Appointment, diagnosis and invoicing system for individual clinics

https://uts74-dev-ed.develop.my.salesforce.com/setup/forcecomHomepage.apexp?setupid=ForceCom

Username: zheng.wangforsalesf@gmail.com

Password: 2677260Sm$$

Abstract

This project plans to design an application on force.com for individual clinics for a group that operates several small clinics. This small system consists of three modules: appointment, diagnosis and billing. Each module is implemented by 1-2 objects, including patient information, appointments, diagnosis, referrals, invoices and discount approvals. This small system implementation demonstrated that the benefits of PAAS in practice include low cost (no system development and hardware deployment required), usability and scalability (new modules can be added at any time to meet demand).

1 Introduction

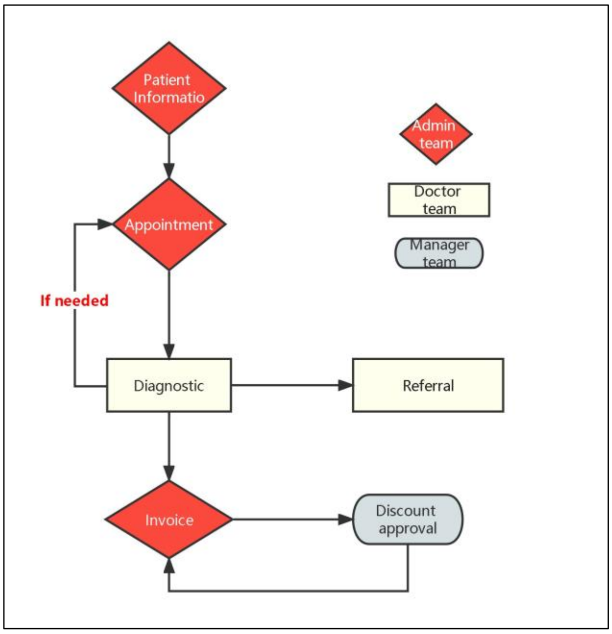
Clinic A is a small clinic in Sydney operated by a large clinic operating group. The clinic mainly provides GP consultation, treatment, and referral services. The business process involves the patient registering and entering their personal details, booking an appointment, and making a diagnosis or referral with doctors. At the end of the consultation, an invoice is issued to the patient, and a discount is given depending on the patient's circumstances. As it is one of the small clinics operated by the group, the clinic does not need to be equipped with finance and HR but is managed by the group. The clinic's daily staff (system users) are admins, doctors, and managers.

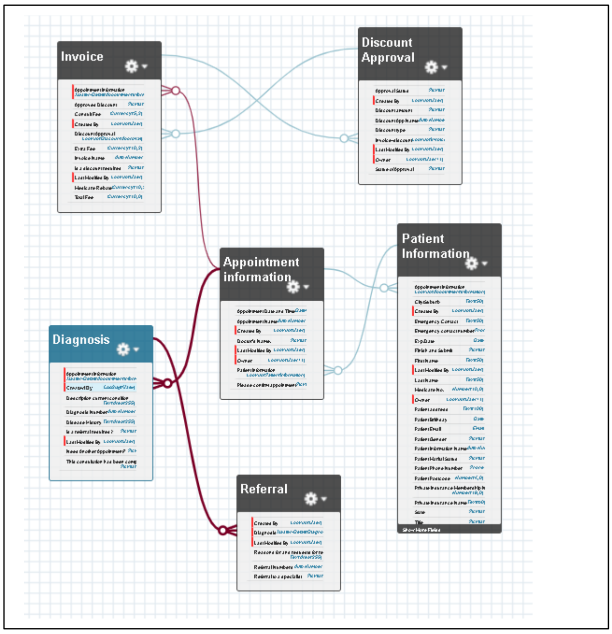
Admin is responsible for entering or assisting in entering patient information confirming and modifying appointments. At the end of the consultation, Admin issues invoices and applies discounts for patients.

Doctors provide consultation and diagnosis based on appointments and make referrals for patients who need them.

Duty Managers are the on-site managers of the clinic and are responsible for the day-to-day management of the clinic, reviewing information, and approving discounts.

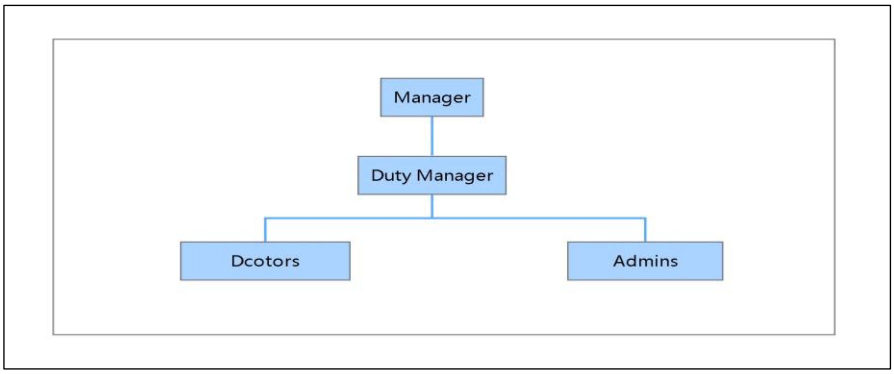
Managers are group administrators and are responsible for the management of several clinics. They have the highest authority over the clinics and are responsible for approving 100% discounts.





