for administering floor stock Controlled Substances?
118	How is a wasted Controlled Substance documented or tracked?
119	Do you have a regular inspection program for Controlled Substances?
120	How does the inspection program work?
121	Are any providers not authorized to order Controlled Substances?
122	Are any nurses or others (physician assistants) authorized to order Controlled Substances?
123	Do Controlled Substances here follow the same Schedules (2-5) as followed in the US?

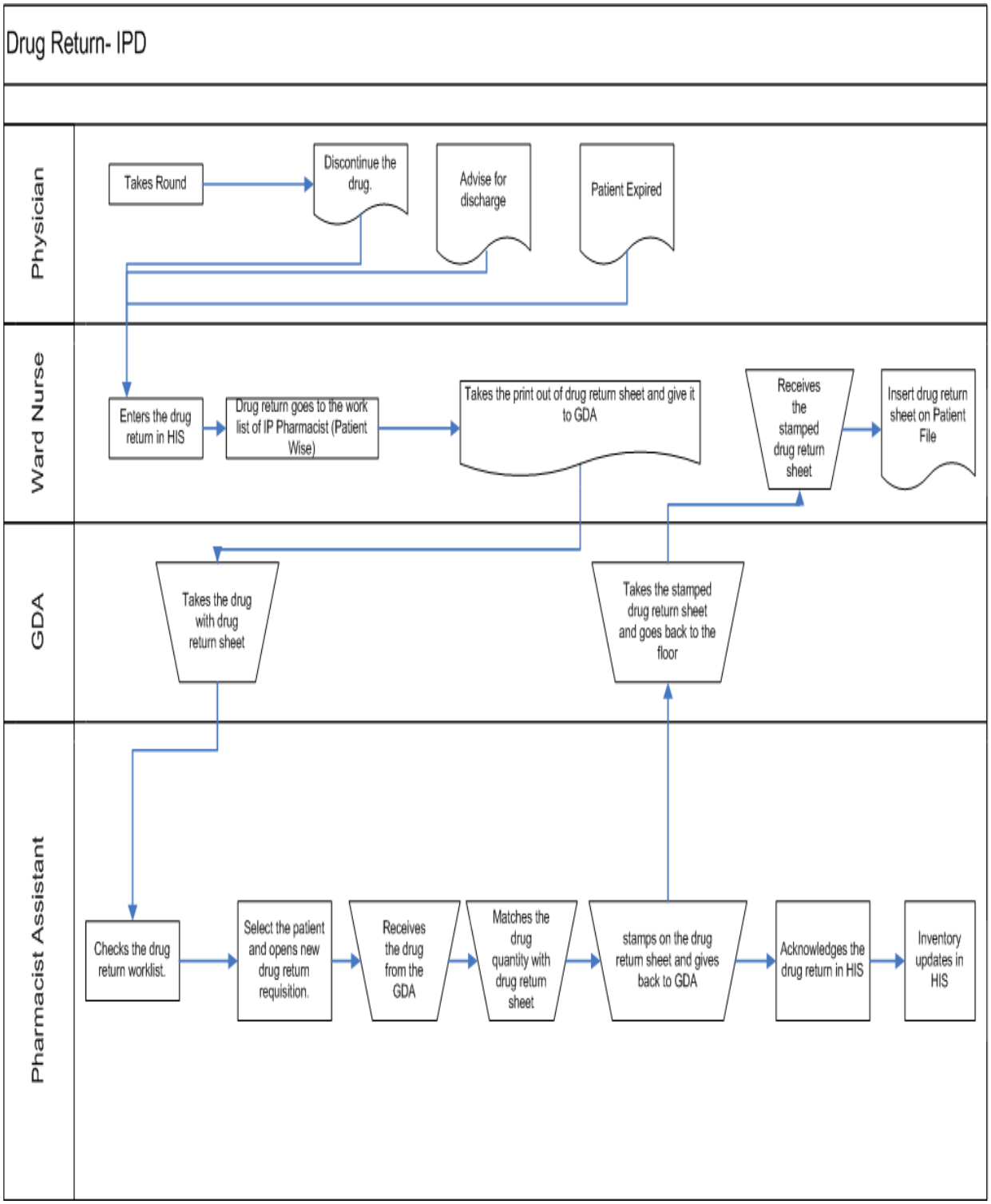
8.2. Annexure-2.Pharmacy_Workflows



Pharmacy OPD Walk-IN




Pharmacy IPD
Physician
Takes ward rounds
Enter drug in treatment advise sheet.
Ward Nurse
Enters the drug in HIS as per the treatment advised sheet
Order goes to the work list of Pharmacist (IP no wise)
Checks each order as per print out
All items delivered ?
NO
Informs Pharmacy stores of the missing item (s)
Yes
Receive the drug
Signs on the manual register of the IP Pharmacy
Ticks on the treatment advise sheet
Drugs administered to patient
Files the dispensing sheet on patient file
GDA
Takes the floor box to the wards
Hands over the medicine to the Nurse
Pharmacist Assistant
Checks for new requisitions in work list
Select the patients and opens the new requisition.
Checks for drug quantity
Is sufficient quantity of ordered drug in stock ?
NO
Yes
Issue the drug
Issues the drug as per the quantity available in IP Pharmacy
Indents to CPS for more stocks
Order goes to the pending list
Prints the dispensing sheets.
Clears the pending indent.
Packs the drug in packet along with the dispensing sheet
Drops the packet in Floor box.
Hands Over the medicine to the GDA
Receive the drug from CPS
Updates stock in HIS
CPS
Receives the indent
Issue the drug against the indent


Drug Return- IPD
Physician
Takes Round
Discontinue the drug.
Advise for discharge
Patient Expired
Ward Nurse
Enters the drug return in HIS
Drug return goes to the work list of IP Pharmacist (Patient Wise)
Takes the print out of drug return sheet and give it to GDA
Receives the stamped drug return sheet
Insert drug return sheet on Patient File
GDA
Takes the drug with drug return sheet
Takes the stamped drug return sheet and goes back to the floor
Pharmacist Assistant
Checks the drug return worklist.
Select the patient and opens new drug return requisition.
Receives the drug from the GDA
Matches the drug quantity with drug return sheet
stamps on the drug return sheet and gives back to GDA
Acknowledges the drug return in HIS
Inventory updates in HIS

8.3. Annexure-3.Pharmacy_MCQs- IPD, OPD, Supervisor

