# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

**Project Report**

**on**

## Solution for Waiting Problems


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MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE

GWALIOR - 474005 (MP) est. 1957


MAY-JUNE 2022

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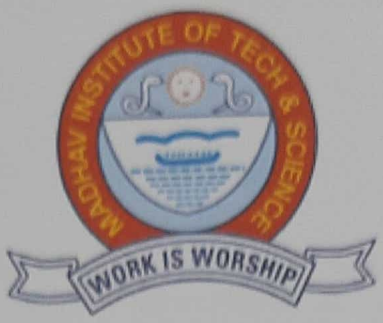


**Project Report**

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## Solution for Waiting Problems

A project report submitted in partial fulfilment of the requirement for the degree of

**BACHELOR OF TECHNOLOGY**

in

**COMPUTER SCIENCE AND ENGINEERING**

Submitted by:

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# CERTIFICATE

This is certified that **Ayush Jain** (0901CS203D01) has submitted the project report titled **Solution For Waiting Problems** under the mentorship of **PROF.Anjula Mehto** in partial fulfilment of the requirement for the award of degree of Bachelor of Technology in Computer Science and Engineering from Madhav Institute of Technology and Science, Gwalior.

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# CERTIFICATE

This is certified that **Nishant Tripathi** (0901CS203D06) has submitted the project report titled **Solution For Waiting Problems** under the mentorship of **PROF.Anjula Mehto** in partial fulfilment of the requirement for the award of degree of Bachelor of Technology in Computer Science and Engineering from Madhav Institute of Technology and Science, Gwalior.

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## DECLARATION

I hereby declare that the work being presented in this project report, for the partial fulfilment of requirement for the award of the degree of Bachelor of Technology in Computer Science and Engineering at Madhav Institute of Technology & Science, Gwalior is an authenticated and original record of my work under the mentorship of **Dr.Anjula Mehto, Assistant Professor**, Computer Science & Engineering

I declare that I have not submitted the matter embodied in this report for the award of any degree or diploma anywhere else.

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# ACKNOWLEDGEMENT

The full semester project has proved to be pivotal to my career. I am thankful to my institute, **Madhav Institute of Technology and Science** to allow me to continue my disciplinary/interdisciplinary project as a curriculum requirement, under the provisions of the Flexible Curriculum Scheme (based on the AICTE Model Curriculum 2018), approved by the Academic Council of the institute. I extend my gratitude to the Director of the institute, **Dr. R. K. Pandit** and Dean Academics, **Dr. Manjaree Pandit** for this.

I would sincerely like to thank my department, **Department of Computer Science and Engineering, for allowing** me to explore this project. I humbly thank **Dr. Manish Dixit**, Professor and Head, Department of Computer Science and Engineering, for his continued support during the course of this engagement, which eased the process and formalities involved.

I am sincerely thankful to my faculty mentors. I am grateful to the guidance of **Anjula Mehto,** Assistant professor, Computer Science &Engineering, for his continued support and guidance throughout the project. I am also very thankful to the faculty and staff of the department.

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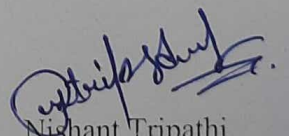

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# ABSTRACT

SWP is a smart web application, that provides a registration and login for both doctors and patients. Doctors can register by giving his necessary details like timings, fee, category, etc. After successful registration, the doctor can log in by giving username and password. The doctor can view the booking request by patients and if he accepts the patient requests the status will be shown as booking confirmed to the patient. He can also view the feedback given by the patient. The patients must be registered and log in to book a doctor on the basis of category and the type of problem that patient is facing.

