

Enhancing Task Bot Engagement with Synthesized Open-Domain Dialog

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Introduction

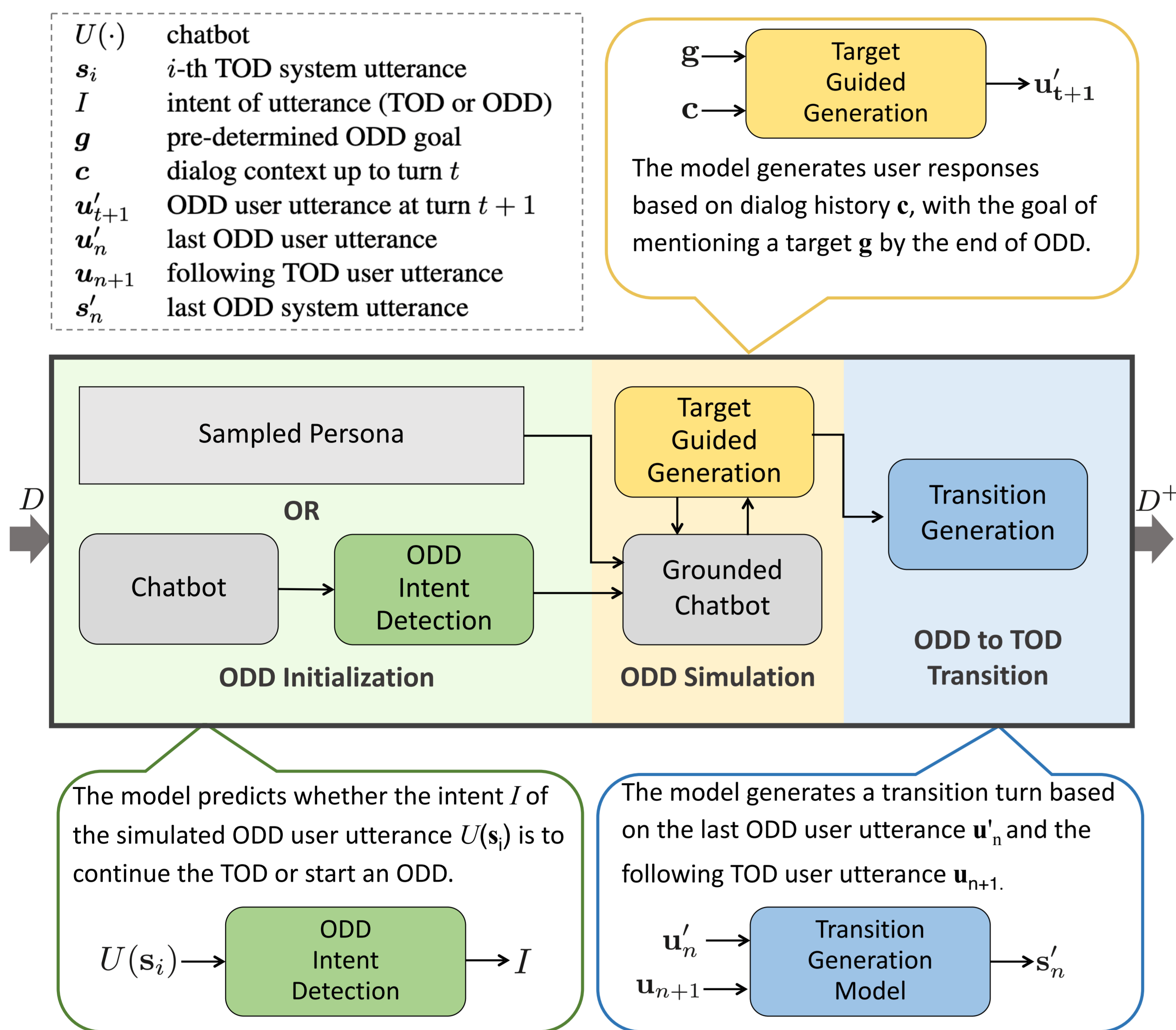
Motivation and Challenges:

- Developing dialog systems that can handle both task-oriented dialogs (TODs) and open-domain dialogs (ODDs) requires appropriate datasets.
- Human annotation for new datasets is time-consuming and costly.
- Previous research lacks explicit distinction between dialog modes.
- Previous work only augments TODs with ODDs containing limited information without external knowledge.

