

**HMIS REPLACEMENT AND IMPLEMENTATION OF NEW
SOFTWARE BMCHRC**

Dissertation Submitted to



The IIHMR University, Jaipur

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Master of Business Administration (MBA)

In

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by

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DECLARATION BY STUDENT

I hereby declare that this dissertation titled “**HMIS Replacement and Implementation of new software in BMCHRC**” submitted by Dr. Vaishnavi Rajesh Rawal, Enrolment No. **IIHMR-U/01/2020-22/1232** is a bonafide record of my original research work. I declare that it has not been submitted to any other University or Institution for the award of any other degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

(Signature)

Dr. Vaishnavi Rajesh Rawal

CERTIFICATE



Bhagwan Mahaveer
Cancer Hospital & Research Centre
(Managed By K. G. Kothari Memorial Trust)

BMH/HRD/2022/ 651

Date: July 02nd, 2022

To whomsoever it may concern

This is to certify that **Dr. Vaishnavi Rawal**, in partial fulfillment of the award of the degree of MBA (Hospital and Healthcare Management) from the **IIHMR University, Jaipur** has successfully completed her dissertation at BMCHRC during **21st March 2022 to 18th June 2022**.

She has done her work satisfactorily during dissertation period.

We wish her all the best for her future endeavors.

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Dr. Vaishnavi Rajesh Rawal

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CHAPTER – 1 INTRODUCTION

(Hospital management Information System)

What's HMIS?

HIMS may be defined as “ *A tool which helps in gathering, aggregating, analysing and also using the information generated for taking conduct to ameliorate performance of health systems. ”*

HMIS is a data collection system specifically designed to support planning, operation, and decision making in health installations and associations. They manage the data related to all the departments of healthcare similar as:

- Clinical
- Laboratory
- Outpatient
- Inpatient
- Operation theatre
- Nursing
- Pharmaceutical
- Material
- Radiology
- Pathology

The processes of a health operation information system include the structured collaboration of health data(input) collection, storehouse, reclamation and processing to grease substantiation- grounded decision- making and in the interventions.

HMS provides the capability to manage all the paper work in one place, reducing the work of the staff in arranging and analysing the paperwork of the cases.

Why is HMS important?

HMIS is vital at all situations of the health system, from public to institutional situations, as it forms the base for substantiation- grounded policy and informed decision- making, It's particularly important in developing countries where substantiation- grounded decision

timber is a useful tool for maximizing limited coffers, HMIS provides the substantiation base for effective planning, perpetration, evaluation, and scale-up sweats through readily available and dependable information. also, HMIS improves governance and responsibility by adding translucency within the HIS and the health system overall.

Being literature and exploration indicate that strengthening the public HIS provides the foundation across the diapason of stakeholders from health care professionals to policymakers to ameliorate the overall health system from a broader, comprehensive perspective.

HMIS empowers individualities and communities with timely and accessible health information towards perfecting the delivery and quality of services for cases. also, Although information systems cannot single- handily transfigure and restructure service delivery, it can serve to ameliorate the health system at all situations.

Advantages

- Time saving technology
- Improves effectiveness by avoiding any kind of error.
- Reduced compass of mistakes.
- Cost effective and fluently manageable.
- Easy monitoring of inventories in force
- Inspection controls and policy compliance.

1.1Purpose

In order to improve the Patient Safety, increase Work Efficiency, manage Data security and most importantly “Go paperless”, BMCHRC needed to implement new HMIS in the hospital.

1.2 Goals and Objectives

» Overall Goal

To identify need for future HMIS in BMCHRC to provide recommendations for better monitoring of health system performance in the Hospital.

» Major Objective

- Aide in setting performance targets at all levels of health service delivery.
- Encourage the use of Health information

» Minor Objective

- Masters Verification
- Finalization of strategy for legacy masters
- Preparation of masters to be ported
- Mapping and porting to the masters in the new HMIS
- Reports mapping with old system
- Send mapped reports for user approval
- Identify the gaps
- Preparing the Gap Documents
- Sign off the documents from Stakeholders.
- Identify items required for TAT monitoring.
- IT Equipment assessment
- IT Equipment Procurement
- SSL certification

1.3 Findings

Provision of inadequate quantity of hardware, slowness of network or system, non-satisfactory training after observation confirmation and sign-off process, lack of data entry operators, mismatch in numbering systems in blood bank and many other challenges concerned with the specific departments had become a major impediment in the efforts to maximize number of patients registered into HMIS.

1.4 Practical Implications

Even after providing many clinical and managerial benefits, being the first cloud-based centrally located HMIS, it imposes a major challenge for the management in terms of resistance of employees toward technology.

This would assist the Hospital to:

1. Increase access and raise the quality of a series of highly cost-effective interventions to improve health outcomes of the poor and underserved population with a focus on the regional disparities.
 2. Strengthen the institutional and policy framework for the health system in BMCHRC.
-

CHAPTER – 2 LITRATURE REVIEW

Health information is that the foundation of public health and a well performing routine health management data system is required to enhance evidence-based deciding and health system performance. The major components of the managerial process for national health development like policy formulation, broad programming, programme budgeting, preparation of programme of action, detailed programming, implementation, evaluation and reprogramming require support within the type of relevant and sensitive information in the slightest degree stages.

Health information systems when used optimally can improve the delivery of health services by encouraging rational higher cognitive process and stimulating use of knowledge at the lower levels of the health system. It has immense potential to strengthen human and health rights by providing an equity- oriented empirical base for deciding in health and allied sectors. The initial step in strengthening health information systems should be a comprehensive and effective assessment of the present system to determine a baseline and to watch progress.

Evaluation of health information systems supports reflective practice and is an ethical imperative though challenging and resource intense. Sourcing of experience should be through the tender process. it absolutely was decided that:

1. The present HMIS and indicators employed in each directorate for performance assessment are reviewed.
2. External assistance / Consultants are going to be used for software development, training and implementation of the system on a turnkey basis
3. The primary stage was to spot the software solution provider, and also the most fitted was selected from these six, supported the RFP (Request for Proposal) submitted by them. Then software solution provider interacted with all the stakeholders of the software - the different groups of doctors, nurses, lab technicians, pharmacists and then on to arrange the software requirement specification (SRS). This process, initiated in august 2021 took 4 months to complete.

3.1 Design/ Approach

A case study methodology was adopted to study HMIS implementation. Phase 1 implementation of HMIS is carried out as a pilot project at BMCHRC, Jaipur which will “go-live” on 1st April 2023. The work for software implementation was awarded to Shivam Medisoftware services pvt ltd. The name of the Project given is “PROJECT PRAGATI”.

- Study area: Bhagwan Mahaveer Cancer Hospital and Research Centre
- Study topic : HMIS Replacement, Upgradation and Implementation
- Study design: Descriptive Study
- Sample size: HOD (25 Department)
- Study tools: Google forms, MS Excel
- Data collection tools and techniques:
 - Observation
 - Interviews
 - Questionnaires
 - Surveys
 - Department discussions
 - Data collection tool was semi structured questionnaire with close ended questions.
 - Data was transferred to the Excel sheet and calculations were made.

3.2 The basic requirements

- Coverage of clinical services of all departments at each level within the framework of the whole health sector.
- Coverage of Program Services of all departments at each level within the framework of the entire health community.
- To study and facilitate analysis on disease pattern, morbidity and mortality.
- To feed information to any or all the users within the health department
- To integrate the whole system in such a fashion so as to avoid redundancy in capture of knowledge and to take care of sustained flow of knowledge in the least levels.

Thus, for preparing the Software Requirement Specification (SRS) for developing the applying, a radical study of the complete health system. Extensive training sessions were conducted for various categories within the health department. It was also decided that data

entry operators won't be used since the system would collapse if they were to go away. Instead, each user would need to use the services himself/herself to make sure effectiveness. Therefore, training was identified as a vital component of the whole process. Periodic review meeting with the varied stake holders were conducted and therefore the follow up action also taken by the respective stake holders.

3.3 Plan of Action

To know the “individual opinion about the current HMIS and expectations of the user from the new HMIS” I had visited the various department of BMCHRC so as to interact with HOD's of the respective departments to know the requirement existing employees of their department and asked them to fill up the questionnaire form to collect some data, and make the analysis accordingly.

The various departments that were being covered under the study for data collection process are as follows:

1. Medical administration (patient safety)
2. Medical administration (support services)
3. Human Resource
4. Medical oncology
5. Surgical
6. Radio oncology
7. Radiotherapy
8. Anaesthesia
9. Nuclear medicine
10. Pathology
11. Psychology
12. Quality assurance
13. CSSD
14. Blood bank
15. MRD
16. Bio medical engineering
17. Nursing administration
18. Billing
19. Pharmacy

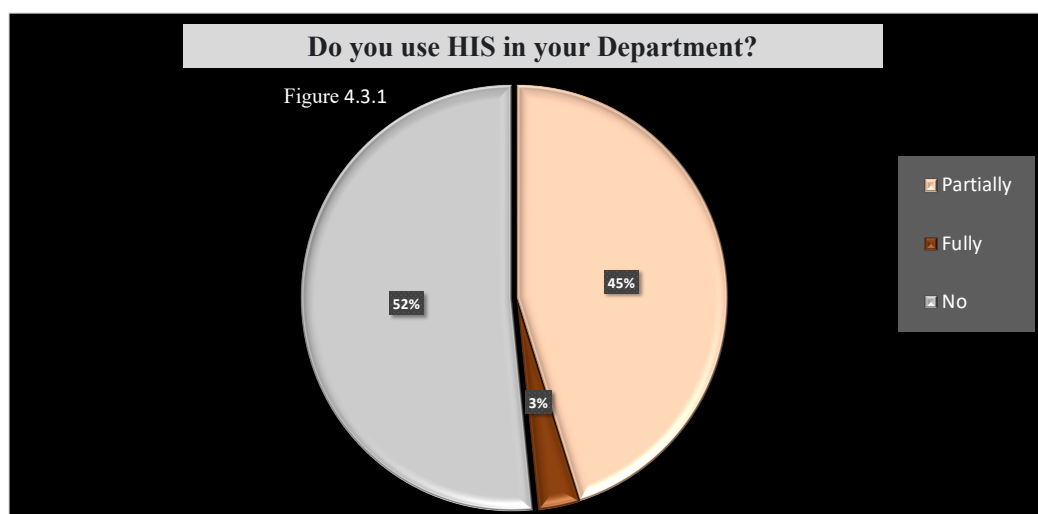
20. Sales and marketing'
21. Supply chain
22. Engineering
23. Accounts
24. IT
25. Purchase

After the link had been circulated, HOS's had multiple discussions with their subordinates regarding the questions mentioned in the questionnaire. Post the discussions the form was filled by the HOD based on their requirements.

