

# Human Evaluation on DALLE

This form is intended to evaluate the quality of the results produced by DALLE, an LLM-based assistant designed to extract microservice-based architecture designs from textual input.

## Overview of the Evaluation

You will be asked to evaluate *4 different projects*. Each project includes:

- A *brief description* of the system to be generated
- A set of *user stories* related to the system

These inputs are provided to the DALLE system, which then produces an architectural design. Among others outputs, DALLE identifies:

- The **list of microservices**
- The **microservice and communication patterns** (based on the reference [book](#))

## Evaluation Process

For each project, you will be presented with:

- The original *system description* and *user stories*;
- A visual representation of the architecture generated by DALLE, including microservice patterns.

You are asked to evaluate whether the identified **data and communication style patterns** are appropriate and consistent with the project requirements.

Each evaluation question uses a **Likert scale from 1 to 7**, where:

- 1 = Strongly Disagree
- 7 = Strongly Agree

You may also provide **additional comments or observations** for each project in the dedicated Observation section.

## Reference Patterns

The evaluation is based on the following architecture design patterns (as defined in the reference [book](#)):

Communication Style Patterns:

- Shared Database
- Database per Service

Data Style Patterns:

- API Composition
- CQRS
- Saga
- Aggregate
- Event Sourcing
- Domain Event

### Final Questions

At the end of the form, you will find a few general questions about the perceived utility and effectiveness of DALLE as a tool for architectural design support.

*\* Indicates required question*

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1. Rate your experience in designing systems based on microservices architecture: \*

1	2	3	4	5
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☆	☆	☆	☆	☆
<hr/>				

2. How many years of experience do you have? \*

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3. What is your age? \*

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4. In what gender do you identify yourself? \*

*Mark only one oval.*

- ☐ Male
- ☐ Female
- ☐ Prefer not to say

5. Have you ever evaluated systems' architectures? \*

*Mark only one oval.*

☐ Yes

☐ No

6. Describe your role in the SE field \*

*Mark only one oval.*

☐ Practitioner

☐ Academic

## Ndannamo

### SYSTEM DESCRIPTION:

The goal of this project is to design and develop a distributed software system that assists individuals in organizing trips. Our solution aims to streamline the process of planning, coordinating, and managing trips, whether they are for leisure or business purposes, by offering a comprehensive suite of tools in a single platform.

Unlike traditional trip planning apps, this system integrates collaborative features like group chat and polls with financial management tools, offering a one-stop solution for trip organization. Its distributed nature ensures reliability and efficiency, catering to both small groups and large-scale travel needs.

### USER STORIES:

- 1) As a future user, I want to register via email and password, to begin using the application.
- 2) As a user, I want to login, to access the application's features.
- 3) As a user, I want to delete my account.
- 4) As a user, I want to access my profile, to see my information.
- 5) As a user, I want to modify my username.
- 6) As a user, I want to modify my password.
- 7) As a user, I want to see all my trips.
- 8) As a user, I want to search my trips by title or destination.
- 9) As a user, I want to see my pending invitations to some trips.
- 10) As a user, I want to create a Trip, to start planning my trip.
- 11) As a trip creator, I want to delete a Trip.
- 12) As a trip creator, I want to invite other users to my trip, to share trip information with them.
- 13) As a user, I want to accept an invitation to a trip.
- 14) As a user, I want to refuse an invitation to a trip.
- 15) As a trip creator, I want to revoke an invitation that has been sent.
- 16) As a trip participant, I want to leave the trip.
- 17) As a trip creator, I want to remove a participant from my trip.
- 18) As a trip participant, I want to modify the trip's title.
- 19) As a trip participant, I want to modify the trip's dates.
- 20) As a trip participant, I want to modify the trip's destinations.
- 21) As a trip participant, I want to see the trip's schedule.
- 22) As a trip participant, I want to filter my schedule by a specific day.
- 23) As a trip participant, I want to see the weather prediction for every day of the trip, to better plan my activities.
- 24) As a trip participant, I want to add an activity to a trip's schedule.
- 25) As a trip participant, I want to delete an activity from a trip's schedule.
- 26) As a trip participant, I want to see the details of an activity from the schedule.
- 27) As a trip participant, I want to modify an activity's name, time, place, date, address and additional information.
- 28) As a trip participant, I want to add an attachment to an activity.
- 29) As a trip participant, I want to see a map with a marker on the activity's address.
- 30) As a trip participant, I want to see an activity's attachments.
- 31) As a trip participant, I want to be able to download the attachments of an activity.
- 32) As a trip participant, I want to add a travel to a trip's schedule.

