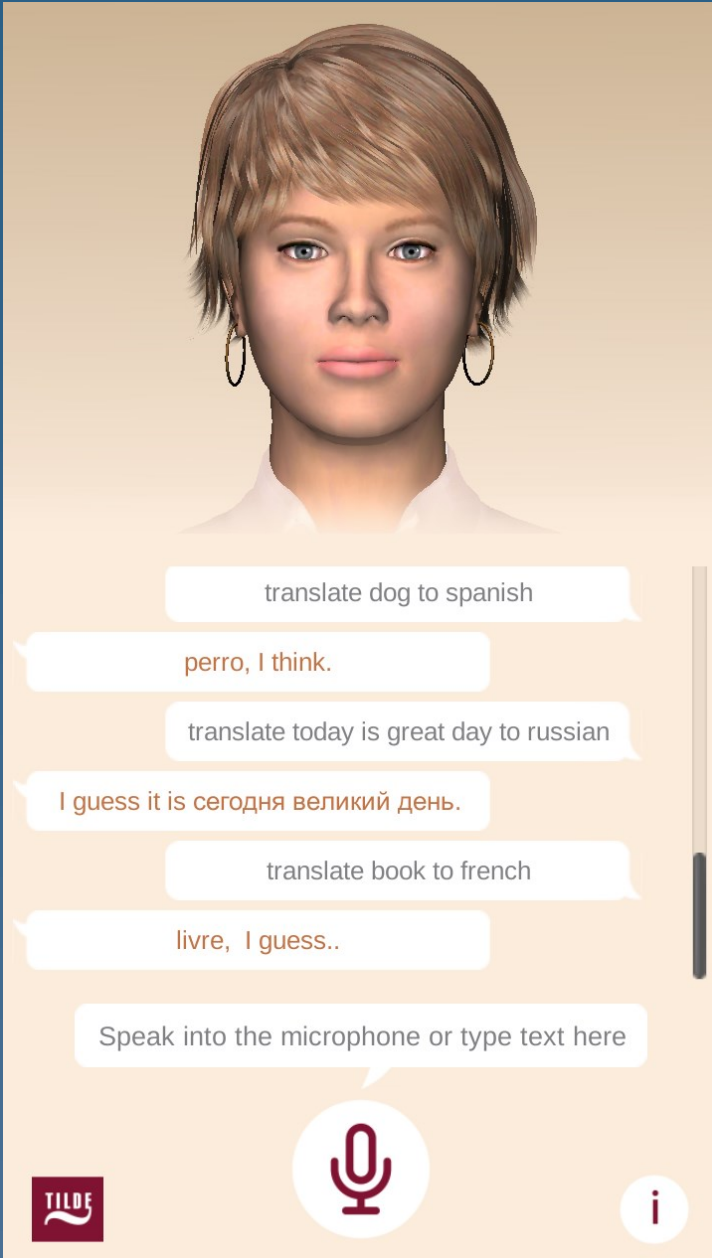


Towards the Development of the Multilingual Multimodal Virtual Agent

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The concept

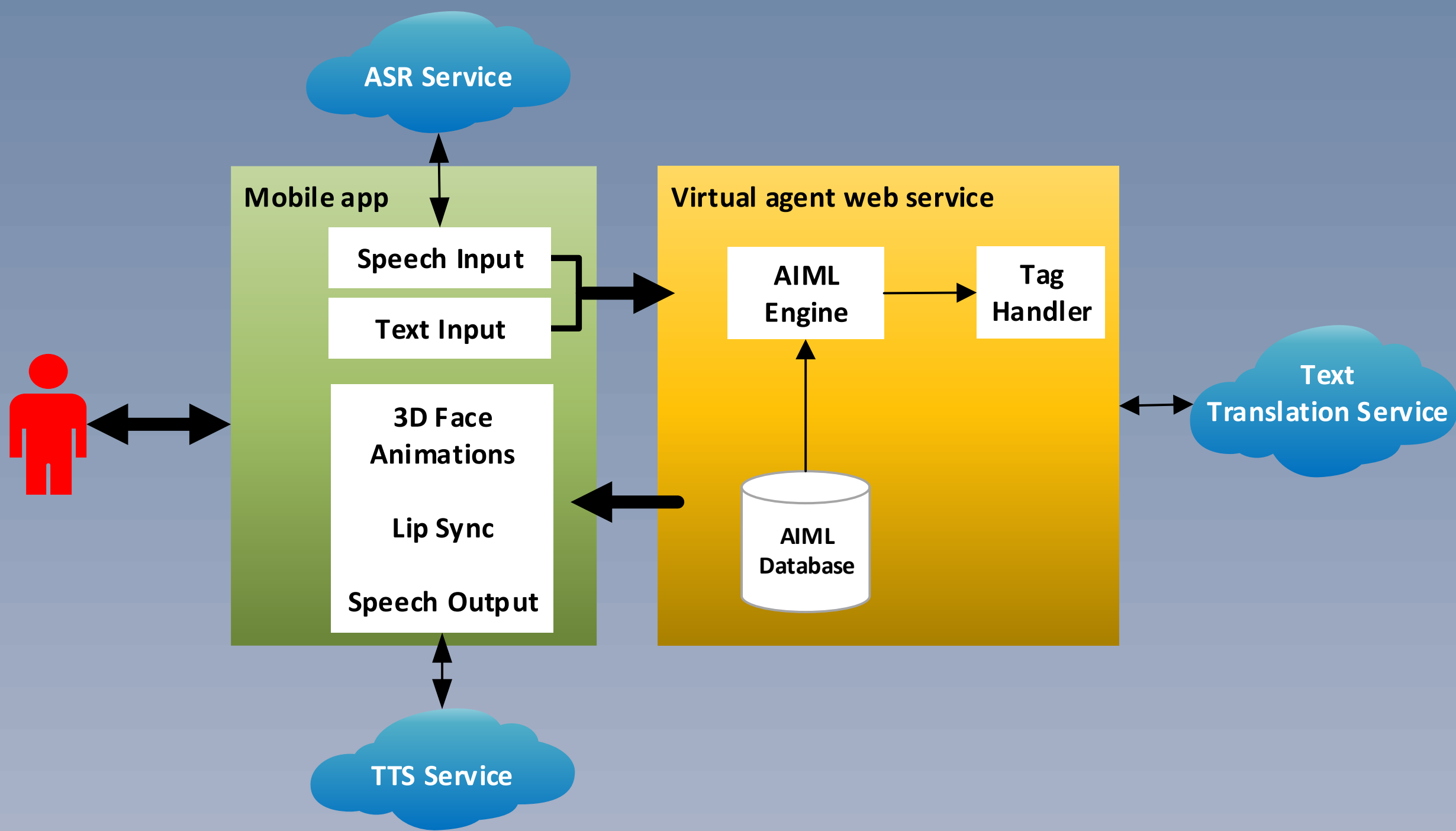


- Goal:** to develop multilingual and multimodal agent.
- First steps towards the goal:**
- ✓attractive 3D multimodal virtual agent Laura;
 - ✓freely talking with natural mimics, synchronous lip movements and emotions;
 - ✓can answer questions and handle simple dialog based on AIML;
 - ✓translates phrases and sentences from English to French, Russian and Spanish.
- Next steps:**
- to extend the functionality to allow dialog and question answering in several languages;
 - emotion recognition;
 - emotional response when speaking about certain topics;
 - to work on fusion and fission.