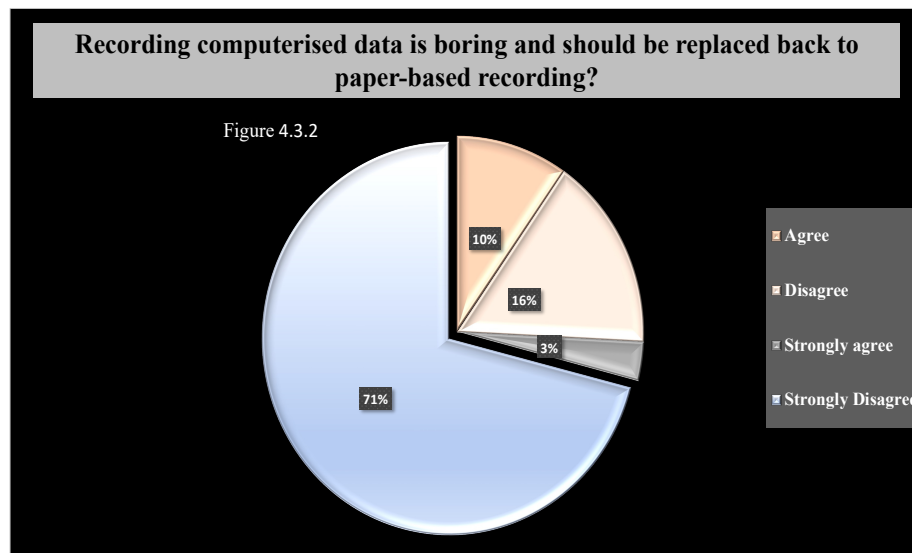
3.4 Data Analysis

Based on the data received, the compilation had been made and interpretation has been done accordingly.

➤ Figure 3.4.1 summerizes that, there are 31 responses from each department. As per the data observed in the google form, it depicts that out of all 25 departments, 51.6% says that they don't use the HMIS in their domain. About 42.2% of dep has functional HMIS who use the system partially. And only 3.2 % (1dep) use the system completey and has a functional flow in the hospital through the HIMS.



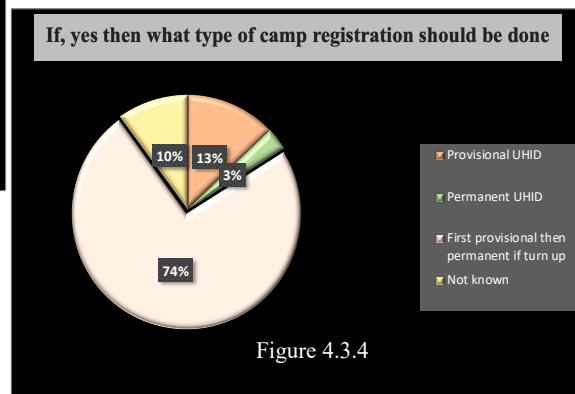
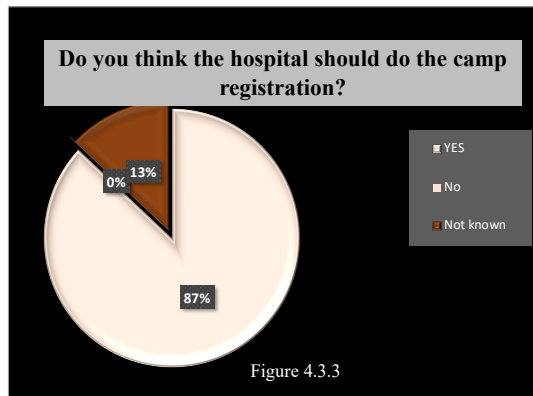
➤ Figure 3.4.2 Reveals that the majority of the departments ie about 71% require computerized data. This has been told by multiple number of consultants that the data which is been captured from the system is more reliable than the manual. However, Digital data shouldn't be replaced by manual practice ex- feeding the data in the paper. It is beleieved that the system gives accurate MIS which is required for the patients and organisation



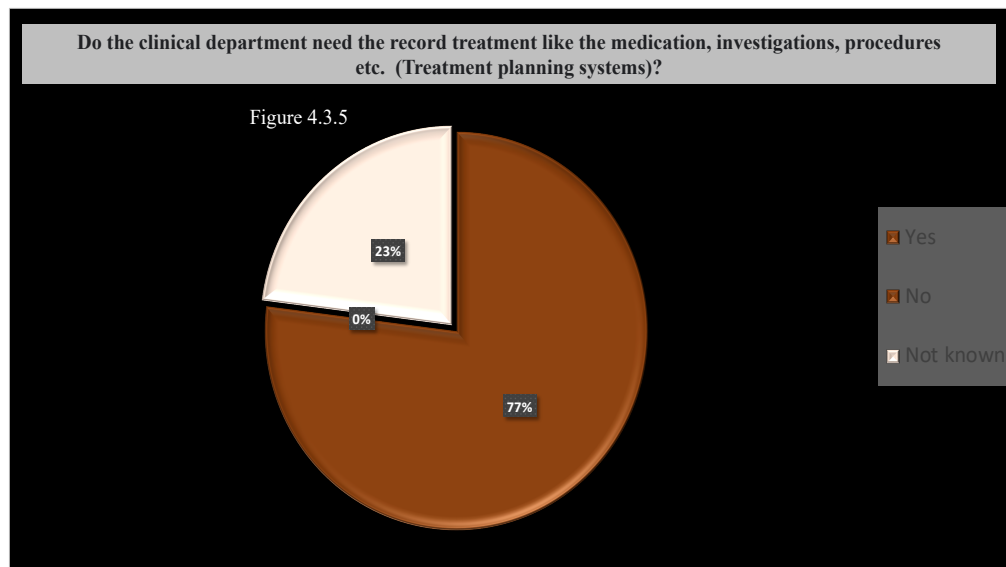
➤ Note : The process for the Camp Registration is done manually so far and Provisional UHID has been generated for the same. This scenario was a point of discussion with the senior management and other clinical department as well. Therefore, this questionnaire had been raised that what should be in the case to camp patient and what type of UHID shall be provided to such patients.

According to the results in Figure 3.4.3 it clearly states that about 87% of the staff thinks what the hospital require camp registration at the time of seeing the patients in the system. Figure 3.4.4 summarizes, 74% of the staff suggests that the registration of the camp patient should be given the provisional UHID at first (at site). Once this patient trun up in the hospital for the treatment, a permanent UHID will be provided to the patient. It will be mandatory for the camp patient to do the registration again to convert into a hospital patient with the permanent UHID. The provisional UHID of camp will be tagged along with the hospital. Based on tagging of provisional ID, MIS will be generated related to

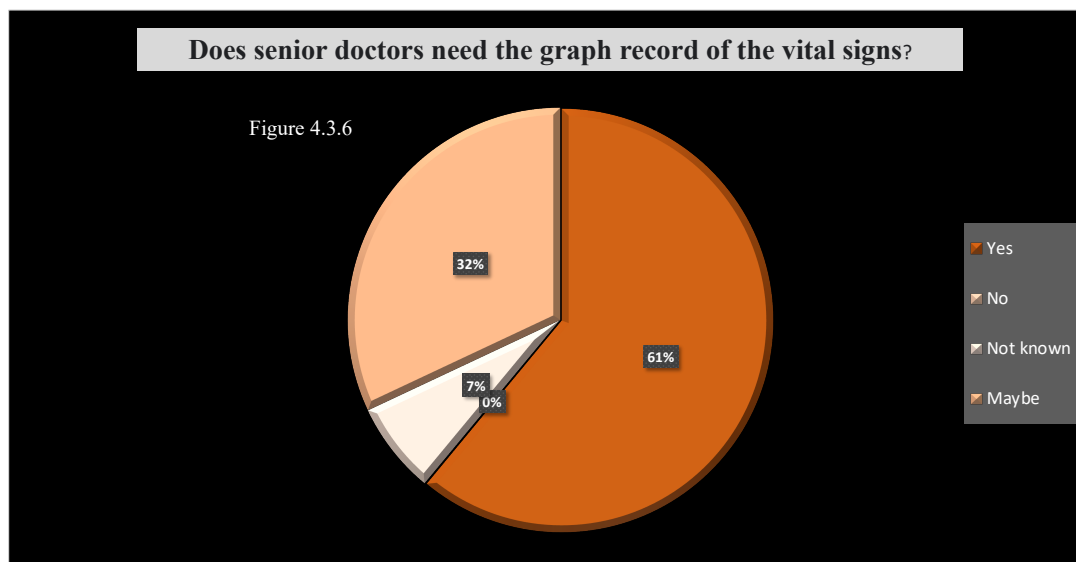
conversion of patients from camp to the hospital.



