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Human-Centred Approach to Chatbot Design

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PhD Context

- Funded by SDS & SGSSS
- Supervisor-led proposal:
  - ‘Natural language interfaces to support career decision-making of young people’
  - Information Science
  - Natural Language Understanding / Generation
  - Career Development Theory
- PhD Supervisors:
  - David Brazier
  - Dimitra Gkatzia
  - Pete Robertson
- SDS Sponsor – Sandra Cheyne

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Skills Development Scotland

Scottish Graduate School of Social Science

Sgoil Cheumnaichean Saidheans Sòisealta na h-Alba

What are Chatbots?

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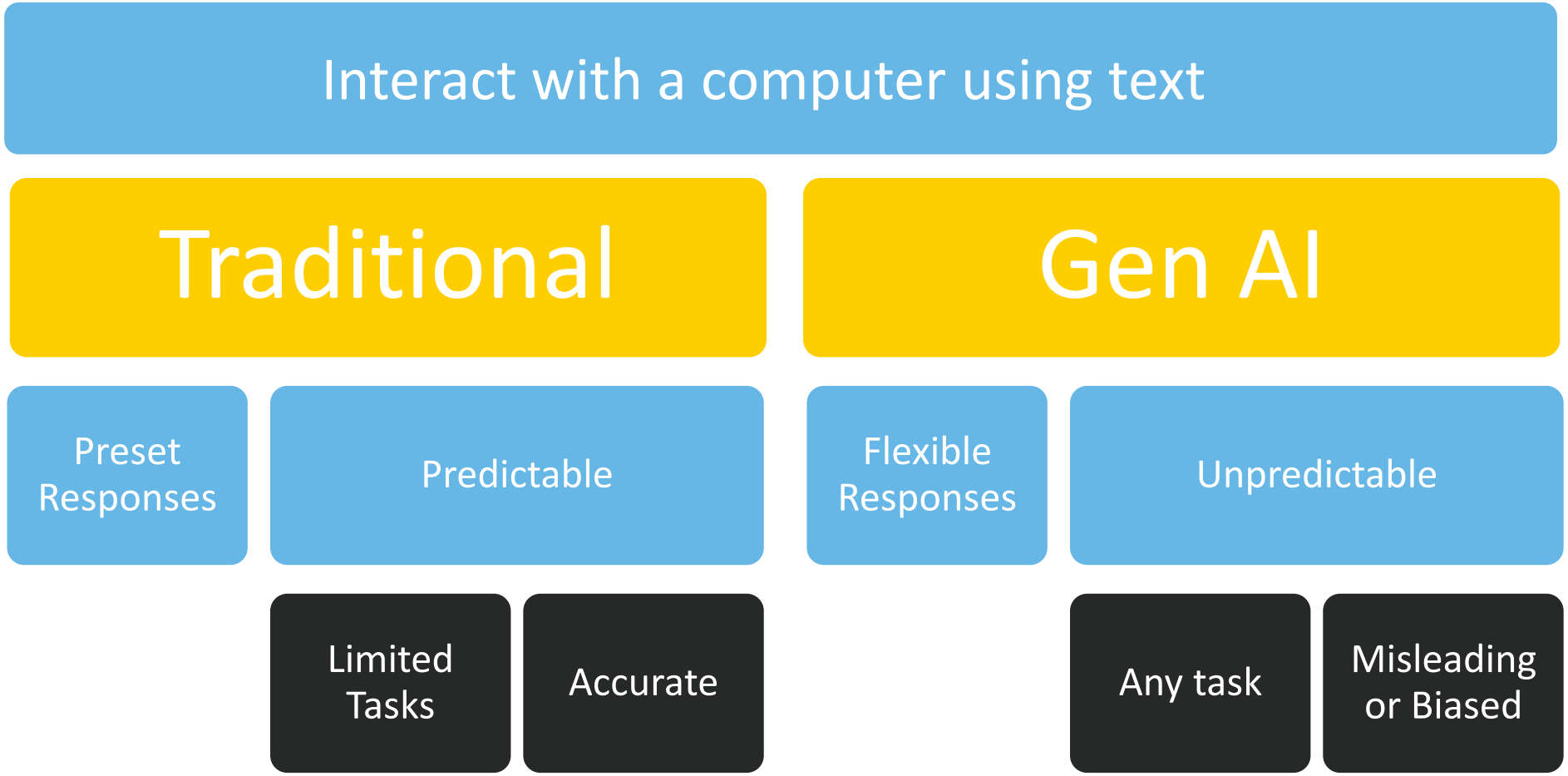

