SENG 696 AGENT-BASED SOFTWARE ENGINEERING

UNIVERSITY OF CALGARY

RESEARCH MATCHMAKING

PROJECT - 1B – DESIGN DOCUMENT

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Introduction:

Group 14 has decided to work on the sample project "Research matchmaking" which was provided on D2L. We will implement all the specifications provided in the Research Matchmaking Requirements document provided on D2L.

The above-mentioned document has been submitted along with this under the same "MatchMaking-1A-SystemSpecifications".

By utilizing the ideas of agent-based software engineering, a multi-agent system will be implemented. This document describes the analysis and design of the research matchmaking system using the GAIA methodology.

According to the GAIA methodology, five models are created: the roles model, interactions model, agent model, service model, and acquaintances model.

Description:

The Client and Providers will be assisted by research matchmaking in connecting on a single platform and in concluding project contracts. In addition to being a client or a supplier, a user may also visit as a guest and browse all the providers. The visitor won't see all the information. Different user types will have access to various functionality with varying permissions.

For the various user groups, various graphical user interface (GUI) kinds will be created. The system will store the date and access it to complete its activated in a dummy database will be built. From the GUIs, all fundamental options will be started. The "MatchMaking-1A-SystemSpecifications" document, which includes detailed specifications, is attached. The design of the system is covered in the parts that follow.

Roles Model:

ROLE SCHEMA	**GRAPHICAL USER INTERFACE (GUI)**	**SIGNUP HANDLER**	**LOGICAL HANDLER**
DESCRIPTION	Serves as the system's user interface for the client	Based on the user's request, registers the user as a client or a provider.	Verify whether the user is a client, a provider, or a guest. Additionally, verify the client's

				and provider's login information.
PROTOCOLS AND ACTIVITIES		Gets the user's reaction after displaying the information.	Obtain user requests, read user information, and register users.	Obtain the user's data, read the database for the data, check the data, and grant the necessary access.
PERMISSIONS		demonstrates the data. Read the information. Send the information to other system elements.	reads supplied User User Data. write User Data in database.	Reads supplied user Data. Reads supplied database Data. Verify the user. Provide required access.
RESPONSIBILITES	**LIVENESS**	Showing GUI for provider and client. User Interface = (Display. Read. Send)	Login = (get, read, verify, provide).	Login = (get, read, verify, provide).
	SAFETY	Successfully demonstrate all system requirements.	Make sure to thoroughly verify all the data. Give only the necessary access.	Make sure to thoroughly verify all the data. Give only the necessary access.

ROLE SCHEMA	**VERIFIER**	**BID HANDLER**	**SORT HANDLER**
DESCRIPTION	Assuming all the information provided by the providers is accurate, it accepts the request and issues a confirmed icon. It verifies the proof of business that the suppliers have submitted.	Accepts the client's request to submit a bid and manages the rejection and acceptance of the bid.	Uses keywords to order the list of providers.
PROTOCOLS AND ACTIVITIES	Obtain business proof, verify the	As you await the request, complies	Obtain the keywords, the

		data, approve the request, and produce a confirmed icon.	with the request for a proposal, Send the bid to the supplier, receive an approval or rejection from the provider, and then communicate the outcome to the client or system.	provider list, sort the list according to the keywords, and then output the sorted list.
PERMISSIONS		Read supplied Provider Proof of business. Issue verified icon.	reads supplied GUI bid. Write the bid to provider.	Read keywords access to list of providers.
RESPONSIBILITES	**LIVENESS**	Verification = (Get. Check. Accept/Reject. Issue Icon.)	HandleBidProcess = (Wait. Request. Send. Accept Response. Act.)	Sorting = (Get keywords. get providers. Sort. Output)
	SAFETY	Runs appropriate checks and reads the correct data.	Make sure the rejection goes to the client after the system receives the acceptance.	Safely display all the sorted providers' information.

