Internship Training

at

Oxyent Medical Pvt. Ltd

Digital Prescription

Name: Dr. Yashika Sharma

Enrollment No: PG15\085

Under the guidance of

Ms. Kirti Udayai

[Assistant Dean]

Post Graduate Diploma in Hospital and Health Management

2015-17

International Institute of Health Management Research New Delhi

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The certificate is awarded

to

Name Dr.Yashika Sharma

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

Product Development

and has successfully completed her Project on

Digital Prescription

Date 1st. May. 2017

Organisation: Oxyent Medical Pvt. Ltd.

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

We wish him/her all the best for future endeavors

Training & Development

Head-Human Resources

Pvt. Ltd.

This is to certify that Dr. Yashika Sharma student of Post Graduate Diploma in Hospital and Health Management (PGDHM) from International Institute of Health Management Research, New Delhi has undergone internship training at Oxyent Medical Pvt. Ltd. from 20th January,2017 to 1st May,2017.

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

The Internship is in fulfillment of the course requirements.

I wish him all success in all his future endeavors.

Dr. A.K. Agarwal
Academics and Student Affairs

(IIHMR, New Delhi)

Ms.KirtiUdayai Dean,

(IIHMR,New Delhi)

Certificate of Approval

The following dissertation titled **"DIGITAL PRESCRIPTION"** at **"OXYENT MEDICAL PVT. LTD.** is hereby

approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **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
MR. ASHISH ROY	
MS. KIRTI UDAYAI	
MR. VINAY TRIPATHI	

Certificate from Dissertation Advisory Committee -

This is to certify that Dr. YashikaSharma , a graduate student of the Post- Graduate Diploma in Health and Hospital Management has worked under our guidance and supervision. She is submitting this dissertation titled "DIGITAL PRESCRIPTION" at "OXYENT MEDICAL Pvt. Ltd." 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.

Kirti Udyai

Ms. Kirti Udyai
(Assistant Dean)

Ms. Suneyna Bansal
(Oxyent Medical Pvt. Ltd.)

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Ms.Kirti Udyai

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INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH, NEW DELHI

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **DIGITAL PRESCRIPTION**submitted by **Dr. Yashika Sharma** Enrollment No.**PG\15\085** under the supervision of Ms. KirtiUdayai for award of Postgraduate Diploma in Hospital and Health Management of the Institute carried out during the period from **20th January, 2017** to **1st May, 2017** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Signature

FEEDBACK FORM

Name of the Student: Yashika Bansal

Dissertation Organisation: Oxyent Medical

Area of Dissertation: Product Development

Attendance: Full

Objectives achieved: Yes

Deliverables: On time

Strengths: collaborative,hardworking ,committed

Suggestions for Improvement: presentation skills

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

Pvt. Ltd.

Signature of the Officer-in-Charge/ Organisation Mentor (Dissertation) :

Date: 16th May 2017

Place:New Delhi

ABSTRACT

Healthcare in India is both a complex challenge and an immense opportunity. The Indian Health care industry is growing at a rapid pace (CAGR of 17 per cent) and is expected to become a US $280 billion industry by 2020 (1). IT deployment has gained paramount importance in the Indian healthcare delivery segment. It's being implemented in various departments of the hospitals, ranging from billing and finance to administration and even patient care, there by simplifying the operations to a great extent.

The 21st Century is the age of informatics. Today's doctor needs to be as well versed in the basics of Information Technology as he/she is in anatomy, physiology and pharmacology. The healthcare Industry has evolved rapidly in the past few years; adopting state-of-art infrastructure, robotics, information systems, IOT devices, etc. Information Technology should necessarily be an integral part of any modern healthcare system. It would be no exaggeration to state that IT has made and is making and will continue to make a significant difference in patient care. Whether it is in the field of diagnosis, investigations, treatment, documentation, retrieval of information, access to state of the art knowledge, medical instrumentation, teaching, research, etc. IT has made a major difference.

In spite of the obvious short term and long term benefits it is a matter of deep concern that the use of IT in the healthcare industry is far less than its use in banking, commerce, travel, automobile or almost any other industry. Less than 2 per cent of gross revenues are set apart for deployment of ICT, compared to 5 to 8 per cent in most other industries (2).

National Medication council defines medication errors as any preventable event, that may cause or lead to inappropriate medication use or patient harm while the medication is in control of the health care professional, patient, or consumer [(3)].

Medication Errors are common in general practice and in hospitals. Two very common types of medication errors are Prescribing Errors and Erroneous Medical Decisions. Any step in prescribing process can generate errors, for example, a fault in dose selection, omitted transcription, and illegible handwritings

Protecting child's health and providing proper care is most important for parents and doctors. Maintaining baby's record from infancy to adolescence is very crucial and hectic task.

To solve this problem, iCHR provides paperless platform integrating parents, doctors and hospitals. It provides quick view of automated vaccination records, schedule and growth monitoring data, and prescriptions on mobile application.

Smart prescription automates all the steps of prescription writing starting from chief complaints, clinical examination, investigation and final diagnosis in simple, user friendly and time efficient manner.

ACKNOWLEDGEMENTS

I would like to express my deepest appreciation to all those who provided me the opportunity to complete this report. A special gratitude to the OXYENT Medical Team, whose contribution in stimulating suggestions and encouragement, helped me to coordinate my project especially in writing this report & improved my presentation skills thanks to their comment and advices.

Furthermore I would also like to acknowledge with much appreciation the crucial role of the staff of OXYENT Medical, who gave the permission to use all required equipment and the necessary materials to complete my Project report. A Special thanks to my mentor at IIHMR, Delhi, Ms. Kirti Udayai, who helped me to assemble the parts and gave suggestions about the project.
I would like to thank the study participants for their contribution to this investigation. It would not have been possible to complete my research work without the physical and unquantifiable moral support of Medical staff of the various hospitals.

Last but not least, many thanks to my Chief Technical Officer, Mr. Harpreet Singh who has invested his full effort in guiding me & providing me an exposure. Finally, an honorable mention goes to my family and friends for their understanding and supporting me in completing this project.

Thank You

Dr. Yashika Sharma

PGDHM

IIHMR, New Delhi

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LIST OF SYMBOLS & ABBREVIATIONS

ISO: International organization for standardization

DSIR: Department of Scientific and Industrial Research

R& D: Research & Development

IOT: Internet of things

iADSS: Information And Decision Support System

iCHR: Integrated Child Health Record

EHR: Electronic Health Records

PMP: Project Management Professional

TB: Tuberculosis

PHC: Primary Health center

FAQ: Frequently asked Questions

GDP: Gross Domestic Product

HL7: Health Level 7

CHR: Clinical Health Record

PHR: Personal Health Record

SRS: Software Requirement Specifications

GUI: Graphical User Interface

CEO: Chief Executive Officer

CAGR: Compounded Annual Growth Rate

EHR: Electronic Health Record

EPR: Electronic Patient Record

EMR: Electronic Medical Record

HIS: Hospital Information System

PART – 1 INTERNSHIP REPORT

Introduction to Organization

Oxyent is an ISO 9001:2008 and DSIR (Department of Scientific and Industrial Research) recognized company based in Delhi, India. The company's development and R&D center is located at DLF Jasola, New Delhi. The company's framework and its components incorporating industry's best practices along with specialized domain knowledge helps in achieving goals of informatics system.

