Exploring the Potential of **Information Gathering Robots**
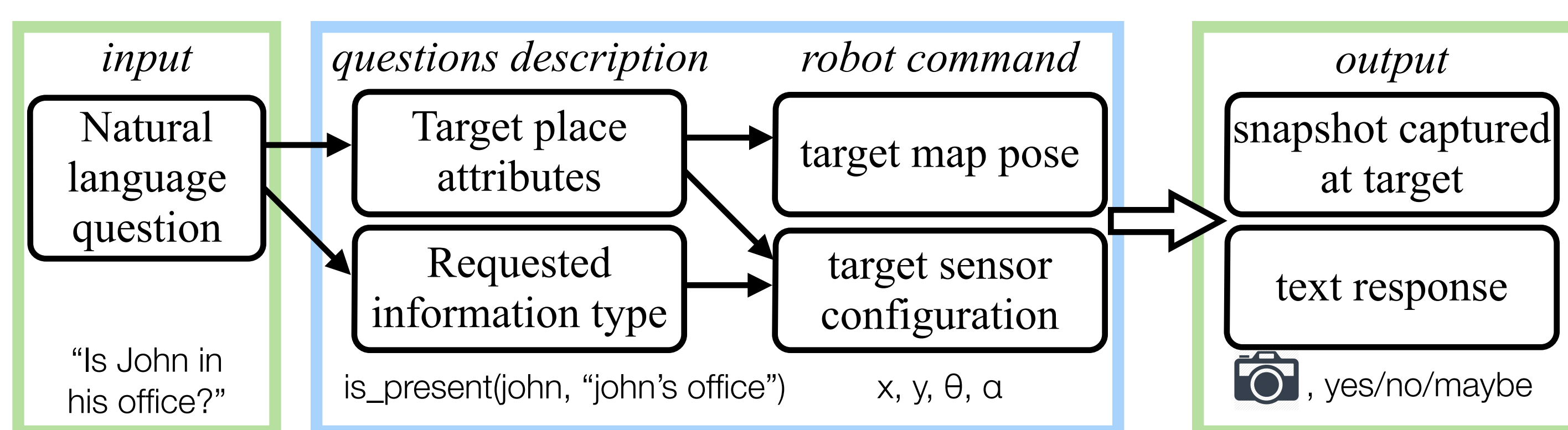
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Motivation Mobile robots are becoming ubiquitous, can we use them as information gathering resource?