10	Question		Type of question			Right ans		Wrong ans		Wrong ans		Wrong ans
11	PY-1	::	Which one would you choose to get a list of possible answers	?	{ =	???	~	?	~	??	~	None of these
12												
13	PY-2	::	The message window in list manager entertains which of the signs	?	{ =	Both (+) & (-)	~	(+)	~	(-)	~	(=)
14												
15	PY-3	::	What does 'e' sign at the right of prescription number in the list manager screen indicates	?	{ =	Electronic third party billable	~	Emergency order	~	Electronic issued order	~	Executed order
16												
17	PY-4	::	What does the synonym [>] indicates	?	{ =	Shift view to right	~	Last screen	~	Next screen	~	Move the line right
18												
19	PY-5	::	Action 'DIN' displays available drug restriction/guideline information for the dispensed drug and orderable item associated with the selected medication order	?	{ =	TRUE	~	FALSE	~	wrong ans	~	wrong ans
20												
21	PY-6	::	Speed action can be applied to only one action at a time	?	{ =	FALSE	~	TRUE	~	wrong ans	~	wrong ans
22												
23	PY-7	::	How many options are there on the archiving menu	?	{ =	8	~	6	~	7	~	
24												
25	PY-8	::	For each prescription identified using Pso Archive FIND, what appears on the screen	?	{ =	Dot	~	Number	~	Found	~	Syntax
26												
27	PY-9	::	Using PSO AUTOCANCEL1, prescriptions of patients who were admitted __ days previous are cancelled	?	{ =	3	~	2	~	4	~	
28												
29	PY-10	::	Which of the synonym is present in the Unit Dose Order Entry profile	?	{ =	RN	~	UD	~	EX	~	MD
30												
31	PY-11	::	Within the inpatient medication package, by how many ways a pharmacist can enter a new unit dose orderor take action on an existing order	?	{ =	3	~	2	~	1	~	
32												
33	PY-12	::	In Word group sort option (^OTHER), the pharmacist doesn't have which option to choose while choosing a profile for the patient	?	{ =	Moderate	~	Short	~	Long	~	No option
34												
35	PY-13	::	When unit dose order has a STAT priority , it will always be displayed	?	{ =	First in the order view	~	Last in the order view	~	As in sequence when it is issued	~	Not displayed at al
36												
37	PY-14	::	The patient information screen is displayed only by entering the patient's name in the select patient prompt	?	{ =	FALSE	~	TRUE	~	wrong ans	~	wrong ans
38												
39	PY-15	::	In free text format the pharmacist can enter information upto how many characters	?	{ =	250	~	150	~	200	~	30
40												
41	PY-16	::	Which of the two dates 1/20/57 or 012057 is/are valid dates	?	{ =	Both	~	1/20/1957	~	12057	~	None

