Research Matchmaking
SENG 696

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System Specification
Phase 1&2

Introduction

This phase includes the design of the project in which researchers share their materials. When a researcher wants to find the code, data, or project of the other researcher to either complete his work or follow-up with that, it may become hard to find it. This project provides the ability of matchmaking between research projects.

System Specifications

Clinet, guest and provider are the main characters of the system. Provider must select one of two basic and premium accounts that have different functionalities. Client searches among providers. He can use filters to narrow down the search result and he can start chatting with provider. If they both accept an offer and sign the online contract they can continue chatting about the progress of the project.

Client may request for change in the project after signing the contract. But provider must review and may accept or reject that. Client may have personal preference on his account. System is responsible to managing the contract or transiting the payments. 30% of the payments will be paid to the system as the earning. The goal of the system is to handle payments with minimum effort of both provider and client.

Methodology

We use GAIA as our methodology that is one of the best methodologies for design and analysis. Firstly, we present the analysis part by defining role models. Second, we document the interaction model and its graph. Lastly, we define agent model, service model and acquaintance model in order to design part.

Analysis

We selected GAIA as out methodology. So, in this section we will present our analysis. We put draws and schemas. This design is meant to be implemented in the next phases. During the implementation, the design may change accordingly.

Role Models

Roles are as below:

- GUI
- Feedback Handler
- Message Handler

- Bid Handler
- Payment Handler
- Project Progress Tracker
- Project Creator
- Project Change Handler
- Authenticator
- Registerator
- Provider Searching
- Plan Verifier

In the table below, we accurately define role models and responsibilities. For each role model, we have description, permission, “protocols and activities”. They are further dividend into Registration, Authentication, and so on according to the full list of roles defined above.

	Role Name	Registration	Authentication	Project Change Handler	Provider Search
Role Model	Description	handling the process of sign up for clients, providers	handling the process of authentication to find if the user is logged in or not, also it can detect whether the user is provider, client or guest	handling the process of changing in projects	handling the process of searching provider by different Criteria
	Protocols and Activities	RegisterUser	AuthenticateUser	ChangeProject	SearchProviders
	Permissions	read user data, write user data	read user data, authenticate user	read project change data, write project change data	read provider data
Responsibilities	Liveness	Register = (Request.register, Client)	ReqeustAccess = (Request. Access, Client)	ReqeustChange = (Request. Change, project)	RequestQuotes = (Request. Quotes, ProviderList)
	Safety	Create a profile in the system	Grant system access	Deliver the changed project	Deliver a list of providers

Provider Search	Project Creation	Plan Checker	Bid Handler	Message Handler	Contract Handler
handling the process of searching provider by different Criteria	handling the process of creating the project based on the client request	1) handling the process of begin registered in one of plans. 2) It proposes different plan options	handling the process of creating, accepting, or rejecting a bid	handling the process of sending messages between users based on different events	handling the process of creating contracts
SearchProviders	CreateProjects	CheckPlans	HandleBids	DeliverMessages	CreateProjects
read provider data	write project data	1) write user's plan 2) read: user's plan 3) modify: user 's plan	write bid data, read bid data	write message data, read message data	write contract data, read contract data
RequestQuotes = (Request. Quotes, ProviderList)	RequestProject = (Request. Project, Project)	RequestPlan = (Request.Plan, Plan)	RequestBid = (Request.Bid, Bid)	RequestMessage = (Request. Message, MessageList)	RequestContract = (Request. Contract, Contract)
Deliver a list of providers	Generating a project	Prcoess the requested plan	Process with the bid	Deliver a list of messages	creating a contract

Payment Handler	Project Tracker	Feedback Handler	GUI
handling the process of Payments	handling the process of tracking project progress, deadline and estimations	handling the process of handling comments and ratings of projects estimations	handling interactions between users and multiple systems
TransferMoney	TrackProjects	DeliverFeedbacks	
write payment data, read payment data	read project tracking data, write project tracking data	read feedback data, write feedback data	
RequestPayment = (Request. Payment, Transaction)	RequestTracking = (Reqeust. Tracking, Progress)	RequestFeedback = (Request. Feedback, Feedback)	ReqeustInteraction = (Request. Interaction,
Process with the payment	Deliver the progress of projects	Generate the feedback	Handle user interaction in the System

