

# From rules-based to AI-based chatbots

## CJ Walker interviews Kaveer Beharee on the future of chatbots in Techcomm

This week I present an interview with Kaveer Beharee, founder of Ubiquity AI, a chatbot development company in Cape Town, South Africa. Kaveer and I work together as linguists in NLP for chatbot conversational design.

In the field of AI, linguistics has been the most challenging area for progress and development. Getting this right will have more practical applications for businesses when now, more than ever, companies should be streamlining and making every single engagement count.

This speaks exactly to the challenges we in Techcomm will need to address in conversational design in the age of machine-human interfaces, and especially the difference in content development for rules-based vs AI-based chatbots.

## Hi Kaveer. Chatbots have been around for more than 10 years. Why so much talk about them right now?

Kaveer: Well CJ, chatbots have been around for much longer than that. And over the years, chatbots were fit for purpose, which frankly wasn't a lot. Chatbots were mostly rule-based (decision-tree), designed to fulfill extremely precise roles - like for example, handle an online FAQ section or for some sort of a sales-lead application. In 2016, Facebook opened up the world to artificial intelligence-based chatbots, which after Siri and Alexa, showed the world what AI chatbots could be capable of. As the technology becomes more robust, cheaper and easier to use, companies around the world are exploring all kind of cool ways to use chatbots to address complex communications challenges.

## What ways do you see the global Covid pandemic changing content?

Chatbots can effectively democratize access to information - meaning it can disseminate it to everyone equally, and this equal access means everyone is treated equally - at little cost. The Covid-19 pandemic is probably the best example of a global population being inundated with information and still being lost on pertinent issues.

## And what role do you see content playing in this?

I strongly feel that the importance of content and content strategy is being reevaluated as organisations, including governments, reassess how best to reach people. I think as content professionals, we are generally behind the curve in understanding how content

dissemination evolves. Over the past ten years or so, I think we were all taken aback by the way in which social media increased the velocity of information.

Today, the pandemic has revealed major flaws in the way we disseminate content, and probably more importantly, the way in which content is received. I believe the next wave in content dissemination will be a focus on targeting content in a way that triggers engagement. I think the days of shouting from megaphones is nearly over.

I couldn't agree more about the megaphones. That's what procedures have been in Techcomm, and this is big (and exciting) that we can change to a real two-way conversation with our users.

## Why are chatbots important for the future of Techcomm?

I came across an interesting article the other day, which stated that "the purpose of techcomms is to make information clear and understandable in order to make business more productive and consumer goods more convenient."

This seems pretty simple and straightforward, right? But in reality it is an extremely challenging undertaking. For example:

- How will a communicator know whether information is clear or understandable?

More importantly, how do we know how content is being received and decoded by the receiver?

Furthermore, how do we know if efforts are making a meaningful contribution to business?

I could probably talk about this topic all day, but AI and especially AI chatbots provide these answers in a way that is effective and scalable.

AI can immediately collect data from the receiver, trigger conversation and provide complex analytics - significantly enhancing data-driven decision making (DDDM), which is something that communicators should really be becoming comfortable with.

Good communicators understand the importance of research and data, but due to the nature of the job, usually rely on survey-type qualitative insights. Chatbots can immediately reach a target recipient, even millions of them, and provide new kinds of quantitative insights - which for me as a former comms consultant, is the Holy Grail of communications.

## But how can they do this?

They have such a bad reputation. Most of the reports I get from clients and users are that they seem to just have frustrating experiences with them.

CJ, that's a fair point. Right now, I can count the number of decent or semi-decent chatbots on one hand. Having AI mimic natural conversation is extremely difficult. More so if you consider that tech people, rather than communicators often drive chatbot projects - which is a huge mistake.

Coupled with that, the skills required to develop good chatbots - namely conversation architecture (teaching AI how to trigger specific kinds of responses to achieve specific goals) are in high demand and short supply.

Yes, as a recruiter in this field, I know they are in very short supply. It's a combination of linguistics principles on the classification side, and new technology on the development side that means most techcomms haven't worked for clients who need an application of these skills yet. But I think it's coming. And those who are ready to apply this will be in high demand.

How did you get these skills?

CJ, I was an economic and financial journalist and then went into technical stakeholder and reputation governance. Around 2010 a client asked which would have a bigger impact on his company's reputation: a cover article in the country's top business magazine or a tweet from the country's top and most influential financial journalist?

The fact is, I couldn't answer the question - but knew that quantitative metrics were the solution. I quickly established that social media monitoring was useless and data-at-rest analytics were the key. But the challenge was: how do you collect, structure, and analyse conversational data?

And here I introduce natural language processing (NLP) technology, which is the heart of our ability to quantitatively analyze conversational data with great accuracy over the past six years.

The leap from data-at-rest social analytics to AI chatbots was smaller than you'd think.

So just to wrap it up: I learnt these skills, especially NLP, in an attempt to answer important business questions. Many people talk about NLP, while very few have actually worked with it. Even if there isn't a business right now, find ways to get exposure to NLP now.

## So, can you give me some examples of what chatbots can actually do with NLP?

Well, there are different kinds of chatbots. The first way I would sort this for my explanation is between open and closed.

Siri, for example, is an open chatbot, which means that she has access to resources to address any number of query categories.

Then there are closed systems, which are chatbots designed to fulfill a very specific task or function, for example, sales support or filling out an enquiry form.

In its simplest terms, NLP and other technologies like NLU and NLG are technologies that

1. Facilitate communication between machine and people in an authentic kind of way
2. Help customers understand what is being communicated
3. And, most importantly to us: NLP gives us the ability to collect, structure,, and apply data in productive ways for conversation that resemble the way the human brain works with language.

