

WarmHerated Welfare Experience Share System

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System Requirements Specification

Document

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1. Introduction

1.1 Purpose

The Purpose of the document is to describe details of an application. It will explain the features of the whole system, including goal, functionality and interfaces. By reading this document, it will help:

- The customer to show their requirements specifically and formally.
- The developer to understand the requirement and how to implement the whole system.
- The developer to understand scale of the project development process and functions this project should fulfil.

1.2 Scope

In the recent year, people are spending too much time on social media but losing their attention to the public welfare issues. Social welfare institutes are facing the great challenge about losing the public focus among people specially at young age. As this phenomenon developed, it causes great effect on the society.

This paper would introduce the new product named Warmhearted which is a perfect combination of public welfare business and social network application. The Warmhearted application has all the basic functions that a mature social networking application has. For example, it allows user to post picture and articles about volunteering and their daily life. It also allows user to share and chat with each other. Those attributes make Warmhearted attractive to people and easy to use.

What makes it different is that it focuses on the social welfare issues, the profit would eventually be used for helping the public welfare either through user donation or from advertisements.

The following will guide you through the hardware, software requirement of the applications, the detailed functions that developer should fulfil and terms, reference developer should use.

1.3 Definitions, Acronyms, and Abbreviations

- HTML: Hypertext Markup Language
- JavaScript: a programming language that conforms to the ECMAScript specification
- CSS: a style sheet language used for describing the presentation of a document
- SSM: a framework which contain Spring, SpringMVC, MyBatis.
- JQuery: a JavaScript library designed to simplify HTML DOM tree traversal and manipulation, as well as event handling, CSS animation, and Ajax
- Bootstrap: an open source toolkit for developing with HTML, CSS, and JS
- MySQL: database

1.4 References

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2.Overall Description

2.1 Product Perspective

This website should be an independent product. Although it will use other APIs.

2.1.1 System Interfaces

Login/out System: This system is designed to provide login and logout functions for users (users can use QQ, WeChat, Weibo account to do this). Users can also register their accounts through this system.

- Tencent QQ API, WeChat API, Weibo API.

Security System: All transferred data are encrypted. Personal data, which stores in MySQL, will be encrypted by the encryption function of MySQL. This system can also detect abnormal activities of users such as remote login.

- AES Encryption and Decryption
- MySQL Encryption/Decryption Functions:

```
select hex(AES_ENCRYPT("123456","aeskey"));  
select AES_DECRYPT(unhex("8770C723D54E05"),"aeskey");
```

Software System: This system allows users to post, share, comment, search, follow and delete articles.

2.1.2 User Interfaces

The user should interact with all the functions of the product through the User Interface (UI). Users can search, view, comment, follow some articles which are in the main page. Users can post, manage, edit their own articles in the second page. Other issues will be in the last page, such as managing accounts. All operations will be user requests which will be send to servers to handle, then, servers will return results which will be presented in users screen.

2.1.3 Hardware Interfaces

Cloud servers will be deployed in this project, which is used to store data and handling users' requests.

2.1.4 Software Interfaces

Windows, MySQL, SSM framework, HTML5, CSS, JavaScript, jQuery, Bootstrap, Tencent QQ, WeChat API, Sina Weibo API. More details are in 3.1.3

2.1.5 Communication Interfaces

Users in PC should be able to communicate with cloud server. HTTP protocol (RFC2616) will be taken as the bridge between users and server

2.1.6 Memory Constrains

As a web application, it doesn't require too much memory (RAM). Therefore, the web application should be designed not exceed 1 GB (when users are using). For cloud server, RAM should be at least 32GB to satisfy 1000 users in doing operations at the same time. Hard disk should be at least 10 TB to store 100,000,000 records.

2.1.7 Operations

- Register: Users can register their new accounts by press register button.
- Login/out: Users can login/out their accounts by press login/out button.
- Post: Users can post their own articles.
- Edit: Users can edit or delete their own articles.
- Follow: Users can choose to follow others and also see more details about what they are following in the follow page.
- Comment: Users can comment articles.
- Share: Users can share articles to QQ, WeChat and other things.
- Report: Users can report fake or illegal articles.

