DISSERTATION

AT

MediIT Health Solutions Pvt.Ltd, Mumbai

By

Dr. Prashant Deshmukh

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International Institute of Health Management Research

DISSERTATION

AT

MEDIIT HEALTH SOLUTIONS PVT.LTD, MUMBAI

SUBJECT/PROJECT TITLE

PRACTICABILITY OF HY-EHR IN INDIAN HEALTHCARE MARKET- A QUALITATIVE STUDY

BY

DR. PRASHANT DESHMUKH

UNDER THE GUIDANCE OF

DR. ANANDHI RAMACHANDRAN

POST GRADUATE DIPLOMA IN HOSPITAL AND HEALTH MANAGEMENT

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INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH

NEW DELHI

The certificate is awarded to

Name
Dr. PRASHANT T. DESHMUKH

In recognition of having successfully completed her
Dissertation in the department of

Title
PRACTICABILIITY OF HY-EHR IN INDIAN HEALTHCARE MARKET- A QUALITATIVE STUDY

And has successfully completed her Project on

Title of the Project

Date: 09/05/2014

Organization
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He comes across as a committed, sincere & diligent
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We wish him all the best for future endeavors

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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 Dissertation is in fulfillment of the course requirements. I wish her all success in all her future endeavors.

21.5.2014

Dr. A.K. Agarwal
Dean, Academics and Student Affairs
IIHMR, New Delhi

Dr. Anandhi Ramachandran
Assistant Professor
IIHMR, New Delhi

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The following dissertation titled **"Practicability of HY-EHR in Indian Healthcare Market- A Qualitative study"** 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.

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DR. ABHIJIT CHAKRABARTY	21/05/14

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This is to certify that Mr. /Ms. /Dr. **DR. PRASHANT T DESHMUKH**, a graduate student of the **Post- Graduate Diploma in Health and Hospital Management** has worked under our guidance and supervision. He/ She is submitting this dissertation titled "**PRACTICABILIITY OF HY-EHR IN INDIAN HEALTHCARE MARKET-A QUALITATIVE STUDY**" at "MEDIIT HEALTH SOLUTIONS PVT. LTD" in partial fulfillment of the requirements for the award of the **Post- Graduate Diploma in Health and Hospital Management.**

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Designation, BUSINESS ANALYST
Organization
09/05/2014

Dr. Arundhi
Organization IIHMR
Designation, Asst. Prof.
Organization

INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH, NEW DELHI

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This is to certify that the dissertation titled "Practicability of HY-EHR in Indian Healthcare Market- A Qualitative Study " and submitted by Dr. Prashant Deshmukh Enrollment No.PG/12/063 under the supervision of Dr. Anandhi Ramachandran for award of Postgraduate Diploma in Hospital and Health Management of the Institute carried out during the period from 10th Feb 2014 to 12th May 2014 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.

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Name of the Student: DR. PRASHANT T. DESHMUKH

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PRACTICABILITY OF HY-EHR IN INDIAN HEALTHCARE MARKET- A QUALITATIVE STUDY

BY

PRASHANT DESHMUKH

PG/12/063

ABSTRACT

Electronic health records: Is nothing but digital version of paper medical records. These records can be accessed by all the stakeholders of the healthcare community. As compared to the western countries India has a very little awareness and acceptance of the EHR concept. There are very few studies from India about EHR in Indian healthcare scenario. This concept is very new to the stakeholders of the Indian healthcare community. As this concept is new many Indian healthcare companies are cashing on it and trying to revolutionize the Indian healthcare scene. Vendors are trying to attract stakeholders by giving them various portfolios of the EHR. They are facing tough competition from foreign vendors too. In order to survive in the market vendors are resorting to other ideas which are maligning the real concept of EHR.

This study focuses on one such startup in the EHR market. This study aims to find out the potential of the EHR and what other factors could help it in sustain its hold in the EHR market.

The study is based on various group meetings with stakeholders, references from the secondary database. The study was spanned out over a period of 3-4 weeks. During the discussions notes were collected in the form of paper record. Secondary data was collected and analyzed along with the notes. Categories were made by analyzing the notes. And inferences were drawn from the patterns seen amongst the categories.

The result showed that there are various barriers in the market regarding the adoption of EHR which can be grouped in5 categories. After doing the SWOT analysis of the startup. We came to conclude that this EHR has many strengths which can overcome the threats and barriers which are found in the study and become a market leader.

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ORGANIZATION PROFILE

About:

MediIT is the team of Professionals from different fields (Medicine, IT & Finance), came forward & joined hands together with the common objective: "To provide Simple & User-Friendly Health Care Solutions". The team MediIT has a perfect balance of the 'youth' - the main driving force & the 'experience' channelizing this driving force.

Founded in June, 2010; MediIT is Health Care Products & Health Care Service Provider company

MediIT is in the process of developing Affordable, High Quality Health Care Solutions for both Health Care Providers as well as Patients. Our innovative solutions will not only provide Basic Management features for Health Care Providers, but also provide user-friendly & valuable solutions to the patients. Our innovative concepts are surely going to bring 'Revolution' in Indian Health Care System & People's perspective towards Health.

Vision:

To develop & provide total automated Healthcare Delivery System i.e.: Simple, Effective & Proactive for the end-users

Mission:

To transform the current Indian Healthcare System & help India to reach high International Standards in Health care: by Provision of Qualitative (Healthcare) Service i.e.

a) Easily Accessible
b) Continuous
c) Coordinated
d) Compassionate
e) Comprehensive & yet,
f) Cost Effective

INTRODUCTION

The electronic medical record (EMR) is simply the electronic format of medical records. EMR stores various types of medical data. The data ranges from medical history, prescriptions, drug allergies to the patients hospital service bills and more. The currently used paper based system is insufficient, ineffective and involves high cost of maintenance. On the contrary, EMR has several advantages like easy data recovery, portability, collaboration etc. EMR assists doctors in making effective medical decisions with ease. In addition, EMR helps the service providers to effectively gather, maintain and recover patient's medical information with the help of hospital information system (HIS). Along with managing the medical data, EMR assists in hospital order management, hospital workflow management and security of the medical data. It assists the entire healthcare delivery process in reducing cost and maximizes the profit.

No doubt the western countries are the leaders in the EMR market both in terms of developed systems and its EMR adoption. While in Asia, it is growing but at a very slow rate. Some of the reasons why the West adopted it faster than India are perhaps based on certain specific factors dominating the Western healthcare scene, such as increased patient awareness, new government initiatives encouraging EMR, high penetration of computers, new product innovations, economic pressures on healthcare organizations and increased legal compulsions for greater accountability and well maintained records.

The growth in the Healthcare sector would be driven by healthcare facilities, both private and public sector, medical diagnostic and path labs, medical insurance sector and medical tourism. Research by McKinsey points that driven by strong local demand; Indian healthcare market is expected to continue growing close to previously projected rates of 10 to 12 per cent. With average household consumption expected to increase by more than seven per cent per annum, the annual healthcare expenditure is projected to grow at 10 per cent and also the number of insured is likely to jump from 100 million to 220 million. All these numbers and drivers show that there is immense potential for the healthcare sector, together with the IT and peripheral industry to benefit from it.

But there is very low penetration of HIT in India as compared to developed countries like the US. The total spending on IT by the US hospitals in 2011 amounted to $79-80 billion compared to healthcare IT spending of $305 million in India. The penetration of EHR has been highest among all others, growing by 13.5 per cent. It is expected to have the same rate or increase due to improving uptake and upcoming hospital projects.

The market has over 120 vendors with small to large scale offerings with variety of web based and client side products. There are approximately 35 domestic EMR vendors in India with multiple product portfolios.

Currently, in India, most of the users of health information systems/EMR/EHR/HIS are large corporate hospitals. Therefore, there are still many other possible clients that are "untouched". But, we have to keep in mind that private companies play a greater role than public sector. Private sector accounts for more than 80% of total healthcare spending in India and they are expected to be financially stronger and well managed. At the moment, most companies only use EMR for billing and administrative purposes than the core healthcare functions. EMR is actually more than just administration and billing

No doubt there is huge potential for growth and like most of the verticals this provides huge potential especially due to ever increasing middle class and population at large. People are becoming more sophisticated, healthcare spending is increasing, people are aging, therefore more people are getting sick, meaning better business for the healthcare industry, middle class income per capita is increasing, medical tourism is huge, and the healthcare industry is growing as a whole. Everything is moving to the right direction. Not to forget, we are looking at developing country where the concept is still developing and there are not as many players as in developed countries. We can see quite a number of familiar names that do not belong to the health care industry originally such as GE (Electric), Dell and Hewlett-Packett (Computer) and Wal-Mart (Retail). However, the opportunities they see in the health care industry with the EMR lure them to join the health care IT scene. None of these big names want to miss out on the potential of the According to the report from Kalorama Information, some of the big players that sells to hospitals are McKesson, Cerner, Eclipsys and MediTech while Allscripts, Epic, eClinicalworks, athenahealth and NextGen are among the leaders in sales to physicians, but no one dominates Comparing the major players between India and US, there are several big names that are similar such as GE Healthcare, Siemens, iSoft. These are power houses that operate internationally.

