K.RAMAKRISHNAN
COLLEGE OF TECHNOLOGY
An Autonomous Institution
Affiliated to Anna University Chennai, Approved by AICTE New Delhi.
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Samayapuram, Tiruchirappalli – 621 112, Tamilnadu, India.

AProjectReport

On

E-HEALTHMANAGEMENTSYSTEM

Submitted in partial fulfillment of requirements for the award of the course

of

CGB1201–JAVAPROGRAMMING

Under the guidance of

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Assistant Professor/ AI

Submitted By

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K.RAMAKRISHNAN COLLEGE OF TECHNOLOGY
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TRICHY–621112

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TRICHY– 621 112

BONAFIDECERTIFICATE

Certified that this project report on **" E-HEALTH MANAGEMENT SYSTEM"** is the bonafide work of **SURYA S (2303811724321115)** who carried out the project work during the academic year 2024 - 2025 under my supervision.

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Submitted for the viva-voce examination held on03-12-2024

INTERNAL EXAMINER EXTERNAL EXAMINER

DEPARTMENT OF ARTIFICIAL INTELLIGENCE

VISION OF THE INSTITUTION

Toservethesocietybyofferingtop-notchtechnicaleducationonparwithglobalstandards.

MISSION OFTHEINSTITUTION

- Be a centre of excellencefor technical educationin emerging technologies by exceeding theneeds of industry and society.
- Bean institutewithworld classresearch facilities.
- Be an institutenurturing talent and enhancing competencyofstudentstotransformthemas all-round personalities respecting moral and ethical values.

VISION ANDMISSION OFTHE DEPARTMENT

To excelin education, innovationand research in ArtificialIntelligence and Data Science to fulfill industrial demands and societal expectations.

Mission 1: To educate future engineers with solid fundamentals, continually improving teachingmethods using modern tools.

Mission2:Tocollaboratewithindustryandoffertop-notchfacilitiesinaconductivelearning environment.

Mission3:TofosterskilledengineersandethicalinnovationinAIandDataScienceforglobal recognition and impactful research.

Mission4:Totacklethesocietalchallengeofproducingcapableprofessionalsbyinstillingemployability skills and human values.

PROGRAMEDUCATIONALOBJECTIVES (PEOS)

PEO1: CompeteonaglobalscaleforaprofessionalcareerinArtificialIntelligenceandData Science.
PEO2: Provideindustry-specificsolutionsforthesocietywitheffectivecommunicationandethics.
PEO3: Honetheirprofessionalskillsthroughresearchandlifelonglearninginitiatives.

PROGRAMOUTCOMES

Engineeringstudentswillbeableto:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conductinvestigationsofcomplexproblems:** Useresearch-basedknowledgeandresearch methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Moderntoolusage:**Create,select,andapplyappropriatetechniques,resources,andmodern engineeringandITtoolsincludingpredictionandmodelingtocomplexengineeringactivities with an understanding of the limitations.
6. **Theengineerandsociety:**Applyreasoninginformedbythecontextualknowledgetoassess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutionsinsocietalandenvironmentalcontexts,anddemonstratetheknowledgeof,andneed for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individualandteamwork:**Functioneffectivelyasanindividual,andasamemberor leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineeringcommunityandwithsocietyatlarge,suchas,beingabletocomprehendandwrite effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11.

12. **Project management and finance:** Demonstrate knowledge and understanding of the engineeringandmanagementprinciplesandapplythesetoone'sownwork,asamemberand leader in a team, to manage projects and in multidisciplinary environments.
13. **Life-long learning:** Recognize the need for, and have the preparation and abilityto engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFICOUTCOMES (PSOs)

- **PSO 1:** Capable ofworking on data-related methodologies and providing industry-focussed solutions.
- **PSO2:** Capable of analysing and providing a solution to a given real-world problem by designing an effective program.