- 33) As a trip participant, I want to delete a travel from a trip's schedule.
- 34) As a trip participant, I want to see the details of a travel from the schedule.
- 35) As a trip participant, I want to modify a travel's name, departure time, arrival time, departure place, arrival place, date, and additional information.
- 36) As a trip participant, I want to add an attachment to a travel.
- 37) As a trip participant, I want to see a map with a marker on the travel's departure address.
- 38) As a trip participant, I want to see a travel's attachments.
- 39) As a trip participant, I want to be able to download the attachments of a travel.
- 40) As a trip participant, I want to change the main location of a night.
- 41) As a trip participant, I want to create an accommodation spanning several nights, to save information about it.
- 42) As a trip participant, I want to delete an accommodation.
- 43) As a trip participant, I want to see the details of a night's accommodation.
- 44) As a trip participant, I want to modify an accommodation's name, check-in and check-out time, dates, contacts, address and additional information.
- 45) As a trip participant, I want to add an attachment to an accommodation.
- 46) As a trip participant, I want to see an accommodation's attachments.
- 47) As a trip participant, I want to be able to download the attachments of an accommodation.
- 48) As a trip participant, I want to create a new expense, to settle up at the end of the trip.
- 49) As a trip participant, I want to change the title of an expense.
- 50) As a trip participant, I want to change the mount of an expense.
- 51) As a trip participant, I want to change the split of an expense.
- 52) As a trip participant, I want to change the date of an expense.
- 53) As a trip participant, I want to delete an expense.
- 54) As a trip participant, I want to see how much I spent during the trip.
- 55) As a trip participant, I want to know who I have to pay back.
- 56) As a trip participant, I want to know who have to pay me back.
- 57) As a trip participant, I want to settle my debts.
- 58) As a trip participant, I want to remind other users to settle their debts with me.
- 59) As a trip participant, I want to send a message to the others participants in a group chat.
- 60) As a trip participant, I want to see the message sent in the group chat in real time.
- 61) As the user who sent a message, I want to delete that message.
- 62) As the user who sent a message, I want to to modify that message.
- 63) As the user who sent a message, I want to see if other participants receive and/or read the message.
- 64) As a trip participant, I want to see the photos of a trip uploaded by me and the other participants.
- 65) As a trip participant, I want to upload a photo of a trip.
- 66) As a trip participant, I want to delete a photo of a trip.
- 67) As a user who's creating or updating a trip, I want to see be suggested names of cities.
- 68) As a user , I want to check if a user is online, so that I know if they are available to chat in real time

## Microservices

name	description
User Management Service	Handles user registration, authentication, profile management, and account deletion.
Trip Management Service	Manages creation, modification, deletion, and retrieval of trips, including trip invitations and participant management.
Schedule and Activity Service	Manages trip schedules including activities, travels, accommodations, and related details such as maps and attachments.
Expense Management Service	Handles creation, modification, deletion, and tracking of trip expenses, including debt settlement and reminders.
Group Chat Service	Provides real-time messaging capabilities for trip participants, including message sending, editing, deletion, and read receipts.
Photo Management Service	Manages uploading, viewing, and deleting photos related to trips.

## Patterns

group_name	implementation_pattern	involved_microservices	explanation
Data Management and Consistency Patterns	Saga Pattern	Trip Management Service,Expense Management Service	Operations like inviting users to trips and settling expenses require coordination across multiple services, making the Saga Pattern suitable for maintaining data consistency.
Data Management and Consistency Patterns	CQRS	Trip Management Service,Schedule and Activity Service	Query-heavy services benefit from maintaining read-only replicas or materialized views to optimize query performance without affecting command operations.

## 7 point likert scale

1. Strongly disagree
2. Disagree
3. Somehow disagree
4. Neither agree nor disagree
5. Somehow agree
6. Agree
7. Strongly agree

7. Is the division in microservice correct with respect to the context and the user stories? \*

1	2	3	4	5	6	7
☆	☆	☆	☆	☆	☆	☆

8. Is **Saga Pattern** correctly applied? \*

1	2	3	4	5	6	7
☆	☆	☆	☆	☆	☆	☆

9. Is **CQRS Pattern** correctly applied? \*

1	2	3	4	5	6	7
☆	☆	☆	☆	☆	☆	☆

10. Observations

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## **Nestigo**

### **SYSTEM DESCRIPTION:**

BedSpace Booking Platform is a system designed to simplify the process of discovering and booking affordable bed spaces for students and young professionals. Users can register, browse listings, post available spaces, and manage their bookings—all from a single intuitive interface.