In the light of all these facts, this study would evaluate the stand of HY-EHR in the Indian healthcare Market.

REVIEW OF LITERATURE

Healthcare records going E-way- Bindu Gopal Rao: An abstract from Life Science India edition Aug-Sep 2012-It captures viewpoints of many prominent names in Healthcare industry regarding the current and future status of EMR in India. It also focuses on the challenges which EMR are facing in India. It concludes that though there are cost barriers legal barriers but EMR is fast becoming a norm in Indian hospitals.

Albert Boonstra, Manda Broekhuis (2010 Aug 6): Barriers to the acceptance of electronic medical records by physicians from systematic review to taxonomy and interventions. Pubmed. doi: 10.1186/1472-6963-10-231 They both did a literature review of various studies to identify, categorize, and analyze barriers perceived by physicians to the adoption of Electronic Medical Records (EMRs). Four databases, "Science", "EBSCO", "PubMed" and "The Cochrane Library", were used in the literature search. At the end of the research they concluded that despite the positive effects of EMR usage in medical practices, the adoption rate of EMR is low and meets resistance from physicians and that the process of EMR implementation should be treated as a change project as change management plays an important role in the success of EMR implementation.

Electronic Medical Records: A Review Comparing the Challenges in Developed and Developing Countries- Sanjay P. Sood, Stacie N. Nwabueze, Nupur Prakash, Saroj Mishra, **Proceedings of the 41st Hawaii International Conference on System Sciences - 2008** This paper examines the challenges faced by developing countries toward the development, progression and sustainability of Electronic Medical Records. The paper also provides a review of implementation of varying types of electronic medical data management systems in developing countries. This study concludes that for developing countries many challenges exist that are unique to the population and environment. Medical record systems so far have been shown to do the job but significant problems are encountered in the management of many systems. Web-based systems for information management will be the first step in making 26

Systems workable. Such systems will eliminate the problems caused by frequent power outages that may affect data storage causing loss and damage to data storage and backup. This will set the stage for more comprehensive development of EMR.

Explaining International Health IT Leadership Daniel Castro Information Technology and Innovation Foundation September 22, 2009: In this report, ITIF Senior Analyst Daniel Castro identifies which countries are leading in the deployment of health IT and highlights lessons that might be useful for other countries. The first section of the report gives an overview of the current state of and trends in health IT adoption in the United States and several other

developed countries, particularly focusing on Denmark, Finland and Sweden. The second section of the report identifies the factors that have led to success in these countries and the lessons that can be learned by other nations to drive health IT adoption. Finally, the report concludes with specific recommendations for policymakers to jumpstart progress on health IT in the United States.

Literature review: implementation of electronic medical records what factors are driving it? Vu, Manh Tuan. University of Hong Kong 2009:

Many pilot studies were included in this review, small and large, but they shared the same point that EMR systems implemented in developing countries, first, only served a certain specific condition and setting of health care system; second, were initiated mostly by NGOs or projects supported by developed countries. This might explain discreteness and narrowness of EMR systems applied in less developed regions.

METHODOLOGY

Research question:

What factors will help HY-EHR sustain in the current Indian Healthcare IT market?

Research Design: Qualitative study

Sampling method: Stratified Purposive sampling

Data collection technique: Focus Group Discussion

Objective:

To assess practicability of HY-EHR Indian Healthcare Scenario.

Specific objectives:

1. To conduct a group discussion
2. Analyzing the data collected.
3. Analyzing the secondary data sources available.
4. Finding out barriers for low EMR adoption
5. Concluding whether or not HY-EHR is Practical.
6. Recommendation based on the findings to improve the feasibility of HY-EHR.

This study is based on formal discussions with two stakeholders (doctors, vendors) of the healthcare HER community and references from many secondary data sources. The discussions were held in variety of settings (one-one, group meetings,). The study was spanned over a period of 3-4 weeks. Notes were taken during each of these meetings and group discussion.

All these notes comprise the views of the participants of the study. These notes were analyzed. And were grouped into various categories. Inferences were drawn from the pattern seen amongst the categories.

FINDINGS

How do you see the future of the implementation of EHR/EMR in Indian healthcare scenario extensively at per of the global standards? Growth of IT in healthcare will be driven by increased usage of web for data warehousing, **customer portals by health service providers, cloud computing, remote medical diagnostics, digitisation of medical records**, drug research and clinical trials, billing systems and other front/back office services. **As the volumes increase, and models like SaaS and cloud computing becomes available, the cost will come down further making IT applications affordable to all**. In future, longitudinal medical records will allow tracking of patients' conditions and medications so that providers in HCOs will have detailed information at their fingertips. Clinicians will document using structured tools that allow capture of patient symptoms, clinical findings, and the physician's assessment. When patients are admitted to a hospital, they will be tracked from the instant they enter the hospital until they leave, and whether guidelines are being followed. Both patients and providers will have a better sense of what will occur and when, and this will result in **higher satisfaction in all stakeholders**. When patients leave the hospital, their discharge summary will go with them to the team responsible for follow up care. This system will include safety nets that are not present today. **Do you think that there is a need for implementing standards, regulation to run an effective system of EHR/EMR in India? How can the government intervene in the scenario?** The **government and regulatory agencies have a major role** in how EMRs are developed and implemented by HCOs. They need **to reward and incentivise** HCOs that adopt IT and EMRs with 'meaningful use', as done in US under HITECH Act. Professional autonomous bodies can also institute competitive awards for excellence for hospitals. Further, government needs **to enact suitable legislation and policies to encourage adoption of EMR**, legally accept	Technical . Technical Change Change

digital signatures, and provide guidelines to standardise records formats, nomenclature, and communication protocols to enhance interoperability of IT applications across healthcare spectrum. While in the U.S, Health Insurance Portability and Accessibility Act (HIPAA) addresses some of the relevant issues, much remains to be done in India. **The Government may also educate care providers and public at large about benefits of EHR and may also mandate compliance**. Thus, while additional legislation is needed**,** it must be crafted in ways that make a revolution in healthcare information possible, and do not paralyse this revolution with possible unintended consequences-such as implementation failures due to organizations' inability to make the necessary cultural changes	Change
Not many Indian hospitals have been as successfully able to implement ICT solutions, and those who have implemented, have not been able to fully incorporate and integrate in their work culture and achieve seamless, paperless and filmless environment. Further, the use of mandatory bar coding by suppliers shall help in checking fake drugs and facilitate efficient inventory management.	Technical and change
Thus, technology can be a big facilitator and enabler, if not panacea for all problems afflicting Indian healthcare industry. If adopted judiciously, it can enhance operational efficiency, contain costs, and improve decision making and quality of healthcare delivery**.**	Technical
What is the reality in India?	
Firstly, **a distinction between EHR and EMR** while both refer electronic version of records, EMR is limited to a specific institution or a group of institutions, while EHR relates to a common platform that would allow disparate institutions in the private and government sector to share medical charts electronically (within strict guidelines for maintaining privacy of patient records). **The whole idea behind the EHR philosophy is to allow the chart to be portable between hospitals allowing greater flexibility for patients and doctors**.	Technical

Where does that bring us in terms of electronic charts in India? I am unaware of any formal study that has been conducted about the prevalence of EHR or the number of doctors who actually use it, if it is available in their institution. My observation is that, at present, **only a miniscule portion of doctors are enthusiastic about embracing this technology**. Given the volume of patients they see in a day, it is hard to imagine physicians **taking time to make notes** directly into the system. There is also a stigma attached to doctors typing their own notes. But, **like any other technology or practice, EHR will not gain a foothold unless there are some incentives and/or some penalties in the healthcare system**. There are **several software packages currently available in the Indian market that offer EMR** along with HIS (Hospital Information System), but unfortunately, there are only few takers for the EMR. Unless there is a serious effort at **educating the medical community** in India about benefits of an electronic system, we will miss out on this marvelous revolution. Selling HIS or EMR packages to hospitals should not be the goal but a by-product**. Software companies should first invest time and effort to educate the customer**. Then they need to sell the **appropriate package if it is the right fit**. We should rather not make a sale if it is not the right fit for the customer and keep his respect for ourselves and our company, than do otherwise and not be able to look him in the eye. "We should rather not make a sale if it is not the right fit for the customer and keep his respect for ourselves and our company" I personally consider that a large portion of the responsibility in advancing this electronic revolution in India rests upon the software community**. Software companies can do a lot for the community they serve and for themselves by paying more attention to the needs of the medical community and gearing up to meet them**. They can also share their knowledge with the medical community about all the marvelous things that are possible through software solutions. After all, if we can provide some of the top talent in software technology to the world should we not learn to benefit from that for our own advancement as well?	Change Technical Time Change and cost Vendor uncertainity. Change Change Technical Technical Change