43	PY-17	::	In the order sets entry the prompt Select drug_x.NAME, What does 'x' represents	?	=	S	~	O	~	G	~	OS
44												
45	PY-18	::	If an order contains multiple dispense drugs, dosage order should contain the individual dosage of the medication to be administered	?	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
46												
47	PY-19	::	When the user presses <ENTER> past the "UNIT PER DOSE" prompt without entering a value , what will be stored	?	=	1	~	0	~	No value	~	None of these
48												
49	PY-20	::	IF special instruction by pharmacist exceeds 180 characters than	?	=	Special instruction will be displayed 'reference provider comments in CPRS for instuctions'	~	It won't get added	~	It will get added	~	Prompt for 'More space required' is displayed'
50												
51	PY-21	::	Which one of the following is a crrect administration time	?	=	1300	~	0100 pm	~	1:00 PM	~	13:0
52												
53	PY-22	::	Start date/time for inpatient medication order can be entered prior to 7 days from the order's login date	?	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
54												
55	PY-23	::	The site manager or application coordinator cannot change which of the following fields	?	=	START DATE/TIME	~	SPECIAL INSTRUCTION	~	DURATION	~	MED ROUTE
56												
57	PY-24	::	Which one is the correct nature of order abbreviation for written orders	?	=	[w]	~	w	~	W	~	(w)
58												
59	PY-25	::	Discontinued or expired orders can be viewed from short profile for the patients	?	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
60												
61	PY-26	::	If a unit dose order has been verified by nursing but has not been verified by pharmacy, it will be listed under the ACTIVE heading	?	=	TRUE	~	FALSE	~	wrong ans	~	wrong ans
62												
63	PY-27	::	What happens if a field marked with an asterisk (*) next to the number in the list area is edited	?	=	The order will be discontinued	~	Editing would not be allowed	~	It will be easily edited	~	None of these
64												
65	PY-28	::	Actions displayed in the action area, enclosed in parenthesis are not available to the users	?	=	TRUE	~	FALSE	~	wrong ans	~	wrong ans
66												
67	PY-29	::	Administration time of an active complex order can be edited	?	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
68												
69	PY-30	::	If the orderable item or dosage ordered fields are edited, the dispense data in such cases can be transferred to the new order	?	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
70												
71	PY-31	::	What does *N/F* besides the dispense drug or oderable item denotes	?	=	Non-fomulary status	~	Non-function status	~	Non-frequent status	~	New-fomulary statu

10	Question		Type of question			Right ans		Wrong ans		Wrong ans		Wrong ans
73	PY-32	::	Orders placed on hold will show under which heading	? {	=	Active	~	Non verified	~	Pending	~	Hold
74												
75	PY-33	::	Is it possible to renew IV Unit dose medication orders that have been discontinued due to ward transfer or treating speciality change	? {	=	No	~	Yes	~	wrong ans	~	wrong ans
76												
77	PY-34	::	Complex orders created with conjugation 'AND' cannot be renewed	? {	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
78												
79	PY-35	::	If an order having a pending status is discontinued ,will the original order be still active	? {	=	Yes	~	No	~	wrong ans	~	wrong ans
80												
81	PY-36	::	Can a complex order with 2 parts, one having schedule of BID and administration time of 8-20 & other having schedule of QDAY & administration time of 8 be finished	? {	=	No	~	Yes	~	wrong ans	~	wrong ans
82												
83	PY-37	::	What does [es] appearing next to provider's name on the order indicates	? {	=	Electronically signed	~	Entry stopped	~	Entry started	~	Electronically suspended
84												
85	PY-38	::	What does the flag action indicate	? {	=	To alert the user that order is incomplete or needs clarification	~	To alert the user of any error in the order	~	To alert the user of a new order	~	None of these
86												
87	PY-39	::	The flag action can be performed in	? {	=	Both	~	CPRS	~	Inpatient medication	~	None of these
88												
89	PY-40	::	Can a order placed through Med order button be discontinued	? {	=	No	~	Yes	~	wrong ans	~	wrong ans
90												
91	PY-41	::	Within the inpatient medication package,a pharmacist can enter a new IV order or take action on an existing order by	? {	=	Both	~	Order Entry	~	Inpatient order entry	~	None of these
92												
93	PY-42	::	Can the IV order be put on call	? {	=	Yes	~	No	~	wrong ans	~	wrong ans
94												
95	PY-43	::	What does NOW+3' stand for	? {	=	Current date & time plus 3 minutes	~	Current date & time plus 3 hours	~	3 days from today	~	Both today & 3 days after
96												
97	PY-44	::	How many users can enter new on a selected patient	? {	=	1	~	2	~	3	~	Many
98												
99	PY-45	::	What is a piggyback	? {	=	A piggyback is a small volume parenteral solution used for intermittent infusion	~	Large Volume Parenteral (LVP) solution intended for continuous parenteral infusion	~	A long-term feeding of a protein-carbohydrate solution	~	A solution meant fo oral administration
100												
101	PY-46	::	Can zero be an additive for an order	? {	=	Yes	~	No	~	wrong ans	~	wrong ans

