Statistisk sentralbyrå
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WORLD STATISTICS CONGRESS 2025 THE HAGUE

<Session IPS 887 >
Harnessing new technologies to improve the respondent experience and hence data quality

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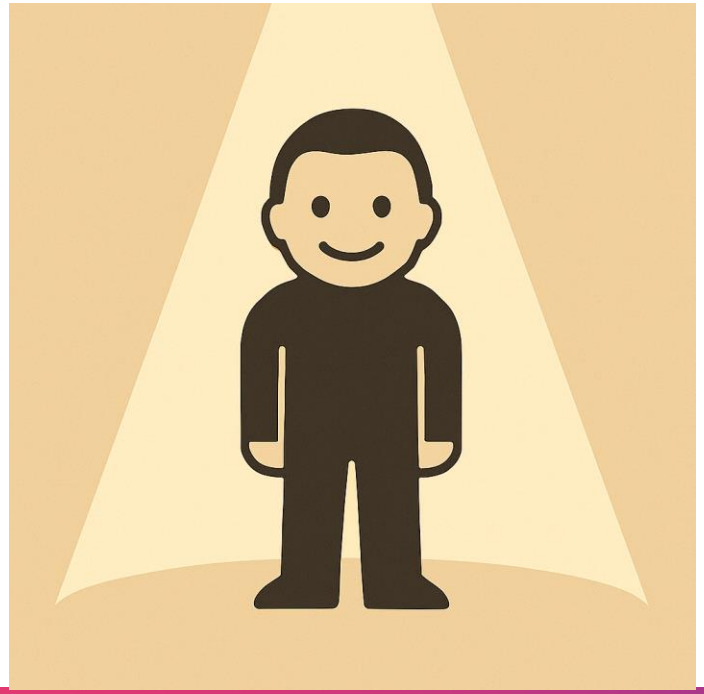
7th October 2025, 10:50-12:30

Respondent-centered survey design



Visualization generated by AI (ChatGPT, 2025)

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English

Did you do any paid work in week 05.-11.02.2024?

Please include all paid work, even if it was only for an hour.

- ◯ Yes
- ◯ No
- ◯ Don't know
- ◯ Rather not answer

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How to design respondent centered surveys?

Methods: User testing and focus groups

Visualizations generated by AI (ChatGPT, 2025)

Technologies in the survey process

- AI-translated surveys
- AI-created interview guides, user test summaries, reports
- Meetings: synthetic sample data, creating persona

→ AI makes life easier for us

↓

How about the respondents?

↓

Can we make their life easier as well?

Case 1: Adult Education Survey (AES) and machine learning (ML)

- High detail level survey

→ Can ML help to ease respondent burden for the most at-risk respondents?

→ **Can ML help to predict break-off?**

Simplified user journey AES

Financed by EU grants

Paradata and AES

Table A.1: Share of error messages, previous page clicks, breakoff rates and "Don't know" and "Rather not answer" for each section in the questionnaire.

Question	Breakoff rate	Share of 'Don't know' and 'Rather not answer'	Number of respondents
Educational attainment	1,4	1,3	1174
Main activity status	1,5	3,1	3868
Not completed formal education	0,2	0,8	3815
Access to information about learning possibilities	0,8	2,2	3809
Participation in formal education	2,0	5,5	3781
Participation in non-formal education and training	5,3	11,6	3721
Obstacles to participation in education	1,5	5,5	3495
Informal learning	0,5	1,7	3520
Languages	1,0	3,5	3512
Parental information	0,2	1,0	1188
Health	0,2	1,0	3482

Source: "Using paradata to assess the quality of the questionnaire design in the Adult Education Survey" Grimstad et al. (2024)

Starting point

Can machine learning help predict which respondents are at higher risk of break-off, and hence support the implementation of measures to avoid it?

