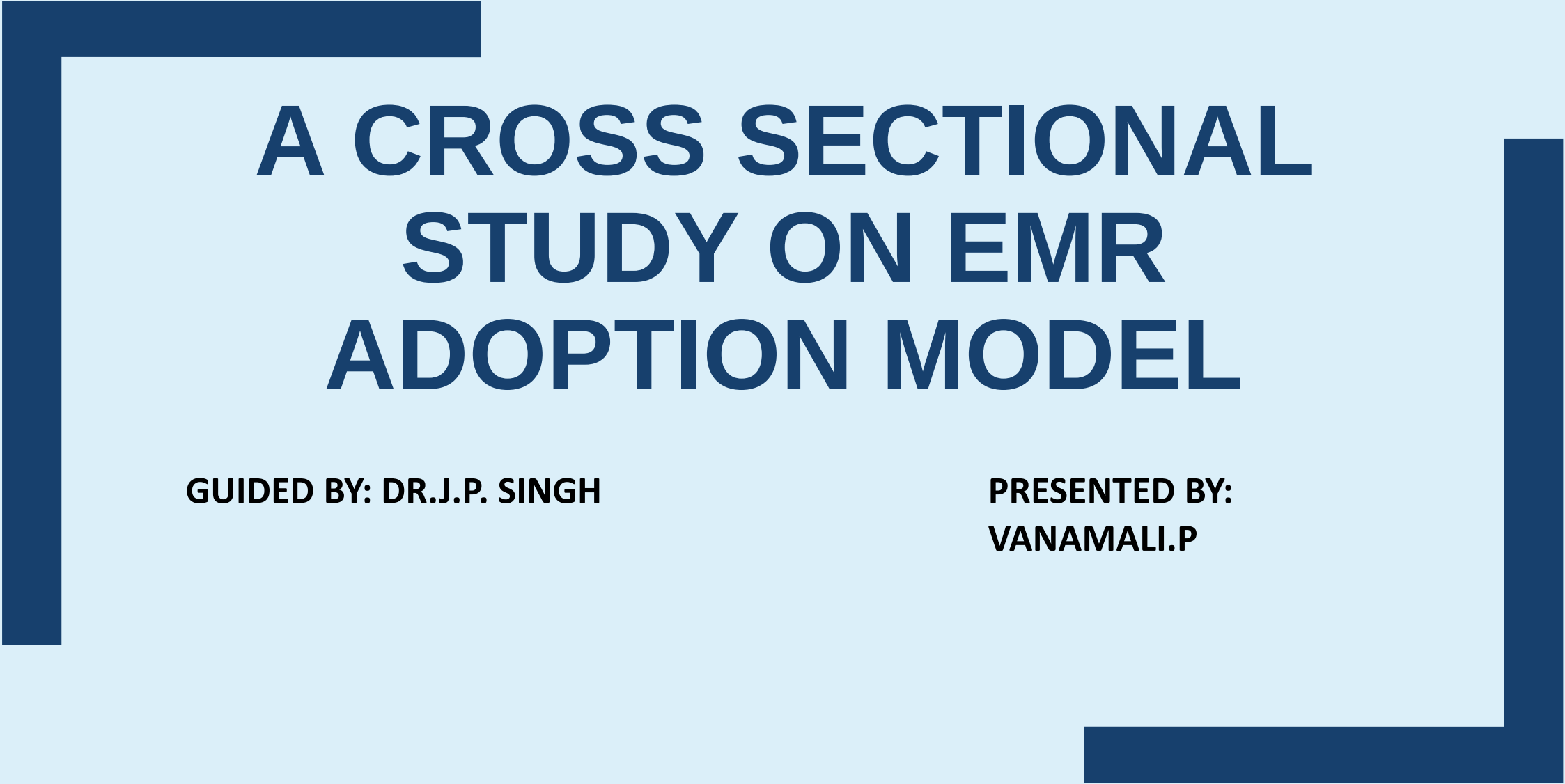




A CROSS SECTIONAL STUDY ON EMR ADOPTION MODEL

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AGENDA

- ❑ INTRODUCTION
- ❑ RATIONALE
- ❑ OBJECTIVES
- ❑ RESEARCH METHODOLOGY
- ❑ RESULTS
- ❑ SWOT ANALYSIS
- ❑ CONCLUSION
- ❑ RECOMMENDATIONS



INTRODUCTION

- ❑ According to Healthcare information and management system Society (HIMSS), an EMR is a part of an electronic health record which belongs to the healthcare provider. “The EMR is a set of applications and workflow tools that digitizes the creation, collection, storage and management of patient information within the confines of a single organization.”
- ❑ Adoption is the process that” involves the multitude of activities, decisions and evaluations that encompass the broad effort to successfully integrate an innovation into the functional structure of a formal organization.” An adoption model explains the complex process in a simple manner.

HIMSS ADOPTION MODEL:

HIMSS Analytics introduced EMR adoption models (EMRAM) in United States and Canada and also Ambulatory EMR's in the United States. The EMRAM has been divide into eight stages and is used to track the healthcare organizations progress in relation to EMR.