1.1 Dataflow

1.2 Schema

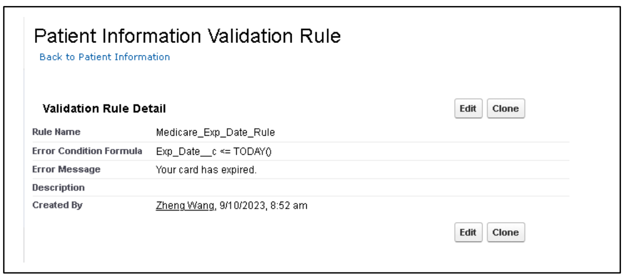


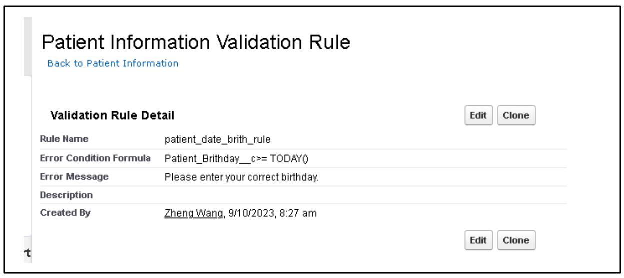
1.3 Clinic Organisation Structure

2 System Modelling Section:

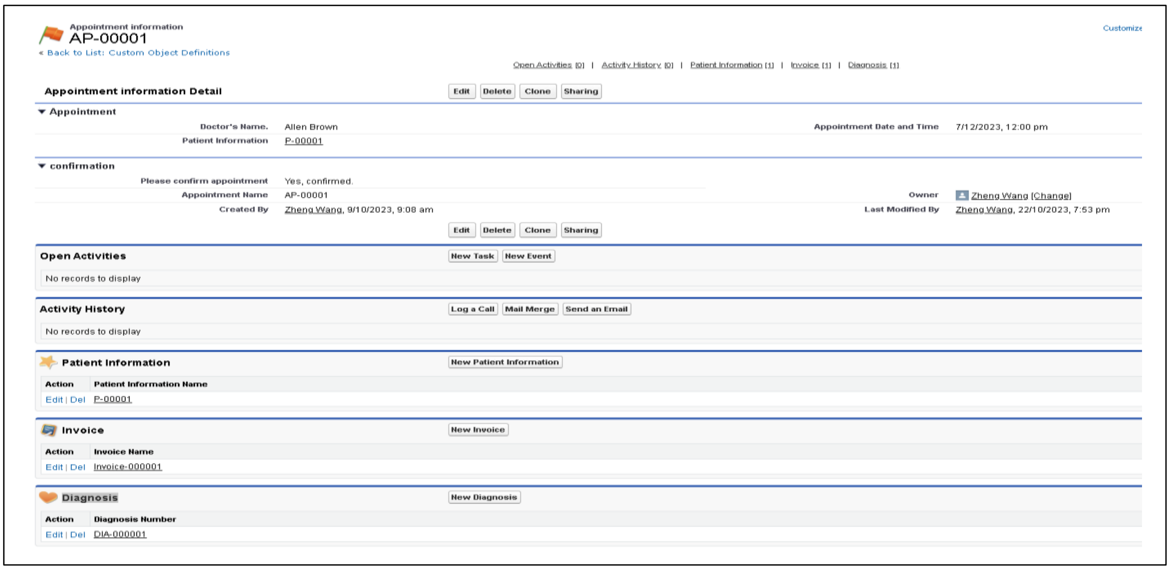
a) Data Model for the PaaS Application

The data model is relatively simple as this small practice only has GP consultation, diagnosis and referral services. As shown in Figure 1.2, the patient's personal information is entered into the system. Necessary information is collected to ensure future services. In the patient's personal information, the patient's birthday and medicare number are verified by setting validation rules to ensure the correct data. Patient information is connected to the appointment information through lookup-relationship. It allows the patient's appointment history to be looked up in the patient information.



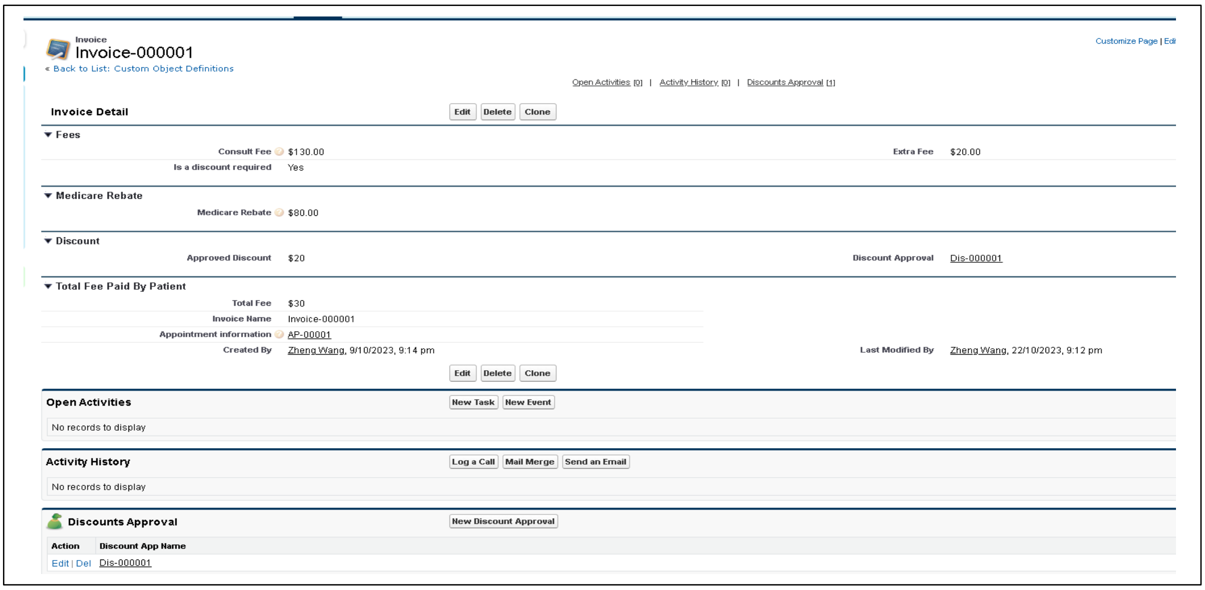


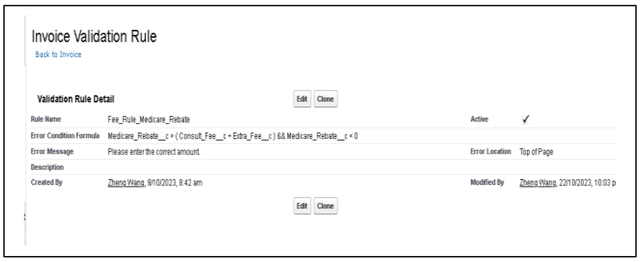
The Appointment Information module allows you to select a doctor and an appointment time and get patient information through lookup relationships. Finally, all information must be selected through a checklist to confirm the appointment. A validation rule verifies the appointment time, and the appointment time must be after the registration of the appointment. After completing all workflows, appointment Information displays completed invoice and diagnosis information through the Master-Detail Relationship.



