

Hospital Online Reservation and Combination with Credit Card

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1. Introduction & Background

Medical service process plays an important role in our daily life. Many people have the experience of seeing a doctor. However, we usually spend much time finishing the whole medical service process. It takes us long time to wait during the medical service process, from the process of walk-in-registration, make-a-diagnosis, pay-money to the process of pick-up-medicine. Besides, there will be more and more people go to the hospital because of aging society.

As a result, it is important to improve the medical service process of hospital. We try to reduce the time patients spend on the whole medical service process, and also raise the profit to the hospital. Therefore, we use INCOME to simulate our new idea and compare to the old one. We also build a website that patients can make an appointment online, so they can save the waste time compared to the on-site registration. And we will give the patients coupon if they make an appointment online for promoting. Besides, they can choose to pay by credit card, so they don't need to waste time paying money to counter staff.

2. Behavior Model

2.1 AS-IS Behavior Model

When the patient goes to the hospital, he should go to the counter first and have a walk-in registration, and he will receive an appointment number. After that, the doctor will make a diagnosis and the patient will get a prescription. Then the patient lines up paying money to the counter staff and receives the proof of payment. Finally, he picks up his medicine at the pharmacy.

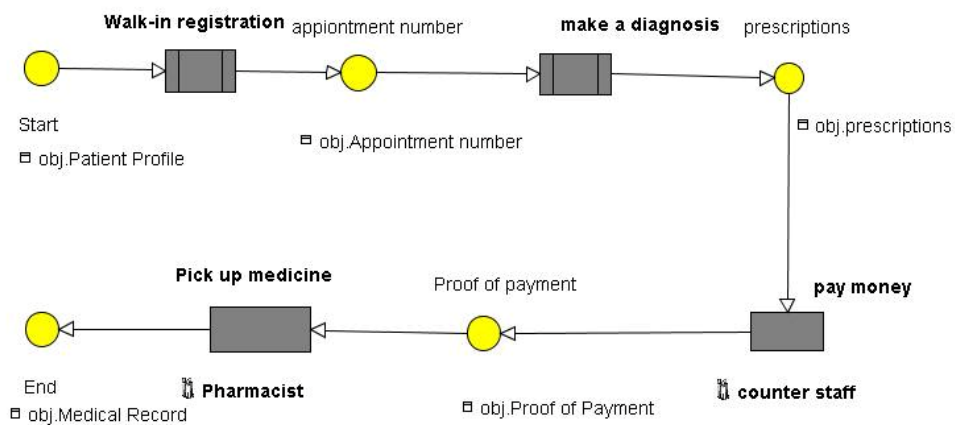


Fig.1 The first layer of the As-Is Model

When the patient goes to the hospital, he should go to pick up a number first and then check IC card at the counter, after the counter staff makes sure that the information is correct, the patient will get the appointment number.

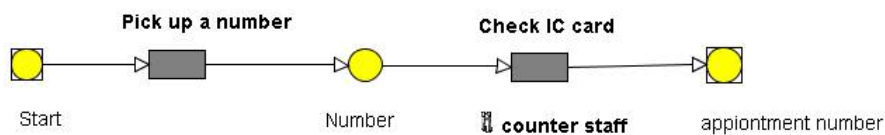


Fig.2 Drill down of Walk-in registration

2.2 TO-BE Behavior Model

To decrease the time patients wait for the walk-in registration process, our method is to set up a new alternative, online reservation. When the patients go to see a doctor, they can register in advance on the internet, so they don't need to wait during registration. Second, we design a new way to pay money. If patients register online, they can choose to pay by credit card, so they don't need to waste time paying money to counter staff.