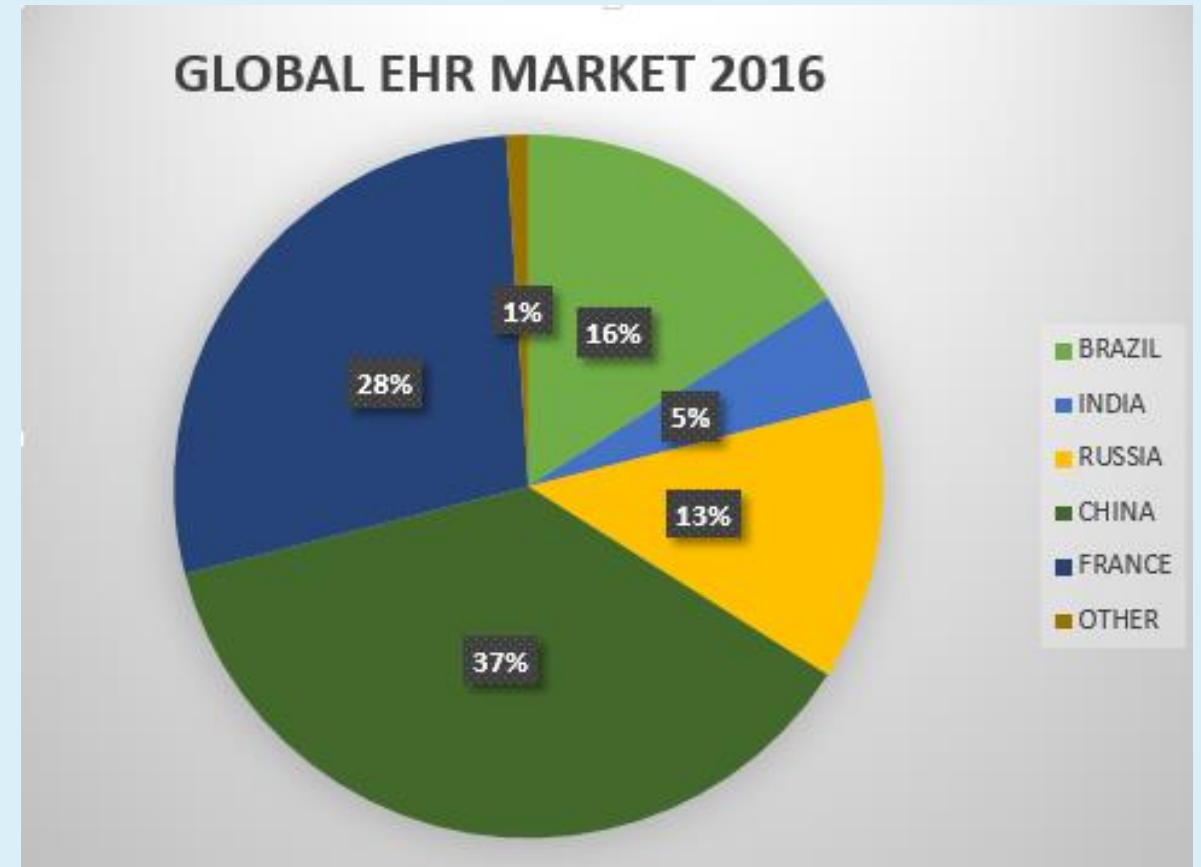
EMR Adoption Model SM	
Stage	Cumulative Capabilities
Stage 7	Complete EMR; CCD transactions to share data; Data warehousing; Data continuity with ED, ambulatory, OP
Stage 6	Physician documentation (structured templates), full CDSS (variance & compliance), Closed Loop Medication Administration
Stage 5	Full complement of Radiology PACS
Stage 4	CPOE, Clinical Decision Support (clinical protocols)
Stage 3	Nursing/clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology
Stage 2	CDR, Controlled Medical Vocabulary, CDS, may have Document Imaging; HIE capable
Stage 1	Ancillaries – Lab, Rad, Pharmacy - All Installed
Stage 0	All Three Ancillaries Not Installed

RATIONALE

- ❑ Electronic Medical Records (EMRs) are computerized medical information systems that collect, store and display patient information. They are a means to create legible and organized recordings and to access clinical information about individual patients.
- ❑ The worldwide expansion and growth of the mobile market has led to the formation of new markets in the majority of industries that are centered on mobile functionality. It includes mobile electronic medical records (EMRs) that are used by healthcare professionals (medical staff), personal health record (PHR) applications that patients can use to examine and control their own health data, and applications that allow direct patient control over diseases.

GLANCE OF GLOBAL EHR MARKET

According to Transparency Market Research (TMR), the industry of healthcare in the middle of a ample move from paper based to digital based, which in turn upshot the enhancement of the EHR worldwide. Globally Market of electronic health records will place at US\$25.98 billion in the year of 2020 as per report by a CAGR.



EMR ADOPTION WORLD-WIDE

... based on HIMSS European EMR Adoption Model

EMRAM Scores, % of Hospitals, Q2/2014 (based on data from the last 24 months, no weighting applied)

Stage	Denmark	Europe*	US**	Canada**	Middle East	Singapore	Australia
Stage 7	0.0%	0.2%	3.2%	0.0%	0.0%	0.0%	0.0%
Stage 6	0.0%	2.6%	15.0%	0.6%	13.6%	85.7%	0.0%
Stage 5	100.0%	17.0%	27.5%	0.5%	16.7%	0.0%	5.9%
Stage 4	0.0%	5.6%	15.3%	3.6%	3.7%	14.3%	0.7%
Stage 3	0.0%	3.7%	25.4%	32.5%	17.0%	0.0%	0.4%
Stage 2	0.0%	33.4%	5.9%	28.9%	19.7%	0.0%	58.3%
Stage 1	0.0%	13.8%	2.8%	14.5%	14.3%	0.0%	3.7%
Stage 0	0.0%	23.8%	4.9%	19.4%	15.2%	0.0%	31.0%
N	24	1,321	5,447	640	123	7	271
Mean	5.3	2.4	4.3	2.0	3.1	5.7	1.8
Median	5.3	2.2	4.3	2.1	2.9	6.1	2.2

* Excl. Denmark; incl. countries listed in the table above, plus: Belgium (2), Finland (3), France (18), Ireland (2), Norway (3), Poland (20), Portugal (18), Slovenia (2), Sweden (1), Switzerland (7), Turkey (143), United Kingdom (29)

** The EMRAM algorithm differs from the European countries, United Arab Emirates, Saudi Arabia and Australia

Source: HIMSS Europe Database, Q2/2014 (data from 7/2012 – 6/2014)

Status as of 7/1/2014

GLANCE OF GLOBAL EMR STAGES

- ❑ According to HIMSS, in Asia, only two hospitals have reached 7th stage of EMRAM and 27 hospitals from Malaysia, India, China, Chinese Taipei, Singapore, Saudi Arabia and UAE have reached 6th stage of EMRAM.
- ❑ While, in Europe, three and 42 hospitals have reached 7th and 6th stages respectively. Of course, there are plenty of hospitals located at lower stages both in Asia and Europe.
- ❑ Meanwhile, the situation of USA is clearer than other parts of the world due to the fact that USA is the emerging source of EMRAM and it is obviously extending more rapidly too. In more detail, HIMSS uncovers that 3.2% of the hospitals in USA are in stage 7, 15% in stages 4 and 6, 27.5% stages in 5, 25.4% in stage 3, 5.9% in stage 2, 2.8% in stage 1 and finally 4.9% in stage 0 out of 5447 hospitals in this country.

Hospitals at stage 6	Hospitals at stage 7
➤ India-6 hospitals ➤ P.R. China-19 hospitals ➤ Taiwan-5 hospitals ➤ Thailand-2 hospitals ➤ Singapore-8 hospitals ➤ Malaysia-1 hospital	➤ Singapore-1 hospital ➤ Korea-1 hospital ➤ China-4 hospital ➤ India-0 hospitals

- Indian hospitals at stage 6
 - 1) Apollo hospitals, Hyderabad
 - 2) Apollo hospitals, Chennai
 - 3) Apollo hospitals, Nandanam, Chennai
 - 4) Apollo hospitals, Aynambakkam, Chennai
 - 5) Max hospitals, East wing, Saket
 - 6) Max hospitals, West wing, Saket

Source: <http://www.himssanalyticsasia.org/emram/stage6hospitals.asp>

OBJECTIVES:

Objective 1

- To identify the current scenario of EMR adoption and its stages (EMRAM Model) in hospitals of Bangalore in India.

