Research Paper

Implementation of Digitized Medical Records to Enhance Patient Satisfaction by Reducing Waiting Time in Out Patient Department

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ABSTRACT:
Background
Although implementing Electronic Medical Records was the initial focus   on improving medical care as a whole; a hunch of retrieval and transferring old case records during footfalls remained a challenge for the organization. Reduced patient and consultant's satisfaction directed for scanning and integrating old medical records with Hospital Management Information System (HMIS) Effective management, storage, and on-time availability of protected health information provided increased productivity of consultants as well as gave a value-added service to patients which reflected in increased patient satisfaction.
Objectives:
To enhance patient & consultant satisfaction in Out Patient Department by reducing waiting time (turnaround time) for physical case records from a medical record storage area.
To reduce risk of damage to stored paper records and loss of healthcare data, physical storage cost and space constraint caused obstacles.
Methods: The study was observational & descriptive. Simple random sampling technique for patient feedback from collected appointment patients was used in the study.
Results & conclusion
Patient waiting time for physical case record reduced from 50 minutes to 8 minutes post DMR application .This enhanced satisfaction of stakeholders on information sharing. Reduce the cost of physical storage space, Reduce the need for additional staff in physical storage area. Manpower for retrieval. Patient satisfaction increased post implementation of DMR from 40% 85% and consultant satisfaction from   35% & 95% respectively. Reduced clutter in storage area eventually reduced occupational hazards caused by dusty, stacked old documents. Improved administrative services by delivering coherent, quick, safe, and secure access to medical records.
Keywords: Out Patient Department, Digitized & indexed medical records, waiting time, patient satisfaction, Consultant Satisfaction.

I.   INTRODUCTION:

Although implementing Electronic Medical Records was the initial focus   on improving medical care as a whole; a hunch of retrieval and transferring old case records during patient footfalls remained a challenge for the organization. This study was conducted in a tertiary care hospital with 400 operational beds.It has a centralized in house physical storage medical records department with traditional paper files stored for outpatient, inpatient, day care, Medico-legal, and expired cases. It is situated at the third floor of the hospital. OPD is with multiple cabins for super speciality as well as general speciality consultants with waiting areas divided into 4 sections horizontally for operational purposes at the ground floor.

Waiting time in OPD is one of the quality indictor for quality assurance as the hospital is NABH. Overcrowding and prolonged waiting time in Outpatient department is harmful for   a hospital on the

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whole[1].Patient feedback collected and monthly presented in quality assurance meeting highlighted & studied various reasons for prolonged waiting time.

One of those causes delay in receiving case records from MRD was the major cause making patients as well as consultant's wait unnecessary in OPD .Patient satisfaction and OPD too showed declining trend in 6 month data analysis whereas consultant too felt wastage of time as for one revisit patient 45-50 minutes they had to wait to receive old case record. An insufficient outpatient department is clearly of critical importance as great volume prefers outpatient services because of lower cost compared to inpatients[2].Multidiscuplinary patient case encourages continuity of care[3].

With increasing OPD and number of MLC case records space constraint was the major issue faced by records storage department. Consultant's request & demand to maintain all active super specialty, special cases records though it has crossed retention period became challenging over a period of time. Outsourced scanning team introduced in year 2016. In house staff were trained for preparing documents for scanning, indexing, quality control on readability and contrast of documents, done. Backdated case records from 2011 till date selected for scanning and indexing. Scanned and indexed case records are protected with a password-protected searchable online HIS database. User names and passwords were provided to authorize stakeholders. This allowed our stakeholders to access instant access to information past or current from anywhere. Enhancing patient & consultant satisfaction in OPD by reducing waiting time for case records from the physical storage area was the main objective of this project.

