# Hospital Management System

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# 1. Introduction

Hospital Management System is powerful, flexible, and easy to use and is designed and developed to deliver real conceivable benefits to hospitals.

Hospital Management System is designed for multispeciality hospitals, to cover a wide range of hospital administration and management processes. It is an integrated end-to-end Hospital Management System that provides relevant information across the hospital to support effective decision making for patient care, hospital administration and critical financial accounting, in a seamless flow.

Hospital Management System is a software product suite designed to improve the quality and management of hospital management in the areas of clinical process analysis and activity-based costing. Hospital Management System enables you to develop your organization and improve its effectiveness and quality of work. Managing the key processes efficiently is critical to the success of the hospital helps you manage your processes.

## 1.1 Problem Introduction

### Lack of immediate retrievals: -

The information is very difficult to retrieve and to find particular information like- E.g. - To find out about the patient's history, the user has to go through various registers. This results in inconvenience and wastage of time.

### Lack of immediate information storage: -

The information generated by various transactions takes time and efforts to be stored at right place.

### Lack of prompt updating: -

Various changes to information like patient details or immunization details of child are difficult to make as paper work is involved.

### Error prone manual calculation: -

Manual calculations are error prone and take a lot of time this may result in incorrect information. For example calculation of patient's bill based on various treatments.

### 5. Preparation of accurate and prompt reports: -

This becomes a difficult task as information is difficult to collect from various registers.

**Objective:-**

1) Define hospital
2) Recording information about the Patients that come.
3) Generating bills.
4) Recording information related to diagnosis given to Patients.
5) Keeping record of the Immunization provided to children/patients.
6) Keeping information about various diseases and medicines available to cure them.

These are the various jobs that need to be done in a Hospital by the operational staff and Doctors. All these works are done on papers.

**Scope of the Project:-**

1) Information about Patients is done by just writing the Patients name, age and gender. Whenever the Patient comes up his information is stored freshly.
2) Bills are generated by recording price for each facility provided to Patient on a separate sheet and at last they all are summed up.
3) Diagnosis information to patients is generally recorded on the document, which contains Patient information. It is destroyed after some time period to decrease the paper load in the office.
4) Immunization records of children are maintained in pre-formatted sheets, which are kept in a file.
5) Information about various diseases is not kept as any document. Doctors themselves do this job by remembering various medicines.

All this work is done manually by the receptionist and other operational staff and lot of papers are needed to be handled and taken care of. Doctors have to remember various medicines available for diagnosis and sometimes miss better alternatives as they can't remember them at that time.

## 2. Literature Survey

### 2.1 Software Requirement Specification

**HARDWARE CONFIGURATION**

| | | |
|---|---|---|
| Processor | : | Pentium 4 processor |
| Memory | : | 1 GB RAM |
| Display | : | 14" LCD |
| Hard disk Drive | : | 80 GB |

**SOFTWARE CONFIGURATION**

| | | |
|---|---|---|
| Operating System | : | Windows XP professional |
| Environment | : | PHP |
| Database | : | MySql |
| Server | : | Apache Tomcat 6.0 |

### J2EE

Java 2 Enterprise Edition is a programming platform part of the Java Platform for developing and running multitier architecture Java applications, based largely on modular software components running on an application server.

### TOMCAT-

It's an application server which is mostly used in the web-applications. It implements the Servlet 2.5 &JSP 2.1 specifications. It's a cross-platform application Server.

### JSP

Java Server Pages(JSP) is a server side Java technology that allows software developers to create dynamically generated web pages, with HTML, XML or other document types. JSPs are compiled into Servlets by a JSP compiler.

### SERVLET

Servlets are Java programming language objects that dynamically process requests & construct responses. The Servlet APIs are contained in the javax.servlet & javax.servlet.http packages. Servlets can be generated automatically by Java server Pages(JSP) compiler.

### NetBeans IDE

NetBeans is the most comprehensive J2EE IDE() for the open Source netbeans platform.It incorporates most innovative open standard technologies to provide a development environment for J2EE WEB,XML,UML & database & a wide array of application server connectors to streamline development ,deployment, testing & portability.It's a cross-platform.