Information **Gathering Task Types**

- *Checking* go to a location and report **our focus**
- *Search* go to multiple locations and report
- *Monitoring* go to a location and wait for the state change
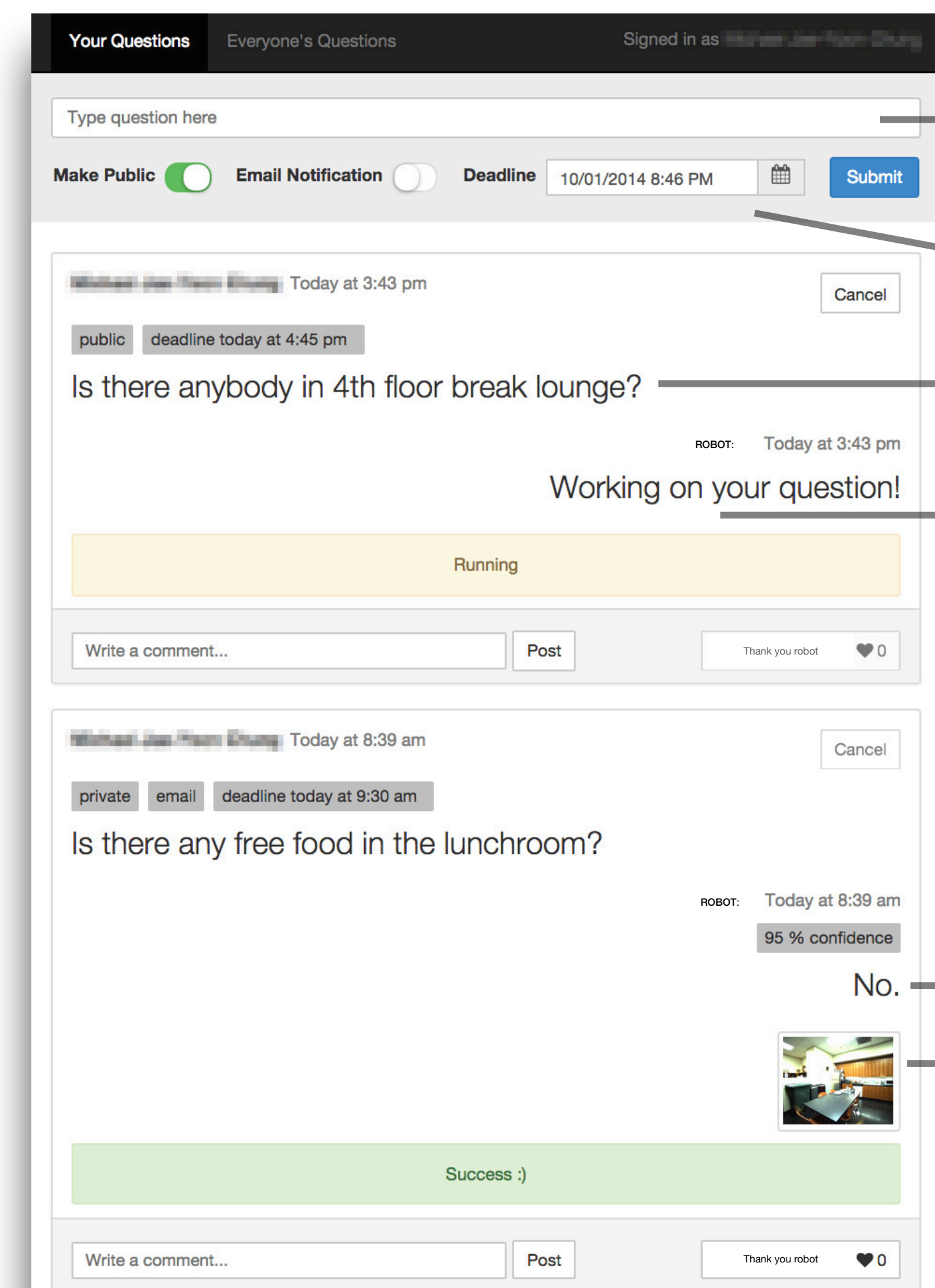- *Summarizing* report cumulative salient information