- Web answers only
- Supervised machine-learning models implemented in Python using scikit-learn

Paradata and AES

- Respondent characteristics
- Answer related features
- Output variables/target

	ACCURACY	SENSITIVITY/Recall	PRECISION	F1
LR	1	1	1	1
KNN	0.99	0.92	0.99	0.95
CART	1	1	1	1
NB	1	1	1	1
SVM	1	1	1	1
RF	1	1	1	1
XGBOOST	1	1	1	1
LDA	0.99	0.95	0.99	0.97

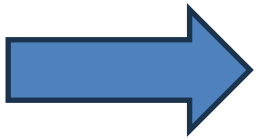
Conclusion based on the results:

Model performance indicates unrealistically high predictive accuracy, which is unlikely for this type of survey data.
A plausible explanation is data leakage associated with a feature related to the language reported by respondents, which may be closely linked to break-off behavior.
Due to limited time access to the data, a re-estimation of the models excluding this feature was not possible.
This highlights the importance of careful feature selection when applying ML to survey process data.

Challenges

- Model uses 2022 data; next AES 2028
  → Not enough training data
  → Model becomes outdated

Possible solution: surrogate evaluation



Conclusion: More frequent surveys are better suited.

Case 2: Labor Force Survey (LFS)

- Mostly telephone interview (CATI)
- Duration: 3-8 minutes
- Panel survey in 8 waves over 2 years
- Participants: age 15 to 74 years old

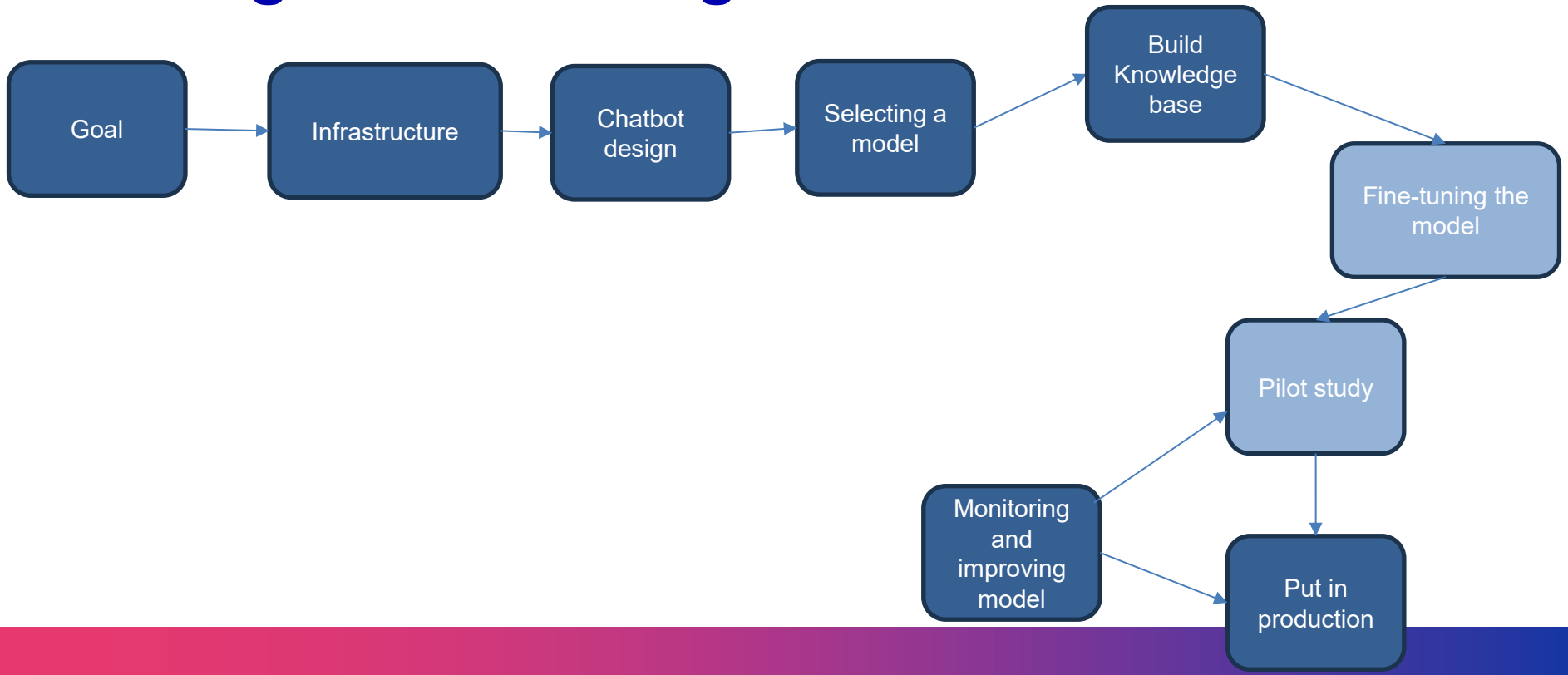
Goal with integrating a chatbot into our LFS web survey