Although EMR has tangible positive outcomes, the adoption rate has been low. The market comprises handful of hospitals using EMR. The usage of EMR is limited to corporate hospitals in the various metro cities of India. The known hospital chain Fortis and Apollo have been using EMR in a few of their hospitals.	
In comparison to developed nations, the adoption of EMR in India has drastically low. The low adoption rate is due to several gaps existing from the doctors to EMR vendors.	Technical
The **lack of awareness** about the benefits of EMR is the largest perceived barrier. The prevailing low awareness about the advantages of EMR among the small and medium scale healthcare service providers is limiting the adoption rate.	Change Change
The **resistance in acceptance of the product new and novel information technology platform impedes the adoption.** Doctors who are the basis of healthcare service are defiant about EMR. This is primarily due to lack of compatible technology available in the market. Additionally, the EMR necessitates the use of computers by the doctors. Along with doctors, the stakeholders operating within a hospital are defiant in changing to the EMR. **The high cost of implementation increases capital requirement**. This is **beyond in reach of the small medium scale hospitals**. The capital intensive EMR will add to the healthcare service providers' financial burdens. **The fragmented Indian healthcare market that does not have a steady revenue and cash flow might view that capital burden as a risk.**	Cost Cost Cost Time
The implementation process of time that negatively influences the ongoing workflow in any hospital. The vendors implement the various modules of EMR in phases. This implementation process affects the ongoing workflow in the hospital.	
Lack of user-friendly interface adoption. The complicated EMR interfaces discourage the technological defiant doctors in adoption. Additionally, the EMR are inadequate to capture the entire data gathered by the doctors.	Technical
The vendors lack domicile knowledge in healthcare. This results in development of EMR with various gaps. Technology being the primary competence of the vendors, they tend to develop products that highly are incompetent. **The gap existing between the information technology and**	Vendor uncertainty

healthcare needs to be bridged by vendors to develop effective EMR products.	Vendor uncertainty
The UID scheme has opened up new vistas for the healthcare sectors. Since the **UIDAI implements an open-system, plug and-play approach, entrepreneurs can develop applications in numerous areas in healthcare**. The medical industry could build up a database using 'Aadhaar' as base for seamless use by various healthcare providers. The government and regulatory agencies have a major role in how EMRs/EHRs are developed and implemented by HCOs. The Ministry of Health and Family Welfare and bodies like National Knowledge Commission, CDAC have constituted an EHR Standards committee that is already seized of this matter.	Technical
The **Government needs to enact suitable legislation** and policies to encourage adoption of EMR, legally accept digital signatures, and provide guidelines to standardize records formats, nomenclature, and communication protocols to enhance interoperability of IT applications across healthcare spectrum.	Change
In USA Health Insurance Portability and Accessibility Act (HIPAA) addresses some of the relevant issues, a lot remains to be done in India. **The government may also educate care providers and public at large about benefits of EHR and may also mandate compliance**. These EHRs can be linked to each citizen's UHID and health data can be filed and retrieved from National Data Record System based on cloud. The issues of capturing, storage, standardisation (ICD-0,SNOMED-CT,LOINC) and interoperability (HL-7 version 3.0, DICOM) of health information, billing formats, authenticity, privacy and security of sensitive data, can also be ensured through laws similar to HIPAA.	Change Technical
The most commonly used interface standards in healthcare are **Continuity of Care Record, or CCR and Continuity of Care Document, or CCD**. CCD is a joint effort of HL7 and ASTM to foster interoperability of clinical data to allow physicians to send electronic medical information to other providers without loss of information.	Technical
Once these regulatory norms and standards are put in place, various HCOs, ISVs (independent software vendors) and stake holders shall come forward to develop and implement EHRs. The linkage of EHRs linked to the UID of the	Technical

patient will ensure achievement of ultimate objective of 'one EHR for each patient, accessible anywhere, anytime'. Also, automated transactions shall create a trail that permits medical audit thereby increasing accountability. In addition, adhering to standard treatment guidelines and clinical pathways shall enable clinicians to practice evidence based medicine. Notwithstanding the immense benefits offered by UID linked EHRs, the journey to their implementation is not going to be smooth. But the gains at the end of journey are worth the efforts. The parliamentary standing committee on the matter has also expressed some reservations on the role of UIDAI. In any EMR adoption such as Detailed workflow study ("as is" and "to be"), User Expectation Management, Clear Requirement & Scope Definition, Adequate Super/End User Training, Department User Champions, Change Management, Management's Commitment & Support, Governance Structure for project steering & monitoring, Proper Communication Strategy, Right Go-live Approach, Adequate Hospital IT Manpower, And so on. However, the most important factor that ensures adoption of an **EMR is its features and usability.** what an EMR should be able to do in order to ensure a sustained adoption: User Friendly Interface – Presentation makes the first impression and is as important as the content is. Simple and neat user interface always attracts the user, Google being the prime example. There should be right balance of color coding on screens as users love different color coding on screen to easily classify the activities. Charts and Graphs – Colorful Vitals/IO Charts and Graphs for quantitative lab reports, vital signs, medicine dosages, etc for clinicians to be able to see the trend over a period of time. It can also help then in preparing research papers and presentations. Longitudinal patient Record (flow chart) – Clinicians prefer to scroll through entire patient record without having to navigate too much. EMR should be able to configure the flow charts for different specialties based on their needs. Computerized Physician Order Entry – This is one of the modules which should be extensively used by clinicians, therefore needs to be extremely user friendly with options like favorite orders, order sets, protocols, delayed orders, etc.	Technical

Alerts & Reminders (Clinical Decision Support System) – EMR should be capable of providing alerts and reminders such as drug to drug, drug to lab, drug to food interactions; duplicate orders alert; order instructions; allergy alerts, health check due reminders, immunization reminders and other clinical reminders to reduce medical errors and enable meaningful usage of the system.

Bar Coded Medication Administration – to ensure RIGHT medicine in RIGHT dosage is given to RIGHT patients at RIGHT time by RIGHT medical personnel. Studies have proved that BCMA reduces medication administration errors by 63%. BCMA also confirms that the prescription by clinician is carried out exactly as per his instructions. Deviations in prescription, if any also get recorded.

Specialty Based EMR – a General Medicine EMR cannot meet the requirements for other super specialty. For example, prescribing a chemotherapy regimen is completely different from prescribing a generic prescription. Similarly, a pediatric or obstetrics history is quite different from a general surgery history. Therefore, the more an EMR fulfills the clinical requirement nuances for each specialty, the better clinician adoption is achieved. These specialist clinicians always look for solutions to their workflows and feel disappointed which leads to ignorance/avoidance of the EMR.

- Tightly linked Work-flow based System – to address clinical protocols and clinical pathways related requirements where system should prompt next action automatically based on diagnosis and selected protocol.
- Work-list based Single Screen Operation – Giving each user a single screen workflow not only makes it very easy to use, but reduces training effort also. Users do not have to navigate between menus and screens to do their job and all their activities are brought into single screen.
- Real-time Dashboard for HODs – HODs keep asking what is there in it for them as what they really needs is a dashboard to be able to monitor how their department is functioning and what the areas of improvement are.

Pre-Configured System with default data and templates – Data collection and validation is one of the major challenges in EMR implementation. EMR system

- should have pre-configured data and templates which can be modified based on the requirements. This reduces the implementation time and therefore the cost.
- Clinical Documentation with least typing – It is

absolutely must for EMR product to support template building and statement generator functionalities to create templates exactly as required by clinicians and to be able to fill it with minimum clicks. Automated Discharge Summary – EMR should be capable to automatically filling the discharge summary from the information already captured by various users across organizations. It reduces the discharge time and increases bed turnover rate. • Extensive Audit trails – To find of out errors and improve on those quickly. • Centralized Appointment System – to organize the time of clinicians, especially surgeons who need to manage their schedule between OPD, IPD and OT. • Patient Record Confidentiality – EMR should be very flexible in setting patient record confidentiality at different levels such as attending physician, specialty, medical team, surgical team, all clinical users, all doctors etc. • Web based Applications – Accessibility and availability as and when needed from any location increases the adoption rate. • Others – use of voice recognition, medical transcription helps to a great extent.	