2.1.8 Site Adaptation Requirements

No modification to the users' work area and no other equipment are required since all handling operations are handled by cloud servers

2.2 Product Functions

The "WarmHeated" allows users to post, edit, share, comment, follow, report and search articles. It will show some popular articles or some articles which are near users in the main page.

2.3 User Class and Characteristics

Generally, the target users are everyone. As a public welfare product, target users will be people who focus on public welfare. The user classes of this welfare system will be:

- UCC-1: System Manager: developers of WarmHearted, who are responsible for maintaining the code of WarmHearted Welfare Experience Share System, require full permission to access all aspects of the system
- UCC-2: Certificated Welfare Groups/Organizations (Group): Instead of using all functions which is released by the welfare system, a certificated icon will be also displayed with their group/organization name.
- UCC-3: Public Users (Individual): All functions (register, login/out, post, comment, follow and so on) provided by the system are released to public (everyone).

2.4 Constrains

As a website which will be deployed in Chinese servers, it should put a record in Ministry of Industry and Information Technology of the People's Republic of China.

2.5 Assumptions and Dependencies

This web application runs in a browser which communicates with cloud server by HTTP protocol.

2.6 Apportioning of Requirements

In the future, we can cooperate with social welfare organizations, and add some welfare programs. We will also perfect the UI and other systems.

3. Specific Requirements

3.1 Functional Requirement

3.1.1 Provide a Register Function

- 3.1.1.1 The system should provide a register option for user to get an account.
- 3.1.1.2 The system should require user enter some personal information.
- 3.1.1.3 The system should automatically login the system and display the home page after user register an account successfully.

3.1.2 Provide a Post Function

- 3.1.2.1 The system should provide a post function for users on the home page.
- 3.1.2.2 The system should require user to enter a short article to share experience, idea or recent news.
- 3.1.2.3 The system should allow users to change the format of articles such as adding a picture.
- 3.1.2.4 The system should return an articles management page after posting

successfully.

3.1.2.5 The system should allow users to delete or change the articles.

3.1.3 Provide a Follow Function

3.1.3.1 The system should allow users to follow other users.

3.1.3.2 The system should display the followers on a follower page.

3.1.3.3 The system should display the followed users on a following page.

3.1.3.4 The system should remind followers once user post something.

3.1.3.5 The system should provide an option to manage the followed users.

3.1.4 Provide a Comment Function

3.1.4.1 The system should allow users to add comments under posting articles.

3.1.4.2 The system should allow users to delete comments.

3.1.5 Provide a Share Function

3.1.5.1 The system should provide an option for sharing.

3.1.5.2 The user can share as a post or share with third-party software such as QQ or WeChat.

3.1.6 Provide a Report Function

3.1.6.1 The system should provide a report function if the users think the post article is fake or illegal.

3.1.6.2 The system should report the process for users.

3.1.7 Home Page

3.1.7.1 The system should display some popular articles on the home page.

3.1.7.2 The system should display the articles or news that happened near the users' location according to the personal information.

3.1.8 Provide a Search Function

3.1.8.1 The system should provide a search function which allow user to search.

3.1.8.2 The search page requires users enter keyword and return a result page.

3.1.8.3 The result page should display articles and users' names contain keyword.

3.2 Hardware Requirements

HR-1: Cloud Server--Data Storage and Memory

- HR-1.1 Online Storage: The system should be able to store at least 100,000,000 documents from at least 10,000 users. The system should be able to store at least 10 TB of data for online storage.
- HR-1.2 Nearline Storage: All data must be fully backed up week-nightly, so the system should have 20 TB data size for fully backup.
- HR-1.3 RAM: The RAM of cloud server should be at least 8G to satisfy 1,000 users doing some operations at the same time.

HR-2: Networking

- HR-2.1: The bandwidth of cloud server should be at least 10M in order to satisfy 1,000 users doing operations at the same time.
- HR-2.2: The network should support CNCC, CTCC, CUCC in order to respond operations in at most 6 seconds.
- HR-2.3: If cloud server is deployed in other countries, HongKong and TaiWan, the server must support CN2 GIA network in order to respond operations in at most 6 seconds.

HR-3 CPU Requirement:

- The minimum requirement of CPU is one Xeon E5645 (2.4Ghz, 6C12T) in order to process 1000 user demands at the same time.

