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Exploration on the Construction of University Logistics Information Service Platform

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Abstract

Logistics information construction in colleges and universities is an important part of smart campus. This paper expounds the current situation and existing problems of the logistics information construction in colleges and universities. Taking China University of Geosciences (Beijing) as an example, this paper discusses the construction principles and Personnel organization structure of the logistics information construction, and provides the construction scheme of the logistics information service platform. It can be used for reference for the implementation of logistics information construction in other colleges and universities.

Keywords

University Logistics, Logistics Information Construction, Smart Campus

1. Introduction

The logistics department of colleges and universities is at the forefront of serving teachers and students, and the service content also involves all aspects of life. High quality logistics service guarantee is a solid foundation for teachers and students to do a good job in teaching and research.

In recent years, the statistical results of the headmaster's mailbox and appeal platform show that teachers and students have the most problems and opinions about logistics management services. The logistics department has been trying to take multiple measures to improve the satisfaction of teachers and students, but the effect is not obvious. Through investigation and communication with other universities, it is found that most universities have similar problems. However, teachers and students are relatively satisfied with the logistics departments of universities with higher degree of logistics informatization, more open and transparent information, and more intelligent and convenient services for them.

How to use the Internet of Things, mobile Internet, big data, cloud computing and other information technologies, integrates the existing public information resources and information platforms of the university, and builds a unified and intelligent logistics information comprehensive service platform, which can effectively collect the life needs of teachers and students, quickly give feedback to teachers and students, practically provide teachers and students with intelligent and convenient services, and improve the satisfaction of teachers and students which is the problem we need to solve.

2. Current Situation of Logistics Informatization in Colleges and Universities

The development path of university logistics informatization is similar to the overall informatization development path of universities. From the early campus network construction (its main purpose is to surf the Internet, send and receive emails and build the department homepage) and office software application, to the medium-term information system construction, and then to the later digital campus construction, in recent years, university informatization has begun to enter the stage of smart campus construction. The logistics informatization of colleges and universities has also entered the stage of intelligent and service-oriented logistics informatization construction, emphasizing the transformation from management to service, taking service demand as the guidance, and providing a comprehensive logistics service platform all-round covering the information environment. Based on the investigation of university logistics informatization and the collection of relevant data from Informatization Construction Professional Committee of China Association For Campus Management, this paper analyzes the current situation of university logistics informatization construction from the following aspects [1].

1) Informatization demands

In general, there are many demands for logistics informatization in colleges and universities. Teachers and students are more and more eager to meet the needs of daily teaching, scientific research and life through the information platform quickly and conveniently.

2) Leadership organization system

University logistics departments generally attach importance to information construction, 93% of the university logistics department leaders are responsible for logistics information construction, of which 54.2% are the main leaders of logistics administration. More than 60% of the university logistics departments set up informatization institutions, nearly 27% of the university logistics departments plan to set up informatization institutions.

3) System guarantee and implementation

Most university logistics departments have formulated information development plans, but the implementation effect is limited. More than 60% of colleges and universities have formed top-level design schemes and plans for logistics

informatization, but nearly 50% of respondents believe that informatization schemes and plans are not effectively implemented or have no practical guiding significance.

4) Capital input and use

The investment in logistics informatization construction varies greatly. Some colleges and universities have more annual investment, while others have less investment. In terms of fund use and allocation, the order from high to low is management information system construction, information infrastructure platform construction, system operation and maintenance, and information training. At present, the funding for logistics informatization of China University of Geosciences (Beijing) needs to be improved.

5) System construction and application

Logistics information systems can be divided into basic platform, business management system and service system according to use scenarios. Among them, the first is the business management system, including maintenance management system, energy management system, dormitory management system, financial management system, OA system, etc. The second is the service system, mainly including information portal, catering service, accommodation service, etc. The third is the basic platform, and the more mature applications are identity authentication and payment platforms.

3. Problems in the Logistics Informatization Construction in Colleges and Universities

With the continuous attention and investment of the state in education informatization, the problems faced by university logistics are more about how to carry out the informatization construction scientifically and sustainably, and how to ensure that the construction results can truly meet the needs of teachers and students. After investigation, there are mainly the following problems in the logistics information construction of many domestic universities [1] [2] [3] [4].

1) Insufficient top-level planning and design

There is a lack of systematic, forward-looking and continuous top-level planning and design. The information development of each department within the logistics is uneven. The information systems with urgent needs are rushed online, and the established information systems are also independent and lack of information sharing.