** Since table is wide, it is dividend into three sub-tables. For full version, check the repo material.

Interaction Model

- Fetch Feedbacks
- Submit Feedbacks
- Project Progress
- Get Messages
- Plans Listing
- Bidder

- Authentication Request
- Registration Request
- Create System Messages
- Create User Messages
- Search Providers
- Respond to Bid

The interaction between different roles in the system is shown in the table below. Purpose, initiator, receiver and processing for each of the interaction models are defined in the table below.

Protocol	Registration Request	Authentication Request	Project Creation	Searching for Providers	Bid Creation	Plans Listing	Plan Payment	Responding Bid
Purpose/ Parameters	User name, password, type	Username, password	Project name and description	keywords, rating interval, salary interval	Project, Bid, Provider	Current provider	Provider, Chosen plan, price	Bid, response (accept/reject)
Initiator(s)	GUI	GUI	GUI	GUI	GUI	GUI	Plan Checker	GUI
Receiver(s)	Registration Role	Authentication Role	Project creation Role	Provider Search Role	Bid Handler	Plan Checker	Payment Handler	Bid Handler
Processing	Validates username, creates user	Validates username and password match	Checks user type to be a client	Filters & sorts providers matching the criteria, prioritizes providers with premium plan	Checking if requesting clients owns the project	Lists available plans	Decreases provider's financial balance by the amount of plan's price	Validates username, creates user

Requesting Contract	Creating system message	Getting messages	Creating user message	Project Progress	Project Payment	Submit Feedbacks	Fetch Feedbacks
Project, client, provider	Project, client, provider, content	Project, User	Project, sender user, content	Project, Progress amount	Project, Client, Provider	Project, Client, Provider, Rate, Comment	Client
Bid Handler	Bid Handler, Contract Handler	GUI	GUI	GUI	Project Tracker	GUI	GUI
Contract Handler	Message Handler	Message Handler	Message Handler	Project Tracker	Payment Handler	Feedback Handler	Feedback Handler
generates contract/request a message to be created for both sides	creates a message from system in the corresponding thread, flags the thread open if a contract has been sent by contract handler	Lists messages in the thread corresponding to the project	generates a message from user inside the thread, checks if the thread is for an accepted project	validates if requesting user is the provider associated to the project, requests a project payment if the project is completed	Makes the transaction from client's account the provider's, subtracting 30% from the total amount written in the contract	Creates the Feedback	Calculates average rate for the requested client, returns list of feedbacks