Oxyent's goal and vision was, and will always be, to provide affordable, functional software and services to various domains. The team consists of domain experts and a group of highly motivated young professionals who are dedicated enough to share the company's value system and to push it to new heights.

Oxyent has State of art technology with focus on Analytics, IoT and Cloud Computing; with immense experience

Figure 1: Lifeline of Oxyent

in product and services domain with proven track record with Net Scope, iADSS and iCHR. With dedicated team of engineers with strong academic background more than 60% of team having degree of Masters and PhD in Software Engineering, Mathematics and Machine Learning; the team raises above individual skills to help customer meet last mile in translation of business requirement.

The advisory board and consultants comprise of best mind in Healthcare domain in India. They also work with partners and experts in other domain across countries in Logistics, HR and Supply Chain.

Oxyent Medical launched Integrated Child Health Record (iCHR) in November 2015 as- India's 1st Hospital linked Integrated Child Health Record – a revolutionary concept of automated vaccination record and growth monitoring, for children. iCHR is up and running currently in Fortis La Femme, Jaypee Hospital, Paras Hospital, Bhagat Chandra Hospital& Alchemist Hospital.

Area of Involvement

The Internship Period was from 20TH January 2017 to 15th May 2017. During this Period, I worked as Business Analyst for Integrated Child Health Record (iCHR).

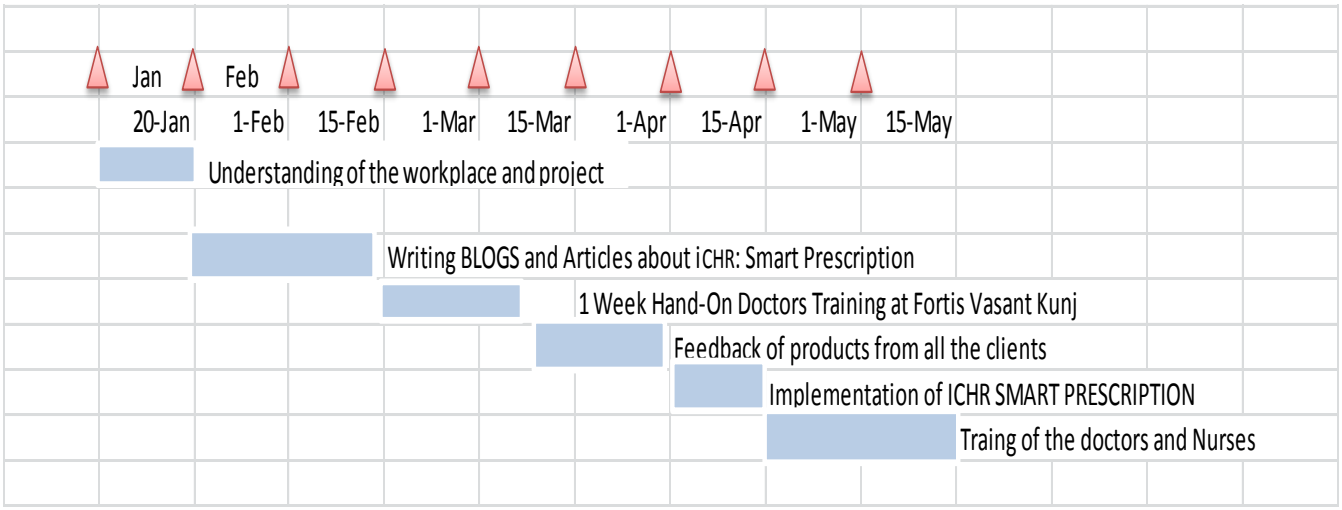


Figure 2: Gantt chart showing the tasks undertaken during the Internship Period.

Project Overview:

Integrated Child Health Record:

Protecting a child's health and ensuring proper nutrition and growth is the single most important goal of all parents. One of the most important ways of protecting a child's future is timely vaccination and every single parent always tries hard to get their child vaccinated, no matter what the circumstances are Vaccination plays a very integral part in establishing a bond between parent/child and the doctor/hospital, not only in the first few years of life but often till adolescence. Maintaining a record of vaccinations for life is extremely important as it not only gives parents constant assurance about their child's health but is also now an important document for school admissions and for visa purposes.

Current vaccination record keeping involves written entries in books/cards, which are manually entered by the doctor and religiously carried by the parents, whenever they visit the hospital. There are numerous disadvantages of this universally practiced system, such as

- Vaccination records are not reproducible since no records are kept by the hospital.
- The sole responsibility of protecting the record lies with the parent.

- If the vaccination record is misplaced or damaged they are lost forever and there is no way to recover this valuable information.
- If the parent forgets to bring the record during the doctor's visit, very often the vaccinations cannot be administered as the doctor is unaware of the previous record.
- There is no authenticity, as anyone can make entries in the vaccination record.
- Since entries are not automated there is no mention of the brand of vaccination used, which may cause confusion to parents as well as doctors (as some brands are not interchangeable).
- Although most vaccination cards/books have growth charts, growth parameters are seldom plotted on the charts as these are time consuming or are plotted wrong due to human error.

In order to empower both parents and doctors, iCHR was introduced – a revolutionary concept of automated vaccination record and growth monitoring, for children. This project, mainly deals with successful recording and submission of each visit details including the vital parameters and the vaccination details recorded in the system by the doctor. Any authorized user can use the application. All features and the underlying data would be controlled by a central access database.

During my Internship Period, I was involved in the requirements gathering part from the Internal as well as External Resources for the Sales of iCHR. Initially for the first week, I was trained about the product with documentation and demos of the iCHR software. Training was provided by the organization for coming up with Ideas & understanding the functionality of the system. Training was to understand the video and concept behind iCHR. Demo Versions of the web and mobile application of the iCHR were studied & understood to get hold of the functionality of the system.

Followed by a training exercise to be performed on the web based software and the mobile application of iCHR.

Once the functionality & the objective of the project was understood, a structured questionnaire was drafted & requirements were gathered & validated from the Practioner at one of the hospital deployed. The Phase I consisted to target Delhi NCR, with March being Delhi & Gurgaon, April would include Noida, and May with Faridabad as the target market. A strategy plan was derived and each sales individual was assigned a set of target. Documentation of the strategy and plans was carried out. FAQ of the cost and challenges faced were also documented.