II.   MATERIALS & METHODS

The study is observational & descriptive, carried out in 400 bedded tertiary care   hospital which generates approximately 75000 new OP cases records and 22500 inpatient case records annually. Patient feedback is one of the quality parameter in the organization. Patient feedback is collected with closed ended questionnaire with comment box. Weekly analysis of the report is generated by quality department to check patient satisfaction at various service providing areas. Simple random sampling technique was used in this study. Random footfall patients waiting in OPD (footfall patients list generated from HIS) were handed over with feedback form from Patient relation executive, educated on feedback with comment on OPD operations.
Inclusion Criteria-Out patient department patients and consultants (both using EMR and not using EMR) for feedback on the availability of on-time case records were included.
Exclusion Criteria-In patient's feedback are excluded.
This study was conducted in two phases as depicted in Fig.1
Phase I –Pre-implementation of Digitized Medical Records & Integration with
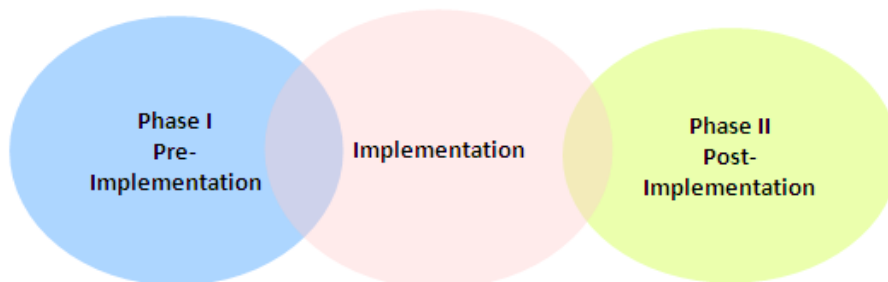Phase II-Post-implementation of Digitized Medical Records & Integration with HIS.

Fig.1

Feedback was collected only from 2% of monthly OPD (new & revisit with appointments) patients before 2015 i.e. approximately 18-20 feebacks.2015 sample size increased to 10% for revisit patients exclusively which was approximately 90-100 monthly feedback with increased sample size problem got defined with clarity on OPD and MRD operations. 10% sample showed patients as well consultant's declining satisfaction satisfaction is declining towards waiting time in OPD for old case files.

Table 1.

Details	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	AVG
New Patients	276	271	204	158	173	134	154
Revisit Patients	426	414	361	301	281	229	335
Total	702	685	565	459	454	363	489
Details	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Total
No of patients submitted	43	23	30	28	36	41	201

feedback(10% of total)						
Male Patients Audited	23	8	12	15	15	19	92
Female Patients Audited	20	15	18	13	21	22	109
Patient satisfaction	19	12	15	10	12	12	80
Satisfaction in percentage in percentage	45	52	50	36	33	29	40
Consultant's Audited	31	31	26	25	25	24	162
Consultant's satisfaction	12	11	9	9	9	8	56
Consultant's satisfaction in percentage	38	36	35	34	34	32	35

Graph 1.
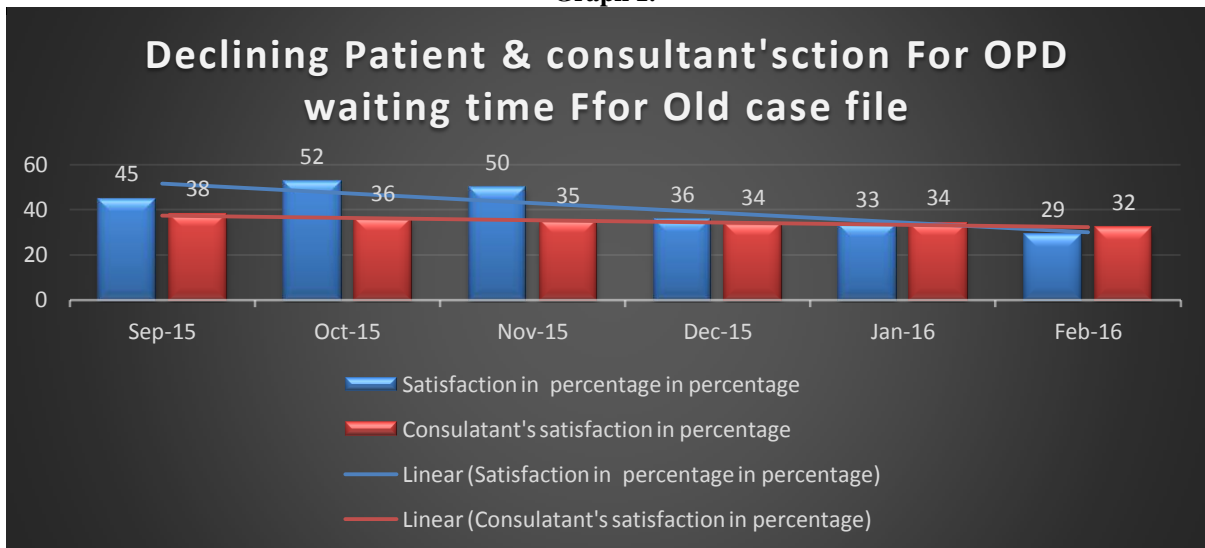
Data was collected with "patient feedback form" by OPD patient relation executive. Question mentioning on OPD services was responded with low score for satisfaction. Feedback was collected post consultation. Comments on excessive waiting time for transferring old case records from physical storage area was mentioned. Improve your records retrieval and transfer policy to reduced excessive waiting time which was causing overcrowding in OPD was mentioned by patients.