The referral module will be accessed if a referral is required at the end of the GP consultation and diagnosis. The referral module requires the doctor to select a specialist and fill in the reason and referral request. In the referral module, all the information about the previous diagnosis can be reviewed directly through the Master-Detail relationship.

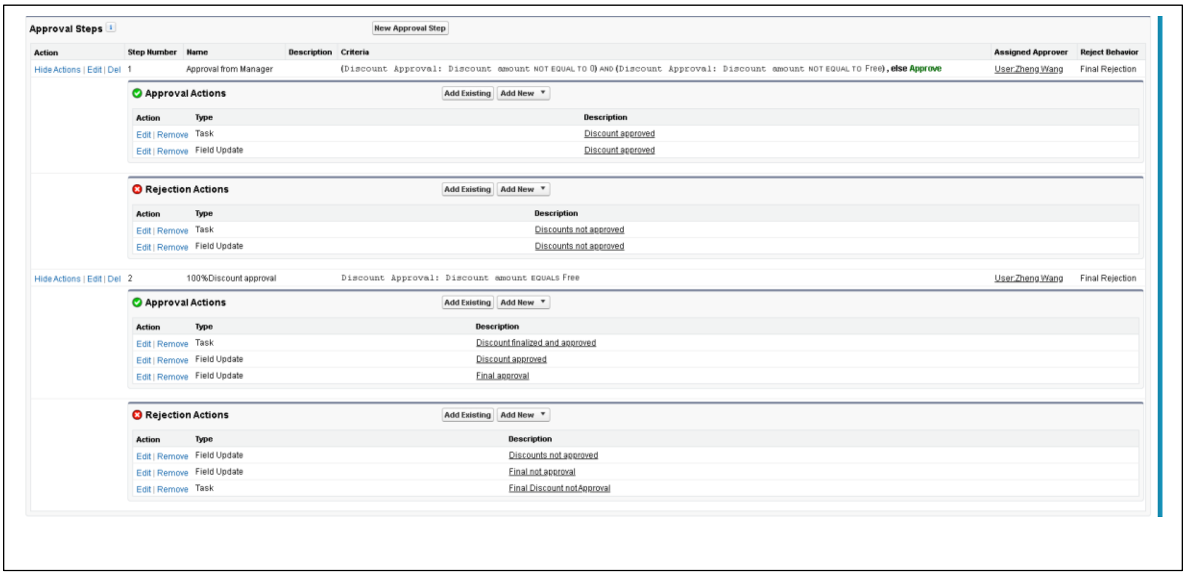
After the diagnosis and consultation are completed, the invoice object obtains the information about the appointment according to the Master-Detail relationship. It fills in the relevant information by the Admin team, and the invoice object selects whether it is necessary to apply for a discount and obtains the information about the post-discount approval from the Discount Approval object. The amount in the invoice object is validated according to the validation rules to ensure the data is correct.





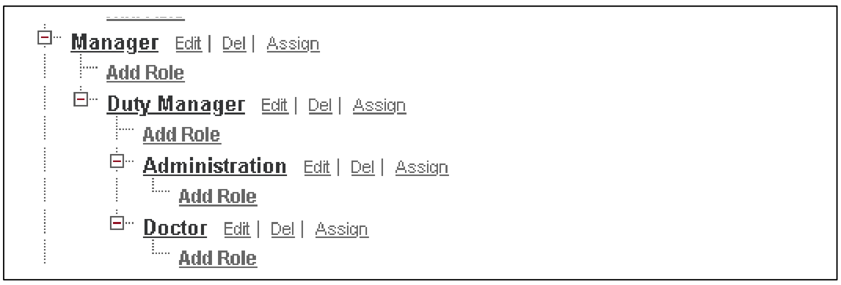
Discount Approvalobject approves modules for discounts. Approving discounts is the responsibility of the Manager team. All discounts can be approved by the manager on duty, except for Totally Free, which requires manager approval. Discount types are differentiated by concession card, senior card, student card and others, and discounts range from $10 to free.

The discount approval process is divided into two steps. When there is a discount amount, but it does not reach 100% free, it is approved by the manager on duty, and after approval, the task is assigned to the Admin team and the related field is updated. If the discount is free, it requires manager approval. After approval, the task will also be assigned to the Admin team, and the relevant field will be updated.



b) Custom User Profile/s with descriptions of each profile

As previously stated, this system has four users. Manager, Duty Manager, Admin, and Doctor. Being a system used by a small clinic, all tabs appear on each user's page and are not hidden for easy access to information.



The admin team is responsible for patient information, patient appointments and invoices and reading discount approvals.

Custom Object Permissions

	Basic Access				Data Administration	
	Read	Create	Edit	Delete	View All	Modify All
Appointment information	✓	✓	✓			
Diagnosis						
Discounts Approval	✓	✓	✓			
Invoice	✓	✓				
Patient Information	✓	✓	✓			
Referrals						

Session Settings

Session Times Out After	2 hours of inactivity
Session Security Level Required at Login	

Password Policies

User passwords expire in	One year
Enforce password history	3 passwords remembered
Minimum password length	8
Password complexity requirement	Must include alpha and numeric characters
Password question requirement	Cannot contain password
Maximum invalid login attempts	10
Lockout effective period	15 minutes
Obscure secret answer for password resets	
Require a minimum 1 day password lifetime	
Don't immediately expire links in forgot password emails	

Edit Clone Delete View Users

The doctor team is responsible for diagnosing and referring objects and needs to read patient information and appointment information. The doctor needs to create the next appointment for the patient if needed.

Custom Object Permissions

	Basic Access				Data Administration	
	Read	Create	Edit	Delete	View All	Modify All
Appointment information	✓	✓				
Diagnosis	✓	✓	✓			
Discounts Approval						
Invoice						
Patient Information	✓					
Referrals	✓	✓	✓	✓		

Session Settings

Session Times Out After	2 hours of inactivity
Session Security Level Required at Login	

Password Policies

User passwords expire in	One year
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Minimum password length	8
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Maximum invalid login attempts	10
Lockout effective period	15 minutes
Obscure secret answer for password resets	
Require a minimum 1 day password lifetime	
Don't immediately expire links in forgot password emails	

Edit Clone Delete View Users

The Duty Manager is responsible for the clinic's day-to-day running, needs de-reading access to all information, and can complete all tasks except diagnosis and referrals.