ROLE SCHEMA	**PLAN HANDLER**	**CONTRACT HANDLER**	**PAYMENT HANDLER**
DESCRIPTION	Shows only the providers the Basic and Premium plans.	As soon as a provider signs up, sends the contract to them, and determines whether they accept it or not. Additionally, sends the contract for the new project to the client and provider.	Manage financial transactions. After deducting 30% of the transaction value, pay the provider.
PROTOCOLS AND ACTIVITIES	Verify the user is a provider, show the plans, and add the provider to the chosen plan.	Receives the request, sends the contract to the service provider, and then determines whether	Request payment from the client, receives the client's money, deducts 30%, and then pays the provider.

			they accept it or reject it.	
PERMISSIONS		Read user data. Write plans.	Read supplied user request. write contract.	Read provider bank details.
RESPONSIBILITES	**LIVENESS**	Display Plan = (Check. Display. Receives Request. Subscribe)	ContractGeneration = (Get Request. Send. Check).	Transaction = (Request. Receives. Deduct. Pay)
	SAFETY	Only the providers should see the plans.	Delivering the appropriate contract.	Make sure the provider gets the required sum.

ROLE SCHEMA		**PROJECT TRACKER**	**CHANGE HANDLER**	**FEEDBACK HANDLER**
DESCRIPTION		Monitors the project's development. It displays the approximate completion date, present status, and projected turnaround time.	Responds to requests to modify a project after it has started.	After the project is finished, collect customer and provider feedback, and enter it in the database.
PROTOCOLS AND ACTIVITIES		Monitors the project's development. shows the status and the anticipated completion date.	Request for a change from the client, provider approval, and project change.	After the project is finished, ask the client and provider for feedback. Get opinions. Fill out the database with it.
PERMISSIONS		Read supplied project handler Project data. Write to the tracking page.	Reads supplied User Project Data. Write to the provider.	Read supplied user Feedback data. Write in database.
RESPONSIBILITES	**LIVENESS**	Project Tracking = (Track. Display)	Change Project = (Change Request. Approval. Change)	Get Feedback = (Request Feedback. Write)

	SAFETY	Successfully updating the tracking page with the progress.	Altering the project after approval with success.	Ensure that the project is completed. Successful database writing.

ROLE SCHEMA		**PROJECT HANDLER**	**CHAT HANDLER**
DESCRIPTION		When the client and provider have both signed the contract, creates the project.	When the client and supplier have both signed the contract, creates the chat.
PROTOCOLS AND ACTIVITIES		The project is started by the provider's approval request.	Establishes the chat, reads user messages, and displays them there.
PERMISSIONS		Develop a project	Make a chat
RESPONSIBILITIES	**LIVENESS**	Project Creation = (Get approvals. Create project)	Chat Creation = (Check approvals. Create chat)
	SAFETY	Add the data to the project successfully.	Verify that both the client and the provider have approved the project.

Interaction Model:

PROTOCOL	**SIGNING IN**	**LOGGIN IN**	**PROOF VERIFICATION REQUEST**
PURPOSE / PARAMETERS	Request for registration to become a client or a provider for the new user. The username and password are included in the request.	Request for user logging as either a client or a provider. The username and password are included in the request.	For a verified icon, please. The evidence of business is included in the request.
INITIATOR(S)	Graphical User Interface	Graphical User Interface	Graphical User Interface
RECIEVER	Signup Handler	Login Handler	Verifier
PROCESSING	The user's information is collected by the GUI, which then sends it to the signup handler for processing.	The user's information is collected by the GUI and given to the login handler so that the action can be carried out.	The GUI lets the user submit business proof, which is then sent to the verifier for verification.

PROTOCOL	**BIDDING REQUEST**	**BIDDING REQUEST: APPROVAL**	**BIDDING REQUEST: REJECTION**
PURPOSE / PARAMETERS	The bidding request is done by a client for a particular provider. This request constitutes information about the provider.	Bidding acceptance is given by the provider for a particular bid. This constitutes information about the bid and its acceptance.	Bidding rejection is given by the provider for a particular bid. This constitutes information about the bid and its acceptance.
INITIATOR(S)	GUI	GUI	GUI (Provider)
RECIEVER	Bid Handler	Bid Handler	GUI (Client)
PROCESSING	The client gives information about the bid to the GUI. The GUI passes this information to Bid Handler.	GUI receives acceptance from provider and sends it to Bid Handler.	GUI receives rejection from provider and sends it to Bid Handler.