Study was done in two phases pre-implementation and post-implementation of digitized medical records. Year 2015-16 analysed data from quality department was considered as Phase I study which was before intervention of DMR. Outsourced DMR (scanning software) was introduced in August,2016 which took one year period for scanning and indexing of old case records with a team of 10 experts.
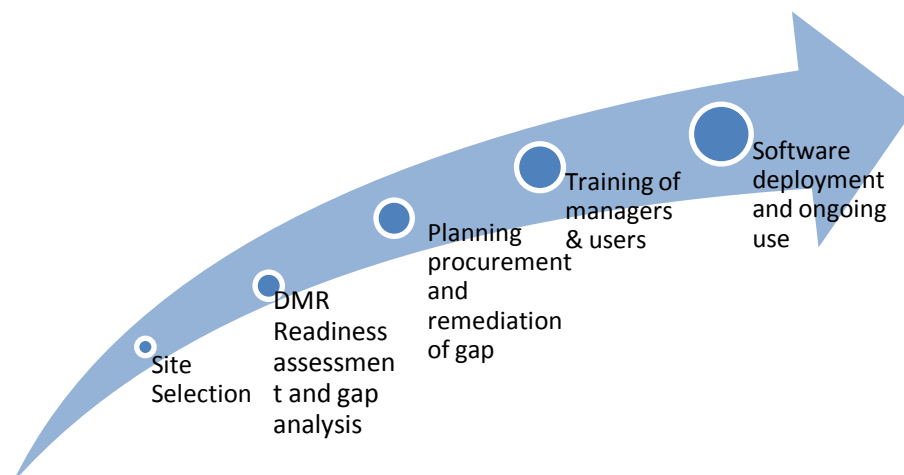

Fig. 2

Integration of scanned documents in DMR was in live application in late December,2017 which got integrated with HIS and was in live from Feb 2018.Patient satisfaction data was collected with 10% footfall patients in Phase II study post DMR application.

In Phase I consultant's satisfaction was not collected through any structured form. It was calculated with incidents raised by consultants on delayed file transfer from MRD. Second dissatisfaction was captured in doctor's clinical meetings with administrative staffs & management. Dissatisfaction on availability of old medical records to review previous notes (IP or OP) was the major concern. These reviews reflected by approximately 60% of general as well as super speciality consultants are not satisfied with the operations of OPD & MRD.

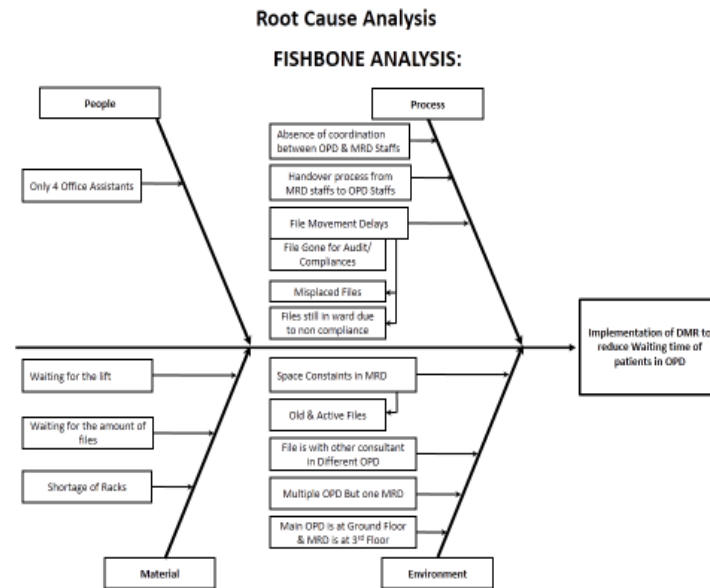Using statistical tools like Fishbone diagrams i.e. Cause – **Effect analysis**[13]

