



# **A Study of HIS integrated Artemis Connect MD applications: Challenges and opportunities.**

Summer Internship Project



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*Summer Internship Report*  
at  
**ARTEMIS HOSPITAL, GURUGRAM**  
(From 9th April to 8th June 2022)

A Report  
By

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PGDM (Hospital and Health Management)  
2021-2023



**International Institute of Health Management Research,  
New Delhi**

The certificate is awarded to

***ABHIMANYU DABAS***

In recognition of having successfully completed his/her  
Internship in the department of

***HUMAN RESOURCES***

and has successfully completed his Project on

***“A Study of HIS integrated Artemis Connect MD application: Challenges and Opportunities”***

***8<sup>th</sup> JUNE 2022***

At

***ARTEMIS HOSPITAL, GURUGRAM***

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

We wish him all the best for future endeavors

(Controller- Ved Prakash)

(CPO - Flt Lt. Saras Malik)

### **Certificate of Approval**

The Summer Internship Project of titled “*A Study of HIS integrated Artemis Connect MD application: Challenges and Opportunities*” at “*ARTEMIS HOSPITAL, GURUGRAM*” 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 report only for the purpose it is submitted.

## **ACKNOWLEDGEMENTS**

I would like to take this opportunity to express my deep sense of gratitude to all those people without whom this project could have never been completed. First and foremost, I would like to thank my Parents for their inexhaustible source of inspiration.

I would like to extend my gratitude to the Human Resources and Trainings department of Artemis Hospital Gurugram, for their constant guidance and providing this platform for me to learn. My special thanks to my senior Dr Simranjeet Kaur for being my constant support and mentor at artemis.

I would like to thank my College IIHMR Delhi and my mentor Dr. Sumant Swain for his constant encouragement and support, without which I would have never been able to give in my best.

Their guidance and supervision was very helpful in bringing this work to conclusion.

Abhimanyu Dabas

PG/21/142

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## **ACRONYMS/ABBREVIATIONS**

HCP- Health Care Professions

HIS- Hospital Information System

HIMS- Hospital Information management system

AHSF- Artemis Health Sciences Foundation

IT- Information Technology

IPD- In-Patient department

OPD- Out-Patient Department

## **OBSERVATIONAL LEARNING**



Artemis Health Institute, established in 2007, is a healthcare venture launched by the promoters of the Apollo Tyres Group. Artemis is the first Hospital in Gurgaon to get accredited by Joint Commission International (JCI) (in 2013). It is the first Hospital in Haryana to get NABH accreditation within 3 years of start-up.

### **Mission**

- Deliver world class patient care services
- Excel in the delivery of specialized medical care supported by comprehensive research and education
- Be the preferred choice for the world 's leading medical professionals and scientific minds
- Develop, apply, evaluate and share new technology
- Be an active partner in local community initiatives and contribute to its well-being and development

### **Vision Statement**

To create an Integrated World Class Healthcare System, Fostering, Protecting, Sustaining and Restoring Health through Best-in-Class Medical Practices and Cutting-Edge Technology developed through in-depth Research carried out by the World's Best Scientific Minds.

### **Core Values**

The corporate value system at Artemis is founded on three pillars – Service, Compassion and Integrity.

- Care for customer
- Respect for Associates
- Excellence through Teamwork
- Always Learning
- Trust Mutually
- Ethical Practices

### **Management Team**

Onkar Kanwar

Dr. Devlina Chakravarty

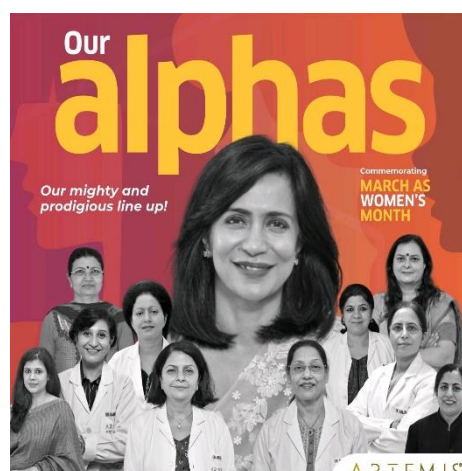
Dr. Manju Aggarwal

Mr. Sanjiv Kothari

Dr. (Col) Manjinder Singh Sandhu

Flt. Lt. Saras Malik

Ms. Shilpa Budhia





### **Quality policy at Artemis:**

- Deliver world class patient care through medical excellence
- Create a patient-centric environment
- Ensure high standards and safety of treatment during the patient's stay
- Continuous quality improvement through implementation of robust clinical and non-clinical process and protocols
- Having world-class infrastructure and cutting-edge technology utilized by highly skilled employees
- Complying with statutory regulations
- 

### **About Artemis Health Sciences Foundation (AHSF)**

- AHSF is a registered not-for-profit society, established under the aegis of Artemis Hospitals. With 'life' as our sole focus we are relentlessly working towards serving the underprivileged communities.
- For Artemis, social responsibility is visceral and deep rooted in both our values and core beliefs. As a result, the hospital is conjoined to its social arm-The Artemis Health Science Foundation, intrinsically. The foundation draws its strength from the hospital and is heavily committed towards spreading awareness about cancer and is successfully transforming lives through early detection and treatment of the underserved communities. The stakeholders too are a part of the same fabric and are partners in change and equal contributors towards enabling us nurture each life.