ABSTRACT

TheE-HealthManagementSystemisaninnovativesolutiondesignedtodigitize and streamline the management of healthcare services, bridging the gap between patients and healthcare providers. This platform provides a centralized system for managingpatientrecords,schedulingappointments,andaccessingmedicalservicesin a secure and efficient manner. With the increasing demand for digital transformation in healthcare, this system ensures seamless communication by enabling real-time interaction between patients and providers through features such as appointment notifications,medicalserviceupdates,andsecuremessaging.Byemployingadvanced Java programming concepts, the system ensures scalability, reliability, and user-friendliness. Key functionalities include secure storage and retrieval of medical records,intuitiveinterfacesforschedulingandmanagingappointments,androle-based accesscontrolstomaintaindataprivacyandconfidentiality.Thesystemalsointegrates essentialhealthcareservices, suchas prescriptiontrackinganddiagnostic management, creating a comprehensive and cohesive digital healthcare experience. This project addressestheneedformodernizedhealthcaresolutionsthatreducemanualworkloads, improve service delivery, and enhance patient satisfaction.

ABSTRACTWITHPOsANDPSOsMAPPING

ABSTRACT	POs MAPPED	PSOs MAPPED
AnE-HealthManagementSystem(EHMS)is a digital platform that simplifies healthcare processes by managing patient records, appointments, and medicalservices.Itenhancescommunicationbetween patientsandhealthcareproviders,ensuringsecureand efficient interactions. Built using modern Java programming concepts, the system is designed for scalability, security, and long-term maintainability.	**PO-1** **PO-5** **PO-8**	**PSO-1** **PSO-2**

Note:1-Low,2-Medium,3-High

SUPERVISOR **HEADOFTHEDEPARTMENT**

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CHAPTER 1

INTRODUCTION

Objective

The objective of the E-Health Management System is to create a robust and user-friendly platform that simplifies healthcare operations by managing patient records, appointments, and medical services efficiently. The system aims to enhance communication between patients and healthcare providers while ensuring data security and compliance with healthcare standards. By streamlining administrative processes and integrating essential medical functionalities, the platform seeks to improve service delivery, reduce manualworkloads, and provide a seamless healthcare experience.

Overview

The E-Health Management System addresses the growing need for digital healthcare solutionsbyofferingacentralizedanduser-friendlyplatform.Thesystemensuresdatasecurityand complies with medical regulations, making it suitable for clinics, hospitals, and other healthcare providers

JavaProgrammingConcepts

- ✓ **Object-OrientedProgramming(OOP):**Forcreatingmodularandreusablecodestructures (e.g., Patient, Appointment, and Doctor classes).
- ✓ **JDBC(JavaDatabaseConnectivity):**Forsecureandefficientdatabaseoperations.
- ✓ **JavaSwing/JavaFX:**Fordesigningauser-friendlygraphicaluserinterface (GUI).
- ✓ **Multithreading:**Forhandlingsimultaneoustaskssuchasappointmentschedulinganddata updates.
- ✓ **ExceptionHandling:**Toensurerobustoperationbymanagingruntimeerrorsgraceful