Fig.3

People
24 hour number of trained Office Assistants was a challenge.
Process
Absence of coordination between OPD & MRD Staffs, Misplaced Files-Due to increased clutter with space restrictions files were misplaced,Tracking of visited files moved for deficiency clearance/audit was time consuming,Handover process is maintained manually.
Environment
Space Constraints in MRD, Old & Active Files since 2011, All MLC, expired patient's case files, Baby of files for 18 years.,File is with other consultant in Different OPD,Location of OPD (Ground Floor), MRD (IIIrd floor)
Material
Waiting for the lift, Shortage of Racks due to space restrictions.
Phase II-Consultants who are using EMR were definite users of DMR. In phase II questionnaire was shared with consultants preferably EMR users i.e. to 50-55% general and super speciality consultants were targeted for this study.15% feedback from consultant's not using EMR but using DMR during patient footfall visits. Same consultants from Phase I were targeted for feedback collection in Phase II.
PDCA (plan–do–check–act or plan–do–check–adjust) four stage management tool known as Deming Cycle model[14]
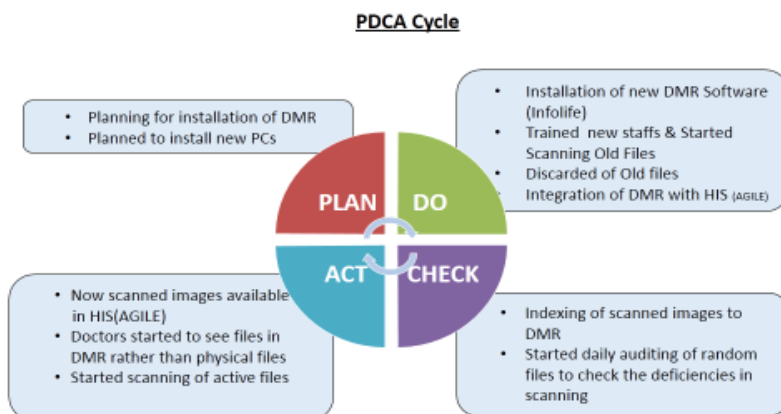
Fig.4

Planning for outsourced DMR was executed with number of new computers and bilk scanners .A team of 5 experts along with in house software team planned all logistics. Existing office assistants and coordinators were trained simultaneously. Integration with existing HMIS was taken care by software team. Old files scanned and integrated and discarded (all outpatient and inpatient files). Indexing of scanned images to DMR.Started weekly auditing of random files to check the deficiencies in scanning & integrating with HMIS. Outsourced team handed over all report files to in house team post one year. At present entire scanning, indexing and integration is handed by in house MRD department, software and hardware department.

