

Conversational AI Solutions:

The Happy Medium with Bold360



Back in the early 1990's, the explosion of e-commerce websites fundamentally changed the way people shop and interact with brands. Clicking "add to cart" was so much more convenient than visiting a physical retail store, and people never looked back. Today, we are on the verge of the next big wave of change in commerce: conversational commerce via artificial intelligence (AI). IDC predicts that by 2020, 40% of commerce transactions will be enabled by conversational AI solutions.¹ Given how much people today use chat and instant messenger in their personal lives, it's no surprise that businesses are leveraging AI through chatbots and virtual assistants for transactional purposes too.

Right now, there is a wide range of technologies and capabilities associated with conversational AI.

On the low end of the spectrum are heavily scripted chatbots that can only handle basic question and answer interactions about a single topic. These bots often rely on keyword and phrase recognition and follow if/then rules that were scripted by a human behind the scenes. On the opposite end of the spectrum is cognitive AI, which leverages advanced Natural Language Processing (NLP) and deep learning to accomplish any number of tasks and learn over time.

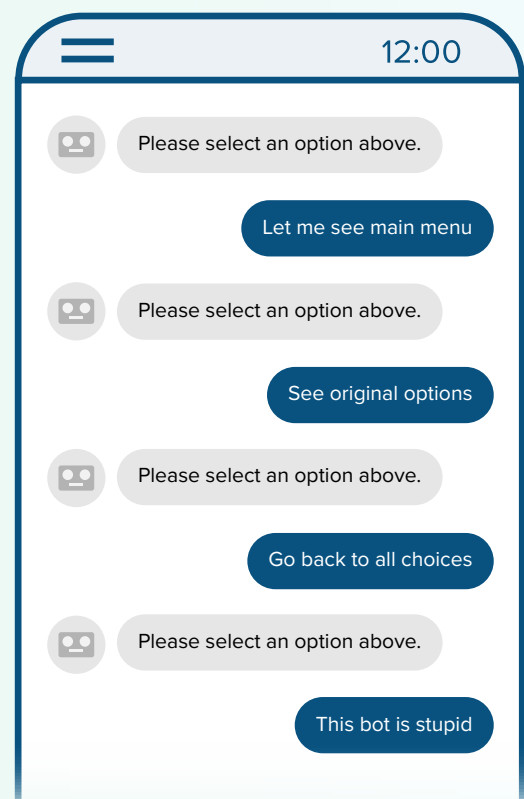
Chatbots on the low end of the spectrum leave a lot to be desired. Although these simple bots can be set up very quickly, they can only handle very narrow use cases, and often leave the user frustrated and seeking human assistance as quickly as possible.

On the other hand, highly complex, general purpose chatbots come with challenges that most organizations are not willing to take on:

significant cost and time commitments and the need for specialized data scientists who understand deep learning.

So, what do you do if you're an organization that needs a human-like chatbot with robust capabilities, but don't want to spend millions of dollars and devote years of resources to development time? **You look for a solution with fast time-to-value that delivers true NLP and conversational capabilities out of the box.**

"Although these simple bots can be set up very quickly, they can only handle very narrow use cases, and often leave the user frustrated and seeking human assistance as quickly as possible."



Example of a low-end chatbot²

Defining the Technology

With so many buzz words being thrown around by vendors selling AI chatbots, it's important to understand what these terms mean before you begin comparing solutions.

Key Term	Definition
Artificial Intelligence (AI)	Any technology that exhibits intelligent behavior.
Machine Learning (ML)	A type of AI technology that learns to behave intelligently based on data/experience.
Supervised ML	When humans provide a training set of structured data that maps inputs to outputs, and the computer makes predictions about new inputs belonging to the provided outputs.
Deep Learning (Unsupervised ML)	When computers are fed structured or unstructured data and use their own logic to classify data. Outputs are not determined by a human.
Natural Language Processing (NLP)	AI technology that uses algorithms to understand the meaning, or "intent" of language, and respond in a human-like way. Also called Natural Language Understanding (NLU).
Conversational AI	AI that comprehends and engages in contextual dialogue by utilizing NLP and additional AI algorithms.
Scripting	Humans writing rules and phrases to manually author bot behavior. This low-level AI uses keyword matching to trigger pre-written responses.
Cognitive AI	High-level AI that uses machine learning algorithms and deep learning to resemble human cognition.

