1.INTRODUCTION

1.1 PURPOSE OF THE PROJECT

Our Web Application facilitates young parents in tracking the immunization of their children. The application takes away pressure of having to remember life critical information amidst juggling work and home for the parents. The objective of this Portal, is to provide health care related information to the citizens of India and to serve as a single point of access for consolidated health information. Women and children have always been a focal audience in its vision.

Our Application aims to provide Immunization to both mother and child. Immunization is the process whereby a person is made immune or resistant to an infectious disease, typically by the administration of a vaccine. Vaccines are substances that stimulate the body's own immune system to protect the person against subsequent infection or disease.

Pregnancy is not an absolute contraindication to any vaccination. On the contrary, some vaccines are strongly recommended for pregnant women during the prenatal period. Therefore, the prenatal visit is an ideal time to assess a woman's need for vaccines.

The period after delivery and before discharge from the hospital is an ideal time to administer both live and inactivated vaccines. It ensures that both the woman and her child will be protected from preventable diseases after leaving the birthing facility, when they are especially vulnerable.

1.2 PROBLEMS WITH EXISTING SYSTEM

There are web sites which provide information regarding the vaccinations, but they don't provide any kind of alerts and notifications for the users.

1.3 PROPOSED SYSTEM

The proposed system is of a web application that is helpful to keep track of the vaccinations that needs to be taken during pregnancy and after delivery for the baby as well as mother. The user will have to mention his/her details.Then the user will have to choose from the options whether pregnant or delivered and then the user will have to mention the month of pregnancy if she is pregnant or the age of the baby if she delivered. Depending on the details provided by the user the web application will display the list of vaccinations and nutrition that needs to be taken at that particular time from the database.

An Email Alert will be sent to the user one week prior to the vaccination to remind the user of vaccination.Another Email will be sent 3 days before the vaccination and one more on the day of the vaccination.After the vaccination is done the user has to update the status of the vaccination as done by clicking on the checkbox otherwise an alert for the vaccination which is not yet done is sent for a week to remind the user of vaccination.

A list of vaccination centers will be displayed from which the user can visit any nearest center of his or her choice to get the vaccinations done.The Nutrition that needs to be taken during this time is also mentioned. For better communication the website has provided a chatbot for the users, they can use the chatbot for any kind of queries.

The web application is user friendly and has easily understandable user interface which in turn enables easy operation in the case of an emergency. Once the details have been submitted the web application connects to the database and retrieves information in the form of a query from the database.

1.4 SCOPE OF THE PROJECT

Our application allows users to register providing the information. User can start their journey with our application from their pregnancy period. They can even join at any month of their pregnancy and after delivery for their child welfare.

Our Application provides the users all the information needed, regarding all the vaccinations and the nutrition required during the particular period in their journey from pregnancy to their child's 18 years of age. We send Alerts for the users regarding vaccination dates. The alerts are given throughout the week of dosage. We also provide the vaccination centers in their city.

2. SYSTEM REQUIREMENT SPECIFICATIONS

What is SRS?

Software Requirement Specification (SRS) is the starting point of the software developing activity. As system grew more complex it became evident that the goal of the entire system cannot be easily comprehended. Hence the need for the requirement phase arose. The software project is initiated by the client needs. The SRS is the means of translating the ideas of the minds of clients (the input) into a formal document (the output of the requirement phase.)
The SRS phase consists of two basic activities:

Problem/Requirement Analysis

The process is order and more nebulous of the two, deals with understand the problem, the goal and constraints.

Requirement Specification

Here, the focus is on specifying what has been found giving analysis such as representation, specification languages and tools, and checking the specifications are addressed during this activity.

The Requirement phase terminates with the production of the validate SRS document. Producing the SRS document is the basic goal of this phase.

Role of SRS

The purpose of the Software Requirement Specification is to reduce the communication gap between the clients and the developers. Software Requirement Specification is the medium though which the client and user needs are accurately specified. It forms the basis of software development. A good SRS should satisfy all the parties involved in the system.

2.1 Requirements Specification Document

A Software Requirements Specification (SRS) is a document that describes the nature of a project, software or application. In simple words, SRS document is a manual of a project provided it is prepared before you kick-start a project/application. This document is also known by the names SRS report, software document. A software document is primarily prepared for a project, software or any kind of application.