RESULTS

Following are the categories in which the discussions and data from the secondary source are grouped:

Cost of the EMR No financial resources	Financial
Lack of infrastructure Complexity of software Computer literacy Customize EMR Standards	Technical
Time to learn Time to enter data More time per patient	Time
Lack of belief on EMR Vendor uncertainty	Social
Privacy and security concerns	Legal
Lack of incentives Lack of participation Lack of awareness	Change management

Description of the categories:

Financial:

Physicians were very concerned about the cost of EMR. These costs include the long-term expenditures incurred in monitoring, modifying, upgrading and Maintaining EMRs. . Further, vendors charge a lot of money for after-sales service. All of these projected costs make physicians unwilling to adopt EMRs.

Doctors also pointed out that small and medium scale OPDs who lack IT budget will not be able to cope up with the high startup and ongoing cost of the EMR.

The questions commonly facing physicians are whether the costs of implementing and running an EMR system are affordable and whether they can gain a financial benefit from it. Since implementing an EMR system is recognized as a complex process with several stages involving purchasing, coordinating, monitoring, upgrading, and governance costs.

, which will be significant

Surprisingly doctors paid very little concerned about the return of investment.

The first point doctor put forth was the cost in incurring the EMR. They were mainly concern about the startup and upgrading and maintenance cost.

Technical:

Another major concern was given to the infrastructure required for EMR. What about the doctors who are not having any infrastructure needed.

Another issue raised in thee technical category was computer literacy or proficiency of the doctor as well as the staff. Unless and until both are well versed about further more stress was given on the computer proficiency of the doctors as well as the staff. Issue was raised as doctors think that handling an EMR needs a special kind of computer literacy. Which neither the staff nor the doctor has. Doctors have receptionist who are just 12^{th} passed or illiterate or lacks computer knowledge. A certain level of computer skills by both suppliers and users (the physicians) is required. Further, good typing skills are needed to enter patient medical information, notes and prescriptions into the EMRs, and some physicians lack them. Further, it is not only the physicians but also other staff at medical practices who lack adequate computer skills. This general lack of skills hinders the wide adoption of EMRs.

The complexity and usability problem associated with EMRs results in physicians having to allocate time and effort if they are to master them. Physicians have to learn how to use the EMR system effectively and efficiently which they may see as a burden.

One reason why physicians do not adopt EMRs is that they cannot find a system that meets their special needs or that they can utilize to meet their requirements. The vendors lack domicile knowledge in healthcare. This results in development of EMR with various gaps. Technology being the primary competence of the vendors, they tend to develop products that highly are incompetent. The gap existing between the information technology and healthcare needs to be bridged by vendors to develop effective EMR products.

Time:

A fluent workflow is very important to the work of physicians. The introduction of EMRs will slow a physician's workflow, as it will always lead to additional time being required to select, implement and learn how to use EMRs, and then to enter data into the system. As a result, their productivity will be reduced and their workload will be increased. This can cause financial problems, such as a loss of revenue.

Physicians also need to spend time and effort on learning how to use an EMR system. However, "the demands and pressures of delivering office based care may not afford them the time to learn the system" It is perhaps surprising that many researchers conclude that data entry is a problem for physicians using EMRs

Many physicians report that using EMRs will take more time for each patient than using paper as, in some situations, it might be more convenient and efficient to use paper records during the clinical encounter the fact that physicians are slow in typing and entering data will cost more time for each patient visit than before

Social:

Those who are unwilling to use such a system are skeptical about claims that EMRs can successfully improve the quality of medical practices this creates a personal resistance to the adoption of EMRs.

Professional autonomy is defined as "professionals having control over the conditions, processes, procedures, or content of their work" who will not be possessed or evaluated by others.

With the implementation of EMRs, physicians are concerned about the loss of their control of patient information and working processes since these data will be shared with and assessed by others.

The quality of vendors of EMR systems is crucial for the acceptance of EMRs.

EMR systems are still relatively new in the marketplace. The lack of suitable vendors reflects an immature industry, without sufficient viable products or competitors able to offer better services, and without enough information on vendors to enable an informed decision. Physicians are concerned that vendors are not qualified to provide a proper service, or

Will go out of business and disappear from the market, leading to a lack of technical support and a large financial loss

Legal and privacy:

Electronic Medical Records deal with medical information on patients, and this should be treated as private and confidential. Physicians believe that keeping such information safe is very important because otherwise it could create legal issues. However, there is a lack of clear security standards which can be followed by those who are involved in the use of EMRs.

Physicians doubt whether EMRs are a secure store for patients' information and records, and

Fear that data in the system may be accessible to those who are not authorized to obtain it. The consequent inappropriate disclosure of patient information might lead to legal problems. Furthermore, there is, in some countries, a lack of clear security regulations that could
Help ensure patient privacy and confidentiality.

Change:

Unless physicians see some personal benefit from using EMRs, they will not be motivated to switch and will instead stick to their traditional working procedures. Potential participants include not only physicians, but also nurses, administrative staff, IT staff, and other organizational members. The wide adoption of EMRs will only be achieved if all organizational members participate in the use of EMRs.

HEALTHY YOU EHR

Healthyyou-EHR boasts of being India's first template free EHR. This EHR is given complimentary to the doctors.

The benefits and the features of it are described as follows:

Benefits:

Storage space

- Store large amount of your Patient's Data
- Ease in retrieving your data
- Quick access to your data from anywhere and anytime with any device

Cloud storage

- Your data is stored online to avoid Data loss due to Natural calamities
- This storage is through multiple cloud loci
- Additional security is provided by user defined password

Role Assignment

- Role assignment provides partial sharing of data with your staff as per defined role
- Limited access to your staff as per their role

Analytics

- Get complete analysis with respect to demographics (Age, Gender, Location etc.) as well as diseases
- Understand your community, disease pattern and prognosis of your patients
- Helps you in presenting your data with ease

Streamline

- Manage your appointments with ease, just by uploading your consultation timings along with location(s)
- Patients can book your appointment as per your availability
- Get alerts on appointment booking, cancellation as well as modification, by SMS and e-mail
- A follow-up can also be assigned to the patient at the same time with similar reminder pattern

User friendly

- Template free
- Easiest User Interface
- Simple sign-up procedure, just like creating an email account
- Self-explanatory and graphical presentation for ease of operation
- Quick retrieval system making it all the more simpler and faster

Features:

Scheduler

- Application provides a free hand to doctors for creating their own scheduler as per their practice pattern (Appointment based or token based)
- Application also provides Holiday calendar, for avoiding inappropriate appointment booking
- Provision to adjust the time slot for the appointment depending on the pattern of the consultant is available
- Additional provision for Emergency Appointment to manage urgency

Search Engine

- Get searched by patients with respect to your Specialty, Locality & Name
- Patients can search you from any corner of the world & get themselves or their family members treated from you
- Let your patients know about your achievements & your experience
- This helps you to grow your practice & also increases your popularity

Alerts & Reminders

- After searching you online, patient can book appointment by just clicking the desired time-slot
- Once appointment is booked, modified or cancelled : sms & email will be sent to both Patient & doctor

E-Referral

- To Doctors
- Create your own referral network with respect to Specialist doctors
- With 'Internal messaging system' you can take opinion from the doctors across the globe
- Enabling you to take better care of your patient

- Thus, increasing patient's confidence in you & thus making him to stay with you for lifelong

E-Rx

- Simply enter the name of the medicine along with the dosage, it will be sent to the chemist
- Your prescription can be sent to the chemist, nearby the patients residence or office by just selecting the chemist from the search engine database, for the convenience of the patient
- Patient can go to the chemist & receive the drug or can get it as Home delivery
- Added advantages
- Get your prescription as per the current prescription norms
- Drug allergy will be mentioned just above the prescription in RED BLOCKS to avoid prescription of such drugs

Admin

- Assign the Role-Play to your staff (Receptionist / Nurse / Asst. Doctor)
- Provide access to the staff as per their ROLE in the Organization
- Enable only part of the EHR Application to maintain the confidentiality & security of your Patient's Data