NLP and Conversational AI

Artificial Intelligence is a blanket term used to describe any machine that mimics human intelligence.

AI can be manifested in many ways, but the use of chatbots has exploded because people like to engage with AI in a conversational, or human-like way. We like to talk with AI rather than fill out forms or type into search bars.

Natural Language Processing is a preliminary capability that a chatbot needs to have before it could be “conversational.” Sometimes called Natural Language Understanding (NLU), this is the ability of a machine to determine the intent of a phrase or sentence and respond to that intent. This capability is much different from recognizing a keyword or phrase and answering with a canned response that was scripted for that keyword.

Natural Language Processing is very important because words and phrases can have different meanings in different contexts.

Example: The word “running” has three very different meanings in these three contexts:

1. “Jason is running a half marathon tomorrow.”
2. “Who left the faucet running in the kitchen?”
3. “The UX team is running a test on the new design.”

In these contexts, “running” means:

1. the act of running
2. turned on
3. performing

The ability to determine the true meaning, or intent, is something that only bots with NLP technology can do. Some bots have true NLP and some bots don’t. Let’s level the playing field.

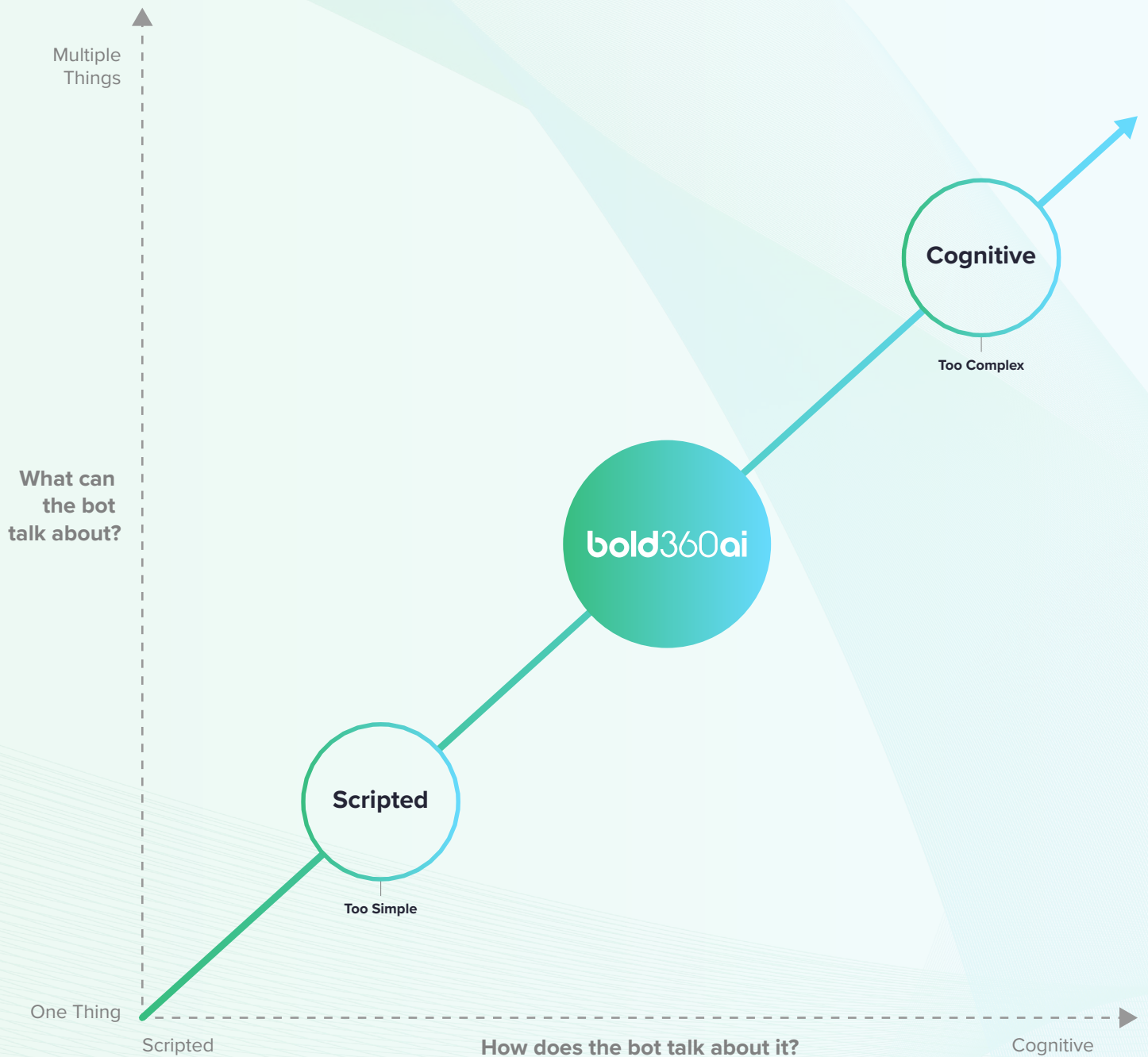


NLP

Natural Language Processing: the ability of a machine to determine the intent of a phrase or sentence and respond to that intent.

Leveling the Playing Field

The Bot Landscape



Scripted Bots