There are a set of guidelines to be followed while preparing the software requirement specification document. This includes the purpose, scope, functional and nonfunctional requirements, software and hardware requirements of the project. In addition to this, it also contains the information about environmental conditions required, safety and security requirements, software quality attributes of the project etc.

The purpose of SRS (Software Requirement Specification) document is to describe the external behaviour of the application developed or software. It defines the operations, performance and interfaces and quality assurance requirement of the application or software. The complete software requirements for the system are captured by the SRS.

This section introduces the requirement specification document for Cancer Detection using Machine Learning which enlists functional as well as non-functional requirements.

2.1.1 Functional Requirements

For documenting the functional requirements, the set of functionalities supported by the system are to be specified. A function can be specified by identifying the state at which data is to be input to the system, its input data domain, the output domain, and the type of processing to be carried on the input data to obtain the output data.
Functional requirements define specific behaviour or function of the application. Following are the functional requirements:

The input design is the link between the information system and user. It compromises the developing specification and procedures for data preparation and those steps are necessary to put transaction data into a useable form for processing can be achieved by inspecting the computer to read data from a written or printed documented or it can occur by having people keying the data directly into the system. The design of input focuses on controlling the amount of input required, controlling the errors, avoiding delay, avoiding extra steps and keeping the process simple. The input is designed in such a way so that it provides security and ease of use with retaining the privacy. Input design considered for the following things:

- What data should be given as input?
- How the data should be arranged or coded?
- The dialog to guide the operating personnel in providing input
- Methods for preparing input validations and steps to follow when error occur.

2.1.1.1. Input design is the process of converting a user-oriented description of the input into a computer-based system. This design is important to avoid errors in the data input process and show the correct direction to the management correct information from the computerized system.

2.1.1.2. It is achieved by creating user-friendly screens for data entry to handle large volume of data. The goal of designing input is to make data entry easier and to be free from errors. The data entry screen is designed in such a way that all the data manipulations can be performed. It also provides viewing facilities.

2.1.1.3. When the data is entered, it will check for its validity. Data can be entered with the help of screens. Appropriate messages are provided as when needed so that user will not be in maize of instant. Thus the objective of input design is to create an input layout that is easy to follow.

1. Enter name and details
2. Tracking the records of users
3. Information about Vaccinations
4. Nutrition Information
5. Sending Alerts the users
6. Storing feedback given by customers

2.1.2 Non-Functional Requirements

A non-functional requirement is a requirement that specifies criteria that can be used to judge the operation of a system, rather than specific behaviours. Especially these are the constraints the system must work within. Following are the non-functional requirements:

Performance:

The performance of the developed applications can be calculated by using following methods:
Measuring enables you to identify how the performance of your application stands in relation to your defined performance goals and helps you to identify the bottlenecks that affect your application performance. It helps you identify whether your application is moving toward or away from your performance goals. Defining what you will measure, that is, your metrics, and defining the objectives for each metric is a critical part of your testing plan.
Performance objectives include the following:

- Response time or latency
- Throughput
- Resource utilization

1. Security for customer details
2. 24*7 availability
3. Giving locations of nearest vaccination centers within a range of 1-2 km
4. Re-usability
5. Reliability
6. The system will allow notifications to be sent to users
7. The platform will protect user data and encrypt passwords
8. The website will be responsive

2.2 Software Requirements

- Spring Framework
- MySQL
- Apache Tomcat Server
- Internet Browser

2.3 Hardware Requirements

- Processor - Intel i5 (Min 2.4 GHz)
- RAM - 8 GB
- Disk Space – 1 G

3. Literature Survey

1. Spring Framework:

Spring is the most popular application development framework for enterprise Java. Millions of developers around the world use Spring Framework to create high performing, easily testable, and reusable code.

Spring framework is an open source Java platform. It was initially written by Rod Johnson and was first released under the Apache 2.0 license in June 2003.

Spring is lightweight when it comes to size and transparency. The basic version of Spring framework is around 2MB.

The core features of the Spring Framework can be used in developing any Java application, but there are extensions for building web applications on top of the Java EE platform. Spring framework targets to make J2EE development easier to use and promotes good programming practices by enabling a POJO-based programming model.

