

## Development of a faculty-specific chatbot to facilitate informational access and enhance student support

### Mission

Student counselling (or peer-counselling) involves students advising other students, rather than professors or external staff.

#### Advantages:

- More accessible; students find it easier to approach fellow students.
- Creates a comfortable, peer-level dynamic.
- Takes work off departments dealing with time sensitive cases.
- Faculty specific help for international students.
- Positive impact on students; helps them make better decisions. [1]

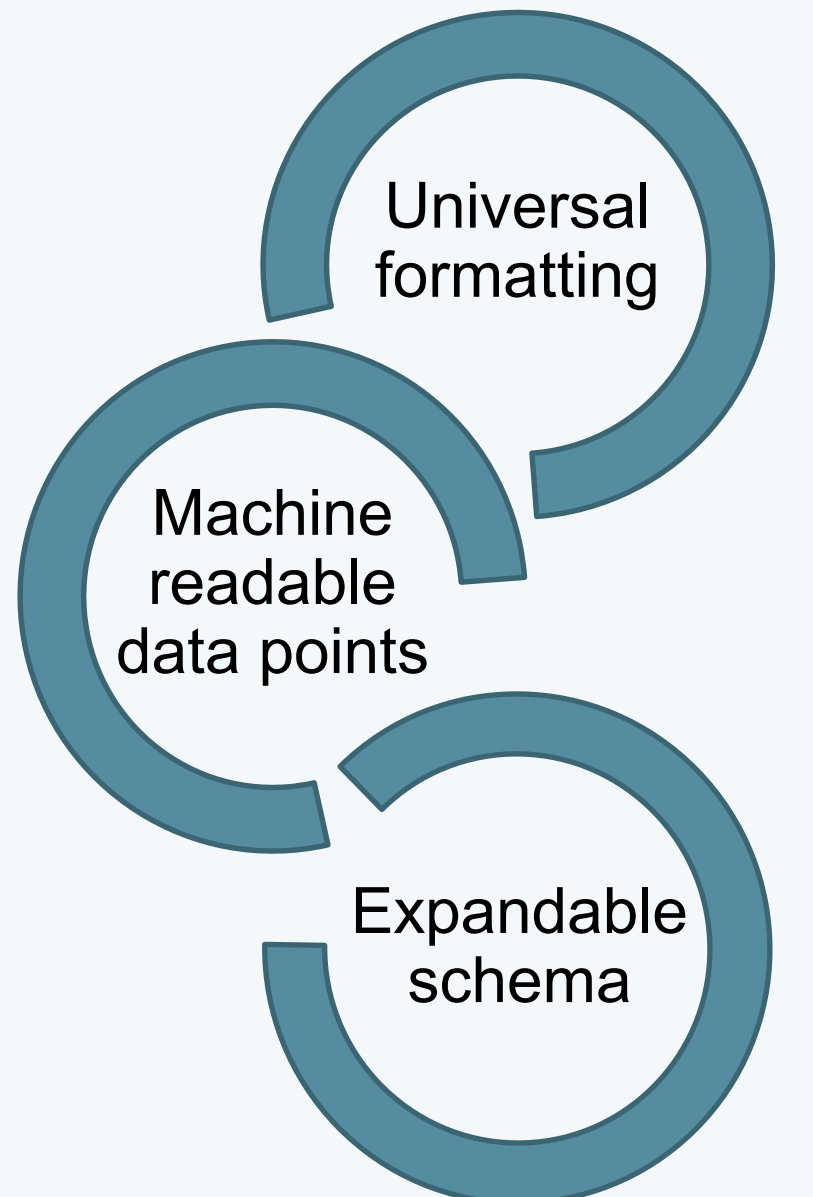
#### Challenges:

- Demand fluctuations; Demand spikes during application periods, containing repetitive questions.
- University resources may lack comprehensive or easily accessible information.
- Some students rely on inaccurate second-hand information, causing further issues.

### Methods [3]

#### Data collection

```
{
  "id": " ", // e.g. "WS230038"
  "interaction_type": " ", // e.g. "email"
  "question": " ",
  "course_of_study": " ",
  "answer": " ",
  "answer_type": " ", // e.g. "redirect"
  "references": [ ],
  "redirect": " ", // optional
  "chat-bot-answerable": " ", // e.g. "yes"
  "labels": [ ]
}
```



#### Data labelling:

anerkennung	zulassung	courses_and_modules	contents
fsb	studium_beenden	pre_studium	ergänzungsbereich
application	extracurricular	international	master
antragsstellung	exams	contents	not_answerable

#### Storage of labels and courses:

Example array to store labels:

[1. 0. 0. 0. 0. 0. 0. 1. 0. 0. 0. 0. 0. 0. 0. 0.]