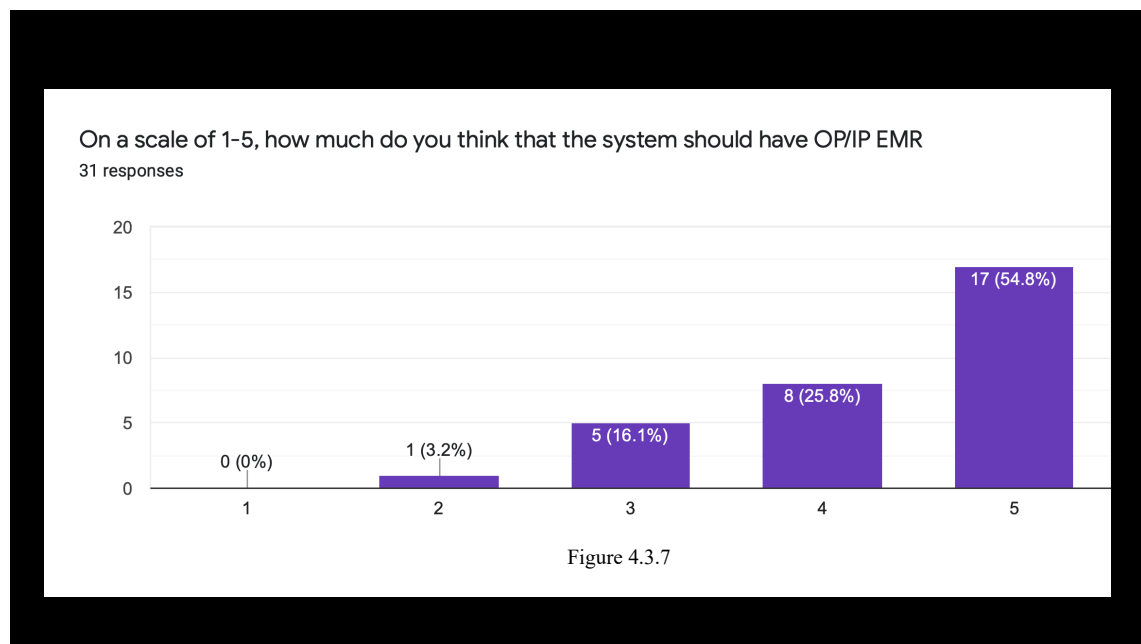
➤ In the current system there no module for the treatment planning system for the treating doctors. Therefore, in respect to that question Figure 3.4.5 about 77% of the Doctors are in a favour of having the “Treatment Planning System (EMR)” on their system in order to prescribe the medications and investigations online, so that the same shall be shown to the concerned nurses, Laboratory and the billing department as well for generating the receipt against the order. Wherein, this would lead to the time consumption for the patients, treating doctors, nurses, laboratory and billing users as well.



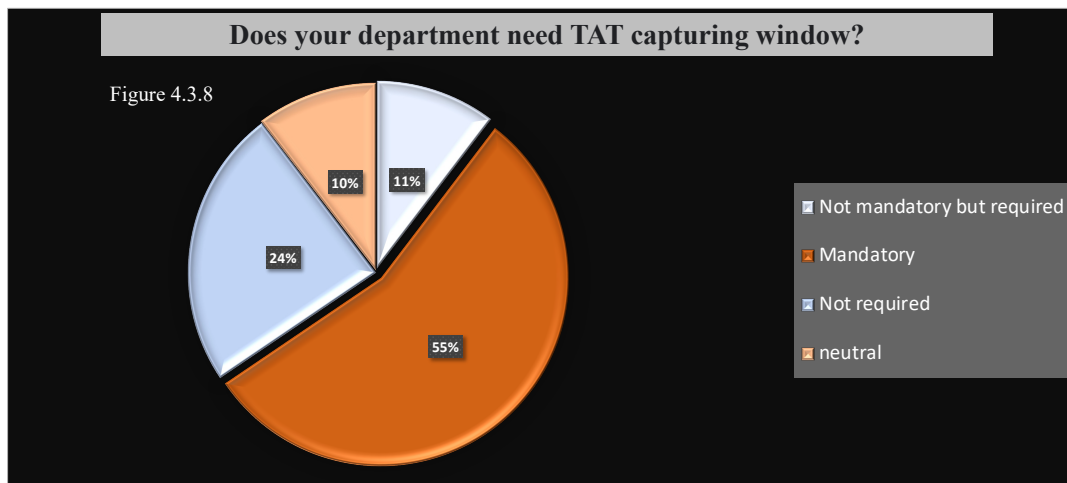
➤ In Figure 4.3.6 About 61% of the senior doctors raised the requirement for the graphic record of the vital signs in the system, so that the electronic record allows each component to be represented in graphic form, for easy assessment of changes. ,Therefore, this feature must be imposed in the system as per the majority of the doctors.



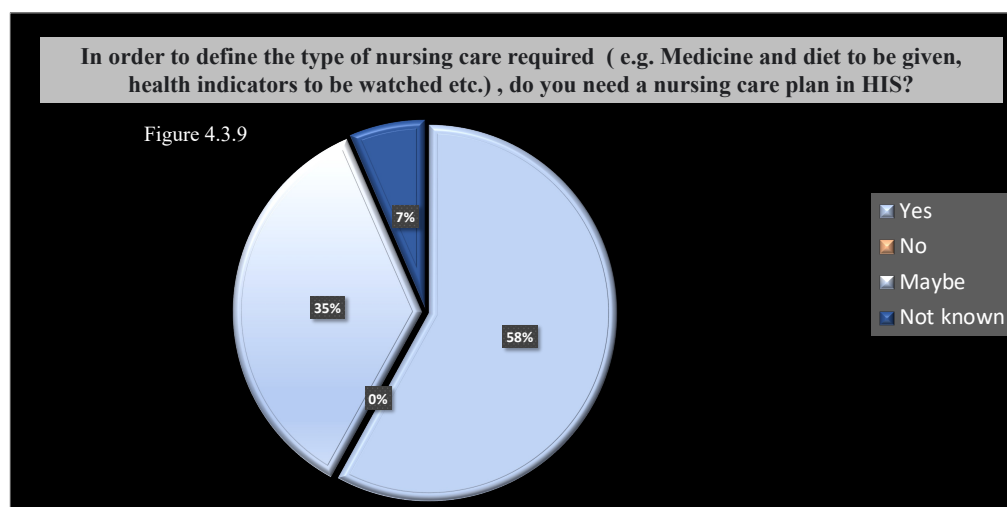
- According to the doctors, the OP/IP EMR automates the inpatient clinical workflow. They believe that technology incorporates integrated clinical practices support tools for enhanced patient safety and outcomes.
- Figure 4.3.7 depicts that about 55% of the department believes that there should be the module and functional flow for OP/IP EMR. It's also been said that EMR system can be accessed anywhere, anytime by the entire care team.



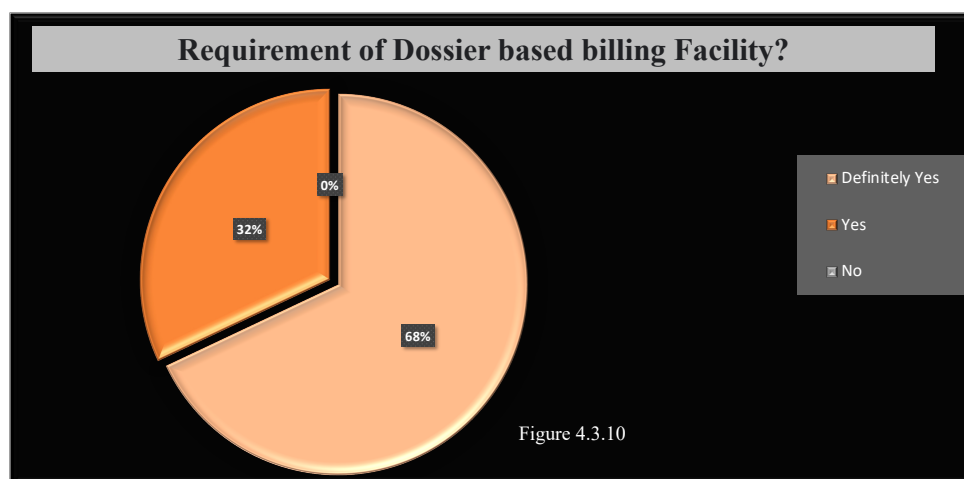
- As its already mentioned in the hospital's overview that BMCHRC is a NABH Accredited hospital. Therefore, it somehow becomes mandatory to capture Turn over time (TAT) of every domain. According to the figure 4.3.8 More than half of the hospital's dep require TAT for certain procedures. Data quality which is been published by the system to the users are authentic and easy to analyse. TAT requires accurate, adequately-analysed, interpreted and communicated data. Wherein, most to the department have put the requirement for TAT capturing window.



➤ According to the figure 4.3.9 summarizes that about 58% of the departments and HoD's of each department require that there must be the functional flow of the nursing plan along with the IP/OP EMR. It is believed that it will easily help the nurse to identify the unique role in attending to patient's overall health and well-being without having to rely entirely on the doctor's orders or intervention. The module support the holistic care which involves the whole person, including physical, psychological, social, and spiritual, with the management and prevention of disease.

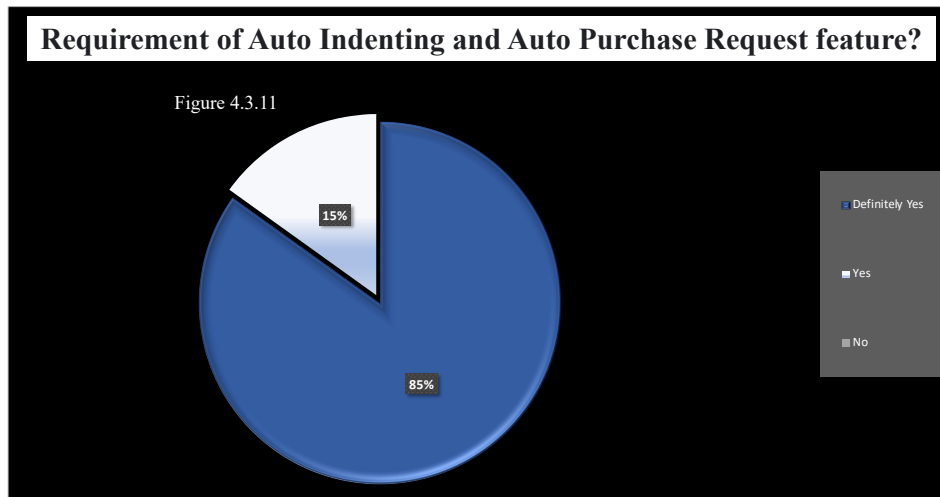


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- Dossier here means in the reference of the stock availability or the set availability in OT. It is a collection or set of requirements required to perform particular OT according to the patients' illness.
 - According to the figure 4.3.10 68% of the OT staff have a urge to require dossier billing feature on the upgraded software. This feature will provide benefits of revenue protection, increased operational efficiency and substantial saving of time and money involved in the manual billing. In this dossier indent will be raised by the OT by the user, and the indent which had been raised will be shown directly to the OT pharmacy. Therefore, this is how the kit (with expected usage of Qty. of drugs, consumables and Misc. items) preparation according to the dossier will be done.

