

# Building SMARTER CHATBOTS

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How Quality Testing Conversational AI  
Delivers Better Customer Experiences



CYARA 



*Hi!*

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No one can deny that robots are smart. Computers have been radically transforming what humans can accomplish for the better half of the last century. Artificial intelligence (AI), in particular, has been a significant game-changer. When IBM's Deep Blue beat a human chess grandmaster at his own game in 1997, it felt like anything was possible.

But those bot-smarts haven't quite been able to traverse the vast and varied terrain of the human intellect, which also encompasses emotions, logic, experience and more. Even now, more than two decades into the 21st century, there's no shortage of funny — and sometimes disturbing — shortcomings in how bots behave and communicate.

Despite those shortcomings, though, bots are getting smarter every day. And businesses are finding new ways to use chatbots to improve customer experiences and bolster their bottom line. As our economy increasingly turns toward digital, omnichannel interactions, those bots will need to get even smarter.

The day may well come when most of our communication with companies begins with bots. Whether that's good for customer experience depends on how intelligent — really, how *human* — we build and train them to be.

1...

Chatbots Aren't People But  
***They Still  
Have Needs***



Humans are pretty high maintenance. From eating and sleeping to bathing and taking care of our bodies and minds, we have to do a lot to stay physically healthy and mentally sharp. By comparison, chatbots' needs are pretty basic. They don't eat, sleep or exercise — and they can be available to help customers 24/7.

Low maintenance, however, isn't quite the same as *no maintenance*. Chatbots have two big needs: training and testing. Why? It all comes down to the core of a chatbot's being.

Today's chatbots are sophisticated software applications built on conversational AI. Unlike older chatbots, which were built to follow basic rules and could only address a limited number of issues in human conversation, these new bots learn and grow based on experience. The more conversations they have with humans, the smarter they become.

But, like any form of artificial intelligence, these AI-powered bots can only learn with human guidance and input. And that's where quality assurance testing and strategic, ongoing training comes in. The software behind the AI must consistently be monitored and tweaked to ensure the bot is learning properly and applying what it learns in appropriate ways.

We'll explore what happens when there's not enough testing in place — and what it looks like when it's done right. For now, though, the important thing to remember is that chatbots need frequent fine-tuning to ensure they do their job well.

## Chatbots have come a long way.



The average customer satisfaction rate for bot-only chats is 87.5%, two points higher than chats that also involve human agents.<sup>1</sup>

# Training + Testing



# *Inside the Mind* of a Chatbot

To truly comprehend what's going on inside a chatbot's "brain," it's important to understand a few key components of the AI that powers them. The following technologies all play an important role in how a bot thinks and behaves:



**Natural language processing:** This is what allows chatbots to process the complex layers of human language, from basic grammar and syntax to more complex emotional and contextual cues.



**Natural language understanding:** This is another layer of NLP, and it enables bots to turn raw language processing into a genuine understanding of user intent.



**Natural language generation:** Communication is a two-way street, so bots must do more than process input. NLG is what they use to convert the raw data of bot language into natural, conversational, human language.



**Conversational user interface and user experience:** This address the actual experience the user has interacting with the chatbot. Is the tool itself easy to use? What's the bot's personality? Is it an enjoyable experience?



**Machine learning:** This technology is foundational for AI, as it's what allows computers to learn and change based on experience. Without it, a chatbot can only respond to cues exactly as it's programmed to.

## #chatbotsFTW

Retailers of all kinds have used bots to pivot to digital sales in recent years. From beauty consultants to logistics managers to store inventory checkers, retail chatbots can do it all.

**These technologies work together to determine how a bot interacts with each human it encounters. In essence, the harmony between them — or lack of it — will determine how smart a bot is. And the difference between a well-trained bot and one that isn't is unmistakable.**

# Think + Behave



# When Chatbot Communication Breaks Down

When chatbot conversations go sideways, it can be quite frustrating for the user. But sometimes, when AI falls short, the resulting chatbot fails are just too funny not to laugh. Consider a few examples that went viral.