After documentation, a financial analysis of the market was done. This involved documentation of Implementation Specification for Indian Scenario. Various workflows involved according to the setup of the healthcare facility; that is; A Corporate Hospital, A Nursing Home & A Polyclinic were documented Theses workflows were designed on the basis of my work experience & the questionnaires designed so that information could be gathered from certain doctors. During this

Period the developing team was also guided regarding the Graphical User Interface (GUI) & the design of the system for implementation of iCHR.

Managerial Task within the Organization

A project plan resource wise was made and is followed till date. The tool used for project management was JIRA – Project Management Professional (PMP) & Bug tracking. This tool helps to manage the entire project well with timeline. The project plan cycle was done for the developers for adding new features to the software as well as for the sales to team for their strategy and penetration into the market. For sales it consisted of the following stages: -

- Project Initiation
- Project Planning
- Project Execution
- Project Evaluation

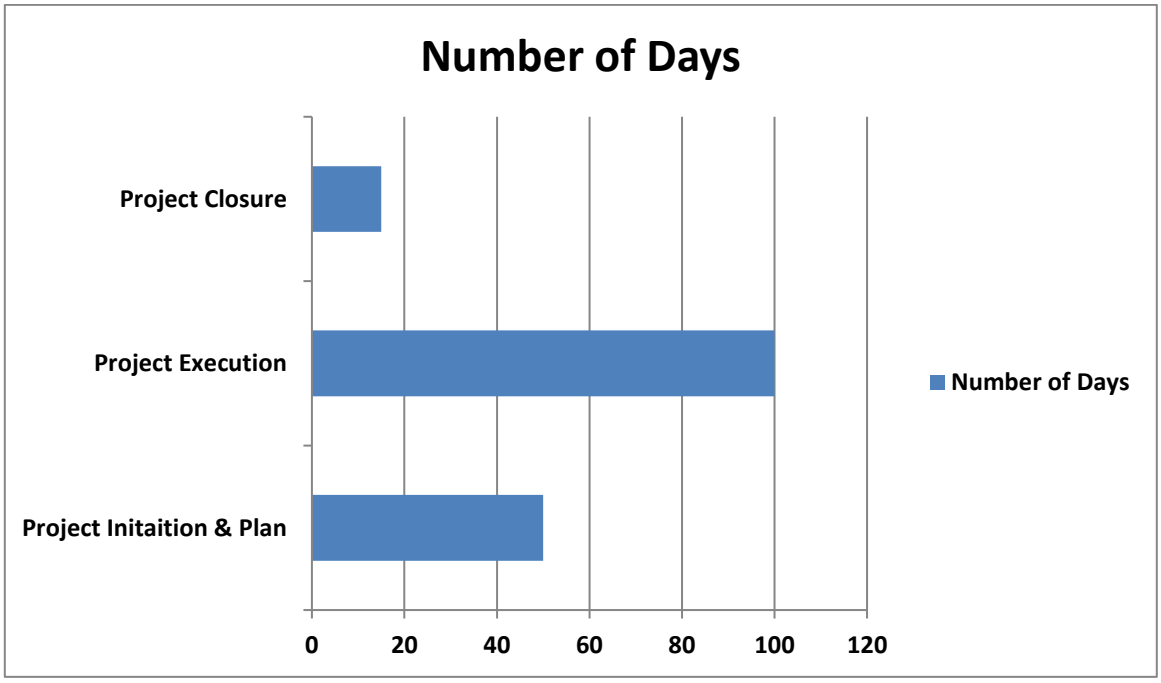


Figure 3: Start Date & Expected Number of days for completion of each phase

Project Initiation

This stage started on January 2017 and is still in progress. The following were the task done during this phase: -

- Identify and document the need/objectives that the project will address.
- Define the objective, approach and controls of the project.
- Ensure a clear and common understanding of the deliverables that will be produced.
- Clear understanding of the market penetration
- Understanding of the competitors and the advantage over them
- Specify what additions need to be completed in order to produce the deliverables.
- Determine the type of strategy followed
- Estimate how long it will take at each hospital
- Obtain appropriate management approval for effort.

Project Planning

Once the project cost was approved, effective deployment in hospitals was critical to successful resourcing and execution of the project activities. This stage included development of the overall project structure, the activities and work plan/timeline that formed the basis of the project management process throughout the project lifecycle. This Process helped in setting out the procedures that will be used within the project for tracking progress, utilizing tools and methodologies, communicating with the project team members, users and other stakeholders, and resolving issues, problems and addressing change requests.

Project Status Report

The project status report communicated the progress of the project across all the levels. The report was generated at the end of every week & also monthly. The report helped in the following ways:

- Reporting the progress of the project towards its objectives, as measured against the plan.
- Evaluating progress, weekly as well as monthly.
- Reporting issues to the authority and seek assistance through escalation, when and as necessary.

Learning from the Internship Period

The Internship Period gave me the hands-on experience with the product development life cycle in the healthcare industry and also to understand the sales prospective for a health IT product. The major learning gathered from this period are as follows:

- Market Research

- Requirement Gathering
- Design Specifications according to the User Interface
- Creating the Project Plan & Execution
- Interaction with the various clients involved

PART – 2 DISSERTATION REPORT

Chapter – 1 Introduction

Healthcare in India

Healthcare industry is growing at a tremendous pace owing to its strengthening coverage, services and increasing expenditure by public as well private players.

• During 2008-20, the market is expected to record a CAGR of 16.5 per cent.

• The total industry size is expected to touch US$ 160 billion by 2017 and US$ 280 billion by 2020.

• As per the Ministry of Health, development of 50 technologies has been targeted in the FY16, for the treatment of disease like Cancer and TB. (4)

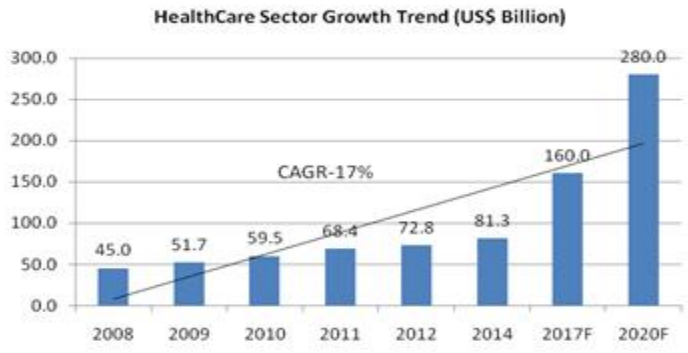


Figure 4: Healthcare in India and its trends (3)

Healthcare has become one of India's largest sectors - both in terms of revenue and employment. Healthcare comprises hospitals, medical devices, clinical trials, outsourcing, telemedicine, medical tourism, health insurance and medical equipment. The Indian healthcare sector is growing at a brisk

pace due to its strengthening coverage, services and increasing expenditure by public as well private players.