Benefits of Using the Spring Framework

• Following is the list of few of the great benefits of using Spring Framework −
• Spring enables developers to develop enterprise-class applications using POJOs. The benefit of using only POJOs is that you do not need an EJB container product such as an application server but you have the option of using only a robust servlet container such as Tomcat or some commercial product.
• Spring is organized in a modular fashion. Even though the number of packages and classes are substantial, you have to worry only about the ones you need and ignore the rest.

• Spring does not reinvent the wheel, instead it truly makes use of some of the existing technologies like several ORM frameworks, logging frameworks, JEE, Quartz and JDK timers, and other view technologies.
• Testing an application written with Spring is simple because environment-dependent code is moved into this framework. Furthermore, by using JavaBeanstyle POJOs, it becomes easier to use dependency injection for injecting test data.
• Spring's web framework is a well-designed web MVC framework, which provides a great alternative to web frameworks such as Struts or other over-engineered or less popular web frameworks.
• Spring provides a convenient API to translate technology-specific exceptions (thrown by JDBC, Hibernate, or JDO, for example) into consistent, unchecked exceptions.
• Lightweight IoC containers tend to be lightweight, especially when compared to EJB containers, for example. This is beneficial for developing and deploying applications
on computers with limited memory and CPU resources.
• Spring provides a consistent transaction management interface that can scale down to a local transaction (using a single database, for example) and scale up to global transactions (using JTA, for example).

Dependency Injection (DI)

The technology that Spring is most identified with is the Dependency Injection (DI) flavor of Inversion of Control. The Inversion of Control (IoC) is a general concept, and it can be expressed in many different ways. Dependency Injection is merely one concrete example of Inversion of Control.

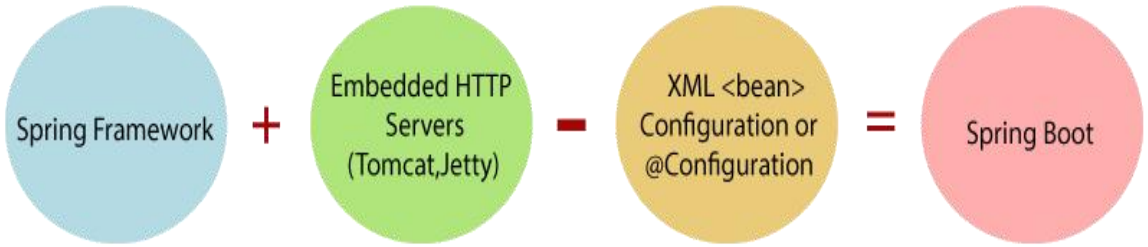
When writing a complex Java application, application classes should be as independent as possible of other Java classes to increase the possibility to reuse these classes and to test them independently of other classes while unit testing. Dependency Injection helps in gluing these classes together and at the same time keeping them independent.

Dependency injection can happen in the way of passing parameters to the constructor or by post-construction using setter methods.

2. Spring Boot Application:

Spring Boot is a project that is built on the top of the Spring Framework. It provides an easier and faster way to set up, configure, and run both simple and web-based applications.

It is a Spring module that provides the RAD (*Rapid Application Development*) feature to the Spring Framework. It is used to create a stand-alone Spring-based application that you can just run because it needs minimal Spring configuration.



In short, Spring Boot is the combination of Spring Framework and Embedded Servers.

In Spring Boot, there is no requirement for XML configuration (deployment descriptor). It uses convention over configuration software design paradigm that means it decreases the effort of the developer.

We can use Spring STS IDE or Spring Initializer to develop Spring Boot Java applications.

Why Spring Boot Framework?

We should use Spring Boot Framework because:

- The dependency injection approach is used in Spring Boot.
- It contains powerful database transaction management capabilities.
- It simplifies integration with other Java frameworks like JPA/Hibernate ORM, Struts, etc.
- It reduces the cost and development time of the application.

Along with the Spring Boot Framework, many other Spring sister projects help to build applications addressing modern business needs. There are the following Spring sister projects are as follows:

- Spring Data: It simplifies data access from the relational and NoSQL databases.
- Spring Batch: It provides powerful batch processing.
- Spring Security: It is a security framework that provides robust security to applications.
- Spring Social: It supports integration with social networking like LinkedIn.
- Spring Integration: It is an implementation of Enterprise Integration Patterns. It facilitates integration with other enterprise applications using lightweight messaging and declarative adapters.