Objective 2

- To identify the barriers in EMR implementation and adoption by the hospitals

Objective 3

- To identify the ways to overcome these barriers

RESEARCH METHODOLOGY

- ❑ The study had carried out in 14 health care facilities of Bangalore.

- ❑ **STUDY DESIGN:**

- ❑ Cross Sectional Descriptive study.

- ❑ **TOOLS FOR STUDY:**

- ❑ Semi structured questionnaire.

- ❑ In depth interviews.

- ❑ **SAMPLING TECHNIQUE:**

- ❑ Purposive sampling.

- ❑ **SAMPLE SIZE:**

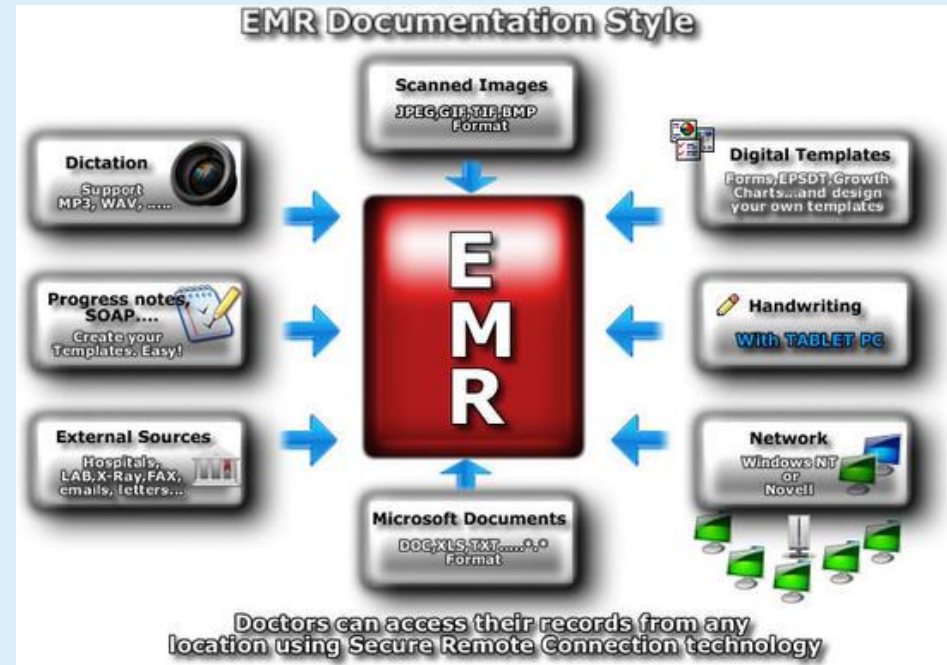
- ❑ Private Hospitals=11 Not for profit Hospitals=3

- ❑ Total respondents=150 from all the 14 hospitals.

- ❑ Doctors = 44 Nurses= 55 Admin staff= 51

- ❑ **EXCLUSION CRITERIA:**

- ❑ Those hospitals which refused to co-operate and share information.



RESULTS

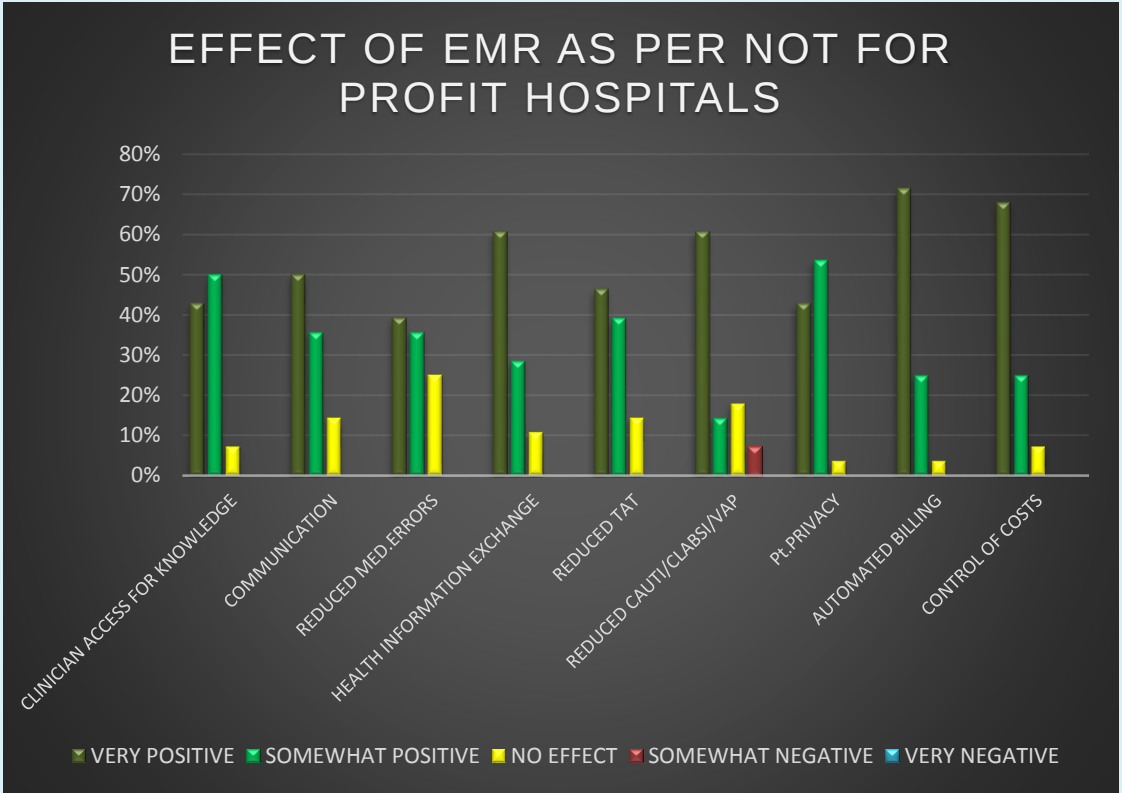
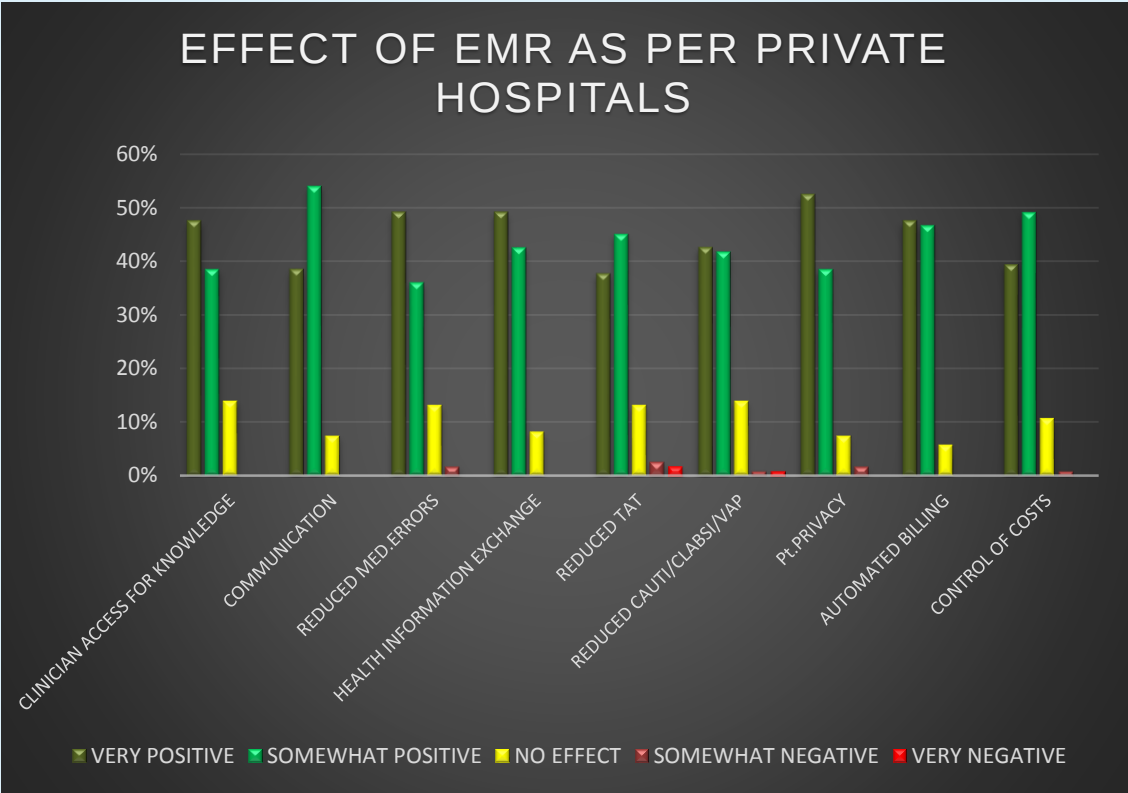
Table 1: Percentage distribution of the respondents according to their demographics

