

## Online Medical Diagnostic System

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### ABSTRACT

Health is a very important aspect of life: "Health is Wealth". So, to stay fit and fine is very important and the importance of health has been increasing day-by-day, as the life is becoming stressful which ultimately leads into many health disorders. Diagnosis of a disease can be done by a Doctor and in many other ways. People often think that some simple looking things like allergies, etc. can be cured by themselves which in order, leads to some big health disorder due to improper diagnosis of the same. This paper discusses about the Online or Web Based Medical Diagnosis System. This is basically a process of three vital parts: Patient's Registration, Diagnosis and Treatment and Health Monitoring.

**Keywords** – Online, Diagnosis, Health, Reports, Patients, Doctors, Medical, Corona

### I. INTRODUCTION

Health is very essential. But now-a-days, almost every person is suffering from one or another disease which ultimately leads in increase of number of patients demanding number of Doctors. According to the latest statistics by WHO, in India the ratio of doctor and patient is 1:1456. The importance of Diagnostic centre came in from the late 19th century and came into force in 20th century with many innovations and discoveries.

As the patients are increasing, the numbers of diseases are also increasing. As a result, many different ways of healing a single disease or disorder are increasing. This is making it difficult for the doctors to plan an accurate methodology for the

treatment of a disease. Doctors really are giving their best to the society as their duty.

World is becoming digital and has made many remarkable innovations and discoveries in the field of Medical Diagnostics too. We are able to experience Online methods for booking the tests prescribed by the concerned Doctors. Hospitals or Diagnostic Centres have their own Websites or Apps for the same which makes it easy for the patient as well as for the doctors and technicians to generate the Reports and make it available as soon as possible to the patients. The key role and the benefit of this system is that, many people at the same time and from anywhere can make use of this facility, which is less time consuming. But with this, many mistakes or errors, fraud etc. go hand-in-hand.

## II. RELATED WORK

Raenu Kolandaisamy and Rafidah Md Noor had presented a paper regarding the same in the year 2016 named as: Web Based Online Medical Diagnosis System (WOMEDS). In this paper, the new system has been developed which is known as Web Based Online Medical Diagnosis System (WOMEDS). This system has the features for users to do diagnostics for the health problem and also the system will provide some health monitoring and tips for the user to follow.

Digital Pathology Research Paper: Attitudes and practices in the Canadian pathology community by Magdalen Bellis, Shereen Metias and Christopher Naugler includes some basic facts related to the Digital Pathology as it is an emerging field.

Errors in pathology and laboratory medicine: Consequences and prevention by Sandra C. Hollensead, William B. Lockwood and Ronald J. Elin discuss about the errors or mistakes done by the Diagnostic Centres and in the field of Pathology.

There are more such papers or reviews which are related to many different topics that come under the field of Pathology or Diagnostic Centres.

## III. ANALYSIS

According to our research, the necessity for Online Diagnostic Tests services was as it is increasing day-by-day and it got an immediate boost in this pandemic situation of COVID-19. The main reason for the boost in this system was due to many facilities including some medical services like Private Doctors, clinics were not available for the people during Lockdown. And in order to decrease the spread of Corona Virus, Lockdown was an essential tool. This gave a boost to not only Online Medical Services but, to many other industries too.

Along with increasing digitalization, it has been observed that threat of fraud, security and privacy is

also increasing day-by-day. Due to this, the result in the reports may be wrong. And this ultimately leads in patients in taking wrong direction and wrong mode of treatment. Not all the fraud cases come out and due to this, many people suffer problems which affect their life in the long run. Below mentioned are two simple Case Studies.

### A. Case study 1:

This Case Study discusses about not only one but, many such cases that happen every day. The discussion is about the "Fraud" that takes place on the name of some disease. We are experiencing this from a long time that sometimes the Diagnostic Centres make a fake report of some disease and put it in front of the patients so that they can wrench money from the people. Considering the pandemic, this has happened with many of the people when they had undergone a diagnosis to know whether they are suffering from Corona or not. Many Offices and Institutes have also faced this problem as these Centres made a fake report and mentioned that each one of them is "Corona Positive".

### B. Case Study 2:

Due to this Online System for Diagnosis of a disease, a facility for sample collection and report delivery at the door step has also been made available. In this, a lab technician has to visit the patients house for the collection and after generation of Reports, a delivery person has to visit the patients place. And this increases the risk and threat of Robbery, Murder for the sake of Money or any other criminal or illegal activities and behaviour which puts in trouble to patients and their family members. Fraud people, thieves, murderers may get ready as a Lab Technician and visit peoples house and by wrong means, they can harm the people. As far as the pandemic is considered, many such cases happened where, a group of people use to get themselves ready as a lab technician and make fake ID and loot the people by

saying that the Government has sent them for the surveys or for testing people whether they are Corona Positive or not.