#### Answer building:

Example configuration:

Label	Code
A	1
B	0
C	0
D	1

Corresponding answer build:

Greeting
Template for label A
Template for label D
Template for combination AD
Reference to in-person counselling

#### Model specifications:

- "Sentence Transformer Fine Tuning" (SetFit) framework
- XLM Roberta Sentence Transformer
- Linear Support Vector Machine for classification

### Approach

#### Traditional solutions

- FAQ pages
- Template emails
- Expanding the team

- ! Lack of personalization
- ! Seasonal overstaffing & cost increase

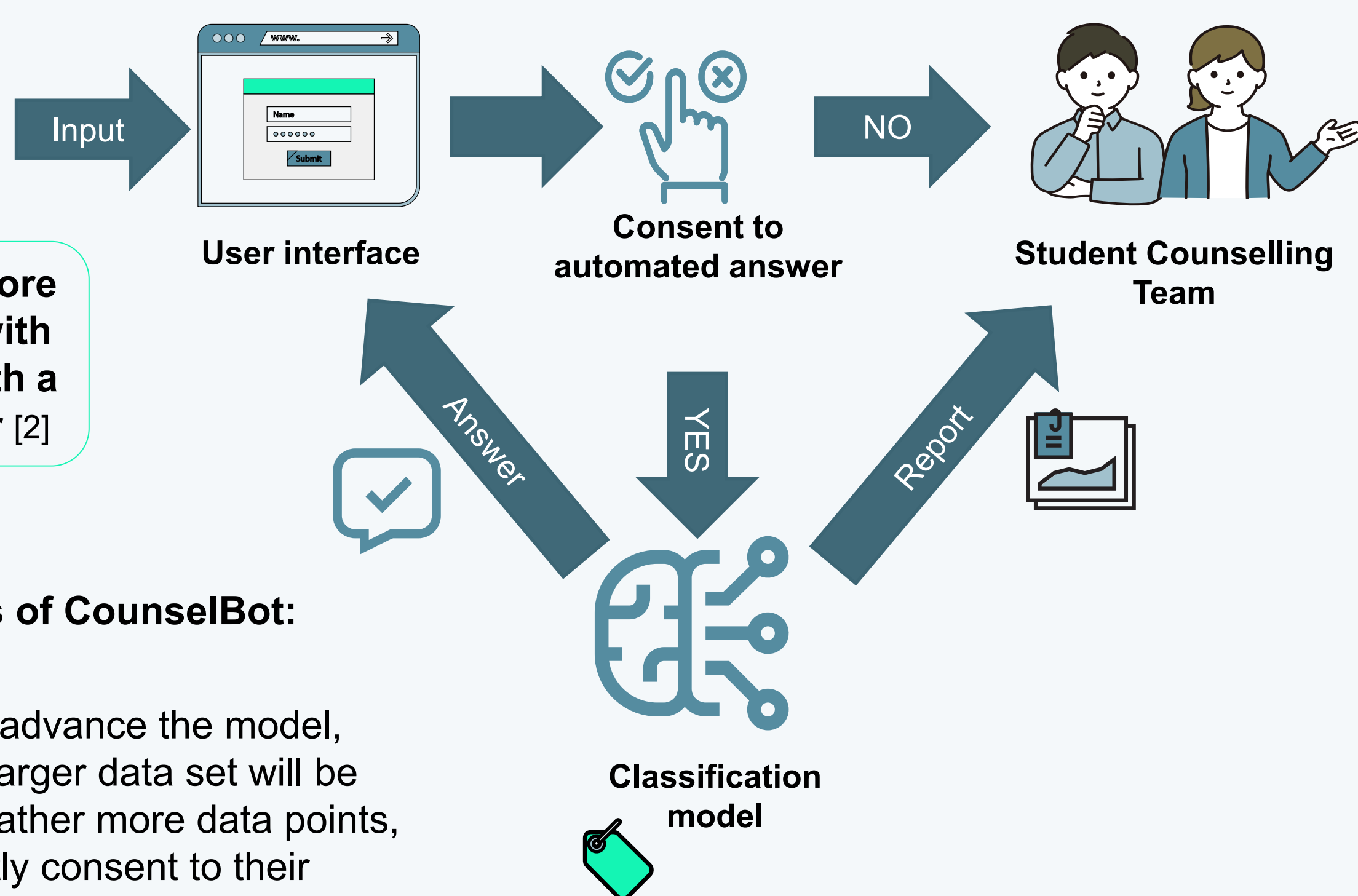
#### Modern solutions

- Automation through software
- Chatbots creating personalised answers

- ! Generative models giving false information
- ! Lack of human contact

#### CounselBot

- Classification model
- Web based user interface
- Personalized answers based on correct templates
- Possibility to directly contact team
- Further lowering inhibition to ask for help