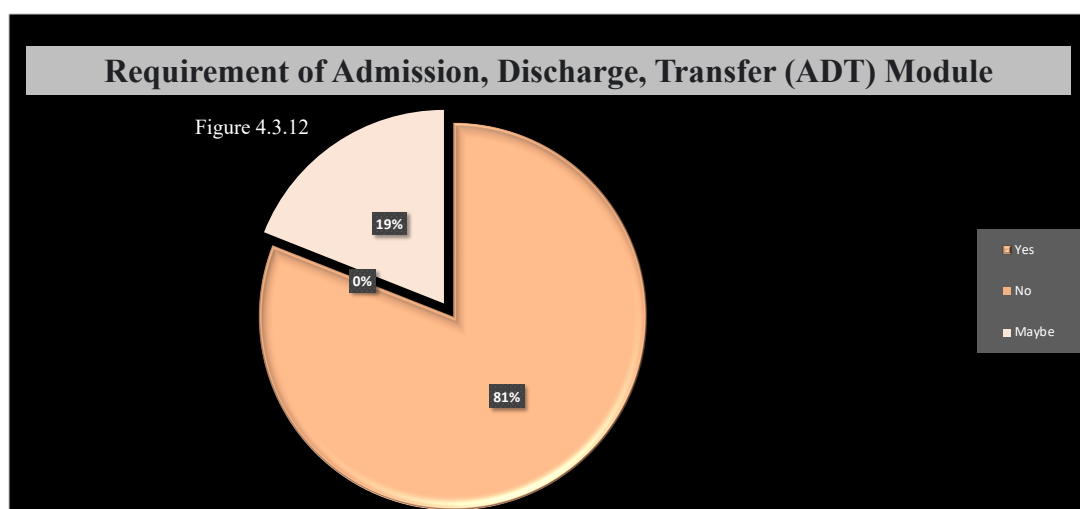


-
- Auto indenting feature controls the level of indentation. It should be based on Min stock from all the sub stores to main store and explained and its benefits. As it is manually done, it is to be automated in the coming software. According to the figure 4.3.11 it shows that majority of the users are agreed for this feature as it will save a lot of repetitive manual work, time and money and eliminates the chances of human errors of omission and

transcription.



➤ According to the Figure 4.3.12 ADT module is required in the majority i.e. 81%, as this module takes care of admission, discharge and the transfer of a patient seamlessly. This module enables the search on availability and manages the allocation of a bed, ward and room to a patient according to the availability or costs associated and thereby managing the transfers. It take care of appropriate discharge process is followed and also ensures a comprehensive discharge summary is generated at the end.



➤ According to the figure 4.3.13, It has been suggested that
OPD consultation appointment (100%)
Service appointment (87.1%)
E-Consultation appointment (48.4%), should be given the at most preference for
implementing these appointments.

What type of appointments are required from the new HMIS

31 responses

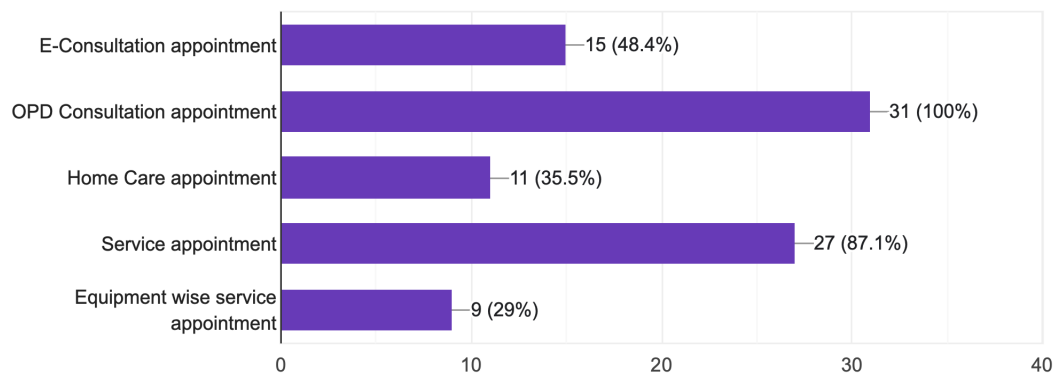
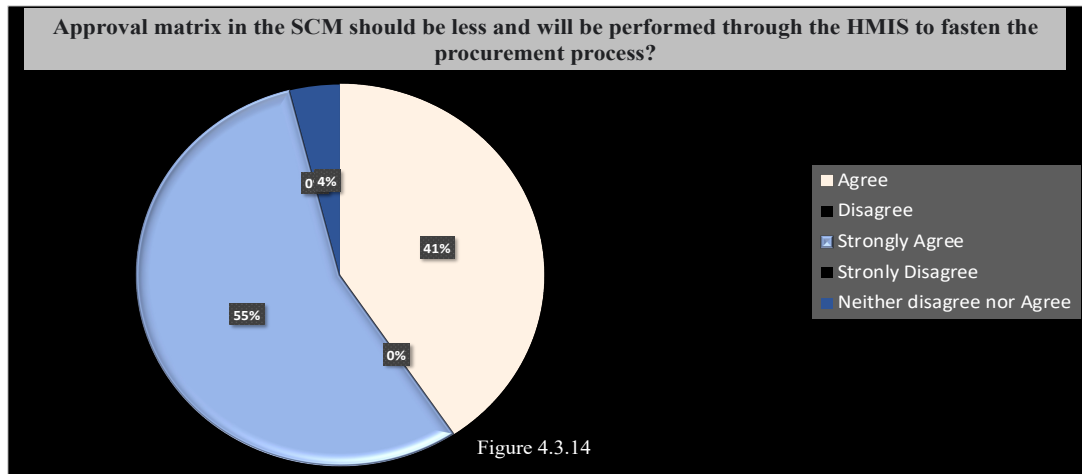


Figure 4.3.13

➤ According to the figure 4.3.14, it depicts that 55% of the staff strongly agree that the approval matrix should be less in the organisation and the approval process if required should be done through the system to initiate the procurement process.



- This questionnaire had only been asked from the HR department that what modules is to be implemented in phase- 1
- According to the figure 4.3.15 it has been suggested that three modules which as got the higher percentage i.e..

Leave management

Payroll

Attendance, will be taken in the phase – 1

which HR module is required in PHASE 1

23 responses

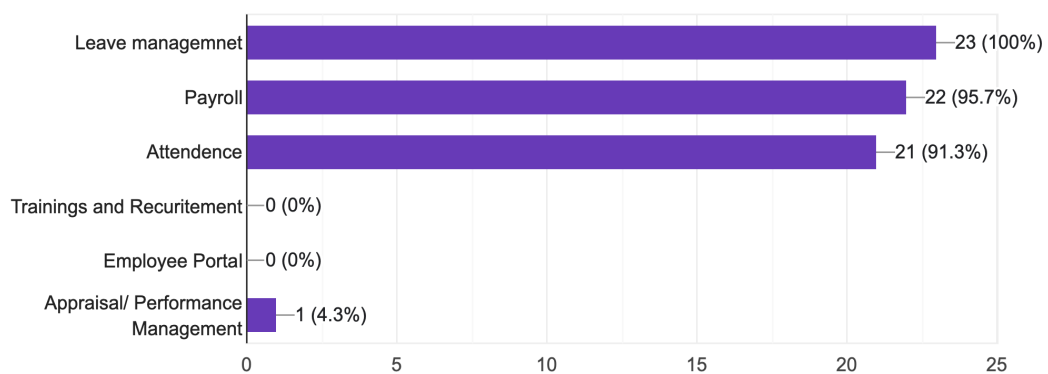


Figure 4.3.15

➤ As the initial user training of 25 department in phase – 1 is already being done. Therefore, it is noted that 74.2% of the staff is satisfied with the upgraded system and is user friendly. However, customization is still required in some of the modules. But the technical/ development team has ensure about the requirement to be provided in the UAT.

On A Scale of 1 to 5, do you think Upgraded software (Shivam Medisoft) will meet the required expectations and user's friendly?

31 responses

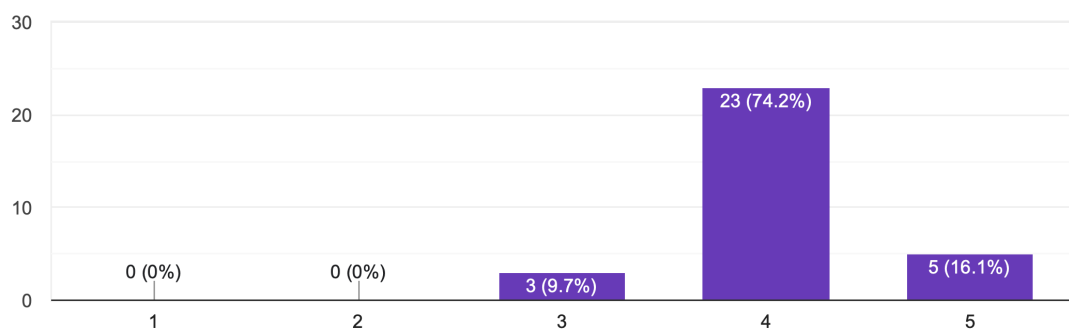


Figure 4.3.16

CHAPTER – 4 HMIS REPLACEMENT AND IMPLEMENTATION

4.1 Preliminary Information Document

A Software in Use

No	Areas of Automation – Software in use	Name	In use since when? (Year)
1.	Name of HMIS Software	PCS Prodoc	2011
2.	Name of Accounting Software	Tally Solutions	2013
3.	Name of HR & Payroll Software	TimeLabs	2013
4.	Name of PACS Software	PACS Fujifilm	2018

B Scope

In use ? - Mark Y for Module / Interface in live use. N for not in live use

Reqd.? - Mark Y for Module / Interface required in New HMIS. N for those not required.