### Back END:

### Structure Query Language(SQL)

A query language for RDBMS based on. Non –procedure approach to retrieve record from RDBMS.

SQL was proposed by IBM and got its standardization by ANSI and adopted by different corporation with bit modification.

SQL can be divided into three categories as given below:

- DML – Data Manipulation Language.
- DCL - Data Control language.
- DDL – Data Definition language
- DML :- Primarily used to retrieve the records from RDBMS
- SELECT [*|ALL] FROM <TABLE> [WHERE <CONDITION"] <ORDER BY [<FIELD>]
- [HAVING<CONDITION>]
- insert into <table> ( field1, field2, field3 ) values(values1, values2,values3);
- DDL:- Primary used to create tables/indexes etc.
- Create table <table name> (
  field name1 type1,
  field name2 type2,
  field name3 type3
  );
- Drop table < table name >;

- DCL:- Primarily used for administrative /option operation like creating if user/assignment of password updation of record/deletion of user/creation of roles/assignment of access right.
- Create user<user name>
- Identified by <password>
- Grant select, insert on EMP to demo;
- Revoke select on EMP from Demo;

In a summarized way it could be concluded that SQL becomes the query engine that resides over the database engine having been designed on the client-server Approach and provided retrieval of data as well as operation on RDBMS. By the Application package and web pages.

## 2.2 Feasibility Study

Depending on the results of the initial investigation the survey is now expanded to a more detailed feasibility study. "**FEASIBILITY STUDY**" is a test of system proposal according to its workability, impact of the organization, ability to meet needs and effective use of the resources. It focuses on these major questions:

> ➢ What are the user's demonstrable needs and how does a candidate system meet them?
> ➢ What resources are available for given candidate system?
> ➢ What are the likely impacts of the candidate system on the organization?
> ➢ Whether it is worth to solve the problem?
> ➢ During feasibility analysis for this project, following primary areas of interest are to be considered.
> ➢ Investigation and generating ideas about a new system does this.

**Steps in feasibility analysis :** Eight steps involved in the feasibility analysis are:

1) Form a project team and appoint a project leader.
2) Prepare system flowcharts.
3) Enumerate potential proposed system.
4) Define and identify characteristics of proposed system.
5) Determine and evaluate performance and cost effective of each proposed system.

6) Weight system performance and cost data.

7) Select the best-proposed system.

8) Prepare and report final project directive to management.

**Technical feasibility**

A study of resource availability that may affect the ability to achieve an acceptable system. This evaluation determines whether the technology needed for the proposed system is available or not.

1) Can the work for the project be done with current equipment existing software technology & available personal?

2) Can the system be upgraded if developed?

3) If new technology is needed then what can be developed?

4) This is concerned with specifying equipment and software that will successfully satisfy the user requirement.

**The technical needs of the system may include:**

**Front-end and back-end selection**

An important issue for the development of a project is the selection of suitable front-end and back-end. When we decided to develop the project we went through an extensive study to determine the most suitable platform that suits the needs of the organization as well as helps in development of the project. The aspects of our study included the following factors.

**Front-end selection:**

1) It must have a graphical user interface that assists employees that are not from IT background.

2) Scalability and extensibility.

3) Flexibility.

4) Robustness.

5) According to the organization requirement and the culture.

6) Must provide excellent reporting features with good printing support.

7) Platform independent.

8) Easy to debug and maintain.

9) Event driven programming facility.

10) Front end must support some popular back end like Ms Access. According to the above stated features we selected VB6.0 as the front-end for developing our project. Hospital Management System

**Back-end Selection:**

1) Multiple user support.

2) Efficient data handling.

3) Provide inherent features for security.

4) Efficient data retrieval and maintenance.

5) Stored procedures.

6) Popularity.

7) Operating System compatible.

8) Easy to install.

9) Various drivers must be available.

10) Easy to implant with the Front-end.

According to above stated features we selected Ms-Access as the backend. The technical feasibility is frequently the most difficult area encountered at this stage. It is essential that the process of analysis and definition be conducted in parallel with an assessment to technical feasibility. It centers on the existing computer system (hardware, software etc.) and to what extent it can support the proposed system.