# सार

एसडब्ल्यूपी एक स्मार्ट वेब एप्लिकेशन है, जो डॉक्टरों और मरीजों दोनों के लिए पंजीकरण और लॉगिन प्रदान करता है। डॉक्टर अपना आवश्यक विवरण जैसे समय, शुल्क, श्रेणी आदि देकर पंजीकरण कर सकते हैं। सफल पंजीकरण के बाद, डॉक्टर उपयोगकर्ता नाम और पासवर्ड देकर लॉग इन कर सकते हैं। डॉक्टर मरीजों के बुकिंग अनुरोध को देख सकता है और अगर वह मरीज के अनुरोध को स्वीकार करता है तो स्थिति को मरीज को बुकिंग की पुष्टि के रूप में दिखाया जाएगा। वह रोगी द्वारा दिए गए फीडबैक को भी देख सकता है। मरीजों को पंजीकृत होना चाहिए और श्रेणी के आधार पर और रोगी को किस प्रकार की समस्या का सामना करना पड़ रहा है, उसके आधार पर डॉक्टर को बुक करने के लिए लॉग इन करना होगा।

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# CHAPTER 1: INTRODUCTION

## 5.2 Introduction

Aim of this project is to create doctor patient handling management system that will help doctors in their work and will also help patients to book doctor appointments and view medical progress. The system allows doctors to manage their booking slots online. Patients are allowed to book empty slots online and those slots are reserved in their name. The system manages the appointment data for multiple doctors of various date and times. Each time a user visits a doctor his/her medical entry is stored in the database by doctor. Next time a user logs in he may view his/her entire medical history as and when needed. At the same time a doctor may view patient's previews medical history while the patient visits him. The system also consists of Blood donor module. This module allows for Blood donation registration as well as Blood group search. The module is designed to help urgent Blood requirements through easy/instant searches.

### 1.2 Objectives

- To Create Web based online Doctor Appointment management system.
- To manage all patients related information.
- To provide emergency information in critical situation.

### 1.3 Justification of study

We implement this system for better user experience. This system is very easy to access. Also for establish real time communication, using modern and updated technology. So, user can see the update without reload or refresh. This system will compatible with user device such as pc, laptop, tab & smart phone. So user can easily access the system anytime anywhere. This system is very simple & user friendly so, any user can use this system easily.

### 1.4 Scope of Study

Scope of the project is very broad in terms of other online doctor appointment portal.
Few of them are:

- Patient and doctor get SMS from the system.
- There is huge collection of doctor information.
- Anyone can get Blood on time.

## 1.5 System Requirement

This section describes the hardware components and software requirements needed for effective and efficient running of the system

**Table: 1 Hardware Requirements**

| SL | Hardware | Minimum System Requirement |
|---|---|---|
| 01 | Processor | 2.4 GHz Processor speed |
| 02 | Memory | 2 GB RA |
| 03 | Disk Space | 500 GB |

**Table: 2 Software Requirements**

| SL | Software | Minimum System Requirement |
|---|---|---|
| 01 | Operating System | Windows Server 2008,Windows7 |
| 02 | Database Management System | Microsoft SQL Server 2014 |
| 03 | Runtime Environment | Visual Studio 2008 Team System |

The table above shows software requirements recommended to enable the system to run as required for using Online Doctor Appointment System (ODAS).

# CHAPTER 2: LITERATURE REVIEW

## Introduction

A study has shown that Online Booking Doctor's Consultation Time system bring out quite a few advantages, one of it is that it can save the patients' time. By using the system, they can book the appointment with doctor through online instead of going to the hospital or clinic and wait for register and wait again for their turn to consult with a doctor after the register. Some of them even need to wait for the nurse or workers there to get their medicine. This waiting process is obviously too long for them and it is time-consuming too [1]. The purpose of literature survey is to give a description of research topics related to patient opinions and feeling on the current way of making appointment with doctors. Waiting in the waiting room of the doctor is a common phenomenon. In general, the patients need to go to the hospital or the clinic and register at the counter first. After that, they need to wait for the doctor to consult them when he is free. If the clinic or hospital is crowded, how long is the patient need to wait? 20 minutes or more? This is so cruel to see the patients, who are already sick, still need to wait for such a long time to wait for their turn to consult a doctor.