Advantages of Spring Boot

- It creates stand-alone Spring applications that can be started using Java -jar.
- It tests web applications easily with the help of different Embedded HTTP servers such as Tomcat, Jetty, etc. We don't need to deploy WAR files.
- It provides opinionated 'starter' POMs to simplify our Maven configuration.
- It provides production-ready features such as metrics, health checks, and externalized configuration.
- There is no requirement for XML configuration.
- It offers a CLI tool for developing and testing the Spring Boot application.
- It offers the number of plug-ins.

- It also minimizes writing multiple boilerplate codes (the code that has to be included in many places with little or no alteration), XML configuration, and annotations.
- It increases productivity and reduces development time.

Web Development

It is a well-suited Spring module for web application development. We can easily create a self-contained HTTP application that uses embedded servers like Tomcat, Jetty, or Undertow. We can use the spring-boot-starter-web module to start and run the application quickly.

SpringApplication

The Spring Application is a class that provides a convenient way to bootstrap a Spring application. It can be started from the main method. We can call the application just by calling a static run() method.

```
1. public static void main(String[] args)
2. {
3. SpringApplication.run(ClassName.class, args);
4. }
```

3. MySQL:

MySQL is an Oracle-backed open source relational database management system (RDBMS) based on Structured Query Language (SQL). MySQL runs on virtually all platforms, including Linux, UNIX and Windows. Although it can be used in a wide range of applications, MySQL is most often associated with web applications and online publishing.

MySQL is a database management system. A database is a structured collection of data. It may be anything from a simple shopping list to a picture gallery or the vast amounts of information in a corporate network. To add, access, and process data

stored in a computer database, you need a database management system such as MySQL Server. Since computers are very good at handling large amounts of data, database management systems play a central role in computing, as standalone utilities, or as parts of other applications.

MySQL databases are relational. A relational database stores data in separate tables rather than putting all the data in one big storeroom. The database structures are organized into physical files optimized for speed. The logical model, with objects such as databases, tables, views, rows, and columns, offers a flexible programming environment. You set up rules governing the relationships between different data fields, such as one-to-one, one-to-many, unique, required or optional, and "pointers" between different tables. The database enforces these rules, so that with a well-designed database, your application never sees inconsistent,
duplicate, orphan, out-of-date, or missing data.

MySQL software is Open Source. Open Source means that it is possible for anyone to use and modify the software. Anybody can download the MySQL software from the Internet and use it without paying anything. If you wish, you may study the source code and change it to suit your needs.

The MySQL Database Server is very fast, reliable, scalable, and easy to use. If that is what you are looking for, you should give it a try. MySQL Server can run comfortably on a desktop or laptop, alongside your other applications, web servers, and so on, requiring little or no attention. If you dedicate an entire machine to MySQL, you can adjust the settings to take advantage of all the memory, CPU power, and I/O capacity available. MySQL can also scale up to clusters of machines, networked together.

MySQL Server works in client/server or embedded systems. The MySQL Database Software is a client/server system that consists of a multithreaded SQL server that supports different back ends, several different client programs and libraries, administrative tools, and a wide range of application programming interfaces (APIs).
We also provide MySQL Server as an embedded multithreaded library that you can link into your application to get a smaller, faster, easier-to-manage standalone product.

A large amount of contributed MySQL software is available. MySQL Server has a practical set of features developed in close cooperation with our users. It is very likely that your favorite application or language supports the MySQL Database Server.

How MySQL works

MySQL is based on a client-server model. The core of MySQL is MySQL server, which handles all of the database instructions (or commands). MySQL server is available as a separate program for use in a client-server networked environment and as a library that can be embedded (or linked) into seperate applications. MySQL operates along with several utility programs which support the administration of MySQL databases. Commands are sent to MySQLServer via the MySQL client, which is installed on a computer. MySQL was originally developed to handle large databases quickly. Although MySQL is typically installed on only one machine, it is able to send the database to multiple locations, as users are able to access it via different MySQL client interfaces. These interfaces send SQL statements to the server and then display the results.