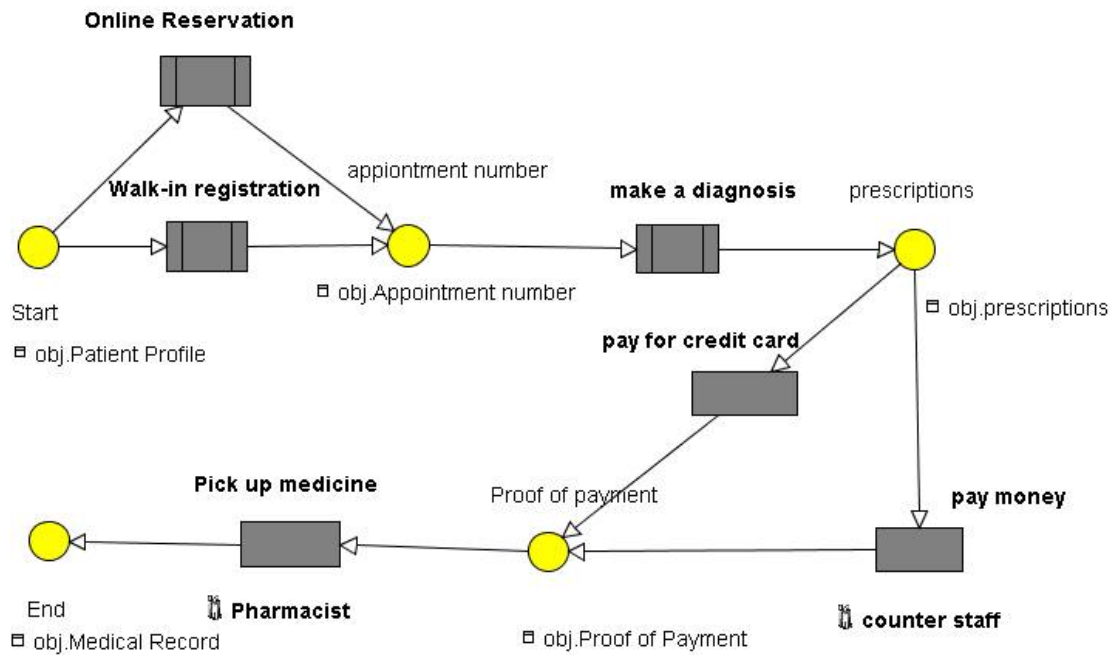


Fig.3 The first layer of the To-Be Model

When patients choose online reservation, they need to key in and submit data. Then they will get a reservation form and a coupon QR code. Finally they will receive a appoint number.

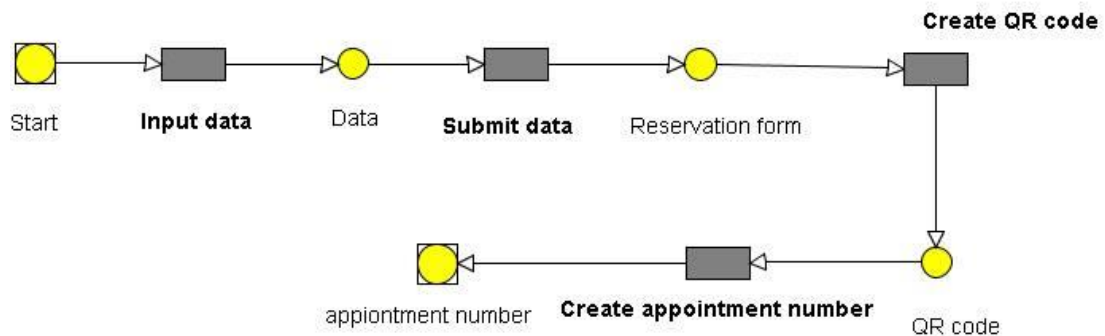


Fig.4. Drill down of online reservation

3. Performance Comparison

We add a new process that patients can register online, such that the hospital can save 43% registration time (from 120 mins to 68 mins) and 39% registration cost (from 100 to 61). We also add an alternative that patients can pay medical expenses by credit card and it will make the hospital saving 40% paying time (from 100 mins to 60.133mins) and 32% paying cost (from 100 to 68). Through these two new processes, the hospital can totally save 11.48% service time (from 800 mins to 708.133 mins) and 9.2% execution cost (from 770 to 699).

According to the results show below, the revenue doesn't increase but we successfully reduce the process time and the cost. It means we simultaneously enhance the service quality and the profit.

