



Design and Implementation of Grassroots Party Building Work System Based on Micro Service System

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Abstract. It is the need of the development of the current grassroots Party organization to improve the traditional way of thinking and quality training of the members of the organization based on face-to-face instruction. With the 100th anniversary of the founding of the Party, Party organizations and units at all levels are attaching more and more importance to the informatization construction of Party construction, investing resources and energy to build exclusive or multi-branch joint Party building education network positions, and improving the transformation rate of the education work of members from offline to online. At present, most grassroots party building work is based on theory and practice, with single functions and weak user stickiness. Technically, most of them adopt single application architecture or combination architecture to achieve basic functions. However, these relatively old design patterns are difficult to conform to the current agile development trends such as on-demand expansion and local update. In addition, in recent years, the number of primary-level Party organizations has increased steadily, improving its carrying capacity, robustness and other conditions have become urgent problems to be solved in the current network construction.

Keywords: Party construction informatization · micro service · SpringCloud · grassroots party construction education

1 Introduction

Under the information environment, according to the requirements of the “14th Five-Year Plan” development plan, all grassroots Party branches combine the internal education work of the organization with the construction and development of the information platform, build a bilateral or multi-department joint online platform, carry out the education of party members by means of digital means, improve the means of education and training, and enrich the refined management of education of grassroots organizations [4]. To alleviate the limitations of traditional teaching methods, such as meeting delivery and lecture report, due to time and space factors. With the rapid growth of the number and scale of grass-roots Party organizations in recent years, the requirements for various types of informatization application construction are correspondingly increased, and the pace of school information system construction should follow the trend of technological

development [5], which means that in the process of informatization construction of Party construction education, on the basis of functional construction to meet the needs of daily education work, As far as possible, the education and training effects of the members of the organization should be improved.

2 Interactive Interface Development Technology

2.1 Vue

Vue is a lightweight, progressive, one-page JavaScript architecture that is currently popular. It differs from other front-end architectures in that Vue includes two types of functionality: incremental progression from the bottom layer to the top layer. The idea of a component is similar to the object-oriented concept, in that developers can package common properties, layout styles, and processing declarations together into a component that can then be used. With the help of large ecological resources, upgrades can be made gradually and basic requirements can be established quickly. Vue can provide two-way data bundle MVVM (model visualization view Model) [49], the interface view changes as the data changes, and likewise, as the view changes. In addition, the system also provides a persistent method based on MVVM, when changing the characteristics of the content, the use of MVVM method for local local upgrade, so as to reduce the entire web page presentation and dynamic loading of resource loss, improve the response speed of the system, improve the user experience.

2.2 ElementUI

ElementUI is a client component warehouse based on Vue open source by Alibaba Element team. Developers can obtain basic resources such as forms and style layout required for building interface from the warehouse, quickly design system page prototype, and through data instructions and binding background properties, write function methods to realize component and background data interaction. This system uses Vue and ElementUI to construct presentation layer interface implementation.

2.3 Axios

Axios is an HTTP communication client framework applicable to browsers and Node.js [50]. Based on the Promise asynchronous communication scheme, Axios completes the secondary encapsulation of AJAX and adds new features such as request and response interception and automatic data format conversion. Axios provides the CrossSite Forgery Request (CSRF) attack protection mechanism for clients to maintain the security of system and data during communication. In addition, Axios provides a concurrent request interface for developers to ensure the system's capacity to carry concurrent volumes and improve the overall reliability of the system.

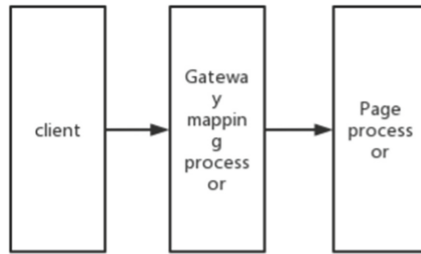


Fig. 1. How SpringCloudGateway works

3 Service Governance Component

3.1 Nacos Governance Center

Nacos is a micro business snap-in that integrates service registry and dynamic configuration. Nacos is a service registration system, which provides a complete service discovery and registration system. Its basic principles are as follows: Nacos determines the arrival status of the target service unit. If the member does not arrive, it will be added to the service list. If the member has completed the registration, it will be updated to the latest status. Nacos will then capture the service pulse periodically and monitor the registered business nodes. In case of business needs, it will screen the failed business nodes. In case of business needs, it can ensure the working condition of the business, so as to prevent the local failure caused by business failures.

3.2 SpringCloudGateway Route Gateway

The gateway works like Fig. 1, which looks like this: A client issues an access request, when a request reaches a gateway, it gets a request declaration and a destination route on an entry map processor, in the case that a request matches a path, the request is passed to a web processor, and the filter link follows a parameter of the request title. It is sent to a destination function in a business terminal, and then through a gateway to send the processed data to a client.

3.3 SpringSecurity Security Filtering

SpringSecurity is a security access solution framework of micro-service architecture [44]. It adopts a responsibility chain structure, as shown in Fig. 2. It realizes core functions such as identity authentication and authorization management through a series of filters, such as user information, HTTP basic authentication filter, exception handling, exception conversion, etc. The responsibilities of each filter are as follows:

- (1) User information filter: This filter is used to intercept login requests and verify basic information.
- (2) HTTP basic filter: This filter is also used to verify identity information, but different from the user information filter, HTTP basic filter completes the identity authentication of visitors by parsing the identity coding string in the request header.