# **PROJECT REPORT**

## **INTRODUCTION-**

Hospital Information system (HIS) is one of the most advance and sophisticated implementations within healthcare industry. The motive is to provide a seamless and hassle-free experience to both the patient and the administration. Gone are those days when their used to be long ques in front of the IPD and OPD counters for admission, and their used to be huge heaps of paper and files. In order to move towards sustainability, the HIS was implemented in Hospitals around the world.

HIS focuses upon the integration of health informatics to achieve the administrations needs of a hospital. This is implemented in an array of departments within the hospitals, from administration to finance, from legal to medical services. HIS was successful in improving the quality-of-care health professionals were providing before it, now they can easy have an access to the patients' medical history and also efficiently schedule timings for consultation. This has improved the way medical professionals used to access the X-RAYS, CAT scan, MRI scans, general prescription. This improved the way professionals communicate within and outside the hospital premises.

Even further development of HIS and its integration within the portable Smartphones and Tablets, took this system from the admission counters to the patient's bedside. HIS has helped the medical industry usher into the new era of instantaneity. Now the doctors can easily prescribe any specific treatment or can order any medicines from the pharmacy while sitting in his room or on the move. Doctor's and patient's time is highly essential, any bit of delay can result in severe results, hence this integration has helped to reduce the time period of any and every consultation and admission.

At Artemis Hospital, Gurugram, HIS has been playing a key role in improving the patient experience and efficiency of the medical professionals. Artemis is keeping up with all the new technology which is being brought about in the healthcare industry. With the motive to provide a world class medical experience to its patients, the hospital has implemented HIS ever since its opening 2007. HIS has been into use at Artemis Hospital for long time now, with the success of the table top HIS software now Artemis has integrated the HIS in mobile application called the Artemis Connect MD application.

This application comes with HIS integration which is helping medical professional who are always on the move. Observing the application work was a treat in itself. I was able to observe the real work and help the application was providing to the medical professionals. To name a few facilities like: Specific Colour-Tagging of patients, Ordering Prescriptions and drugs for the patient, Daily update on the number of patients admitted, sending the referral directly to the other doctor, enabling the doctors to right their own notes about every particular patient and so much more. This application is a ground-breaking implementation within hospital.

HIS is a good example of how information technology is helping out each and every industry flourish. Integration of IT within the Health industry was pending for a long time, slow acceptability resulted in this delay. But now the tides have changed, Health industry is now accepting and welcoming this integration because it is helping them to improve their experience.

## **RATIONALE-**

This study is being conducted to analyse the knowledge, attitude and perception of the medical professionals about the Artemis Connect MD application. The result shall be collected and analysed, which will help us to find out the user satisfaction and help us to improve user experience where it is lacking. What are all challenges that an organization is facing while integrating Information Technology?

## **RESEARCH QUESTIONS-**

- To find out the satisfaction level of Hospital Information System (HIS) integrated Artemis Connect MD application among the Health Care Professionals of the Artemis Hospital, Gurugram in a time period of 5 Weeks.

## **OBJECTIVE-**

1. To find out the satisfaction level of HCPs at Artemis Hospital, Gurugram using the HIS integrated Artemis Connect MD application.

## **SPECIFIC OBJECTIVES-**

- i. To find out whether the integration of HIS into a mobile device has changed the perception of HCPs towards it.
- ii. To Analyse the level of adaptability of healthcare industry towards Information Technology.

## **DATA COLLECTION-**

In order to collect data a Microsoft Form was created and circulated among the prospective candidates which includes Doctors, Nursing Staff and Coordinators who are the daily users of the application. Mode of Data collection was 'Primary' and was tracked using MS Excel.

## **SAMPLE SIZE-**

The sample were collected in the month of May and June. The sample size was kept to be 50 and was analysed after the data was collected.

**STUDY DESIGN-** Cross-Sectional quantitative Study

**SAMPLING METHODOLOGY-** Convenient Sampling

**LOCATION OF THE STUDY-** Artemis Hospital, Gurugram

**TARGETED GROUP-** The users of the Artemis Connect MD application

**TYPE OF DATA-** Primary Data

## DATA ANALYSIS

In order to go ahead with the project work, the very first step was to understand the application, what the application has to offer which in turn is making the work of Artemis Hospitals' Health Professionals work more and more efficient and were the users satisfied with the working of the application.