Indian healthcare delivery system is categorized into two major components - public and private. The Government, i.e. public healthcare system comprises limited secondary and tertiary care institutions in key cities and focuses on providing basic healthcare facilities in the form of primary healthcare centers (PHCs) in rural areas. The private sector provides majority of secondary, tertiary and quaternary care institutions with a major concentration in metros, tier I and tier II cities.

India's competitive advantage lies in its large pool of well-trained medical professionals. India is also cost competitive compared to its peers in Asia and Western countries. The cost of surgery in India is about one-tenth of that in the US or Western Europe (4). There is a significant scope for enhancing healthcare services considering that healthcare spending as a percentage of Gross Domestic Product (GDP) is rising. Rural India, which accounts for over 70 per cent of the population, is set to emerge as a potential demand source (5).

India requires 600,000 to 700,000 additional beds over the next five to six years, indicative of an investment opportunity of US$ 25-30 billion. Given this demand for capital, the number of transactions in the healthcare space is expected to witness an increase in near future. The average investment size by private equity funds in healthcare chains has already increased to US$ 20-30 million from US$ 5-15 million, as per PriceWaterHouseCoopers (6).

On average, one episode of hospitalization accounts for 58% of per capita annual expenditure. At the same time, increases in per capita spending, disposable income and health insurance penetration makes the health industry an attractive market opportunity to many investors. Historically, private spending within the sector has outmatched public spending by 80:20. While this allows for agile innovation and free-market competition that drives down prices, this often creates a skew towards urban care for the wealthy. Large low-income populations in rural and peri-urban areas are often neglected (7).

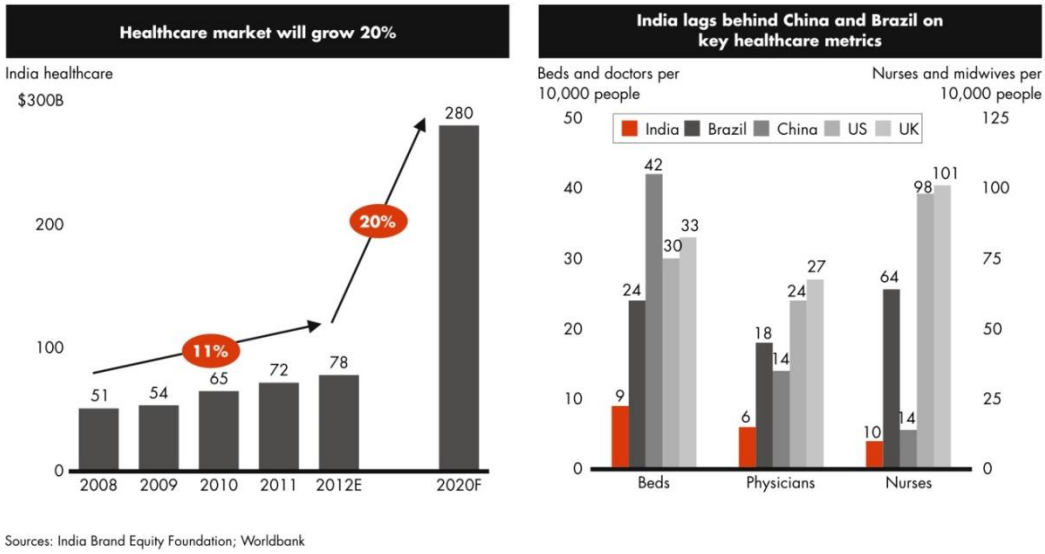


Figure 5: Healthcare in India and comparison to other countries (6)

Health IT should not be viewed as a dehumanizing process. IT should be viewed as a tool to achieve an end. Not an end by itself. IT has improved patient care in many, many ways. Providing real time appropriate relevant information to every stakeholder in the healthcare industry makes all the difference. Well informed patients and doctors can make significant differences in the standard of healthcare. Rapid increase in computing power is accompanied by exponential reduction in costs. Though the healthcare IT market in India has grown 200—300 per cent in the last 10 years, it is accepted that the healthcare sector has to be more IT-oriented (2).

E- Prescription

E-prescription or electronic prescribing is a technology framework that allows physicians and other medical practitioners to write and send prescriptions to a participating pharmacy electronically instead of using handwritten or faxed notes or calling in prescriptions

At the most basic level, an e-prescribing system serves as an electronic reference handbook. More sophisticated e-prescribing systems act as stand-alone prescription writers. They can create and refill prescriptions for individual patients, manage medications and view patient history, connect to a pharmacy or other drug dispensing site, and integrate with an electronic medical record (EMR) system.

PROBLEMS ASSOCIATED WITH HANDWRITTEN PRESCRIPTIONS

- Illegible Handwriting
- Misinterpretations

- Increase chances of dispensing errors E.g. LASA (Look Alike Sound Alike) drugs
- Poor maintenance
- Easy to misplace

To beat such problems E-Prescription is growing rapidly, not just because technology has improved, but because of substantial benefits for the patients and physicians.

Advantages of E-Prescription

- **Prevent Errors**: Smart Prescription eliminates handwriting errors and provides an aesthetic view of prescriptions.
- **Digitization**: Parents can view the prescribed prescription on the mobile application, help in proper documentation, prevents conditions like damage of paper, lost and theft.
- **Easy and Quick**: Auto-populated fields and single click prevent writing long prescriptions, thus saves the time of the physicians as well as of the patients.
- **Easy Identification of Drugs**: Many drugs are available in different forms like Syrup, Tablet, and Capsule. There is proper segregation of drugs based on concentration, quantity etc. prevent dispensing errors.
- **Remote Monitoring**: It increases the doctor-patient interaction. Physician can prescribe drugs from any part of the world.
- **Disease Predictions**: Based on data available through "Smart Prescription" we can predict future complications and send notifications to physicians beforehand.
- **Automated Clinical Decisions Support**: By quick view of growth charts based on length, weight, height, and head circumference doctors can modify dosage and prescribe other supplements accordingly.
- **Instant Notifications**: The physicians will have full visibility into all of the patients documented allergies, previously prescribed drugs, and potential negative reactions.

Review of Literature

E-prescribing is the use of health care technology to improve prescription accuracy, increase patient safety, and reduce costs as well as enable secure, real-time, bi-directional, electronic connectivity between clinicians and pharmacies. This is achieved by providing prescribers with a secure means of electronically accessing health plan formulary, patient eligibility, and medication history at the point of care and securely transmitting the prescription electronically into the pharmacy's computer system. The purpose of this paper is to review the key features in many e-prescribing applications as well as some of the benefits and challenges.