VARIABLE		'n' VALUE	PERCENTAGE
Response code	Doctors Nurses Admin staff	n=44 n=55 n=51 Total = 150	29.3% 36.6% 34%
Age group	20-30 31-40 41-50 >50	n=31 n=48 n=4 n=2 Total=85	36.4% 56.4% 4.7% 2.3%
Working Experience	0-5 Years 6-10 Years 11-20 Years >20 Years	n=76 n=34 n=11 n=02 Total=123	61.7% 27.6% 8.9% 1.6%
Hospital Size	250-500 bedded >750 bedded OPD & Day care centres Super speciality hospitals	n=6 n=3 n=2 n=3 Total=14	42.8% 21.4% 14.2% 21.4%

Table 2: Table showing EMR utilization in hospitals

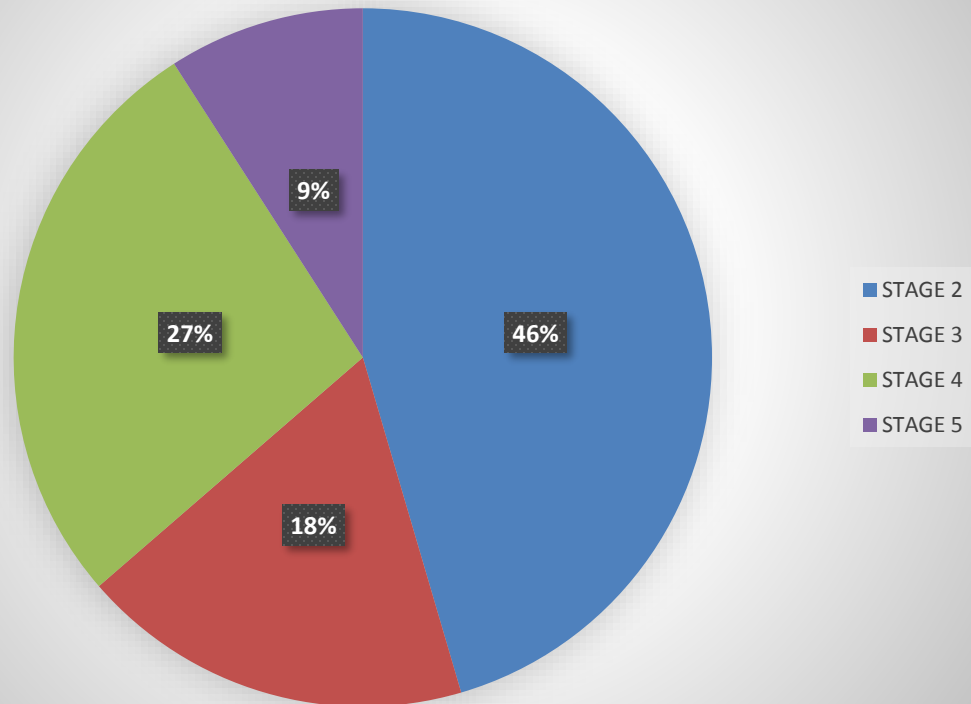
VARIABLE		'n' VALUE	PERCENTAGE
Frequency of usage of computer	Very frequently Frequently Often Rarely	n=48 n=94 n=5 n=3 Total=150	32% 62.6% 3.3% 2%
Internet usage for patient care	1) Cli.research,Telemed,e-consul, Appoint. Sched 2) Telemedicine, e-consul and Appoint.sched 3) Telemedicine and Appoint.sched	n=4 n=4 n=6 Total=14	28.5% 28.5% 42.8%
Usage of EMR outside clinical office	Yes No	n=23 n=127 Total=150	15.3% 84.6%
No. of years of using EMR/HIS	1-2 Years 3-5 Years 5-7 Years >7 Years	n=42 n=51 n=34 n=23 Total=150	28% 34% 22.6% 15.3%
No. of training sessions on EMR/HIS	1-2 3-4 5-6 None	n=53 n=81 n=5 n=11 Total=150	35.3% 54% 3.3% 7.3%
Effect of training on EMR/HIS implementation	Satisfied Neutral Dissatisfied	n=121 n=24 n=5 Total=150	80.6% 16% 3.3%
Effect of EMR/HIS in increasing productivity(i.e. patients per day)	Agree Neutral Disagree	n=142 n=8 n=0 Total=150	94.6% 5.3%

Figure 1: Figure showing the perception of Private and Not for profit hospitals staff about the effect of EMR