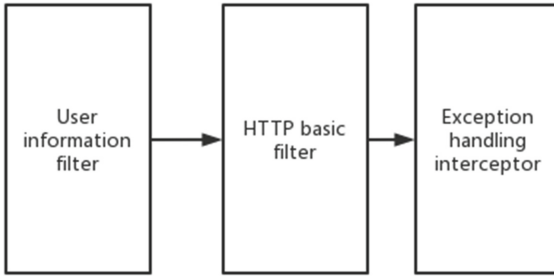


Fig. 2. SpringSecurity filter chain

3.4 Hystrix Fuse

In the development of micro-businesses, there is often an interdependence that leads to an overall functional application chain. When a service on a link is disabled, higher-level threads are blocked continuously. As a result, the entire service chain cannot provide services to the external continuously. This is called service avalanche.

Hystrix fuse has good call link detection and protection capabilities to prevent the above “avalanche” phenomenon and maintain the fault-tolerant ability of the whole system [47]. Hystrix is a physical circuit that acts as a “circuit breaker”, preventing the failure of one service so that other services can operate normally (Fig. 3).

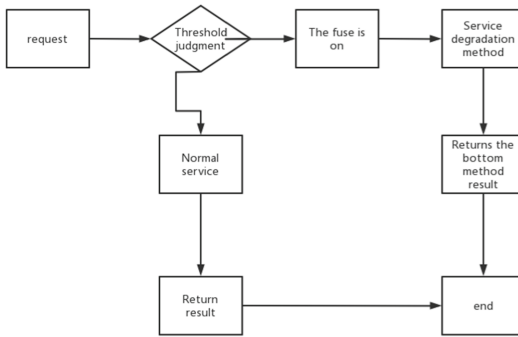


Fig. 3. Service degradation and fusing principles

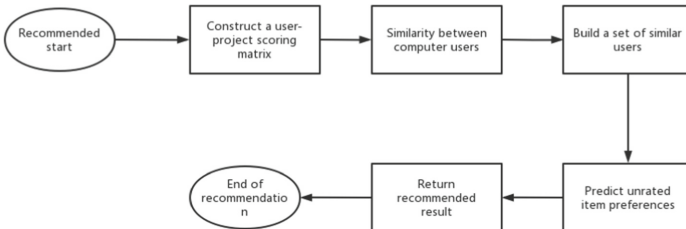


Fig. 4. User-based collaborative filtering recommendation algorithm process

The core recommendation process of user-based collaborative filtering algorithm is shown in Fig. 4.

4 Data Storage Layer Design

In the design of database, the structure of data table will be directly related to the performance of the whole system, so in the design should be strictly in accordance with the design principles and principles of the database to construct the appropriate data table, to ensure the normal work of the system.

4.1 User Center Micro-Service Database Design

The database of this module includes the basic information of members and the management of authorization, in which the user information relates to the user information, and in the design of authorization, the member information, the Role information and the right information are connected through the role-controlled access mode of RBAC (role-baseaccesscontrol). Thus, the design difficulty of permissions is reduced. The architecture of a consumer micro business module E-R is shown in Fig. 5. The Membership database contains the basic information of the members of an organization, including account, password, name, political status, department, etc., as shown in Table 1 below. In this case, the cryptofield stores the salt value in plain text.

The structure of the permission information table is shown in Table 2. This table stores specific permission data. The core fields in this table include permission name, permission level, parent permission number, function name, and permission path. Among them, the permission value level contains 0, 1 and 2, which correspond to the general directory on the left side of FIG. 15, level 1 and level 2 navigation respectively.

Table 1. Member information table

Fieldname	Datatype	Primarykeyornot	Fielddescription
Id	Char(20)	True	Memberinformationtableprimarykey
Account	Varchar(20)	False	Loginaccount
Password	Varchar(20)	False	Encryptedpassword
Phone	Varchar(20)	False	Mobilephonenumber
Name	Varchar(20)	False	name
Gender	TinyInt(2)	False	gender
Avatar	Varchar(50)	False	Headpicture

Table 2. Permission information table

Fieldname	Datatype	Primarykeyornot	Fielddescription
Id	Char(20)	True	Permissionableprimarykey
Permission	Varchar(20)	False	Permissionname
Level	Tinyint(3)	False	Authoritylevel
Parent_Id	Char(20)	False	Parentauthoritynumber
Per_Value	Varchar(30)	False	Functionname
Service	Varchar(30)	False	Correspondingmodule
Router_Path	Varchar(30)	False	Permissionrouting

5 Conclusion

The article discusses in detail the construction of the grassroots Party organization in colleges and universities. This paper starts with the development of Party building in colleges and universities, and expounds the function of Party building in colleges and universities. Secondly, according to the actual research needs of an enterprise, the current system structure and functions of the party construction work are studied, and it is organically combined with the system construction, and the relevant theories and technical knowledge of micro-service design are elaborated in detail. Thirdly, the functional requirements of the software are analyzed, and the specific design is carried out from the overall architecture, application scenarios and data storage, and the development and implementation of the whole system are described, and some specific operation scenarios are given.

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22DJQN080 Nanchang Institute of Technology “Military spirit Education” characteristic brand. 22djqn080 Nanchang Institute of Technology “Military Spirit Education” characteristic brand education model of Party building.

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