A lot of chatbot vendors claim to have conversational capabilities, but in reality, a lot of the chatbots on the market today rely on humans to write scripts and dialogues behind the scenes. When (and only when) the chatbot recognizes words or phrases in a question, they respond with pre-written answers for that question.

Companies that purchase a scripted chatbot solution have to build a set of conversation-like responses to popular inquiries. Having to script responses to every potential question is, of course, impossible, so users inevitably end up with frustrated with nonsensical responses.

Scripted chatbots are very limited in their ability to respond in a human-like way. Though some may seem like they have conversation skills, this conversational ability is not innate to the bot; A human has trained it for every single occurrence. Unless you find a solution with true NLP and conversational capability built in, you will always need to write new “conversations.”

Greeting

Enter the bot's greeting message:

Hey There!

Question 1

Enter the first question your bot should ask:

What brought you here today?

Demo

Trial

Support

Demo

Your lead answered question 1. How do you want the bot to respond?

Great! I'll help you schedule a demo with our sales team.

Support

Create a special message for contacts who need support.

Please [log into your account](#) for support. Thank you!

Trial

Create a special message for contacts who want a trial.

You can start your free trial by clicking [here](#).

Conversational Bots

What is conversation and how is it different from understanding and responding to a group of words? Think of conversational capabilities as the glue that holds individual utterances together. In conversation, humans remember what they're talking about from one response to the next. More and more bots these days can determine the intent in singular interactions, but they can't retain context throughout an entire conversation.