SCREENSHOTS OF HY-EHR

Figure 1: Login Screen

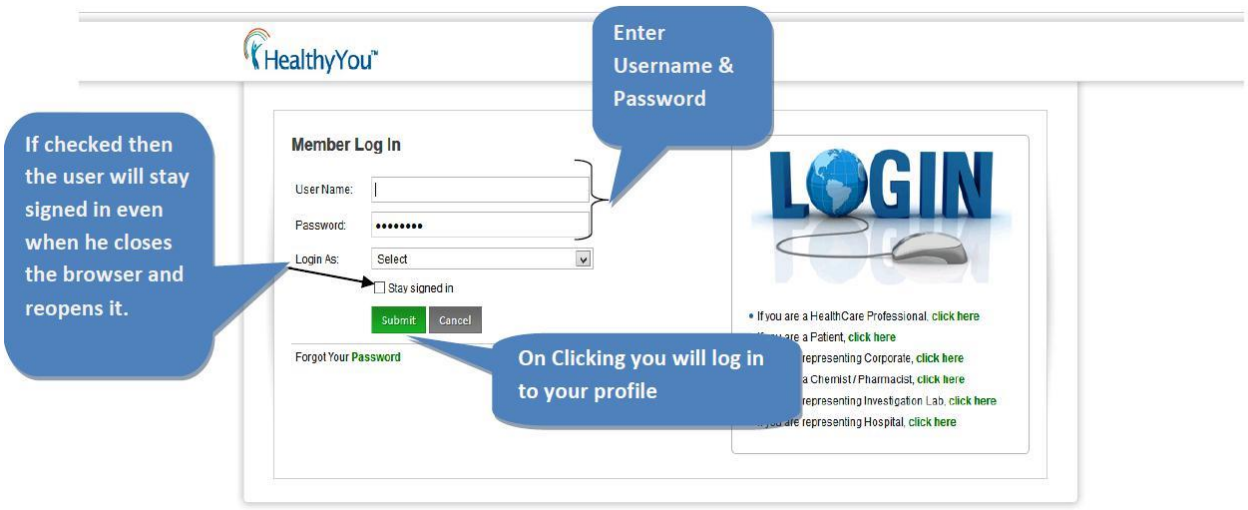


Figure 2: Doctor's dashboard

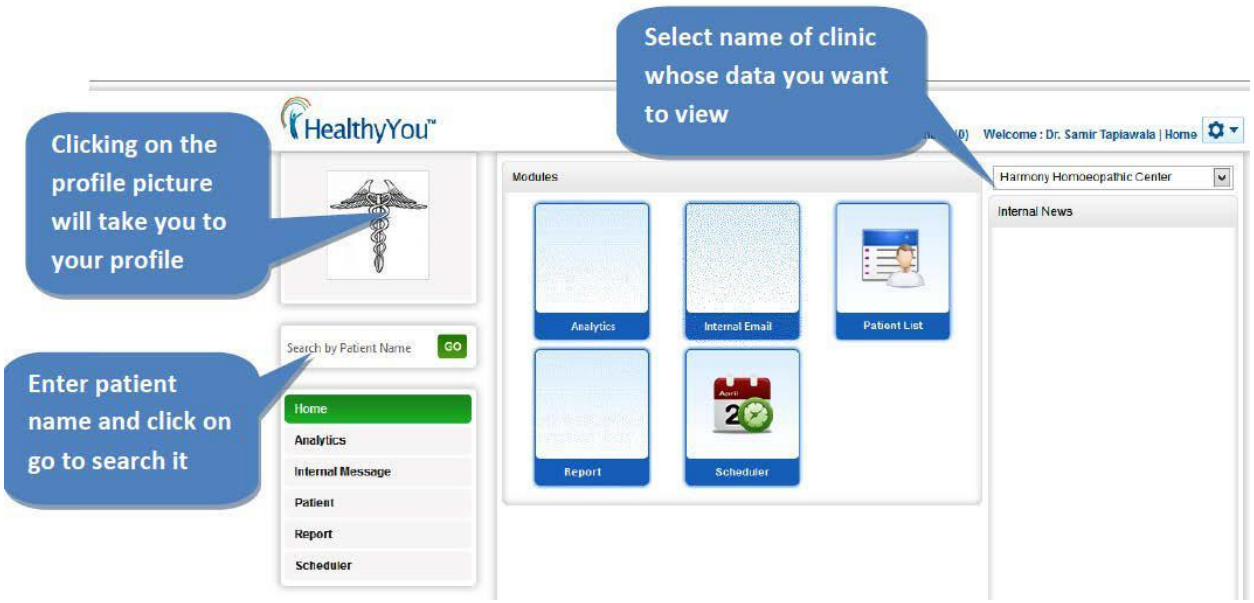


Figure 3: Doctors user interface

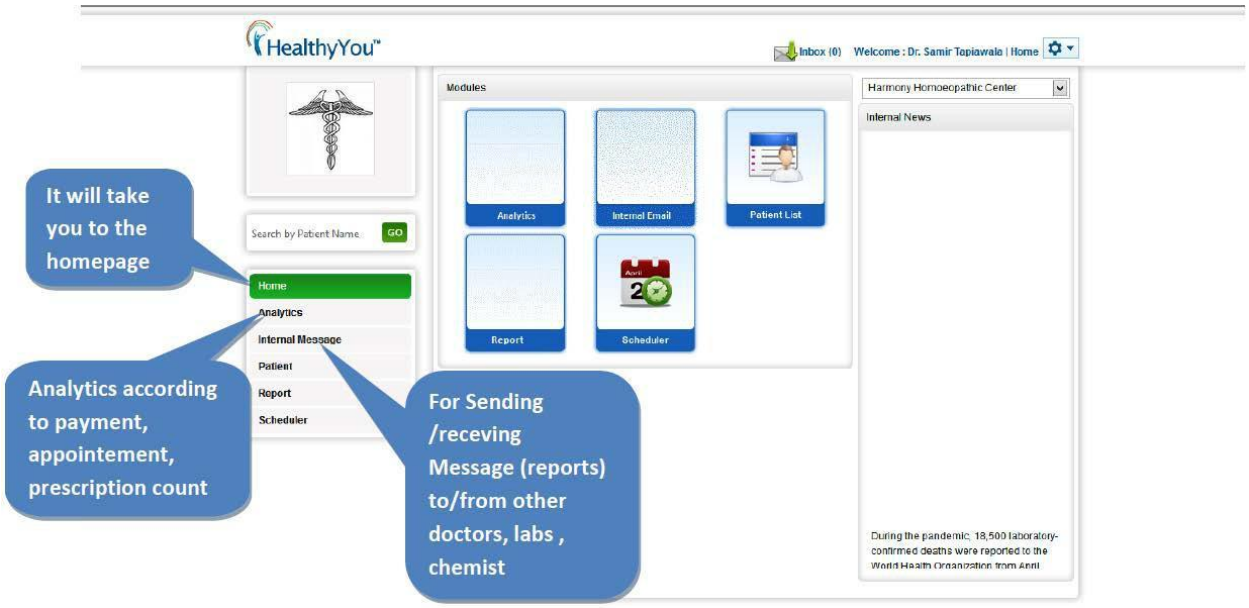


