The Functional Design of Self – service Dressing System on White garment

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Abstract: *This paper explores the types and quantity requirements of white garment needed in hospital reality, and not only carries out a modular analysis on its release and recycle control but also elaborates the function module about the self-service dressing system of white garment.*

Key Words: *white garment; self-service; system; research and development*

The self-service dressing system of white garment is designed to achieve self-service releasing and recycling control of the white garment and visualize its data. Overwhelmingly similar, other information systems, the self-service dressing system of white garment which provides real-time efficient serial communication with an external device have a powerful server for centralized scheduling and computing, to realize the releasing and recycling automated management of the white garment. The system has set aside the human race for the hospital, reduced the time cost of the doctors and nurses, and played a crucial role in promoting to form the self-service scale.

1. Research Status at Home and Abroad

At present, there are an army of communities in the community around the nature of the package from the mention of service points, such as Nanjing cloud cabinet and magic grid, Shanghai box treasure and so on [1]. With the further development of information technology in China's medical industry, the information systems established in hospitals have been continuously refined. The advanced automation equipment which makes the medical practice more efficient and standardized has been more combined with the mature hospital information system[2]. In order to address the problem of patient goods nowhere to be stored, inspired by the supermarket lockers, intelligent lockers which have anti-theft function have placed in Maternal and Child Health Hospital outpatient infusion room, Ezhou City, Hubei Province. Besides outpatient infusion room, pharmacy is also the focus of the development of automated mode. The construction of hospital automation pharmacy is mainly to transform the distribution mode of drug hand transfer, improve the speed and quality of the pendulum, give full play to the function of HIS and realize the informationization and automation of hospital drug dispensing [3].

Foreign also put an army of energy into the development of automation. The Deutsche Post DHL, the US Amazon and BufferBox which Google launched in San Francisco all has achieved self-pickup function[4-6]. The automatic dispensing system in the Grenoble hospital pharmacy in France guarantees the correct rate of medication and avoids the adverse events of intravenous injection due to drug errors[7,8].

The self-service mode is widely used in the logistics, banking, supermarkets and food distribution at home and abroad, and the hospital's self-service system is more used in pharmacy and outpatient infusion.

2. Analysis of R & D Motivation

As early as 2008, some people conducted a survey analysis on the French university hospital medical staff, the survey results show that, [9]most of the physicians (83%) declared they had used their coats for too long because of a low coat turnover, an insufficient number of coats per batch, poor accessibility to the storage area and the inconvenience of each change; regarding the duration of use they would recommend of the physicians answered 7 days or less; 63% of them wished to change their white garment daily if a sufficient number of coats were available.

According to the statistical analysis of the National Health and Health Health Research and Development Center, the quantity of registered nurses had reached 3.241 million in 2015, and the number of practitioners (assistants) reached 3.039 million. White garments must always be replaced to guarantee the neatly which resulted in the heavy white garment workload in the hospital. Under the distribution mode manually, the issuer can't be informed of the doctor's and nurse's state of return; can't find out the current number of unreturned white

garment and nurse uniform; can't guarantee the integrity and consistency of the data; can't check the number of past recipients and getting time at any time; can't know clearly the current number of white garment; can't be scientific and informatization management. The limitations of manual operation, have brought broad prospects for the development of large-scale self-service clothing system. Therefore, a comprehensive white garment self-service dressing system required establishing to provide the information service nearest for doctors and nurses. Self-service dressing system applications can effectively reduce the "non-medical" time consumption and waste of human race.

3. Requirement analysis

According to the results of the survey and the communication with health care workers and interns in the First Affiliated Hospital of Wenzhou Medical University, the following requirements are obtained.

1. How doctors, nurses and interns get white garment nearly?

2. How to minimize the loss of white garment and nurse clothes?

3. How do I check the current number of white garments?

4. How do I check the usage of the white garment?

5. How to get the white garment, nurse clothes object clearly?

6. How to allocate out-wardrobe and recycling-wardrobe reasonably?

According to requirement analysis, the entire system which is divided into four types of users including doctors, nurses, interns and administrators and allocated into user, administrator, out- wardrobe management module, recycling-wardrobe management module, out-wardrobe map and statistical analysis module and other basic modules has been thoroughly designed.
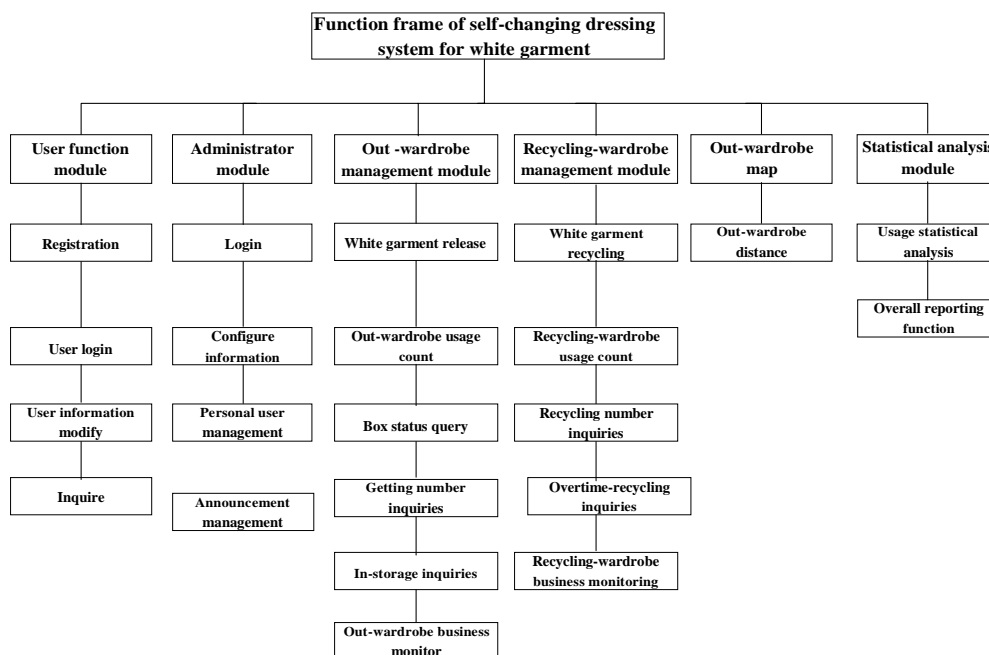