10	Question		Type of question				Right ans		Wrong ans		Wrong ans		Wrong ans
103	PY-47	::	When an order is received from CPRS, Inpatient Medications accepts infusion rates in	?	{	=	Both	~	ml/hour	~	infuse over time	~	None of these
104													
105	PY-48	::	In other print info ,the free text can be upto how many characters	?	{	=	60	~	70	~	80	~	9
106													
107	PY-49	::	The Day-of-Week schedule in the order entry follows the format	?	{	=	days@schedule name	~	schedule@days name	~	daysschedule@name	~	None of these
108													
109	PY-50	::	The "Select CLINIC LOCATION" prompt displays	?	{	=	Outpatient IV orders entered through the Inpatient Medications package	~	Inpatient IV orders entered through the Inpatient Medications package	~	Outpatient IV orders entered through the Outpatient Medications package	~	None of these
110													
111	PY-51	::	If the order contains no errors, but has a warning, will the user be allowed to proceed.	?	{	=	Yes	~	No	~	wrong ans	~	wrong ans
112													
113	PY-52	::	For Bypassing an action what should be entered	?	{	=	Both b & ^	~	B	~	^	~	>
114													
115	PY-53	::	In "Action (PBS)" prompt , S will only appear as a valid action if the USE SUSPENSE FUNCTIONS site parameter is answered with	?	{	=	Both	~	YES	~	1	~	None of these
116													
117	PY-54	::	In case of APSP INTERVENTION file, the pharmacist can delete an entry that was entered	?	{	=	On the same day	~	On any day	~	On prior 3 days	~	None of these
118													
119	PY-55	::	In a CPRS Med Order what does "d" to the right of the number signifies	?	{	=	DONE	~	DISPLAY	~	DEVELOP	~	None of these
120													
121	PY-56	::	Can an order placed through the Med Order Button be discontinued.	?	{	=	Yes	~	No	~	wrong ans	~	wrong ans
122													
123	PY-57	::	The old and new orders may be viewed using	?	{	=	History Log function	~	View order function	~	Display function	~	None of these
124													
125	PY-58	::	What would you enter in the expected first dose for orders containing a schedule with a schedule type of One-time	?	{	=	The prompt will not display	~	1	~	One	~	None of these
126													
127	PY-59	::	Orders that have been accepted by the pharmacist will appear on the BCMA VDL.	?	{	=	If verified by a nurse	~	As such	~	Would not display	~	None of these
128													
129	PY-60	::	Can an order placed on hold through the pharmacy options be released from hold using any of the CPRS options	?	{	=	No	~	Yes	~	wrong ans	~	wrong ans
130													
131	PY-61	::	If an associated child order is non renewable, can a complex orders still be renewed	?	{	=	No	~	Yes	~	wrong ans	~	wrong ans
132													

133	PY-62	::	Is the Start Date/Time option available for editing when an order is renewed.	?	=	No	~	Yes	~	wrong ans	~	wrong ans
134												
135	PY-63	::	:Orders having a schedule type of One-Time or On Call must have a status of "Active" in order to be renewed	?	=	TRUE	~	FALSE	~	wrong ans	~	wrong ans
136												
137	PY-64	::	IV and Unit Dose medication orders that have been discontinued due to ward transfer or treating specialty change cannot be Renewed	?	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
138												
139	PY-65	::	What status does a renewed order has	?	=	Active	~	Non verified	~	Pending	~	Renewed
140												
141	PY-66	::	Will the orders created by checking the "Give additional dose now" box in CPRS, when ordered in conjunction with a Complex Order, be available for renewal.	?	=	No	~	Yes	~	wrong ans	~	wrong ans
142												
143	PY-67	::	If an order having a pending status is discontinued, what would be the status of the original order	?	=	Active	~	Non verified	~	Pending	~	Discontinued
144												
145	PY-68	::	If Expired Continuous IV Orders are renewed, what would be its status after renewal	?	=	Expired	~	Active	~	Non verified	~	None of these
146												
147	PY-69	::	A label log provides a trace of every action taken on an order since the original entry.	?	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
148												
149	PY-70	::	What does "H" signifies in the options of of AL(Activity Log)	?	=	History	~	Hold	~	Hints	~	Hide
150												
151	PY-71	::	Can pharmacy technicians holding the PSJI PHARM TECH key verify orders	?	=	No	~	Yes	~	wrong ans	~	wrong ans
152												
153	PY-72	::	When an order is placed through CPRS prior to the next administration time for today, the Expected First Dose will be	?	=	Today at the next administration time	~	At the point of order	~	Tomorrow at the first administration time	~	None of these
154												
155	PY-73	::	IV Fluid orders will default to IV Admixture when finished by pharmacy	?	=	TRUE	~	FALSE	~	wrong ans	~	wrong ans
156												
157	PY-74	::	What should the user enter if more information is needed before the order can be processed, without saving any changes	?	=	^	~	>	~	<	~	#
158												
159	PY-75	::	Can a pharmacist place an order on call	?	=	Yes	~	No	~	wrong ans	~	wrong ans
160												
161	PY-76	::	When one piggyback is removed, another is hung immediatly	?	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
162												
163	PY-77	::	When a future date/time is entered at the Start Date/Time prompt, will the user be prompted immediatly	?	=	No	~	Yes	~	wrong ans	~	wrong ans