## #chatbotfail

### “You had one job.”

Sometimes, a bot fails at its fundamental task. That was the case with a weather app that was designed to let users quickly look up weather forecasts based on their location.

What's the weather like this weekend?

Are you on a boat? Because I was not able to find any results for that location.

What's the weather like in Brooklyn this weekend?

The weather in Brooklyn, NY is 46°F and clear.

This weekend?

Excusez-moi?

WEEKEND

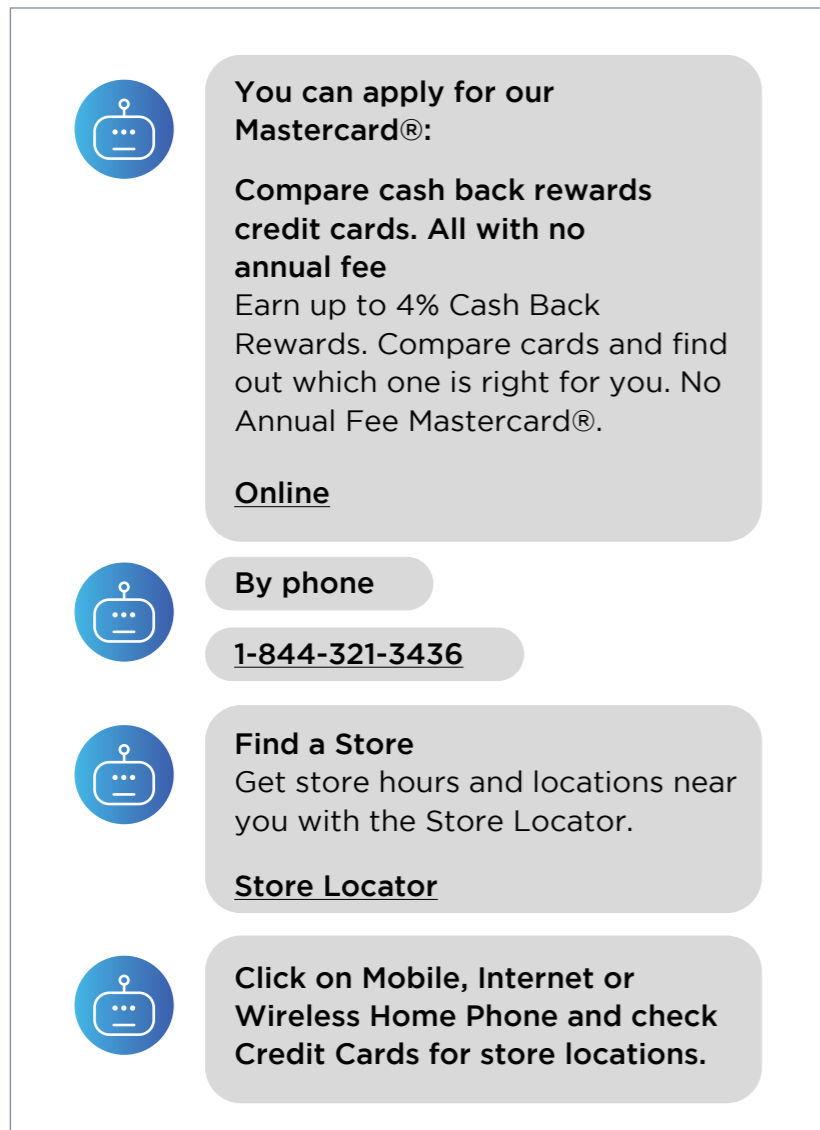
Sorry, dozed off for a second. What were you saying?

When you can't even get a bot to do what it's meant to do, you know you have a serious flaw in your conversational design.

## #chatbotfail

### “TMI, bot, TMI.”

When you ask for information, some bots come back with a firehose full of it.