During the process of making ourselves familiar with the application, we are able to see that the applications offer the user with several facilities and tools which were making work more and more efficient, out of all the features few were found out to be used in a large number and were directly involved in both the patients and doctor day-to-day work. These features are as follows:

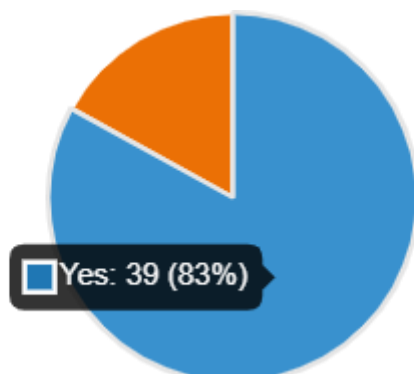
- Patient Tagging
  - Ordering drug or Prescription
  - Referral feature
  - Document Upload feature
- Patient Tagging features helps the User which is primarily a doctor or a nursing staff to tag the patient with specific colours which can help them to recognize the status of the patient and the disease. Like a specific was assigned to a COVID-19 positive patient, A specific colour of a patient with breathing problems or with low Hb etc.
- Ordering Drug or Prescription features as the name suggests helps the Health Profession to order a specific drug or a specific procedure for specific patient while sitting or examining the patient. This helps to significantly reduce the time which was being wasting in going to the pharmacy and standing in lines to get any drug.
- Chart or the To- do list helps the user to plan his day ahead more efficiently, like with reminder and alarms. Along with this the doctor can also keep a track of their patients' procedures, improvement and condition on a regular basis.
- Referral feature helps the doctor to refer a patient to a specialist within the hospital premises, without the hassle of paper work and prescription information. All of the above information is available to the specialist on his application page, while the doctors can keep a track of the procedures which are being caried out on the patient.
- Document Upload features makes it easy for the user to capture and save any treatment the patient has been diagnoses or has been suggested before by some other doctor of some other hospital.

These feature broadly were taken into consideration while framing the project's questionnaire in order to contemplate the views and satisfaction level of each and very user.

For this around 55 potential candidates were approached with the questionnaire which mainly included Doctors, Doctor's Coordinator and Nursing Staff. The result and analysis are as follows.

1. Our very first question was to know whether the candidate usage about the applications, have they ever used the application or not. Responses are illustrated below:

H



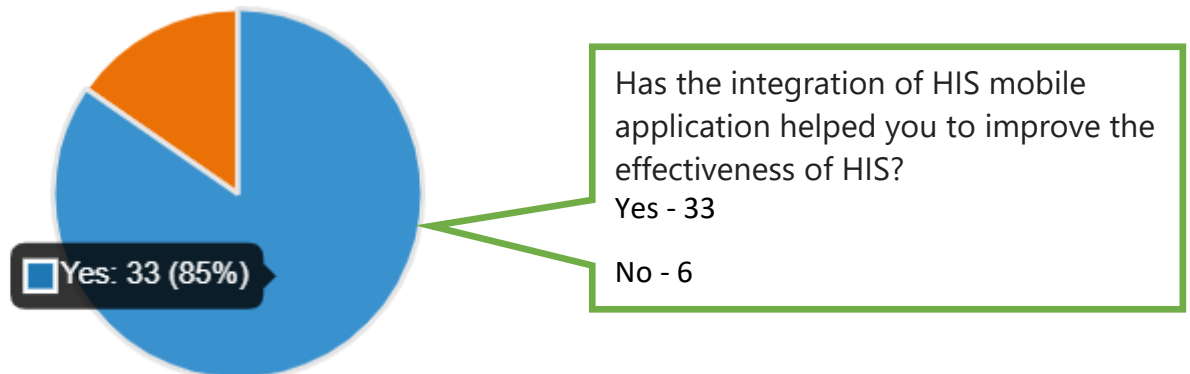
Have you ever used the Artemis Connect MD app?

Yes - 39

No - 8

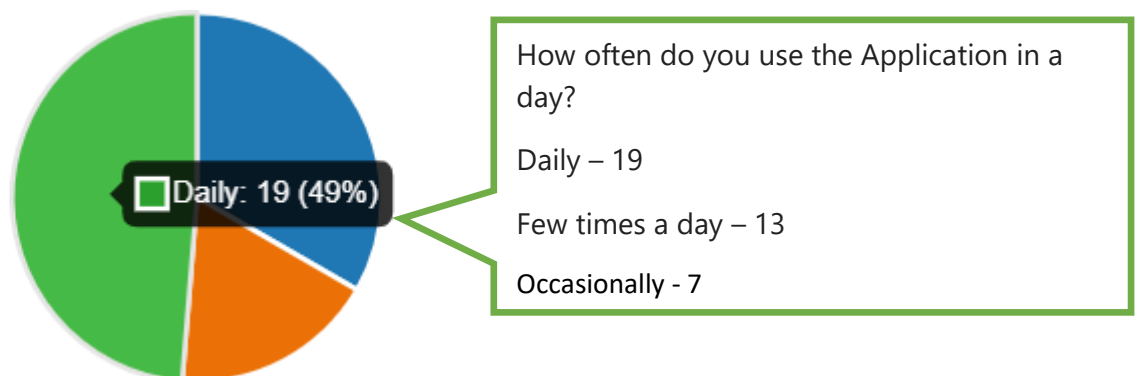
- Through this we can clearly see that 83% of the total respondents are familiar with the working of the application, clearly showing the level of awareness among the staff members regarding the new technology. We can also depict the level of acceptance the respondents have towards new technology being implemented within the system.