There are many drivers contributing to the increased use of e-prescribing applications. Improved patient safety is probably the most important, because e-prescribing generates legible prescriptions that have been checked at the time of prescribing against the patient's electronic medication profile for possible harmful interactions. Medication errors and adverse drug events contribute to approximately 7,000 deaths a year, with an estimated cost for drug-related morbidity and mortality exceeding $77 billion a year. (9) A minimum of 1.5 million preventable medication errors occur each year in hospitals, nursing homes and ambulatory care settings, according to the Institute of Medicine (IOM). IOM has recognized e-prescribing as one of the most promising tools to reduce such errors and recommends that all prescriptions be written electronically by 2010.(10) The Massachusetts eRx Collaborative has documented this increase in safety: 2 percent of electronic prescriptions written in June 2006, more than 8,000 prescriptions, were changed by prescribers as a result of drug-drug or drug-allergy interaction notifications provided to prescribers through an e-prescribing system.(11)

Data released in October 2007 by the Southeast Michigan ePrescribing Initiative (SEMI), a broad coalition involving General Motors, Ford Motor Company, Chrysler LLC, the United Auto Workers (UAW), Blue Cross Blue Shield of Michigan, Health Alliance Plan, Henry Ford Medical Group, Medco Health Solutions, Inc. and CVS Caremark Corporation, also demonstrated that e-prescribing significantly reduced medication errors. The analysis is the first to look at the overall results of the SEMI program, which has generated nearly 6.2 million prescriptions using e-prescribing technology since its launch in February 2005. In October 2007, the program had nearly 2,500 physician participants electronically prescribing more than 282,000 prescriptions each month. Their findings demonstrated that e-prescribing substantially improved patient safety by alerting physicians of risks related to drug interactions and other potential medication problems. This resulted in a significant number of prescription changes, which prevented possible adverse events. Among a sample of 3.3 million prescriptions reviewed, a severe or moderate drug-to-drug alert was sent to physicians for more than 1 million prescriptions (33 percent), resulting in nearly 423,000 (41 percent) of those prescriptions being changed or canceled by the prescribing doctor. More than 100,000 medication allergy alerts were presented, of which more than 41,000 (41 percent) were acted upon.(12)

Another driver contributing to the increased use of e-prescribing is that the population in general, including prescribers and physician office staff, has become more familiar with computer technology. Computers, PDAs, digital notepads and other computer-type devices are now commonplace. More physician offices use computerized office management systems and electronic medical records. The net cost of e-prescribing applications, computers and connecting to the internet or intranet through vendors and wireless networks have all decreased in price, making them more accessible. Lastly, all the key constituencies, prescribers, patients, pharmacies, health plans and prescription benefit management companies (PBMs) see the advantage in the promise of e-prescribing.

The Medicare Prescription Drug, Modernization and Improvement Act of 2003 (MMA) requires that Medicare Part D plans must support e-prescribing by 2009. The MMA provides for the development of e-prescribing standards. All prescription drug plans participating in Medicare must have the capability to handle e-prescribing by 2009. The adoption of e-prescribing by prescribers and pharmacies is voluntary. Prescribers are not required to prescribe electronically, but if they do, they must use information technology that conforms to standards established by the Centers for Medicare & Medicaid Services (CMS).

Benefits to prescribers

When e-prescribing is fully implemented in the office environment, prescribers find that efficiency increases. When the prescriber enters the prescription into the e-prescribing application, the prescription is transmitted to the pharmacy and may be entered into the patient's medical record and integrated with the office billing system if these systems are linked electronically. Automated steps free up the prescriber and office staff from routine tasks and allow the staff to perform other functions. Such efficiencies translate into lower overall operating costs.

E-prescribing improves the accuracy of the prescribing function. The legibility issues related to a handwritten prescription are resolved. Of equal or greater importance, the data entry format, where the prescriber must choose the drug name, quantity and directions from an established list of choices, improves the standardization of the prescription writing process. Many e-prescribing applications will auto-populate the prescriber's commonly used medications with quantities and directions. This standardization streamlines the process and reduces the number of errors. The American Medical Association (AMA) has acknowledged the benefits of e-prescribing functionalities, including the ability to review patient medication histories, formulary information and safety alerts, in order to help reduce the risk of adverse drug events and out-of-pocket costs for patients.(13) In the SEMI initiative, nearly 56,000 lists of dispensed prescription histories were downloaded by physicians.(14)

Many e-prescribing tools are able to connect to the patient's health plan or PBM information and provide feedback as to whether a specific medication is included on the organization's formulary, and if not, provide a list of formulary alternatives. This additional information available to the prescriber reduces the number of questions that patients or pharmacists dispensing a prescription ask regarding formulary issues. The prescriber is able to obtain that information as the prescription is being written. E-prescribing applications have the potential to check drug information databases for appropriate prescribing guidelines, the patient's complete medication profile for drug interactions, and the patient's electronic medical record for disease contraindications. This resource allows the prescriber to review the chart while the patient is still in the office and to request additional information from the patient if necessary. E-prescribing enables prescribers to take advantage of larger medication history databases through electronic prescription data communication link organizations. Such organizations electronically route patient medication history and pharmacy

benefit information to physicians in their offices and at hospitals in order to improve patient safety. (15) This feature saves the prescriber valuable time and effort and further reduces the number of errors or adverse events.(16)

E-prescribing applications streamline communications between pharmacies and prescribers. The eprescribing tool can automatically send the prescription to the pharmacy via a fax server or through secure electronic transmission of prescriptions. In addition, pharmacies have the capability to request refills electronically or to pose routine prescriber questions via the e-prescribing system rather than through a phone call to the prescriber.

This process is more efficient because refill requests can be queued up and reviewed at the prescriber's convenience. The prescriber will be able to review those requests anywhere using a hand-held device (PDA) or a remote computer. The end result is increased efficiency and fewer pharmacy calls to the prescriber.

Benefits to patients

The benefit most evident to patients is increased convenience. Prescription orders sent via fax or electronically to pharmacies make it possible for patients to arrive at the pharmacy and have their prescription orders waiting for them. If a prescription order is sent to a mail order pharmacy, the patient does not have to mail it and may receive the prescription in the mail several days earlier. Refill orders will also be streamlined and processed faster.

As explained above, the ability to cross-check a new prescription order at the point of prescribing for drug interactions and the patient's medical conditions will result in a reduced incidence of adverse events. Warning checks for allergies and duplication of current medications can be communicated to the prescriber. There is the capability to cross-check the patient's prescriptions with their current insurance coverage and across other insurance coverage where the patient may be eligible for benefits.

Lastly, patients may be able to reduce their copayment expenses, because prescribers will have the patient's health plan or prescription benefit Management Company (PBM) formulary information available at the point of prescribing. This will make it easier for the prescriber to consider alternatives and to discuss options directly with the patient while the patient is at the prescriber's office rather than while the patient is waiting at the pharmacy. The SEMI initiative found that when a formulary alert was presented, 39 percent of the time the physician changed the prescription to comply with formulary requirements.(17)

Benefits to pharmacies

E-prescribing has the potential to significantly improve pharmacy dispensing operations. Prescriptions that are electronically transmitted are more legible and can improve work flow.