10	Question		Type of question			Right ans		Wrong ans		Wrong ans		Wrong ans
165	PY-78	::	What is TPN.	?{	=	Total Parenteral Nutrition	~	Total Patient Nutrition	~	True Patient Nutrition	~	True Parentral Nutr
166												
167	PY-79	::	If the pharmacist enters additive quick codes, they will be handled like they are for	?{	=	Admixture order	~	Piggyback Order	~	Hyperal Order	~	Such entry is not p
168												
169	PY-80	::	In syringe-type order ,If the syringe is intermittent, the user will follow the same order entry procedure as an admixture order .	?{	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
170												
171	PY-81	::	In Patient Profile (IV) option, can a user print the report	?{	=	No	~	Yes	~	wrong ans	~	wrong ans
172												
173	PY-82	::	Which of these option is not included in the patient profile	?{	=	Patient maitial status	~	Patient Name	~	Date of Birth	~	Sex of Patient
174												
175	PY-83	::	Which one is not an option of type of order	?{	=	O	~	P	~	H	~	S
176												
177	PY-84	::	The Inpatient Profile option allows the user to view the Unit Dose and IV orders of a patient simultaneously	?{	=	TRUE	~	FALSE	~	wrong ans	~	wrong ans
178												
179	PY-85	::	What is the default for the administration team in inpatient profile	?{	=	ALL	~	OR	~	AND	~	None of these
180												
181	PY-86	::	In inpatient profile while selecting by ward or ward group,can the profile be sorted by room-bed.	?{	=	Yes	~	No	~	wrong ans	~	wrong ans
182												
183	PY-87	::	For IV orders, the short and long activity logs give the user all activities of an order	?{	=	TRUE	~	FALSE	~	wrong ans	~	wrong ans
184												
185	PY-88	::	In check order option ,the checks are performed on all but	?{	=	Duplicate dose	~	Duplicate Drug	~	Duplicate Class	~	Drug-Drug Interacti
186												
187	PY-89	::	For a Critical Interaction, the pharmacist is allowed to enter an intervention, but one is not required	?{	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
188												
189	PY-90	::	After the user has discontinued an order, any duplicate Inpatient orders also discontinues	?{	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
190												
191	PY-91	::	Where are the Unit Dose Maintenance Options located	?{	=	Unit Dose Medications m	~	Unit Dose Option menu	~	Unit Dose Maintainence men	~	None of these
192												
193	PY-92	::	Non-Standard Schedules is not an option on a IV Menu	?{	=	TRUE	~	FALSE	~	wrong ans	~	wrong ans
194												
195	PY-93	::	Which type of ward groups are selectable in ward group option in Pick list	?{	=	pharmacy-type	~	User-type	~	Ward-type	~	All-type
196												
197	PY-94	::	In Pick list, for each patient, the orders are sorted by	?{	=	Both	~	Schedule type	~	Drug Name	~	None of these
198												