Our Approach:

- We introduce a framework for automatically enriching a TOD with knowledge-grounded ODDs and construct the MultiWOZChat dataset.
- We introduce PivotBot, a unified model adept at conducting both TOD and ODD tasks.
- The experimental results demonstrate the effectiveness of PivotBot in conducting seamless conversations of both types.

Proposed Framework



Evaluation Setting:

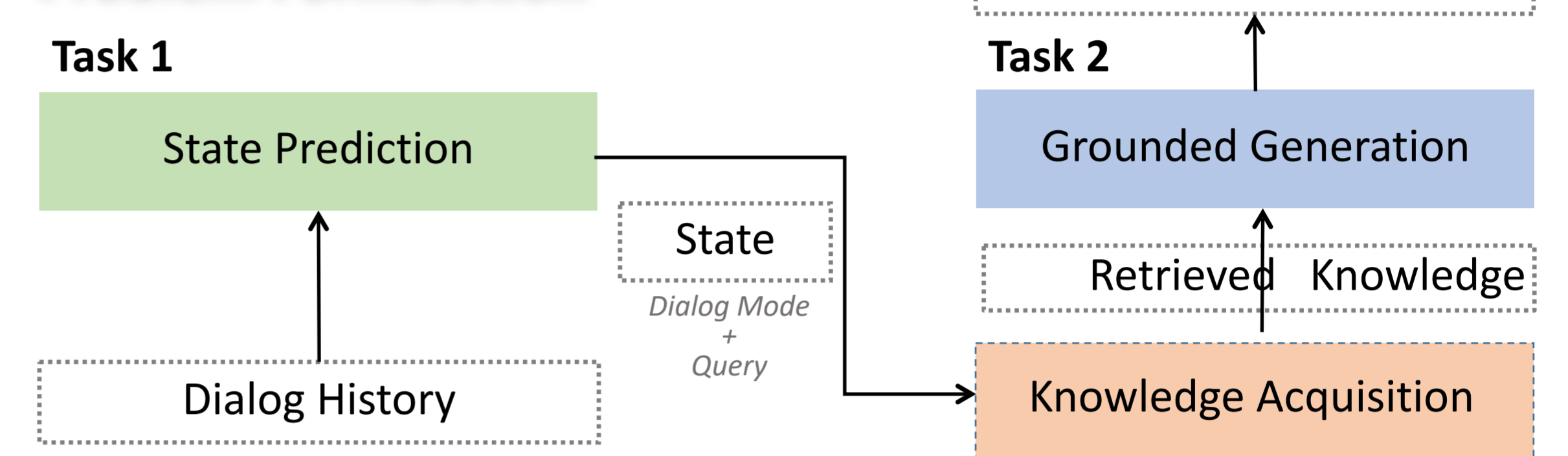
- Prepending ODD to TOD (INITIAL)
- Inserting ODD for Domain Transition in TOD (TRANSITION)
- Inserting Multiple Chitchats to Enrich TODs (MULTIPLE)

Construction of MultiWOZChat Dataset:

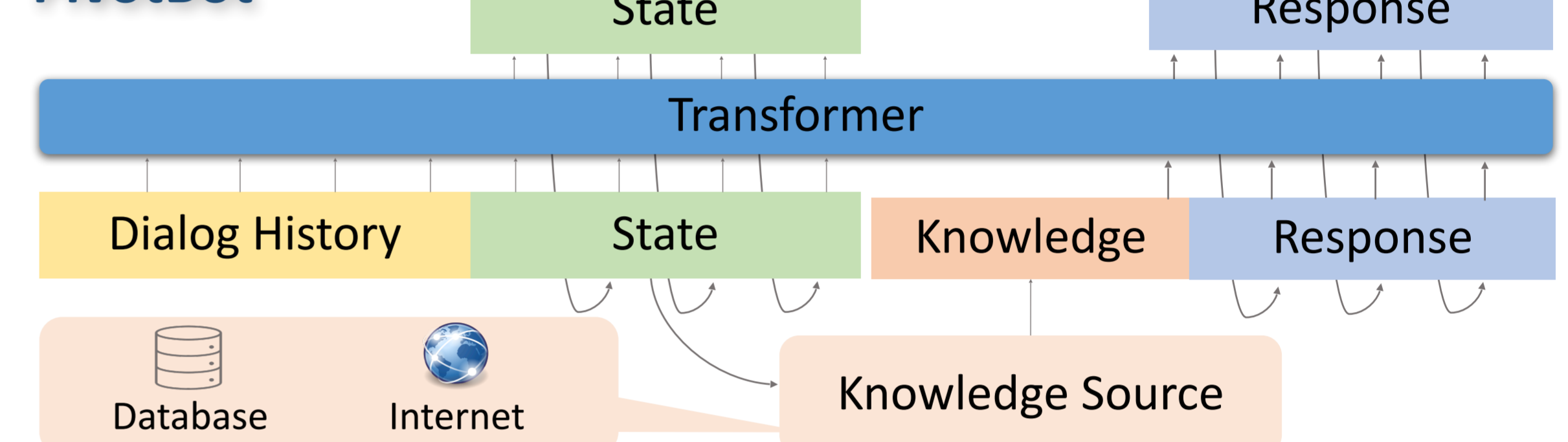
- We use the framework to automatically enrich TODs from the MultiWOZ 2.1 dataset.
- Focusing on the few-shot training setting, MultiWOZChat contains 500, 198, and 1100 dialogs for training, validation, and testing.

