A Trend from Germany: Library Chatbots in Digital Reference

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Outline

1. Introduction to library chatbots
2. The making of a library chatbot
3. Experiences and learnings from chatbot projects

1. Introduction to library chatbots

A chatterbot is a computer program designed to simulate an intelligent conversation with one or more human users (...).

http://en.wikipedia.org/wiki/Chatterbot

intelligent conversation = reference interview

automatic reference interview = 24/7 availability
How much reference can a chatbot actually take care of?

Let’s take a look at the four chatbots.

Library chatbots in numbers

Benefits of library chatbots

Create a chatbot in 10 steps

1. Define the scope
2. Find a suitable software solution - or create one
3. Figure out who is going to pay for it
4. Create an avatar
5. Build the knowledge base
6. Put the chatbot on your website
7. Go online - but be aware that you are not done yet!
8. Read session transcripts
9. Improve the knowledge base
10. Evaluate the chatbot
Create a chatbot in 10 steps - The particularly tricky parts -

1. Define the scope
2. Find a suitable software solution – or create one
3. Figure out who is going to pay for it
4. Create an avatar
5. Build the knowledge base
6. Put the chatbot on your website
7. Go online - but don’t relax just yet!
8. Read session transcripts
9. Improve the knowledge base
10. Evaluate the chatbot

Chatbots don’t come cheap.

Costs of a chatbot project

<table>
<thead>
<tr>
<th></th>
<th>Euros</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software license</td>
<td>5,000-24,000</td>
</tr>
<tr>
<td>Training</td>
<td>2,000</td>
</tr>
<tr>
<td>Avatar (e.g. graphics, photos)</td>
<td>2,000</td>
</tr>
<tr>
<td>Personnel (6 months minimum)</td>
<td>25,000</td>
</tr>
<tr>
<td>Consulting (optional)</td>
<td>1,000 (per day)</td>
</tr>
</tbody>
</table>

Most of the German bots were build with funds from grants.

Create an avatar
The development of a biography for a library chatbot is a challenge for creativity.

None of the library chatbots is a librarian.

A chatbot needs to be credible and reliable.

The chatbot has to fit in with the library’s image.

Humour is vital!

<table>
<thead>
<tr>
<th>User</th>
<th>Are you a ghost?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stella</td>
<td>No I'm not. I am chosen to revive at the library’s website. As a patron saint for all those searching for literature and information.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>User</th>
<th>How did you die?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stella</td>
<td>I fought for the implementation of the library – which was never acknowledged. An unmarried woman in academia – that was sort of suspicious at the time and caused some examinations. In the course of which I died...</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>User</th>
<th>I like you.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stella</td>
<td>Well, thank you! I am happy when I can help you.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>User</th>
<th>Cool system – thank you, library folk!</th>
</tr>
</thead>
</table>
Graphic design

First drafts...

Men were afraid of her...

Steffi Graf?

Too hot

Star Trek librarian?

Giving Stella a face

Four out of ten moods

laughing

explaining

enthusiastic

confused

Build the knowledge base.

Library chatbots in numbers

The basics

Rule 3

Rule 2

Rule 1

- Input from user

- Answer from chatbot

Each rule addresses one subject

The differences

1. How specific are the rules?
2. How are the rules coded?
3. Which means of dialog control are available?
How specific are the rules?

- what is interlibrary loan?
- how much does it cost?
- where can I buy ILL vouchers?

... ASKademicus features approximately 10 ILL-related rules

- can I renew books from interlibrary loan?
- what is the difference between ILL and document delivery?
- how can I order a book from abroad?
- can I order a book that is checked out here from another library?
- do I have to know which library holds the book I want before I can order it?
- in which cases do I have to pay more than 1.50 Euros?
- what does „Mehrkosten” mean?

... Stella features 128 ILL-related rules

Depth of knowledge depends on the scope of the project.

Large knowledge bases require software products that can handle this complexity.

Coding rules: AIML

```
<alice>
  <category>
  <pattern>Good morning *</pattern>
  <template>Good morning. How are you? </template>
  </category>
</alice>
```

Coding rules: Regular expressions

```
(["HOW\w+ (.*(order|make|do) .*#ILL#) | | ("WHAT\w+ does #ILL# work") | | ("how works #ILL#") | | ("what do I have to do to (make|place)?") | | ("order(s)? .#ILL#")])
```

covers these questions plus semantic variations

- How does interlibrary loan work?
- How do I order via interloan?
- What do I have to do to order something via document delivery?
- How do I order something with the interlibrary loan system?