10	Question		Type of question			Right ans		Wrong ans		Wrong ans		Wrong ans
199	PY-95	::	. Under the "Units Needed" column for an order, the pharmacist will see the following codes except	?	=	MO	~	HD	~	NV	~	OE
200												
201	PY-96	::	If an update is run after units dispensed are entered, the units dispensed are lost for those orders actually updated.	?	=	TRUE	~	FALSE	~	wrong ans	~	wrong ans
202												
203	PY-97	::	The pharmacist will not be prompted to enter the actual number of units dispensed for orders that have the code	?	=	HD	~	WS	~	ATC	~	OI
204												
205	PY-98	::	If the pharmacist wants to skip over to the next patient,he should enter a	?	=	^	~	>	~	<	~	None of these
206												
207	PY-99	::	What does <^^> signifies	?	=	Jump to the end of the pick list	~	Jump to the next team	~	Jump to next provider	~	None of these
208												
209	PY-100	::	Will the system allow to enter negative numbers in the Report Returns option	?	=	Yes	~	No	~	wrong ans	~	wrong ans
210												
211	PY-101	::	In the Reprint Pick List option is it possible to recalculate the data	?	=	No	~	Yes	~	wrong ans	~	wrong ans
212												
213	PY-102	::	What is ATC	?	=	A dispensing machine for Unit Dose medications.	~	A dispensing machine for multi dose medication	~	A dispensing machine for IV medication	~	None of these
214												
215	PY-103	::	Only those medications previously designated as ATC items is sent to the ATC	?	=	TRUE	~	FALSE	~	wrong ans	~	wrong ans
216												
217	PY-104	::	Where are all of the Production Options located on the	?	=	IV Menu option	~	Unit dose Menu option	~	Both	~	None of these
218												
219	PY-105	::	The Ward List must be run before the Manufacturing List	?	=	TRUE	~	FALSE	~	wrong ans	~	wrong ans
220												
221	PY-106	::	Any action on the Update Daily Ward List (IV) option will be reflected in the A	?	=	TRUE	~	FALSE	~	wrong ans	~	wrong ans
222												
223	PY-107	::	The RETurns and Destroyed Entry (IV) option will allow the pharmacist to enter the number of Recycled, Destroyed,Expired and Cancelled IV bags per day in the IV room or satellite	?	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
224												
225	PY-108	::	Where in the label the internal order number of the order is printed	?	=	top left corner	~	top right corner	~	top center	~	Not printed
226												
227	PY-109	::	Are the reports generated by the Unit Dose package in the Reports Menu option QUEUABLE	?	=	Yes	~	No	~	wrong ans	~	wrong ans
228												
229	PY-110	::	For an IV order with no schedulethe 24 Hour MAR report does not includes	?	=	Administration times	~	Strength	~	Schedule type	~	Schedule

10	Question		Type of question			Right ans		Wrong ans		Wrong ans		Wrong ans
231	PY-111	::	If the user chooses to print MAR by patient, is it possible to select more than one patient	?	=	Yes	~	No	~	wrong ans	~	wrong ans
232												
233	PY-112	::	In case of a MAR order for an outpatient, what would be filled in room/bed field	?	=	Field be left blank	~	0	~	Number	~	None of these
234												
235	PY-113	::	How many medication choices does the user have	?	=	Six	~	Four	~	Five	~	Three
236												
237	PY-114	::	The MAR is separated into how many sheets	?	=	Two	~	Three	~	Four	~	Five
238												
239	PY-115	::	Can the user print blank MARs	?	=	Yes	~	No	~	wrong ans	~	wrong ans
240												
241	PY-116	::	Each sheet of the 24 Hour MAR consists of how many parts	?	=	Three	~	Two	~	One	~	Four
242												
243	PY-117	::	If the 24 Hour MAR START DATE/TIME for ward parameter is left blank, then the time will default to 0:01 a.m. system time.	?	=	TRUE	~	FALSE	~	wrong ans	~	wrong ans
244												
245	PY-118	::	Labels are placed over order information already on the MAR	?	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
246												
247	PY_119	::	The actual administration is to be recorded on which side of the main body of MAR	?	=	Right	~	Left	~	Any side	~	None of these
248												
249	PY-120	::	On the continuous medication sheet of MAR, the right side is divided into how	?	=	Seven	~	Six	~	Five	~	Four
250												
251	PY-121	::	In MAR, what does asterisks corresponding to the dates represents	?	=	medication not to be given on that days	~	medication to be given on that days	~	medication to be verified before giving	~	None of these
252												
253	PY-122	::	The start and stop dates must be in the future, is NOW acceptable.	?	=	Yes	~	No	~	wrong ans	~	wrong ans
254												
255	PY-123	::	In start and stop date prompt, time is required only if the current date of TODAY or T is entered	?	=	TRUE	~	FALSE	~	wrong ans	~	wrong ans
256												
257	PY-124	::	Is it possible to continue the order even after discharge of the patient	?	=	Yes	~	No	~	wrong ans	~	wrong ans
258												
259	PY-125	::	If more than one clinic visit of the patient is scheduled, all will print.	?	=	TRUE	~	FALSE	~	wrong ans	~	wrong ans
260												
261	PY-126	::	The Authorized Absence/Discharge Summary Report uses a how many digit y	?	=	Four	~	Two	~	Both	~	None of these
262												
263	PY-127	::	If the applicable Possible Dosages or Local Possible Dosages do not match the Dosage Ordered, then this is considered a Free Text Dosage Entry	?	=	TRUE	~	FALSE	~	wrong ans	~	wrong ans
264												