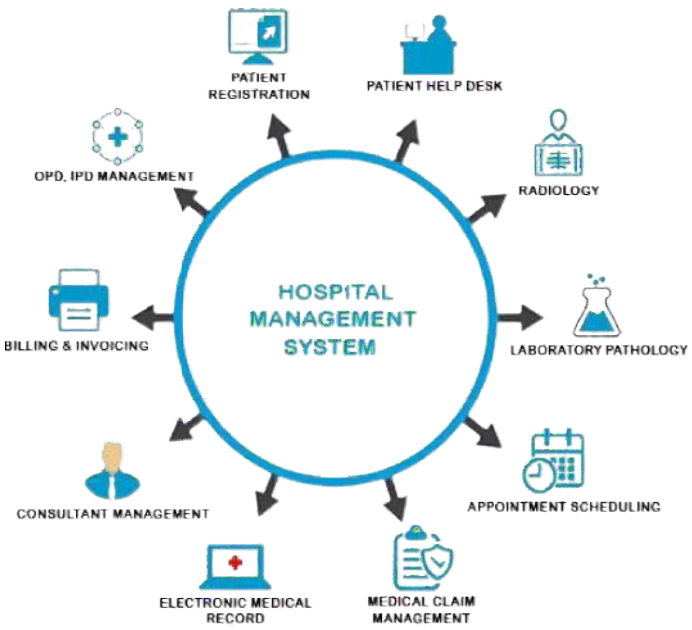
CHAPTER 2

PROJECTMETHODOLOGY

ProposedWork

- ✓ **PatientManagementModule:**Allowshealthcareproviderstocreate,retrieve, update, and delete patient records securely.
- ✓ **AppointmentManagementModule:** Simplifiesschedulingbyenablingpatientsto book and manage appointments online.
- ✓ **CommunicationModule:**Enablessecuremessagingandnotificationsbetween patients and doctors.
- ✓ **DataSecurity:**Implementsencryptionandsecureauthentiationtoprotectsensitive health information.

BlockDiagram



CHAPTER 3

MODULEDESCRIPTION

PatientRegistration:

The Patient Registration module handles the additionofnew and returning patients to the system. It stores important demographic information such as name, age, contact details, and medical history. This ensures that patient recordsareeasilyaccessibleforfuturevisits.Italsoprovidesaseamlessprocess for updating patient information as needed.

RadiologyModule:

The Radiology Module integrates with imaging systems such as X-rays, CT scans, and MRIs. It allows healthcare providers to store, view, and analyze diagnostic images. This module ensures that doctors have quick access to importanttestresultsforaccuratediagnosisandtreatmentplanning.Itplaysavital role in patient care by ensuring timely analysis of radiology reports.

AppointmentScheduling:

The Appointment Scheduling module provides an interface for both patients and staff to book, reschedule, or cancel appointments. It helps track doctor availability and ensures that patient appointments are scheduled efficiently. This modulereducesthechancesofdoublebookingsandallowsforbettermanagement of patient flow. It can send reminders to patients, ensuring they do not miss their appointments.

BillingandInvoicing:

The Billing and Invoicing module generates detailed bills for various services provided, suchas consultations, tests, and medicines. It ensures accurate billing and integrates with payment gateways for secure online payments. This module improves financial transparency and helps patients and the hospital keep

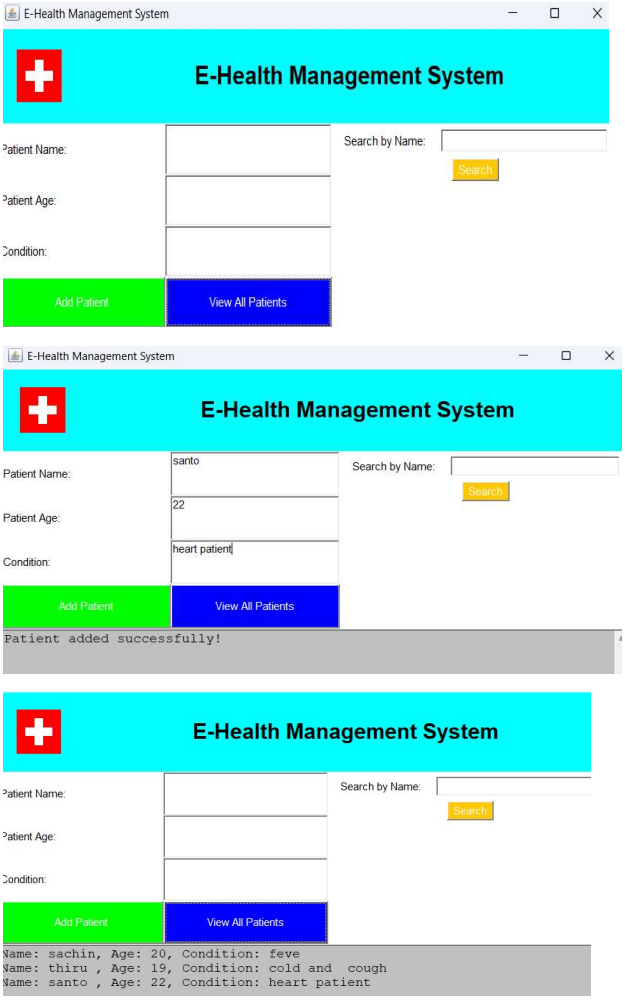
trackofpayments.Italsosimplifiestheprocessofgeneratingreceiptsand invoices.