Custom Object Permissions

	Basic Access				Data Administration	
	Read	Create	Edit	Delete	View All	Modify All
Appointment information	✓	✓	✓	✓	✓	
Diagnosis	✓				✓	
Discounts Approval	✓	✓	✓		✓	
Invoice	✓	✓	✓		✓	
Patient Information	✓	✓	✓		✓	
Referrals	✓				✓	

Session Settings

Session Times Out After	2 hours of inactivity
Session Security Level Required at Login	

Password Policies

User passwords expire in	One year
Enforce password history	3 passwords remembered
Minimum password length	8
Password complexity requirement	Must include alpha and numeric characters
Password question requirement	Cannot contain password
Maximum invalid login attempts	10
Lockout effective period	15 minutes
Obscure secret answer for password resets	
Require a minimum 1 day password lifetime	
Don't immediately expire links in forgot password emails	

Edit Clone Delete View Users

The manager has the highest level of access to the clinic and can read, create, edit, and delete information except for diagnoses and referrals.

Custom Object Permissions

	Basic Access				Data Administration	
	Read	Create	Edit	Delete	View All	Modify All
Appointment information	✓	✓	✓	✓	✓	✓
Diagnosis	✓				✓	
Discounts Approval	✓	✓	✓	✓	✓	✓
Invoice	✓	✓	✓	✓	✓	✓
Patient Information	✓	✓	✓	✓	✓	✓
Referrals	✓				✓	

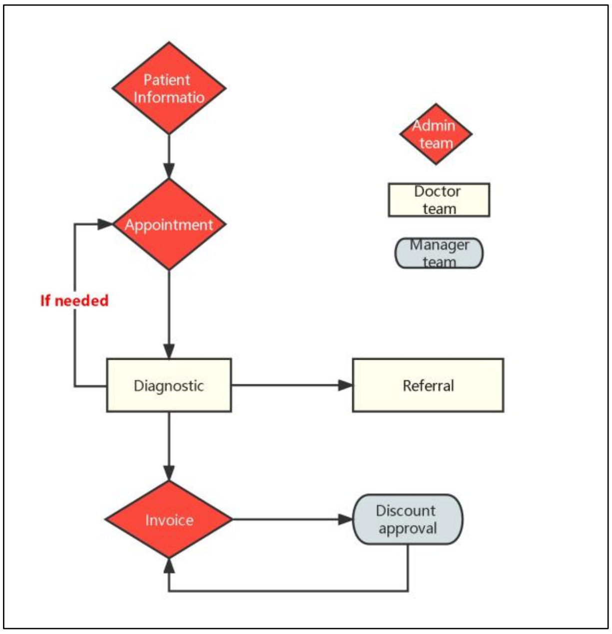
Session Settings

Session Times Out After	2 hours of inactivity
Session Security Level Required at Login	--None--

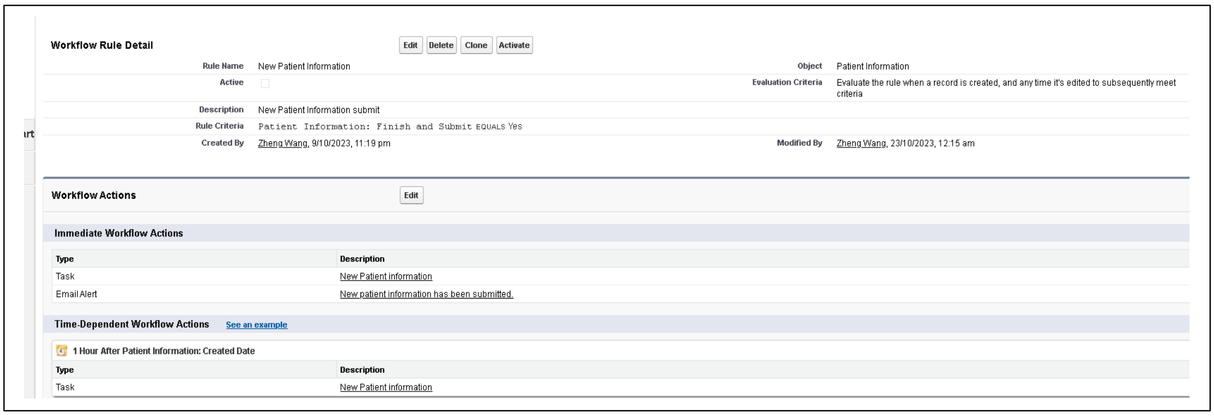
Password Policies

User passwords expire in	60 days
Enforce password history	3 passwords remembered
Minimum password length	8
Password complexity requirement	Must include alpha and numeric characters
Password question requirement	Cannot contain password
Maximum invalid login attempts	10
Lockout effective period	15 minutes
Obscure secret answer for password resets	
Require a minimum 1 day password lifetime	
Don't immediately expire links in forgot password emails	

c) The workflow diagrams



When new patient information is entered, the system automatically sends a work target to the Admin team requesting team members to review the new patient information. And an email is sent to the patient using the email address in the patient information to confirm that the information has been uploaded into the system.


Workflow Rule Detail Edit Delete Clone Activate

Rule Name	New Patient Information	Object	Patient Information
Active		Evaluation Criteria	Evaluate the rule when a record is created, and any time it's edited to subsequently meet criteria
Description	New Patient Information submit		
Rule Criteria	Patient Information: Finish and Submit EQUALS Yes		
Created By	Zheng Wang, 9/10/2023, 11:19 pm	Modified By	Zheng Wang, 23/10/2023, 12:15 am