2) Lack of collaborative linkage with the overall informatization construction of digital campus

Logistics informatization has its own system, but it is still part of the smart campus. It is necessary to make full use of the public information platform of digital campus, and consider the sharing, coordination and linkage with other information systems of other business departments in in Colleges and Universities.

3) The concept of information construction needs to be improved

Many colleges and universities build management information systems ac-

cording to the existing management systems and business processes of the school. Effective information construction is not to move the existing offline management processes to the online as they are, but to sort out, optimize and transform the existing management processes, so as to promote the standardization and scientific management with information. The logistics informatization should be oriented by the service demands of teachers and students, and aim to build a logistics information platform providing comprehensive services.

4) Lack of IT professionals

The lack of information professionals is a common problem faced by many university logistics departments in the information construction. In fact, the logistics informatization construction does not require the logistics department to establish an informatization professional team that integrates demand research, design, development, testing and operation and maintenance, which can be handed over to professional IT companies. What the logistics department needs is a key person who understands both logistics business and information technology, and is fully responsible for the logistics informatization construction.

5) Insufficient continuous investment and unscientific fund allocation

Lack of continuous investment is one of the key factors restricting the construction of logistics informatization. The author has consulted the literature related to the university logistics information work, and conducted research and exchange with more than a dozen university logistics departments, it is found that many universities have the following problems in capital investment in logistics information construction: firstly, the capital is mostly used for the purchase of hardware equipment, and a small part is used for the development of software systems; secondly, the fund was not focused on the key projects that directly serve teachers and students and can quickly reflect the achievements of logistics informatization, lacking highlights and visibility; thirdly, the capital investment ignores the upgrading and maintenance of existing projects.

6) Low utilization of some management information systems

Some colleges and universities have invested heavily in building information systems, but some information systems are not fully utilized or even idle, resulting in waste of resources. For example, some colleges and universities have developed online repair reporting systems. However, due to various reasons, some logistics staff cannot make good use of the information system, resulting in some repair reporting problems that have not been resolved and the repair reporting system has not played a full role.

4. Construction Scheme of University Intelligent Logistics Service Platform

4.1. Business Related to University Logistics

Taking China University of Geosciences (Beijing) as an example, as shown in Figure 1, university logistics business mainly includes catering services, apartment and dormitory management, classroom management, water and electricity

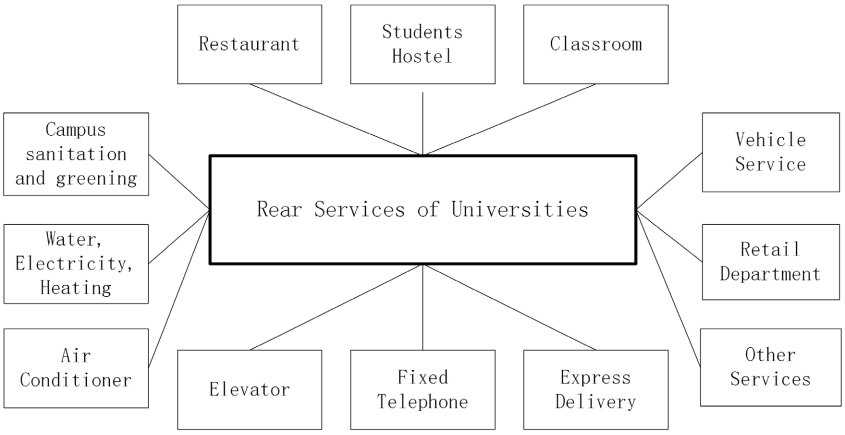

Figure 1. Business related to university logistics.

supply, campus sanitation and greening, air conditioning maintenance, elevator maintenance, fixed telephone access and telephone billing, mail receiving and sending service, express delivery service, vehicle service, commodity retail service, etc.

The overall situation of logistics informatization of China University of Geosciences (Beijing) is as follows. Campus card System has been built for canteen consumption, which supports various ways of card swiping, code scanning and face recognition. Recharging, loss reporting and other businesses can also be operated through the mobile terminal. The student apartment management system has been built, which can realize the management of student dormitories, application and exchange of student dormitories. Water, electricity, heating, air conditioning, elevators and other problems can be reported through the online repair system and you can get a reply of the problems. Some smart classrooms have been built to support multimedia teaching and online and offline hybrid teaching. You can apply for vehicle use through the vehicle operation management system on the mobile. Teachers and students can find their own letters and package information by using the electronic mail room, which is convenient to arrange time to get them in the mail room.