Systems exist for electronic prescriptions to automatically flow into the pharmacy's prescription filling software and prepare the label and paperwork ready for the pharmacist review. More effective handling of refill authorization and routine issues via electronic means will also improve the efficiency of pharmacy operations. Lastly, many of the issues currently resolved at the pharmacy level, such as benefit design, formulary alternatives, utilization management requirements, and quantity limits, will be addressed at the time the prescriber transmits the prescription, and a clean prescription will be received at the pharmacy.

Benefits to pharmacy benefit management companies (PBMs) and health plans

E-prescribing brings many benefits to PBMs and health plans. Studies have demonstrated that drug costs may decrease and plan performance may improve as a result of better formulary adherence, better drug utilization review, and fewer errors when the prescription claim is adjudicated.(18) PBMs benefit from simplification of the administrative process when the drug formulary is considered at the point of prescribing, because fewer prior authorizations are generated. In the future, there may be opportunities for improving drug utilization if PBMs or health plans are able to provide feedback at the point of prescribing, such as a patient's prior claim history from other prescribers. Savings from administrative simplifications and improved drug utilization can be passed on to payors, such as employers, that utilize PBMs and health plans to administer their pharmacy benefit. E-prescribing software also provides an opportunity for PBMs and health plans to implement clinical decision support tools, or electronic guidance, which encourages providers to follow recognized prescribing guidelines.

Challenges for e-prescribing

The e-prescribing industry is rapidly changing. The number of prescribers using e-prescribing tools is growing rapidly. Some of the challenges are briefly discussed below:

• Usability/complexity: Some prescriber's offices do not make extensive use of computer technology. For those prescribers, introducing an e-prescribing application is a major hurdle. However, the trend is for most office personnel, as well as prescribers, to become more familiar with this technology.

• Financial consideration: Determination must be made as to who has the financial responsibility to pay for an e-prescribing system.

• Incorporation into workflow: This is a major factor in determining e-prescribing application success. If the e-prescribing tool is integrated with the office management, scheduling system, billing systems, and electronic medical records, then there is a greater potential for success.

• Prescriptions for controlled substances: As of April 2008, federal regulations prohibiting controlled substances from being electronically prescribed continue to be an impediment to the widespread adoption of e-prescribing.

• National standards: In order for all prescribers to communicate electronically with many different entities, pharmacies, PBMs, and health plans, it makes sense to standardize the data and information that is transmitted to each entity. The National Council for Prescription Drug Programs (NCPDP) has a long history of working with the pharmacy industry to build consensus for electronic claim transactions. NCPDP is doing the same with e-prescribing. NCPDP has been successful in developing a prescription order electronic standard (SCRIPT standard) and is working on developing other standards to support e-prescribing (e.g. SIG standard).

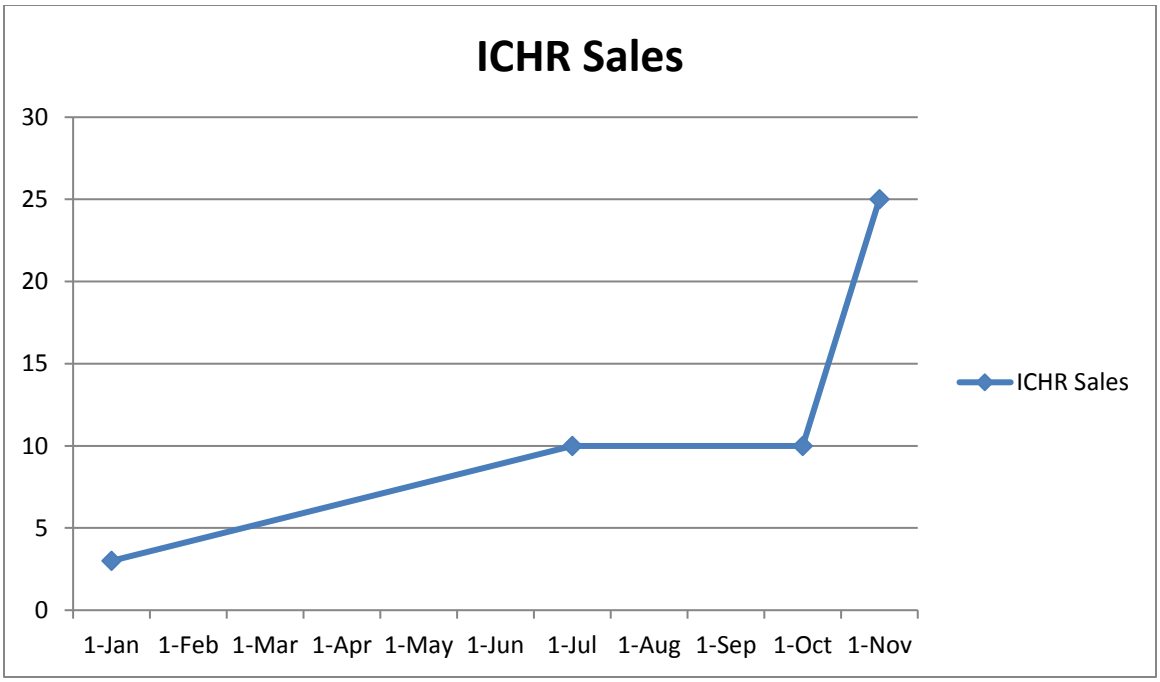
• Security and privacy concerns: E-prescribing vendors have successfully addressed the concern regarding the transmission of electronic records from prescriber to pharmacy or between other entities. The current standard is to use 128-bit encryption and has been found to be effective in protecting electronic prescriptions or medical records. However, the U.S. Drug Enforcement Administration has not permitted the use of eprescribing for controlled substances.

• Opportunity for new types of prescribing errors: Published studies conducted in hospitals using computerized prescription order entry (CPOE) have identified examples of computer-entry errors. One study found that a widely-used CPOE system facilitated 22 types of medication error risks. Examples include fragmented displays that prevent a coherent view of patients' medications, pharmacy inventory displays mistaken for dosage guidelines, and inflexible ordering formats generating wrong orders.(19) e-prescribing systems are implemented, health care professionals must monitor for errors that these systems may cause in addition to the errors that they prevent.