Workflow Actions Edit

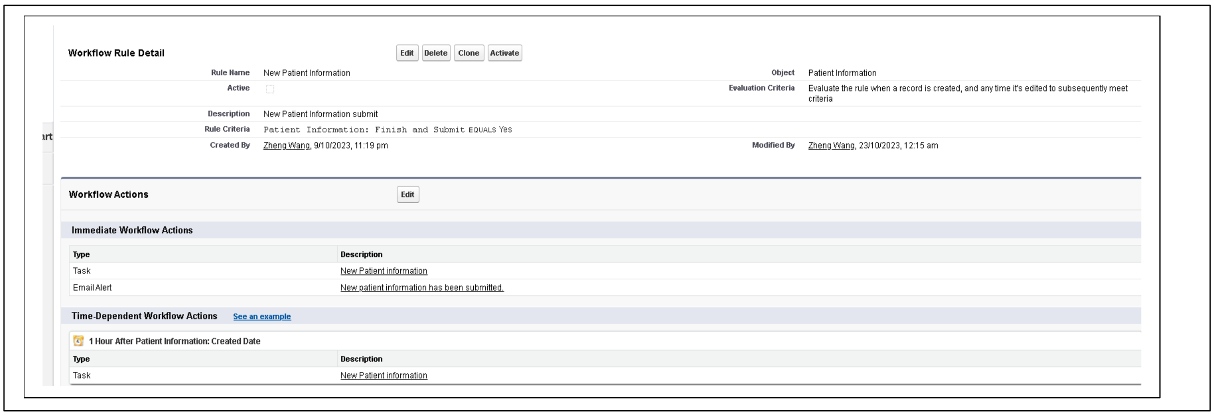
Immediate Workflow Actions

Type	Description
Task	New Patient information
Email Alert	New patient information has been submitted.

Time-Dependent Workflow Actions See an example

1 Hour After Patient Information: Created Date

Type	Description
Task	New Patient information


Workflow Rule Detail Edit Delete Clone Activate

Rule Name	New Patient Information	Object	Patient Information
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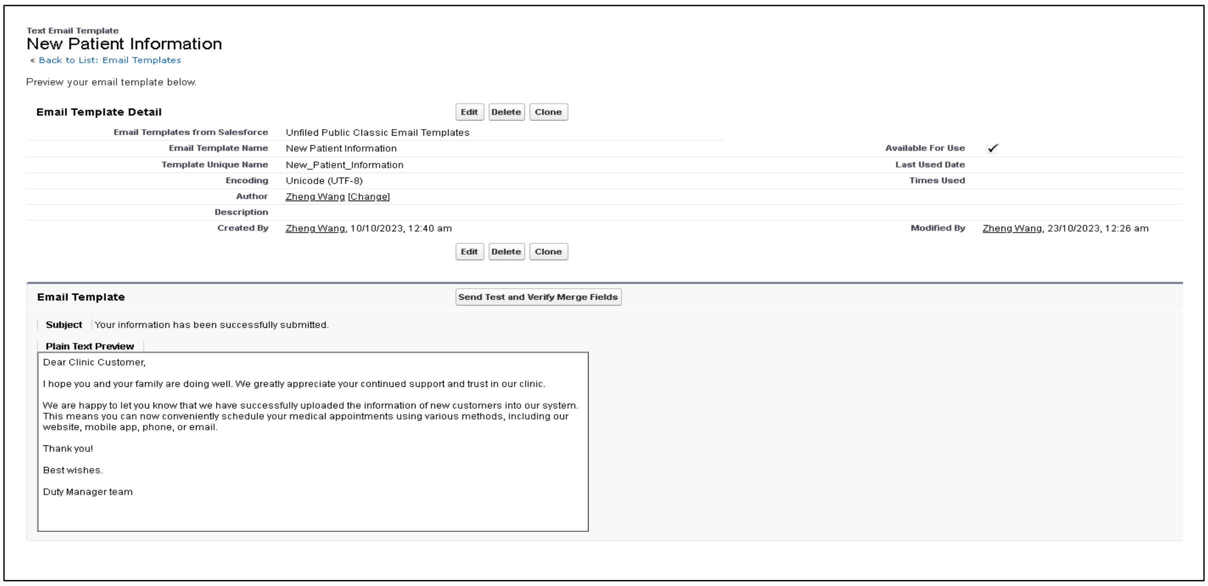
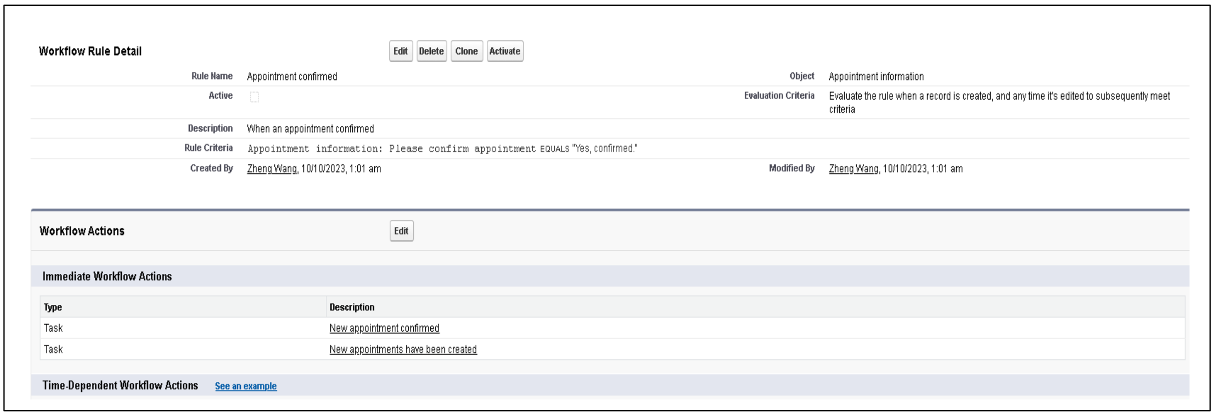
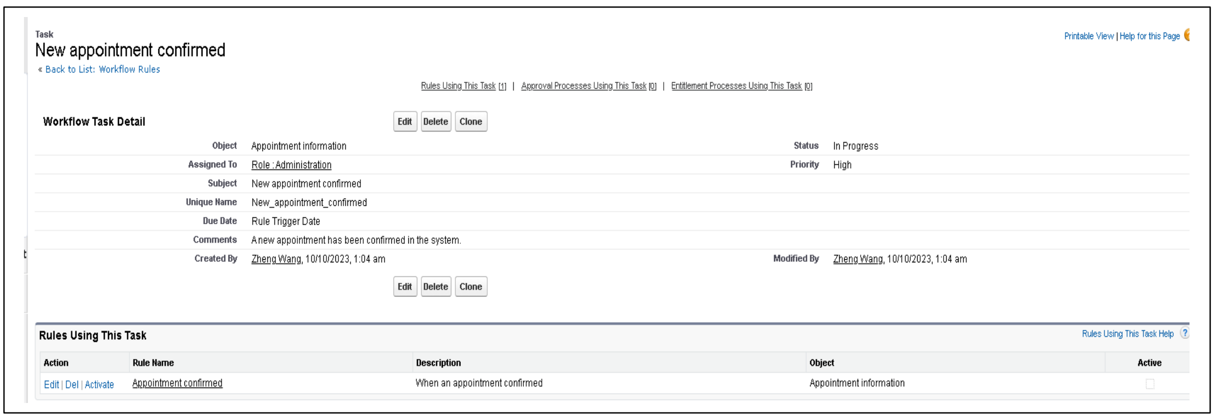
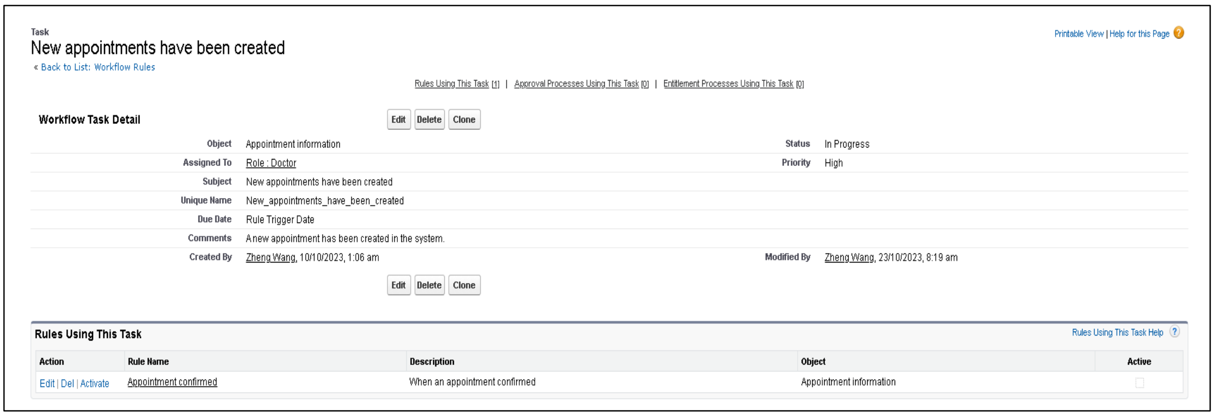