In general, catering, dormitory and other major businesses have achieved basic information management. But the problem is also obvious. First, the information systems are independent of each other, lacking information sharing, and not connected with the digital campus public data center. The basic information of teachers and students needs to be maintained repeatedly in multiple systems. Second, the online repair system is only applicable to the personal computer terminal and does not support the mobile terminal. Third, logistics informatization has not been integrated with digital campus and has not made full use of the functions and resources of digital campus public information platform. The fourth is the lack of data mining and statistical analysis of business data, and the lack of intelligent decision support for logistics business. Fifth, there is a lack of information platform for service supervision and evaluation system.

4.2. Construction Principles of Intelligent Logistics Information Service Platform

1) Overall planning and step-by-step implementation

Formulate a plan for about 5 years, take the plan as guidance, consider the actual situation, and implement it step by step. The planning of logistics information construction should be integrated into the overall planning of smart campus, and the design of logistics information system should comply with the unified standards of the school.

2) Application oriented and data driven

Build applications based on the needs of teachers and students, and use big data technology to provide users with decision support and intelligent services.

3) Focus on integration and experience first

All information systems within the logistics department should be interconnected, and the information should also be shared with other business departments in colleges and universities. The use experience of teachers and students should be taken as an important evaluation indicator, and the mobile service experience should be fully considered.

4) Safe, reliable and moderately advanced

The logistics information service platform needs to be integrated into the overall security guarantee system of the digital campus and comply with relevant security operation specifications. Balance the progressiveness and practicability of technology, so that the system has good scalability and flexibility, to ensure that the technology platform can adapt to changes in business requirements.

5) Make full use of the old

Evaluate the existing information systems, consider rebuilding the old application systems that are not running smoothly, and integrate the well running systems into the logistics intelligent service platform.

4.3. Construction Scheme of Intelligent Logistics Information Service Platform

As shown in Figure 2, the logistics intelligent information service platform is divided into four layers: application foundation layer, business service layer, access control layer, and front-end presentation layer.

The existing management information systems and common business platform constitute the application foundation layer, and they complement each other. The vehicle management and service system, students' apartments management system, online ordering system, online repair system and other existing well running systems need to consider the integration with the public data platform to achieve data sharing with other information systems in the digital campus. The common business platform is a low-code public information platform, and its core business components are the process editor and form editor. For most filling and approval businesses, visual customization of business processes and page forms can quickly move the businesses from offline to online without