## 2.1 Waiting time

Waiting time is essentially a period of time to wait for a certain action to take place after that action is demanded or ordered [2].Waiting time is the duration that a patient already waited in the clinic before meet by anyone of the staff [3].Patient's waiting time is a very important indicator of quality of services offered by hospitals [4].One factor affecting the use of healthcare services is the amount of time a person spends waiting to be seen. Patients view long waiting times as an obstacle to receiving services effectively. For both patient and doctor, letting patients waiting unnecessarily can cause them stress. Waiting time is a measurable part of the profession which clients will use even more than their knowledge and ability to judge medical professionals. According to Institute of Medicine (IOM), the patients should wait less than 30 minutes of their schedule appointment time [3].But it is not achieved by most of the clinic and hospital in some of the places like Malaysia. The duration of waiting time varies from country to country, and even within country, it varies from center to center. Long waiting times have been reported in both developed and developing countries. According to a research done in 2017[5] the average waiting time for each clinic's registration time is 17.20 minutes. The pre-consultation time has an average of 13.66 minutes of waiting time while the waiting time for consultation has an average of 24.05 minutes. The research has also shown that the total average waiting time of registration for consultation is 41.06 minutes. Another 2011 research study of outpatient waiting time in 21 hospitals in Malaysia found that the average waiting time was 60 minutes to see the doctor [6].A research in Kedah found that patient waiting less than 2 hours were happier with the ambulatory service compared to those waiting longer than 2 hour [7].From these research findings, one thing can be sure is that the patients rather wait for almost 1 or 2 hours for outpatient service rather than waiting for consultation inside the hospital or clinic. This shows that the patients are really dissatisfied with the current waiting time for consultation.

## 2.2 Appointment Delay

Appointment delay is defined as the time between the days a patient requests an appointment and her actual appointment date, the higher the chances that he/she will cancel or not show up[8].According to the research done by [8], 31 percent of the 5901 samples cancelled or did not show up at their appointment with doctor. These appointments are mostly scheduled for a few days after the making the appointment. Thus, asking the patients to come right away or make appointment requests on the day they want to be seen is the solution [9].

## 2.3 Waiting for Registration

The clinic and hospital have a counter for patients to register first before their consultation with doctor. The intentions of this step are actually queuing up for the consultation and wait for their turn. It is actually the reason of many of patients were still waiting very long time to register at the counter to see the doctor. The Registration must be a very quick process and also simple to avoid long waiting time. The research done in 2017 identified that the long waiting time is because of long queues at the registration counter being operated by one staff who is also responsible for giving out appointments to patients[5].The number of staff is not enough is also a known reason for longer waiting time in hospital and clinics. The solution to this issue is by implementing an online booking system. This can save the cost hiring more staff to handle the registration counter and also can reduce the waiting time of patients.

## 2.4 Earlier Arrival

Most of the patients tend to arrive earlier even though they already book consultation time with doctor. This is usually happening on those who need follow-up consultation.Scheduling is very important to make sure a smooth and fast consultation process and to decrease waiting times [5]. A research study found that those patients who had an appointment time and arrived at the appropriate time had shorter waiting time than those who came in without an appointment [10].A more reliable scheduling system can also increase waiting times, such as scheduling appointments in line with the planned consultation period. Hence, an online booking appointment system with scheduling function is needed and can significantly reduce the waiting time of patients.