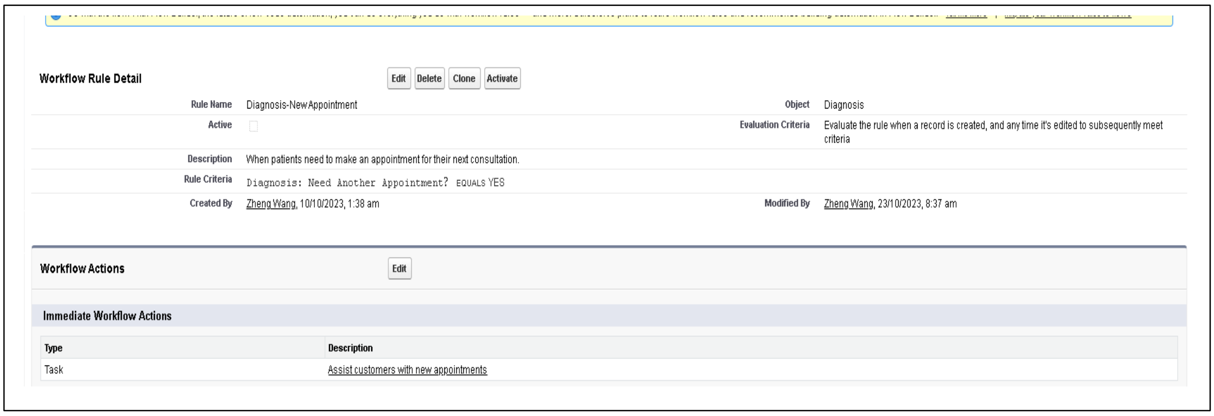
When a patient appointment is created, the system assigns the task to the Admin team and Doctors, respectively. The system will directly inform the new appointment that is created.

