

# Conversational Design

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As a designer I am very much interested in the design process and the tools used in the design process. One aspect that I find exceptionally interesting about the design process is how we communicate with one other specifically within the realm of verbal communication and conversation. Conversation and verbal communication was one of the first ways stories were passed down and still plays a very important role in our daily lives today from a quick chat in the hallway to formal presentations. As such I would like to wrap my thesis around this idea and create a tool to augment the design process from verbal input. Along the way we will explore the role that conversation and vocal communication plays in design.

To start its good to think about and explore the voice assistants we have around us all the time, Apple's Siri, Amazon's Alexa, Microsoft's Cortana, and Google's Assistant to name a few. For most of us these assistants go unused as they don't do what we expect them to do, or it just doesn't make sense in the context of the situation at hand. Many of the reasons we see these tools as broken is they are sold to us as the be all end all solution, where in fact they are only designed and build to handle very specific queries. But because of the way they are marketed we expect the world of them like a voice assistant from a modern-day Hollywood blockbuster. Creating a realistic scope for these tools can help them meet expectations, which we will explore in this paper. On the other hand, could you imagine asking Siri what the weather was going to be at the end of the

day, while sitting in a meeting? That just wouldn't make sense. Or asking Siri to send a text to a friend while sitting in a subway car? You can imagine the looks everyone in the car would give you. For these reasons and several others, they fail to work in the context of our situations. We need to design our interactions to allow for more scenarios. As such I would like to look within the context of a design process at a couple different scenarios to start exploring the use of a design bot or design assistant.

One scenario I would like to explore is that of the brainstorming process given a certain design challenge. Let's take for example there is a team of designers tasked with designing a new bike for commuters. This simple prompt leads to many questions that the designers run through. Who are commuters? What are their needs? What is the context in which the bike will live? As the brainstorming starts many questions arrive and conversations about each start to fill the room. Where the team is coming to some mutual understanding to design the right product under the same assumptions. What if a voice tool could help the team come to that understanding quicker and more accurately? It would not only give the team more time, but also help produce a better product as they understand the domain more so. We could imagine a tool like this providing the team with several definitions of a commuter and suggesting contexts to which the bike may live. Asking the designers to turn over every stone before leaving the meeting, by stoking the conversation as needed maybe by user prompt or based on the current state of the conversation completely autonomously. Could a subsequent conversation about the bike aesthetics happen at the same time rather than several days later after the designers have scoured for inspiration and generated mood boards and sketches?

Growing on the initial momentum of the project rather than after the potential of it fizzling out. I could imagine a space where the team are congregated around a table and sketching out what they would imagine a commuter bike to look like and as this is happening the bot could be showing the team images to help articulate or showcase an aspect that the designer is thinking about such as materiality or color of the bike, which may be more difficult to sketch in the context of the meeting. Again, this gives the team a clearer understanding of what you as the designer is thinking and saves time.

To have a system that could handle this first scenario would require an understanding of the designer's lingo and the semantics of the conversation. As well as an understanding of the space to which they are working. Bikes meaning a bicycle versus a motorcycle for example. Or when referring to a city understanding that the team is referring to a place like Pittsburgh over a place like New York City, where these nuggets of information may not be explicitly disclosed in the conversations but is understood by the team. Which would require a robust machine learning system or clever machine interactions. Kyle McDonald takes about a machine learning example of the chess game in "A Return to Machine Learning." It is an interesting example as the way McDonald talks about it makes it sound as if the neural net is a child learning to play chess due to the way the system mirrors moves from previous games and from the many mistakes made throughout the following game. It's almost poetic the idea that we are "growing" these machines to learn and understand in similar ways to how we do when growing up. An even stronger parallel can be drawn as a lot of learning depends on the teacher or the training data in the case of machine learning algorithms. The cleaner the data the better

and the more the merrier, the clearer the instruction and the more examples generally equates to better understanding. But that begs the question what does it mean to understand something? McDonald touches on this a bit in his enjoyable story about the MegaHAL chatbot.