3.3 Software Requirements

SR-1 Backup Software: All data will be backed up in every day of 3:00 PM to 5:00PM if network throughput is less than 100 kb/s. All data will be fully backed up in every Friday night from 3:00 to 4:00. Therefore, there is a software in server for backing up and load the data if there is problem.

SR-2 Database: The data would be stored in MySQL database and normal users can only edit their own data and administrator can manage all data. These operations would be finished through MySQL.

SR-3 HTTP Server Applications: As the Web will be the primary delivery protocol for the application, HTTP server applications will be required to support system functionality.

SR-4 Web Browsers: For users, they can access the web pages which are user interface through web browsers. In the meanwhile, commonly supported web browsers will be used to implement a thin-client architecture.

3.4 Design Constrains

- This system can be divided into two parts, front-end and back-end.
- The front-end of the system is the websites. Therefore, the standard web page should meet Microsoft's GUI standards.
- The back-end of the system should be developed by Java with MySQL database and SSM framework.
- The personal computer should install a web browser.
- The system should not require extra computer memory space.

4. External Interfaces

4.1 User interfaces

Front-end software: HTML5, CSS, JavaScript, jQuery framework, Bootstrap.

Back-end software: MySQL, JAVA, SSM framework.

4.2 Hardware interfaces

The system requirement: Windows.

The software requirement: A browser which supports CGI, HTML & JavaScript.

4.3 Software interfaces

Following are the software that we used to develop the application

Software Used	Display and share the welfare experience with others
Operating System	We chose windows operating system.
Database	We chose MySQL database including SSM framework.
HTML5, CSS, JavaScript, jQuery framework, Bootstrap	We chose HTML, CSS, JavaScript Bootstrap to design the front-end web page including jQuery framework. Also, use json related tools to parse the URL, file or strings.
Tencent QQ and WeChat API, Sina Weibo API.	We would use Tencent QQ and WeChat API and Sina Weibo API to complete sharing function of WarmHeart website system. In addition, the user can login and logout using QQ, WeChat or Weibo account.

4.4 Communication interface

This website can be visited by all users whose personal computer is Windows operation system with a web browser. A web browser is a necessary requirement for accessing the website. In the meanwhile, the user can share the website to QQ, WeChat or Weibo.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

This system is a client server system. The user interfaces are based on the website and the database is implemented on the server. Therefore, the loading time depends on the hardware and network speed.

5.1.1 Static Requirements

- Each user has two different terminals to access the system usually PC and phone.
- The system should allow at least 1000 users do some operations in the same time.
- The system should admit at least 10,000 users access the system in the same time.
- The system should maintain at least 100,000,000 documents and records in the server.
- The system should respond the operation in at most 2 seconds unless there are some problems about hardware or network.

5.1.2 Dynamic Requirements

- The size of documents and articles depends on the hard disk in server.
- Database size limit: only when the capacity of hard disk is not exceeded.
- The search function responding time depending on the number of results.
- If the number of search result is larger than 10,000, the respond time should be within 2 to 3 seconds with no hardware or network problem.
- If the number of search result is less than 10,000, the respond time should less than 1 second.
- The data in the server should be backed up every day.

5.2 Software System Attributes

5.2.1 Reliability

- The data in the server should be backed up every day.
- The system should have different permissions for different users. For example, the administer can delete all post articles while the ordinary user can only delete the articles they posted.
- The system should be working without any errors in a perfect hardware and network environment.

5.2.2 Availability

- The system should be available for many users to access in any time. The availability should be more than 99.9%.
- If the web browser crashes, the user can still visit the websites.
- If the server crashes, the server would restart and load the back-up.

5.2.3 Security

- The system shall log out automatically when there is no operation for a while usually one hour.
- The data in the database should be encrypted.
- If the user logout, the connection should be terminated.
- The data in the server should be backed up every day.
- Only administer can access the whole database.
- All password should be represented by special characters.
- All database operations have operation logs and it can be accessed when the system has errors.

5.2.4 Maintainability

The details of each functions are not accessed by users. All functions hide details. The users can give some feedbacks for the interfaces or functions and ask developer to change. In the meanwhile, users cannot access the detail of charged functions. In addition, the users can report the illegal or fake information and the administrators can delete them in database.

5.2.5 Portability

This system is designed for Windows operating system users. The users can visit this system through any web browser.