In the future, we hope all of patients can use online reservation and paying by credit card, because it can make the hospital operate more efficiency and patients also needn't to wait for a long time.

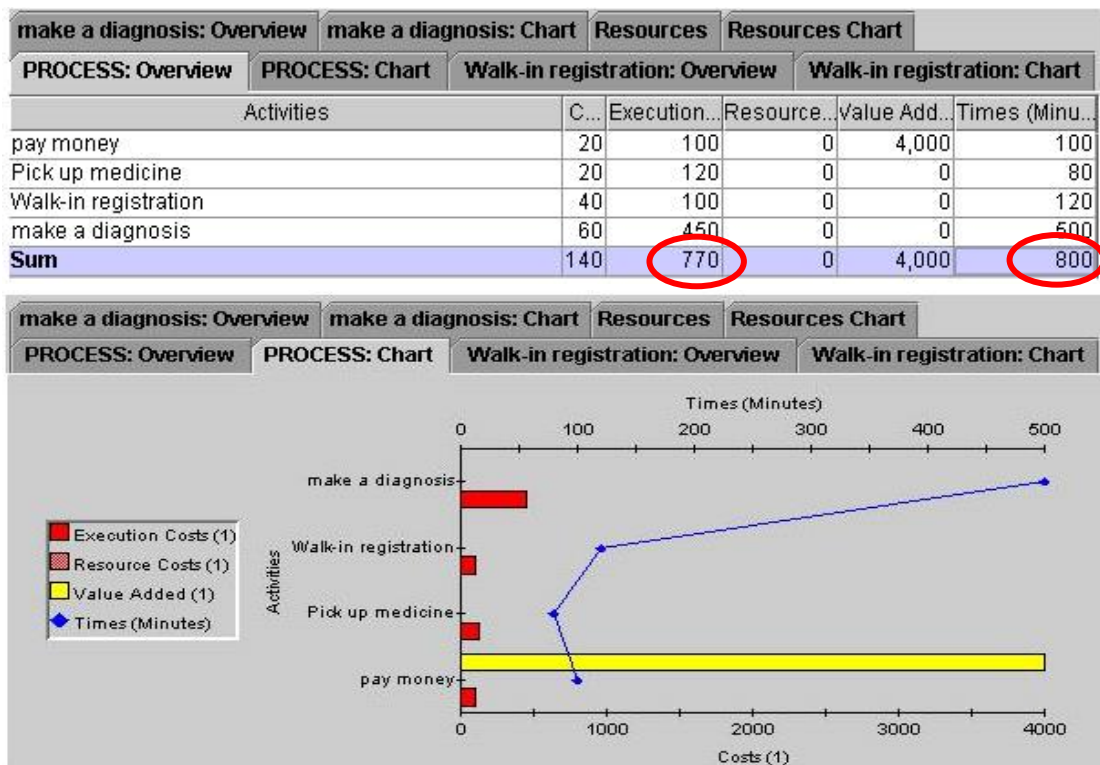


Fig.7 The result of the As-Is Model

make a diagnosis: Chart		Resources	Resources Chart			
Walk-in registration: Chart			make a diagnosis: Overview			
NEWPROCESS: Overview		NEWPROCESS: Chart		Walk-in registration: Overview		
Activities	C...	Execution...	Resource...	Value Add...	Times (Minu...	
pay money	12	60	0	2,400	60	
Pick up medicine	20	120	0	0	80	
Online Reservation	13	26	0	0	26	
pay for credit card	8	8	0	1,600	0.133	
Walk-in registration	14	35	0	0	42	
make a diagnosis	60	150	0	0	600	
Sum	127	699	0	4,000	708.133	