2. After observing this trend, the question that occurs was simple, how are the people who have used the application find the integration of HIS within the Mobile application are they satisfied or not, Responses are illustrated below:



- Here we can clearly see that 85% of 39 respondents who showed an affirmative response in the previously asked question say that they are pleased with the integration of HIS within a mobile app. Now this clearly suggests that the candidates were happy to use a portable HIS system rather than a whole desktop system which can only be accessed from a specific location. The mobile app gives our user to take the HIS system to the patients table.

3. Now we want to understand the frequency by which the application is being used. The responses are illustrated below:



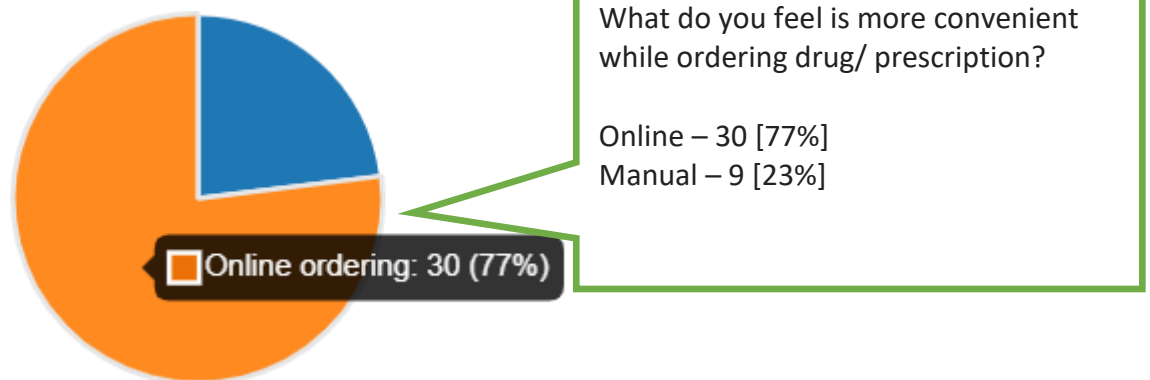
- The responses clearly depict that the users are majoritarilly using the application daily which suggests that 49% of users are using the application for their day to-day activities.

Whereas 33% say that they use the app few times a day which suggests that they are also relying on the desktop based HIS system for their work. Which is justifiable because not everyone is used to small screen while doing work.

Now we will be analysing both the positive and negative of the various features of the app that we have taken into consideration. Almost every user has used all the given features multiple times hence also encountering various problems or glitches we will try to find them out and analyse them too.

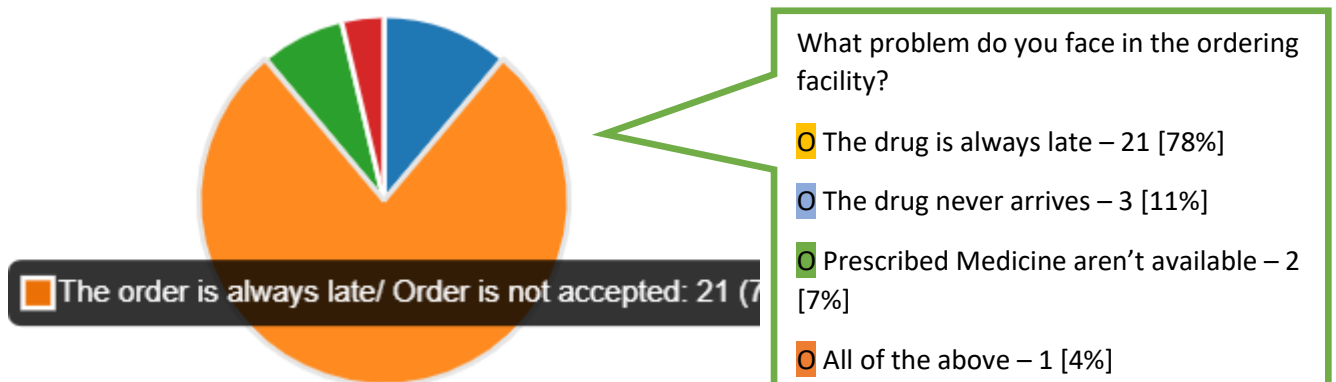
Starting with the Ordering feature - In this feature the user can through the app order a specific drug or prescription for a specific patient which will show up every time in the system whenever anyone opens the patients' details. This feature helps the user to do this at the comfort of their room or at the bedside of the patient while examination.