## 2.5 How the Online Booking System can help

The significant help of online booking doctor's consultation time system is able to reduce the waiting time of patients. By using the proposed system, the patients can choose their desired time to consult with a doctor and book the time from the system. This can reduce the registration step at the counter. Thus, for the patients that looking for follow up consultation, they can book the consultation time for a future time. Those patients who need faster consultation from doctor like having fever can check for nearest doctors available time and book that slot and reach there on time to avoid long waiting time. Usually registration at the counter has two purposes. One of it is to queue up and another is to check whether the patient have any consult history at that clinic or hospital. Using the booking system can reduce the step of registration because the necessary patient's details are in their profile. When they book a consultation time, the nurse or doctor can see their records. Thus, when the patients arrived at the clinic or hospital, they can immediately enter the doctor's room without wasting the time for registration. Besides that, online appointment booking is great for those people that doesn't have much free time, especially the working adult as it gives a patient to book an appointment through online
whenever he/she is free and convenient to book. This is very convenient for those needs to book a consultation time for afollow-up check-up.That means they can do this after-hours, on weekends, or whenever the best works for them. The online booking doctor consultation system will show the time slots available to patients. It is time-efficient, transparent and helps patients to feel better educated and in control [1].Furthermore, with the implementation of the online appointment booking system, the no-show up rates can be reduced because the system allows patients verify, cancel and reschedule their appointment at their ease. Some of the people will miss their appointment schedule without giving any prior notice and result in wasting the doctor's time and also the other patient's time. The time slot of them can be given for those who is really
needed.

## 2.6 Similar Systems

In this section, similar system like TeLeMe is taken for a review to justify the idea of implementing the proposed online doctor consultation system. The existing online booking doctor's consultation time system is TeLeMe. Unlike the proposed system, it allows patients to consult through online video or messenger call. The proposed system is focused on booking consultation time with doctors and can meet the doctor as per the consultation time. Whereas, TeLeMe is focused on the entire consultation through video call/Voice chat. Though TeLeMe has all the security features, the system that is proposed here gives more importance to patient's privacy and safety of their information. The proposed system will use SQL injection prevention features to avoid any hacking from SQL injection. Besides that, it also encrypts the patient's username and password, and also their information to avoid hacker from hacking the database and get their information. Besides that, the proposed system will use the various techniques like indexing to improve the database performance for a better user experience and faster data retrieval. Access control will be the main focus of the system too. For example, doctors will only be able to see the patient's name, age, gender and symptoms but not their login credentials. The following section research methodology spells out the how the proposed system is developed.