Agent model

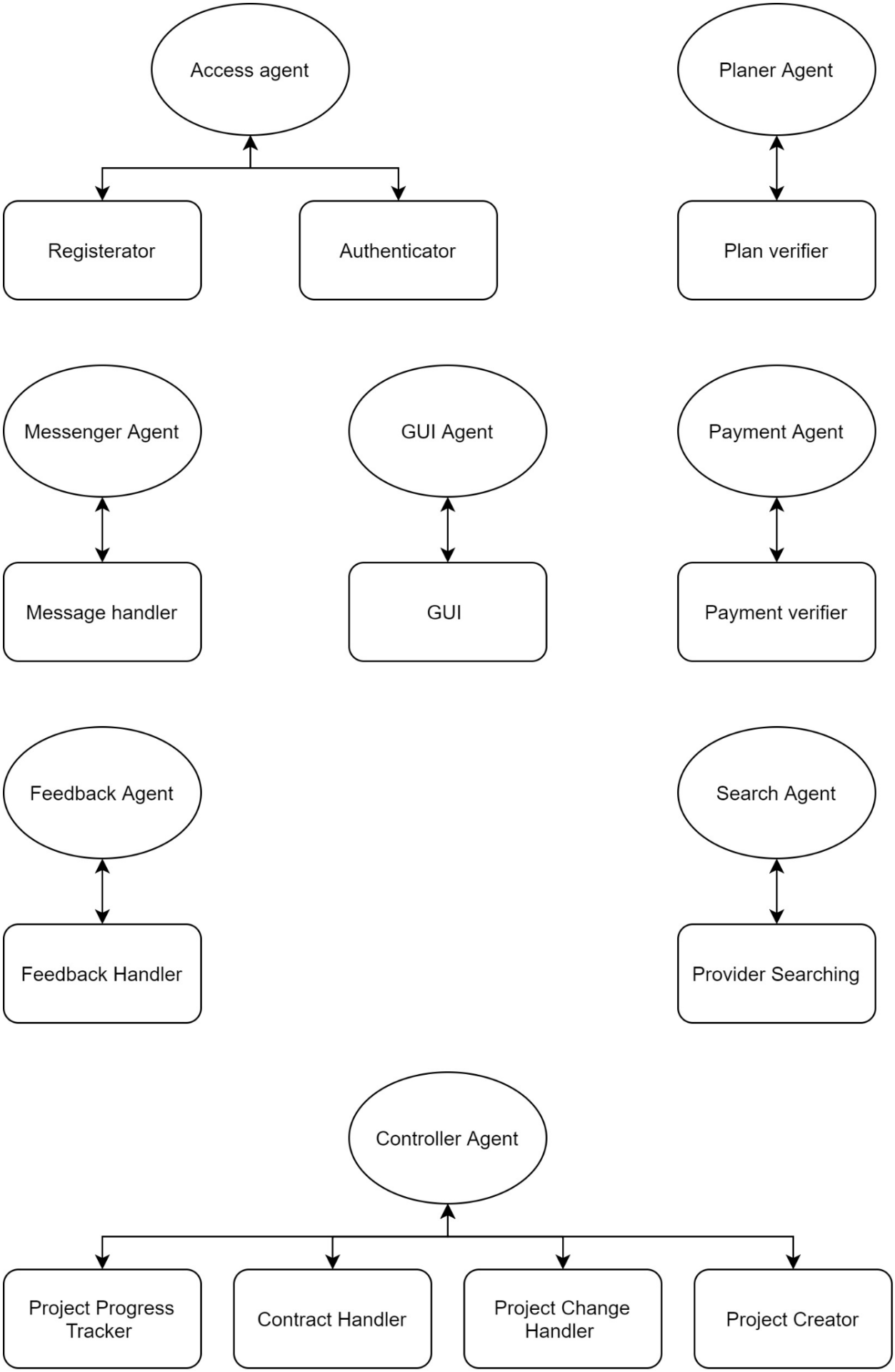
- GUI
- Messenger Agent
- Payment Agent
- Feedback Agent
- Controller Agent
- Search Agent
- Planner Agent
- Access Agent

Design

In the following diagrams and schemas, we show the detailed analysis of the research matchmaking system in GAIA methodology.

Agent Model

We group the roles and agents in the following way.


Access agent
Registerator
Authenticator
Planer Agent
Plan verifier
Messenger Agent
Message handler
GUI Agent
GUI
Payment Agent
Payment verifier
Feedback Agent
Feedback Handler
Search Agent
Provider Searching
Controller Agent
Project Progress Tracker
Contract Handler
Project Change Handler
Project Creator

Service Model

Services are:

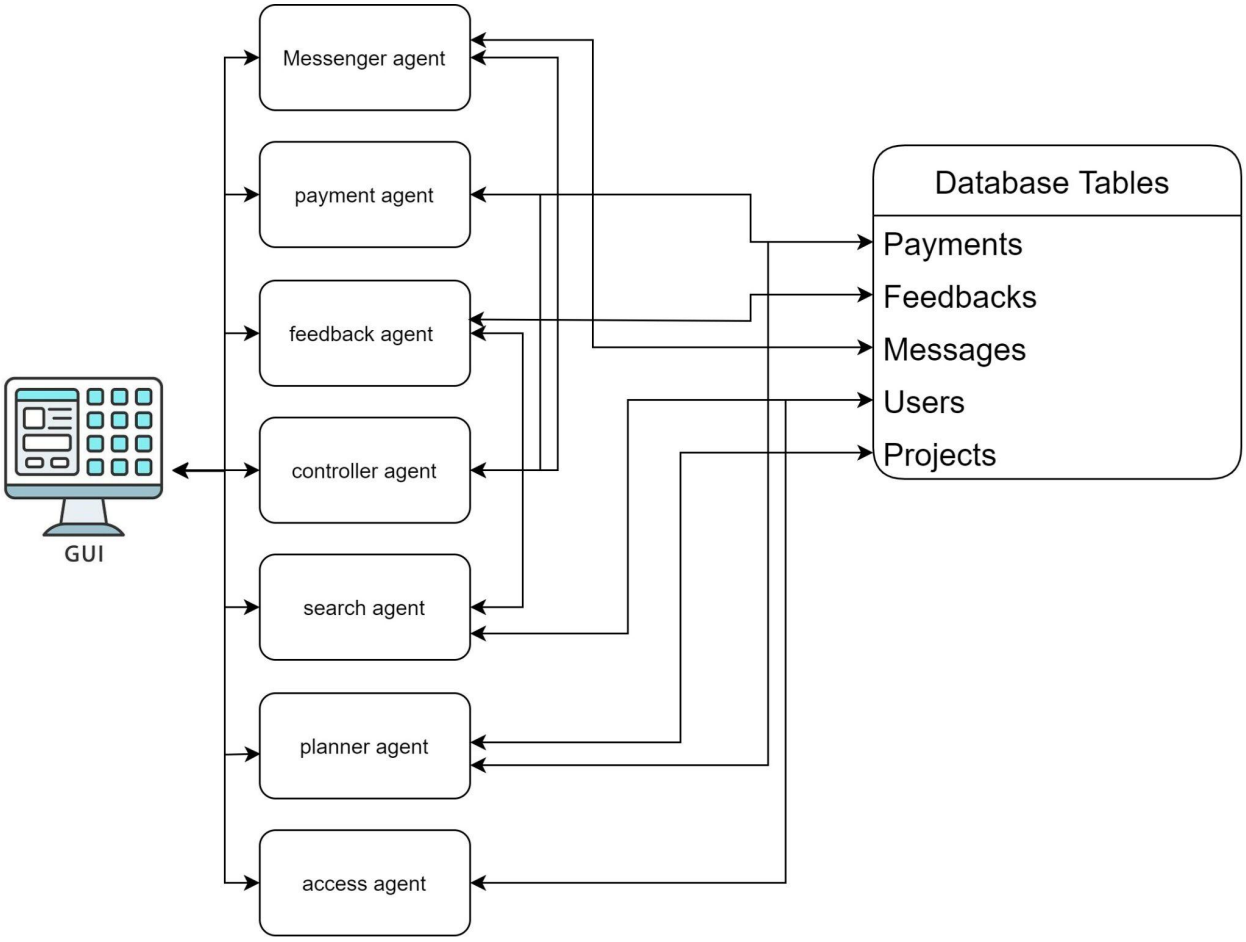
- Search
- Access
- Payment
- Plan
- Controller
- Message
- Projects
- Feedback

In the figure below, for each service, Inputs, Outputs, Preconditions and Postconditions are described.

Service Name	Search	Access	Payment	Plan	Message	Controller	Projects	Feedback
Inputs	Provider Info	Login Info	credit cart info	provider	message text	contract	Projects	comments
Outputs	Result list	Ok/ Denied	approve/deny	assign or change plan	sent the message	result of contract	result of project	assigned comments
Preconditions	Search GUI	Access GUI	payment gateway available	connection with db	connection with contract db	controller connectionjs	connection with project db	feedback gui
Postconditions	access and query in providers DB to fetch the result	grant access to Agent to be able to see the result	Update the result of the payment in internal DB	Send Features to the Provider and put them in DB	Send messages to the client and put them in DB	update changes of projects in DB (Create, Change or Progress)	Apply the changes to project DB	put feedbacks in DB

Acquaintance model

We visualize the acquaintance model using the graph below to show the links between different Agents and database tables. In this way we can predict the potential bottlenecks and prevent them.



Future

We have two ideas for next level of the matchmaking system

1. Artificial Intelligence for smart matchmaking or automated bidding
2. Advertisement Options