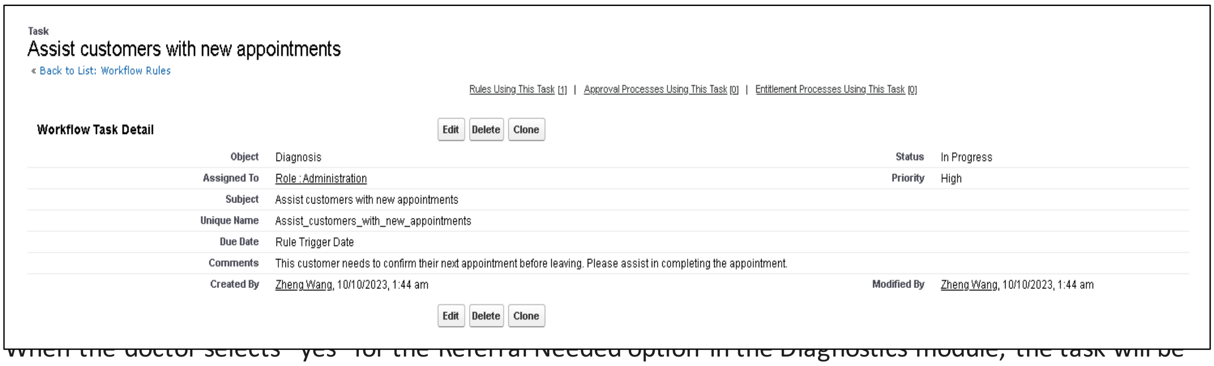




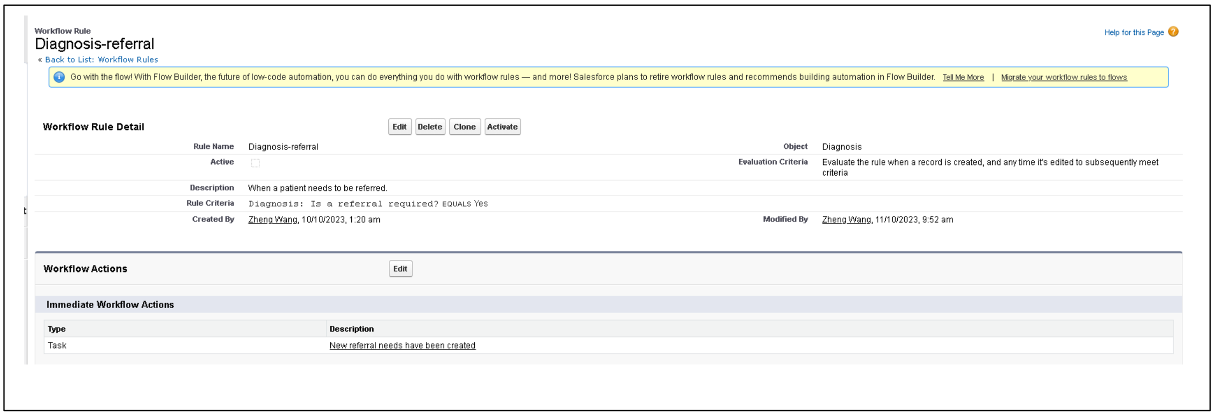


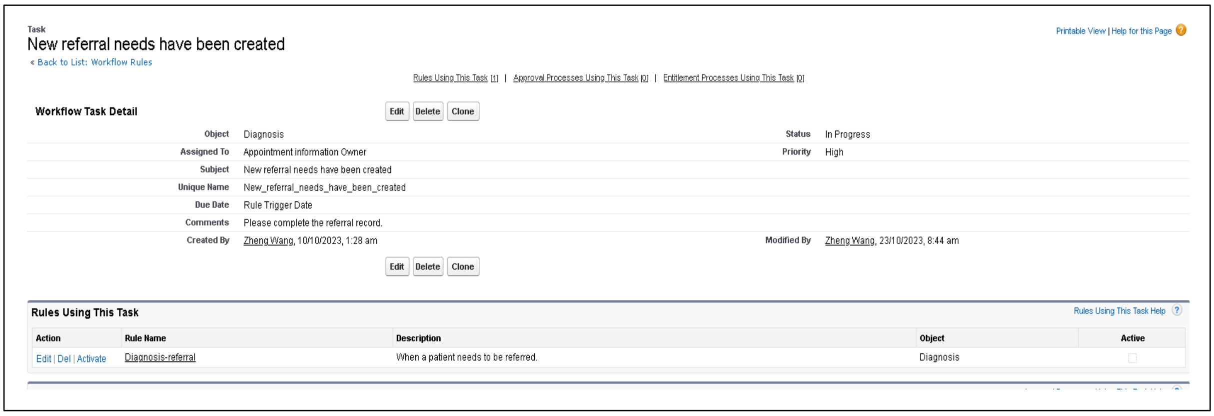
If a patient needs to create a new appointment after the diagnosis is completed, the system automatically assigns a task to the admin team after the physician selects "Need New Appointment". The task will require the admin team to assist the patient in completing the new appointment.



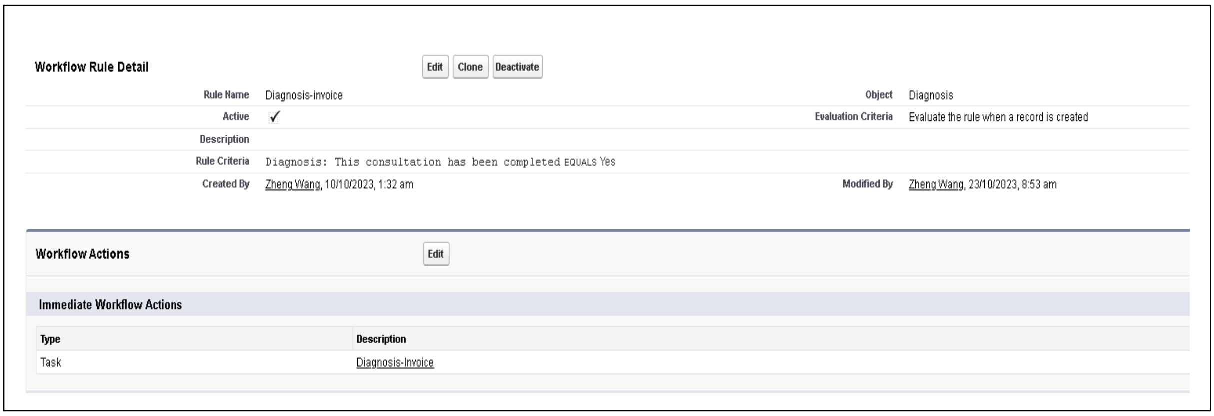


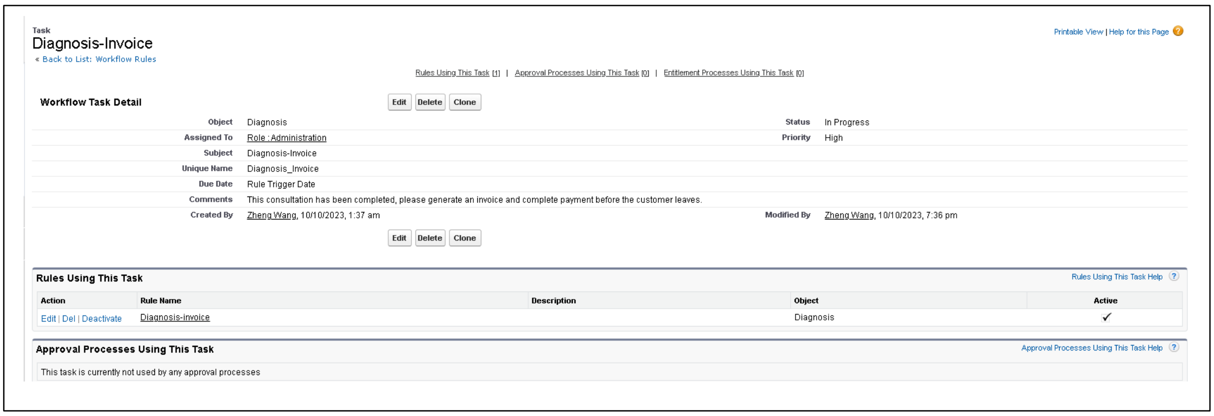
When the doctor selects "yes" for the Referral Needed option in the Diagnostics module, the task will be assigned to the Information Owner, prompting the need to complete the referral record.



