Development of A Web Sharing System of Human Body Data Using Lightweight JavaEE

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Abstract: This paper presents a method based on lightweight JavaEE for developing the web sharing system of human body data. This method is based on the feature that the body data is collected by different 3D laser body scanners from different places and the design ideal of this method is directed by UP (The Unified Software Development Process). Some open source tools (such as struts, spring and hibernate) has been introduced in this project for building the project efficiently. In Web Sharing System of Human Body Data, struts framework has been used for building the presentation layer, spring for business and logic layer, hibernate for data persistent layer. For using different data persistent strategy flexibility, the MODEL (data access object) layer has been abstracted in this method. This method not only meets the requirement of OCP(Open-Closed Principle) in computer software development, and does the best way to avoid the problems of rigidity, fragility, immobility and viscosity, but also has the features of extensibility, flexibility and pluggability in software design.

Keywords: body data, data sharing, data persistent, lightweight javaEE

1. Introduction

China is a country of a large population, there were significant differences in somatotype of people among different regions; meanwhile, body type of every generation has been progressing with the development of human society and the increasing of substance life level. Therefore, it offers an important technological support for the information process of clothing industry which builds measurement stations of human body and establishes the human dimensions database for collecting the body data of whole Chinese.

Industries and enterprises that need Chinese population's human body data have distributed in different areas of whole country. These industries and enterprises have different requirements for different causes; And this system needs to own the ability of developing, which can meet the requirement of social developing. Furthermore, there is a diversity of data acquisition mode and data acquisition equipment. Therefore, there are great application values and good market prospect for developing the Sharing System of Human Body Data based-on Web. By this system, the human body data could be transmitted and shared on Internet. This project would serve to the purposes that need to use the human body data of Chinese people for various fields.

The Sharing System of Human Body Data based on Web should meet the requirements as below: [1]

(1) The stations that posses 3D laser body scanners can be a member by remote registration with Internet, these stations should collect the human body data according to the 3D Data Representation Model of Human Body;

(2) Transmitting the collected information to the sharing database of human body by Internet. The Sharing System should check the legalization and validity of the input data for its source. Transferring the data files from different 3D laser body scanners to the data that can be stored in the human dimensions database;

(3) Data in human dimensions database can be figured out by Web search engine.

According to the requirements of the system, 4 studies have been made in this paper.

(1) The plan of the stations registered in this Data-Sharing System;

(2) Checking the legalization of the input data for its source by Data-Sharing System;

(3) Checking the validity of the input data by Data-Sharing System;

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(4) Transferring the data files to the data that can be stored in human dimensions database from different 3D laser body scanners.

According to the analysis on the requirements of the Sharing System of Human Body Data based-on Web, this system should be developed through lightweight JavaEE technology, and the reasons are as follow:

(1) The system does not need the functions of distributed servers;

(2) This system is a dedicated system, and develops for certain purpose. There is a special business setting in this system: transferring the data files from different 3D laser body scanners to the data that can be stored in the human dimensions database. So there are a great number of methods for those data, if those methods are added in EJB (Enterprise Java Bean) container, obviously, the DTO (Data Transfer Object) will increase, and makes data transmission slowly, due to the EJB container need to implement massive functions which are unnecessary for the application.

(3) There is no need to operate database frequently in this application;

(4) Lightweight JavaEE can meet the requirements of this application well.

The difference between lightweight JavaEE and heavyweight JavaEE can be distinguished by the occupied memory size of running object. The lightweight JavaEE has simplified the heavy weight JavaEE, the POJO (pure old java object or plain ordinary java object) is used on lightweight JavaEE rather than EJB. This kind of replacement (POJO replace the EJB) reduces the programming tasks, costs and difficulties of deployment in the process of developing.

2. Plan of the Stations Registering in this Data-Sharing System

The stations possessing 3D laser body scanners are distributed in different places, the distribution of these stations and their equipments are shown in Figure 1

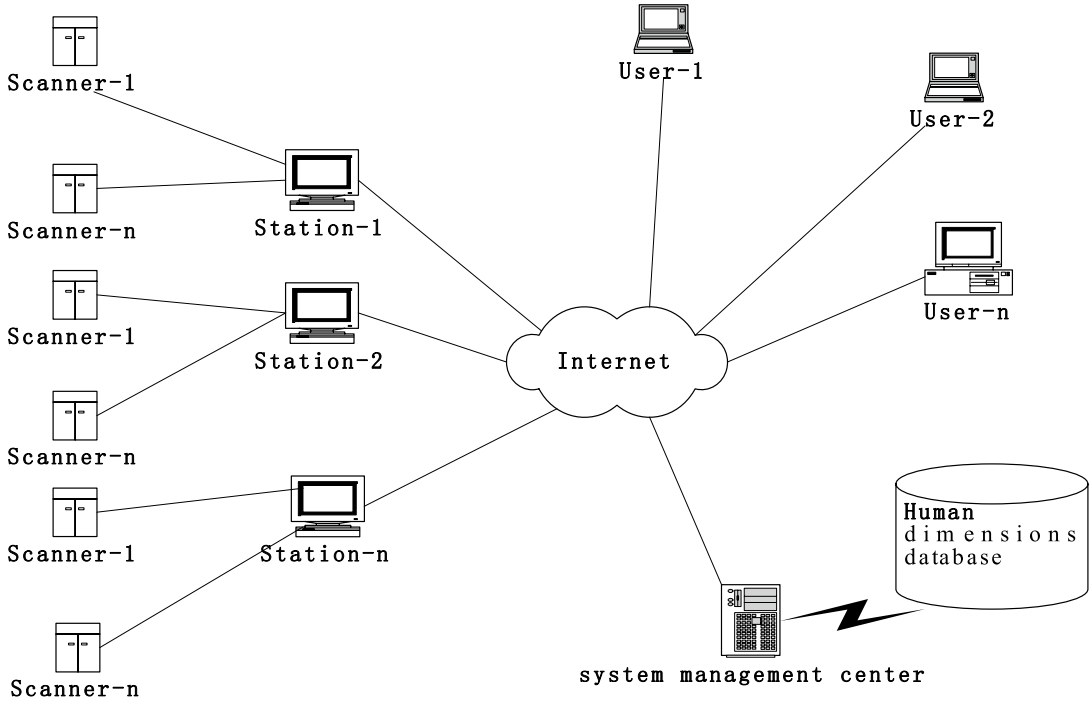

Figure 1 The distribution of stations