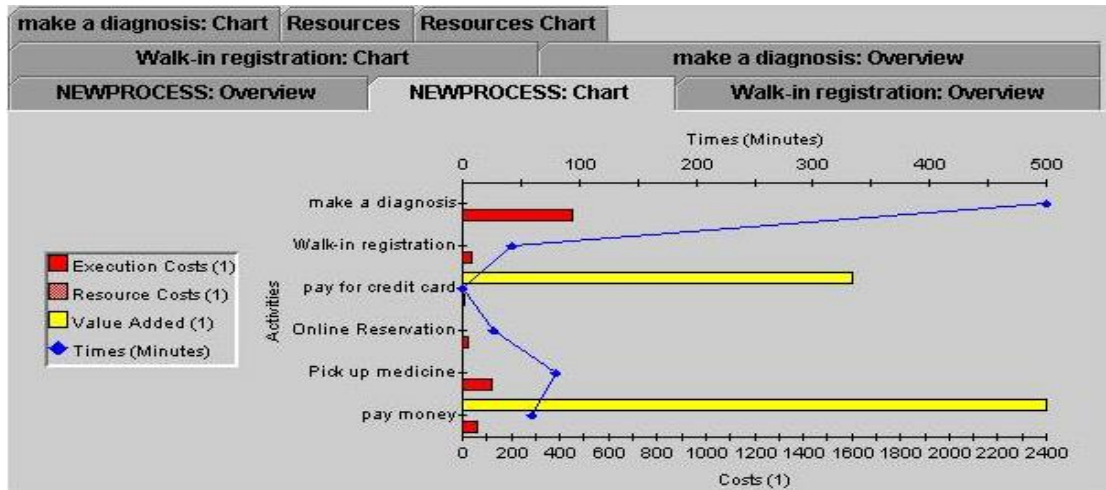


Fig.8 The result of the To-Be Model

4. Website Description

4.1 Online Reservation Process (include pay by credit card)

The hospital website has five main pages, Home, Introduction, Member, Appointment, and Login page. In our home page, we have promotion: if you use appointment online, you will get a QR cord as a coupon for discounting \$50. You can use it in our restaurant. In the Introduction page, we elaborate our mission, philosophy, vision, and core values. In the member page, it links to three pages, doctor, nurse and administrative staff page. And in these three pages, we respectively introduce the doctor, nurse, and administrative staff's profile, which includes ID, name, age, gender and service time. In the appointment page, the patient, that is the customer, can make an appointment through filling the appointment form, and it can reduce the waste time of waiting for seeing a doctor. The patient has to input his ID or passport number, name, age, date, and choose one doctor and time which has been set already. Any space is not allowed for submitting the form. And in every page, it can link to the home page through pressing the home button.