PROTOCOL	**PROVIDER LIST REQUEST**	**DISPLAY PROVIDER LIST**	**PLAN SUBSCRIBE REQUEST**
PURPOSE / PARAMETERS	Based on some specific keywords, the list of providers can be requested. This request constitutes the information about keywords.	This request is to display a sorted list of providers on the GUI. This request constitutes the sorted list of providers.	This request is made by the provider to subscribe to basic or premium plan. This request constitutes the information about the required plan which the subscriber desires.
INITIATOR(S)	GUI	Sort Handler	GUI
RECIEVER	Sort Handler	GUI	Plan Handler
PROCESSING	GUI is responsible for reading the list of keywords it receives from the user, and then sends it to the Sort handler for processing.	Based on the received keywords, the Sort Handler sorts the list and sends it back to GUI.	GUI received the request from provider and routes the same to the plan handler.

PROTOCOL	**REGISTRATION CONFIRMATION REQUEST**	**CONTRACT REQUEST**	**RESPOND CONTRACT REQUEST**
PURPOSE / PARAMETERS	The Contract Handler received the information about the	Contract is sent to the new provider for approval.	This is the response from the provider

	new provider from the Signup Handler. This request constitutes the information about the provider.		regarding approval or rejection of contract. This request constitutes the information about the acceptance or rejection of the contract.
INITIATOR(S)	Signup Handler	Contract Handler	GUI
RECIEVER	Contract Handler	GUI	Contract Handler
PROCESSING	Signup handler has the information of the new provider as it awaits the contract response from the contract handler.	Contract Handler is responsible for generating contract for the new provider.	GUI received the request from provider and routes the same to the contract handler.

PROTOCOL	**REGISTRATION DECISION REQUEST**	**STATUS REQUEST**	**PAYMENT REQUEST**
PURPOSE / PARAMETERS	Contract Handler is responsible for sending the information about the acceptance or rejection of the contract to the signup handler.	Project Tracker is responsible for sending the status of the project as completed.	Payment is requested from the client for the project.
INITIATOR(S)	Contract Handler	Project Tracker	Payment Handler
RECIEVER	Signup Handler	Payment Handler	GUI
PROCESSING	GUI sends information to the Contract Handler, who in turn routes the same to Signup Handler.	The status of the project is tracked by the Project Tracker, who informs the Payment Handler regarding the completion of the project as soon as possible.	Once the payment is received from the Client, the Payment Handler deducts 30% amount and pays the same to the provder.

PROTOCOL	**PROJECT TRACKING**	**PROJECT CHANGE**	**APPROVED CHANGE REQUEST**
PURPOSE / PARAMETERS	Project Tracker sends out the information regarding the status of the project.	This request constitutes the information regarding any changes in the project.	All the changes that are approved, will be sent to the project tracker. This request constitutes the information about the specified changes.

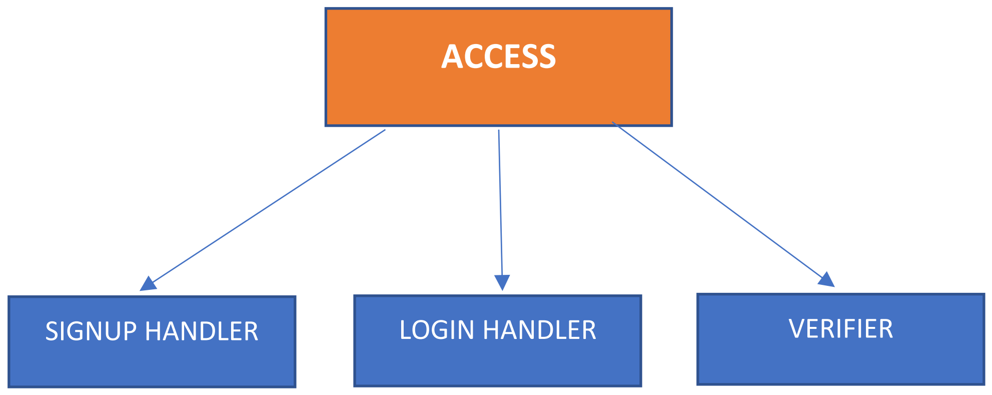
INITIATOR(S)	Project Tracker	GUI (Client)	Change Handler
RECIEVER	GUI	GUI (Provider)	Project Tracker
PROCESSING	The progress of the project is tracked and sent to the GUI.	The Provider GUI will receive the specified change request from the Client GUI.	The provider approves the changes.