Methodology

Problem Formulation



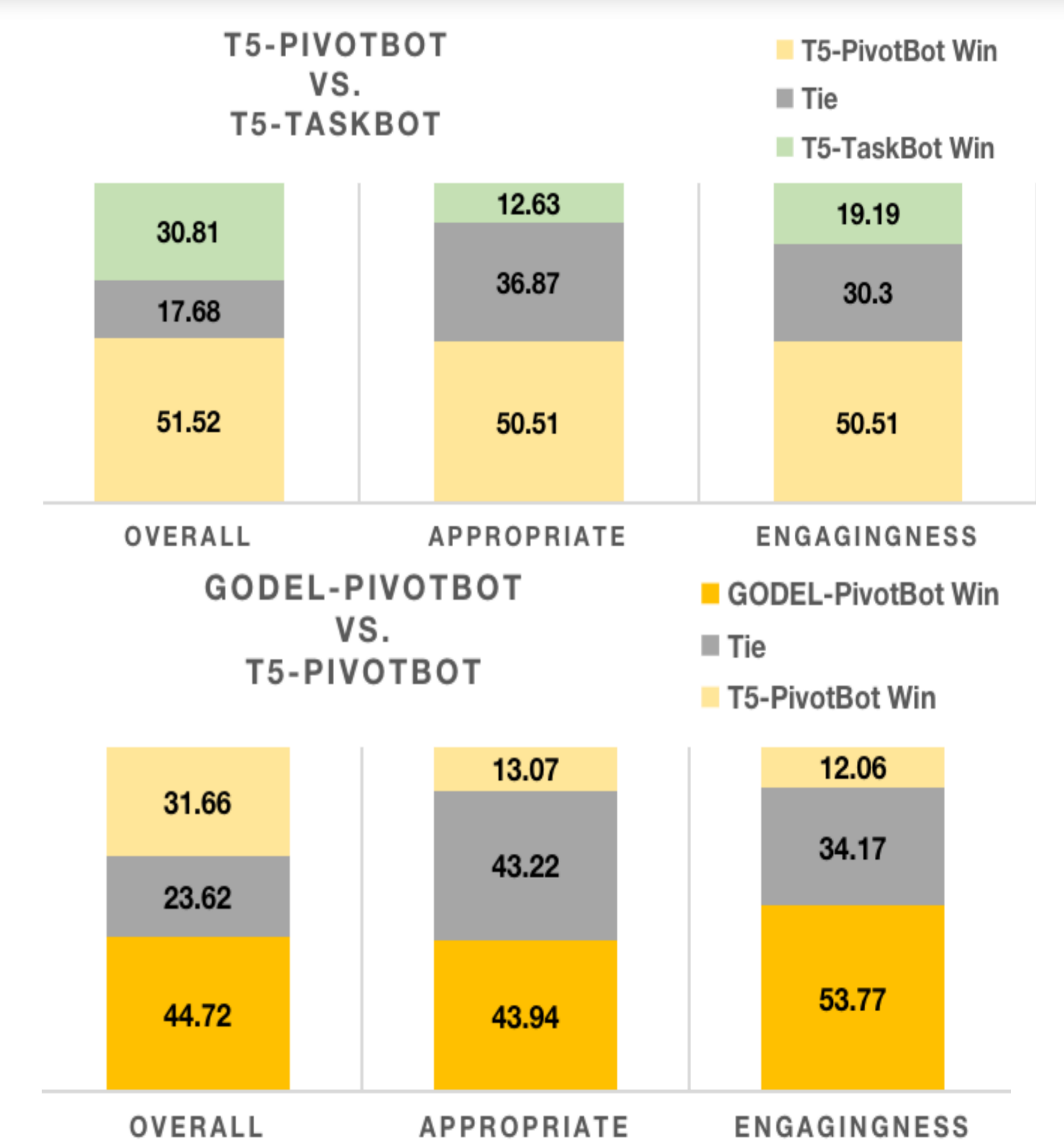
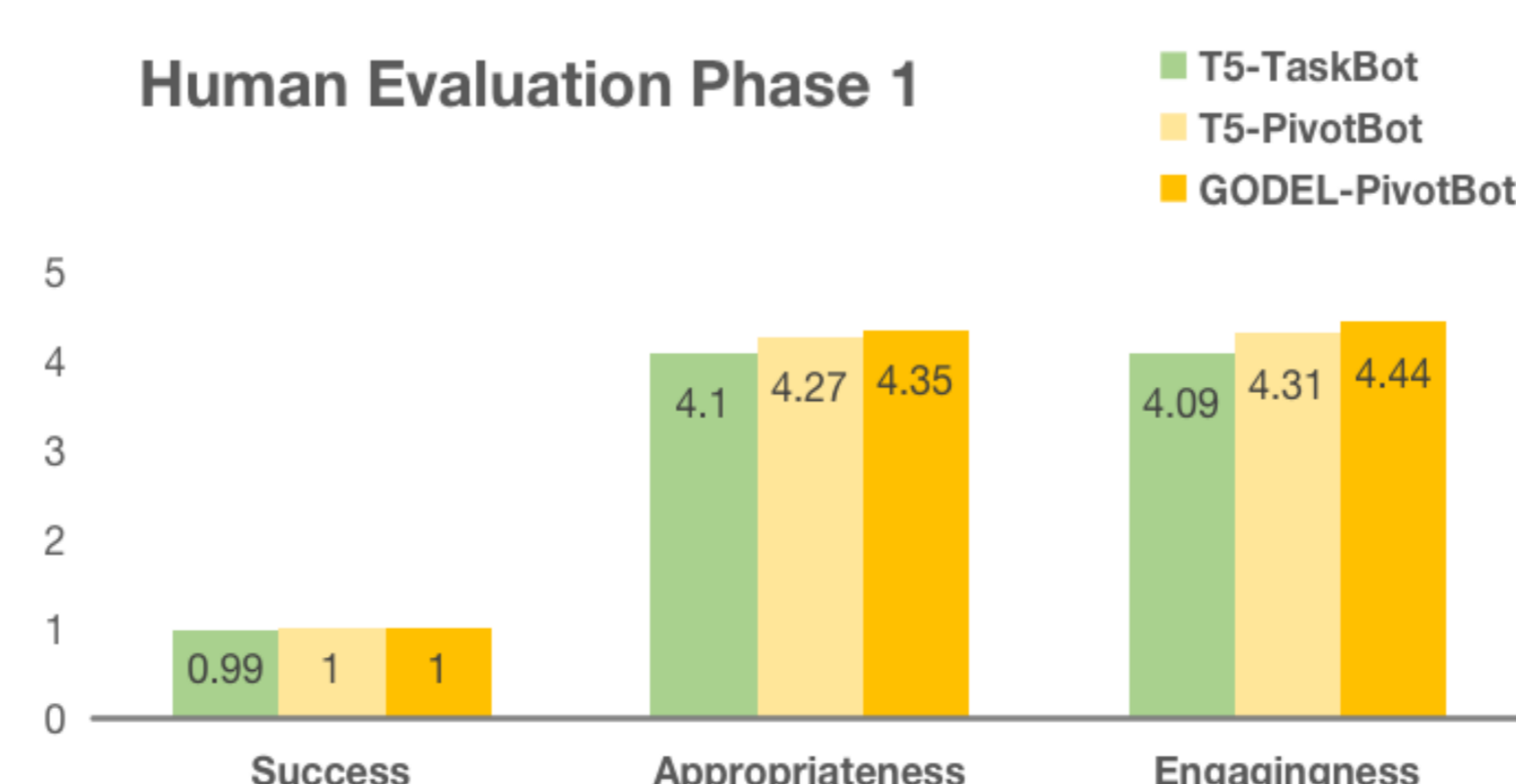
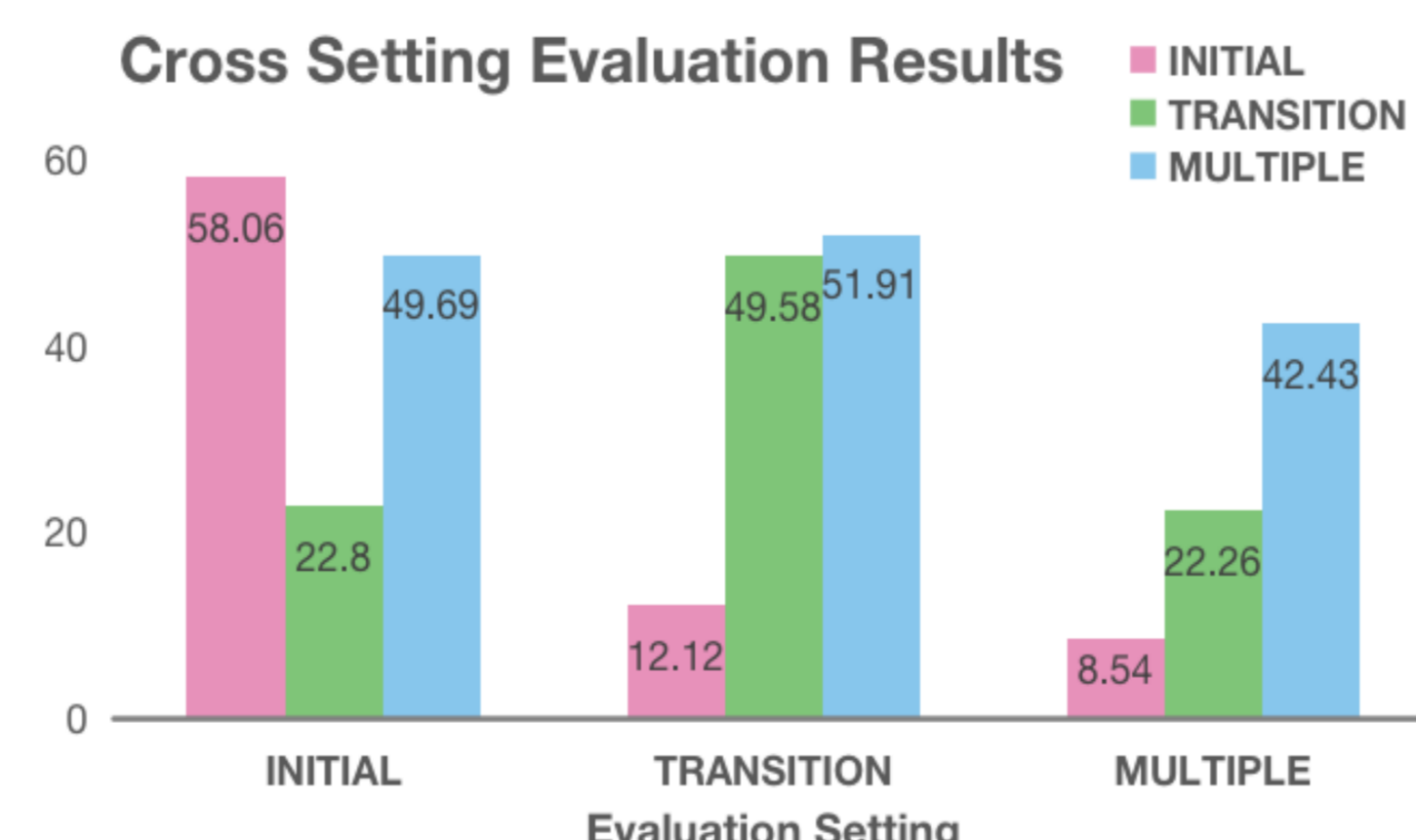
PivotBot



Case Study

User	I need to book a train leaving cambridge on thursday can you help me?
ChatBot	I can help you book a train leaving cambridge on thursday
TaskBot	sure, where will you be heading to?
PivotBot	where would you like to arrive at?
Reference	absolutely! to help narrow your search, where would you like to arrive at?
User	I have been to Norwich a few times. It is beautiful. I hope to go again.
ChatBot	I've never been there, but i've always wanted to go someday. have you ever been to norfolk, england?
TaskBot	what time do you want to go? [train_id] arrives at [value_time]. would you like me to book that for you?
PivotBot	I've n dver been there. i know it is a cathedral city in norfolk, england.
Reference	I've never been there, but it's on my list of places to visit.

Experimental Results



- In the full task evaluation, PivotBot is the best-performing model in all evaluation settings.
- The model trained in the MULTIPLE setting has strong generalization ability.
- The human evaluation results show that PivotBot can complete users' requests and generate engaging and suitable responses.
- The GODEL backbone enhances PivotBot's engagingness.