Figure 4: Doctor's profile

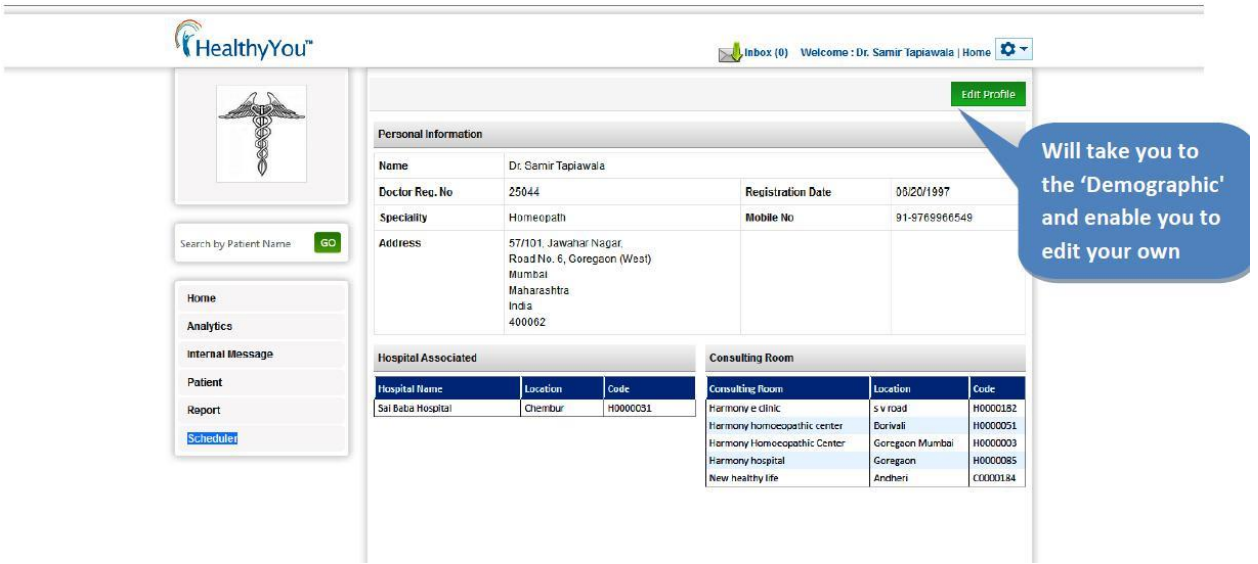


Figure 5: Scheduler

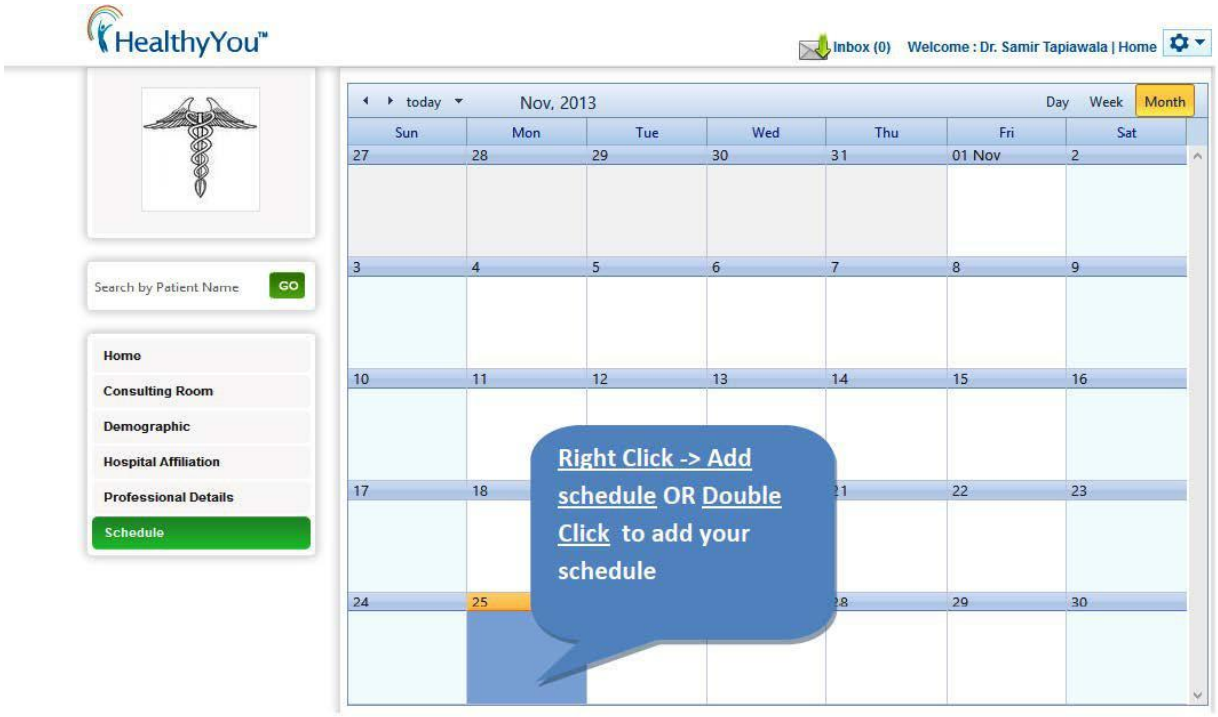


Figure 6: Doctor's clinic

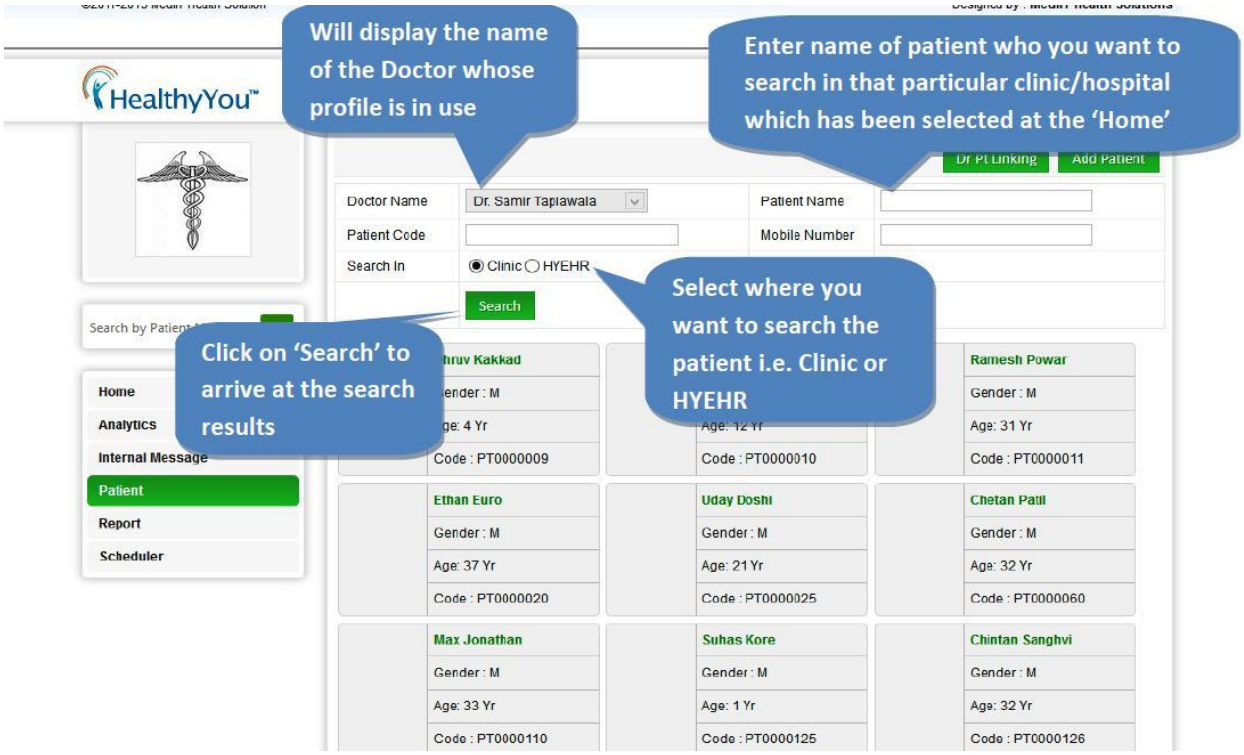


Figure7: Patient's follow up report