Excerpt:

**User:** *Tu parles français?*

**MegaHAL:** *I GUESS SO. PARLEZ-VOUS FRANÇAIS?*

**User:** *In 1793 the french king was executed.*

**MegaHAL:** *HA HA HA! CORRECT. ALTHOUGH, EXECUTED HAS MULTIPLE MEANINGS.*

**User:** *The revolution started on July, 14.*

**MegaHAL:** *IT IS 14 DEGREES CELSIUS HERE*

**User:** *Another revolution was carried out by Lenin in Russia in the year 1917.*

**MegaHAL:** *WHILE LENIN READ A BOOK.*

This story is interesting because of the perceived intelligence of the bot. McDonald explains that he was in awe of this chatbot and goes on to explain that it was a bit of hidden magic that create this perception of intelligence. Where the bot would take one word from the previous input and give back some information on it. In some cases, it makes more sense than others but it is still interesting that these black box style bots could be perceived as intelligent systems where they are simple queries or even human users on the other side communicating back, in the case of a mechanical turk based system.

Would a system need to be open to collect enough data in order to understand the nuances is the human language rather than doing some sleight of hand magic in the background? Terrapattern starts to explore what an open data system could look like. Terrapattern explores what an open mapping data system could look like and explores some of the use cases of such a system. The Terrapattern project is particularly interesting due to the inspiration that led to conception of the project. The inspiration looked at how industries were monetizing mapping data. The first example uses mapping data to calculate the number of cars in surface lots at malls to approximate the performance of big-box stores. Mapping the number of cars to the number of visitors to the dollars spend. Which in turns helps the companies gauge aspects of their performance, such as dollars spend in store versus online. And helps investors track their investments early, potentially affecting the markets for publically traded companies. The second example talk about mapping data being used to calculate levels of oil in tanks to helps investors and third parties truly get a sense of what the near future looks like and if there are going to be expected hikes in oil prices; this also plays a big deal in global politics and economies. The second example particularly brings to light the point of gated data, that Terrapattern expresses as well, and how we should go about democratizing data. Data privacy comes to play here as well, which would be a big concern for organizations that wanted to adopt a voice based design assistant as I am proposing. What if in the case of the oil example, the organization was planning to pivot from an oil company to an electric company and wants to have their plan together before letting everyone know, but this data lets the cat out of the bag early when they

are not prepared and ruins the future plans as investors get nervous without knowing the whole picture. Looking at this scenario in terms of the design assistant is interesting to consider as it begs the question is there a way to create this context aware system within the confines of a single project or within an organization to eliminate the democratization of internal data? This is mainly a technical challenge that is currently being talked about in the field, but it's important to bring up as it plays a role in the usefulness of the assistant. Counter to this scenario would be that of solving a problem across multiple locations or solving a problem as open source. In the case of multiple locations would all information be passed back and forth or would the system curate it? Should each team have access to all the thoughts and pieces of information within the project? Ideally leaving the information open to the whole team would be best, but may also be tedious if there are a lot of artifacts to sift through. Would the system be able to reasonable create a hierarchy of artifacts or how could the system scaffold a process to help the designers create and document their designs in such a way that the other teams would be able to pick up where they left off and run with it in a clear and quick way.

Let's come back to the case of asking Siri to text a friend while sitting in a subway car. This seems very bizarre, but why? Vannevar Bush in "As We May Think" explore some of the reasons. Bush starts by talking about the idea of right time, right place. That no matter how interesting or potentially beneficial something could be only under the right circumstances will it created, whether for technical reasons or because of the mindset of the time. I find the second part of this statement far more compelling. The mindset or the context around the idea causes it to fail, because people are not ready or willing, or

have not be primed to take it on. This reminds me of a design study I read a while back about easing people into something new, we have to be lead to a certain point, from 'a' to 'b' for the transition to be smooth. Let's take for example the design trend of a couple years back of skeuomorphism, the idea that the digital version of things needed to look and feel like the tangible and now the trend of flat, simple and clean. In a way, this is that weaning off process and a necessary jumping step for us to adopt and stick with the technology. It could be said that if the digital tools around us of several years back looked like they did today they would have failed, due to this leap that's would not have met our mental models and expectation of the time. This would be one of the reasons that voice assistants fail in public settings today. But as they become more ubiquitous and useful the social norms will change as well. Just as chatting with other travelers was more of the norm 10/15 years back now everyone keeps to themselves and their smartphones.