ElectronicMedicalRecord(EMR):

The Electronic Medical Record (EMR) module serves as a centralized systemforstoringandmanagingpatienthealthrecords.Itincludescomprehensive details like patient history, test results, prescriptions, and diagnoses. This module allows healthcare providers to access real-time, accurate information, improving decision-making. It also enhances patient care by ensuring all medical data is available in one place for easy reference.

CHAPTER4

RESULTSANDDISCUSSION



Discussion:-

- ✓ **Advantages:**Reducespaperwork,improvescommunication,andspeedsup decision-making.
- ✓ **Challenges:**Highinitialsetupcost,stafftrainingrequirements,anddatasecurity concerns.
- ✓ **Future Scope:** Integration with telemedicine, AI for diagnosis, and real-time patient monitoring through IoT.

CHAPTER5

CONCLUSION

The hospital management system helps hospitals run more smoothly by automating tasks, organizing patient data, and improving overall care. While it may be costly to set up and require staff training, the benefits, like saving time, improving communication, and making information easily accessible, make it worthwhile. The systemcan also grow with future technology, such as telemedicine and AI, to further enhance hospital operations and patient care.

REFERENCES:

- https://www.who.int/health-topics/digital-health-tab=tab_1
- https://www.healthcareitnews.com/
- https://www.amia.org/

