Design and Development of High Quality Education Resource Sharing Platform Based on Big Data

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Abstract: Through the analysis of the characteristics and requirements of the high-quality educational resources sharing platform, the key implementation technologies of the platform are analyzed from the aspects of data storage, data collection, data backup and authority management. To construct a high-quality educational resources sharing platform based on big data, which can better promote the opening and sharing of high-quality educational resources under the background of big data.

1. Introduction

The era of big data has come, and big data is becoming a scientific force to promote subversive innovation and change in education system. As the gathering place of talents and the initiating place of scientific innovation, schools have abundant resources of education, teaching and scientific research, which are constantly changing, renewing and accumulating. These static and dynamic resources, together with the relevant information from outside, are bound to form large-scale and massive data of education [1]. As a special resource, education big data can be maximized only if it is fully shared.

2. Performance of Unbalanced Development of High-quality Teaching Resources

2.1 There is an unbalanced situation of high-quality teaching resources in urban and rural areas

At present, there are great differences in the construction of digital teaching resources, software and hardware teaching environment and digital teaching resources platform between urban and rural primary and secondary schools. In the process of sharing high-quality teaching resources between urban and rural areas, because of the slow development of rural economy and remote geographical location, the development of rural education is relatively lagging behind, the construction of resources is relatively slow, and the strength of teachers is relatively weak [2]. Therefore, it is suggested that the relevant departments of education should pay more attention to the high-quality teaching resources between urban and rural areas when promoting the sharing of high-quality teaching resources between urban and rural areas. The goal, direction and approach of teaching resources sharing.

2.2 Low Sharing Degree of High-quality Teaching Resources

Through investigation, the research team found that in the process of sharing high-quality teaching resources between urban and rural areas, compulsory education in urban and rural areas basically develops separately. In the process of sharing high-quality teaching resources between urban and rural areas, the schools in urban and rural areas are basically closed to each other. There are few opportunities for communication and communication between urban and rural schools,

whether hardware resources, high-quality teaching resources or the open course of urban schools. The degree is very low, even there is "information island" phenomenon. Due to the lack of awareness of sharing high-quality teaching resources between urban and rural primary and secondary schools, teachers and students in rural areas can not effectively share high-quality teaching resources in urban areas.

3. Platform Architecture Design

The development of the whole platform adopts Service Oriented Architecture (SOA), with Microsoft's. NET technology architecture as the core, and considering the purchase of BizTalk middleware according to the actual situation of the project. The platform takes learners'needs as its starting point to build a platform for sharing network teaching resources. It uses the concept and technology of information management to build a platform for sharing network teaching resources [3]. It systematically and scientifically manages scattered teaching resources and builds an intelligent platform for teaching resources with individuality and convenience for scholars to use.

3.1 User Interface Integration

There are many users and types in the system. It is necessary to analyze in detail the user needs of different users at all levels, distinguish different user identities, and reduce the complexity of the same user's switching in different identities, so as to avoid misjudgments. User selection interface is planned by using unified design idea, while the general page is unified, different sub-interfaces are also unified to distinguish, which leaves room for the expansion of the system in the future.

3.2 Application Integration

Due to the business interoperability between different subsystems and applications, the functional coverage problem of each system also appears at the same time. In order to optimize the design and minimize the functional coverage, we adopt the SOA software architecture to design the real-time system, accurately, simplify and compress the functional realization of each subsystem, and store the functional data of different system modules separately. And design the rules and processes of data exchange in each system.

3.3 Information Integration

Each subsystem of the platform will produce a large number of different types of data. How to unify the data of each system in standards and norms is an important issue. We can monitor the integrity and accuracy of data by setting real-time data change early warning module at the back end of output function of each subsystem, and compare different rules to ensure data integrity [4]. It can also integrate the data of different subsystems, enhance the compatibility of data among systems, exchange data generated by different functional sub-modules, integrate and store data in a unified standard database, and further strengthen the unified platform exchange and processing of data in the system.

4. Implementation of Platform Module

4.1 Data acquisition

Data acquisition is one of the core contents of large data education platform. Data generated by students in learning, data generated by teachers'teaching, data generated by college entrance examination and daily exercises can be shared and transmitted. Data acquisition is the premise of data storage and computing platform. For data acquisition, we choose the data acquisition source, set the acquisition time, cycle and other parameters. The data we collected are processed and stored in the original data warehouse as the basis of the education platform.

4.2 Data Storage

Data storage is one of the important contents of big data education platform. The databases used

for storage can be relational databases Mysql, Oracle, sqlserver, or non-relational databases, such as Redis, Hbase, etc. We require that the collected data should be stored in the database according to certain rules.

4.3 Data backup

Because of the unsafe factors of data storage, single stored data is easy to lose in the server power failure, damage and other issues, so we need to do the corresponding data backup, data backup will generally backup 3-5 copies, in case of emergency.

4.4 Computing Platform

Computing Platform is one of the core contents of Big Data Education Platform, such as the role of the brain. Computing platform is mainly used to analyze data. It can be a big data processing platform like Hadoop. In the calculation, the related algorithms and models of data mining will be used. Educational big data center will integrate data mining and analysis methods effectively [5]. Commonly used data mining fields, such as correlation analysis, clustering analysis, classification analysis, anomaly analysis, specific group analysis and evolutionary analysis, and existing mining algorithms are mature open source tools integrated into educational data center platform. On the one hand, in order to facilitate the number of business system data. According to the mining procedure, on the other hand, more targeted analysis can be made. On this basis, a variety of models can be constructed, such as the prediction model of curriculum learning success, the prediction model of regional education balanced development trend, the diagnosis model of students'learning disabilities, the model of teaching behavior, and so on.