The system consists of two main roles: Users (students/tenants) and Bed Owners (landlords/posters). Users can search and book spaces while Bed Owners can list and manage their postings.

### **USER STORIES:**

- 1) As a user, I want to register on the platform so I can book bed spaces.
- 2) As a user, I want to log in to my account to access personalized features.
- 3) As a user, I want to stay logged in across sessions for convenience.
- 4) As a user, I want to log out so my data remains secure.
- 5) As a user, I want to view available bed spaces to choose a suitable one.
- 6) As a user, I want to search for bed spaces by name or location.
- 7) As a user, I want to view detailed information about a bed space.
- 8) As a user, I want to view my profile information.
- 9) As a user, I want to contact the bed owner via WhatsApp for clarifications.
- 10) As a bed owner, I want to register so I can list available bed spaces.
- 11) As a bed owner, I want to log in and manage my listings.
- 12) As a bed owner, I want to add a new bed space with all necessary details.
- 13) As a bed owner, I want to view all my posted bed spaces.
- 14) As a bed owner, I want to edit or update my listings.
- 15) As a bed owner, I want to remove a listing if it's no longer available.
- 16) As an admin, I want to view all users for monitoring.
- 17) As an admin, I want to delete inappropriate listings or users.



## Microservices

name	description
User Management Service	Handles user registration, login, logout, session management, and profile information.
Bed Space Listing Service	Manages bed space listings including adding, viewing, editing, updating, and removing bed spaces by bed owners.
Communication Service	Facilitates communication between users and bed owners, such as contacting via WhatsApp.
Admin Management Service	Allows admins to monitor users and listings, including viewing all users and deleting inappropriate content.

## Patterns

group_name	implementation_pattern	involved_microservices	explanation
Saga Pattern	Saga	User Management Service, Bed Space Listing Service, Communication Service	For operations like user registration triggering listing permissions or communication setup, the Saga pattern ensures data consistency through a sequence of local transactions.
API Composition or CQRS for Queries	API Composition	Admin Management Service	To support queries requiring data from multiple services (e.g., admin viewing all users and listings), API Composition is used to invoke relevant services and compose results.

## 7 point likert scale

1. Strongly disagree
2. Disagree
3. Somehow disagree
4. Neither agree nor disagree
5. Somehow agree
6. Agree
7. Strongly agree

11. Is the division in microservice correct with respect to the context and the user stories?

\*

1	2	3	4	5	6	7
<hr/>						
☆	☆	☆	☆	☆	☆	☆
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12. Is **SAGA Pattern** correctly applied? \*

1	2	3	4	5	6	7
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☆	☆	☆	☆	☆	☆	☆
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13. Is **API Composition Pattern** correctly applied? \*

1	2	3	4	5	6	7
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☆	☆	☆	☆	☆	☆	☆
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14. Observations

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## SmartCuisine

### SYSTEM DESCRIPTION:

Smart Cuisine aims to develop an application to discover new recipes and check their nutritional values in order to monitor the daily intake of macronutrients.

This application aims to improve the quality of the food intake and to give new ideas to people who want to eat in a healthier way, without giving up on tasty meals.

The application meets the needs of the users with dietary restrictions given by health issues, intolerances and religious or moral choices.

To achieve the previous purposes the system allows short-term and medium-term meal planning for the following days.

The type of users which could be interested about this application are personal trainers, people who can't afford a dietist or prefer to plan their meals by themselves.

Another possible user could be a person who uses the application to write down his shopping list and check the nutritional values of the items in the list.