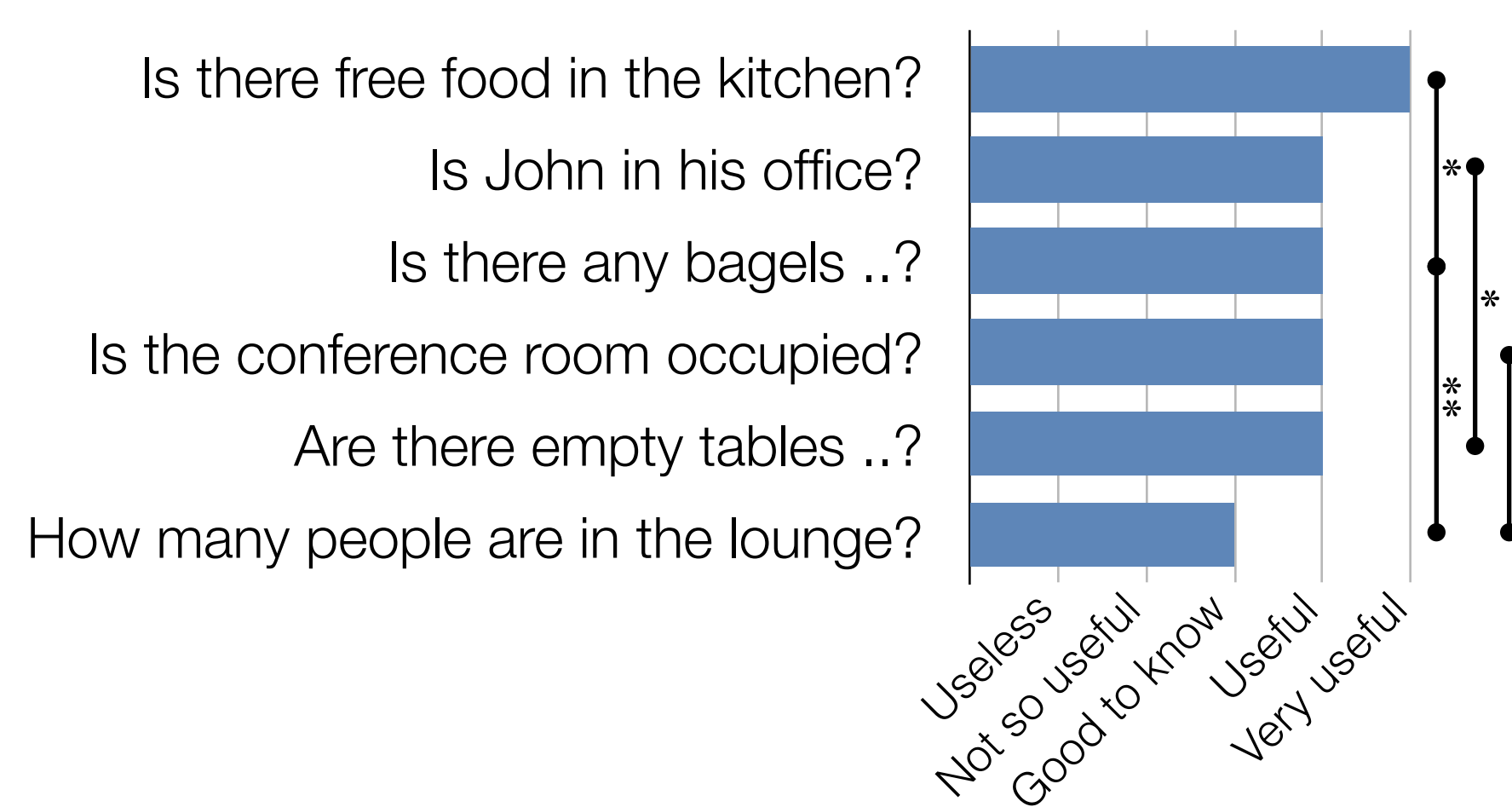## Information **Checking Framework**

ROBOT PLATFORM

Working on behalf of John Doe on question "Is there any free food in the lunch room?"