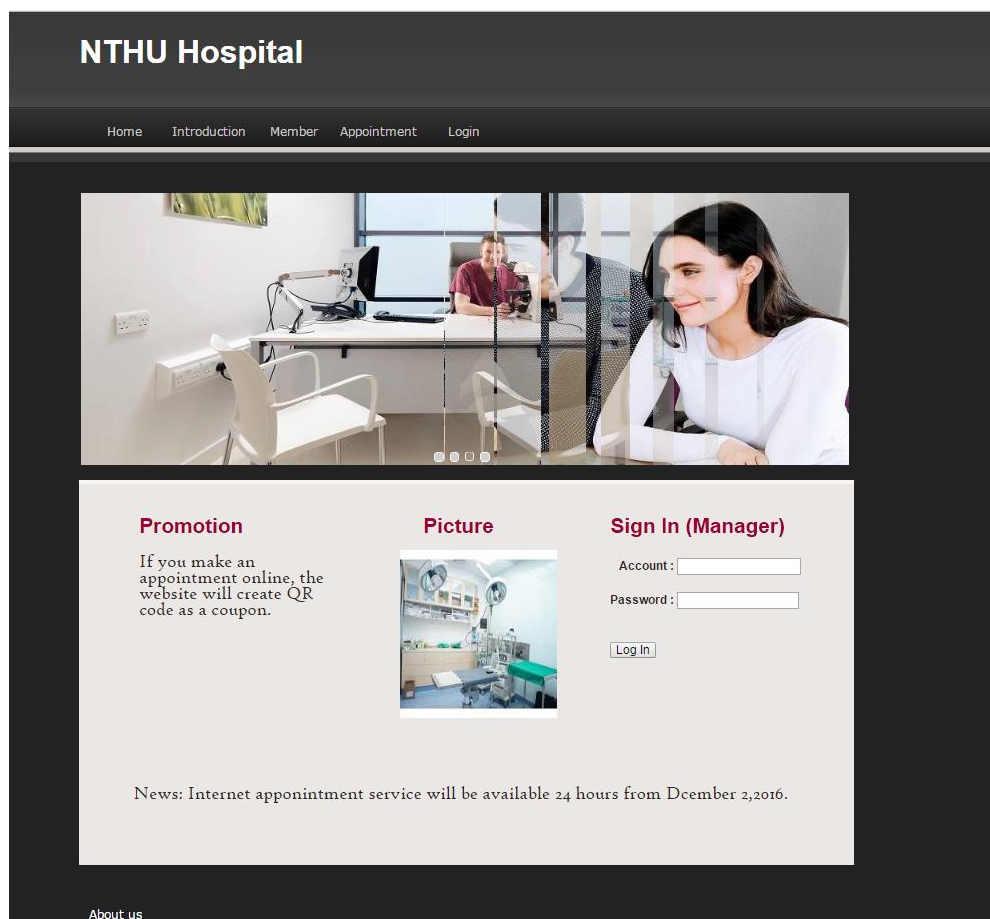


Fig.9. The Website: Home Page

Appointment

Home Introduction Member Appointment Login

Appointment

ID or Password

Name

Age

Doctor

Date 1:30~5:30 P.M.

Credit Card(optional)

About us

NTHU hospital

Address : No.101, Sec. 2, Guangfu Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)

Contact Phone : (03)5715131

Fig.10. The Website: Appointment Page

4.2 Promotion

After the patient did the online reservation, the website will emerge a QR cord as a coupon for discounting \$50. The QR cord will be valid after the patient pays the money, and the patient should show the QR cord to the staff in the restaurant to discount.

Appointment

Home Introduction Member Appointment Login

Appointment Success!!

ID	Name	Doctor	Age	Year	Month	Date	Time	appointmenttime	credit_card
105034542	mav	ChiuMing-Chuan	23	2016	4	1	9:00~12:00 A.M.	22:09:20.8942687	123456789111

Thanks for making an appointment online, and we give you coupon \$50 as a promotion. You can use it in our restaurant.
Have a nice day!

Coupon \$50




Fig.11. The Website: QR cord shown when appointment is successful.

4.3 Connection to Database

When the patient uses online registration, he inputs his ID or passport number, name, age, and chooses a doctor and the time that he is available. As he clicks the submit button, the data is inserted to the table, “Appointment”, which tells the information of patient’s appointment. He will see the newest appointment in the page after he makes an appointment successfully. However, sometimes, people want to cancel the appointment. Then, he can link to Login page, and input his ID or passport number, and password. As he logs in, the page shows the information of the appointment, which connects to database, and he can delete the appointment in the page.

In the database, we have the table, “DoctorProfile_”, which tells the information of the doctor, includes doctor’s id, name, gender, age, and service time. We have the table, “NurseProfile”, including nurses’ id, name, gender, and age. Besides, “AdministrationStaffProfile”, including administration staffs’ id, name, gender, and age. The manager can login in home page and update the information of doctors, nurses, and administration staffs. As the data is changed, which connects to the database, the information of the doctor, nurses, and administration staffs people see in the member pages is also changed. The doctor’s service time in appointment people see is updated, too.