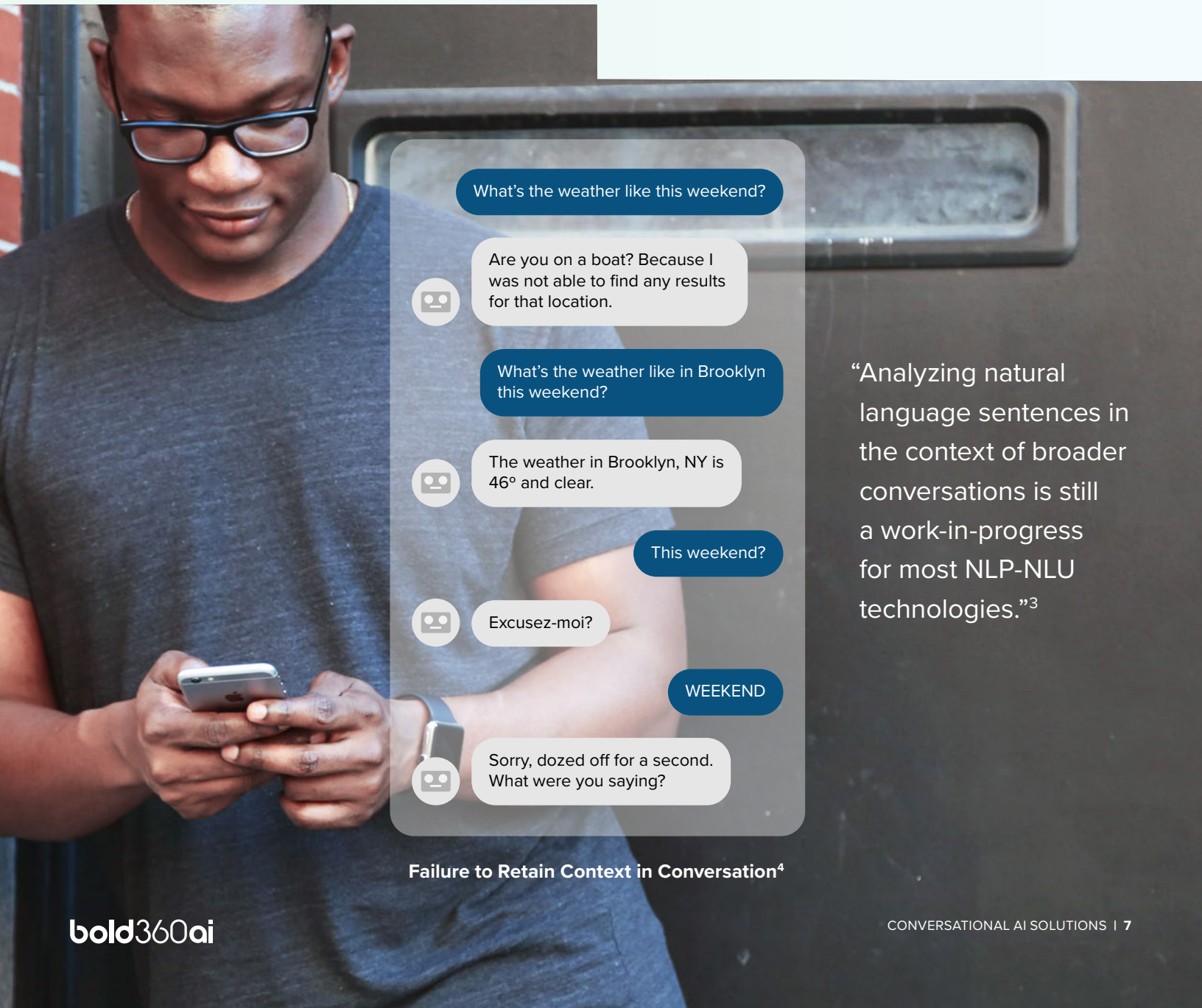
Amazon's Alexa uses NLP technology to determine the intent of the question, but she doesn't retain context from one question to the next; She can't have a conversation:

Person: "Alexa, what is the capital of Australia?"

Alexa: "The capital of Australia is Canberra."

Person: "How do you spell that?"

Alexa: "T-H-A-T."



Failure to Retain Context in Conversation⁴

“Analyzing natural language sentences in the context of broader conversations is still a work-in-progress for most NLP-NLU technologies.”³

I want to go on holiday

I love holidays and I can help narrow it down to a destination perfect for you! Use the buttons below to get started, or let me know what time of year you would like to travel.

Find discounted flights

See popular destinations

Great! Now what sort of temprature are you after?


May - Jul

Next up, how long are you wanting to fly for? Don't forget our beautiful A330's make flying long haul a dream so if you are worried about the flight you don't need to be!

I want it hot!

Last question, are you looking for that traditional beach holiday or something a bit different?

4 - 7 hour flight



Holidays to Gran Canaria
Destinations for couples that you'll love.
www.thomascookairlines.com

Something different

Can I bring baby milk

Medical products such as baby milk or essential medicine and equipment are allowed in hand luggage but you may need extra security clearance on Thomas Cook Airlines.

Restriction Info

Wedding Baggage

Musical Instruments

What is the currency of Gran Canaria?

The local currency of Gran Canaria is the Euro. If you'd like more info or you'd like to check out some great offers to Gran Canaria, then just click below!

See offers

And in Canada?

The local currency of Canada is the Canadian Dollar. If you'd likemore info or you'd like to check out some great offers to Canada, then just click below!

See offers

A bot with built-in conversation skills would be able to retain that context throughout the entire conversation. An interaction with a conversational AI chatbot would look more like this.

CONVERSATIONAL AI SOLUTIONS | 8

The result is a much more human-like interaction where the chatbot uses NLP to determine the user's intent, and then retains this context throughout the entire conversation. The conversational capability is built into the software; No one wrote a script to make it look like the bot can have conversation. When you have a truly conversational chatbot, it has the innate capability to engage in dialogue about any topic – you just give it the data (more on that below).

Cognitive Bots

The highest level of chatbot sophistication is Cognitive AI. Cognitive artificial intelligence is capable of doing just about anything including predicting cancer, driving cars, and beating humans at Jeopardy. Cognitive AI uses these technologies – Natural Language Processing to understand intents, and conversation skills to engage in dialogue – and takes them one step further. Cognitive chatbots use algorithms created by data scientists to organize vast amounts of unstructured data, recognize patterns and relationships in the data, and make predictions about the future.