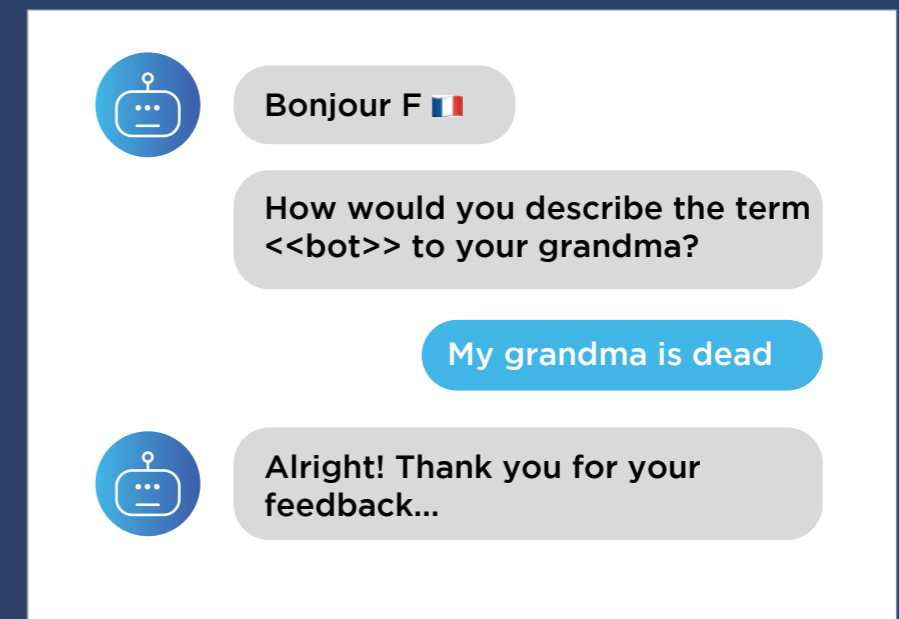
The screenshot shows a chatbot interface with a blue header and a white background. On the left, there is a vertical list of four blue circular icons, each containing a white chatbot icon. To the right of each icon is a grey rounded rectangle containing text. The first icon is followed by a large grey rounded rectangle containing the text: "You can apply for our Mastercard®: Compare cash back rewards credit cards. All with no annual fee Earn up to 4% Cash Back Rewards. Compare cards and find out which one is right for you. No Annual Fee Mastercard®. Online". The second icon is followed by a grey rounded rectangle containing "By phone" and another grey rounded rectangle containing "1-844-321-3436". The third icon is followed by a grey rounded rectangle containing "Find a Store Get store hours and locations near you with the Store Locator. Store Locator". The fourth icon is followed by a grey rounded rectangle containing "Click on Mobile, Internet or Wireless Home Phone and check Credit Cards for store locations."

It's hard to parse out the real information from the links in that example, so your most likely response might be to close the app and seek help elsewhere.<sup>2</sup>

## #chatbotfail

### “Well, that was offensive.”

Some bots haven't quite mastered the art of tactfulness.



The screenshot shows a chatbot interface with a white background. On the left, there is a vertical list of three blue circular icons, each containing a white chatbot icon. To the right of each icon is a grey rounded rectangle containing text. The first icon is followed by a grey rounded rectangle containing "Bonjour F 🇫🇷". The second icon is followed by a grey rounded rectangle containing "How would you describe the term <<bot>> to your grandma?". To the right of this is a blue rounded rectangle containing "My grandma is dead". The third icon is followed by a grey rounded rectangle containing "Alright! Thank you for your feedback..."