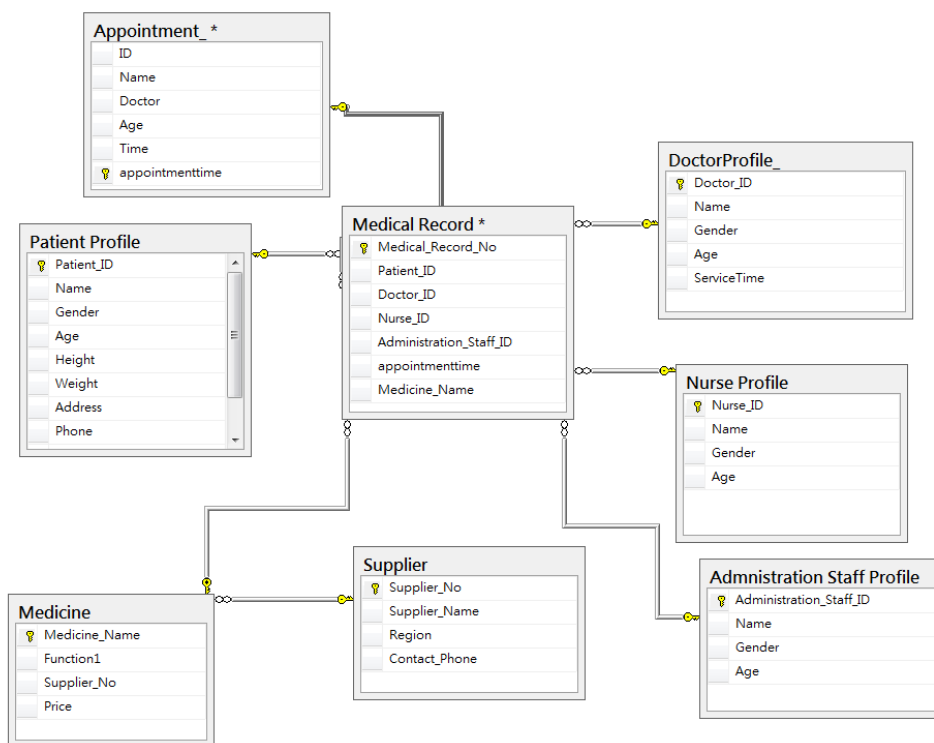


Fig.12. Database: Hospital.

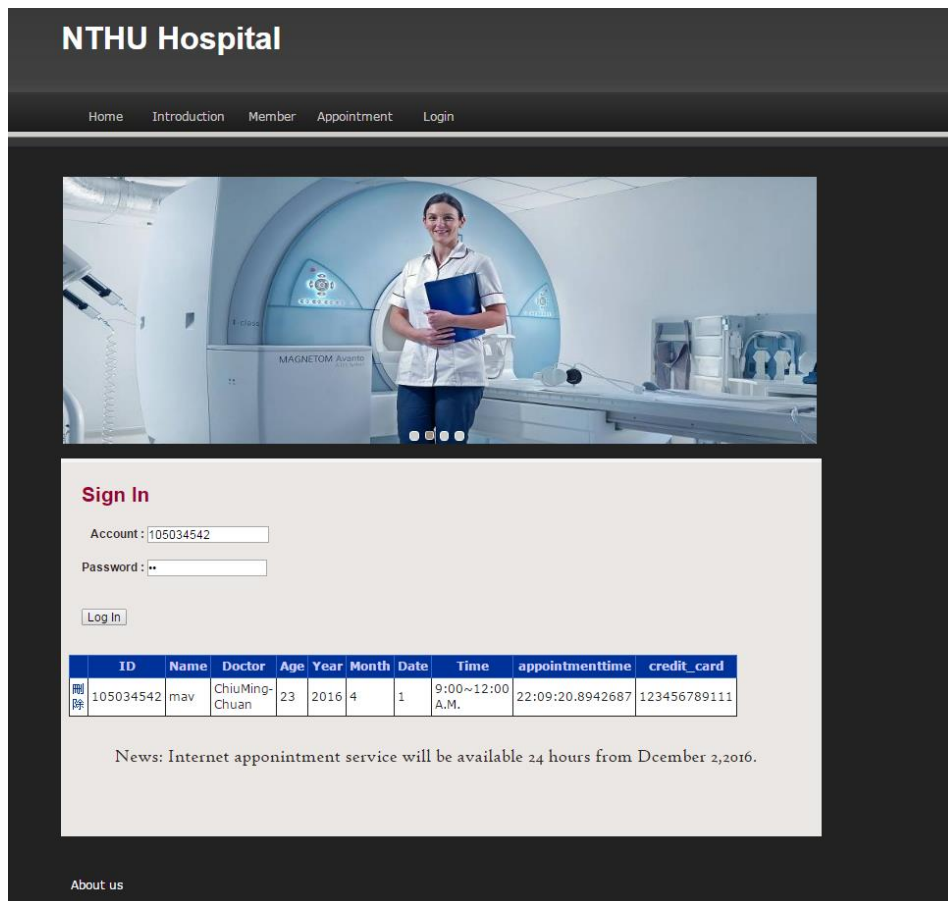


Fig.13. The Website: patient can delete the appointment.