Research Context

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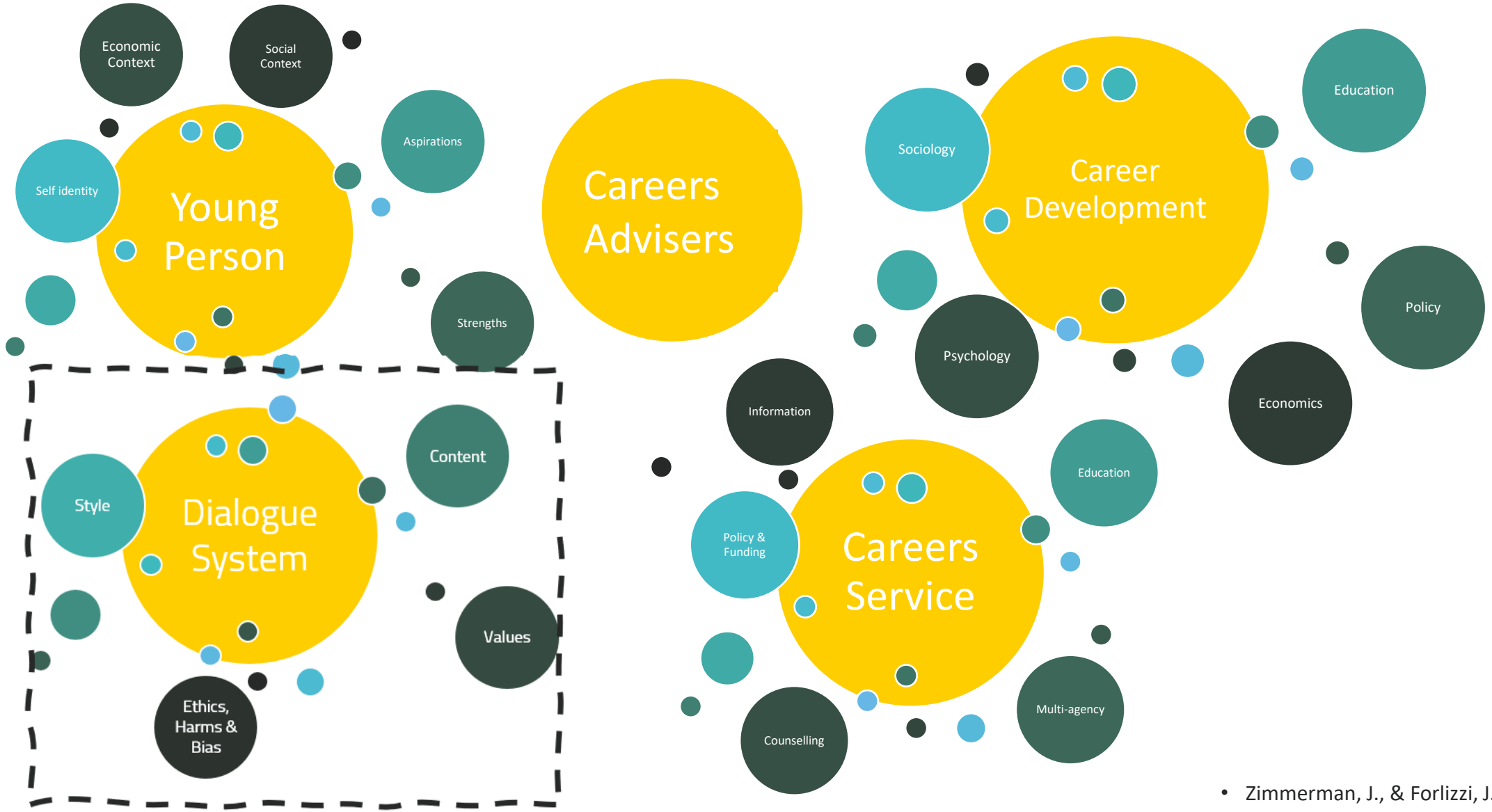