The same idea of mapping to our mental models exists in Licklider's paper as well. Licklider explains that the transition to a new technology needs to be gradual enough that people adopt it rather than pulling away from it, along with pulling away from certain aspects of technology they are already using. People like to be in control or at least think they are in control for the most part. As such if we were to remove or hide actions done by the machine it would turn users off as the technology would be viewed as too creepy or omniscient as many people find bots today and the way people view ad engines that track your browser searches today. These scenarios help us as designers create clearer interactions for users and asks us to create feedback loops to help the

user understand what is happening which in turn can help improve the expected interactions of the system and the system overall.

Another aspect of technological adoption is that of ease and seamlessness. Which Hiroshi Ishii and Brygg Ulmer discuss in “Tangible Bits: Towards Seamless Interfaces between People, Bits and Atoms”. “We see the locus of computation is now shifting from the desktop in two major directions: i) onto our skins/bodies, and ii) into the physical environments we inhabit.” (Ishii 2) In both these cases it’s about making the technology invisible creating seamless interactions between the technology and the users. Let’s take the second case as it pertains more closely to the proposed design assistant. Ishii describes us as being “citizens” of both physical worlds and of cyberspace. This is compelling as by definition that would mean you belong to both worlds entirely or is an inhabitant of both. Inhabitation is interesting as it expresses this idea of living in cyberspace, rather than coming in and out of the space, or separating yourself from the digital realm. Seamless communication from the digital world to the physical and back. Can a voice based design assistant tackle the challenge of a seamless conversational interaction? That’s the hope and the challenge in continuing to do this work. Creating a system that can handle or create the illusion of intelligence while still aiding in the decision-making process for designers. We could imagine a bot that could carry on a conversation in a similar way to how you would with a colleague, understanding the context of the conversation being able to pull up useful tidbits of information from previous chats and pull information from the web to help create and design better, a design companion if you will.

As an experiment for another course I built a chatbot. Throughout the process we chatted about the personality and the natural aspects of the interactions which I think ties in very much so with McDonald's story of MegaHAL. How do you make a tool have personality and have the user want to interact with it even outside of the main functionalities? How can you get users to connect with it? One of the aspects that affects the personality is the context or platform to which the tool lives. In the case of my chatbot I build it was SMS. SMS comes with some expectations of being quite informal causing people to use many abbreviations, fragmented messages or even emoji responses. Which is very different from what the expectations of email are today. As such my bot, Jasper, had to be able to handle at least some of these cases and reply in a similar style, being colloquial and using emojis or potentially gifs to interact with the end user. The second aspect that helps to dictate the personality is the domain or the field in which the bot is in. Jasper is in the design space specifically looking at color and how to share visual inspiration around these colors with the user, which in turn should reflect into a creative and artistic tone versus a bot that was in the space of stock markets. I would expect a bot in that space to be more analytics and serious. Another aspect that is important to keep in mind when building these tools is to keep them simple and robust. Keep the feature set small, but it in such a way that the bot can handle a large set of varying inputs to account for as many users as possible. People who actually want to have a conversation with the bot as another person or people you use it just as a tool and throw one word asks at it similarly to how many of us use those automated voice systems when calling fortune 500 systems. Creating a more robust tolerance will allow the bot to shine rather than have it spit out instructions for the user to read and follow,

break the seamless and natural aspects that the tool is suppose handle as a baseline product.

All in all, the above examples and scenarios help to define a space around the design process in which a design assistant could be injected at several different points to help designers and facilitate the decision-making processes they encounter. As a designer I find the process of designing and the tools we use quite compelling and would like to create this assistant as part of my research to improve the design process as it exists today. Looking specifically at voice as the avenue for these interactions and conversation to occur. With the hope this project will lead to more exploration in the space and better, more human, design tools and procedures.

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