Reasons to choose MySQL:

- Secure Money Transactions MySQL transactions work as a single unit, which means unless and until every individual operational stage is successfully completed, the transaction is not cleared. So, if an operation fails at any stage, the entire transaction happening within that group fails. MySQL ensures that financial transactions have data integrity, so customers can make worry-free transactions online. The money is not debited until the entire process is completed and in case of failure, every process is reverted to the previous stage.
- On-Demand Scalability MySQL comes with the advantage of unmatched flexibility that facilitates efficient management of deeply embedded applications, even in gigantic data centers that stack tremendous amounts of mission-critical information. It enables complete customization to cater to the unique requirements of eCommerce businesses with a much smaller footprint. MySQL provides ultimate platform flexibility to enterprises who need additional features and functionalities for their database servers.

- High Availability Consistent availability is the stalwart feature of MySQL – enterprises that deploy it can enjoy round-the-clock uptime. MySQL comes with a wide variety of cluster servers and master-slave replication configurations that enable instant failover for uninterrupted access. Whether you run an eCommerce website or a high-speed processing system, MySQL is designed to process millions of queries and thousands of transactions while ensuring unique memory caches, full-text indexes and optimum speed.
- Rock-Solid Reliability Protecting sensitive business information is the primary concern of every enterprise. MySQL ensures data security with exceptional data protection features. Powerful data encryption prevents unauthorized viewing of data and SSH and SSL supports ensure safer connections. It also features a powerful mechanism that restricts server access to authorized users and has the ability to block users even at the man-machine level. Finally, the data backup feature facilitates point-in-time recovery.
- Quick-Start Capability You can go from software download to complete installation in just 15 minutes. MySQL is exceptionally quick, regardless of the underlying platform. It features self-management capabilities like auto restart, space expansion and automatic configuration changes for ease of management. It also comes with a comprehensive set of migration tools and a fully loaded graphical management suite. MySQL enables real-time performance monitoring for timely troubleshooting of operational issues from a single workstation. For all of these reasons, organizations are using MySQL to instantly develop and launch apps. From retail and finance, to healthcare and manufacturing, many industries are capitalizing on the cost-effectiveness, efficiency and reliability of MySQL to deliver seamless services and boost their revenue.

4. Spring Boot Application with MySQL:

Accessing data with MySQL

This guide walks you through the process of creating a Spring application connected to a MySQL Database (as opposed to an in-memory, embedded database, which most of the other guides and many sample applications use). It uses Spring Data JPA to

access the database, but this is only one of many possible choices (for example, you could use plain Spring JDBC).

We will create a MySQL database, build a Spring application, and connect it to the newly created database.

Maven

To connect a MySQL, we need to add this dependency to pom.xml file
<dependency>
<groupId>mysql</groupId>
<artifactId>mysql-connector-java</artifactId>
</dependency>

Configure MySQL

Update the MySQL setting in application.properties file
MySQL
spring.datasource.url=jdbc:mysql://localhost:3306/database_name
spring.datasource.username=user_name
spring.datasource.password=password
# hibernate_sequence' doesn't exist
spring.jpa.hibernate.use-new-id-generator-mappings=false
drop n create table, good for testing,
you can also use spring.jpa.hibernate.ddl-auto=create

5. ChatterBot

ChatterBot is a Python library that makes it easy to generate automated responses to a user's input. ChatterBot uses a selection of machine learning algorithms to produce different types of responses. This makes it easy for developers to create chat bots and automate conversations with users.

Language Independence:

The language independent design of ChatterBot allows it to be trained to speak any language. Additionally, the machine-learning nature of ChatterBot allows an agent instance to improve it's own knowledge of possible responses as it interacts with humans and other sources of informative data.

How ChatterBot Works:

ChatterBot is a Python library designed to make it easy to create software that can engage in conversation. An untrained instance of ChatterBot starts off with no knowledge of how to communicate. Each time a user enters a statement, the library saves the text that they entered and the text that the statement was in response to. As ChatterBot receives more input the number of responses that it can reply and the accuracy of each response in relation to the input statement increase. The program selects the closest matching response by searching for the closest matching known statement that matches the input, it then chooses a response from the selection of known responses to that statement.