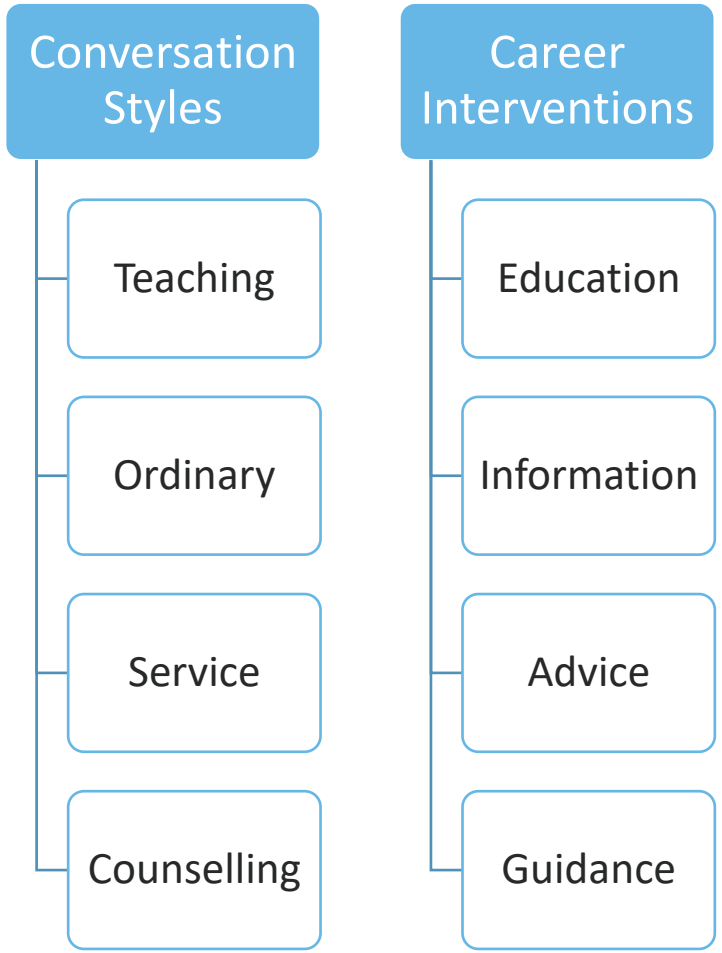
- Zimmerman, J., & Forlizzi, J. (2014)
- The Scottish Approach to Service Design (2019)

Research Questions

- Which career support tasks could a dialogue system be useful for in the context of SDS's existing services for young people?
- How can the ethical integrity of a dialogue system for use in this domain be managed effectively?
- Which conversation designs will deliver a positive user experience in this context?

Conversation Design

- Based on Conversational Analysis
- Natural Conversation Framework Pattern Language
  - Conversation level
    - e.g opening, closing, expectation setting, task identification
  - Sequence level
    - e.g. clarifications, repair, opening, closing



Moore RJ & Arar R *Conversational UX Design: A practitioner's guide* (2019)

Delphi Study Method

What

- Panel of Experts
- Multiple rounds of surveys
- Results of previous round included
- Anonymous

Why

- Build Consensus
- Qualitative data
- Mitigate prestige/ power
- Analysis is refined, rejected or validated

Linstone & Turoff, 1975/2002
Baumer et al, 2020

Sambasivan & Veeraraghavan (2022)
Birhane et al (2022)