4. The first question which was put in front was to find out whether the user uses the application to order drug or is still taking part in manual ordering. The responses are as follows:



○ The above illustration clearly suggests that majority of users have found the feature of ordering by using the application much more convenient than the manual one. Clearly this result was anticipated because for manual you had to go to the pharmacy and wait till the medicine arrive. Here you can pre-order the drug without the hassle of going to the pharmacy.

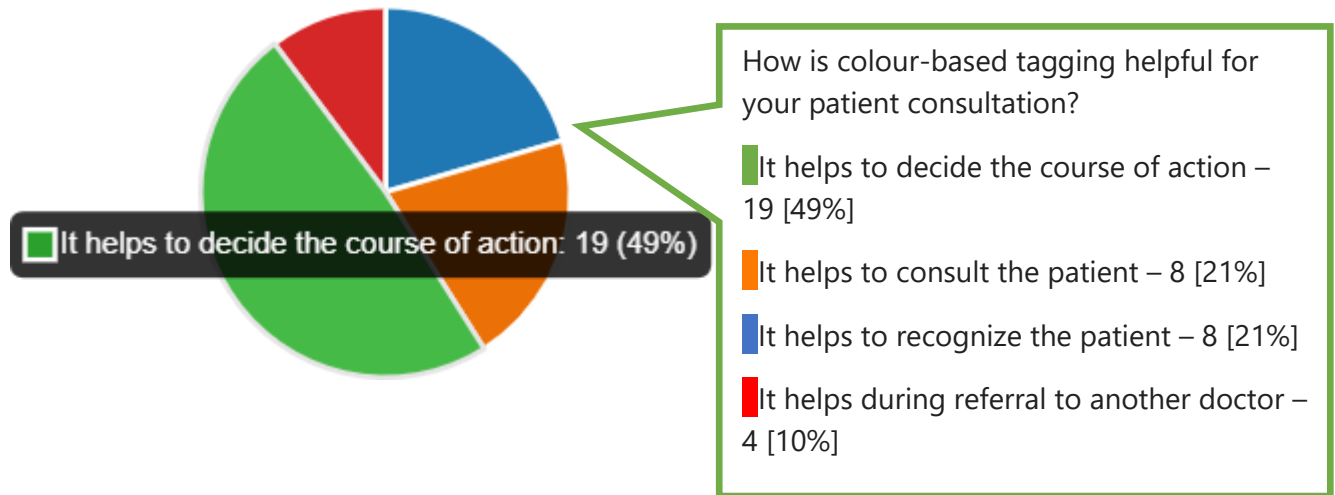
5. Now we confronted the user about the glitches and problem that they faced in the ordering feature of the app. The response are as follows:



- As we can see the feature comes with its own problem which the candidates of the questionnaire have faced. The biggest factor which can be seen is clear, the drug once ordered arrives late.

Now we shall shift our focus to the patient tagging feature of the app. In the patient tagging the doctor is able to place a specific on every patient which is under his supervision and hence in his system. This kind of features helps the doctors to identify the allergies or specific disease the patient might be suffering from.

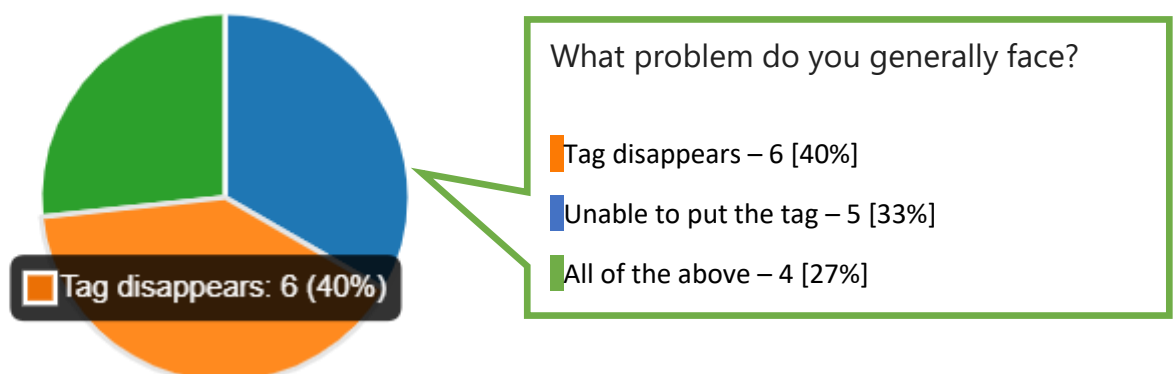
6. So, in the questionnaire it was asked to the candidates how the colour-based tagging was helping them out in the treatment for the patient. Few reasons are illustrated below:



- The above illustrations clearly depict the various ways in which the health professional is using the colour-based tagging feature of the application. Out of which it was observed that the feature helps the user to decide the course of action for the patient, which makes sense because if there is a specific tag for a patient the doctor can decide easy what to include and what to exclude from the treatment of the patient.