Fig 5. Scanned and Indexed Medical Record View
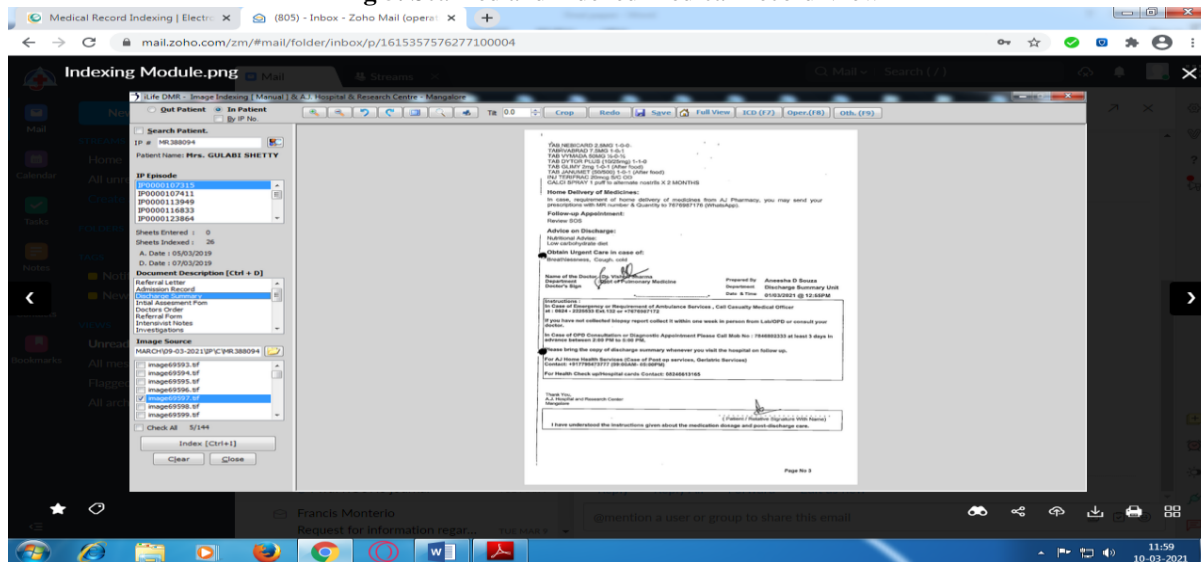
III. RESULTS:

Same 27 consultants were concentrated for the post implementation feedback .Phase I consultant's feedback was not structured feedback, it was collected from clinical meetings consultant's reviews, complains, suggestions. In phase II structured questionnaire was formulate for same consultants. Analysis showed same consultants showed increased level of satisfaction as system was giving all old documents in an indexed form with date& year of visits.

Details	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	AVG
New Patients	289	301	354	217	289	302	292
Revisit Patients	516	515	596	722	751	601	292
Total	805	816	950	939	1040	903	909

| Details	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Total
No of patients submitted feedback(10% of total)	81	82	95	94	104	90	545
Male Patients Audited	48	41	39	41	51	47	267
Female Patients Audited	33	41	56	53	53	43	278
Patient satisfaction	68	71	77	83	85	81	78
Satisfaction in percentage in percentage	84	87	81	88	82	90	85
Consulatant's Audited	24	25	26	31	30	33	162
Consulatant's satisfaction	22	24	24	29	29	32	160
Consulatant's satisfaction in percentage	92	96	92	94	97	97	95
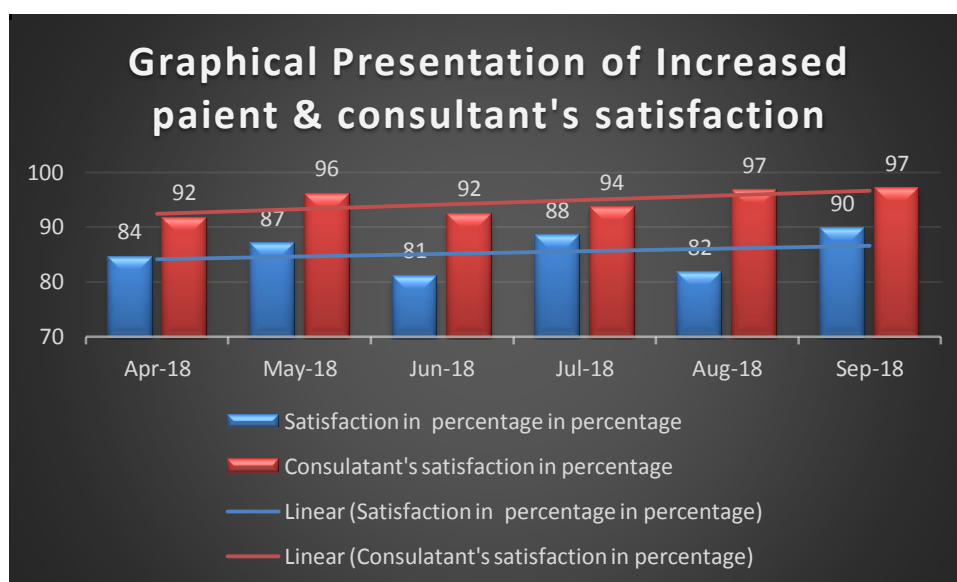
Analysis of Data: Data collected using the patient feedback form, doctors interviews as well as clinical meetings discussions.MS Excel (version 2007) & analysed with Statistical Package for Social Science (SPSS) (version 16), R (version 3.3.2). We used a Wilcoxon paired test at 0.05 level of significance as our data was categorical data.