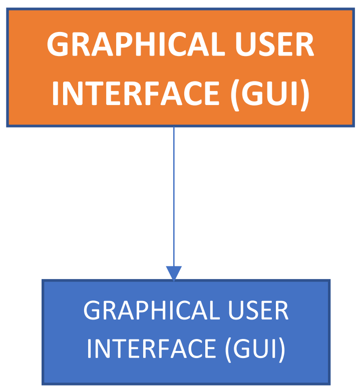
PROTOCOL	**FEEDBACK REQUEST**	**FEEDBACK INITIATION**	**FEEDBACK SUBMISSION**
PURPOSE / PARAMETERS	The feedback is requested from the client as well as the provider.	The feedback handler is informed regarding the completion of the project.	The feedback handler stores the feedback in database.
INITIATOR(S)	Feedback Handler	Project Tracker	GUI
RECIEVER	GUI	Feedback Handler	Feedback Handler
PROCESSING	It is the responsibility of the project tracker to inform the feedback handler about the project completion.	The project is marked as "Completed" by the Project Tracker.	The feedback should be submitted by the user in the GUI.

PROTOCOL	**PROJECT REATION REQUEST**	**CHAT CREATION REQUEST**
PURPOSE / PARAMETERS	Once both Client and provider have accepted the contract, the project is created. This request constitutes the acceptance confirmation from both client and provider.	Once both Client and provider have accepted the contract, the chat is created. This request constitutes the acceptance confirmation from both client and provider.
INITIATOR(S)	Contract Handler	Contract Handler
RECIEVER	Project Handler	Chat Handler
PROCESSING	Confirmation acceptance from both provider and client must be received by the Contract Handler.	Confirmation acceptance from both provider and client must be received by the Contract Handler.

AGENT MODEL:

Agents and their respective roles have been displayed below:




GRAPHICAL USER INTERFACE (GUI)
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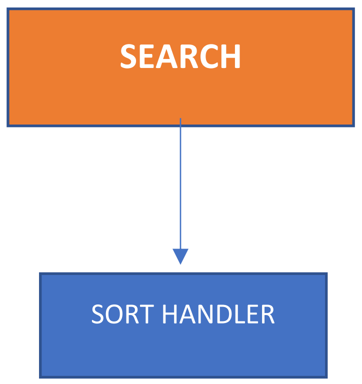
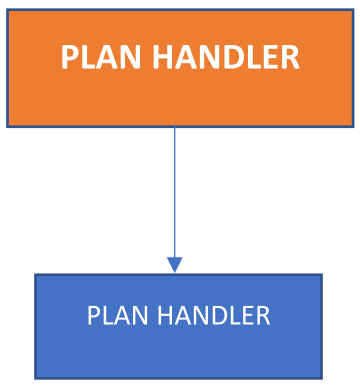
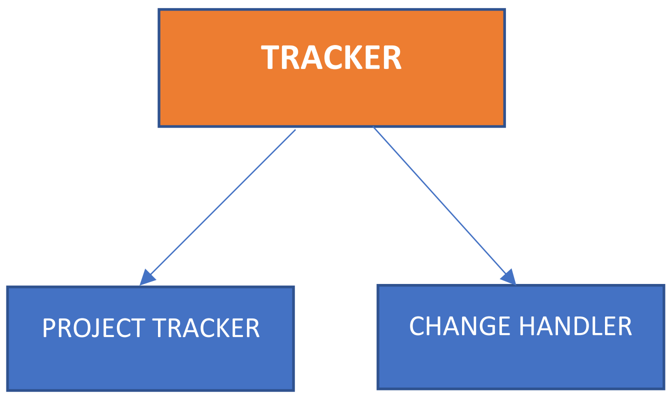
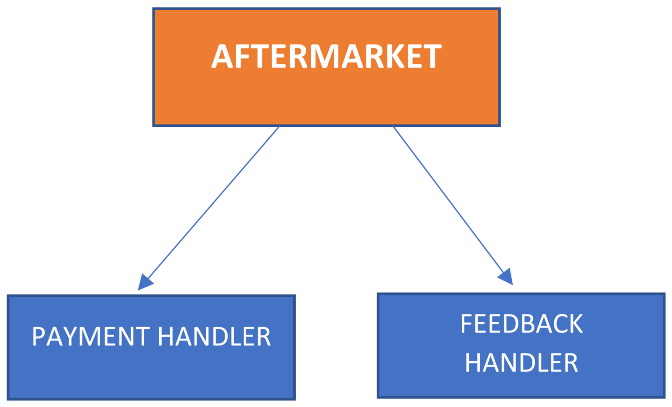
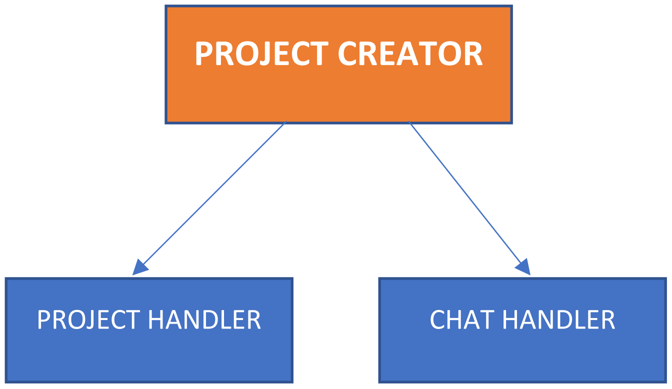
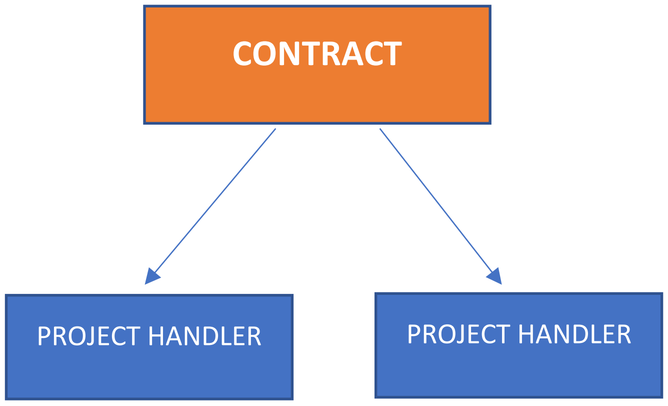



