User Stories for online waste recycling application.

The objective is to investigate how different LLMs detect and resolve ambiguities within user stories compared to human participants. We aim to explore differences and similarities between the solutions presented by both LLMs and human individuals. This research aims to deliver fresh insights into the roles of LLMs in detecting and resolving ambiguities within user stories and bridging the existing research gap.

Domain description:
The waste recycling application is a website that allows users to view nearby recycling centers and see their details, for example, the opening hours. Users can book drop-off days to visit the recycling center and drop off waste. Each user can create an account and access their profile page. The profile page will allow users to favorite any recycling centers, enter their weekly schedule, and get recommendations for recycling centers. Users can also view details about previously recycled waste in the history section on the profile page.

A recycling center can also create an account to enter their opening hours, location, and types of materials to recycle. The admins of the system are responsible for managing the data of both users and recycling centers. The admin has permission to block specific user accounts. By collecting user feedback, admins of the application can update the system features. Overall, this system is a home to facilitate better waste management with the help of an interactive platform.

How can you help?
Following are 20 user stories for this application domain.

Please refer to the QUS framework criteria available below to evaluate whether the user stories are ambiguous or not and answer the questions. You are requested to answer all questions related to them. To complete this questionnaire you will need **approximately 30 minutes**.

Please note that your answers will be stored anonymously and the data will remain confidential. Your participation is voluntary and you have the right to withdraw from the experiment without any consequences at any time.

This is a data collection process for the bachelor's thesis. For any questions or feedback please contact **gusciuag@student.gu.se**.

* Indicates required question

Quality User Story Framework

Reference:
 G. Lucassen, et al. "Forging high-quality user stories: To-
wards a discipline for agile requirements," in 2015 IEEE
23rd international requirements engineering conference
(RE), IEEE, 2015, pp. 126–135

As a user of the system, I want to be able to select different types of recyclable waste, so I get a list of facilities that accept each type and their opening hours, so that I can find an optimal route and schedule.

QUS Framework

QUALITY USER STORY FRAMEWORK

Criteria	Description
Syntactic	
- Atomic	A user story expresses a requirement for exactly one feature
- Minimal	A user story contains nothing more than role, means and ends
- Well-formed	A user story includes at least a role and a means
Semantic	
- Conflict-free	A user story should not be inconsistent with any other user story
- Conceptually sound	The means expresses a feature and the ends expresses a rationale, not something else
- Problem-oriented	A user story only specifies the problem, not the solution to it
- Unambiguous	A user story avoids terms or abstractions that may lead to multiple interpretations
Pragmatic	
- Complete	Implementing a set of user stories creates a feature-complete application, no steps are missing
- Explicit dependencies	Link all unavoidable, non-obvious dependencies on user stories
- Full sentence	A user story is a well-formed full sentence
- Independent	The user story is self-contained, avoiding inherent dependencies on other user stories
- Scalable	User stories do not denote too coarse-grained requirements that are difficult to plan and prioritize
- Uniform	All user stories follow roughly the same template
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1.   Is this user story ambiguous? *

Mark only one oval.

◯ Yes

◯ No

◯ Not sure

2.   If the answer to the previous version was yes, can you fix it? If yes, please write the correct version of the full user story, following the format "As a (..), I want (..), so that (..)". If no, please write no.

_____

As a user of the system, I want to get feedback when I enter an invalid zip code.

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3. Is this user story ambiguous? *

Mark only one oval.

◯ Yes

◯ No

◯ Not sure

4. If the answer to previous version was yes, can you fix it? If yes, please write the correct version of the full user story , following the format "As a (..), I want (..), so that (..)". If no, please write no.

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As a user of the system, I want to be able to give my email address, so that I can receive notifications for new events as they are posted.

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5.   Is this user story ambiguous? *

   Mark only one oval.

   ◯ Yes

   ◯ No

   ◯ Not sure

6.   If the answer to previous version was yes, can you fix it? If yes please write the correct version of the full user story , following the format "As a (..), I want (..), so that (..)". If no, please write no.

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   As a user of the system, I want the recycling center to have flexible opening hours, so that I can more conveniently use the website.

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   ◯ No

   ◯ Not sure

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   As a user of the system, I want the application to be user friendly, so that all age groups can use it.

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9. Is this user story ambiguous? *

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◯ Yes

◯ No

◯ Not sure

10. If the answer to previous version was yes, can you fix it? If yes please write the correct version of the full user story , following the format "As a (..), I want (..), so that (..)". If no, please write no.

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As a user of the system, I want to favorite recycling centers after account creation, so that I can view them later on my profile.

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◯ No

◯ Not sure

12.　　If the answer to previous version was yes, can you fix it? If yes please write the correct version of the full user story , following the format "As a (..), I want (..), so that (..)". If no, please write no.

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A user wants to have a great UI and UX from the sites.

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14.   If the answer to previous version was yes, can you fix it? If yes please write the correct version of the full user story , following the format "As a (..), I want (..), so that (..)". If no, please write no.