APPENDIX

(Coding)

```
import java.awt.*;
importjava.awt.event.*;
importjava.util.ArrayList;

classEHealthManagementSystemextendsFrameimplements ActionListener{ private
    TextField patientName, patientAge, patientCondition, searchField; private
    TextArea displayArea;
    privateArrayList<Patient>patients;

    publicEHealthManagementSystem(){
        // Initialize patient list
        patients=newArrayList<>();

        // Set layout and title
        setLayout(newBorderLayout());
        setTitle("E-HealthManagementSystem");

        //Addcolorfulheaderwitha hospitalicon
        PanelheaderPanel=newPanel(newBorderLayout());
        headerPanel.setBackground(Color.CYAN);
            LabelheaderLabel=      new   Label("E-HealthManagement     System",
Label.CENTER);
        headerLabel.setFont(new Font("Arial", Font.BOLD, 24));
        headerPanel.add(newHospitalIcon(),BorderLayout.WEST);
        headerPanel.add(headerLabel, BorderLayout.CENTER);
        add(headerPanel, BorderLayout.NORTH);
```

```
//Createinputpanel
PanelinputPanel=newPanel(newGridLayout(4,2));
inputPanel.add(new Label("Patient Name:"));
patientName = new TextField(20);
inputPanel.add(patientName);

inputPanel.add(newLabel("PatientAge:"));
patientAge = new TextField(20);
inputPanel.add(patientAge);

inputPanel.add(newLabel("Condition:"));
patientCondition = new TextField(20);
inputPanel.add(patientCondition);

ButtonaddButton=newButton("AddPatient");
addButton.setBackground(Color.GREEN);
addButton.setForeground(Color.WHITE);
addButton.addActionListener(this);
inputPanel.add(addButton);

ButtonviewAllButton=newButton("ViewAllPatients");
viewAllButton.setBackground(Color.BLUE);
viewAllButton.setForeground(Color.WHITE);
viewAllButton.addActionListener(this);
inputPanel.add(viewAllButton);

//Createsearchpanel
```

```
PanelsearchPanel=newPanel(newFlowLayout());
searchPanel.add(new Label("Search by Name:"));
searchField = new TextField(20);
searchPanel.add(searchField);

Button searchButton = new Button("Search");
searchButton.setBackground(Color.ORANGE);
searchButton.setForeground(Color.WHITE);
searchButton.addActionListener(this);
searchPanel.add(searchButton);

//Displayarea
displayArea = new TextArea(10, 50);
displayArea.setBackground(Color.LIGHT_GRAY);
displayArea.setFont(newFont("Monospaced",Font.PLAIN,14));
displayArea.setEditable(false);

// Add components to the frame
add(inputPanel, BorderLayout.WEST);
add(searchPanel, BorderLayout.CENTER);
add(displayArea, BorderLayout.SOUTH);

//Frameproperties
setSize(700, 500);
setVisible(true);

// Close window event
addWindowListener(newWindowAdapter(){
```

```
        publicvoidwindowClosing(WindowEvente){
            System.exit(0);
        }
    });
}

publicvoidactionPerformed(ActionEvente){
    Stringcommand=e.getActionCommand();

    if (command.equals("Add Patient")) {
        String name = patientName.getText();
        StringageText=patientAge.getText();
        Stringcondition=patientCondition.getText();

        if(name.isEmpty()||ageText.isEmpty()||condition.isEmpty()){
            displayArea.setText("All fields are required!");
            return;
        }

        try {
            int age = Integer.parseInt(ageText);
            patients.add(new Patient(name, age, condition));
            displayArea.setText("Patientaddedsuccessfully!");
            patientName.setText("");
            patientAge.setText("");
            patientCondition.setText("");
        } catch (NumberFormatException ex) {
            displayArea.setText("Agemustbeavalidnumber!");
```

```
    }

}elseif(command.equals("ViewAllPatients")){ if
   (patients.isEmpty()) {
      displayArea.setText("Nopatientsavailable.");
   }else{
      StringBuilderbuilder=newStringBuilder(); for
      (Patient p : patients) {
         builder.append(p).append("\n");
      }
      displayArea.setText(builder.toString());
   }
}elseif(command.equals("Search")){
   StringsearchName=searchField.getText(); if
   (searchName.isEmpty()) {
      displayArea.setText("Pleaseenteranametosearch!"); return;
   }

   booleanfound= false;
   StringBuilderbuilder=newStringBuilder();
   for (Patient p : patients) {
      if(p.getName().equalsIgnoreCase(searchName)){
         builder.append(p).append("\n");
         found=true;
      }
   }
```

```
        if (found) {
            displayArea.setText(builder.toString());
        }else{
            displayArea.setText("Nopatientfoundwiththename:"+searchName);
        }
    }
}

//InnerclasstorepresentaPatient class
Patient {
    privateStringname; private
    int age;
    privateStringcondition;

    publicPatient(Stringname,intage,Stringcondition){
        this.name = name;
        this.age = age;
        this.condition=condition;
    }

    publicStringgetName(){
        return name;
    }

    publicStringtoString(){
            return"Name:"+name+",Age:"+age+",Condition:"+condition;
    }
}
```

```
    //Customcanvasforthehospitalicon
    class HospitalIcon extends Canvas {
        publicvoidpaint(Graphicsg){
            g.setColor(Color.RED);
            g.fillRect(20, 20, 50, 50);
            g.setColor(Color.WHITE);
            g.fillRect(40, 30, 10, 30);
            g.fillRect(30,40,30,10);
        }

        publicDimensiongetPreferredSize(){
            return new Dimension(90, 90);
        }
    }

    publicstaticvoidmain(String[]args){ new
        EHealthManagementSystem();
    }
}
```