Cognitive AI uses a technology called Machine Learning, which ranges in complexity. Simple machine learning clusters data into similar groups and maps those groups to outcomes that it was given. For example, if you teach a computer that everything shaped like this is called a circle, then every time it encounters a shape like this: ○, it will treat it like a circle.

In complex machine learning, or deep learning, the outcomes are not given to the computer ahead of time. Instead, the computer reaches conclusions on its own based on experience. Humans do not know what the output will be or how the computer reached that outcome.

Deep learning is the technology behind these eyebrow-raising accomplishments. And while this technology will certainly change what the future looks like for humans, it is still in infancy. When outcomes are out of human control, the results are unpredictable and can be undesirable. Of course, businesses need to have complete control over the conclusions that artificial intelligence draws, or your chatbot may end up giving away all of your products or services for free after “learning” that it makes customers happy!

This is why we recommend human-supervised machine learning. With a human-supervised approach, businesses not only avoid undesirable outcomes, but also cut the significant cost and time required to set up a chatbot with unlimited capabilities. As a business owner in today's world, you aren't trying to cure diseases or solve other complex human problems; You just need to serve your customers as quickly and efficiently as possible. So, choose a chatbot designed just for that purpose. Nothing more. Nothing less.

Plugging in Knowledge

Structure Data with Entity Graphs



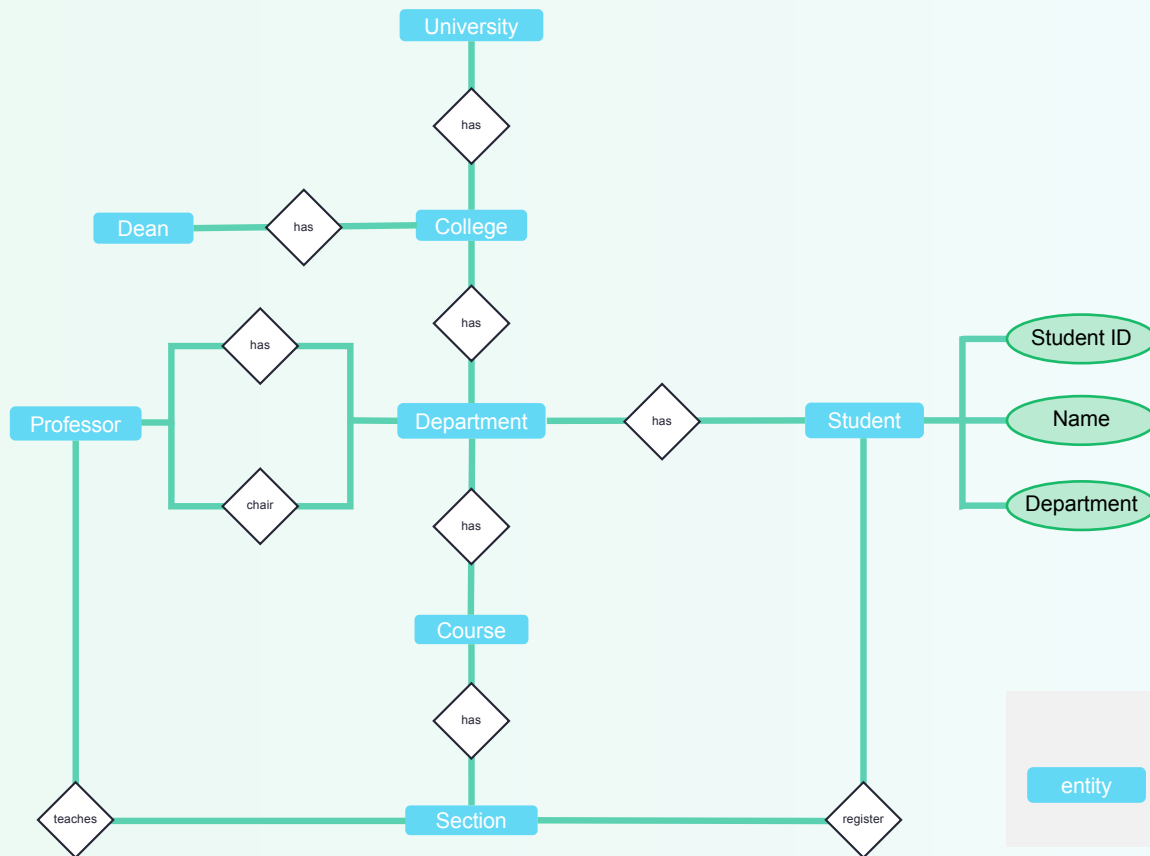
So, now we know that businesses should look for an AI-powered solution with true Natural Language Processing, or the ability to understand what the customer really needs and respond in a human-like way.