#### IV. ADVANTAGES

Due to Online Tests Booking facility, it has made easy for the people in time management instead of visiting and waiting for the number to come in sequence. With online Report generation, it has also provided us with the facility that the concerned lab technician can visit the patients house for the sample collection and if the reports are needed in paper form, they can also courier the Reports. This again saves a lot of time of the people. Not all the Diagnostic Centres are fraud but, some are really good at the services, looking at the accuracy of the results. They even offer good discounts and offers for the regular patients and so on. These centres are really helpful for the people. Some of them also have the facility of consulting doctors either online or by booking an appointment with the concerned doctor online. This is helpful for the aged ones or for those who stay alone or for those who stay away from their family, etc.

#### V. DISADVANTAGES

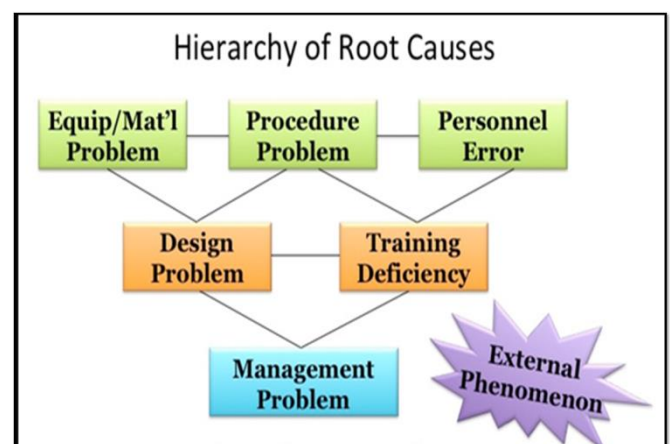
Diagnostic Centres have a facility of Online Booking for the Tests and the Reports are generated digitally and are sent to the patients through E-mail. Many-a-times, it happens that someone else's reports have been sent to someone else or the reports are not been sent on time in spite of requesting for the same on urgent basis. It has been also observed that the reports are not accurate and up to the mark. What takes people here is because of the offers or discount these centres offer and apply. Off course, Money is essential in order to live life peacefully. This is how people are running a business and playing with the health of patients and on top of that, the Diagnostic Centres refuse to accept their mistakes. This puts

common people in trouble because they have to bear a severe loss of Money as well as health sometimes. Also, the fraud cases has been discussed above in the Case Study section.

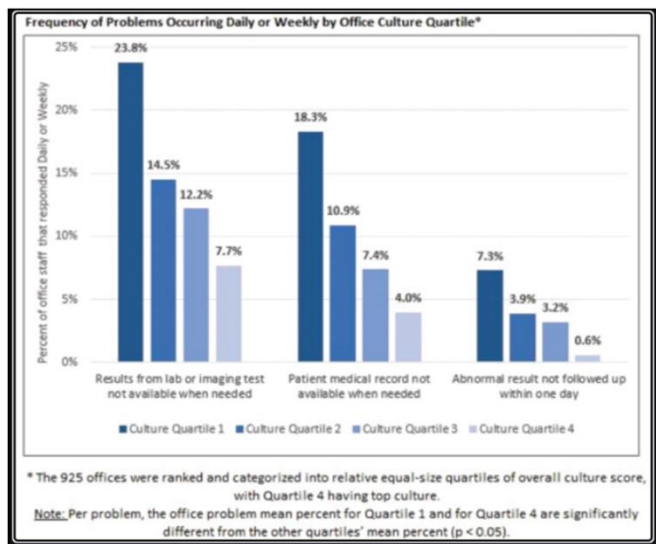
#### VI. RESULT AND DISCUSSION

Due to the implementation of Lockdown, people were forced to switch on the Digital platform as compared to offline interactions. As the pandemic situation was new, unexperienced and unexpected where everything became Online, it took some time for the people to get adjusted. But now as almost everything is as before, people have accepted the situation and the challenges that they are going face due to COVID-19. Also, people have accepted the emerging technology and digitalization and have learnt them considering it as a demand of current time. As a result, people are now aware of the benefits as well as the harms of digitalization.

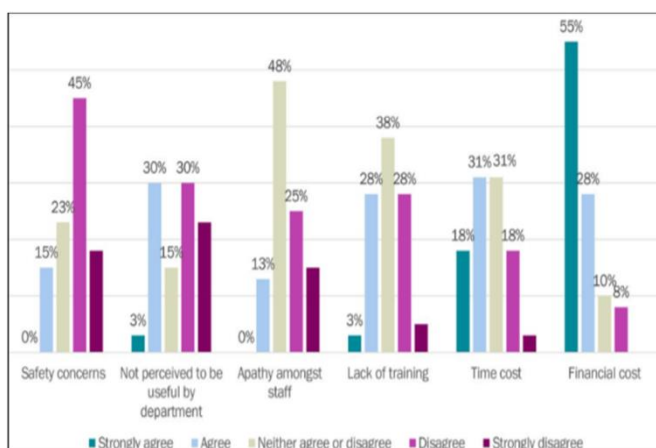
The image mentioned below shows what are the root causes for the errors and mistakes that we are experiencing in the field of Pathology or Medical Diagnosis.