No	Areas of Automation - Department / Module / Functionality Name	In use ? Y / N	Reqd. ? Y / N
A	HMIS Modules		
1.	Patient Registration	Y	Y
2.	Doctor Appointment Scheduling	N	Y
3.	OPD Consultation	N	Y
4.	Laboratories (OPD, IP)	N	Y
5.	Radiology (OPD, IP)	N	Y
6.	PACS Software	Y	Y
7.	Pharmacy (OPD, IP)	Y	Y
8.	OPD Billing (Cash, Credit, Scheme for Staff / Staff dependents)		
9.	Day Health Check (Appointments, Billing, Reporting)		
10.	Bed Booking	N	Y
11.	Theatre Booking	N	Y
12.	IP Reservation, Admission, Discharge Transfer	N	Y
13.	Wards	N	Y
14.	Operating Theatre Operations, Billing	Y	Y
15.	Electronic Medical Records	N	Y
16.	OP Nursing, IP Nursing Charts	N	Y
17.	IP Billing (Cash, Credit, Scheme for Staff / Staff dependents)	Y	Y
18.	CSSD	N	Y
19.	Catering	N	Y
20.	Laundry	N	Y
21.	Housekeeping	N	Y
22.	Blood Bank, if applicable	N	Y

No	Areas of Automation - Department / Module / Functionality Name	In use ? Y / N	Reqd. ? Y / N
23.	Infection control	N	Y
24.	Mortuary, if applicable	NA	N
25.	Doctor Payment	N	Y
26.	MIS / Dashboard Software	N	Y
27.	Purchasing	Y	Y
28.	Inventory Control	N	Y
29.	Accounts Receivable	Y	Y
30.	Accounts Payable	Y	Y
31.	General Ledger	Y	Y
32.	Fixed Assets	N	Y
33.	Maintenance Management	N	Y
34.	HR	Y	Y
35.	Payroll	N	Y
36.	e Consultation	N	Y
37.	Home Care	N	Y
38.	Name - Any other Module in use	-	-
B	HMIS Portals		
39.	Patient Portal	N	Y
40.	Doctor Portal	N	Y
C	HMIS Apps		
41.	Mobile App for Patients	N	Y
42.	Mobile App for Doctors	N	Y
NIV	HMIS Interfaces		
43.	SMS Interface	N	Y
44.	Email Interface	N	Y
45.	WhatsApp Interface	N	Y
46.	Bar Code Labels	Y	Y
47.	Lab Equipment Interfaces - If Yes, please state how many	Y	Y
48.	PACS interface	Y	Y
49.	Credit Card interface	N	N
50.	Payment Gateway	N	Y
51.	Patient Monitoring system interface	N	Y
52.	Queue Management System interface	N	Y

C. Facilities

No	Facility	Nos.
1.	Wards	8
2.	ICUs	2
3.	Beds (Wards + ICUs)	260
4.	Operation Theatres	4
5.	A&E – Minor OT if any	5
6.	Lab sections	1
7.	Radiology sections	1
8.	Pharmacies	3
9.	Main Stores	1

10.	Sub stores	Null
11.	Hospital Clinics	Null
12.	Doctors	26
13.	Nurses	233
14.	Employees	745

D. Computer Installation details - Hardware, Operating System, Database & related details

1. **Server/s** - Server/s with Configuration details of each Server
2. **PCs / Clients**- Number of PCs / Clients
3. **Printers** - Number of Printers by type of Printer
4. **Database** - Database Software with version
5. **Server Operating System** - Server Operating System with version for each Server
6. **Client Operating System** - Client Operating System Name with version
7. **Other communications / connectivity software** in use - if any
8. **Backup device/s** with configuration

4.2 Replacement of HMIS

4.2.1 Objective

The main objective of its replacement is to obtain a system that provides future proofing. BMCHRC expects a product that is using latest technologies, has significant Clinical informatics depth and can serve as a backbone to enhance clinical care, improve patient experience, promote business and manage & control operations efficiently and profitably. The main objectives can be summarized as:

- Provide international level quality of Medical care to Patients
- Provide Medical records electronically to Care giver at the Point of Care

- Facilitate excellent Patient experience
- Increase revenue & expand Customer base by providing value add services using HMIS backbone
- Use technology to service key stake holders viz. Patients, Doctors, Relatives, Management & Staff
- Increase operational efficiency by built in controls, validations, alerts & escalations
- Provide up to the minute, accurate and customizable MIS for management decision making
- Create a Paperless environment by computerizing all Administrative, Clinical & Financial processes
- Enable compliances to International Medical, Clinical and Codification standards
- Fully adhere to State and Central Laws, Regulations, Practices and provide Statutory Reports

BMCHRC welcomes use of modern technologies such as AI, Robotics, BI tools, CRM, Digital Marketing and multi-channel integration. Your solution should provide contemporary Modules like E-Consultation, Home Care, Patient App, Doctor App, Patient Portal and Doctor Portal. Hospital is expecting a comprehensive and fully integrated HMIS with all integrated Modules and Interfaces readily available. In addition to conventional HMIS Modules, it will be an advantage if HMIS offers facilities such as Worklist / Dashboard approach, Configurable work flow, Configurable Rules engine, Alert & Escalation engine, MIS Dashboard, Marketing engine integration, Chatbot integration etc. HMIS must offer flexible EMR and Nursing modules that are either Data driven or can be easily configured for Oncology Specialty and for workflow of Clinical & Administration information to adopt to BMCHRC's processes. You may also suggest / propose additional enabling technologies and products to fulfil BMCHRC's objectives - as long as they are integrated / you can easily integrate them with your HMIS.

In the evaluation, high weightage will be given to solutions that fulfil and exceed stated objectives.

4.2.2 Scope

In brief, the work consists of HMIS and other related Software Licensing, Customization, Implementation & support. Broadly, this will cover

- Software Licensing (Perpetual License to use) and services for Data porting, Gap analysis, Customization, Interface development and integration, Delivery, Installation & commissioning, Application Training to Users, Technical Training to IT, User Acceptance Testing Support, Parallel Run support, Go Live and Post Go Live support and Warranty.
- Post Warranty, support will be covered by an AMC contract.
- IT Department training should cover Technical training on system internals to empower IT to provide quality Level 1 support and to develop in house, ad hoc Reports.
- Supplying User and Support documentation for the HMIS and Interfaces.
- Specifications for hardware and connectivity, backup and disaster recovery.

BMCHRC considers the following Modules and Interfaces as Scope of work:

- A.** management wishes to implement them with the new HMIS. All these should be quoted either as part of Product's own Modules or as 3rd Party Products integrated with HMIS. Quotation without inclusions of all these will be an incomplete quotation.
- B. Required 3rd Party Products** – These Products (e.g. RDBMS) are essential to implement HMIS. These should be quoted. Quotation without these will be an incomplete quotation.
- C. Optional Modules & Interfaces** - These Modules and interfaces may be implemented in future.

No	Module / Functionality / Interface
A	Required Modules & Interfaces
1.	E-Consultation
2.	Home Care
3.	Patient App (Android, iOS)
4.	Patient Portal
	Doctor App (Android, iOS)
	Doctor Portal
	Patient Registration
	Doctor & Service Appointment Scheduling

No	Module / Functionality / Interface
9.	Laboratories (OPD, HCK, IP)
10.	Radiology (OPD, HCK, IP)
11.	Pharmacy (OPD, HCK, IP)
12.	OPD Billing – Cash, Credit, Insurance / TPA, Scheme, Staff, Staff dependents
13.	Day Health Check Up (HCK) - Appointments, Registration, Servicing, Reporting and Billing
14.	Day Care, Accident & Emergency, Admission, Discharge, Transfer (ADT) including Bed Booking and OT Booking
15.	Ward orders & In Ward Services
16.	Nursing Care and Nursing Charts
17.	Credit control / Insurance Desk (OPD, HCK, IP)
18.	O. T. Operations & OT Billing
19.	Electronic Medical Records
20.	IP Billing – Cash, Credit, Insurance / TPA, Scheme, Staff, Staff dependents
21.	MIS Reports & MIS Dashboards
22.	Blood Bank
23.	Pathology Lab Equipment interfaces (10)
24.	SMS Interface
25.	Email Interface
26.	MIS Reports
27.	Product's own integrated BI Tool
28.	Purchasing
29.	Inventory Control
30.	Maintenance Management OR Integration with 3 rd Party Maintenance Package
31.	Doctor Payment
32.	Compliance with State and Central Government Taxes, Duties, Levies and generation of required Returns and State and Central Ministry of Health requirements and Reports
B	Required Third Party Products
1	RDBMS – Please enter name of the Product and Version number

No	Module / Functionality / Interface
2	Any other software that may be required to run HMIS, if any
C	Required Interfaces
1.	Existing PACS Software
2.	Existing Tally Accounting software
3.	Third party HR & Payroll software
4.	Payment Gateway
5.	BI Tool (If Product does not have its own BI Tool)
6.	Credit Card interface
D	Optional Modules & Interfaces
	Infection Tracking
	Lab QC
	Laundry
	Housekeeping
	WhatsApp interface
	CRM Tool interface
	Patient Monitors interface
8.	Clinical Pathways & Drug Formulary interface

4.3 New HMIS

4.3.1 Company Information

» **Company Name: Shivam Medisoft Services Private Limited**

4.3.2 Product Details

No	Other details	Y / N
	Ownership - Does your Company own the HMIS Product you plan to propose ?	Y
	Web based - Is the Product Fully Web based ?	Y

No	Other details	Y / N
3.	Responsive screens – Does the product have Responsive screens with built-in support for use on Mobile Phones with Android iOS	Y
4.	Export of Reports – Does the to product support export of all Reports to Word, Excel, PDF, XML, Text file, etc. as appropriate ? If Y, pls state whether this capability is Built-in and data driven or needs additional programming effort to implement	Y
5.	Workflow configuration – Does the Product provide flexibility of using configurable workflow ? If Y, please provide details of workflow reconfiguration that can be done by a trained IT User or it needs to be done by your Development / Support team	Y
6.	Screen Builder – Does Product offer a Screen Builder using which a trained user can add A New fields to Product screens B New Screen	Y
7.	TAT analysis – Does the Product provide facility to store and report standard and actual TAT for various front Office and Back Office operations. If Y, state for which operations this facility is available	Y
8.	Security – does the Product offer Role based security ? Is it possible to apply SSL for required pages ?	Y

No	Other details	Y / N
	SMS / Email based approvals - Does the system offer capability of generating automated email / SMS approval requests and accepting approvals by email / SMS and directly integrating the same with Database. If Y, are these instances configurable by a Trained IT user or it needs to be done by your Development / Support team ?	Y
.	NABH, JCI & CAP support - Does the Product provide data capture and reporting required for NABH JCI CAP If the Product supports any other, please state here	Y
.	Integration with Medical / Clinical Databases – For enhancing clinical services, Is the product integrated with a database for :	Y
	Clinical Pathways - If Y, pls provide details here	
	Drug formulary - If Y, pls provide details here	
	Allergy Alerts - If Y, pls provide details here	
	Interaction Alerts - If Y, pls provide details here.	
	Discharge Advice - If Y, pls provide details here.	
	Clinical Calculators - If Y, pls provide details here.	
	Any other such integration – If available, please state here	
23	Integration with Third Party Products – Please provide name of the Third Party Products with which HMIS is integrated / interfaced	Y
	BI Tool	
	CRM	
	Patient Monitoring System	
	PACS	
	Finance	

No	Other details	Y / N
	HR /Payroll	
	Maintenance Management	
	Any other such integration – If available, please state here	

4.3.3 Level of Customisation

L1 - After Gap analysis and until Go Live

L2 - After 1 month of Go Live

L3 - After 3 months of Go Live

4.4 IMPLEMENTING HMIS

4.4.1 Scope

The mandate given to the software solution provider was to implement an answer that might cover all the **45 modules**. It will link the first, secondary and tertiary levels for patient monitoring and referral, except for providing information to programme managers and administrators. Within hospitals, it'll function a tool for better hospital management and thereby ensuring better service delivery for the community. Hence the HMIS will provide at each level the data required to assess and proper (if required) their performance.