The Panel

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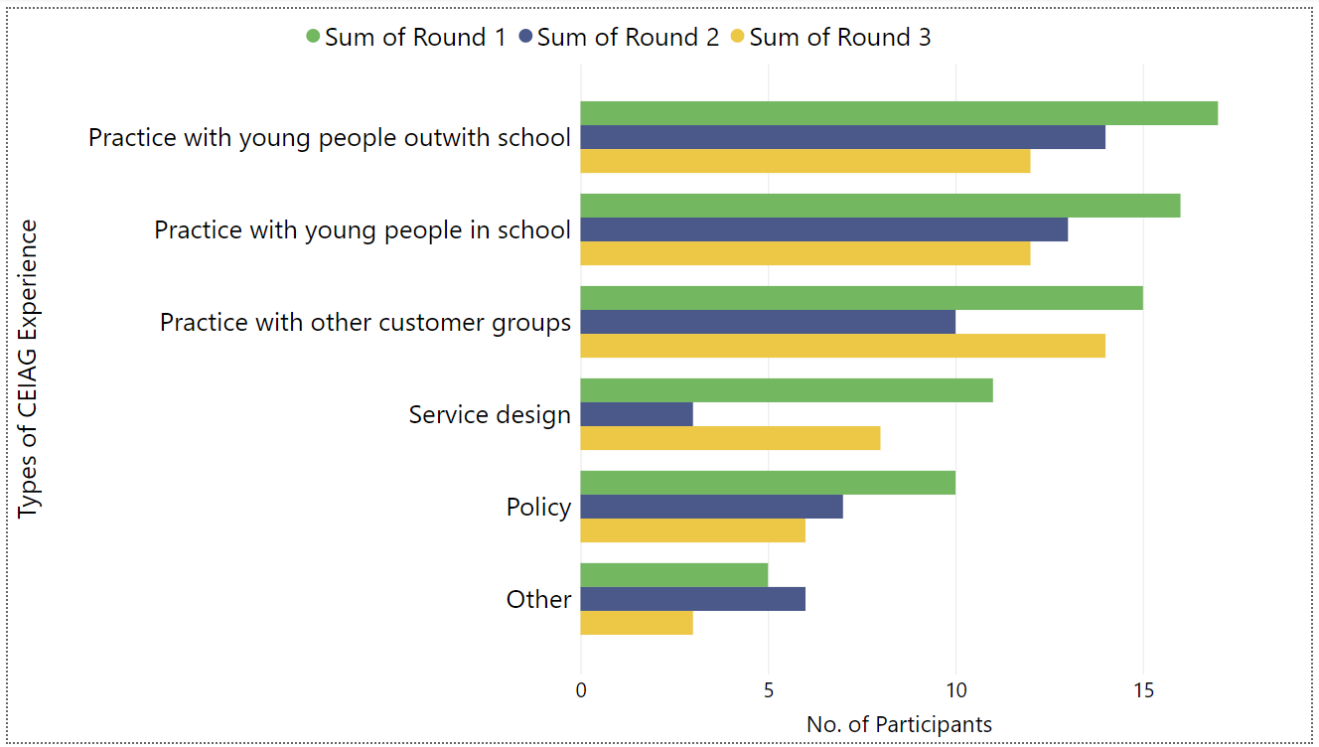