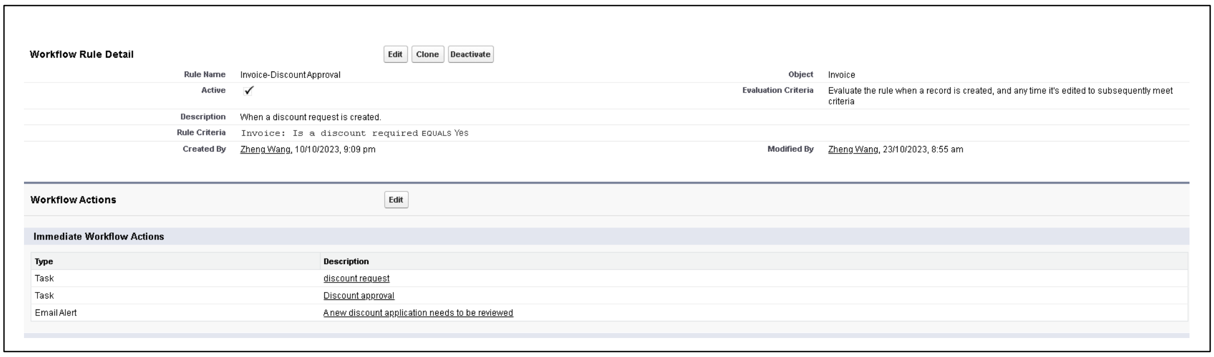


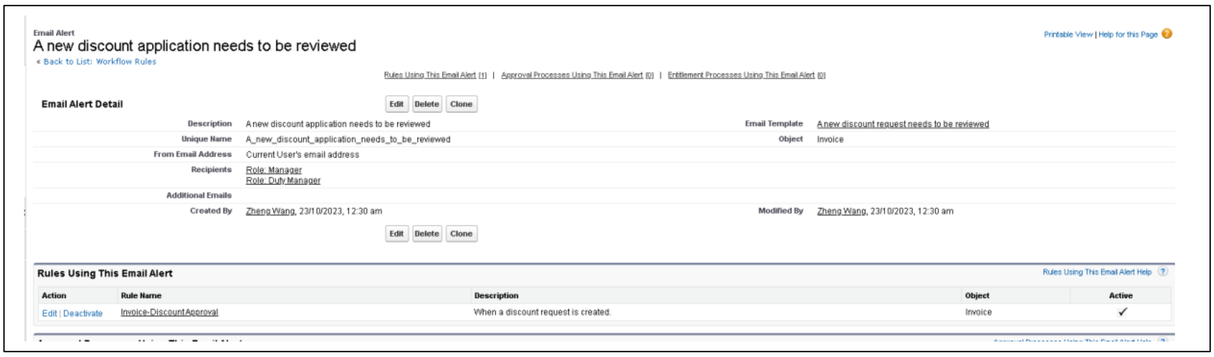
When the physician chooses to complete the current diagnosis, requesting an invoice to be issued to the patient is assigned to the admin team.





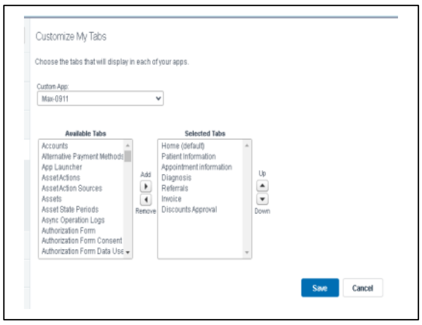
When a discount is selected as required in the invoice module, the system assigns two tasks directly to the Duty Manager, reminding the Duty Manager to complete the Discount Approval module for completion and review. At the same time, an email will be sent to the Duty Manager and Manager, alerting them that a new discount request needs to be reviewed.



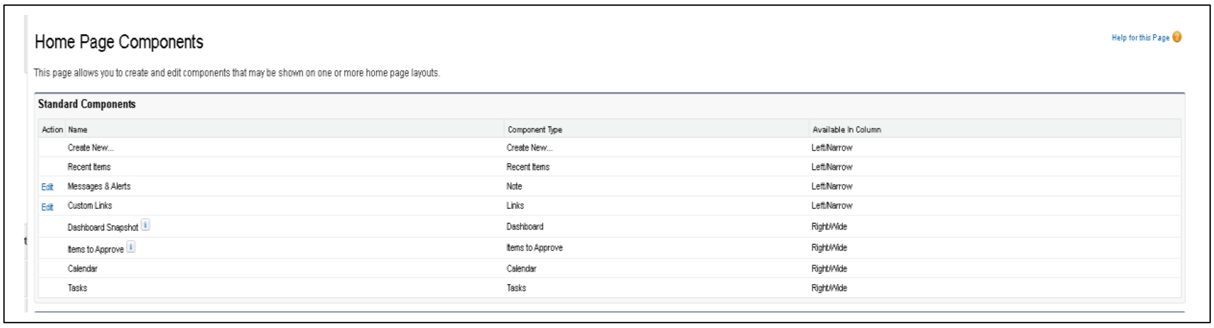


d) Prototype System Screens

The original interface begins with the inclusion of Home and all tabs. As previously mentioned, the system can restrict job permissions in a small clinic work environment. Use 'Customize My Tabs' to select the Tabs on the home page.



On the left side of the screen are 'Create New', 'Recent Items', 'Messages and Alerts' and 'Custom Links'. The main screen displays Calendar, My Tasks, Dashboard, Pause Flow Interviews and Items to Approve. Use 'Home Page Components' in 'Customize' to select the desired components. Furthermore, set the position of each component in 'Home Page Layouts'.



Home Page Components

This page allows you to create and edit components that may be shown on one or more home page layouts.

Standard Components

Action	Name	Component Type	Available In Column
	Create New...	Create New...	Left/Narrow
	Recent Items	Recent Items	Left/Narrow
Edit	Messages & Alerts	Note	Left/Narrow
Edit	Custom Links	Links	Left/Narrow
	Dashboard Snapshot	Dashboard	Right/Wide
	Items to Approve	Items to Approve	Right/Wide
	Calendar	Calendar	Right/Wide
	Tasks	Tasks	Right/Wide

So the resulting page is as follows.