The HMIS is predicted to function a call network (DSS) once phase III clinical trial is additionally implemented for coordinated planning, monitoring, implementation, assessing achievements, reporting and feedback, policy formulation and strategy development.

4.4.2 Modules

Phase	Deliverables		Implementation
	Modules	Interfaces	
1	30	2	All core modules and interfaces
1A	7	1	Remote access to Patients, Relatives & Doctors (These will be delivered along with Phase 1 but will be implemented after stabilization of Phase 1)
2	8	1	Other value adds modules
Total	45	4	

MODULES		
Sr. No	Module Name	Description
1	Ward Management	ER Working Dashboard
2	Appointment	Online Doctor Appointments
3	OPD	Queue Management
4	OPD	Reception Working Dashboard
5	Doctor Portal	Doctor Portal
6	Diagnostics	Phlebotomy Working Dashboard
7	Diagnostics	LAB Reporting Working Dashboard
8	Diagnostics	Radiology Working Dashboard
9	Purchase	Purchase Working Dashboard
10	Purchase	Auto PO

11	Pharmacy	Pharmacy Working Dashboard
12	IPD	Admission Desk Working Dashboard
13	IPD	Billing Desk Working Dashboard
14	Ward Management	Wards Nurse Working Dashboard (EMR)
15	OT	OT Booking,
16	Electronic Medical Record	Doctors Working Dashboard (EMR)
17	TPA	Panel Cell Dashboard
18	OPD	Cashier Working Dashboard
19	Blood Bank	Blood Bank Working Dashboard
20	Diet	Diet Indent from Ward
21	Complaint Management	Complaint Management Working Dashboard
22	Asset	Asset Working Dashboard
23	MRD	File In and Out System for MRD
24	Financial Accounts	Financial Working Dashboard
25	Doctor Accounting	Doctor Accounting
26	HR	Payroll
27	HR	Leave management
28	HR	Employee Portal
29	Risk Management	Risk Working Dashboard
30	Admin	IT working Dashboard
31	Feedback	Patient Feedback Working Dashboard,
32	Dashboard	Top Management Dashboard
33	Objection	Objection Management
34	Dashboard	NABH Dashboards
35	Dashboard	Dashboards and Analytics
36	Gateway	Payment Gateway(Doctor Appointments)
37	Online Consultation	Teleconsultation
38	Mobile App	Patient APP (IOS & Android)
39	PACS	PACS Setup
40	Mobile App	Mobile APP(Shivam Dashboard)
41	Integration	SMS Integration
42	Integration	Email Integration

The following are the key areas that the HMIS addresses:

➤ Inventory

- Personnel
- Infrastructure and Equipment (Available, Working, Repairable, Required)

➤ Hospitals Activity and Efficiency Indicators

- In-patient and Outpatient Departments (IPDIOPD) and workflow in and out.
- Quality care.

➤ Finance

- Budget
- Expenditure on various items

Thus, the HMIS has two categories:

➤ **HMS-Hospital Management System**

- ✓ Registration.
- ✓ Outpatients.
- ✓ In patients.
- ✓ Medical records.
- ✓ Laboratory.
- ✓ Radiology.
- ✓ Nuclear medicine.
- ✓ Pharmacy.
- ✓ Stores.
- ✓ Blood center.

Above mentioned modules are regarded as the patient MIS.

➤ **MIS Management Information System**

- ✓ Accounts.
- ✓ Finance.
- ✓ Lab services.
- ✓ Patient census.
- ✓ Patient services.
- ✓ Administrative information.

4.5 Implementation Overview

» The Implementation is divided into 3 phases

Total number of modules = 45
Phase 1 = 30 modules
Phase 1A = 7 modules
Phase 2 = 8 modules

PHASE 1					
No	Phase	Required Module / Functionality / Interface	Deployed	Gap Analysis Steps	
				Flowcharting (Old)	GAP Document Signoff
1	Phase 1	Patient Registration	Y	Y	Y
2	Phase 1	Doctor & Service Appointment Scheduling	Y	Y	Y
3	Phase 1	Laboratories (OPD, HCK, IP)	Y	Y	Y
4	Phase 1	Radiology (OPD, HCK, IP)	Y	Y	Y
5	Phase 1	Pharmacy (OPD, HCK, IP)	Y	Y	Y
6	Phase 1	OPD Billing – Cash, Credit, Insurance / TPA, Scheme, Staff, Staff dependents	Y	Y	Y
7	Phase 1	Day Health Check Up (HCK) - Appointments, Registration, Servicing, Reporting and Billing	NA	NA	NA
8	Phase 1	Day Care, Accident & Emergency, Admission, Discharge, Transfer (ADT) including Bed Booking and OT Booking	Y	Y	Y
9	Phase 1	Ward orders & In Ward Services	Y	Y	Y

10	Phase 1	Credit control / Insurance Desk (OPD, HCK, IP)	Y	Y	Y
11	Phase 1	O. T. Operations & OT Billing	Y	Y	Y
12	Phase 1	IP Billing – Cash, Credit, Insurance / TPA, Scheme, Staff, Staff dependents	Y	Y	Y
13	Phase 1	MRD – File Tracking, Death Registration, MOH and Other Statistics	Y	Y	Y
14	Phase 1	Blood Bank	Y	Y	Y
15	Phase 1	Pathology Lab Equipment interfaces (10)	N	NA	NA
16	Phase 1	Departmental Reports	Y	Y	Y
17	Phase 1	Purchasing	Y	Y	Y
18	Phase 1	Inventory Control	Y	Y	Y
19	Phase 1	Doctor Payment	Y	Y	Y
20	Phase 1	Compliance with State and Central Government Taxes, Duties, Levies and generation of required Returns and State and Central Ministry of Health requirements and Reports	Y	Y	Y
21	Phase 1	Existing PACS Software	N	NA	NA
22	Phase 1	BI Tool	N	NA	NA
23	Phase 1	Accounting software	Y	Y	Y
24	Phase 1	Payroll	N	N	N
25	Phase 1	SMS Interface	Y	NA	NA
26	Phase 1	Email Interface	Y	NA	NA
27	Phase 1	WhatsApp interface	Y	NA	NA
28	Phase 1	Payment Gateway	NA	NA	NA
29	Phase 1	Credit Card	NA	NA	NA
30	Phase 1	Maintenance Management	Y	NA	NA

PHASE 1A		
NO	PHASE	REQUIRED MODULE/ FUNCTIONALITY/INTERFACE
1	Phase 1A	Nursing care Nursing charts
2	Phase 1A	EConsultation
3	Phase 1A	Patient app

4	Phase 1A	Patient portal
5	Phase 1A	Doctor App
6	Phase 1A	Doctor Portal
7	Phase 1A	Product's Own integrated BI Tool

PHASE 2		
NO	PHASE	REQUIRED MODULE/ FUNCTIONALITY/INTERFACE
1	PHASE 2	Home Care
2	PHASE 2	Electronic Medical Record (EMR)
3	PHASE 2	MIS Reports MIS Dashboard
4	PHASE 2	Maintenance management
5	PHASE 2	Infection Tracking
6	PHASE 2	Laundry
7	PHASE 2	House Keeping
8	PHASE 2	HR

CHAPTER – 5 METHEDOLOGY

5.1 Agile Model

This Model is been used for the implementation of Software in BMCHRC. It may be a combination of the Iterative and incremental model. This model focuses more on flexibility while developing a product instead of on the need.

5.2 Project Plan

- Project kick off meeting
- Gap analysis
- Decision on freezing each Gap (Hospital Process change /Acceptance of available system work around /System change)
- Customization / Configurations / Tuning at different levels as required
- Delivery of HMIS version and Interfaces on site
- Installation of the above on site
- Onsite Testing
- Interface deployment
- Data porting
- Training to Doctors, Staff, Operators, Users, HODs, IT Department
- User Acceptance testing support
- Parallel Run / Mock Run support
- Data porting
- Go Live preparation
- Go Live and Post Go Live support
- Final Acceptance
- Warranty coverage

5.3 Gap Study

» Pre-Gap Analysis

Activities:

- Preparation of champions team

- Champions Team's Roles and Responsibilities
- Preparation of Process flow charts of each department.
- Finalization of strategy for legacy masters
- Preparation/ vetting of masters to be ported
- Consolidation of the reports – MIS and others
- Hard copy of all reports in live use.
- List of BMCHRC specific customization
- Billing Rules
- Doctor payments Rules
- BPR Process of all the departments
- Error handling for porting
- Automated Dossier based OT billing
- Automated Sub stores indenting

1. For the analytical method we tried to Identify the areas (departments) of concern, picked the areas to visit for the observation and determine the current status of the hospital system.
2. Determining the current and future state of things which we want to implement in the organisation.
3. Flow charts made of all the essential departments as per the current process in the system. Revised the flow charts timely as per the need to identify the gap.
4. Functional working and observational learnings of the departments, targeted behaviour and is watched and documented and then BPR is done– Reception, OPD, IPD, Billing, Admission process, Discharge process, laboratory, radiology, nuclear medicine, stores & purchase, Pharmacy.
5. Again Collection of the desired documents of respective departments which to be taken in the gaps and then in the system.
6. In the operational studies we tried to find out the initial gaps which can be sort before the actual gap analysis to make the further process smooth.
7. The questions which were raised by the Shivam during the initial study, were being answered by the respective department accordingly.