Figure 1 System function frame diagram

4. Functional module design

□ **User function module**

➢ **Registration:** First of all, the user need to register before use the resources the system provided.

➢ **User login:** Hospital legitimate users (doctors, nurses and interns) can log on by credit card; when forgot to bring credit

card, you can log on through entering the password; when the password is forgotten, you can also enter your phone verification code via SMS prompt

➤ **User information modification:** When the personal information transforms, you can use the information modification function to update or to modify your personal information and password and so on.

➤ **Inquire:** After log on the system, you can inquire about the records of getting and recycling the white garment, personal information and so on.

☐ **Administrator module**

➤ **Login:** After the user logs on the system, the system will automatically identify whether the target user is an administrator.

➤ **Configure information:** Configure the information mostly about the out-wardrobe, recycling- wardrobe and white garment.

➤ **Personal user management:** Mainly contains the individual management, including the modifying and viewing of user profile, querying the user's white coat and return status.

➤ **Announcement management:** This function achieves that the administrator can publish the announcement information pushed to the system terminal through this system, informing the urgency of the news or the role of daily notice ultimately.

☐ **Out -wardrobe management module**

➤ **White garment release:** Judge whether the out-wardrobe has a type of clothing according to the user login information; if not, the system will inform users of getting clothes nearby according to the prompts.

➤ **Out-wardrobe usage count:** Query the out-wardrobe which can be used most frequently according to the usage count.

➤ **Box status query:** Query whether there are clothes inside the box.

➤ **Getting number inquiries:** Perform the quantitative statistical analysis on getting clothes about the single out-wardrobe.

➤ **In-storage inquiries:** Perform the in-storage statistical analysis about the single out-wardrobe.

➤ **Out-wardrobe business monitoring:** The specific rules can be configured according to the system and user needs. To name only a few, provided that the usage rate of this out-wardrobe can be more than 90%, otherwise, the remaining inventory is

insufficient, then the appropriate administrator will be reminded. In addition, the state of the out-wardrobe can also be monitored
and the administrator will be informed when the out-wardrobe or pane status is abnormal.

☐ **Recycling-wardrobe management module**

➤ **White garment recycling:** Determine whether recycling is full; if not, the recycling-wardrobe will be opened.

➤ **Recycling-wardrobe usage count:** Perform the statistical analysis of white garment recycling about the single recycling-wardrobe.

➤ **Recycling number inquiries:** To prevent that there is too much clothing in the recycling- wardrobe, it will show that the clothes inside are full when the quantity of recycling exceeds the limitation.

➤ **Overtime-recycling inquiries:** Perform the quantitative statistical analysis on overtime recycling clothes about the single recycling-wardrobe.

➤ **Recycling-wardrobe business monitoring:** High load recycling-wardrobe warning, that is, the recycling-wardrobe monitoring business function will inform the administrator.

☐ **Out-wardrobe map**

➤ **Out-wardrobe distance:** It will show that the nearest out-wardrobe which has the clothes matching when its clothes can't match the user type.

☐ **Statistical analysis module**

➤ **Usage statistical analysis:** Include the usage analysis, using percentage analysis, vacancy rate analysis about out-wardrobe and recycling-wardrobe.

➤ **Overall reporting function:** Include the user information summary report, out-wardrobe summary report, recycling-wardrobe summary report, in-storage summary report, out-storage summary report, overtime-recycling summary report.

5. Conclusion

The self-service dressing system of white garment is an application system designed for self- help getting and recycling of white garments and other suits. The system can monitor the in-storage of white garments and nurses uniform real-time, and record the status of their getting and recycling real-time. The system administrator can analyze the usage of the out-wardrobe and the recycling- wardrobe, making

the distribution of the out-wardrobe and the recycling-wardrobe more reasonable. According to the characteristics of the various departments, different out-wardrobe and recycling- wardrobe (large, medium and small Specifications of the ratio) can be customized so that the management can be more scientific. The system can make a real-time adjustment according to the situation of the clothes in the out-wardrobe, and inform the user of the nearest out-wardrobe.

The transformation from the old management manual model to the new information-based management model intelligently direction can be realized by the self-service dressing system of white garment which follows the information, scientific and intelligent management model. The system can not only further improve the hospital's management level and reduce waste of the human race, but also meet the needs of the development of the times.

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