Just like the above feature of drug and prescription ordering through the application comes with its set of problem, hence it was important to know whether the colour-tagging options have some glitches or not.

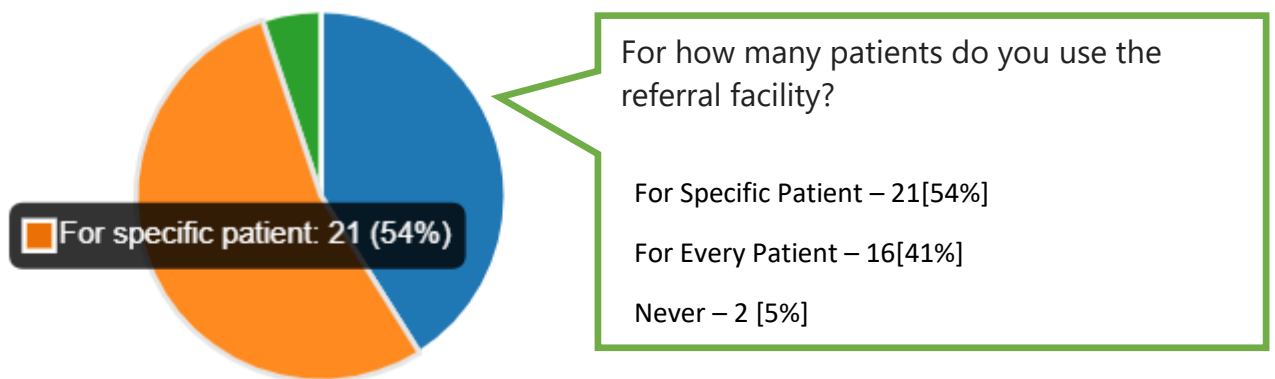
7. The very first question that was asked was a confirmation whether the candidates have faced any problem in the tagging feature so far. Out of 39 respondents, 24 [62%] said that they have so far never experienced any kind of glitch or problem with the tagging feature whereas, 15[38%] said that they have faced some problem in this feature, hence it was evident that we had to ask and get to know about the problem these candidates have faced. These responses are illustrated below:



- Clearly the most prevalent problem is of tag disappearing after sometime. Well, the proportion of the user who were unable to put the tag is also not that low. After further discussion the problem with the later was that the user wasn't aware of these feature of the app. These problems were occurring due to the networking problem as well.

Out all the features of the Artemis Connect MD app the referral feature is one of the most interesting, enduring features. Earlier the referral method was one which used to take the highest amount of time. Earlier the patient had to use the lengthy paper-based referral procedure where the doctor first used to give the refer order on a paper, then take it to be approved by the respective doctor. A lengthy and confusing process, but with the implementation of Connect MD application this procedure has also changed significantly. Now the referral request can be generated using the application that will show on another doctor's mobile. Reducing not just time but also making it efficient.

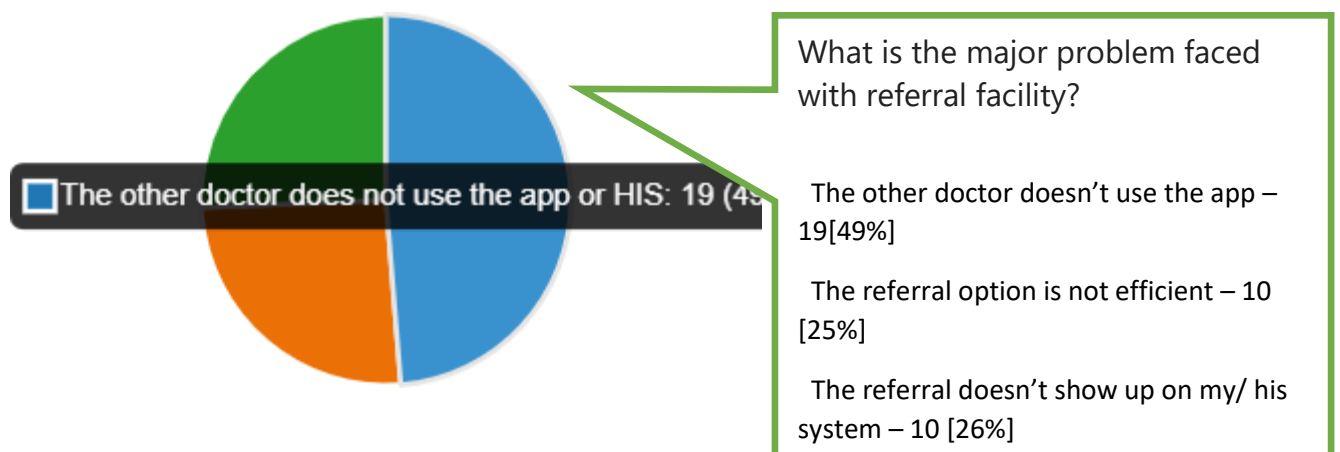
8. The question was asked about the number of patients for whom the HCP use the referral feature. The responses are illustrated below:



- As we can see here the HCP are using this app enthusiastically using this referral feature for their patient. Where few doctors are using the feature only for specific patient (which was actually misunderstood by them as the specific patient requiring the referral). All the HCP find this feature more and more relevant and efficient, along with making their work more and more paper-less.

While discussing the problems faced in the referral feature, we must reflect on the fact that not every doctor is so comfortable when it comes to new technology adaptation, they generally take their time to understand the feature at their own pace. Hence this became one of the major problems with the referral feature.

9. Now discussing the problems, the candidate face in the referral feature is illustrated below:

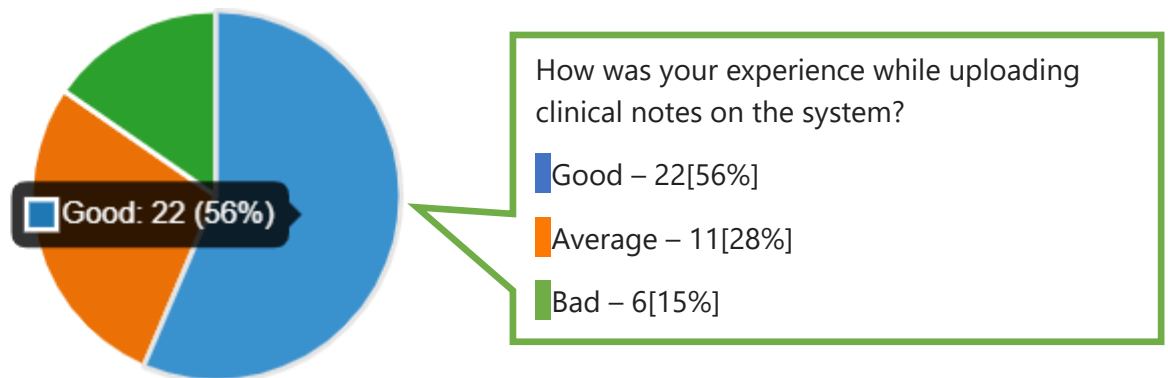




- Now in the above illustration clearly depicts the problem that we just discussed above. The other doctor to whom the referral is generated doesn't use the application, the adaptability might be taking little time with some doctors. The other problem are just the glitches where appear due to networking problem.

The next comes the feature of document upload, this is a very basic yet effective feature. Here if the patient comes from some other hospital with his prescriptions, then the HCP can upload that prescription along with the patient on the app, which shall show up on the app on every doctor to whom the patient shall consult. Now for this a general question was enough.

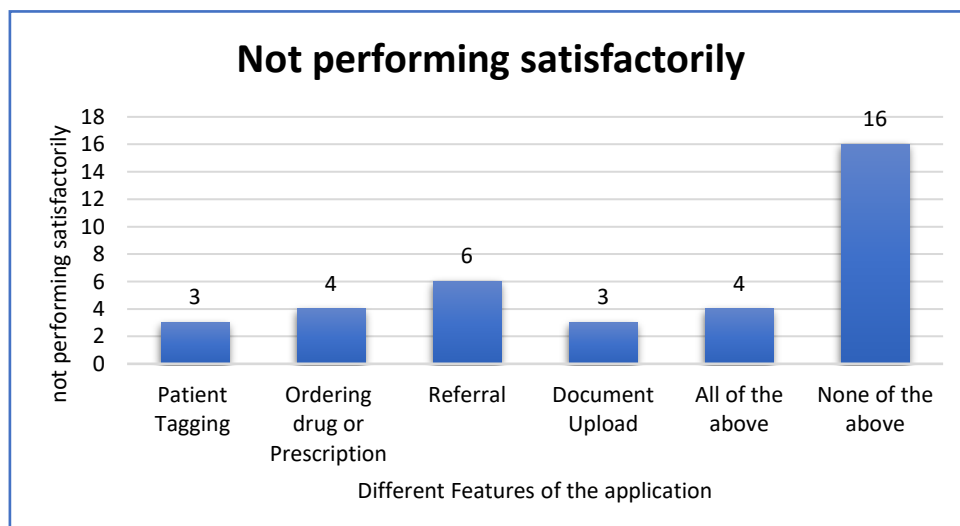
10. The responses of the candidate regarding the satisfaction level of the candidate against the upload feature. The illustration depicts the responses below:



- The following illustration clearly depicts that the majority of candidate are completely satisfied with the document upload feature.