### USER STORIES:

- 1) As a not registered user, I want to subscribe with email and password so that being a registered user.
- 2) As a registered user, I want to log in with email and password so that logging in my account.
- 3) As a registered user, I want to access my profile so that I can visualize my personal data.
- 4) As a registered user, I want to delete my account so that being no more a registered user.
- 5) As a registered user, I want to modify my email address so that I can update it.
- 6) As a registered user, I want to modify my password so that I can update it.
- 7) As a registered user, I want to modify my gender so that I can update it.
- 8) As a registered user, I want to add my ingredients to the storage so that I can keep track of the ingredients I have at home.
- 9) As a registered user, I want to delete an ingredient from my storage so that I can delete an ingredient I used for a recipe.
- 10) As a registered user, I want to search for recipes so that I can find ideas for meals.
- 11) As a registered user, I want to save recipes so that I can access them easily in the future.
- 12) As a registered user, I want to add the ingredients to my shopping list so that I can keep track of what I need to buy.
- 13) As a registered user, I want to delete a saved recipe so that I can remove it if I don't like it.
- 14) As a registered user, I want to search recipes containing a specific ingredient so that I can find something I can cook with the ingredients I have in storage.
- 15) As a registered user, I want to move the ingredients from my shopping list to my ingredients storage so that I can keep track of what I bought.
- 16) As a registered user, I want to delete an ingredient from my shopping list so that I can remove it if I already have it.
- 17) As a registered user, I want to set the expiration date for the ingredients in my storage so that I can remember when they will expire.
- 18) As a registered user, I want to receive notifications 1 day before my ingredients expire so that I have time to cook them before the expiration date.
- 19) As a registered user, I want to set the quantity for the ingredient in my storage so that I can know the quantities of each ingredient in the storage.

- 20) As a registered user, I want to create a shopping list, so that I can keep track of what I want to buy.
- 21) As a registered user, I want to delete a shopping list, so that I can keep track of what I want to buy.
- 22) As a registered user, I want to read my shopping lists, so that I know what to buy.

## Microservices

name	description
User Management Service	Handles user registration, authentication, profile management, and account deletion.
Ingredient Storage Service	Manages the user's ingredient inventory including adding, deleting, setting expiration dates, quantities, and notifications for expiring ingredients.
Recipe Management Service	Allows users to search, save, and delete recipes, including searching recipes by specific ingredients.
Shopping List Service	Manages shopping lists including creation, reading, updating, moving ingredients to storage, and deletion of shopping lists.

## Patterns

group_name	implementation_pattern	involved_microservices	explanation
Data Consistency	Saga	Ingredient Storage Service, Shopping List Service	I chose this pattern to maintain data consistency when moving ingredients from Shopping List to Ingredient Storage.
Query Efficiency	API Composition	Recipe Management Service, Ingredient Storage Service	I chose this pattern to fulfill complex queries by invoking multiple service APIs and performing in-memory joins.

7 point likert scale

- 1. Strongly disagree
- 2. Disagree
- 3. Somehow disagree
- 4. Neither agree nor disagree
- 5. Somehow agree
- 6. Agree
- 7. Strongly agree

15. Is the division in microservice correct with respect to the context and the user stories? \*

1234567

16. Is **Saga Pattern** correctly applied? \*

1234567

17. Is **API Composition Pattern** correctly applied? \*

1234567

18. Observations

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# WattsUp

## SYSTEM DESCRIPTION:

Our distributed application concerns energy (electricity) management, both on the user's side and on the energy grid level.

The energy grid is the system that allows the distribution of electricity from the power stations to the final consumers. An important role in this process is done by the grid control center (we call it the central node). This structure manages the distribution of energy, in order to always ensure the stability and availability of energy. Each central node covers a certain area with the users residing in it. It is also linked to other adjacent central nodes, and (possibly) to a power station.

A crucial element in the energy grid system are the energy storages, since they allow storage of energy for later use; this improves the stability of the system. Usually they are batteries or some other similar method of storing energy.

## USER STORIES:

- 1) As a user, I want to register an account with my personal information, so that I can be a registered user.
- 2) As a central node manager, I want to register a new central node and link it to providers and users, so that I can ensure proper energy distribution.
- 3) As a user, I want to log in with username and password so that I can access all the website functionalities.
- 4) As a user, I want to have a home page, so that I can quickly access all the areas of the website.
- 5) As a user, I want to be able to access my personal information, so that I can change my password
- 6) As a user, I want to be able to register my devices, so that I can monitor their consumption.
- 7) As a user, I want to have a page where I can see all the notifications that are sent me so that I can be aware of the changes that are happening.
- 8) As a user, I want to monitor my energy consumption and production through a dashboard, so that I can track my energy usage and make informed decisions.
- 9) As a user, I want to receive personalized energy-saving tips and sustainability recommendations, so that I can reduce my costs and environmental impact.
- 10) As a central node manager, I want to monitor the real-time energy usage of all users in my grid, so that I can efficiently distribute energy and maintain grid stability.
- 11) As a renewable energy producer, I want to sell my surplus energy to the central node, so that I can earn revenue from my production.
- 12) As a user, I want to receive energy bills sent by the central node based on my provider's rates and my consumption, so that I can track my expenses.
- 13) As a central node manager, I want to be able to see the energy storage levels within my grid, so that I can ensure energy availability during peak demand.
- 14) As a user I want to be able to access my energy storage in order to see my stored energy level.
- 15) As a user, I want to compare different energy providers within my central node, so that I can choose the most convenient and sustainable option.
- 16) As a user, I want to insert/update my current provider contract, so that I can adjust my account to fit my changing energy needs.