Design of the System

- I. Mobile application** (implemented using Unity game engine)
- II. Virtual agent web service** - responsible for intelligent conversation between the agent and the user (AIML)
- III. Automatic speech recognition** (ASR) service used for voice input
- IV. Text translation service** - for translation of the user's queries
- V. Speech synthesis service** (TTS) - used for speech output



Translation

```
<category><pattern>TRANSLATE * TO *</pattern><template>
  <think>
    <set name="topic">translate</set>
    <set name="text"><star index="2"/></set>
    <set name="language"><star index="1"/></set>
  </think><srai>TRANSLATEANSWERS</srai>
</template></category>
<topic name="translate">
<category><pattern>TRANSLATEANSWERS</pattern><template>
  <random>
    <li>I think it is &lt;<translate lang="<get name="language"/>">&gt;
    <get name="text"/>&lt;/<translate>&gt; </li>
    <li>&lt;<translate lang="<get name="language"/>">&gt;
    <get name="text"/> &lt;/<translate>&gt; I guess.</li>
    ...
  </random>
</template></category></topic>
```

Translate cat into French
< translate lang="french">cat</translate>

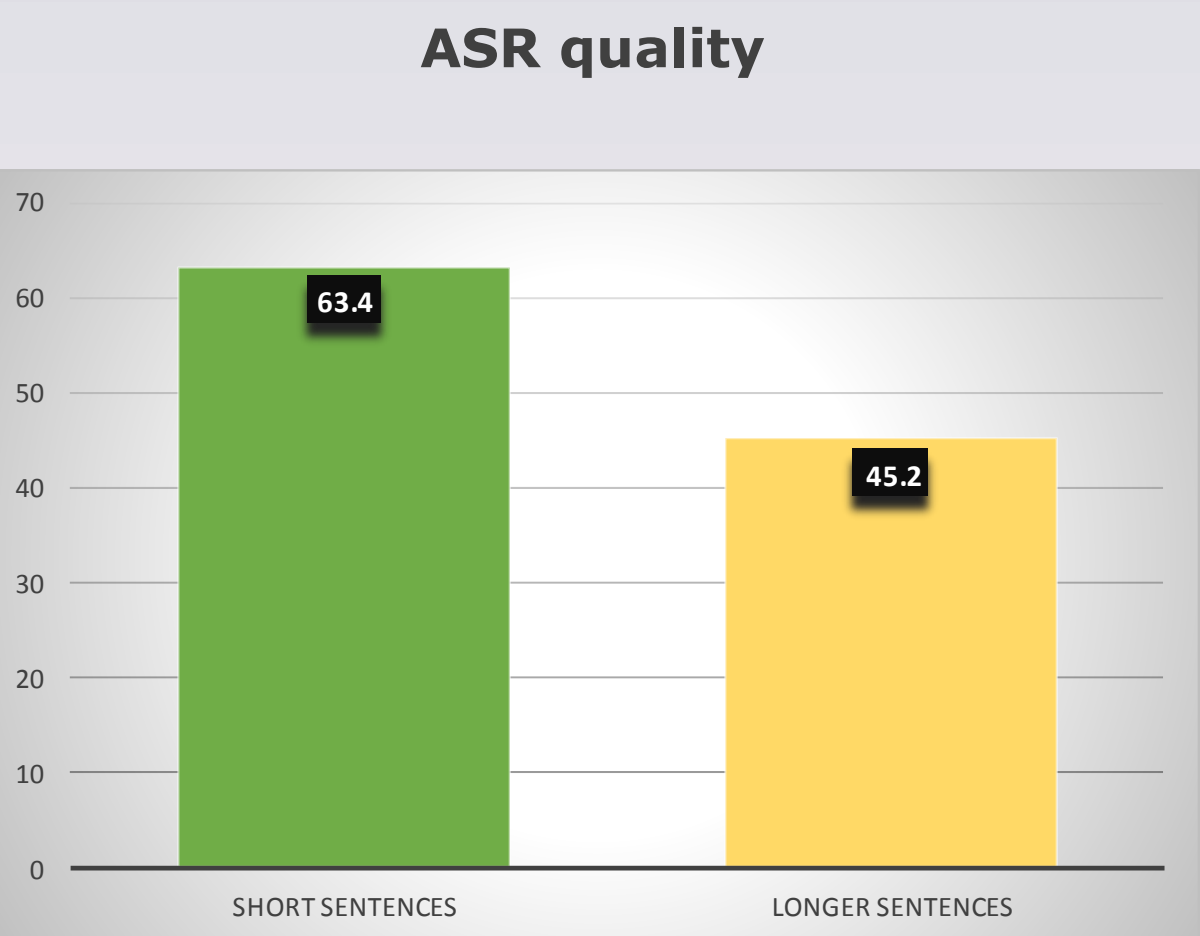
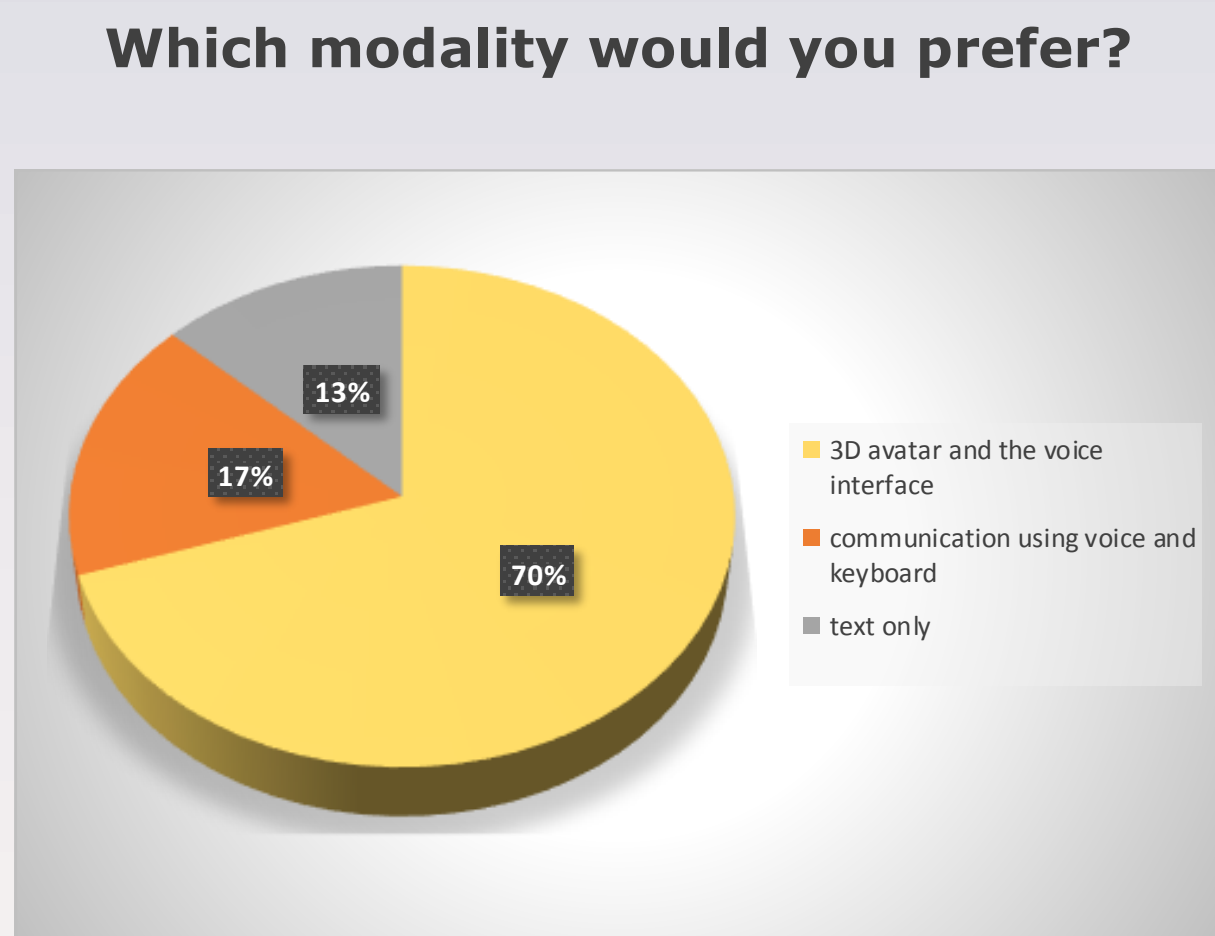
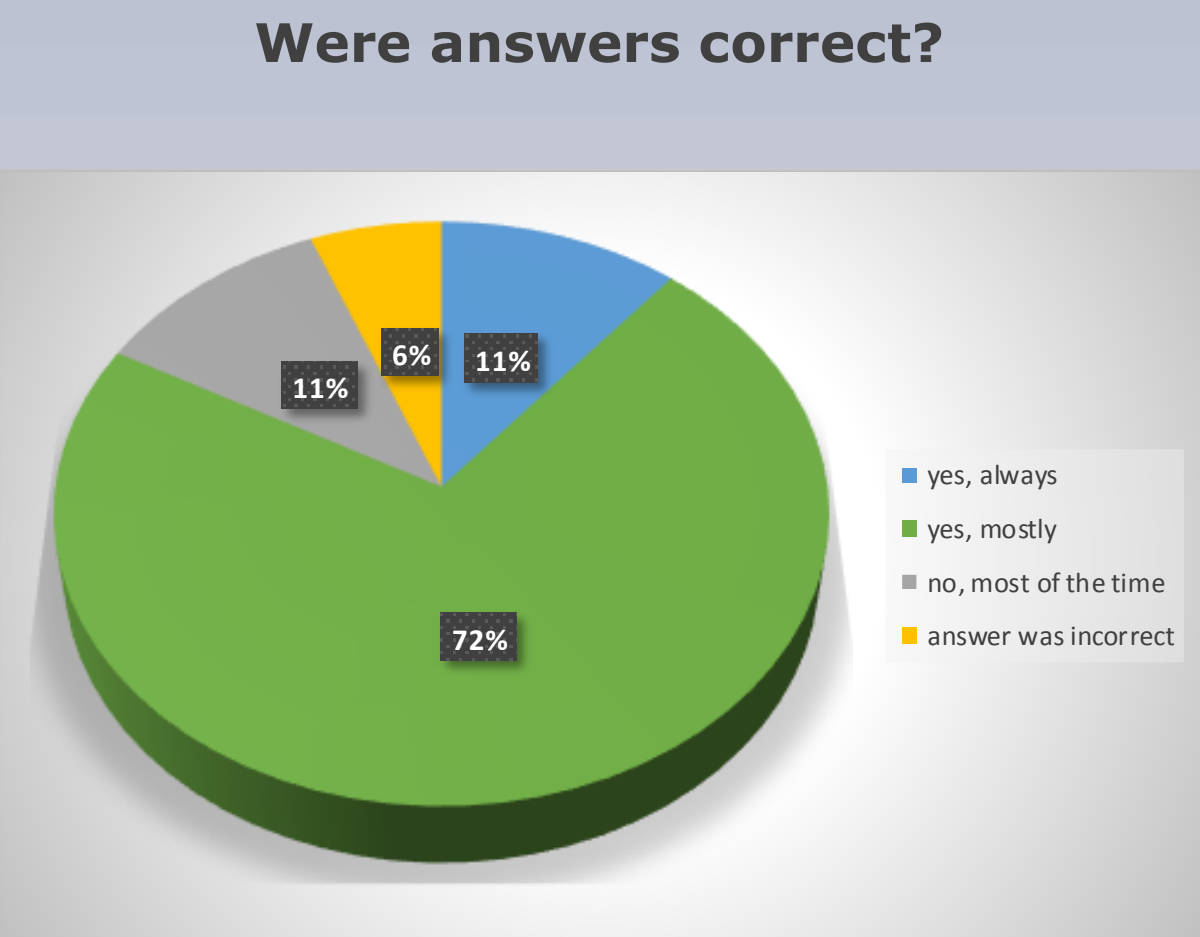
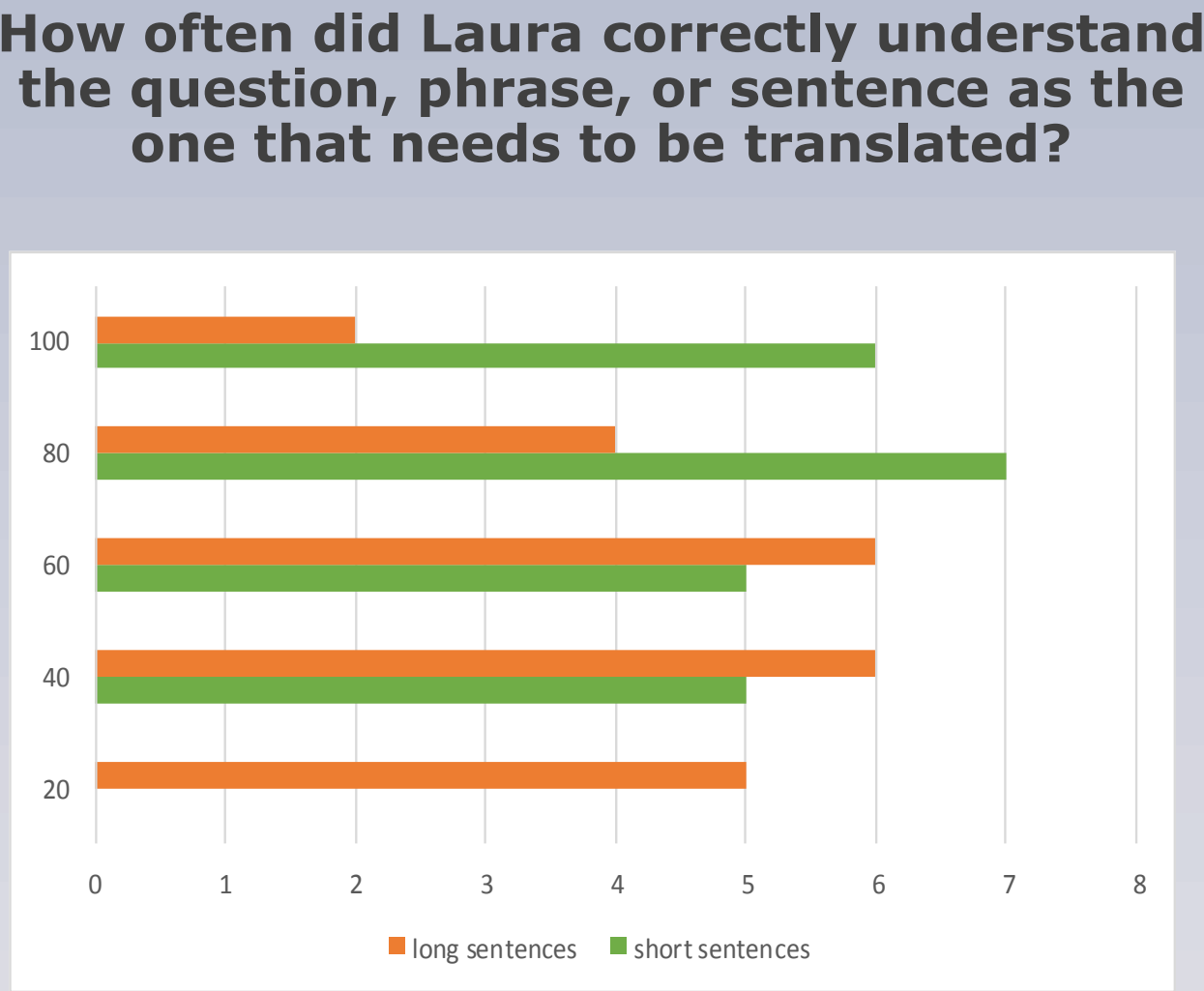
Dear Laura could you please translate today is a lovely day in Spanish
<translate lang="spanish">today is a lovely day</translate>

Please translate dog. / remembers the previous language/
<translate lang="spanish">dog</translate>

Demonstration



Evaluation



Acknowledgements

The research leading to these results has received funding from the research project "Information and Communication Technology Competence Center" of EU Structural funds, contract nr. L-KC-11-0003 signed between ICT Competence Centre and Investment and Development Agency of Latvia, research No. 2.1 " Natural language processing in mobile devices".



IEGULDĪJUMS TAVĀ NĀKOTNĒ