Design-Bot - Using Half-Automated Qualitative Interviews as Part of Self Communication within the Design Process

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In this paper the possible use of chatbots within the design context as design-bots is explored. The prototype of a design-bot called “Nuncia” is presented and used as a basis to discuss special qualities and suitable characteristics for design-bots. Its development is based on the ongoing integration of creative writing into design courses as well as a preliminary qualitative study on customer communication, conducted with entrepreneurs in the field of handcrafted design products.

Keywords: chatbot, design-bot, responsive design strategies, creative writing

INTRODUCTION
Simple dialogue systems or chatbots have been and are developed as an alternative to or a intermediate step towards more advanced dialogue systems, who still face major difficulties interpreting the ambiguities of natural human language [Augello and Pilato 2014]. Chatbots, which are mainly based on pattern matching rules, are easier to develop than advanced dialogue systems but limited, e. g. to certain contexts that are covered by the patterns they can match and the responses that are linked to these patterns.

CHATBOTS AS TOOLS WITHIN THE DESIGN CONTEXT
Chatbots are therefore not suited for generalized conversation but good to use in specialized contexts, e. g. special design tasks. Development of chatbot systems has reached a point allowing users to design their own chatbots utilizing customizable chatbot 2.0 software like Hubot (Schumacher 2017). As design-bots, chatbots might be used to gather information via an online platform to enhance (semi-) automated customer communication but also to support the designer’s communication with him- or herself in the iterative design process, switching between internal idea development and external materialization (Welzer 2006), on a professional level or as part of educating future design professionals raising their awareness for communication processes between the internal and external while designing.

CHATBOTS AS A PART OF RESPONSIVE DESIGN STRATEGIES
A chatbot is first and foremost a responsive system. It gives a preprogrammed response to user input, displays results of triggered routines and is guided by rules and constraints. A chatbot may be a tutoring, critiquing or recommender system or a mixture of any of these. But it may also be none of the above e. g. a chatbot working as a design-bot to keep an initial iterative design-process based on text entries, in a sense “voiced” reflections on the task, going. Such a system doesn’t teach the user in a way a tutoring system would (Herr and Karakiewicz 2006), it doesn’t display critique and it doesn’t recommend certain solutions, especially not adhering to stakeholders’ needs.
other than those of the designer using it - in contrast to a number of commercial recommender systems (on this subject see Tiihonen, Felfernig and Mandl 2014). Only in an indirect way it gives a recommendation on what might be worth to think about next by asking follow-up questions.

CHATBOTS AS TOOLS TO ENHANCE SELF-COMMUNICATION

In 1966 Joseph Weizenbaum presented his ELIZA-program to the scientific community, reflecting the question why people using the software were anthropomorphizing it further in his publication “ComputerPower and Human Reason” (Weizenbaum 1976). Basing ELIZA rules and constraints on a specific dialogue technique developed by Carl Rogers might have been to a significant degree responsible. ELIZA reacts to user input mainly by appearing to apply reflective listening, by mirroring or asking input-based questions itself, thus following a therapeutic or tutorial role Rogers saw and labeled as facilitator rather than expert (Heim 2011). ELIZA as a facilitator encourages the person using it to talk on his/her own accord; by employing reflective listening and therefore more or less refraining from giving any primary expert input, apart from encouragement to talk further about subjects hinted at in what has already been said by the user. This technique doesn’t have to be seen as a ruse or trick (to hide the absence of real input, empathy, knowledge or intelligence on the part of the questioner) if integrated into a chatbot, as some developers may see it (see Feindt 2006). It might also be described as a strategy of pushing the user to self-communicate, which still functions even if the user is informed about the way the algorithm works. Using this as potential nonetheless requires not to overstep the boundaries of what is artistically meaningful and desirable. In their preface to “Mind over Machine” the authors quote Weizenbaum as conceding to the eventual success of the artificial intelligence enterprise (Dreyfus and Dreyfus 1988) as he states on the subject of chatbots: “It is technically feasible to build a computer system that will interview patients applying for help at a psychiatric outpatient clinic and will produce their psychological profiles complete with charts, graphs, and natural-language commentary”, but it remains crucial to note that he adds “The question is not whether such a thing can be done, but whether it is appropriate to delegate this hitherto human function to a machine” (Weizenbaum 1976).

THE DESIGN-BOT “NUNCIA”

The author has used creative writing as a design technique in architectural education beginning in 2011 with the course “Narratives Design” (narrative design) in collaboration with Andrea Duchek and Gesine Kulcke at the HafenCity University; the approach was further elaborated on during a guest lecture at the Institut für Bildungswissenschaft (institute for educational sciences) at Heidelberg University in the same year and is since then an integral part of the course “Prozesse der Innenraumgestaltung” (processes of interior design) at the Hamburg University of Technology. Using creative writing about design ideas and contexts to initiate and fuel a design process lies at the heart of taking chatbots into consideration as potential design tools.