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As a user of the system, I want to view user manual for the application, so that I know how to use the system.

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I want to have data encryption mechanisms, so that important information protected from malicious intent.

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As an admin of the system, I want to view users' statistics, so that I can view in real-time how many users have visited my recycling center information and their recyclable waste.

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◯ Yes

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◯ Not sure

20. If the answer to previous version was yes, can you fix it? If yes please write the correct version of the full user story , following the format "As a (..), I want (..), so that (..)". If no, please write no.

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As a user of the system, I want to be able to enter my zip code as well as get a list of nearby recycling facilities, so that I can determine which ones I should consider.

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◯ Not sure

22.   If the answer to previous version was yes, can you fix it? If yes please write the correct version of the full user story , following the format "As a (..), I want (..), so that (..)". If no, please write no.

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As an admin of the system, I want to be able to update recycling facilities' address, so that users get the most recent information.

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◯ No

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As a developer of the system, I want to access an API from the website, so that I can integrate it and implement certain features in my own iOS application.

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◯ No

◯ Not sure

26.   If the answer to previous version was yes, can you fix it? If yes please write the correct version of the full user story , following the format "As a (..), I want (..), so that (..)". If no, please write no.

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As a user of the system, I want to be able to create an account, so that I can update my profile.

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28.   If the answer to previous version was yes, can you fix it? If yes please write the correct
version of the full user story , following the format "As a (..), I want (..), so that (..)". If no,
please write no.

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As an admin of the system, I want to be able to block specific users based on IP address, so
that I can prevent spamming on the websites.

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◯ No

◯ Not sure

30.   If the answer to previous version was yes, can you fix it? If yes please write the correct version of the full user story , following the format "As a (..), I want (..), so that (..)". If no, please write no.

_____

As an admin of the system, I want to be able to read users' feedback, so that I can keep improving the service.

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32. If the answer to previous version was yes, can you fix it? If yes please write the correct version of the full user story , following the format "As a (..), I want (..), so that (..)". If no, please write no.

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As an admin of the system, I want to get notifications from users of the application quickly, so that I can process their requests.

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34. If the answer to previous version was yes, can you fix it? If yes please write the correct version of the full user story , following the format "As a (..), I want (..), so that (..)". If no, please write no.

_____

As an admin of the system, I want to be able to have a dashboard that shows usage stats and locations, so that I can identify the neighborhoods with the largest number of drop-offs as well as try getting more facilities involved.

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35.   Is this user story ambiguous? *

Mark only one oval.

◯ Yes

◯ No

◯ Not sure

36.   If the answer to previous version was yes, can you fix it? Is yes please write the correct version of the full user story , following the format "As a (..), I want (..), so that (..)". If no, please write no.

_____

As a user of the system, I want to be able to view a map of the public recycling bins around my area, so that I can select the recycling bin closest to my house.

QUS Framework

QUALITY USER STORY FRAMEWORK

Criteria	Description
Syntactic	
- Atomic	A user story expresses a requirement for exactly one feature
- Minimal	A user story contains nothing more than role, means and ends
- Well-formed	A user story includes at least a role and a means
Semantic	
- Conflict-free	A user story should not be inconsistent with any other user story
- Conceptually sound	The means expresses a feature and the ends expresses a rationale, not something else
- Problem-oriented	A user story only specifies the problem, not the solution to it
- Unambiguous	A user story avoids terms or abstractions that may lead to multiple interpretations
Pragmatic	
- Complete	Implementing a set of user stories creates a feature-complete application, no steps are missing
- Explicit dependencies	Link all unavoidable, non-obvious dependencies on user stories
- Full sentence	A user story is a well-formed full sentence
- Independent	The user story is self-contained, avoiding inherent dependencies on other user stories
- Scalable	User stories do not denote too coarse-grained requirements that are difficult to plan and prioritize
- Uniform	All user stories follow roughly the same template
- Unique	Every user story is unique, duplicates are avoided

37.   Is this user story ambiguous? *

Mark only one oval.

◯ Yes

◯ No

◯ Not sure

38.   If the answer to previous version was yes, can you fix it? Is yes please write the correct
        version of the full user story , following the format "As a (..), I want (..), so that (..)". If no,
        please write no.

_____

As a user of the system, I want to be able to check the history of waste I recycled as well as
keep a record of it, so that I can review previous waste deposits.

QUS Framework

QUALITY USER STORY FRAMEWORK

Criteria	Description
Syntactic	
- Atomic	A user story expresses a requirement for exactly one feature
- Minimal	A user story contains nothing more than role, means and ends
- Well-formed	A user story includes at least a role and a means
Semantic	
- Conflict-free	A user story should not be inconsistent with any other user story
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- Uniform	All user stories follow roughly the same template
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39. Is this user story ambiguous? *

Mark only one oval.

◯ Yes

◯ No

◯ Not sure

40. If the answer to previous version was yes, can you fix it? Is yes please write the correct version of the full user story , following the format "As a (..), I want (..), so that (..)". If no, please write no.

_____

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