The solution should also come out of the box with conversational skills, or the ability to string individual prompt-response interactions together into a cohesive, contextual dialogue. Ideally, the solution leverages human-supervised machine learning to improve its performance over time. With all of this technology, the chatbot has the structural capabilities it needs to talk about anything you want it to. We just need to give it the content to talk about. So, how do we do that?

The answer is with an entity graph. Also called entity maps or knowledge maps, they give a chatbot the content to plug in to its conversational structure. The content, called entities, can be people, places, or things, and entity graphs show the relationships among all of these things. In other words, entity graphs model the world for the machine. Once the machine is given the relationships among the entities that you want it to talk about, it uses its innate conversation skills to construct natural language responses to questions from customers.

“Chatbots with true NLP and conversation skills that leverage structured data to have natural-language conversations offer robust capabilities with quick deployment.”

Sample Entity Graph for University



In this example⁵, entities are shown as rectangles. The relationship between the entities are shown in diamonds. Characteristics of the entities are shown in ellipses.

Using this entity graph, a conversational chatbot with NLP can understand questions asked about these entities no matter how that question was posed, and it can generate human-like responses to these questions. This structured data gives the bot the flexibility to engage like a human, without needing the time and expertise to make sense of volumes of unstructured data.

In sum, scripted chatbots without NLP and conversation skills are way too limited, and cognitive chatbots are too time, cost, and labor intensive. But there is a happy medium: chatbots with true NLP and conversation skills that leverage structured data to have natural-language conversations offer robust capabilities with quick deployment.

Businesses can count on this type of artificial intelligence to help their customers and support agents quickly find the answers they need, no matter how it's asked.



At this point you may be thinking about some of the chatbots you've encountered and trying to figure out where they would fall on this spectrum of intelligence. And you may be thinking that the chatbot wasn't very smart – likely scripted – and wondering why more chatbots out there don't have innate NLP and conversational skills. Lots of smart people with the right expertise can build this type of chatbot and sell it. So why haven't they?

Because it's hard. And it takes time.

Building a scripted chatbot is much easier; there is no technology behind it. All a vendor needs is a chatbot icon and a blank script and they can start selling their product to companies as a “conversational AI” solution. It's quick to get out the door and start making sales, but the hype around these simple chatbots is quickly dying. Companies that deploy them are often underwhelmed with the quality of the product and the return on their investment. And customers hate a stupid chatbot.

The patented Natural Language Processing and conversational skills behind Bold360 ai have been in development for a decade. We've taken the time to build real technology in a product that delivers the kind of results customers and companies expect: easy-to-find answers, fast resolution time, and a positive experience. Don't waste time with a simple product that won't meet your needs or pay for an overly complex solution that does more than you need. Find one that's just right for a delightful customer engagement experience.

Don't waste time with a simple product that won't meet your needs or pay for an overly complex solution that does more than you need. Find one that's just right for a delightful customer engagement experience.



Sources

- 1 IDC, Developing Conversational AI Interfaces and Applications, Dec 2017
- 2 <https://chatbot.fail/>
- 3 <https://chatbotsmagazine.com/bot-talks-intent-based-vs-flow-base-conversations-798788dc9cf6>
- 4 <https://chatbot.fail/>
- 5 <http://www.sqlservercentral.com/articles/Miscellaneous/designadatabaseusinganentityrelationshipdiagram/1159/>



bold360

Engage smarter.

Deliver value, instantly,
with a more human AI,
platform and interface.

Contact Us:
866.753.9933
info@bold360.com

Bold360 is an intelligent customer engagement solution that provides businesses with actionable customer insights to efficiently deliver richer and more personalized experiences in real time. We provide the digital channels and tools needed to engage and support consumers as they seamlessly move across self-service and agent-assisted channels like chat, email, messaging and social.

Visit **bold360.com** to learn more.