Descriptive statistics

	N	Mean	Z Value	p Value
Negative Ranks	5	1.41	-1.807	0.071
Positive Ranks	18	1.56		
Tied Ranks	4			
Total	27			

Table 1: distribution of patient waiting time in OPD pre & post implementation of DMR.

SI	Turnaround Time(TAT)Details	Bench Mark(in minutes)	Pre implementation of DMR(TAT in minutes)	Post-Implementation of DMR(TAT in minutes)
1	TAT from patient check In to OPD to Visit Entry.	5	5	5
2	Case record retrieval from MRD, receiving to OPD & consultation	20	45	3
	Overall TAT	**25**	**50**	**8**
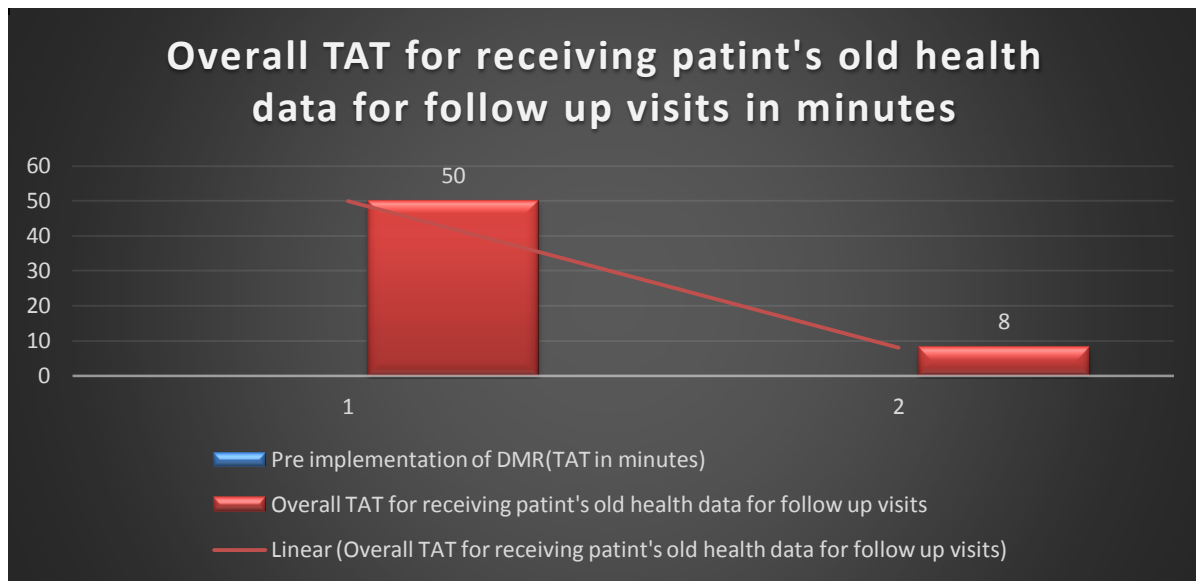
IV. DISCUSSION

Introduction of digitized medical records with integration to hospital HIS is possible without disturbing clinical practice flow. The frequency and acceptance towards DMR was high by all stakeholders.

Waiting time in OPD was one of the quality indictor for quality assurance as the hospital is NABH accredited[8]. Monthly trend in OPD waiting time as well as patient satisfaction for the OPD was declining. Overcrowding of OPD and prolonged waiting time in OPD would be critical in for a hospital on the whole. Waiting time for appointment patients should not be above 30 minutes of their scheduled appointment[1].