8. The statements which were given for the query raised by The Shivam is recorded manually and then process charts being made is termed as “Proposed Business Process Re-engineering (Proposed BPR)” in the discussion with Shivam as well as IT team.
9. It has been observed that the process in Departments like stores/purchase and pharmacy is quite lengthy and bit complicated and needed to be simplify as much as possible taking the senior management in consideration.
10. The BPR is made mapping all the required documents with the current process and the proposed the flow which is more efficient and easier to go.
11. Preparation of process BPR of the following departments is done based on the operational studies:
 - Patient registration
 - OPD and billing process
 - Admission process
 - BPR Laboratory
 - BPR Radiology
 - Supply chain process
 - Purchase and Pharmacy procurement
 - Work order process
 - GPF wallet process
 - OT management
 - Blood center process
 - MRD working

» Gap Analysis



Task to be done in the gap analysis :

- ✓ Approval of the pending documents
- ✓ Departmental reports Finalisation
- ✓ Pre-printed document finalization

- ✓ Label Mapping
- ✓ NABH Tracking sheet
- ✓ Lab Equipment Interface
- ✓ PACS integration
- ✓ Masters Finalization
- ✓ Third party Integrations
- ✓ Facility for higher economic segment patients

» Customization

- System Design Specification
 - Design Document Specification
- ✓ The next phase is about to bring down all the knowledge of requirements, analysis, and development of the specific requirement (forms, reports, process flow etc) raised by the user at the time of gap analysis.
- ✓ This phase is the product of the last two, like inputs from the user came from the each department and their requirement gathering.
- ✓ Transformation of all the requirements given by the user into detailed specifications in the system
- ✓ Module deliverables – The deliverables produced during this phase should be reviewed in detail and follow the approval path.
- ✓ User testing the deliverables according to their respective modules and approve the same.
- ✓ User will create the cases on the system and enter the desired data to check whether the deliverables received are okay and ready to use.

» UAT (User Acceptance training)

- ✓ *UAT is yet to complete.*
- ✓ USER TESTING -UAT will be performed only after the approval of the deliverables by the user, or the testing is done.
- ✓ SIGN OFF - When accepted, will take the sign off on the same and will freeze the module and mark as completed.

✓ REDEVELOPMENT - In case, if any requirement is needed at the time of UAT, the module will be again documented as per the end user and redevelopment will be done accordingly

» User Training

- ✓ User training belongs to the implementation phase along with the parallel run of the system.
- ✓ Training manual will be given to each department so that they can understand functional flow.
- ✓ Training is about the use of the data - edit, add, query, and delete the records.

» Go Live / Implementation

Going Live Checklist:

1. End user training is completed.
 2. System administration is ready.
 3. Stress test is completed.
 4. Conversion and business process in production system have been checked.
 5. Perform internal quality check.
 6. Final preparation review.
-
- ✓ The implementation phase is the doing phase.
 - ✓ This stage commence after the system is been completely tested along with the parallel run and accepted by each end users of their respective department.
 - ✓ In this stage there will be configuring the HMIS for certain conditions of use, as well as the training customers to work with the system.
-

CHAPTER – 6 RESULTS ACHIEVED

6.1 Patient Registration

- Covers all the demographic details of the patient. The online verification of various entitlements except Cash shall be done at the reception counter by the system.
- Permanent Registration will be allocated by reception user to the patient
- After Registration Patient's Panel Allocation & Initial Assessment will be also done through the HMIS.
- Patient will visit to Billing Counter for OPD Billing. Appointment Token Time will be allocated by Billing User
- Patient will move to OPD Area for Consultation as per given appointment time.
- Type Of Registration -
 - **Hospital Registration** - *Hospital Registered Patient will the permanent UHID.*
 - **Camp Registration** - *A camp patient will get the provisional UHID Initially, but when the patient turn up in the hospital will be given the permanent UHID along with the temp/provisional UHID tagged.*
Whenever the camp will be organised at the time of camp spot registration a separate alphanumeric series will be allocated for registration. ex- C-202200001 . which is based on yearly sequence reset option.
 - **Online Registration** - *If the new patient is registering self from Website or Mobile App and the patient has to pay Registration fee Rs. 150 and the Hospital UHID should be allotted.*
- SMS and Mail shall be triggered to the newly registered patient. (SMS Text Dear Patron, Thanks for registering with us. Your registration no. is <reg No.>. This UHID is valid for lifetime in BMCHRC.) Email text should be same along with Patient ID Card as an attachment. (Card sample to be provided).
- Following data will be captured form the registration:
 - Generate MIS of Camp patient
 - Generate MIS of Hospital patient

- Generate MIS of converted patient from Camp to Hospital
- Generate MIS of User wise registration
- Generate user wise update demographic detail.
- User can convert cash patient to organisation and vice versa
- In Billing Screen Patient should be shown as New Patient.
- In doctor screen patient should be shown as new patient.
- In Panel allotment doctor screen it should be visible for panel allocation.

6.2 Payment Gateway

To improve Patient experience, it was suggested to provide facility for all the Prepaid services, so that Patient can directly go to servicing department on arrival at the hospital without having to register at a counter first and then go to servicing department. This will result in faster service to the Patient and reduce queues at the Counter. Similarly, when a Doctor prescribes Lab or Radiology test, Patient can directly pay from his mobile phone and proceed to Servicing department instead of going to Billing counter to make payment. Hence, will require Payment Gateway facility.

Decision - It was agreed that this will be useful and should be implemented. IT Department to arrange for demonstration with Payment Gateway Vendors and get quotations and will be further done online through the system.

6.3 Doctor Prescription – EMR

- The record of the patient and each consultation results are noted directly into the system
- Doctor's order for any procedure and investigation will also be automatically record in the system through EMR.
- Doctor will prescribe the medicine by the EMR window.
- The pharmacy module gets an alert and shows the stock position immediately. T
- The doctor knows directly if there are enough medicines there or if he or she needs to change the prescription. If there is an injection to be administered, the nurses are alerted.

6.4 Nurse Station

- Initial Assessment, nursing assessment, re- assessment, daily nursing assessment will be done by the nurse in the system.

- Medication order or indent, ward indent, IPD return indent will be managed by the nursing staff on the system.
- Ward Consumption should be done in system. Monthly Indent and consumption summary should be visible to in charge.
- In case of critical value during any investigation, the alerts will be shown at the nurse dashboard.
- NABH indicators/ TAT will be captured in the system.
- All the forms and registers which are used by the nurse to enter the data of the patient will now be captured on the system through HMIS.

6.5 Laboratory Investigations

- If the doctor feels the need for further tests like blood, urine, X-ray etc, he can indicate the tests in the system and the laboratory is alerted.
- Doctor will order the investigation on EMR and will fill the digital requisition form.
- Further, all the requisition forms are to be digitalized in the HMIS and will be filled online.
- TAT – OP Waiting time and Report TAT will be captured through HMIS
- SMS/Email alert to the doctor at the time of any critical value.

6.6 Radiology Procedures

- Doctor will order the procedure on EMR and will fill the digital requisition form.
- Further, all the requisition forms are to be digitalized in the HMIS and will be filled online.
- Radiology TAT are captured through the HMIS.
- ✓ TAT 1 – Patient receiving to modality
- ✓ TAT 2 – Patient receiving to study end
- ✓ TAT 3 – study end to approval of the report SMS/Email alert to the doctor at the time of any critical value.
- SMS/Email alert to the doctor at the time of any critical value.

6.7 Pharmacy

- The moment a doctor prescribes medicines, the system alerts the pharmacist, who can keep them ready.
- In case of insufficient stock, there is an automatic indent in the pharmacy module, alerting the local store on the need to replenish the medicines.
- Doctor can get an alert if the medicine is not in stock and substitute of the medicine will be shown to doctor. This would be based on the stock availability at OPD Pharmacy.

- Purchase Order Process –
 - » **Auto PO based on ROL and Sale Pattern**
 - » Approved by Pharmacy Head.

6.8 Supply Chain Management

- Vendor selection process –
 - » Quotations/Offer are invited by purchase from system
 - » Comparison sheet prepared from system and vendor will be categorized into L1,L2,L3
 - » From system L1 vendor is selected based on commercial and technical discussion
 - » Purchase Committee is done and Vendor is finalized as per the discussion
 - » 5 Introduce the vendor portal where vendor and offer details uploaded from system
 - » 6 Upload the finalized offer sheet from vendor portal again signed by following Members
(Manually signed by approving authority) HOD User Department HOD Purchase
COO/MS Advisory Purchase AGM Commercial Executive Director (if the value is 2 to 10
Lacs)
 - » Purchase order is generated from system and signed in following sequence Prepared By
Head Purchase
 - » Purchase Order is sent automatically to the Vendor through mail
 - » Advance Payment Required that case payment released by Accounts Department
 - » If advance payment not required than Ordering Process Done from system and the
Delivery of the Order is awaited.
- Purchase Request/Demand Sheet/ Note Sheet –
 - *ROL Based Purchase Request -*
 - » Central Store of Hospital can generate the purchase request based on ROL set for the
central store only for the ROL items.
 - » PR will be approved by Central Store HOD. Manual Purchase Requisition process from
Ward/Department for
 - *NON ROL Items –*
 - » case of Online indent request - Indent raised by user Online from other departments/wards.
 - » Indent will be approved by Department HOD. Medical department indent will be approved
by MS, NON Medical department indent will be approved by COO.
 - » After approval from head of the department requisition is routed to Central Store
department..
 - » Central Store can issue the material in case of stock is available.