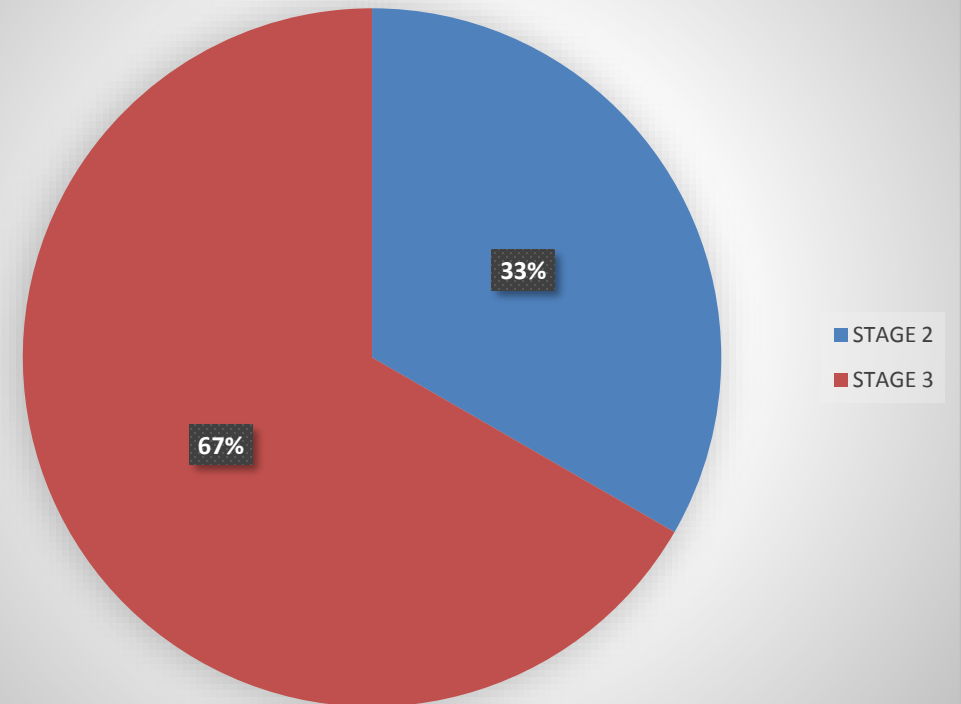


Objective 1: STAGES OF PRIVATE AND NOT FOR PROFIT HOSPITALS

PRIVATE HOSPITALS

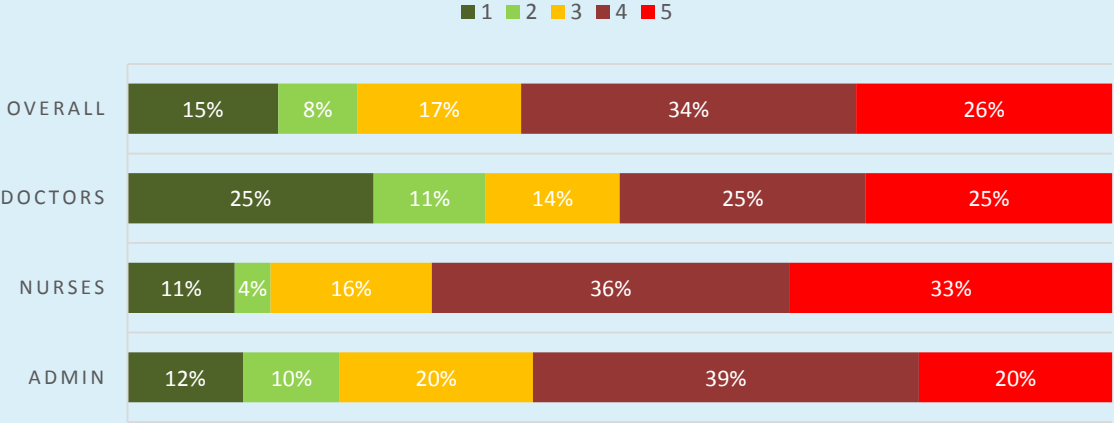


NOT FOR PROFIT HOSPITALS

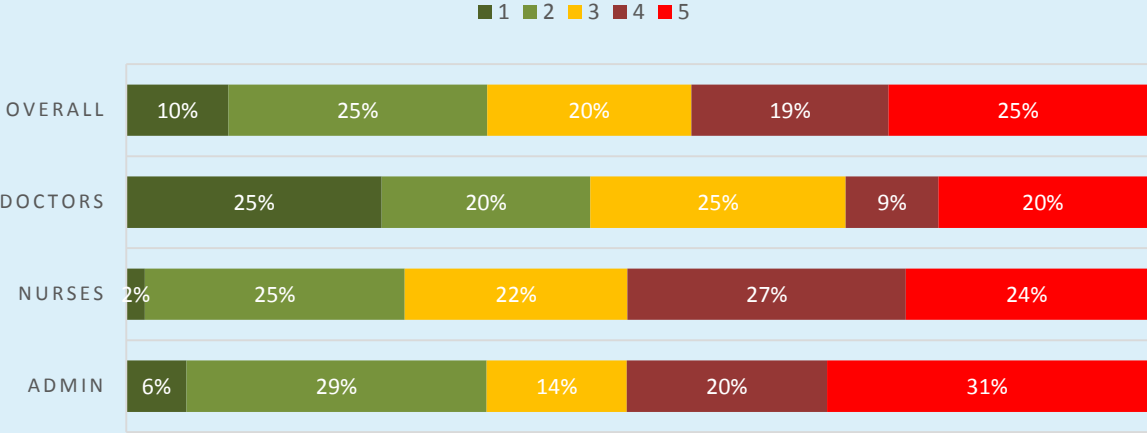


Objective 2: Greatest inhibitors for EMR adoption as per the respondents from the hospitals