- Clarifying questions which are difficult to either understand or answer

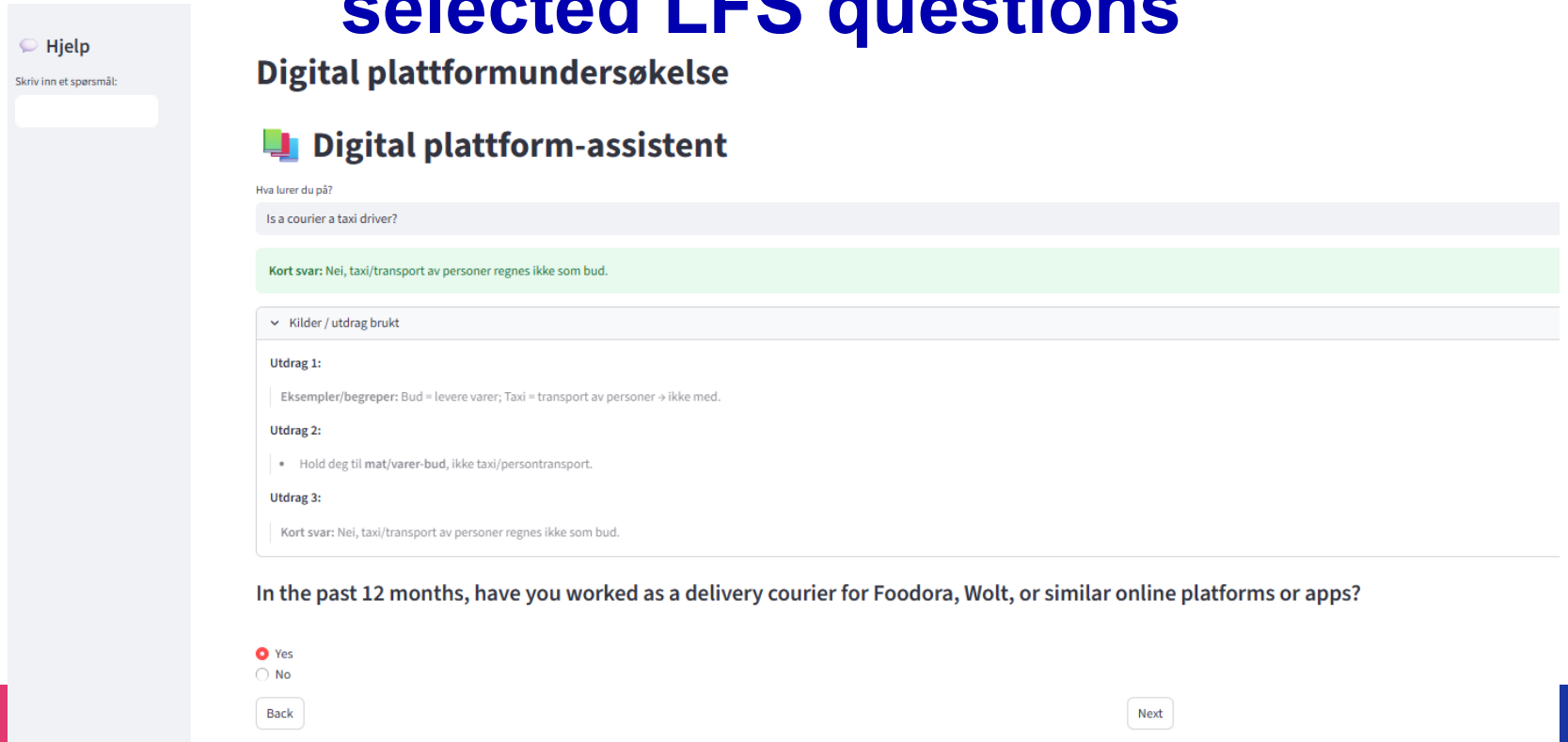
→ Avoid breakoff

→ Ensure good data quality

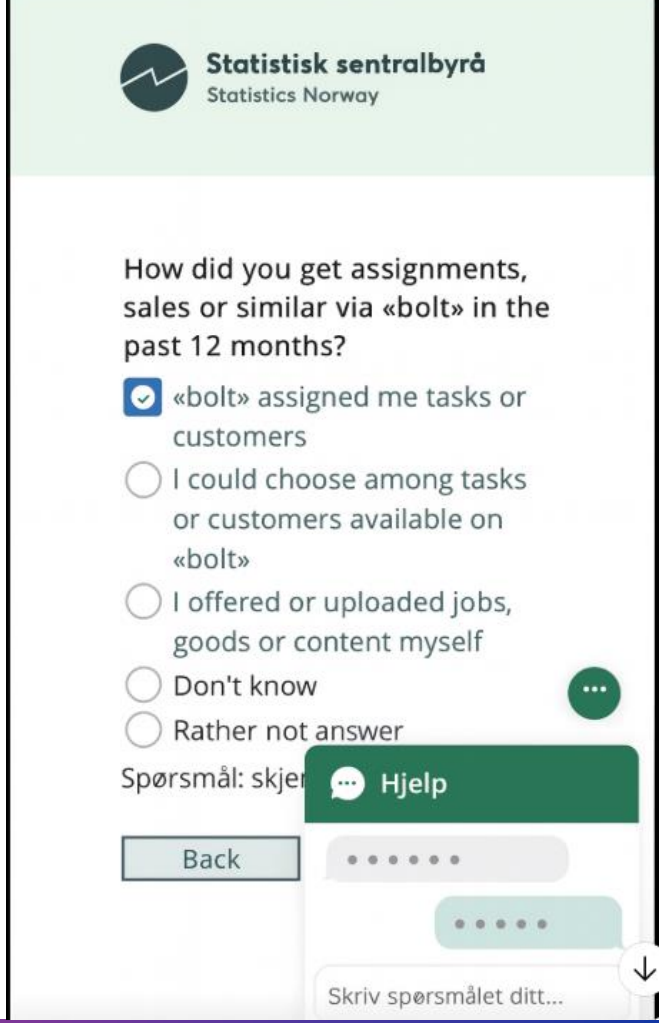
Planning Chatbot integration in LFS



Exploratory prototype: Simple chatbot for selected LFS questions



Illustrative design example: Chatbot option integrated into the LFS web survey



Design illustration generated using ChatGPT, based on the current LFS web design.

Challenges in integrating chatbots into web surveys

BUILD	PRODUCT ITSELF	USE
Time	Hallucination	Trust & Acceptance
Resources	Bias	International /National laws
Infrastructure	Language	Accessibility
Maintenance	Tone	User friendliness
…	…	…

Conclusion

Despite recent advances in AI development and the increasing availability of language models, developing a well-functioning chatbot remains a time-consuming task. Key challenges include integration into internal systems, ensuring relevant and reliable responses, and ethical and legal considerations. Long-term success is best supported through adequate resources and international collaboration.

References

Slides from scientific conference in Wiesbaden, 2024:

Can we use AI chatbots to assist respondents with question clarification in web surveys?

Exploring ML-algorithms in social surveys to improve respondent experience and data quality, exemplified by the Adult Education Survey

Link to Paradata AES paper presented at Q2024: AES paradata paper

Link to AES report 2022: Final methodological and implementation report

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THANK YOU.

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