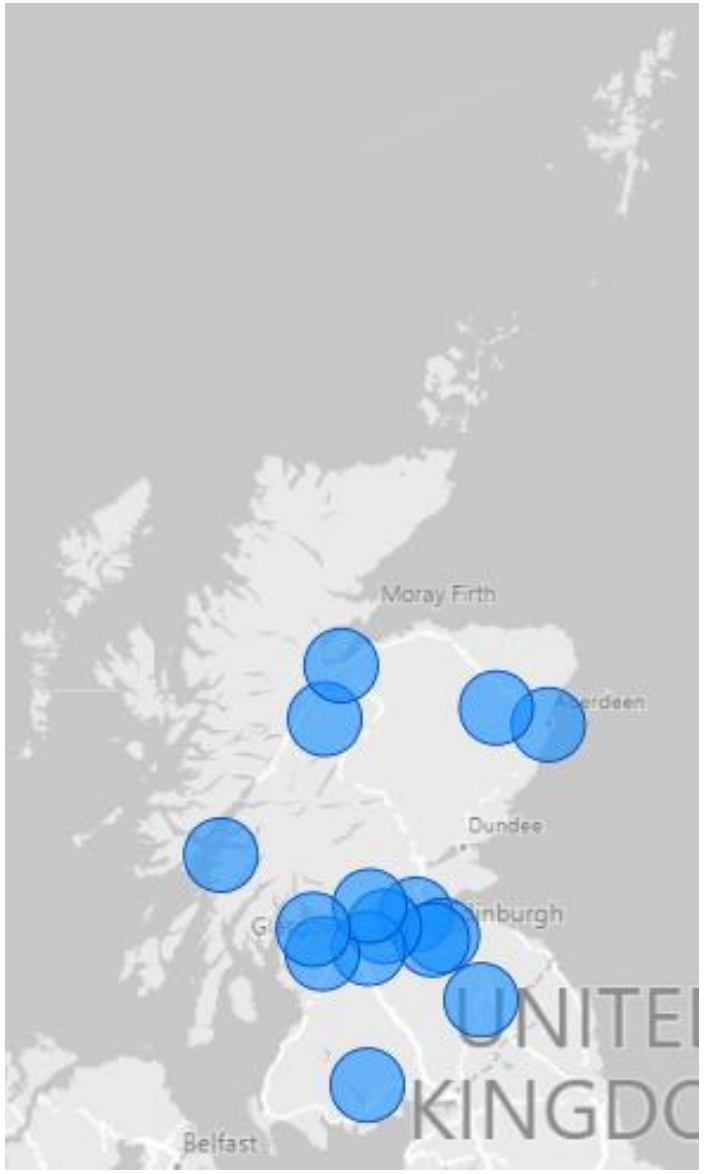

NO. OF PARTICIPANTS	
ROUND 1	23
ROUND 2	22
ROUND 3	20

YEARS OF EXPERIENCE	RD 1	RD 2	RD 3
Average	13	15	17
Min	3	3	3
Max	31	31	32

Delphi Study Design

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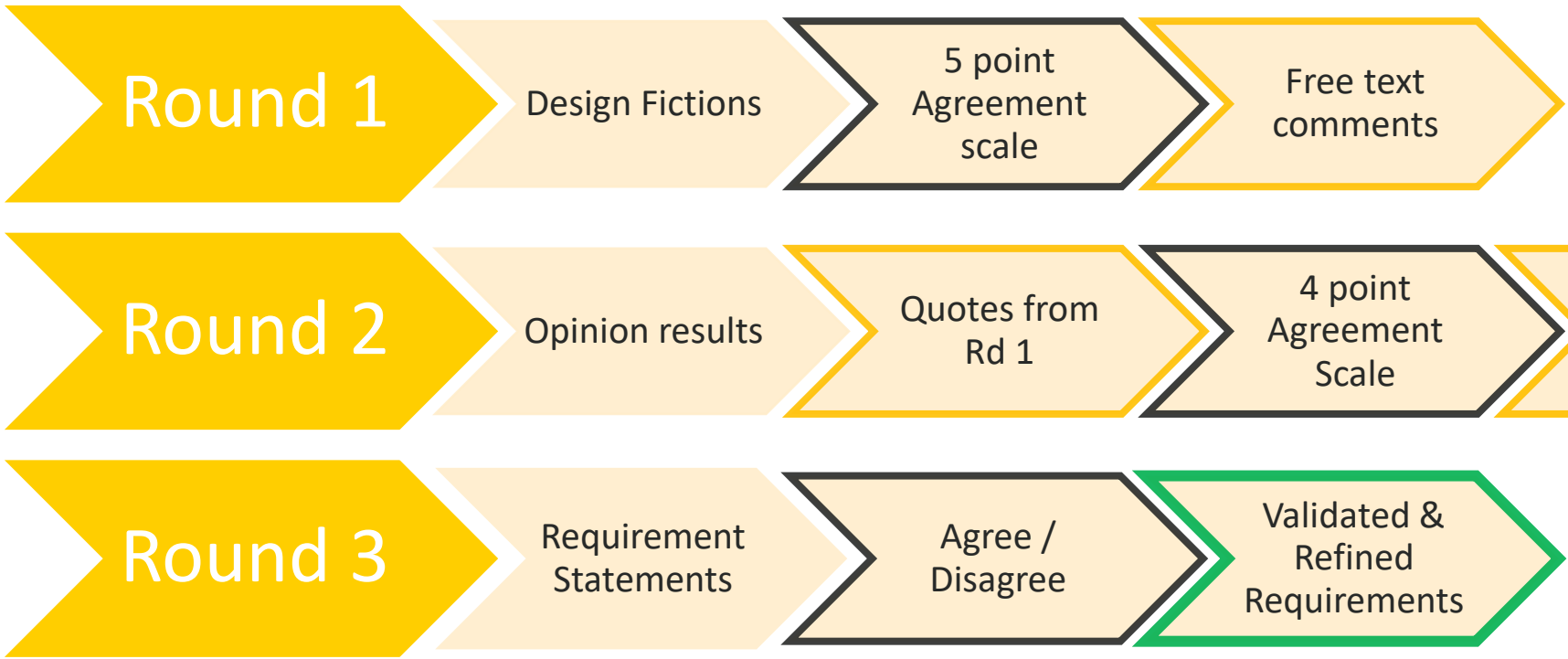

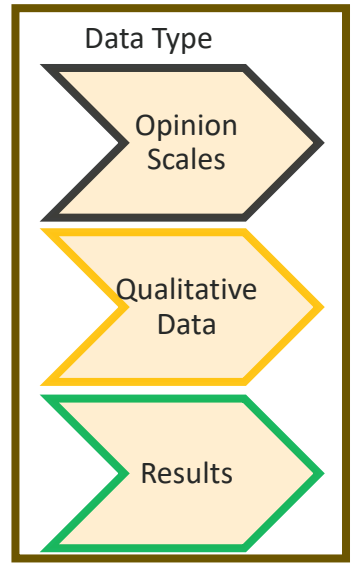

Design Fictions

- Speculative design method
- Four imagined scenarios of young people using chatbots for:
  - Signposting to services
  - Career information
  - In-class CMS activities
  - Support for personal statements
- Each included details about:
  - Location and route to access
  - The interaction
  - The outputs
- Included both ‘good’ and ‘bad’ design elements