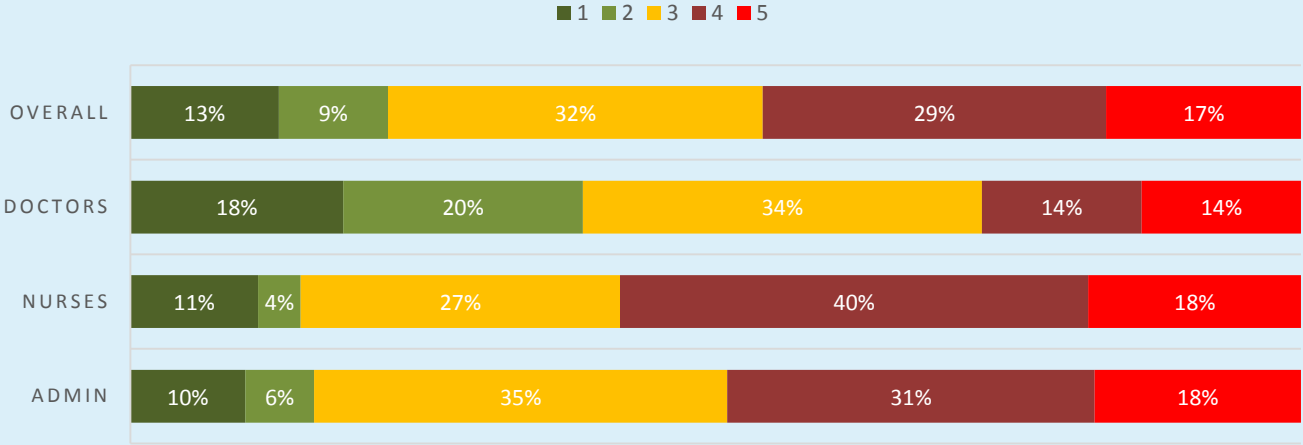
HIGH COST OF IMPLEMENTATION



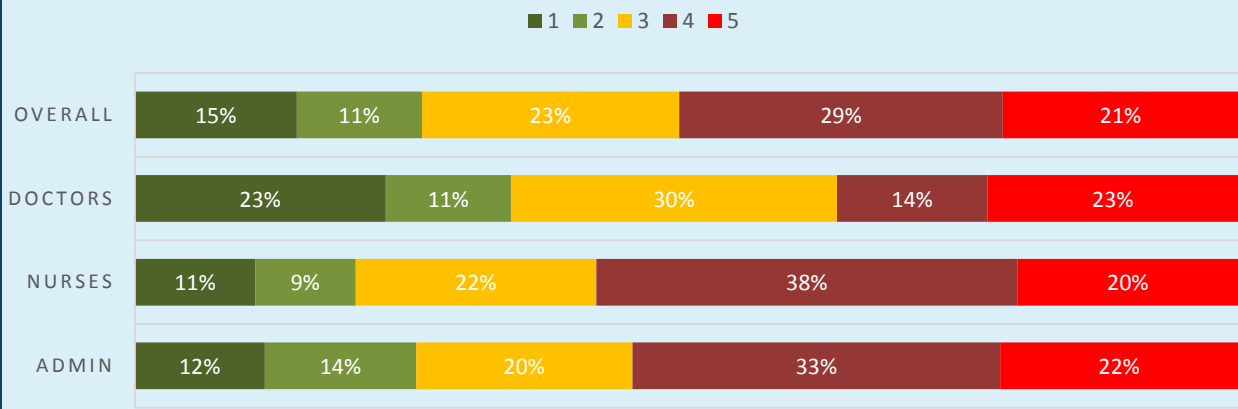
INADEQUATE IT STAFF



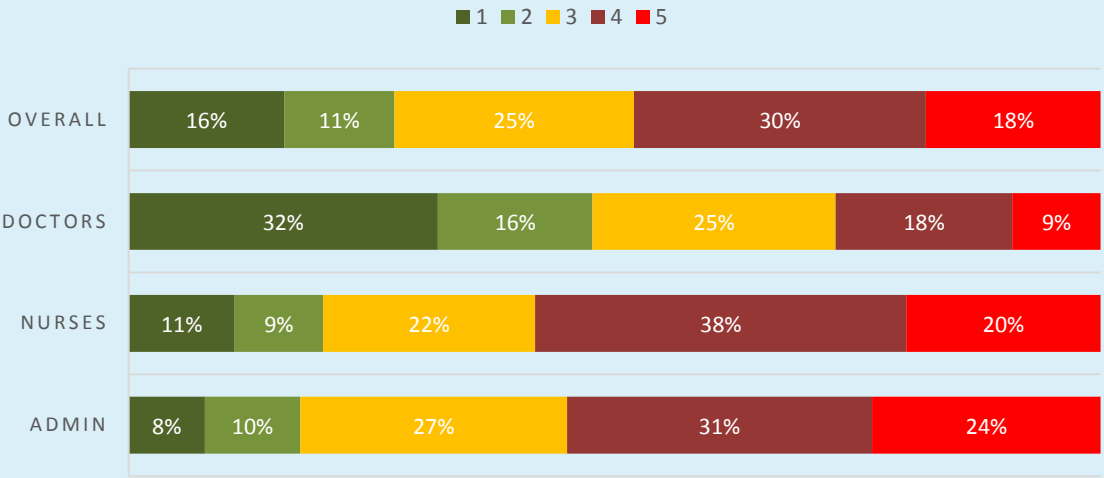
LACK OF CLARITY IN HIT POLICIES



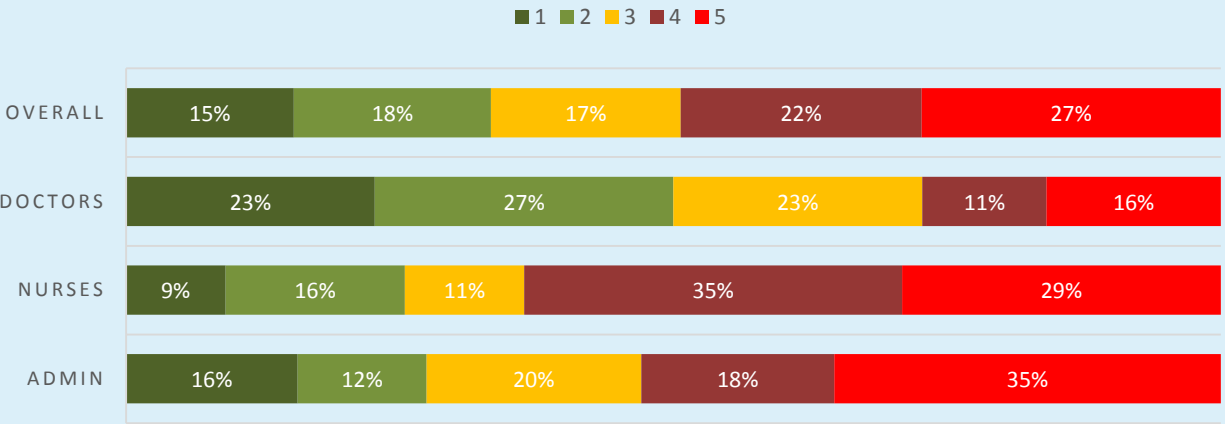
TECHNICAL LIMITATIONS



LACK OF TRAINING



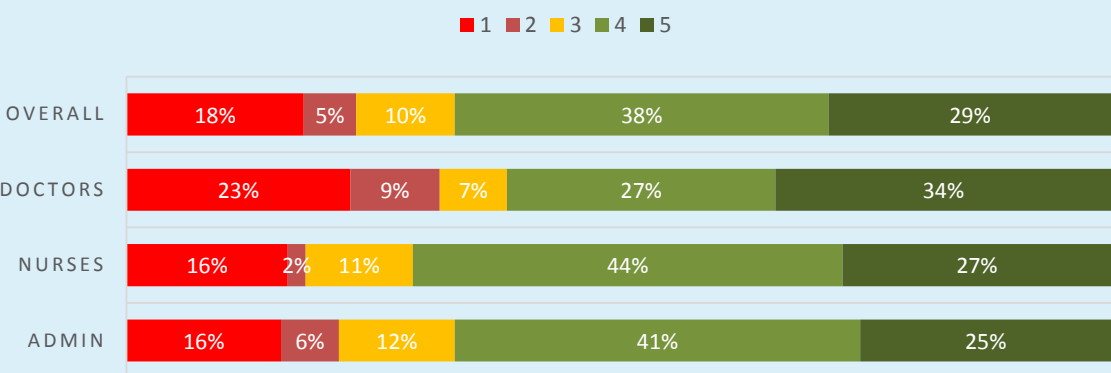
PATIENT PRIVACY & SECURITY CONCERNS



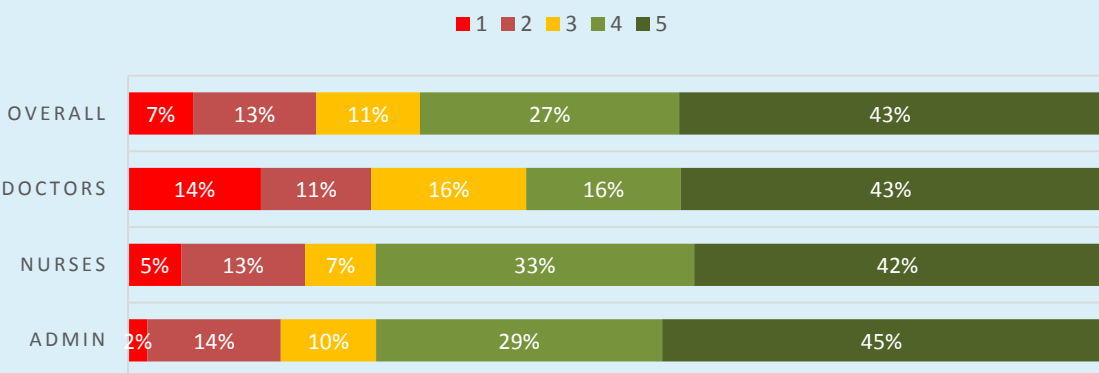
- ❑ The other inhibitors that were mentioned by some respondents as the questionnaire is open ended:
 - Too many options with too many entries
 - Integration of EMR leads more application part to view patient data
 - More habitual to work manually