Now the question asked was to find out how the candidates have reacted to the different features. Basically, we are asking the question that which feature has not been working satisfactorily.

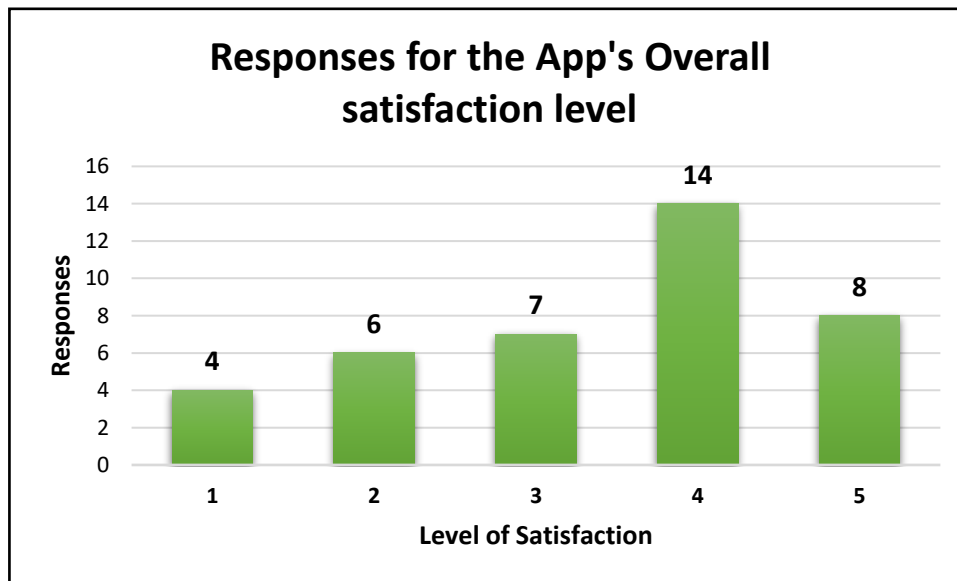
11. The satisfaction level regarding the working of the features are as follows:



- The chart clearly defines the status of the candidates when it comes to different features within the Artemis Connect MD application. While we can see some level of dissatisfaction when it comes to the referral feature which as discussed above was justifiable, the fact that various HCP were still on the course of adaptation of this app.
- Overall as we can see the majority of people think that there is significant error or problem or glitch which is all together affecting their App experience.

Having been illustrated all the experience and feedback of the feature in focus, now the questionnaire shifts to the satisfaction level of the candidates who have been using this application. A scoring process which was carried out at the end of the questionnaire, focusses upon getting to know the overall satisfaction level for the Artemis Connect MD application.

12. The overall satisfaction level which is the specific objective of this project has been illustrated below:



- The level of satisfaction was divided into 5 different level, where 5<sup>th</sup> level is the utmost satisfaction level, and 1<sup>st</sup> being the least satisfaction level. It has been clearly illustrated that the users of the Artemis Connect MD application are quite happy and satisfied while using this application. The most responses have been clearly in the 4<sup>th</sup> satisfaction level which depicts a high amount of satisfaction for the application.

➤ After a clear observation and study of the responses it can be easily concluded that the idea of taking the Hospital Information System from a heavy desktop into a portable mobile device is being appreciated all over the organisation.



## **DISCUSSION**

After a thorough study, one can easily reflect upon the fact that the Hospital Information System (HIS) was a truly pathbreaking discovery when it comes to the healthcare industry, and now developing it even further to integrate it into the handy mobile system is the new era's welcoming amendment into this discovery.

As discussed earlier, this is an era of instantaneity and not industry today can afford to remain untouched by this. And in healthcare time is everything.

After going through the responses given by the candidates of the questionnaire one thing is clear, this change is being welcomed. Integration of HIS within an application was a very thought after change.

Clearly there are few problems that the app user might face in the starting just like we observed in the Referral Feature and Online ordering feature. These few glitches can be explained as to networking issues and or lack of awareness or knowledge about the application.



## **RECOMMENDATIONS**

The very first thing that I would like to recommend is that proper training on how to use the applications should be given to the employees over a period of time, so that they can be made familiar with the app, and can easily use it.

At times the app can get a bit chaotic and confusing to use, considered the sheer number to features provided by it, so at first, we can start by providing few features and then later on adding the new ones.

All the glitches being encountered in the starting must be mended so that the users might not feel dissatisfied.

HIS integration within the handy mobile device is a welcome step, but I would have recommended to start this app with tablets. Tablets give you access to a relatively bigger screen and also much space to look into things clearly, making working with the application much easier.



## **REFERENCES**

- Mahak Rana Study on the user satisfaction among hospital's mobile app users in Artemis Hospital using usability scale.
- Dr. Gaurav Arora study on implementation of HIS in pharmacy module for IPD.