Chatbots can be deployed on social media platforms, messenger apps, websites, company apps or any customer touchpoint to fulfil any number of tasks like providing a statement, or answering a question, or providing advice.

I see three areas where chatbots are poised to shine. The common requirements being, the need to be cost effective, two way communications, where real-time consumer input can be analyzed in real time to enhance decision making. The three areas are:

1. Public sector - service delivery, transacting, public advocacy, public service announcements, news dissemination etc
2. Healthcare - advice, managing public healthcare facilities (making bookings etc)
3. Financial sector - promoting financial education and literacy, automating low value tasks

Maybe, to manage expectations, it would be good to underline what can't they do?

Chatbots cannot replace humans. Chatbots can mimic empathy, but really they aren't empathetic at all.

AI chatbots follow the rules defined by its developer, and if you assume it proficiently fulfils its primary defined role, the user experience and the efficacy of the bot will be a reflection of the team that builds it.

I've had trouble with this in the past. I had a chatbot designed for the Firehead website, and it never brought in a single registration. Do you think this is because people are still afraid of new technology, or was it a limitation of the conversational design?

Regarding your website, that is definitely the exception and not the rule. Rule-based chatbots are highly-defined and have been reasonably successful in accomplishing highly specified and low-value tasks, like helping people navigate a website or filling in a form. If your bot failed to deliver, it's most likely a design issue rather than a technology issue.

Many would still argue that using a rules-based chatbot is still the most cost effective and efficient way to help site visitors navigate through your website. However, a rules-based system is static.

AI chatbots are more dynamic and have the obvious advantage that they can learn. This is what makes AI chatbots so much cooler. The more data you feed an AI model, the better it becomes at identifying user intent - and you can keep training infinitely. We primarily use AI chatbots to understand user intent better and for linguistics purposes (understanding and natural language generation).

## How does good conversational design create a more successful experience with the machines?

Conversation design is how the conversation is literally predicted to flow, based on the scenarios for which the chatbot was built. To build a successful bot means developing a platform where customer retention will be high, which means loyalty, which means a great experience and likeability. This is a direct function of how the bot engages and how efficiently it addresses a query or complaint. These are not technical considerations, but rather a function of communication science, psychology, values and principles.

## What happens when a conversation goes “wrong”?

Conversations will always go wrong. My focus is training our chatbots to learn faster than any other commercial chatbot. And we use real live conversations to train AI. From a consumer's point of view, conversation design and the chatbot design itself can mitigate the reputation risk of a chatbot conversation gone wrong - but successful chatbot models will have the ability to hand over a conversation to a human if things go wrong.

## Where are the jobs going to be?

When I was younger, guidance counsellors insisted, or at the very least, strongly pushed us into commerce or the sciences. Not the arts. Today, I believe that creativity and the ability to communicate effectively are the most important and rare skills. In this new world, communicators are more valuable than developers.

Can you name some roles you think will be in high demand?

Designers, content developers, technical communicators, taxonomers, information architects, knowledge managers, marketers, domain experts, developers, data analysts, data scientists, and data visualization engineers.

The communication skills I think will become increasingly important are domain experts and conversation design experts, who are able to meld their knowledge of the industry, subject matter and the consumer (or market) into an AI model.

## But won't communicators be boxed in by the parameters of technology?

No, communications is a social science. Technology - AI, or otherwise - is just a tool. The communications principles that were successful a thousands years ago are equally important and applicable today.

And CJ, you know, one of things that frustrates me in my field is the nebulous debates about the future of AI is the very public spats between the likes of Elon Musk and Mark Zuckerberg. The fact is that AI is pragmatically being used around the world in every industry, in every sector.

When I think about the future of AI, I think about this quote by Sandro Skansi, the author of the textbook AI : introduction to deep learning (published by Springer).

The quote is beautiful as it is inspiring...

“Artificial intelligence is a discipline to be considered as a sort of philosophical engineering. What I mean by this is that AI is a process of taking a philosophical idea and making algorithms that implement them. The term “philosophical” is taken broadly as a term that also encompasses the sciences which recently became independent sciences (psychology, cognitive sciences, and structural linguistics, as well as sciences that are hoping to become independent (logic and ontology).

“Why is philosophy in this broad sense so interesting to replicate? If you consider which topics are interesting to replicate in AI, you will discover that AI, at the most basic level, wishes to replicate philosophical concepts, for example, to build machines that can think, know stuff, understand meaning, act rationally, cope with uncertainty, collaborate to achieve a goal, handle and talk about objects. You will rarely see a definition of an AI agent using non-philosophical terms such as “a machine that can route internet traffic” or “a program that will predict the optimal load for a robotic arm” or a program that identifies computer malware” or “an application that generates a formal proof for a theorem” or “a machine that can win at chess” or “a subroutine that can recognise letters from a scanned page”. The weird thing is, all of these are actual historical AI applications, and machines such as these always made the headlines.

“But the problem is, once we got it to work, it was no longer considered ‘intelligent’, but merely an elaborate computation. AI history is full of such examples. The systematic solution of a certain problem requires a full formal specification of the given problem, and after a full specification is made, and a known tool is applied to it, it stops being considered a mystical human-like machine, and starts being considered ‘mere computation’. Philosophy deals with problems that are inherently tricky to define such as knowledge, meaning, reference, reasoning, and all of them are considered to be essential for intelligent behaviour. This is why, in a broad sense, AI is the engineering of philosophical concepts.

“But do not underestimate the engineering part. While philosophy is very prone to reexamining ideas, engineering is very progressive, and once a problem is solved, it is considered done. AI has the tendency to revisit old tasks and old problems (and this makes it very similar to philosophy), but it does require measurable progress, in the sense that new techniques have to bring something new.”