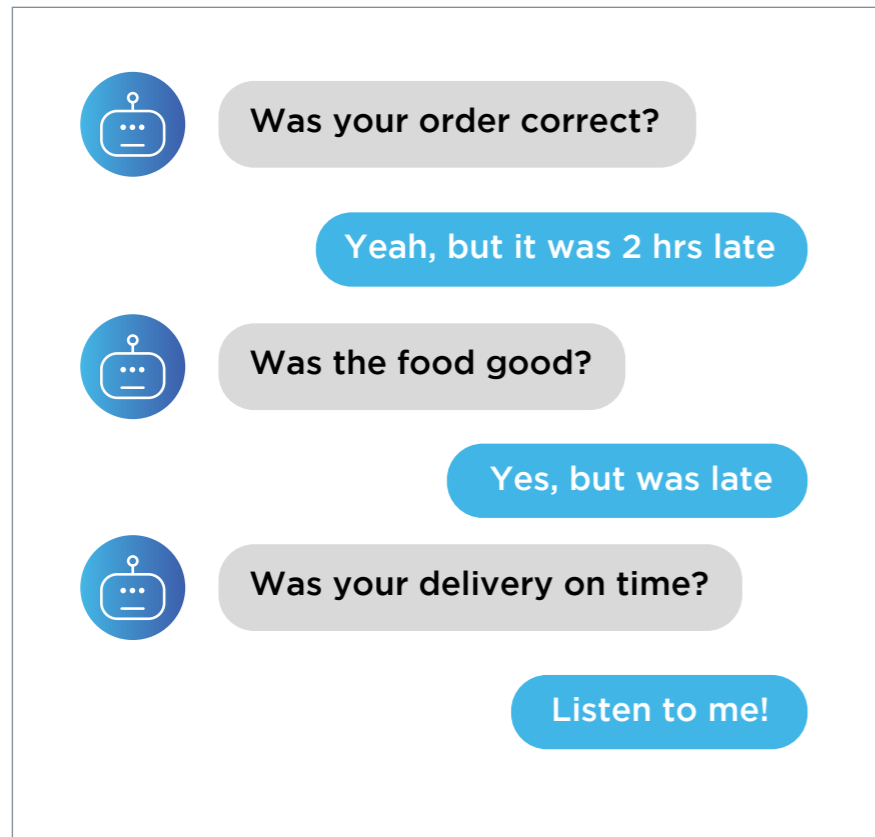
That's painful, isn't it? If you weren't sure whether you were talking to a robot before that exchange, you'd have no doubt afterward.



## #chatbotfail

### “Are you listening to me?”

Finally, there's the bot that can't seem to take a hint.



Clearly, that bot has one mission, and it doesn't involve serving the customer. All you can really do in this situation is laugh — and then give up.<sup>3</sup>

These are only a few examples. And some of them — like Tay, Microsoft's disastrous bot-turned-neo-Nazi<sup>4</sup> — aren't quite so funny.

**“You had one job.”**  
*“TMI, bot, TMI.”* “Well, that was offensive.”  
**“Are you listening to me?”**  
**“You had one job.”**  
*“TMI, bot, TMI.”* “Well, that was offensive.”  
**“Are you listening to me?”**  
**“You had one job.”**  
*“TMI, bot, TMI.”* “Well, that was offensive.”  
**“Are you listening to me?”**  
**“You had one job.”**  
*“TMI, bot, TMI.”* “Well, that was offensive.”  
**“Are you listening to me?”**



## When a Chatbot Has a Human Touch

All of us can think of situations when chatbots haven't quite hit the mark. But there are plenty of examples of chatbots achieving more than expected, too. Success happens when you are not even aware that you are talking to a bot.

### #chatbotsFTW

Insurance companies are using chatbots to handle claims, provide updates and offer personalized quotes. AI and chatbot technology are expected to save the industry \$1.3 billion in 2023.<sup>4</sup>

## WHEN A CHATBOT'S PROGRAMMING IS DIALED IN, YOU'LL GET:

### **Quicker responses to inquiries**

When they're functioning well, bots can answer service requests 24/7. If you need an answer right now, this is a significant plus.

### **Accurate answers**

Chatbots that have been tested and properly trained will give the right answer far more often than not, enabling you to quickly move on and go about your day. It might not have even occurred to you to wonder whether you were chatting with a bot or a live human!

### **Always-on-script messaging**

Well-programmed bots don't go off the rails. They stick to the conversation at hand — and they know when to hand it off to a human.

### Improved containment rates

Many issues can be resolved without a human agent. When chatbots can successfully address your question without involving an agent, it significantly cuts down on the number of requests that funnel into the call queue. That means lower wait times for customers and reduced labor costs for your call center.