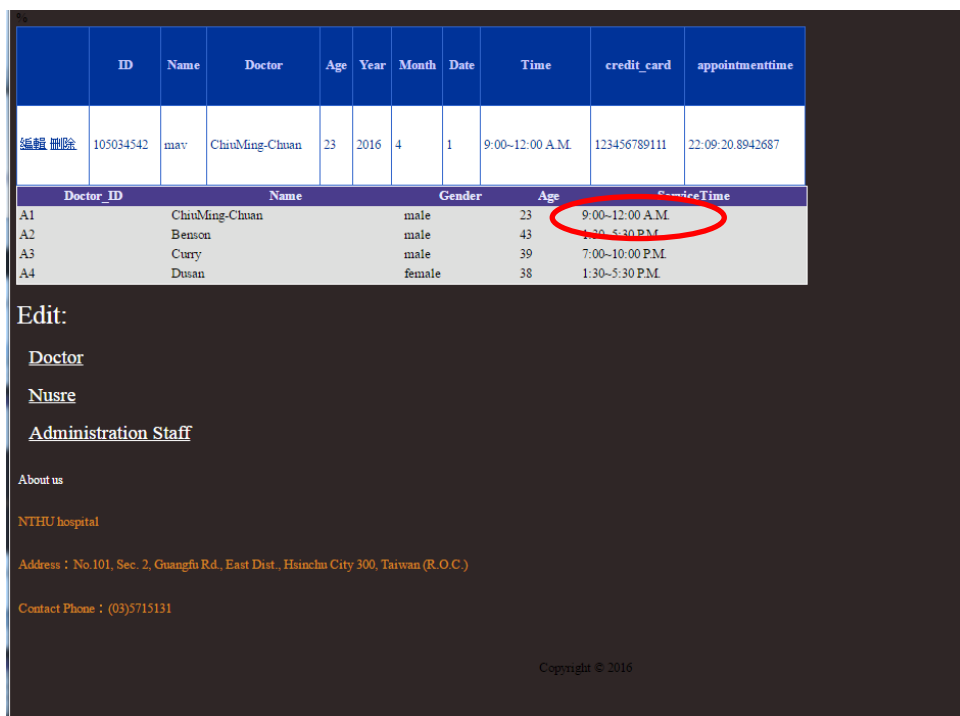


Fig.14. table " DoctorProfile_ " before change

	ID	Name	Doctor	Age	Year	Month	Date	Time	credit_card	appointmenttime
編輯 刪除	105034542	mav	ChiuMing-Chuan	23	2016	4	1	9:00~12:00 A.M.	123456789111	22:09:20.8942687

Doctor_ID	Name	Gender	Age	ServiceTime
A1	ChiuMing-Chuan	male	23	9:00~13:00 A.M.
A2	Benson	male	43	1:30~5:30 P.M.
A3	Curry	male	39	7:00~10:00 P.M.
A4	Dusan	female	38	1:30~5:30 P.M.

Edit:

[Doctor](#)

[Nusre](#)

[Administration Staff](#)

About us

NTHU hospital

Address : No.101, Sec. 2, Guangfu Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)

Contact Phone : (03)5715131

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Fig.15. table " DoctorProfile_" after change

Appointment

[Home](#)
[Introduction](#)
[Member](#)
[Appointment](#)
[Login](#)

Appointment

ID or Password

Name

Age

Doctor

Date

Credit Card(optional)

Fig.16. table " DoctorProfile_" after change in appointment page

5. Conclusion

We refine the process of medical service of hospital to make people can be served as soon as possible. We have promotion to encourage all of patients can use online reservation and paying by credit card. By the refined process and promotion, patient's waiting time becomes shorter, the satisfaction of patient is increasing, and the hospital can operate more efficiency.