PLAN HANDLER
PLAN HANDLER


TRACKER
PROJECT TRACKER
CHANGE HANDLER


AFTERMARKET
PAYMENT HANDLER
FEEDBACK HANDLER





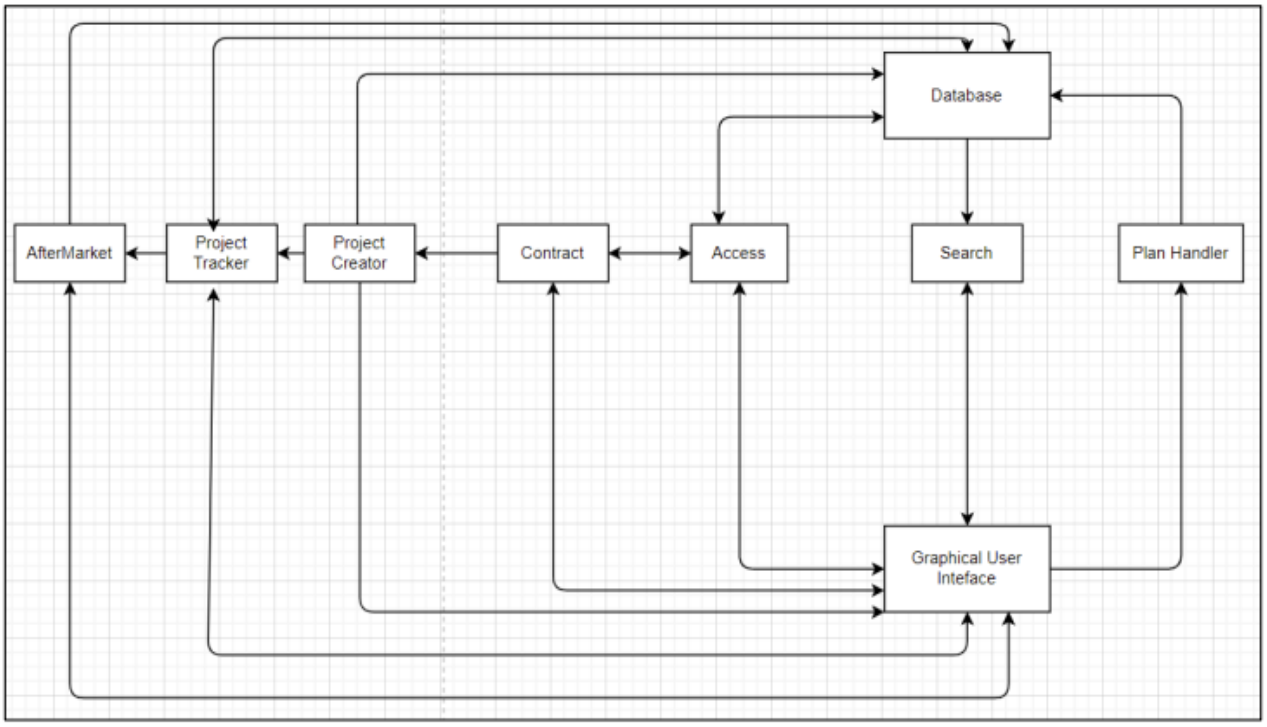
SERVICES MODEL

SERVICES MODEL	INPUTS	OUTPUTS	PRE-CONDITIONS	POST-CONDITIONS
LOGIN	User's login credentials	Authentication: checks if user is valid or not.	User should be able to input using his/her login credentials on the GUI.	Reads the supplied information from the user, reads the database data, verifies the user and provides the required access.
SEARCH / SORT	Keywords and list of providers.	List of providers after the sorting based on keywords provided.	User should be able to submit the keywords through GUI.	Keywords are read, database is accessed to get list of providers, message is

				displayed on chat.
CHAT	Message for Chat	Message displayed to users	Secure connection to be created for communication between client and provide after the contract has been signed.	Connection is created for chat, messages are read from the users and displayed on chat.
PLAN	Request from provider to subscribe to either basic or premium plan.	Provider subscribed to selected plan	One of the plans should be selected by provider via GUI	User data is read, it is written in database, subscription is provided for the selected plan.
FEEDBACK	Ratings/Comments/any other form of feedback from client as well as provider.	Feedback is displayed to the client.	Feedback information to be entered by user via GUI.	First the feedback supplied by the user is read, then it is written in database.
PAYMENT	Payment model related user information (Credit Card/Debit Card/Any other form of payment details)	The information is checked, based on which the payment is either accepted or declined.	Payment information to be entered by user via GUI.	Payment is received from client, 30% is deducted from that amount to pay the provider, client information is accessed from database to reflect the changes done.
SIGNUP	User credentials	User is registered as either a provider or a client.	GUI to be launched.	User data is read and stored in database.
GUI	Input from user	GUI output to user	User can run the system	Input is taken from user.
VERIFICATION	User submits the proof of business.	Validation check: The proof of business is	Users can provide proof via GUI.	Information is read and verified.

		checked for its validity.		
BIDDING	Client submits bidding request.	The bidding will either be accepted or rejected by the provider.	Users to submit the bidding request via GUI.	Bidding information is read, sent to provider, provider's response is read.
CONTRACT	User data which is newly signed	Verification: The user will either be signed up as a provider or client	Provider to signup via GUI.	User data is read, contract is sent to provider, its acceptance or rejection is verified.
TRACKER	Project data	Project Data is displayed on GUI	Project to be signed by both client and provider.	Project data is read.
CHANGE	User submits a 'Change Request'	Change Request is sent to provider and change is either accepted or rejected.	User to provide Change Request via GUI.	Data in Change Request is read and the same is sent to provider.
PROJECT HANDLER	Approval Request from client, Provider and project details.	Project is created	Users will submit the project request via GUI.	Project information is read, sent to the provider, response is read.

AQUAINTANCE MODEL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AfterMarket
Project Tracker
Project Creator
Contract
Access
Search
Plan Handler
Graphical User Inteface