### Privacy and security

Agents are trained to vigilantly guard customer privacy, and bots should be, too. Well-designed and tested chatbots won't slip up and accidentally disclose something they shouldn't, and won't expose you to compliance violations that can result in costly fines. Customers can feel at ease that any data they hand over will be handled safely.

### Other business benefits

When chatbots are effectively deployed and maintained, a business doesn't spend as much time or money putting out the proverbial fires of customer complaints. You can instead invest resources in higher-value propositions, such as improving products and further enhancing customer experience outcomes.

A chatbot failure can certainly make your business look bad. But these advantages — for both customers and businesses — are substantial, and they make investing in chatbot technology worth the effort.

## When chatbots are working well:



The top reason customers value them is 24/7 support.<sup>6</sup>



When functioning properly, chatbots can handle 80% of customers' routine tasks and questions.<sup>7</sup>



Businesses can cut support costs by as much as 30%.<sup>7</sup>

# Human Touch

3...

What Makes a  
***Great Chatbot?***





The truth is, making great chatbots takes a lot of effort. And to build better bots, we have to go deeper in understanding those human touches. Beyond simply appreciating when a bot does its job well, we have to ask what features made it capable of providing great service.

Overall, there are eight key elements that make a great chatbot. We can group these together into four functional and four non-functional features.



# FUNCTIONAL FEATURES

Functional features deal with a bot's ability to directly address customer questions and needs. This will make or break a user's experience with a chatbot.



## It provides accurate answers.

There's no quicker way to lose a customer's trust than to provide wrong answers or inaccurate information. When you're investing in bot technology, this has to be priority number one.

Accuracy requires basic programming. The bot should know your store hours and give the right ones when asked, for instance. But consistent accuracy demands much more than that. The AI engine that drives your chatbot should allow it to learn from end-user inputs so that it consistently provides more accurate information over time. And when it doesn't have an answer, it should make it easy for the user to reach a human who does.



## It understands context.

Context is always key in human conversation. The better a bot can understand context, the more natural that human conversation will be.

Consider how you'd ask a friend about the weather forecast. You might start by asking "What's the weather forecast looking like?" If your friend answers with today's weather when you really wanted to know about the weekend, you probably wouldn't respond, "What's the weather forecast for the weekend?" You'd simply say, "What about the weekend?" Your friend would understand you're still talking about the weather and respond accordingly.

Chatbots need to be able to carry on a conversation in the same way. To understand context, they must have strong recall and an ability to comprehend natural language clues that people use in back-and-forth conversations. Otherwise, customers will grow frustrated as they explain themselves repeatedly.



3

### It lets users down easy.

Just like humans, chatbots will never have ALL the answers. But there's a difference between failing in a way that frustrates the user and failing in a way that empowers them to take the next step.

In other words, a well-designed chatbot should let your customers down easy. That means not sending them into an "I don't understand the question" doom loop, or giving endless run-arounds when they just want to talk to an agent. Bots should be programmed to acknowledge when they're not getting the job done and offer easy alternatives.

4

### It works across multiple channels.

As customers increasingly favor digital, cross-channel service experiences, brands must adapt by employing smarter and more nimble technology. The best chatbots are capable of retaining information from an interaction in one channel and transferring it to a follow-up interaction in a different channel. This keeps users from repeating themselves, and matches the way they already use technology in other areas of their lives.

For instance, if a customer initially reaches out via SMS, a chatbot should be able to collect their information, retain it, and move the conversation to another channel, like a website or proprietary chat app, and pick things up right where it left off. To do this, chatbots need effective, end-to-end testing on every platform where they're used.

**The omnichannel experience is increasingly crucial for customer support.**

**Consider:**

**73%**

Customers prefer to use multiple channels when shopping for products and services.<sup>8</sup>

**89%**

Companies with omnichannel customer engagement strategies retain 89% of their customers on average, compared to 33% for companies without omnichannel engagement.<sup>9</sup>

**9 out of 10**

Consumers prefer omnichannel service.<sup>10</sup>





# NON-FUNCTIONAL FEATURES

Although secondary to functional features, non-functional chatbot features provide another layer of depth to the customer experience. If you have the functional features in place, these next four can prove transformative.