Objective 3: Suggestions to improve the adoption of EMR in the hospitals

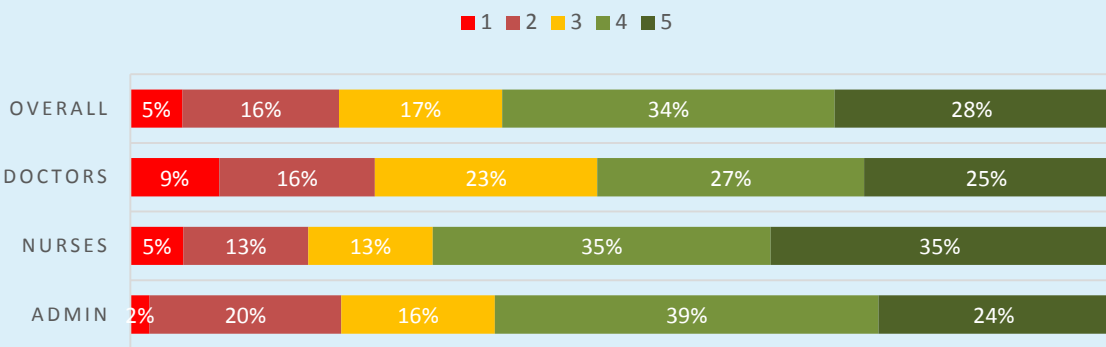
CREATING AWARENESS OF USING EMR



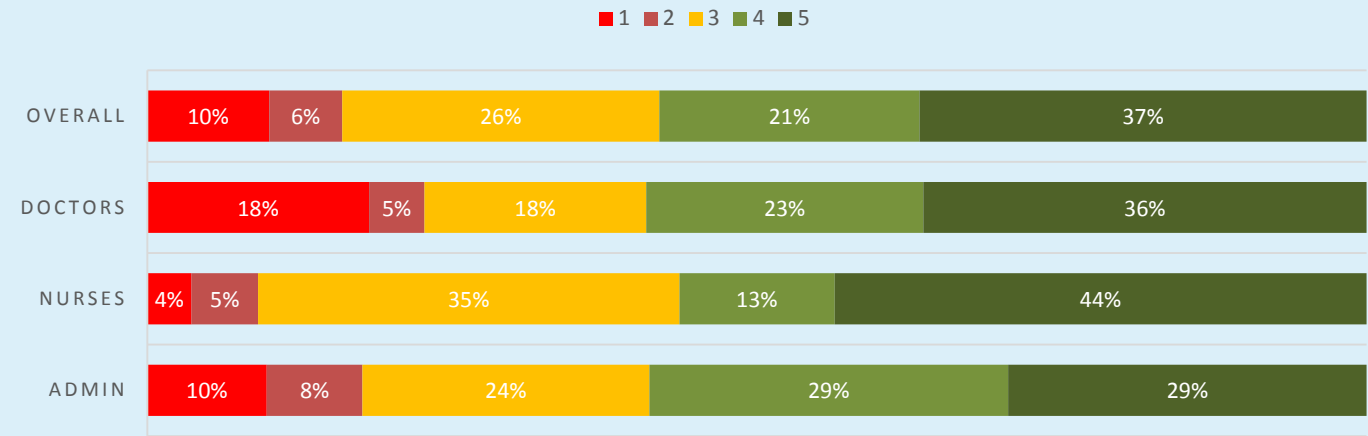
TRAININGS TO IMPROVE KNOWLEDGE



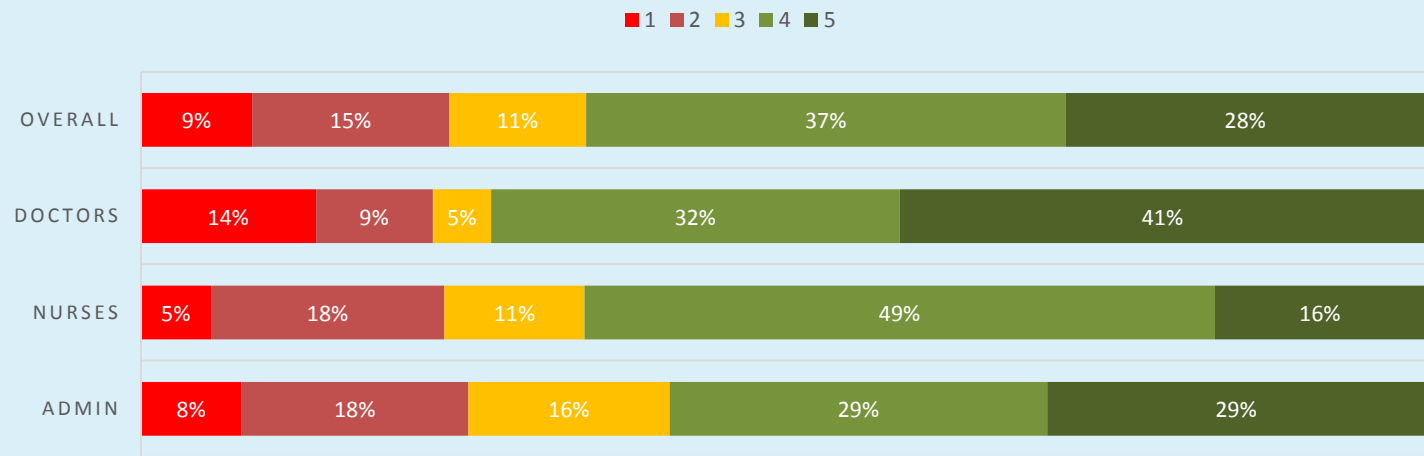
TECHNICAL SUPPORT FOR IMPLEMENTATION



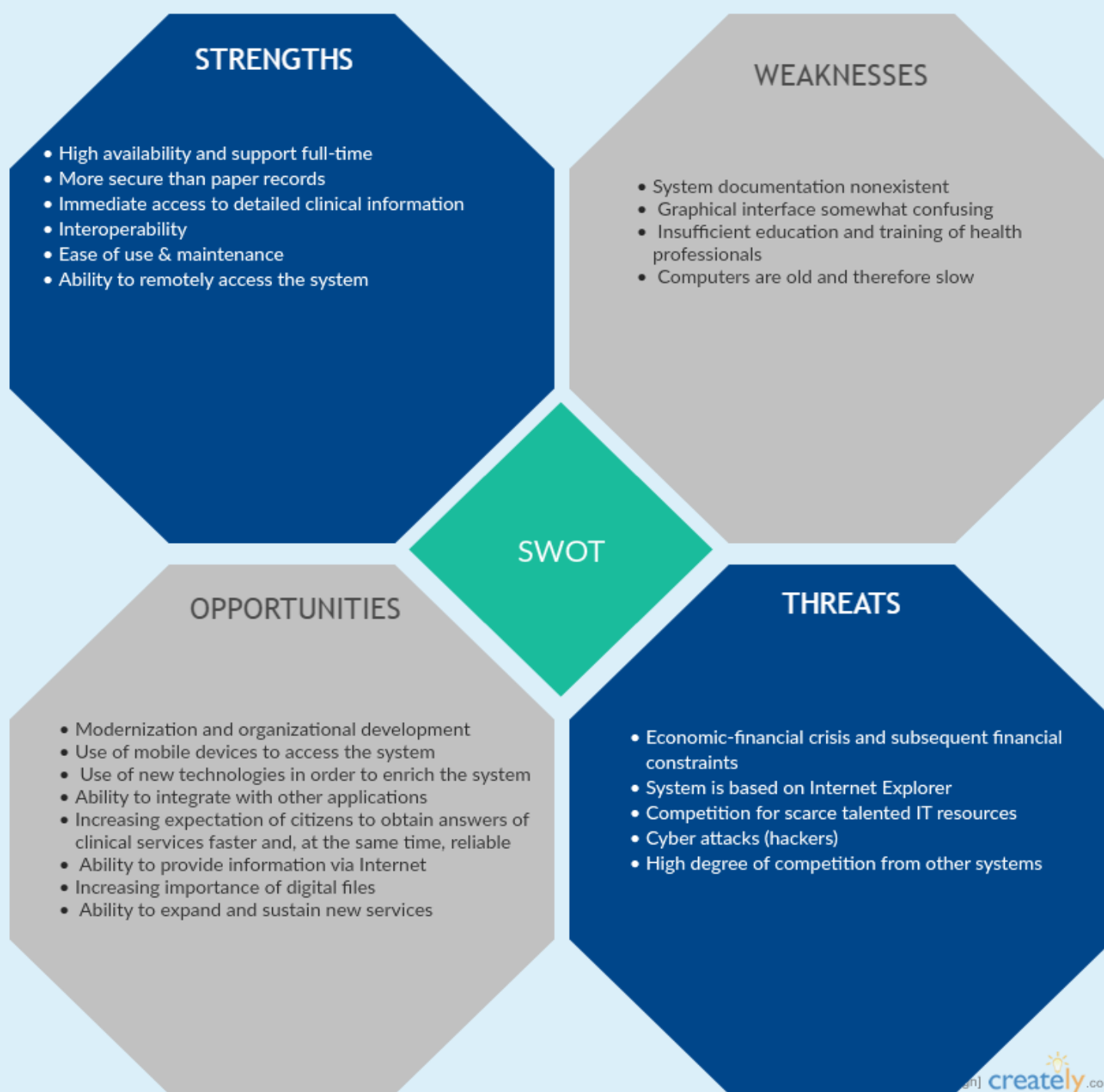
HIRING IT STAFF FROM VENDOR FOR IMPROVEMENTS



FLEXIBLE EMR DESIGN



- ❑ As the questionnaire is open ended some of the respondents has given their own suggestions to adopt EMR.
 - Simple & user friendly
 - Should not waste time in loading
 - Flexibility and versatility are the key terms to adopt EMR



SWOT ANALYSIS

CONCLUSION:

- ❑ As per the survey out of 11 private hospitals 1 hospital is in stage 5, 3 hospitals are in stage 4, 2 hospitals are in stage 3 and 5 hospitals are in stage 2 whereas out of 3 Not for profit hospitals 2 are in stage 3 and 1 is in stage 2.
- ❑ By this study, it can be conclude that EMR adoption was gaining in India.
- ❑ According to the survey the major inhibitors are
 - High cost of implementation
 - Technical limitations
 - Patient privacy and security concerns
- ❑ The major suggestions as per the survey are
 - Trainings to improve knowledge
 - Creating awareness of using EMR
 - Flexible EMR design

RECOMMENDATIONS

- ❑ Have a plan before starting the implementation process
 - Assess workflow of the departments and identify which processes will change.
 - Avoid creating extensive data entry-focused templates for physicians.
 - Select hardware after talking to your EHR vendor.
 - Create a plan of action in case of emergency.
 - Request workflow customization from your EHR vendor upfront.
 - Determine how will you scan and import all your old charts
- ❑ Right Vendor Partnership Relationship

Cont.....

- ❑ Training needs to occur on a regular basis which includes basic skills, application functions and live instruction.
- ❑ Physicians need to be an integral part of the training as a representation of the importance of EHR implementation and to increase their own ability to utilize the system which plays a critical part of EHR success because, if your staff is not properly trained, then the EHR implementation becomes a painful process.
- ❑ Utilize compatible hardware. Assessing your current hardware and making appropriate changes will ensure that all hardware is up and running for training, implementation and use of the new EHR system.