10	Question		Type of question			Right ans		Wrong ans		Wrong ans		Wrong ans
265	PY-128	::	Each entry in the Free Text Dosage Report consists of at least how many line(s) of display	?	=	Two	~	One	~	Three	~	Four
266												
267	PY-129	::	For IV orders that have no schedule, the projected administration times will be calculated based on the order's volume, flow rate,dosage and start time.	?	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
268												
269	PY-130	::	Dose order information can move outsie the physical boundaries of the label.	?	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
270												
271	PY-131	::	THe Bar Code ID comprises a delimiter,it is represented by which symbol	?	=	V	~	D	~	B	~	I
272												
273	PY-132	::	The Label Menu (IV) option contains how many sub options	?	=	Five	~	Four	~	Three	~	Six
274												
275	PY-133	::	The Label printer will always print how many test labels	?	=	Three	~	Two	~	One	~	Four
276												
277	PY-134	::	The Individual Labels (IV) option is often used for On-call and automatically delivered orders	?	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
278												
279	PY-135	::	The Scheduled Labels (IV) option prints labels for a particular scheduled ward time.	?	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
280												
281	PY-136	::	An entire label can be printed using The Test Control Codes (IV) option	?	=	No	~	Yes	~	wrong ans	~	wrong ans
282												
283	PY-137	::	The report created by The Active Order List (IV) runs only at a start of coverage	?	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
284												
285	PY-138	::	The report created by The Active Order List (IV) will not affect the calculation of number of labels needed after order entry	?	=	TRUE	~	FALSE	~	wrong ans	~	wrong ans
286												
287	PY-139	::	Can the information in the INQuiries Menu option be edited	?	=	No	~	Yes	~	wrong ans	~	wrong ans
288												
289	PY-140	::	To view a list of the available administration schedule abbreviations, enter at the prompt "Select STANDARD SCHEDULE:".	?	=	?	~	??	~	???	~	None of these
290												
291	PY-141	::	Only electrolyte or multivitamin type additives can be entered as IV fluid additiv	?	=	TRUE	~	FALSE	~	wrong ans	~	wrong ans
292												
293	PY-142	::	What does BCMA stand for	?	=	Bar Code Medication Administration.	~	Basic Code Medication Administration.	~	Base Code Medication Administration	~	None of these
294												
295	PY-143	::	The default answer appears before	?	=	//	~	??	~	\\	~	>>
296												

10	Question		Type of question			Right ans		Wrong ans		Wrong ans		Wrong ans
297	PY-144	::	The IV duration can be specified in terms of time (hours or days).	?	{	= TRUE	~	FALSE	~	wrong ans	~	wrong ans
298												
299	PY-145	::	What does code B signifies in IV label action prompt	?	{	= Bypass any more actions	~	Begin printing a specified number of labels now	~	Begin suspending a specified number of labels now	~	None of these
300												
301	PY-146	::	The abbreviation cannot be longer than how many characters to fit on labels and the MAR	?	{	= Five	~	Four	~	Three	~	Six
302												
303	PY-147	::	Can a ward staff verify a non-verified order.	?	{	= No	~	Yes	~	wrong ans	~	wrong ans
304												
305	PY-148	::	The name with a strength attached to it is an Orderable Item	?	{	= FALSE	~	TRUE	~	wrong ans	~	wrong ans
306												
307	PY-149	::	An Order Set is a set of N pre-written orders, what does N stand for	?	{	= Number of orders in an Order Set is variable	~	Number of orders in an Order Set is constant	~	New orders in an order set	~	None of these
308												
309	PY-150	::	Is Volume or Strength part of the print name.	?	{	= No	~	Yes	~	wrong ans	~	wrong ans
310												
311	PY-151	::	Is it possible to scroll the header area	?	{	= No	~	Yes	~	wrong ans	~	wrong ans
312												
313	PY-152	::	What does the "$" displayed to the right of the prescription number indicates	?	{	= The prescription is copay eligible.	~	The prescription is electronic third-party billable	~	The prescription is rejected by third-party payers	~	None of these
314												
315	PY-153	::	Outpatient Pharmacy hidden actions are displayed with the letters	?	{	= OP	~	Out P	~	Out Pat	~	OPP
316												
317	PY-154	::	What does [MI] in Other Out Patient Pharmacy Actions [OTH] signifies	?	{	= Print Medication Instructions	~	Add Medication Instructions	~	Edit Medication Instructions	~	Hold Medication Instructions
318												
319	PY-155	::	What does the speed action (CM) signifies	?	{	= Action taken to manually queue to CMOP	~	Action taken to copy medication	~	Action taken to correct medication order	~	None of these
320												
321	PY-156	::	How many statuses are possible for a patient's order	?	{	= Four	~	Three	~	Five	~	Two
322												
323	PY-157	::	This [PSOD SUPERVISOR] menu provides options to create a questionnaire based on the criteria of a Drug Usage Evaluation	?	{	= TRUE	~	FALSE	~	wrong ans	~	wrong ans
324												
325	PY-158	::	The Medication Reconciliation functions may be performed using how many of tools	?	{	= Four	~	Five	~	Six	~	Seven
326												