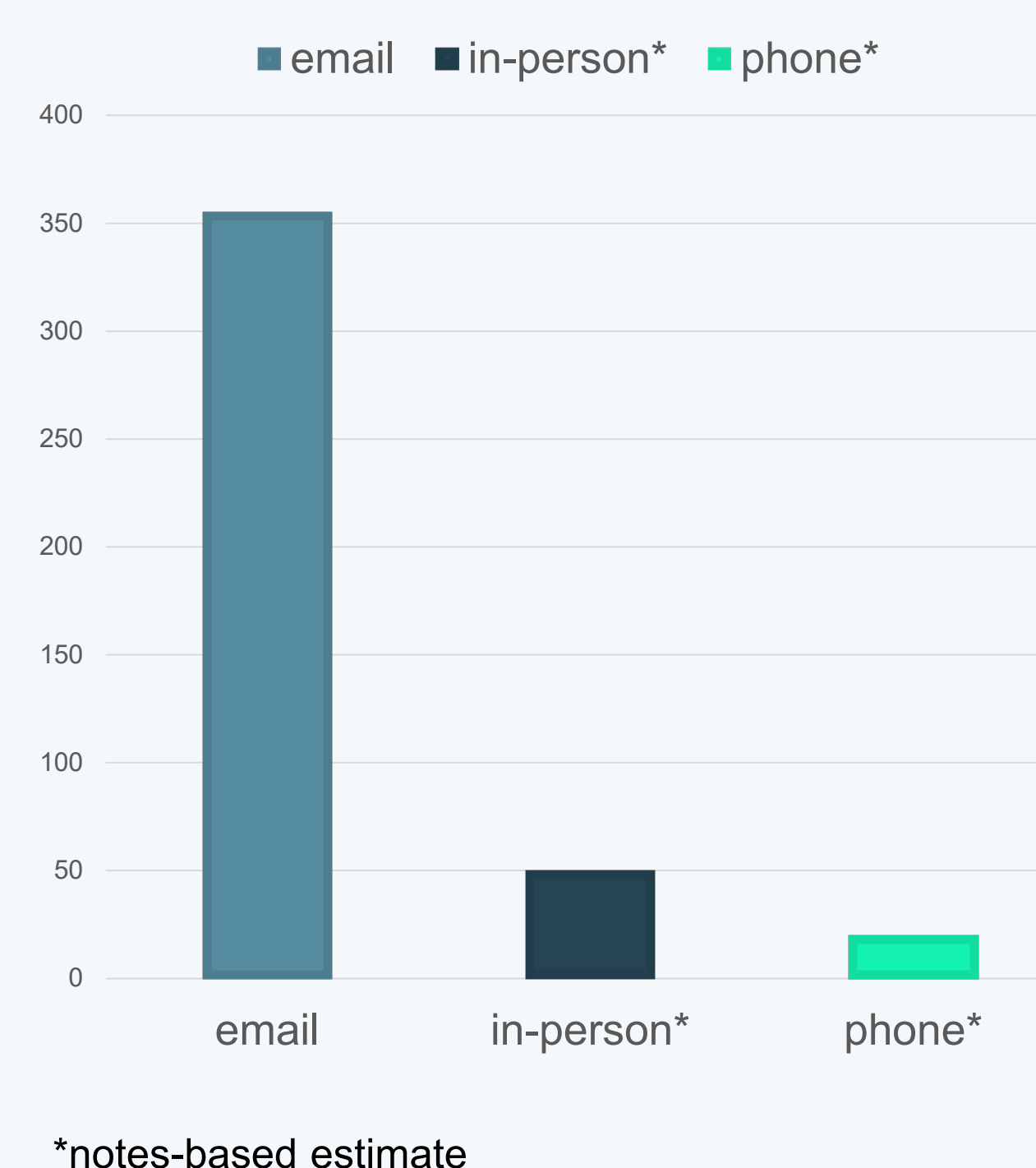


#### Further advantages of CounselBot:

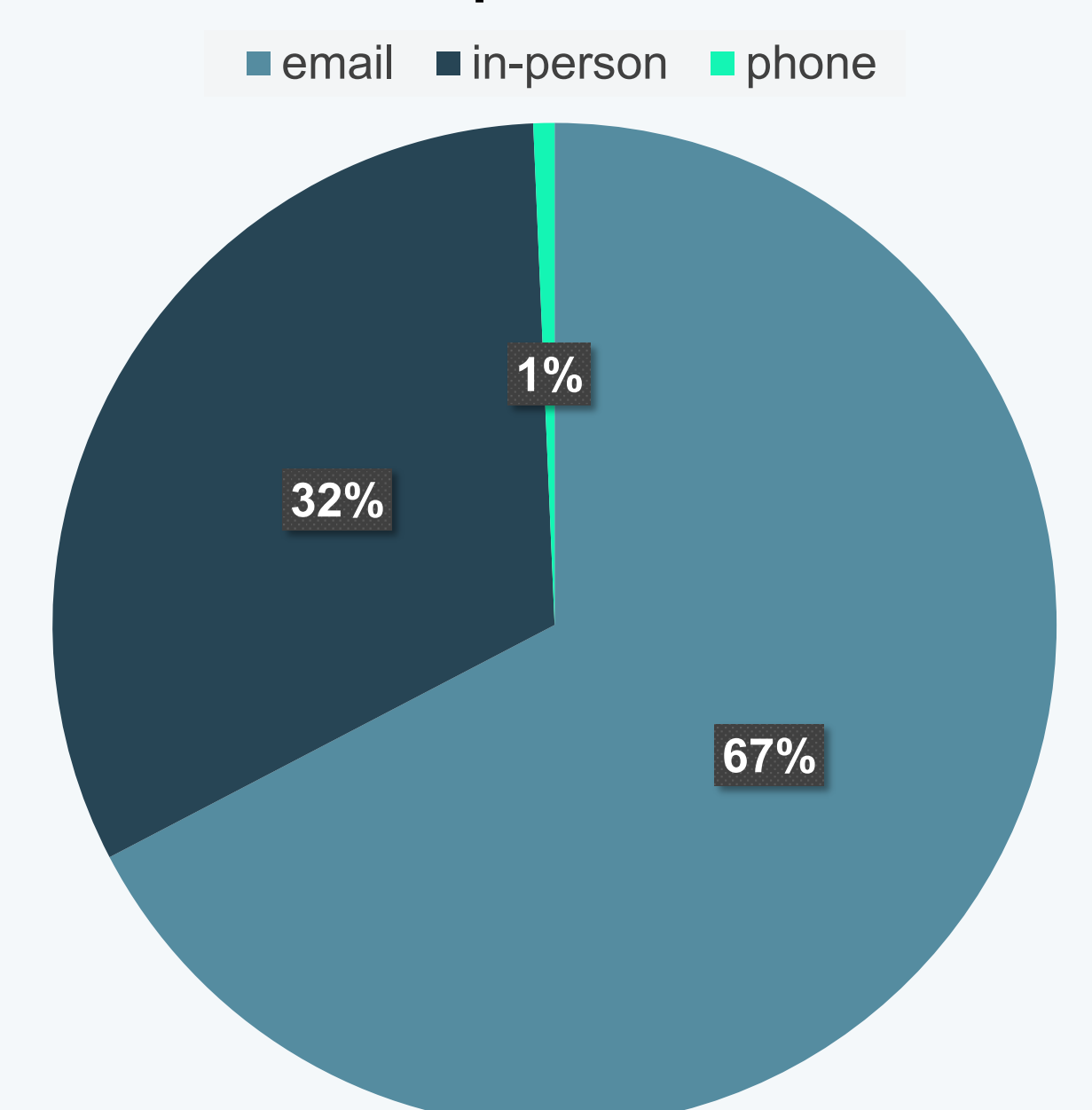
- **Data collection**  
To successfully advance the model, retraining on a larger data set will be necessary. To gather more data points, users can directly consent to their requests being used for training.
- **Anonymity**  
Newly collected data points are automatically collected, but manually curated, to ensure proper censoring of personal and identifying information and the integrity of the data set.
- **Problem identification**  
Both the collected data and non collected requests give indication of problems faced by the students. This allows for the faculty to inspect and solve arising problems earlier.
- **Acknowledgement**  
By expanding the resources available to students, it is more likely they feel acknowledged, leading to a higher overall satisfaction in their studies.

### Collected data

#### First contacts (both recorded and non recorded)



#### Contact types of retrieved data points



### Outlook

#### Degree of Individualisation:

- Further labels and templates
- More specific templates

#### Feedback Collection:

- Feedback about the contact form and chatbot
- General feedback about the student counselling

#### Retraining:

- Including newly collected data from chatbot
- Specifically including or excluding greetings

#### Possible model change:

- Generative models
- Further or different classification methods