- 17) As a user, I want to access a history of my past energy bills, so that I can review my previous payments and budget accordingly.
- 18) As a user, I want to receive notification when a new bill is produced by the central node, so that I can know when to pay it.
- 19) As a user, I want to select my energy source (renewable or traditional) when signing up with a provider, so that I can align my consumption with my sustainability goals.
- 20) As a user, I want to buy additional energy from the central node when my energy needs exceed my provider's supply, so that I can avoid power shortages.
- 21) As a user, I want to be able to pay through an integrated payment gateway (Stripe), so that I can manage transactions efficiently.
- 22) As a user, I want to insert and change my payment method, so that I can pay bills or energy.
- 23) As a user, I want to receive real-time transaction confirmations when buying or selling energy, so that I have a clear record of my energy trades.

## Microservices

name	description
User Management Service	Handles user registration, authentication, profile management, and personal information updates.
Central Node Management Service	Manages central nodes registration, linking to providers and users, and oversees grid-level operations.
Device Management Service	Allows users to register and manage their energy-consuming devices for monitoring purposes.
Notification Service	Manages sending and displaying notifications to users about system updates, bills, and other alerts.
Energy Consumption and Production Service	Provides dashboards and tools for users to monitor their energy consumption and production data.
Energy Saving Tips Service	Delivers personalized energy-saving tips and sustainability recommendations to users.
Energy Trading Service	Facilitates buying and selling of surplus energy between users (producers) and the central node.
Billing Service	Generates and sends energy bills to users based on consumption and provider rates, and manages billing history.
Energy Storage Service	Monitors and provides information about energy storage levels both at the grid and user level.
Provider Management Service	Allows users to compare energy providers, select energy sources, and manage provider contracts.
Payment Service	Handles payment methods, processes payments through integrated gateways, and provides transaction confirmations.
Home Page Service	Provides the home page interface for users to quickly access all website functionalities.



Patterns

group_name	implementation_pattern	involved_microservices	explanation
Database per Service Pattern	database per service	User Management Service,Central Node Management Service,Device Management Service,Notification Service,Energy Consumption and Production Service,Energy Saving Tips Service,Energy Trading Service,Billing Service,Energy Storage Service,Provider Management Service,Payment Service,Home Page Service	Each microservice should have its own database to ensure loose coupling and independent scalability.
Saga Pattern	saga	Energy Trading Service,Payment Service,Billing Service	Saga pattern is ideal to maintain data consistency across services through a series of local transactions with compensating actions.
API Composition and CQRS Patterns	api composition and cqrs	Energy Consumption and Production Service,Provider Management Service	Queries that require data aggregated from multiple services should use API Composition or CQRS for improved performance and availability.

7 point likert scale

- 1. Strongly disagree
- 2. Disagree
- 3. Somehow disagree
- 4. Neither agree nor disagree
- 5. Somehow agree
- 6. Agree
- 7. Strongly agree

19. Is the division in microservice correct with respect to the context and the user stories? \*

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20. Is **Saga Pattern** correctly applied? \*

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21. Is **CQRS Pattern** correctly applied? \*

1	2	3	4	5	6	7
☆	☆	☆	☆	☆	☆	☆

22. Is **Database per Service Pattern** correctly applied? \*

1	2	3	4	5	6	7
☆	☆	☆	☆	☆	☆	☆

23. Is **API composition Pattern** correctly applied? \*

1	2	3	4	5	6	7
☆	☆	☆	☆	☆	☆	☆

24. Observations

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### Utility of DALLE

Please answer the following questions related to the utility of the proposed approach.

Look at the [demo](#) of the tool to understand how it works.

25. Would you consider using DALLE to help design system architectures? \*

*Mark only one oval.*

☐ Yes

☐ No

☐ Other: \_\_\_\_\_

26. Do you think DALLE could make your work easier or more efficient? \*

*Mark only one oval.*

☐ Yes

☐ No

☐ Other: \_\_\_\_\_

27. Would you use DALLE to check or validate your design ideas? \*

*Mark only one oval.*

☐ Yes

☐ No

☐ Other: \_\_\_\_\_

28. Do you find the suggestions provided by DALLE useful? \*

*Mark only one oval.*

☐ Yes

☐ No

☐ Other: \_\_\_\_\_

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