The graph below is about the Office Culture Quartile. It discusses about the four quartiles which show the percentage of mistakes or errors done in the field of Pathology or Medical Diagnosis.



The below mentioned graph discusses some of the barriers with respect to the field of Pathology or Medical Diagnosis after doing a survey.



## VII. SUGGESTIONS

Due to boost in the Digitalization, the threat of security has also increased. As mentioned in the above sections, many fraud and illegal practices took place, are taking place and are going to happen in future too. It is very difficult to keep each and every piece of data safe in this highly populated world where tons of data is generated every millisecond. But, some suggestions can definitely make our systems stronger and safer.

Suggestion for the Online Medical Diagnosis System is that, we can have an application or website through which people will be able to track the status of their Diagnosis when given for it. For example, there are many tests which need a time of few days for the results to be generated. In such cases, sometimes it happens that some or the other step of processing is left out and finally, the result of the test generated is not correct and accurate. This increases the threat of life of the patients. And many-a-times, the staff at Diagnostic Centres don't accept their mistake where in turn, the people have to face problems.

The suggestion about the tracking system given above can be useful for those tests whose processing cannot be done at a place and it has to be sent to some different place for processing. So the sample can be collected and can be sent to a different place for processing but, the patient need not visit that place unnecessarily when their work is not done. The patient can track the status of the processing and accordingly visit the place for report collection or for further treatment. This will help people with time and money management both.

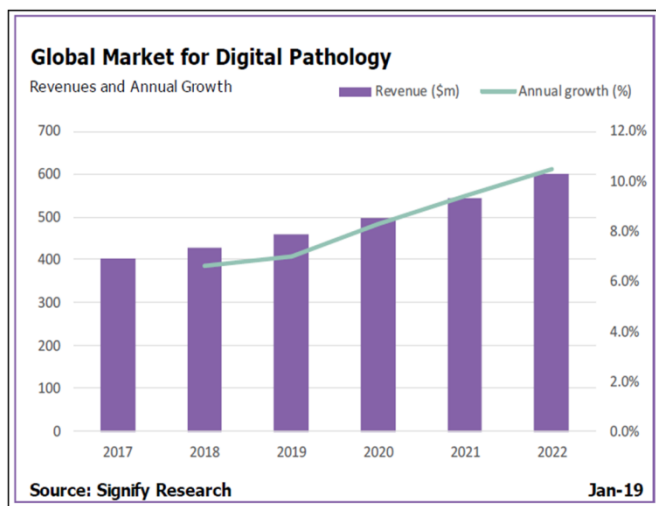
In this way if we try to implement the tracking system for status of diagnosis, it will help us in making less mistakes. Also, people will have a proof with them via this app that they can use if any mistake is done from the Diagnosis Centre's side.

Another suggestion is that, we can send the details of the Lab Technician who will be visiting the patients place for sample collection. This feature can be added to the app. This idea will increase awareness among the people as well as, it will decrease the risk and threat of any criminal or illegal activity. People will be alert beforehand and if still some activity takes place, then the people will be able to produce proof for the same. Very few Diagnostic Centres or

Hospitals provide this information with the patients but not all. Considering safety as an essential tool, our system needs to modify some things.

Along with this, many-a-times there is a confusion between the patients of similar names. This also can be avoided if we implement the following method i.e. after collecting the sample of the patient, the patients will immediately receive a message regarding the details of their sample which will include the things like- Name of patient, name of the test, time of sample collection, in what type of condition is it kept, in which section it is kept, name of the Doctor, estimated date and time when the reports will be received by the patient, etc. This feature can also be added to the app in order to avoid confusion.

As Digital Pathology is the emerging industry which is a sub-field under pathology, which mainly focuses on the data management based on the information generated from digitized specimen slides through the use of computer-based technology. It also uses Virtual Microscopy. This goes hand in hand with the Online Medical Diagnosis System and hopefully will help us reduce errors.



The above mentioned graph represents the predictions of Global Market for Digital Pathology.

## VIII. CONCLUSION

After analysing the available data we can come to a conclusion that due to pandemic, digitalization has got a huge boost. We can say that people have turned to Online means for making every necessary thing available and are now well adapted to the situation. People are expecting similar trends of digitalization in the coming years too. Like Digital Pathology, more such fields are likely to emerge in the upcoming years.

## IX. ACKNOWLEDGEMENT

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## X. REFERENCES

- [1]. Web Based Online Medical Diagnosis System (WOMEDS) by Raenu Kolandaisamy and Rafidah Md Noor
- [2]. Digital pathology: Attitudes and practices in the Canadian pathology community by Magdaleni Bellis, Shereen Metias and Christopher Naugler.
- [3]. Errors in pathology and laboratory medicine: Consequences and prevention by Sandra C. Hollensead, William B. Lockwood and Ronald J. Elin.
- [4]. Improving Diagnosis in Health Care.
- [5]. Startup firm brings medical lab tests to doorstep.