## Economical feasibility

Economic justification is generally the "Bottom Line" consideration for most systems. Economic justification includes a broad range of concerns that includes cost benefit analysis. In this we weight the cost and the benefits associated with the candidate system and if it suits the basic purpose of the organization i.e. profit making, the project is making to the analysis and design phase. The financial and the economic questions during the preliminary investigation are verified to estimate the following:

1) The cost to conduct a full system investigation.

2) The cost of hardware and software for the class of application being considered.

3) The benefits in the form of reduced cost.

4) The proposed system will give the minute information, as a result the performance is improved which in turn may be expected to provide increased profits.

5) This feasibility checks whether the system can be developed with the available funds. The Hospital Management System does not require enormous amount of money to be developed. This can be done economically if planned judicially, so it is economically feasible. The cost of project depends upon the number of manhours required.

**Operational Feasibility**

It is mainly related to human organizations and political aspects. The points to be considered are:

1) What changes will be brought with the system?

2) What organization structures are disturbed?

3) What new skills will be required? Do the existing staff members have these skills? If not, can they be trained in due course of time?

4) The system is operationally feasible as it very easy for the End users to operate it. It only needs basic information about Windows platform.

**Schedule feasibility**

Time evaluation is the most important consideration in the development of project. The time schedule required for the developed of this project is very important since more development time effect machine time, cost and cause delay in the development of other systems.

A reliable Hospital Management System can be developed in the considerable amount of time.

### 2.3 Modules:

### Patient:

In patient module here we can registered the new patient, during registration we enter the basic information regarding patient. There are two types of patient one is INPATIENT and another is OUTPATIENT. If patient is INPATIENT then we can check the availability of room in particular ward.

### Appointment Scheduling:

In appointment scheduling we schedule the appointment for new patient in which we assign the date, time, department and doctor is available that time. If patient want particular doctor then we can search the doctors scheduling and available time for that doctor. Here we add the urgency and reminder to patient. We can also cancel the appointment of particular patient.

### Medocs (Medical documentation and services):-

- We can enter or view the previous medical record of particular patient.
- We can enter or view the PRESCRIPTION of particular patient.
- We can enter or view other information like :
- Notes and reports,
- Allergy,
- Diet Plan,
- Physician Orders,
- Problems,
- Measurement,
- Diagnosis,
- Therapy,
- Medical advice

### Admission:

In this module we can search the only admitted patient. Here we can update his details like prescription, notes and reports, measurement, birth details, pregnancies and we can cancel the particular admission.

### Ambulatory:

In this module we can see the information related to patients which are outpatient. Here we can see the department wise appointment and particular day's outpatient. We can also see the today's waiting list and also transfer or take over the patient from one department to another department .From here we can also admit the patient.

### Employee:

In this module we can register the new employee, for which we can enter the basic information about employee and his professional details.

### Doctors:

In this module we can view the today's doctor on call schedule department-wise .Here we can create the duty plan of doctor and edit or update the duty plan of particular doctor. Here we can add/delete the doctor to particular department.

### Ward Management:

Here we can create new ward, in particular department, assign the rooms to ward, how many beds for particular room. All of these we can set from here.

### Operation Room:

Here we can search the patient who is gone through any operation and his detail information like operation date, surgeon, therapy, special notice, operation type, operation room number. Here we can also give the quick view of today's nurses on standby duty and we can create the duty plan for particular nurse.

**Laboratories:**

In this module we have to fill up the form and send the request to laboratory test. Here we can also see the pending request. We can also search the particular patient and view the laboratory information of particular patient.

**Type of laboratories:-**

- Medical Lab,
- Pathological Lab,
- Bacteriological Lab,
- Blood Bank.

**Radiology:**

In this module we can request for a radiological test. Contains test for X-ray, sonography, computer tomography, mammography, magnetic resonance tomography etc. We can view the pending request for radiology

**Chatting**

In this module patients can send chat request for doctors for asking any query. If doctor is accepts chatting request then patients is able to chat with online doctors.