Interim Findings

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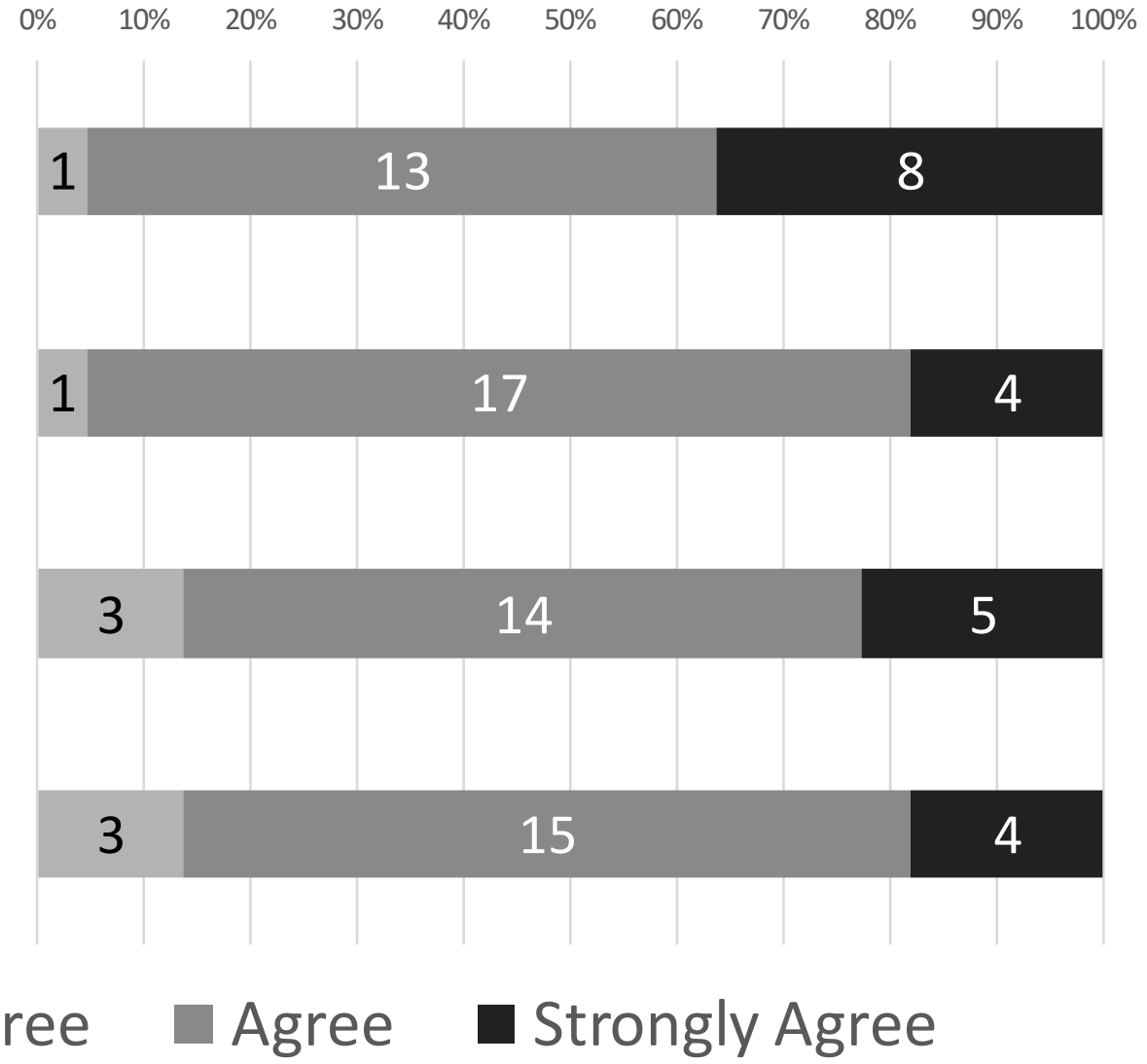
The chatbot should help users to slice through the sheer volume of information

The chatbot should feed curiosity, initial thoughts, support the learning process (CMS)

The chatbot could act as a diagnostic tool for customers that helps them realise they have more to consider