10	Question		Type of question			Right ans		Wrong ans		Wrong ans		Wrong ans
327	PY-159	::	The Medication Reconciliation Tool 3 is a Medication Worksheet component	?	=	TRUE	~	FALSE	~	wrong ans	~	wrong ans
328												
329	PY-159	::	Host processing errors are identified by all the following reject codes,except	?	=	M4	~	M6	~	M8	~	NN
330												
331	PY-160	::	A prescription can only be returned to stock if the prescription status is Active, Discontinued, Not released or Expired	?	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
332												
333	PY-161	::	What is HDR	?	=	Health Data Repository	~	Health Data Resource	~	Health Data Review	~	None of these
334												
335	PY-162	::	Any remote Outpatient order that has been expired or discontinued fornot more than 20 days will be included in the list of medications to be checked	?	=	FALSE	~	TRUE	~	wrong ans	~	wrong ans
336												
337	PY-163	::	Will the Prescriptions with a missing expiration date be included in order checks	?	=	No	~	Yes	~	wrong ans	~	wrong ans
338												
339	PY-164	::	What is ECME	?	=	Electronic Management C	~	Electronic Management Cl	~	Electronic Medication Claims	~	None of these
340												
341	PY-165	::	The Route is not required to complete a prescription.	?	=	TRUE	~	FALSE	~	wrong ans	~	wrong ans
342												
343	PY-166	::	Can the Sig field be edited directly	?	=	No	~	Yes	~	wrong ans	~	wrong ans
344												
345	PY-167	::	Use the up-arrow (^) after editing one field to jump past the rest of the fields	?	=	TRUE	~	FALSE	~	wrong ans	~	wrong ans
346												
347	PY-168	::	What does DAW stands for	?	=	Dispense as Written	~	Do as Written	~	Dosage amount Withdrawn	~	Drug administerd w
348												
349	PY-169	::	There are how many DAW codes available	?	=	Ten	~	Nine	~	Eleven	~	Eight
350												
351	PY-170	::	The recommended usage of [PSO INTERNET REFILLS] option is how many times a day	?	=	Three	~	Five	~	Seven	~	No limit

8.4. Annexure-4.Questionnaire

(Selection of super users among the hospital's nursing staff for imparting EHR training)

QUESTIONNAIRE

- **How much do you think I.T. is important in carrying out hospital functions?**

✓ Very Important
✓ Important
✓ Moderate
✓ Less Important
✓ Not Important

- **Have you heard of Hospital Information System (HIS) In Max?**

✓ Yes No

- **Do you work on Max H.I.S?**

✓ Yes No

- **How much time do you work on Max H.I.S?**

✓ 25% Of Duty Hours
✓ 50% Of Duty Hours
✓ 75% Of Duty Hours
✓ 100% Of Duty Hours

- **How do you find working on Max H.I.S?**

✓ Very Easy
✓ Easy
✓ Moderate
✓ Difficult
✓ Very Difficult

- **Do you find any limitations in Max H.I.S?**

✓ Yes No

- **If yes, specify**

- **Do You Require Any Changes In Max H.I.S?**

✓ Yes No

- **If yes, specify**

- **Have you heard of the organization named DELL-PEROT?**

✓ Yes No

- **Do you know of any deal between DELL-PEROT SYSTEMS & Max Hospital**

✓ Yes No

- **Have you ever heard of VistA?**

✓ Yes No

- **If yes, have you ever used VistA?**

✓ Yes No

- **How do you find using VistA?**

✓ Very Easy
✓ Easy
✓ Moderate
✓ Difficult
✓ Very Difficult

- **If compared with Max H.I.S , how would you rate it?**

✓ Better
✓ Same
✓ Worse

- **Any changes you recommend in VistA?**