# CHAPTER 3: PRELIMINARY DESIGN

## 3.1 Methodology

- Waterfall Model

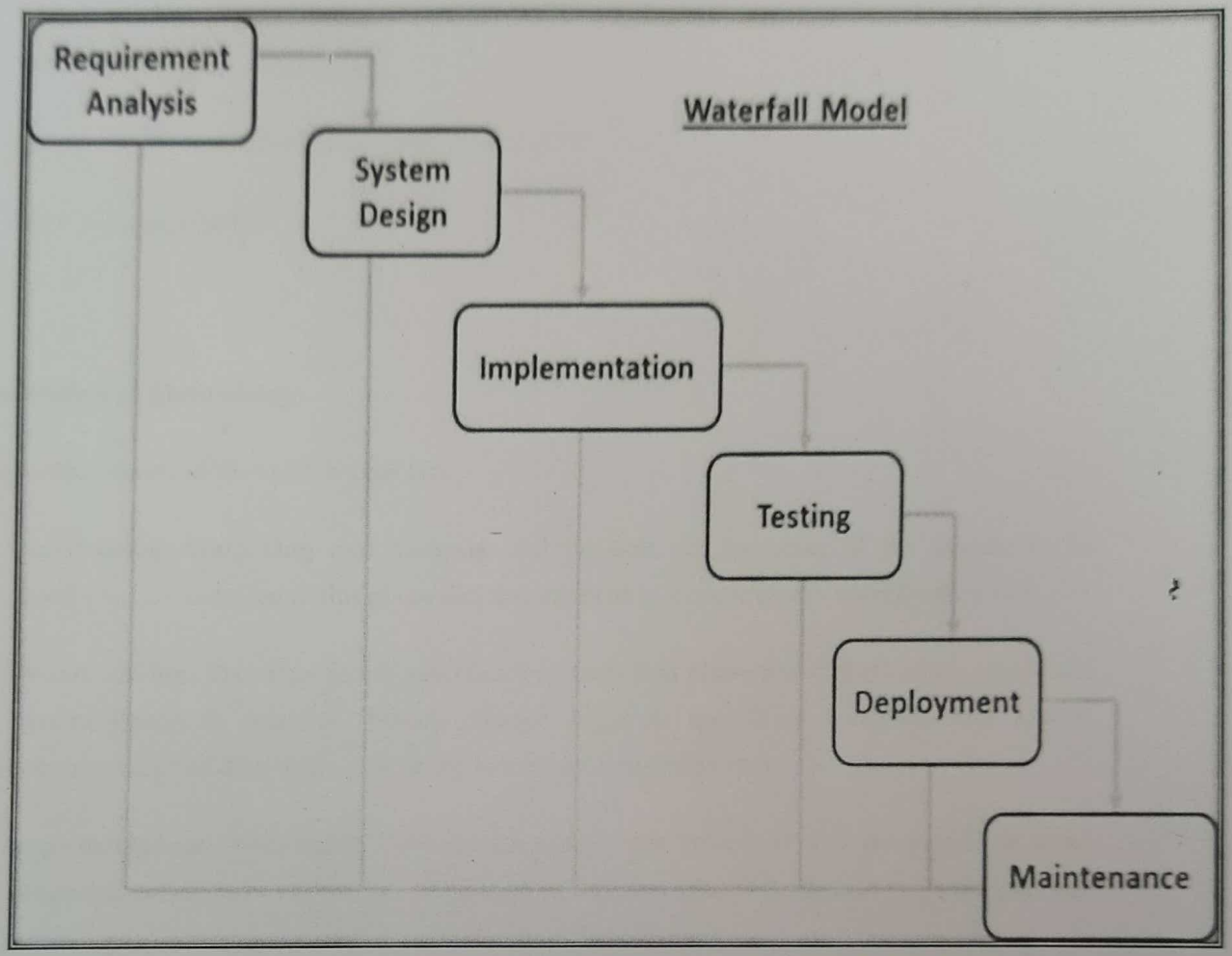


**Fig. 3.1 Methodology**

## 3.2 Justification of Methodology

Every software developed is different and requires a suitable SDLC approach to be followed based on the internal and external factors. Some situations where the use of Waterfall model is most appropriate are:

- Requirements are very well documented, clear and fixed.

- Product definition is stable.
- Technology is understood and is not dynamic.
- The project is short.
- Simple and easy to understand and use
- Easy to manage due to the rigidity of the model . each phase has specific deliverables and a review process.
- Phases are processed and completed one at a time.
- Easy to arrange tasks.

### 3.3 Description of Methodology

The sequential phases in Waterfall model are:

- **Requirement Gathering and analysis:** All possible requirements of the system to be developed are captured in this phase and documented in a requirement specification doc.
- **System Design:** The requirement specifications from first phase are studied in this phase and system design is prepared. System Design helps in specifying hardware and system requirements and also helps in defining overall system architecture.
- **Implementation:** With inputs from system design, the system is first developed in small programs called units, which are integrated in the next phase. Each unit is developed and tested for its functionality which is referred to as Unit Testing.
- **Integration and Testing:** All the units developed in the implementation phase are integrated into a system after testing of each unit. Post integration the entire system is tested for any faults and failures.
- **Deployment of system:** Once the functional and on-functional testing is done, the product is deployed in the customer environment or released into the market.
- **Maintenance:** There are some issues which come up in the client environment. To fix those issues patches are released. Also to enhance the product some better versions are released. Maintenance is done to deliver these changes in the customer environment.

All these phases are cascaded to each other in which progress is seen as flowing steadily downwards (like a waterfall) through the phases. The next phase is started only after the defined set of goals are achieved for previous phase and it is signed off, so the name "Waterfall Model". In this model phases do not overlap.

# CHAPTER 4: ANALYSIS, DESIGN AND DEEVELOPMENT

**Introduction**

The chapter describes the system study, analysis, design strengths and weaknesses of the current system, Contest level diagrams, Entity Relationship Diagram, Architectural design.