The chatbot should also be used for nudging young people



Results: The Task

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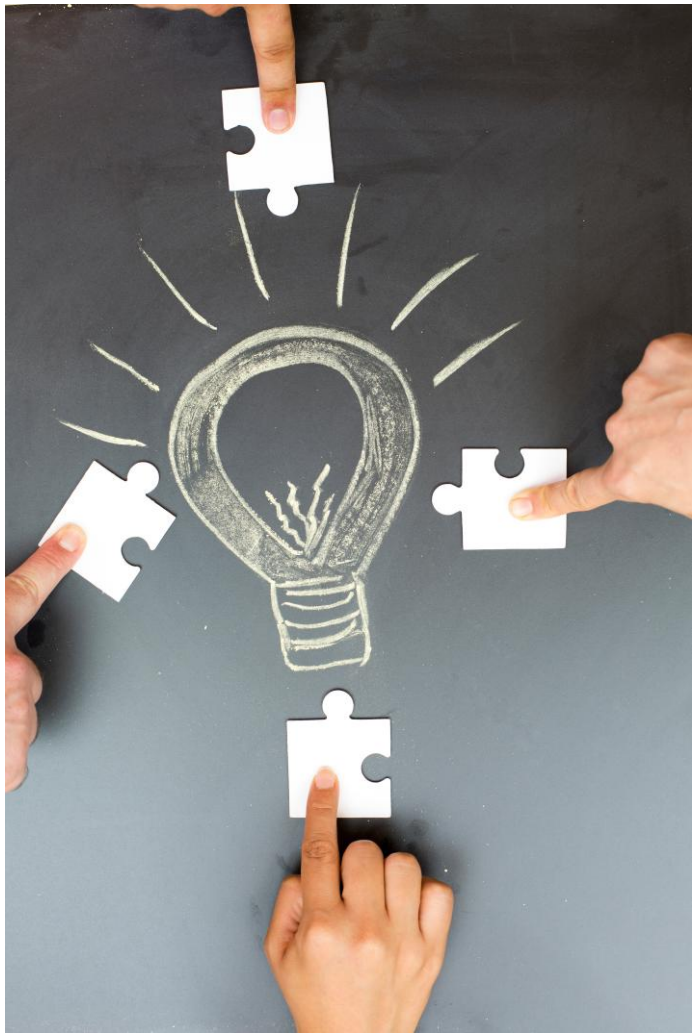
- The chatbot should support young people to **navigate information** in a way that encourages **curiosity and exploration**.
- The chatbot should be thoroughly **tested** to ensure it **meets the needs of young people** using it as an **independent self-service route** to access support.
- The chatbot should ensure that the **range of information** presented is broad enough to encourage users to **explore their options further**.



Savickas, Mark L., and Erik J. Porfeli. 'Career Adapt-Abilities Scale: Construction, Reliability, and Measurement Equivalence across 13 Countries'. *Journal of Vocational Behavior* 80, no. 3 (June 2012): 661–73.

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Results:
Integration with Existing Services

- The chatbot should ensure that all users are aware of how to access other sources of support from partner organisation (e.g. Helpline, appointment with careers adviser).
- The chatbot should function well as a tool for independent use. It should not require significant changes to existing services in order for potential benefits to be realised for young people.
- Users should be made aware of alternative sources of support, and how to access them before any potentially overwhelming responses are provided.
- The chatbot should be tested with young people to determine the appropriate volume and complexity of information to be included in chatbot responses.

Results: Integrity

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- Ensuring that users **understand the scope and limitations** of the chatbot is important for aligning with the partner organisation's approach to career support.

- The chatbot should focus on guiding users through **existing SDS-managed information**, but it may be appropriate to direct users to **carefully selected external sources** where required.

- Customisation of responses should be based on **high level, non-sensitive information** provided by users during the conversation only. (For example: whether user is in school/unemployed/college etc; non-specific location).

Results: No Consensus

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- The chatbot should not be password protected, and therefore should not store or process personal or sensitive data.
- If it is unclear what level of support a user required, it would be preferable for the chatbot to encourage the user to contact the helpline or a careers adviser, before continuing the interaction, even though this may result in some unnecessary calls / appointments
- There may be occasions where it is clear that a user requires a level of support beyond the scope of the chatbot but continues the interaction even after being advised to contact the helpline or an adviser. In these circumstances it would be preferable for the chatbot to reiterate other sources of support available and end the conversation in order to avoid the risk of confusing the young person, even although this may mean their experience with the chatbot is perceived negatively.

Summary

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- **Useful** Conversational Agent = Understanding the **Task**
- Understanding the Task = Working with **Domain Experts**
- Domain Experts = **SDS Staff**

- **Delphi Study**
  - 3 rounds of surveys
  - Round 1 – Design Fictions
  - Round 2 – Experts in their own words
  - Round 3 – Requirement Statements
- **Requirement Statements = System Evaluation**

CDI AI for Career Practitioners Course

The chatbot should support young people to **navigate information** in a way that **encourages curiosity and exploration.**

Thank you!

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