Answer:
It depends! You can either order online or with a paper form. But the process is basically the same: You pay the fee of 1.50 Euro in advance, fill out the online or paper form. You will be notified when your order has arrived.

Dialog control
Reference interview as a model.

Software for chatbots: Novomind IQ™

Stella: System architecture

3. Experiences and learnings from chatbot projects

How Stella runs into trouble...

<table>
<thead>
<tr>
<th>User</th>
<th>Stella</th>
<th>User</th>
<th>Stella</th>
<th>User</th>
<th>Stella</th>
</tr>
</thead>
<tbody>
<tr>
<td>(...) quick reference</td>
<td>Just a quick reference - in this case I would suggest using the reading rooms on level 1 and 2. They offer for comprehensive resources for all subjects.</td>
<td>But I am not in Hamburg</td>
<td>I am sorry, but could you rephrase that for me?</td>
<td>I don’t live in Hamburg.</td>
<td>Hamburg is my favourite city – that’s for sure!</td>
</tr>
<tr>
<td>Help!!!</td>
<td>Call my real colleagues at 428382214 or send us an email</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dialogs per day

- N.N. (Sachsen)
- Stella
- NA
- AskAdemticas
Stella: Usage

Average number of dialog per day

Dialogs per day (total) 251

Popular topics
- Finding books
- Circulation
- Hours
- E-Resources

Off topic
- 592 marriage proposals

Stella and other electronic reference services

Benchmark „real“ reference: 370 queries per day

<table>
<thead>
<tr>
<th>Usage per day</th>
<th>Source of data</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAQs 160</td>
<td>Log files of library website (2005)</td>
</tr>
<tr>
<td>Online Tutorials / Guided Tours 25</td>
<td>Log files of library website (2005)</td>
</tr>
<tr>
<td>E-Mail 5</td>
<td>Statistics from Reference Services (2005)</td>
</tr>
<tr>
<td>Chat 0,7</td>
<td>Study on live chat reference services in Germany (2004)</td>
</tr>
<tr>
<td>Stella 251</td>
<td>October 2004 - July 2007</td>
</tr>
</tbody>
</table>

Evaluation methods used for Stella

Transcript analysis
- Extensive after launch, ongoing
- Decrease in wrong answers from 30% to 15% within 2 months
- 83% of dialogs on library-related topics
- 25% information literacy

Questionnaire
- 1 month, online
- Poor turnout => limited validity
- High polarisation
- Interesting quotes

Users about Stella

„I only knew this kind of virtual characters as an entertainment tool on websites. Stella however is a better help than any FAQ, user guide or such like“

„You should spend your resources on the development of a more usable website rather than on projects like Stella."

Stella - an alternative catalog interface?

Stella
Hello – my name is Stella and I am here to help you navigate the Hamburg State and University Library website. Can I help you?

User
ameri?a? Society

Stella
Is that a topic you want to find information on?

User
ameri?a? society

Stella
I can not perform the actual search for you, but I will be delighted to help you find suitable catalogs and databases. Are you interested?

Usability studies would been helpful!
Connecting Stella to the catalog

User enters author or subject

Stella:
1. searches catalog through XML interface
2. tells users about number of hits and links to the results
3. asks users if they want to go to the results or get help on improving them

User: go to results
User: help

Stella: open results in new window
Stella: explain about truncation, databases for articles...

Learnings

Chatbots are used much more frequently than other forms of digital reference.

Why is that?

Chatbots don’t make you think. (At least, they shouldn’t.)

Chatbots provide instant answers.
Asking stupid questions is easier. Chatbots can be used anonymously.

Chatbot reference resembles peer-to-peer services. But:

Other forms of reference doubtlessly provide better answers. Chatbots can do marketing for other reference services.
Anyway:
Chatbots are really good at marketing.

Chatbot merchandise

Chatbot 2.0: Lillian
- designed to inform about library holdings
- uses Web Services from Amazon and OCLC to pull more information on a title
- prototype stage

Points for discussion
1. How much reference should chatbots take care of?
2. Are chatbots worth the money and the effort?
3. What are the alternatives for digital reference in a web 2.0-world?