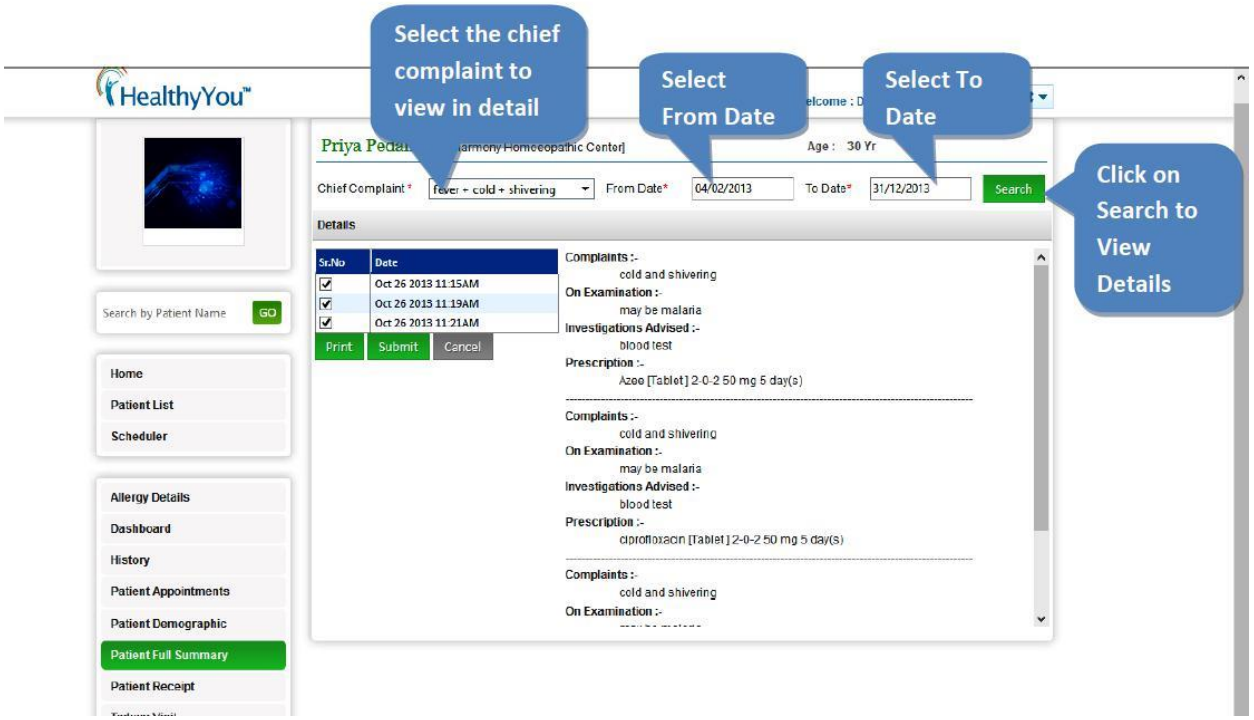


Figure 8: Pdf format of the patient's report

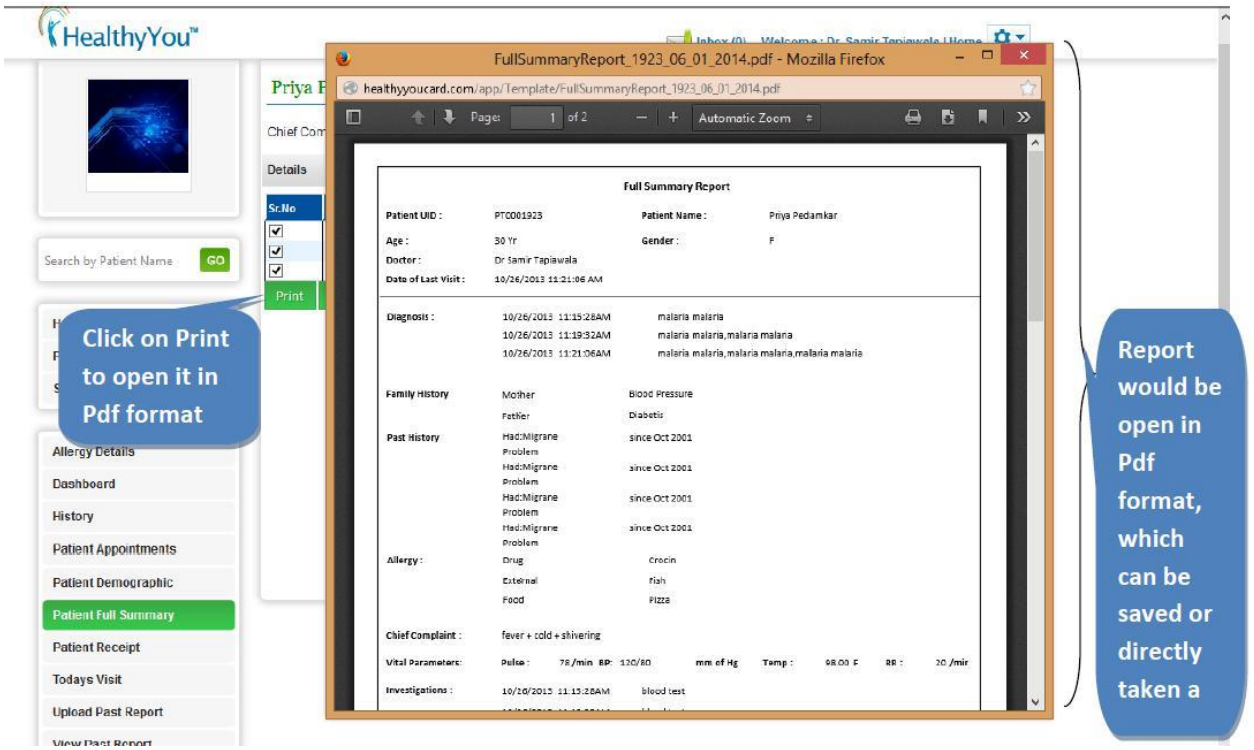


Figure 9: Patient's template

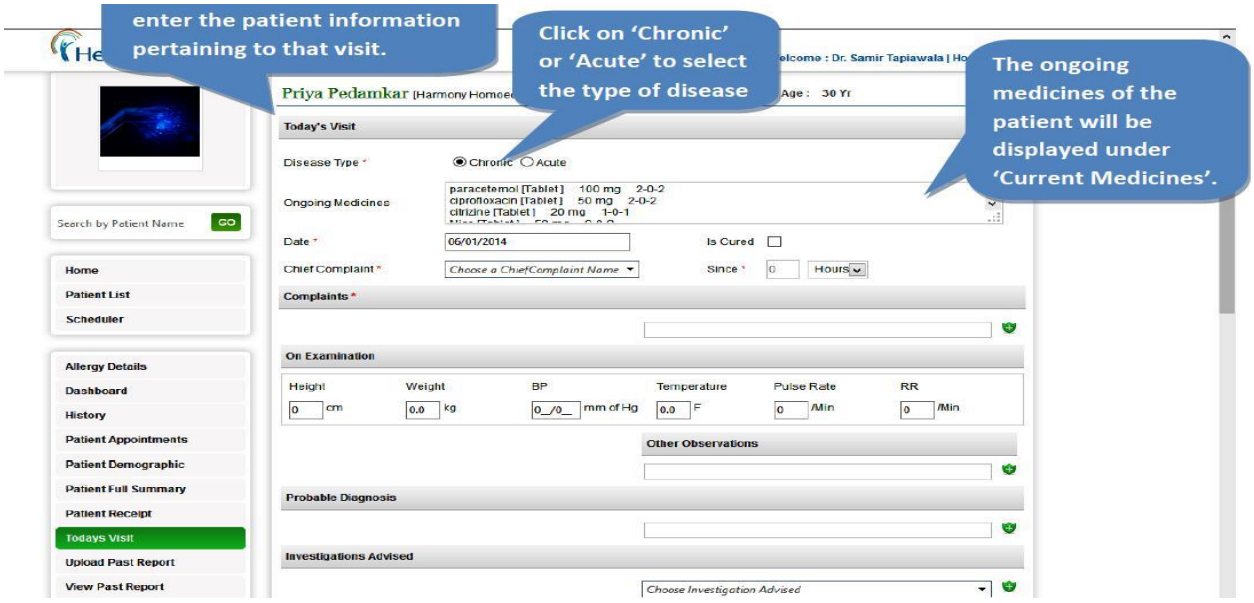
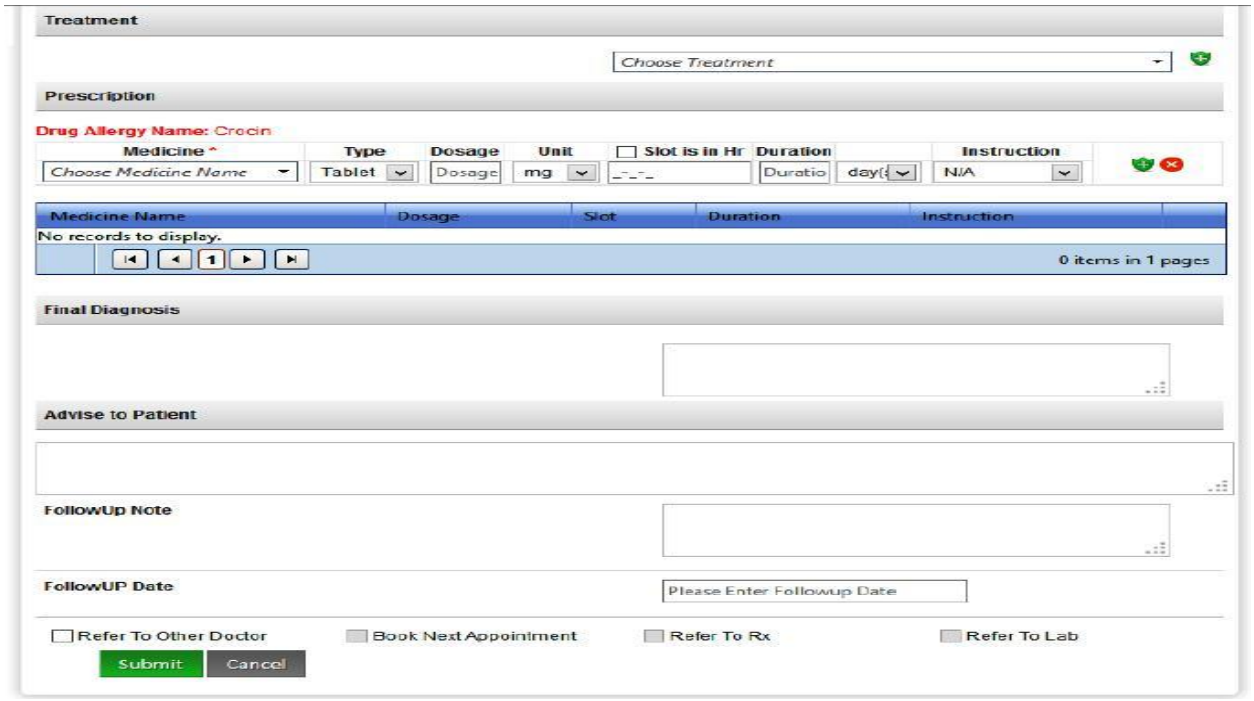