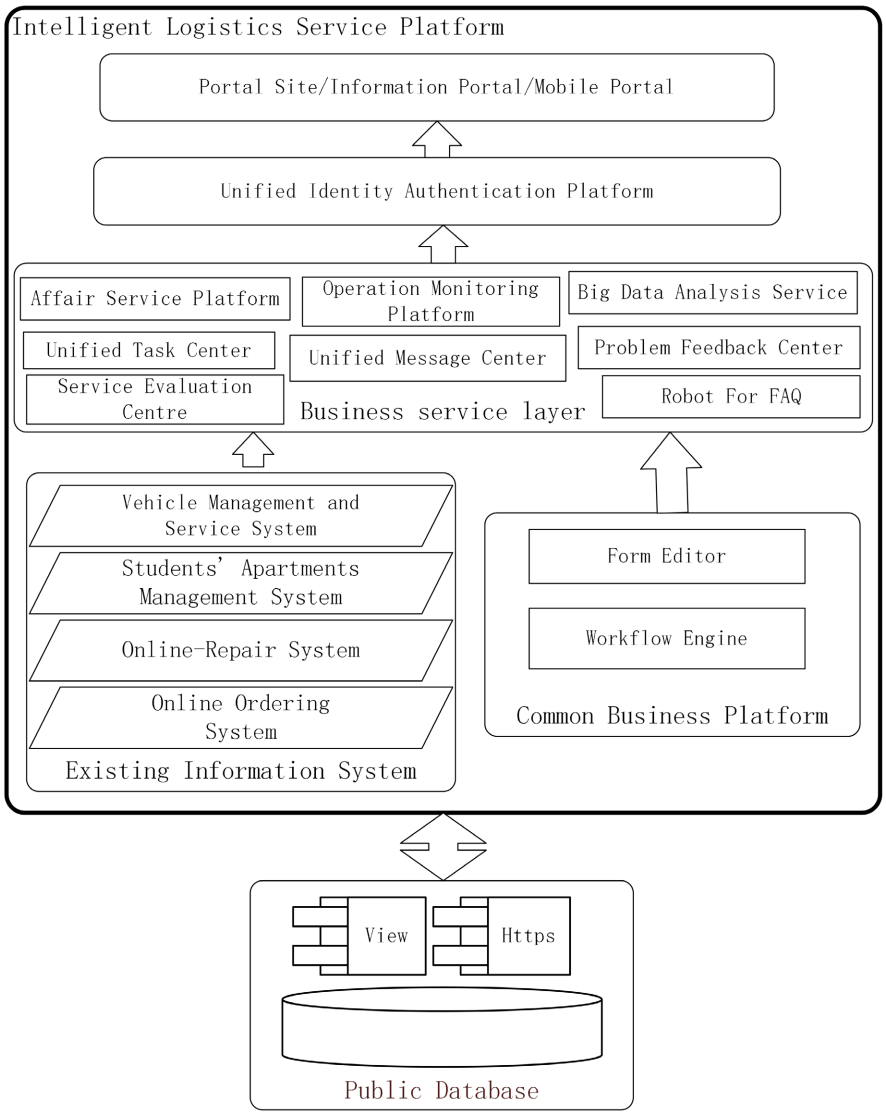

Figure 2. Scheme of intelligent logistics information service platform.

development work. For example, we can quickly build the infrastructure maintenance process, procurement and reimbursement process, facility and equipment inspection process, on duty process and excellent staff selection process into the common business platform [5].

The business service layer includes the following components:

1) Affair Service Platform

The affair service platform integrates the information systems and the service items customized through the general business platform into the service platform by category, which is convenient for teachers and students to handle affairs online.

2) Operation Monitoring Platform

The operation monitoring platform is mainly used by logistics leaders and managers to display the number of people involved in various service items, the

number of people, the number of applications, the number of completed items, the completion rate, the average service time of each service item, etc.

3) Big Data Analysis Service

After a long period of operation, a large amount of business data has been accumulated, which can be used for multi-dimensional statistical analysis to provide data support for logistics leadership to make intelligent decisions [6]. For example, the change of logistics personnel, the distribution of students' meal time and consumption quota, the distribution of students' accommodation, the early departure and late return of students, the use and maintenance of vehicles and equipment are output in the form of visual charts. Using the statistical results of the distribution of students' dining time, we can guide students to have meals in different peaks, or we can arrange enough food and logistics support staff during the peak dining hours. We can also compare the student's consumption quota with the student's application for hardship allowance, so as to judge the real economic situation of the student.

4) Unified Task Center

Integrate my pending work in information systems and common business platforms into the unified task center according to different categories such as to-do items, notification items and filling items, so as to facilitate work processing.

5) Unified Message Center

All message alerts are integrated in the unified message center. Messages are associated with tasks, and you can enter tasks directly from messages.

6) Problem Feedback Center

Classify all logistics business problems and designate the person in charge of all kinds of problems. The problem feedback center is open to all teachers and students of the school. The problems fed back by teachers and students are transferred to the corresponding person in charge of the problem. The logistics leaders can master all feedback problems and their responses.

7) Service Evaluation Center

Based on the goal of improving service quality, comprehensively summarize the management and service of logistics for teachers and students, determine the elements and indicators for teachers and students to evaluate logistics management services, and form a logistics service evaluation system. Teachers and students can conduct online evaluation once a semester, or conduct online service evaluation at any time according to service experience.

8) Robot for FAQ

List the common questions, form an intelligent question answering database, and the intelligent service assistant will answer the common questions of teachers and students online.

The unified identity authentication platform constitutes the access control layer.

Portal site, information portal and mobile portal constitute the front-end presentation layer.

4.4. Personnel Organization Guarantee

We should improve the logistics informatization construction personnel support system. As the person in charge of information construction, the leader of the logistics department shall coordinate the overall planning of the logistics information construction, capital investment and the coordination with other departments. At least one full-time informatization professional shall be arranged to be specifically responsible for the organization, implementation, daily coordination. It is recommended to choose the professional IT companies for the specific work such as development, operation and maintenance.

5. Conclusions

The university logistics information service platform aims to improve the refined management level and improve the service quality of teachers and students. It integrates the existing logistics information systems with the public information platforms of digital campus such as public data platform, common business platform, unified identity authentication platform, unified message center, unified task center. At the same time, according to the characteristics of service-oriented logistics business, it sets up components such as problem feedback center, operation monitoring platform, big data analysis service and service evaluation center. On the one hand, it provides teachers and students with intelligent and convenient life information services as much as possible. On the other hand, it can grasp the overall operation of the current services and the evaluation feedback of teachers and students, which is conducive to the logistics department to continuously adjust and improve the management service system, forming a virtuous upward cycle.

With the development of information technology, the Internet of Things, big data and digital twins will be the future development direction of smart logistics in colleges and universities. More information technology applications in the logistics field will bring new experiences to teachers and students, and new ideas to logistics management service staff.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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