The design-bot “Nuncia” is the prototype of a simple chatbot (Fig. 1), whose aim is to encourage the user to keep on talking respectively typing about his/her design project. Its name “Nuncia” (derived from lat. nuncius or nuntius which translates to “messenger” or “message”) was chosen since the web-application is merely a messenger; carrying (in a somewhat idealized approach) the users own messages back to him/her in a converted form as questions, thus triggering new responses (Fig. 2).

This first prototype is based on a preliminary research on customer communication in the area of handcrafted design products conducted as part of an ongoing research. In the course of this study six entrepreneurs in that field have been interviewed and asked about the strategies they use in customer communication. The interviews have been analyzed using a macro program developed by the author. This
A macro called “excerpt ease” is a VB-based macro program designed to help analyze qualitative interviews, based on qualitative content analysis (for a brief explanation of qualitative content analysis see Mayring 2010). The software assists the user to select parts of a given text (e.g. an interview transcript), paraphrasing and then condensing the selection, finally assigning categories in a two-step cycle to it and saving the result to a database or simply an .xls-file allowing for its retrieval later on. In this case, the goal was to gain fragments of the communication process that could be documented as flow-chart modules to be assembled later on to an exemplary full flow chart. The aim is thus to achieve a flow chart describing a customer communication as a basis for computer aided semi-automation of such a communication. Such flow-charts may also serve as a basis for developing a computer aided design process utilizing text based self communication (left in Fig. 3).

NUNCIA AS A TOOL TO ENHANCE SELF-COMMUNICATION
The use of a program such as “Nuncia” runs more smoothly, if the user is instructed from the beginning not to aim at finding out if the machine is “in itself” intelligent or “alive” (see Feindt 2006) (which it of course couldn’t be as long as we haven’t reached a singularity), but rather to see it as what it is: a tool to bring forth what is present within the user already i.e. wishes and ideas. “Nuncia” is not supposed to ever pass a Turing test, but to keep the user talking, resp. typing in text about his/her design project. The main and crucial axiom is: it is the user that is intelligent and has the ideas. Through the algorithm its programmer only motivates the users to speak of their ideas in an (actually) asynchronous communication with the creator of the design-bot (which could or even should in fact also be the using or another product designer). This can include dialogue sections where different user-input procures the same question (right in Fig. 3).

WHO IS BEHIND THE CURTAIN?
Consequently it should be possible for users to manipulate the algorithm in varying degrees of complexity from the front-end, e.g. choosing via the user interface if certain words should trigger a web search or a search through beforehand specified documents on the user’s hard drive, or the back-end, e.g. manipulating trigger keywords and sentence structure of the replies. The central idea is that of assisting users in a non-directive self-regulated process of developing or simply unveiling of what they might even already want but just haven’t consciously formulated yet.
Nuncias general functional concept

1. starter question, e.g. "what project/object is on your mind?"

2. Nuncia saves its own questions and the replies in .txt-file for documentation and later use

3. possible design-oriented replies by user

4. "what is the perfect shelf-system?"
5. "I'm thinking about my living space"

6. different input...

7. Nuncia detects first noun in the sentence

8. Nuncia (randomly) selects a reply sentence structure out of a predefined range of answers

9. possible reflective question by Nuncia

10. "what bothers you about existing designs of shelf systems/living spaces?"
11. "what makes a shelf system/living space special for you?"

12. other output...

13. further steps...
Figure 3
(left) Exemplary dialogue fragment as a result of the interview analysis
(right) Nuncia - using stored dialogue data

Figure 4
Transforming text to picture in wordseye
CONCLUSION AND OUTLOOK
Programming special chatbots to serve as design-bots appears to be an undertaking worthwhile, especially if aiming at the enhancement of semi-automated customer communication or professional/educational self-communication during the design process. For these purposes only a simple algorithm compared to advanced dialogue systems is necessary, at least at the outset. It remains to further develop evaluation and analysis of the collected data, to pinpoint and further define potential user groups and contexts and to discuss the connection to additional media in the ongoing self-communication as well as the possible integration of design-bots in meta systems, e.g. product configurators. Design aspects mentioned by the user typing text to the design-bot could be automatically structured, saved to an ontology and be used e.g. as a basis for an automated pictorial output [1] with the help of text-based image creation (Fig. 4).

REFERENCES
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