General Objective: To study the Knowledge, Attitude, & Adoption towards Electronic Prescription amongst Physicians

Specific Objective:

- To increase the retention of iCHR among parents.
- To know problems faced by users and to identify its solution.
- To study the Adoption of Electronic prescriptions among Physicians.
  Roles and Responsibilities:
- Developing technical solutions to *business* problems
- Advancing a company's sales efforts
- Defining, analysing and documenting requirements

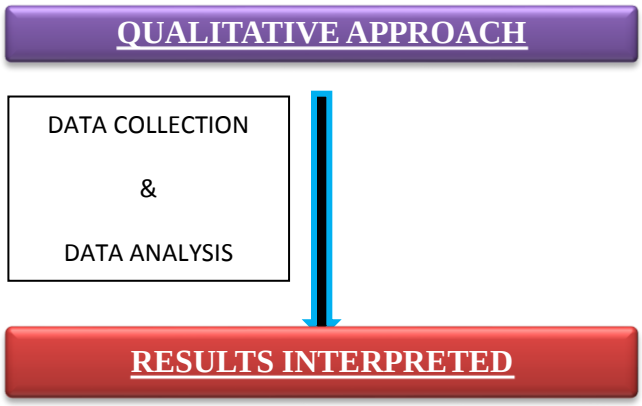


GRAPHICAL PRESENTATION OF ICHR SALES REVIEW

Project Management Plan

Research Design

The study is Qualitative by nature. The study employed primary data gathering through direct interviews of physicians. The research is derived from interviews conducted using questionnaires & focuses on the interpretation of the participants.



Sample Design

- Sample Unit: Current clients of iCHR.
- Sample Size: **50** Physicians from our clientele**.**
- Sampling Technique: Simple Random Sampling
- Sampling Area: Delhi, NCR hospitals and clinics

Data Collection Method

- Data Type : Primary data collection
- Data Collection Tool: Semi structured questionnaire through direct interviews

Limitations of Study

- Study limited to only current users of iCHR
- Involving Physicians from all the age group including residents would have given a clearer picture & accurate analysis.

Chapter – 3 Results & Findings

- ICHR require lots of typing
- Many competitors provide prescription with click buttons. Eg: DOCON
- Many physicians are not computer friendly
- Prescription is not in proper format and sequence
- Parents with children above 1 year of age found no features beneficial for them.

Recommendations

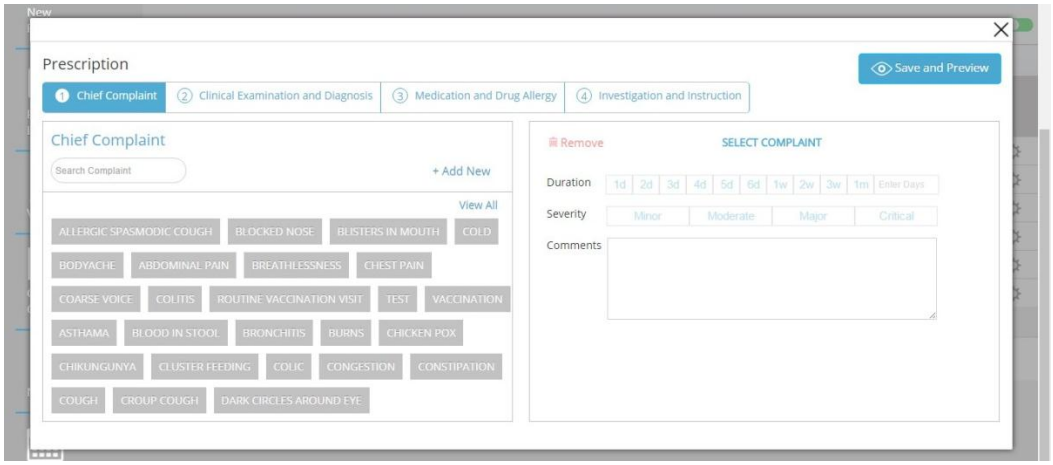
To achieve the above mentioned benefits, following recommendations should be taken: -

- Implementation of clickable E-prescription
- Proper sequence of the prescription like : chief complaint, symptoms, investigations and diagnosis
- Implementation of child development parameters, tooth shedding and eruption pattern and diet advices for parent retention and to increase sales

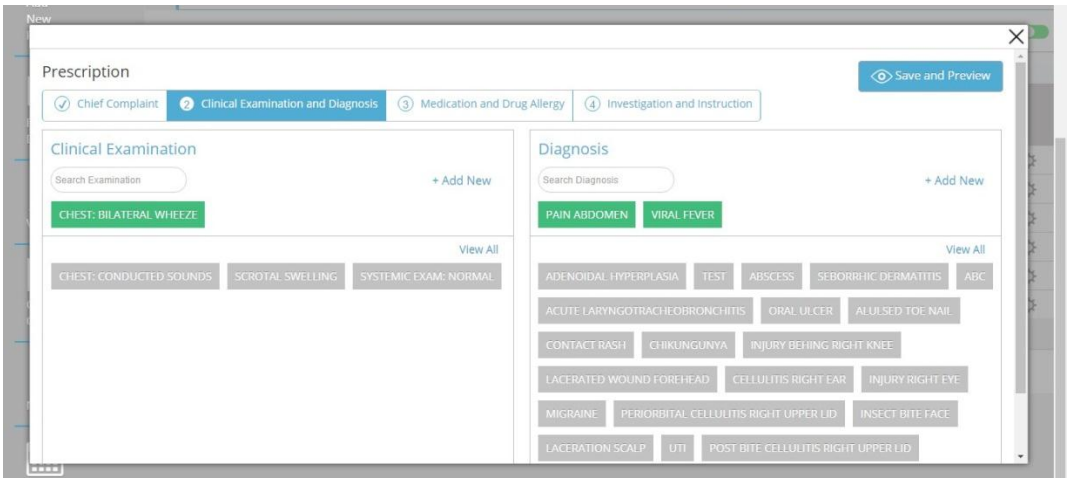
Implementation: iCHR E-Prescription (SMART PRESCRIPTION)

1. **Chief Complaint**: One click accessibility to the chief complaints with auto-populated list of complaints based on old records.