- » In case of stock is not available central store will raise the PR for NON ROL item based on indent selection and conversion from the PR form by selecting multiple indent.
- » Central Store Head -> COO/MS -> Advisory Purchase will approve the purchase request.
- » purchase department will verify the item if the item is new quotation will be called by purchase department, vendor selection process and approval will be followed and in case of old item purchase order will be generated.
- » In few cases if there is changes in requisition then sent back to requester for the changes.
- » Once the requisition is approved again, purchase order is created with specify the quantity , types and prices previously agreed upon.
- » User wants for all requisition that listed in system in PR, user want to click on every single item and PO prepared automatically from system (separate window needed to user for the item listed on PO). User can see the details of PR and prepare the order by selecting the items.
 - Purchase Order Process -
- » After approval of PR the same shall be forwarded to Purchase Department
- » Purchase order shall be Generated
- » Authorised and shall be sent to the Supplier/Vendor
- » If advance amount is required, Payment sheet will be generated and visible to MIS.
 - GRN Process - After completion the Stock Inspection ,GRN Process is Initiated from system. GRN Prepared first in draft mode in system and finally approved by Store Head. Following documents to be attached with the GRN bill print Original Invoice Installation Report (if needed)
 - GRN Dispatch to MIS –
 - Payment Process
- » GRN Prepared
- » GRN Approved by HOD
- » GRN send to MIS
- » GRN Approved by MIS
- » GRN send to accounts by MIS
- » GRN receive by Accounts
- » Payment Processed based on credit days mentioned in GRN from GRN Date.

6.9 Medical Record Department

- The movement of the patient's file will be done and tracked on HMIS
- Follow up - OPD consultation show on MRD Screen

- After the completion of the consultation process file will be received in MRD on the HIS and status will be updated as “closed”.
- In the further process TAT shall be calculated through EMR on the system.
- All Consents will be scan by MRD and uploaded in HMIS. In Case of any document which is not available in HMIS, it will be scan by MRD and uploaded in HMIS.
- IPD file checking - Nursing care sheet and doctor sheet is checked through EMR. From registration form to discharge paper all things checked and verified from the system.
- Report send to outside of organisation – MIS for the same will be captured in the system.
- Department wise file issue –
 - » Department fill the digital requisition form.
 - » Department requested file should be on MRD Working dashboard
 - » MRD user based on requested issue to the Department.
- File Tracker –
 - » MRD User will Issue file to Users the time of issue file and handover to user.
 - » File will be received by Department/Doctor/Issued User
 - » File Tracker will be available in system to track the file where it is located as per the received user.
 - » File can be send back to MRD via system
 - » File will be received by MRD via system
 - » File can be send further to any ward or department or user.
 - » File will be received by User in system

6.10 Blood Centre

All the below modules in the blood centre will be done through the HMIS

- Donor Registration
- Blood grouping
- Blood product receive
- Blood Request
- Blood Request Receiving
- Blood reservation
- Blood Issue
- NABH Indicators
- Registers

6.11 Dossier Billing

- Dossier here means in the reference of the stock availability or the set availability in OT. It is a collection or set of requirements required to perform particular OT according to the patients' illness.
- This feature will provide benefits of revenue protection, increased operational efficiency and substantial saving of time and money involved in the manual billing. Indirectly, it will also help in reducing patient's complaints (due to manual errors) and avoid delay in discharges since normally, patients check bill just prior to discharge and raise objections which delays the physical discharge.
- In this dossier indent will be raised by the OT by the user, and the indent which had been raised will be shown directly to the OT pharmacy.
- Many hospitals implement this in phase – 2 but if BMCHRC can do the required setup, this should be implemented in phase-1

6.12 Auto Indenting

It is suggested Auto Indenting based on Min stock from all Sub stores to Main store and explained its benefits. This is currently manually done at BMCHRC.

Once implemented, it increases operational efficiency, saves a lot of repetitive manual work, time & money and it eliminates chances of human errors of omission and transcription. Above all, this process will avoid stockout situation and enable uninterrupted services to Patients.

In order to try this during Gap analysis, it was decided that BMCHRC will Set up at least 50 items for 2 critical stores (e.g. OT Sub store and Pharmacy Sub store) and test Auto Indenting facility during Gap analysis.

Many Hospitals implement this in Phase 2 but if BMCHRC can do the required setup, this should be implemented in Phase 1.

6.12 Auto Consumption

As Hospitals face problem of inaccurate Profitability reports from the system since many times, Users do not enter consumption details in the system regularly - especially for non-chargeable Items since it does not impact Patient Bill.

It is recommended that to avoid this, BMCHRC should implement one of the following 2 options:

1. Enable Auto Consumption for such Items. Item will be treated as consumed the moment it is sent from Main store to Sub store and expense will be booked.

OR

2. Ensure that proper Minimum stock levels are setup at sub store level, Users enter actual consumption quantity and system validates that no Indenting can be done if Sub store stock is = or > Minimum stock.

6.11 Others

These modules are also been taken care on the HIS in the phase-1

- Complaint Management
 - HR management – Payroll, Leave, Attendance
 - Sales and Marketing
 - NABH Indicators
 - TAT
 - MIS Reports
 - OT working
 - IP/OP billing
 - TPA billing
 - Admission
 - Finance and Accounts
 - Free ship/ Free ship Wallet
 - ROL based Module
-

CHAPTER – 7 DISSCUSSIONS

7.1 Sustainability

No job is complete with just the implementation. If anything, it is just the first step. HMIS story is no different. The purpose of implementing the HMIS was to have a grip on the pulse of the health care initiatives, its impact and the areas that need attention..

Success of the project is when poor patients walkout of Government hospitals with a pride of holding printed prescription slip/OP case record/Lab investigation report. The smile in their face indicates the usefulness of this system(HMIS)

7.2 Monitoring Aspects

In addition to being able to monitor the progress of the healthcare services, it was also important to assess the performance of the HMIS system itself and the progress in implementation. Therefore, there are periodic review meetings by the stakeholders including the doctors, nurses, and the administrative staff across different levels. Each meeting is recorded and follow ups done to monitor the progress on the action to be taken.

7.3 Challenges and Lesson Learnt

Mindset is one of the biggest challenges in any new initiative faces. Or rather, resistance to new initiatives is. And the implementation of HMIS was no exception to this. Used to their old system that seemed to work just fine for the doctors and all the other hospital are available-onsite and off staff, the new system seemed filled with hurdles and inefficiencies. Training and ensuring the use of the systems correctly has been task in itself.

The journey to IT-enablement began slowly, with delays in getting the clearance for initiating the process of implementing the HMIS. Even during the gap analysis, documentations were made and identified, the decision was contested further delaying the take-off. The software vendor then taking time to prepare the SRS and so the hardware procurement process is getting delayed too. Further, Server stabilization could to be an another major challenge since load balancing activity might be the hurdle we had to overcome.

CHAPTER – 8 CONCLUSION

8.1 Hospital staff

With the HMIS in place, managing infrastructure, equipment, admissions, surgeries, maternity ward etc - all these are tracked with ease. The record of each patient is transferred from ward to ward based on requirement. Lab testing and results can also be noted and remain in the system, to be accessed if needed later

With the implementation of the system, the number of patients handled at each level can go up. In the initial stages, the system developed glitches and the old manual method had to be deployed, doubling the workload. Doctors had to manually note down the patient details and then update the system. Now those glitches can be handled successfully. So is the case along the entire healthcare chain, it thus could a boon to the patient as well as the hospital.

» Brief Assumptions

- Time saved for reports and data consolidation/ Automatic consolidation.
- Easy analysis of the MIS.
- Uniformity in reporting formats across the hospital.
- Highly scalable solution.
- Ten Thousand users and one lakh patients cycled through system daily.
- Real time data available - for monitoring.
- Inbuilt validations for data entry.
- Uniformity in master data entry to bring the authenticity in standardized of reporting.
- User-friendly easy to use screens.

8.2 Hospital Administration

As a result of collation of all pertinent data related to patients and administration under different categories in one system health administrators can retrieve any data within seconds. This gives them an overall view as well as specific information on different aspects of running the healthcare enters.

» Brief Assumptions

- Quick and easy retrieval of data - real time data across hospitals/districts available on line
- Upgraded and improved inventory.
- Easy access to data helps to analyse disease patterns and trends.
- Evidence based decisions for investments, improvements of the Health System.

- Easy data analysis.
 - Cost effectiveness.
-

CHAPTER – 9 REFERENCES

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CHAPTER – 10 ANNEXURE

10.1 Questionnaire

Aim of the Questionnaire

The H.O.D's of the respective departments are requested to spare some of their precious time and fill up the questionnaire.

(This information will be kept confidential)

Name of the department-

HOD of the department-

1. Do you use HIS in your Department?

- Partially
- Fully
- No

2. Recording computerised data is boring and should be replaced back to paper-based recording?

- Agree
- Disagree
- Strongly agree
- Strongly disagree

3. Do you think the hospital should do the camp registration?

- Yes
- No
- Not known

4. If yes, what type of registration should be done?

- Provisional UHID
- Permanent UHID

- First provisional and then Permanent, if turn up
- Not known

5. Do the clinical department need the record treatment like the medication, investigations, procedures etc. (Treatment planning systems)?

- Yes
- No
- Not known

6. Does senior doctors need the graph record of the vital signs?

- Yes
- No
- Not known
- Maybe

2. On a scale 1-5, how much do you think that the system should have IP/OP EMR

- Strongly agree
- Strongly disagree

3. In order to define the type of nursing care required (e.g. Medicine and diet to be given, health indicators to be watched etc.) , do you need a nursing care plan in HIS?

- Yes
- No
- Not known
- Maybe

4. Does your department need TAT capturing window?

- Not Mandatory but Required
- Mandatory
- Not required

5. Requirement of Dossier based billing Facility?

- Definitely yes
- Yes

- No

6. Requirement of Auto Indenting and Auto Purchase Request feature?

- Definitely yes
- Yes
- No

7. Requirement of Admission, Discharge, Transfer (ADT) Module?

- Yes
- No
- Maybe

8. What type of appointments are required from the new HMIS?

- E-Consultation appointment
- OPD Consultation appointment
- Home Care appointment
- Service appointment
- Equipment wise service appointment

9. Approval matrix in the SCM should be less and will be performed through the HMIS to fasten the procurement process?

- Agree
- Disagree
- Strongly Agree
- Strongly Disagree
- Neither disagree nor agree

10. which HR module is required in PHASE 1

- Leave management
- Payroll
- Attendance
- Trainings and Recruitment
- Employee Portal
- Appraisal/ Performance Management

11. On A Scale of 1 to 5, do you think Upgraded software (Shivam Medisoft) will meet the required expectations and user's friendly?

- Strongly Disagree
- Strongly Agree