Figure 10: Patient's template



BUSINESS MODEL

Healthyyou-EHR is a cloud based EHR. That means it's not software but an application. Just like Gmail, Facebook etc. we are giving the application free of cost to the doctors for life time. Doctors are charged nothing for the startup, ongoing, and maintenance cost. We are engaging doctors by personally meeting them and enrolling them and also through CMEs. We are also enrolling laboratories and diagnostic centers for free of cost. With an aim of creating a healthcare network to speed up the healthcare delivery system.

On the other hand we are enrolling patients via customer care and also by arranging free health camps for them.

We provide various health cards to the patients which are divided into paid and non-paid mode.

In paid cards we will be providing patients with various VAS such as medicine reminders, vaccination reminders etc.

So the money comes from the patient and not the doctors.

The Healthyyou-EHR is targeting only small OPD doctors.

SWOT ANALYSIS

Strengths:

a. Cost free
b. Simple user interface
c. Less tabs
d. High end security
e. Cloud based
f. Patient awareness measures
g. Doctor awareness measures
h. Strong team
i. Targeting the untouched OPD doctors.

Weakness:

a. The system lacks the scalability
b. Not customized
c. Not based on standards
d. Doctors lack infrastructure
e. Non-revenue generating model.

Opportunities:

a. 80% of doctors are practicing in OPDs
b. Dentist forms a huge chunk of the computer literate doctors.
c. Mobile application
d. Application focus on all aspects of OPD and not just scheduler and billing.

Threats:

a. A tough competition from Market leaders.
b. EMR standards already declared by the govt.

DISCUSSION

The discussion aims at analyzing the feasibility of HY_EHR in the current Indian healthcare market scenario.

Financial barrier:

According the results obtained there are various barriers perceived by the doctors why they are not using EHR/EMR. The cost is the most important barrier in the list. Doctors are concerned with the cost of installing monitoring and maintaining the EHR systems. HY-EHR and its business model give the answer for that. The fact that doctors will be getting it free takes off the burden of paying anything from their own pocket. As the system is a cloud based system you won't need a single penny for upgrading and maintaining the EHR. All the responsibilities will be carried out by the organization which owns HY-EHR. Doctors will be getting upgrades to the HY-EHR free of cost. It additionally provides you a free space on the server so the cost required for storing the health records of their patients will be cut down. As the HY-EHR is not software but an application just like a Gmail in need to install it like you do for software. It's an application which you can access by typing the link in the browser. So the installation charges too are cut down. Over all it saves the whole lot of money from the doctor. This also eliminates the other barrier which states that the doctors lack fin sources for implementing the EHR. Which makes healthy you a unique product from rest of the products in the Indian healthcare IT market.

Technical barriers:

As far as the need for the infrastructure is concerned yes HY-EHR is will not work or will not be feasible. But given the reach android, iOS, and Symbian phones in the market the mobile application of HY-EHR can solve the problem to a great extent though not fully. Doctors have to have a computer and a net service to avail the HY-EHR. In the mobile application of HY-EHR doctors can review the details of the patient bath clinical and non-clinical, they can upload a report by clicking its picture or scanning it, they can send the report to the patient via mail. They can refer the patient to the doctor. But the doctors will not be able to enter any clinical data not the application except patient's name, his HY-PIN. Thus HY-EHR solves the problem of the lack of infrastructure in a great ay but not fully.

The application HY-EHR is very easy to learn as it is streamlined according to the doctor's workflow. The tabs are arranged chronologically so that doctor doesn't need to search for any special tab somewhere else in the application. Efforts have been made to put less no of tabs and still give doctors what they want in a real time. Thus it overcomes the barrier of complex software.

Handling any application on the computer does need some basic computer knowledge; the implementation team of HY-EHR helps the doctors and the staff to go through the process smoothly.

Time:

Doctors don't have time off their busy schedule to learn some new technology. We have taken care of the same by building a user friendly and easy to learn application such that within 2-3 trials doctors will get accustomed to it. The features such as simple user interface, less no of tabs, streamlined workflow. Simplicity of the template all makes it easier for the doctor to adapt to the HYEHR.

Other barrier as perceived by the doctor was time required to enter the data. The HY-EHR application is integrated with an artificial Intelligence tools which auto saves the inputs of the doctor. because of which the next time doctor enters the same data it will appear in the dropdown list and doctor need to type the rest of thing but just drag and drop it into the window. This makes it easier to enter the data as well as saves a lot of time of the doctor.

As it will save lots of time for the doctors, they can focus more on the patients and helps in increase in the productivity of the clinic.

Lack of belief:

Doctors have their own view and thinning about storing their data in to electronic format. This leads to cynical attitude towards the EMR as a whole. HY-EHR can do a little to divert the thinking of the doctors and make them use HY-EHR.

Vendor Uncertainty:

Definitely HY-EHR is a new product and one of its kinds in the market. But the organization has a mixed of healthcare and IT professional which makes the HY-EHR mature product as compared to the other competitors. The dedicated CRM will provide a 24*7 support and a dedicated implementation team will provide the required training and implementation of the application. These factors make HY-EHR quality product and thus remove any uncertainty about the application as well as the organization as a vendor.

Privacy and security concerns:

Concerns about the privacy and security of the electronic data are a valid concern. Though there are no laws regarding the electronic storage of health information, no security standards given for the electronic storage of the data, HY-EHR is providing 128-bit **Secure** Socket Layer (SSL) technology, which is the highest

level of **security** commercially available. This definitely can give a safe feel to the doctors about storing their data electronically.

Lack of incentives:

In our revenue generation model we are planning to provide doctors with some financial incentives. That incentives depends on the no. of his or her patient getting enrolled with HY-EHR and is taking a paid version of the HY-EHR. Thus doctors will be getting rewarded for using the application that too free of cost. This model is based on the US Healthcare reform.

Considering the current picture of the Indian Healthcare IT industry and the trends going in it. There is very low penetration of HIT in India as compared to developed countries like the US. The total spending on IT by the US hospitals in 2011 amounted to $79-80 billion compared to healthcare IT spending of $305 million in India. The penetration of EHR has been highest among all others, growing by 13.5 per cent. It is expected to have the same rate or increase due to improving uptake and upcoming hospital projects.

The market has over 120 vendors with small to large scale offerings with variety of web based and client side products. There are approximately 35 domestic EMR vendors in India with multiple product portfolios.

Currently, in India, most of the users of health information systems/EMR/EHR/HIS are large corporate hospitals. Therefore, there are still many other possible clients that are "untouched". Private companies play a greater role than public sector. Private sector accounts for more than 80% of total healthcare spending in India and they are expected to be financially stronger and well managed. At the moment, most companies only use EMR for Scheduling and administrative purposes than the core healthcare functions. EMR is actually more than just administration and scheduling.

This is how HY-EHR tries and overcome the barriers what doctors perceive. This makes HY-EHR a better product and fit for the doctors. And considering the current market scenario it stands a great chance of revolutionizing the Healthcare delivery in INDIA.

CONCLUSION

There are various features (cost effective, template free, simple user interface etc.) of HY-EHR which make it unique from the rest of the domestic vendors. There are barriers from the doctors, there are threats present in the market alongside the weakness in the application which stands in its way to become a market leader. Working on its strength and catching on the opportunities in the market it could overcome the hurdles and be a market leader.

From the study we can conclude that HY-EHR has a potential of being the market leader in the Indian healthcare industry.

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