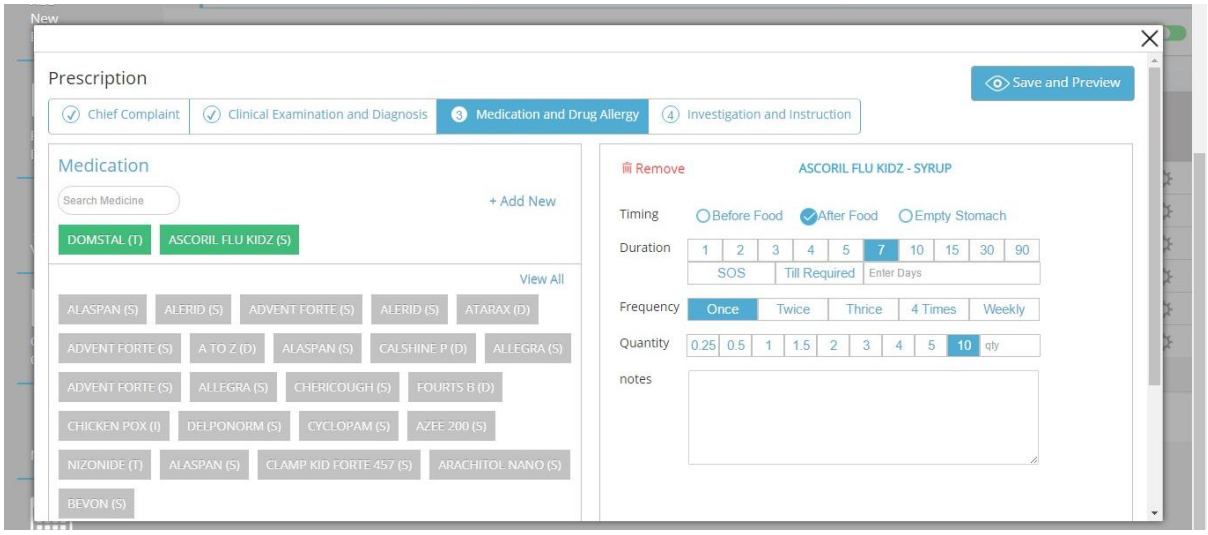
- "Quick search" by just clicking the first alphabet of the condition.
- Easy to "add" new conditions.
- Easy to incorporate durations and severity of the condition by just "one click".



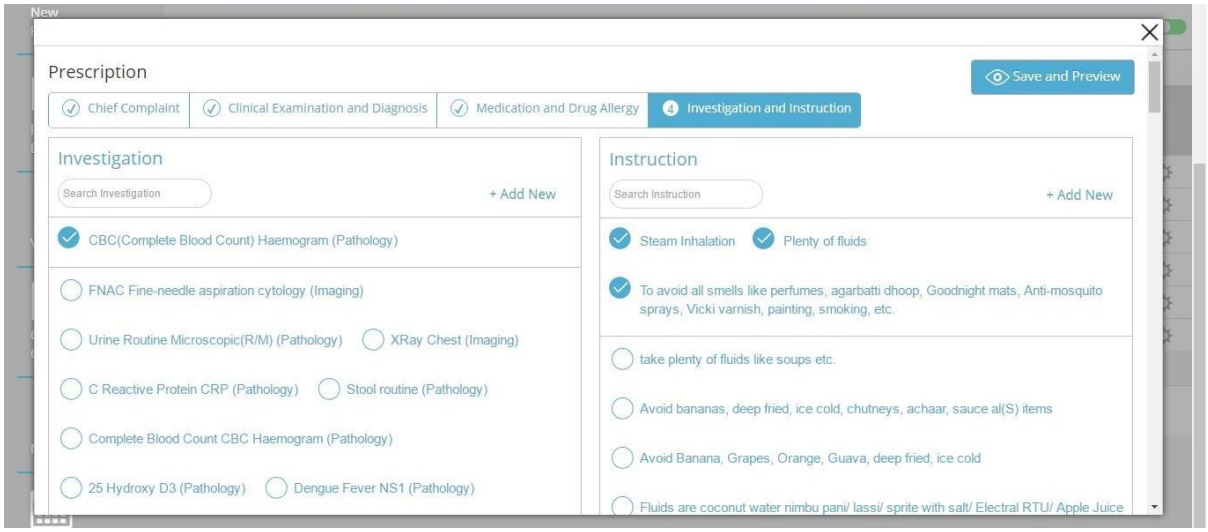
2. **Clinical Examination and Diagnosis**: Based on "chief complaint", iCHR's Smart Prescription auto-populate the associated examinations and provisional diagnosis.



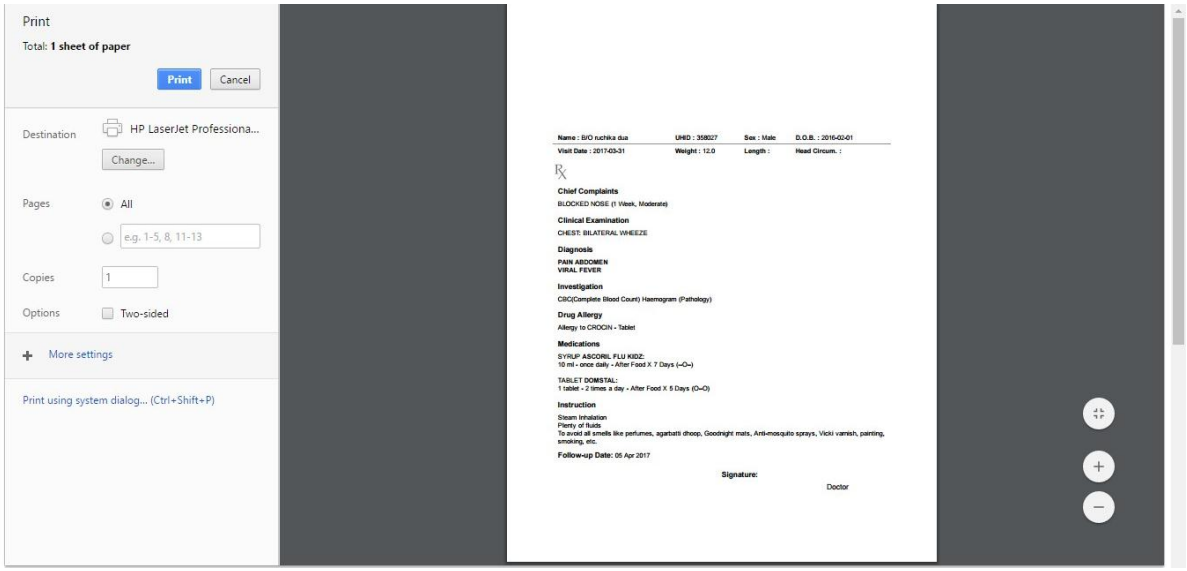
3. **Medication and Drug Allergy**: Based on previously prescribed drugs, it auto-populates medication options for the physicians.
   On the same screen we provide timings, duration, frequency, and quantity to be clicked by the physicians as per the guidelines.



4. **Investigation and Instructions**: Auto – population of investigations and instructions based on diagnosis



5. **Save and Preview**: One click on the button saves the prescription in proper sequence and easy to read format. Physicians can either give the print of the prescription to the patients or parents can access the same on their app.



CONCLUSION

Advances in technology and scientific understanding of disease process are presenting new opportunities to improve health through individualized approach referred to as personalized medicines. (20)

A key cornerstone to this potential approach is the knowledge by effective use of electronic medical records. E-prescription is very important part of electronic clinical decision support system. Thus, in coming years electronic health records will create new opportunities for scientists and clinicians to improve quality and effectiveness of health care industry. (20,21)

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