Waiting time is time spent by the patient from arrival to the OPD to consultation by one of the medical staff[7] this is however, not the case in most developing countries, as several studies have shown that patients spend 2-4 hours in the outpatient departments before seeing a doctor. [10, 11, 12] .Standard benchmark of 25 minutes was fixed for file transfer from MRD to OPD based on previous in house turnaround time. Since Sufficient space and storage equipment's were available before 2015.(Hospital started in 2001).As appointment patients revisit files used to move to OPD on time when number of visits as well as man, material space problems were not faced by records department. With increasing number of patients and MLC cases and consultant's request to maintain all active case records though it has crossed retention period became challenging over a period of time. Many hospitals have seen the use of digitized medical records (scanned paper) as a means to save money on administration and improve access to records.[4, 5]

The electronic medical record is considered a prerequisite for the efficient storage, distribution, and use of data in inpatient care[3] .Our results are consistent with digitized and integrated medical records. Our study offers insight into a scalable approach to workflow analysis that makes use of readily available data and that can support rapid learning. The scanned document images should be considered an intermediate stage toward fully electronic medical records[6]

Paper based documents data need to be collected manually.Digotized medical records have saved space consumption cost, equipment cost as well as manpower cost with easy and accurate access to case records by the stakeholders.

This is the first paper on scanning and indexing which is the first step towards a comprehensive digital health care system... This source of data captures key attributes of clinical workflow, including who is involved, their activities, and the sequencing and duration of activities. Patient prolonged waiting has many factors. Efficiency of healthcare workers, punctuality, dedication, knowledge also afftects patient waiting time in OPD[9]

V. CONCLUSION

Scanned and indexed medical records allowed stakeholders for instant access of past and current health information from anywhere. Patient waiting time for physical case record reduced from 50 minutes to 8 minutes post DMR application .This enhanced satisfaction of stakeholders on information sharing. Reduce the cost of physical storage space, Reduce the need for additional staff in physical storage area. Manpower for retrieval. Patient satisfaction increased post implementation of DMR from 40% 85% and consultant satisfaction from 35% & 95% respectively. Reduced clutter in storage area eventually reduced occupational hazards caused by dusty, stacked old documents. File movements for revisit cases to OPD was completely ceased from MRD department. Any special case file was sent with request form to OPD on consultant's request.

Improved administrative services by delivering coherent, quick, safe, and secure access to medical records.

PATIENT EXPERIENCE FEEDBACK (OPD)

1. Name--- UHID No.- ------------------ Age- -------- Sex- --------
Occupation- --
 2. Residential Locality- --
3. How did you know about this hospital OPD?
 From Referring Doctor ☐ Friends ☐ Relatives ☐ Newspaper Ads ☐ Social Media ☐ Brochures ☐ Others ☐
4. Did you take an appointment /make an enquiry about the doctor's availability on requested time?
Yes ☐ ☐ No ☐
5. How satisfied are you with the way your appointment was taken/phone call handled?
Highly Satisfied ☐ Satisfied ☐ Average ☐ Not Satisfied ☐ Not Applicable ☐
6. How would you rate the reception staffs guidance and information regarding waiting time upon arrival in the OPD?
 Excellent ☐ Above Average ☐ Average ☐ below Average ☐ Very Poor ☐
7. How much time did it take you to meet your doctor after your arrival? (To be answered only appointment patients)
   <25minutes ☐ 25-30Min ☐ 30-60mon ☐ 60mon. ☐
8. How would you rate -you made to wait for your old case record availability in OPD? (Only follow up patients to answer) (1 is very poor and 5 is excellent)
1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
9.Any other suggestions for improvement on OPD Services --
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CONSULATNAT'S FEEDBACK ON DMR

1. Is Electronic Medical Record available in your personal computer/tab/phone?
    Yes ☐ No ☐
2. Are you aware of Digitized Medical records (DMR?)
    Yes ☐ No ☐
3. Are you using DMR to view old case records in follow up cases?
    Yes ☐ No ☐
4. Are you satisfied with DMR services?
    Yes ☐ No ☐
5. If "NO" mention reason-
Clarity ☐ integrity ☐ continuity ☐ quick availability ☐ others ☐ ---------------------
6. Any suggestion--

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