## 3. System Design

**What is a Methodology?**

Software engineering is carry out of using preferred procedure techniques to progress the quality of a software development effort. A methodology is defined as a collection of procedures, techniques, tools, and documentation aids which will help developers in their efforts (both product and process related activities) to implement a new system. For successful implementation, a well-organized and systematic approach is crucial. Therefore,

several methodologies were developed to encourage the systematic approach to planning, analysis, design, testing and implementation. Methodologies offer various tools and techniques to assist in analysis, design and testing in terms of detailed design of software, data flowcharts and database design.

**Why Methodology?**

1. To complete a project within time and budget with the expected scope and quality we need methodologies which provide for a framework.

2. Most methodologies have a general planning, developing and managing stages in common. They suggest the development team the ways of thinking, learning and arriving at a regular feasible solution.

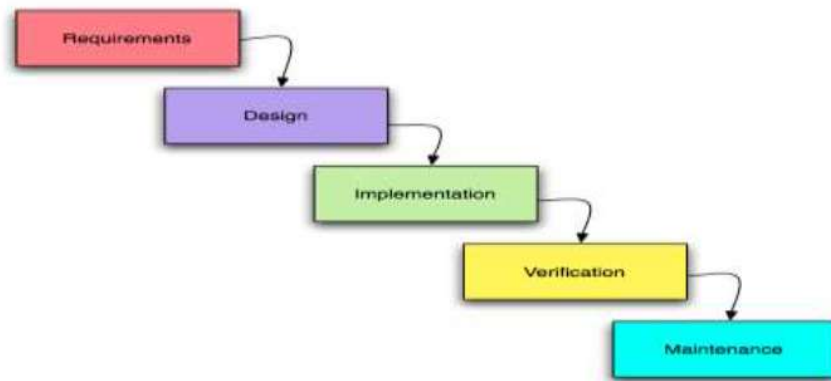To select an ideal methodology was based on project requirements and goals.

❖ Functional Decomposition: The methodology should have stages according to the interrelated activities which can be grouped into different functional areas.

❖ Requirement Changes: If required, methodology provides scope to change the requirement.

❖ Manage Risks: Determined the risk is an important activity to develop a project.

❖ Iterative approach: Iteration allows refinement of requirement as well as design.

❖ Documentation: Methodology provides support for large documentation.

❖ Analysis and Design Support: A well defined structure of the methodology helps for analysis and designing to development process..

❖ Implementation: The system should be implemented as per plan.

❖ Testing Support: More testing, more reliable the product is.

❖ Object Oriented Approach: Object oriented concepts will be used in developing the project as it supports component reusability.

**Suitable Methodologies:**

**Waterfall Methodology**: All projects can be managed better when segmented into a hierarchy of chunks such as phases, stages, activities, tasks and steps. It follows a linear structure starting from requirement analysis, through design, implementation and maintenance. Most widely accepted methodology for student projects, this model has been well tried and tested. Each phase of it has sub phases which produce deliverables.

Requirements are fixed at initial stages before proceeding with development plans in system development projects; the simplest rendition of this is called the "waterfall" methodology, as shown in the following figure:

Fig 2: waterfall model



The graphic illustrates a few critical principles of a good methodology:

- Work is done in stages,
- Content reviews are conducted between stages, and
- Reviews represent quality gates and decision points for continuing.

The waterfall provides an orderly sequence of development steps and helps ensure the adequacy of documentation and design reviews to ensure the quality, reliability, and maintainability of the developed software. While almost everyone these days disparages the "waterfall methodology" as being needlessly slow and cumbersome, it does illustrate

## 4. Concluding Remarks

- Hospital Management System not only provides an opportunity to the hospital to enhance their patient care but also can increase the profitability of the organization
- Hospital Management System would enable hospitals or Nursing Homes to serve the rapidly growing number of health care consumers in a cost-effective manner
- Hospital Management System can also save extra money on your current computer hardware shopping. Check up with our executive to more on this

- Hospital administrators would be able to significantly improve the operational control and thus streamline operations
- This would enable to improve the response time to the demands of patient care because it automates the process of collecting, collating and retrieving patient information
- Accounting sometimes becomes awfully pathetic and complex. This product will eliminate any such complexity, since the retrieval of information through its MIS will become virtually on the tip of your fingers

Very important for some, the reduced cost of the manpower would pay for the cost of this product with in a short time after its implementation