4.5 Privilege management

Role and privilege management are the basis of the safe operation of the whole system. Only when different users are assigned different roles, they will enjoy the corresponding services according to their privileges. Only with the authority management can we ensure the security of our duties, data and so on. The specific functions of role and authority management include: role management, adding roles, deleting roles, modifying roles, user role assignment, role authority association, group management, etc. Safety management: Safety management is responsible for the security and confidentiality of large data education platform, which is an important part of the system. Educational big data center has high requirements on data backup strategy, recovery mechanism, encryption strategy, data cleaning and so on. First, the backup of the database, which can be mirrored and snapshot, can restore data through snapshot and mirror when encountering problems [6]. In order to ensure that the data is not viewed by dangerous people, we can encrypt the data in MD5, RSA and other ways. Check the data regularly and do some cleaning for the unnecessary data. We also look at the operation log and locate it when problems arise. Visual Analysis and Reproduction: Visual Analysis and Reproduction is for those who need to understand the results of data analysis. Different data mining models are used to generate the corresponding results through computing platform, and then some processing of the data results is done, which is displayed to users in the form of text, icons (polygons, histograms, pie charts).

5. Part of the platform development code

```
public void Page_OnClick(Object sender, CommandEventArgs e)
    {
      CurrentPage = (int)ViewState["PageIndex"];
      PageCount = (int)ViewState["PageCount"];
      string cmd = e.CommandName;
      switch (cmd)
      {
        case "next":
          if (CurrentPage < (PageCount - 1)) CurrentPage++;
```

```
                break;
            case "prev":
                if (CurrentPage > 0) CurrentPage--;
                break;
            case "Last":
                CurrentPage = (PageCount - 1);
                break;
            default:
                CurrentPage = 0;
                break;
        }
        ViewState["PageIndex"] = CurrentPage;
        ListBind();
    }
    public void PageNum_SelectIndexChanged(object sender, System.EventArgs e)
    {
        ViewState["PageIndex"] = int.Parse(Ddl_PageNumber.SelectedItem.Value) - 1;
        PageSize = 8;
        CurrentPage = (int)ViewState["PageIndex"];
        PageCount = (int)ViewState["PageCount"];
        ListBind();
    }
    override protected void OnInit(EventArgs e)
    {
        InitializeComponent();
        base.OnInit(e);
    }
    private void InitializeComponent()
    {
        this.Load += new System.EventHandler(this.Page_Load);
        this.Ddl_PageNumber.SelectedIndexChanged += new
System.EventHandler(this.PageNum_SelectIndexChanged);
    }
protected void DList_sd_SelectedIndexChanged(object sender, EventArgs e)
    {
        if (DList_sd.SelectedValue != "")
        {
            string strSql;
            strSql = "select * from [Class] where CollegeID=" +
Convert.ToInt32(DList_sd.SelectedValue) + "";
            DList_sc.DataSource = DbHelperSQL.Query(strSql).Tables[0];
            DList_sc.DataValueField = "ClassID";
            DList_sc.DataTextField = "ClassName";
            DList_sc.DataBind();
            DList_sc.Items.Add("--请选择--");
            DList_sc.Items[this.DList_sc.Items.Count - 1].Value = "";
            DList_sc.SelectedIndex = this.DList_sc.Items.Count - 1;
        }
        else
        {
            DList_sc.SelectedValue = "";
        }
```

```
            page();
            ListBind();
        }
        protected void Button1_Click(object sender, EventArgs e)
        {
            page();
            ListBind();
            ChangeBind();
        }
private void ChangeBind()
        {
            string StuIDValue = StuID.TrimEnd(new char[] { ',' });
            string StudentID = "";
            if (StuIDValue != "")
            {
                StudentID = " and  StudentID not in(" + StuIDValue + ") ";
            }
            else
            {
                StudentID = "";
            }
            string strSel = "select * from Student where 1=1 " + StudentID + "";
            if (DList_d.Text != "" && DList_d.Text != null)
            {
                strSel += " and CollegeID =" + Convert.ToInt32(DList_d.SelectedValue) + "";
            }
            if (DList_c.SelectedValue != "" && DList_c.SelectedValue != null)
            {
                strSel += " and  ClassID=" + Convert.ToInt32(DList_c.SelectedValue) + "";
            }
            DataSet ds = DbHelperSQL.Query(strSel);
            GridView1.DataSource = ds;
            GridView1.DataKeyNames = new string[] { "StudentID" };
            GridView1.DataBind();
        }
        protected void DList_d_SelectedIndexChanged(object sender, EventArgs e)
        {
            if (DList_d.SelectedValue != "")
            {
                string strSql;
                strSql = "select * from [Class] where CollegeID=" +
Convert.ToInt32(DList_d.SelectedValue) + "";
                DList_c.DataSource = DbHelperSQL.Query(strSql).Tables[0];
                DList_c.DataValueField = "ClassID";
                DList_c.DataTextField = "ClassName";
                DList_c.DataBind();
                DList_c.Items.Add("--请选择--");
                DList_c.Items[this.DList_c.Items.Count - 1].Value = "";
                DList_c.SelectedIndex = this.DList_c.Items.Count - 1;
            }
            else
            {
```

```
            DList_c.SelectedValue = "";
        }
        TextBox1.Value = "";
        page();
        ListBind();
        ChangeBind();
    }
```

6. Conclusion

In education, we use big data technology to build a high-quality educational resources sharing platform, better realize personalized and differentiated learning, so that more students can learn more knowledge through this platform, and obtain more high-quality educational resources.

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