**4.1 System Study**

The study was carried out at Patient, Doctors and Hospital the main purposed of the study was to find out how the process of recording patient's data is carried out. The system that is currently being used in Patient, Doctor and Hospital is entirety manuals. When a patient requests all the information is recorded manually from the appointment then the system are very lazy and more hesitation from the real information, doctor availability and proper time maintenance of the doctor appointment system.

**4.2 System Analysis**

During the system study phase, requirements of Online Doctor Appointment System (ODAS) were categorized into user requirements, system and hardware requirements.

**4.2.1 Existing Online Doctor Appointment Systems**

Refer to the literature review, observation, interviews and questionnaires as explained in chapter three it should be noted that at Hospital doctor maintenance we were able to analyze existing systems as discussed below.

The current system was manual where data is written on different papers and transferred to the different departments, human errors were vulnerable since it was paper based and retrieval of files was time consuming as they had to manually locate patient some of which were even lost and thus finding such information was hard. Per the statistics carried 90% of the users were not contented with the system reason that is was not secure in terms of security and storage as it was prone to damages like loss of important information, worn out papers, out break of lire, The speed of recording and retrieval Patients information was average yet 10% were some ok with the system reason that the paper work can used for future reference.

The users recommended that the proposed system should be user friendly, multipurpose enough to handle a number of users at a go, could generate feedback when request is submitted and a use of passwords which could deny access to unauthorized users of system which ensured security. Context diagrams, Data flow diagrams and Entity Relationship Diagram (ERD) where used in the analysis and design of the system.

**4.2.2 Requirements Specifications**

After analyzing the data collected, we formulated a number of requirements namely user requirement, system hardware software attribute. These were grouped as user, functional, non-functional and systems requirements.

### 4.2.3 User Requirement

During data collection, the we investigated and found out how the current system operates, not only that but also tried out which problems are faced and how best they can be settled. The users described some of the basic requirements of the system this includes Search for Patients, Register Patient, Update record, Doctor information record, view doctor availability record and view all types of reports.

### 4.2.4 Functional and Non Functional Requirements

The following is the desired functionality of the new system.

Accept of submissions in form of raw patients; perform analysis of financial to authenticate the users of the system.

And non functional requirement include the following

The system must verify & validate the all user input ant user must be notified in case of errors detected in the database, the system should allow room for expansion.

## Result

### Login Form for the Different Users

Only authorized user with the right user name and password has right to access the services to particular department as like Patients, Doctors and Hospital he or she intern to view. When wrong user name and password is used the System rejects access to the services.

### System Administration Home Page

The system administrator can add, edit system user and has access to view the services offered by the different for easer tracking in cases of mismanagement in the Hospital.

### Patient Appointment Home Page

This page is patient can access the appointment and view the doctor available time and can known the time to views the doctor actual time. Then the system is patient not a more time queue.

# Chapter 5: CONCLUSION & FUTURE SCOPE

## 5.1 CONCLUSION

The core reason for the establishment of computerizing Online Doctor Appointment System is to enable the hospital administrators in a convenient, fair and timely manner. Therefore the IT used should support the core objective of the system if it is to remain relevant to the hospital. A lot still needs to be done in the IT department in order to make available technology effective. This may involve training of the hospital staffs on how to enter data in the right and relevant data in the system and the management to keep updating the hardware and software requirements of the system. IT and computer systems need to be kept being upgraded as more and more IT facilities software are introduced in to days IT market. The researcher acknowledges the fact this system does not handle all patient doctor and hospital. The researcher therefore suggests that for further research, the following can be researched on. The most cost effective way of handling all Hospital Patient management system process.

## 5.2 FUTURE SCOPE

- We can add online payment in future.
- We can tie up with the hospitals & provide ambulance service for critical patients .
- In future we can provide home doctor on call or at home checkup .
- We will similarly can do it for pathologies .
- we can add appointment booking for hair saloons also because our motive is to provide waiting free life to people so we are planning to add as many services as we can .

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