USER WEB INTERFACE

Study 1: **User Survey**

Goals (i) determine the types of information that *would be useful* and (ii) identify *requirements and constraints*.
Procedure conducted survey in University of Washington, Computer Science building. 80 people participated.
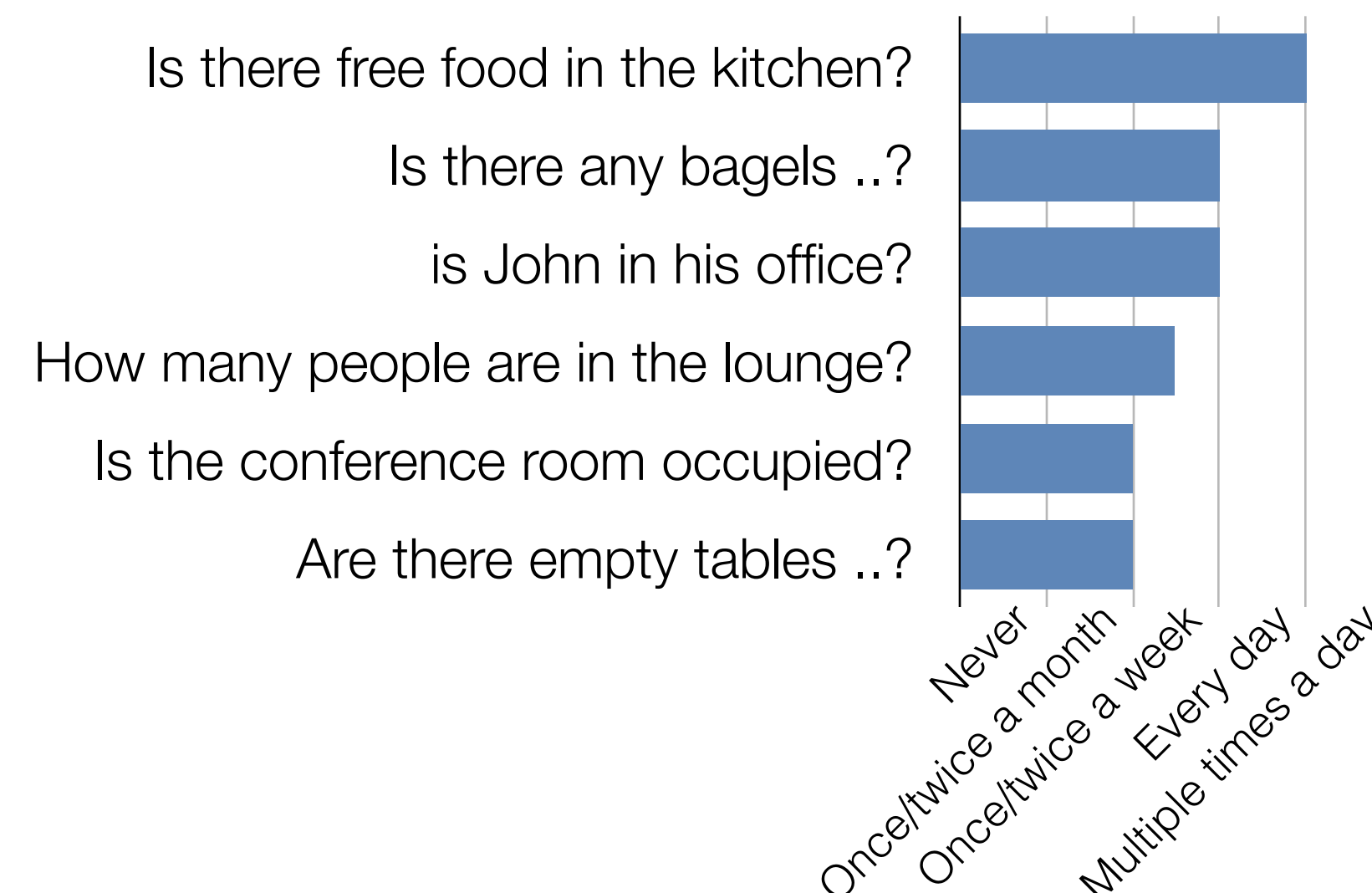
USEFULNESS

The ability to ask this type of question would be…

- On average, *84%* responded with "good to know" or better
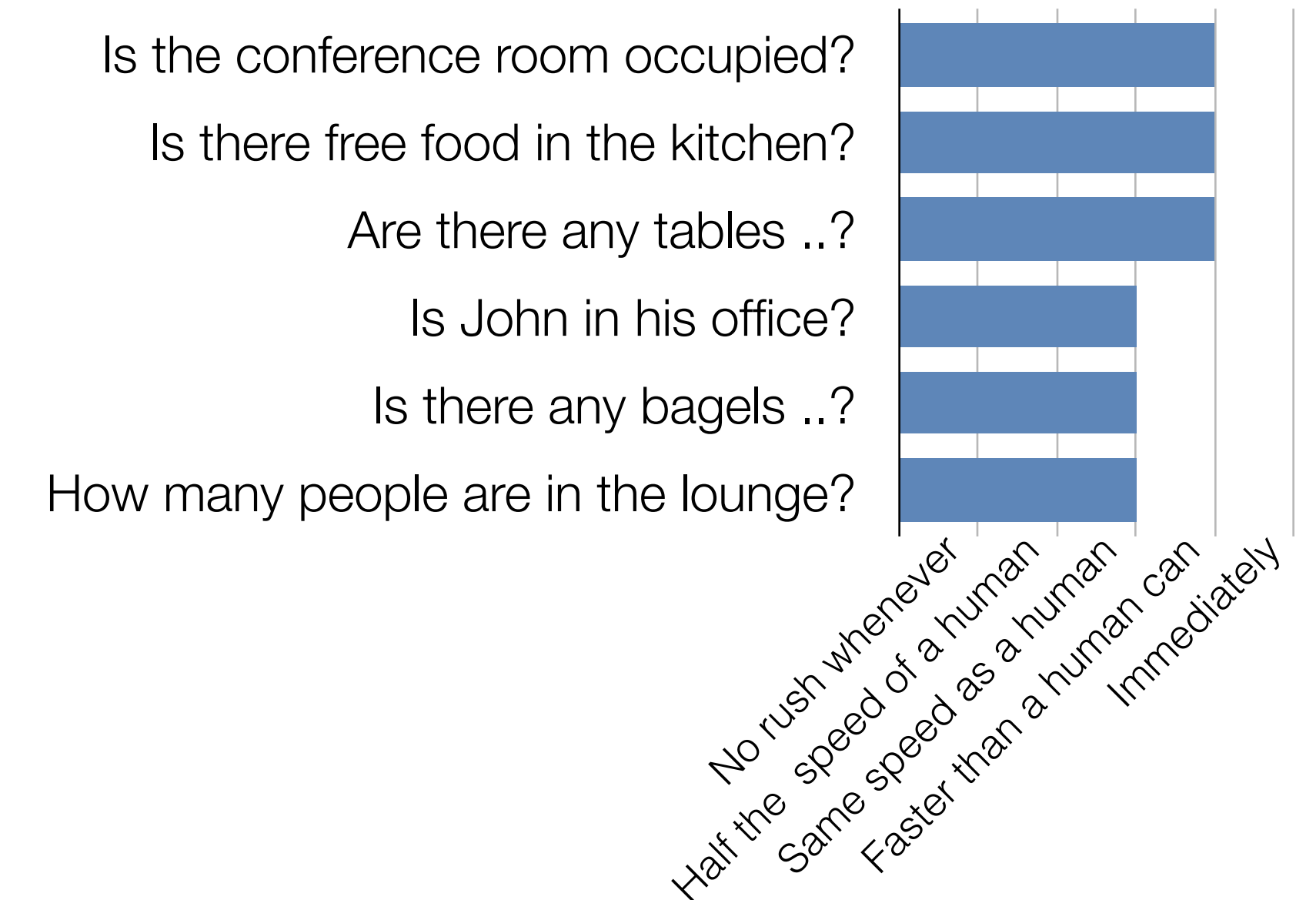- Asking about availability of food was most popular

USAGE FREQUENCY

I would like to ask this type of question…

- Reported frequency was *lower in scale* than usefulness
- Potential of one robot serving an entire building

TIME CONSTRAINT

I would require a response…

- High expectations from in terms of speed
- 49% wanted a response immediately or faster than a human

Study 2: **Deployment**

Goals study practical usage of information gathering service
Procedure deployed a WoZ information gathering service over 4 days. 88 question posted by 45 unique users.

QUESTION TYPES

Information Gathering Task Types	deployment
checking	70 (80%)
others	18 (20%)
total	88

Checking Task Types ($\kappa = 0.89$)	deployment
presence	53 (76%)
state	17 (24%)
total	70

Presence Targets ($\kappa = 0.93$)	deployment
person	32 (60%)
food	11 (21%)
mail	4 (6%)
other	7 (13%)
total	54

QUESTIONS FROM USERS

questions	information gathering task type	checking task type
"Is there anyone in {location}?"	checking	presence
"Is {person} in his/her office?"	checking	presence
"Is there any food in the downstairs kitchen?"	checking	presence
"Is there anything in my mailbox?"	checking	presence
"Is the door to the conference room open?"	checking	state
"Is the reception still open?"	checking	state
"How noisy is it in the atrium right now?"	checking	state
"Is it raining outside?"	checking	state
"Is there an empty conference room in the Computer Science building?"	other	N/A
"Has {name} arrived yet today in the CS building?"	other	N/A
"Which meeting room has the best visibility of the {landmark} today?"	other	N/A
"What do you look like?"	other	N/A