## 1

### It's secure.

As customers conduct more of their business with brands via chatbots, they share more of their sensitive, personal information via chat channels. Depending on your industry, this could include basic information, such as names, addresses and phone numbers. Or it may include more sensitive details, like credit card information and Social Security numbers.

If your chatbots handle any of your customers' personal information, they must be equipped to collect, use, and process it safely and securely. Rules such as Europe's General Data Protection Regulation (GDPR) impose strict standards of user consent and control when sharing information, and there are likely many similar laws to come around the globe.<sup>12</sup>

When you implement chatbot technology, be sure it meets or exceeds these regulations. To start, a bot should always ask for user consent for any information that it will share. It should offer information about company privacy policies up front — before collecting anything personal.

## 2

### It's personalized.

The benefit of collecting user information is, of course, that it enables a more personalized service experience. The more detail a chatbot can access, the better it can tailor its responses toward each individual customer.

For example, suppose a customer uses a chatbot to request a refund. The chatbot should be able to collect enough information to identify the customer and create a refund ticket in the background. If the same customer returns several days later to ask about their refund, the bot should be able to pick up the conversation where they left off and provide an update on their refund status.

## #chatbotsFTW

Banks around the globe are using chatbots to maximize customer self-service and satisfaction, whether by handling balance checks, money transfers, lost credit card reports or countless other everyday banking functions. Chatbots are expected to save banks a total of \$7.3 billion globally in 2023.<sup>5</sup>





### It learns.

A chatbot's ability to learn is the sum of all the key AI components we discussed earlier. How well do its NLP, NLU and machine learning capabilities work together to enable the bot to interpret new and different inputs and contexts? A well-designed bot with a robust AI engine and proper training will gradually get better and better at answering increasingly complex questions.

The danger, of course, is that bots that are capable of learning can also be reprogrammed by user inputs in less beneficial ways. The aforementioned neo-Nazi bot<sup>4</sup> is an infamous and unsettling example, but it doesn't have to reach that extreme to cause problems. To ensure reliable, consistent learning that stays on brand and on message, chatbots need regular NLP testing and training. This supplements the power of AI with a guiding human hand so your bot doesn't stray off course.



### It's accessible.

Web accessibility is gaining more attention from legislators and companies of all sizes and industries. However, many brands have a long way to go toward assuring that anyone can use their digital services, regardless of any disabilities they may have.

Chatbot technology can get ahead of these trends by ensuring that the widest variety of users can engage and interact with bots pleasantly, and with ease. Screen readers are particularly relevant in a chat context, as a visually impaired user can't use a chat interface without one. Building better bots means giving adequate attention to these and other accessibility-related issues.



Research by Botium demonstrates the importance of many of these features, as 28% of users still avoid using chatbots for reasons such as:

**46.2%** *"I usually have complex questions."*

**34.6%** *"It's annoying."*

**34.6%** *"It's time-consuming." <sup>1</sup>*

Want to Build Smarter Bots?  
***Start by Quality  
Testing Them***

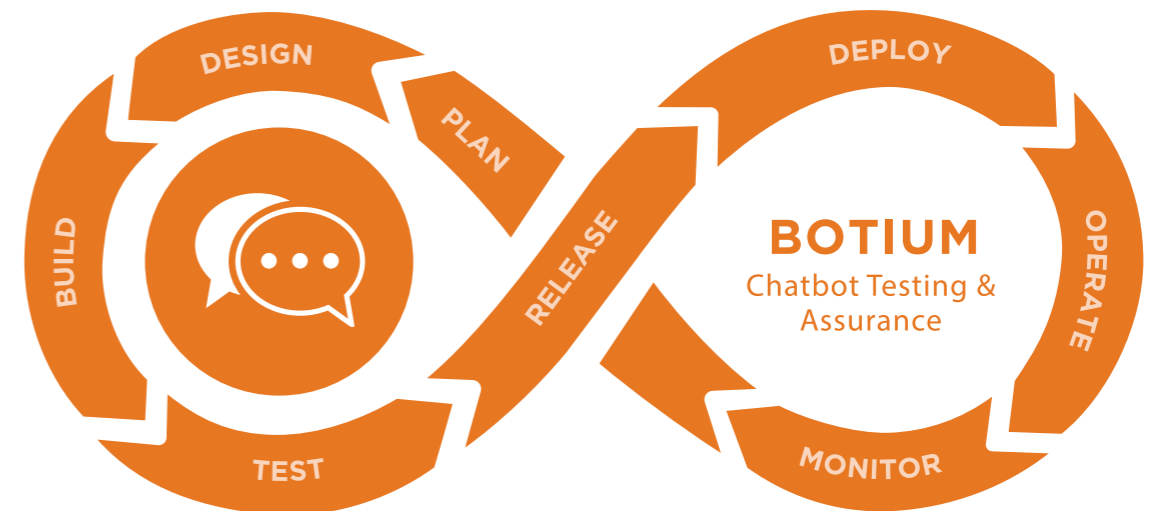


The features we've explored so far span a wide range of chatbot technology and capabilities. But there's one common thread when it comes to achieving them: QA testing. Without constant, end-to-end testing on your bots in all their support channels, it's difficult to meet these quality standards.

Like any software, bots will fail at times. Interactions won't go as planned, defects will cause problems, or customers will raise unexpected concerns. You can't avoid these hiccups entirely, but you can minimize them — and catch them before they reach customers — through continuous testing and monitoring. The only other options are to avoid chatbots entirely, use simple ones with minimal AI capabilities, or let your customers do the testing (yikes).

None of those options will allow you to stay competitive in the age of omnichannel, digital-first customer service. Still, the prospect of adding another layer of complex technology to your business — especially one that requires so much quality testing, training and monitoring — may sound like too much work. The good news is that you don't have to figure it out on your own.

An outstanding chatbot is a complex system that requires a *comprehensive testing strategy* to ensure the highest level of quality under all conditions. Testing only one aspect of your chatbot virtually guarantees that you'll be left vulnerable to undetected errors. You could put all your efforts into achieving the highest possible confidence estimation in NLP, but it's useless if the chatbot simply gives up and shuts down when overwhelmed by a higher-than-normal volume of users.

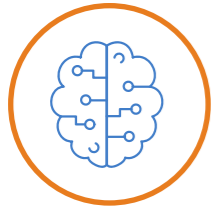


Detecting specific types of failures requires specific types of testing. That's why a holistic approach to chatbot testing is what the experts recommend.



# FUNCTIONAL TESTING

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**NLP testing** tests and analyzes your chatbot training data, and provides guidance and resources that continuously improve your chatbot's ability to understand.

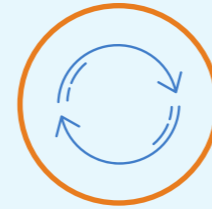


**Regression testing** automates conversational flow testing, ensuring your chatbot is delivering accurate answers to customers in a timely manner.

Your customers expect a stable, predictable response from a chatbot, which requires you to deliver *quality and consistency* in every interaction. With Cyara Botium, you can leverage the most comprehensive, automated chatbot assurance solution on the market to do precisely that. Botium tests chatbots at every phase of the software development lifecycle and in every context of your business so you can ensure customers have the same high-quality experience everywhere, regardless of how they engage with your business.

# NON-FUNCTIONAL TESTING

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**End-to-end testing** ensures that all customer channels are delivering quality customer experiences across all browsers, mobile applications, and devices.



**Performance testing** assures that your chatbot can carry the load, responding to inquiries and requests in a timely manner through heavy traffic, peak seasons, and busiest hours of operation.



**Security testing** automates testing against the latest and highest security and data privacy requirements.



**Customers who use Botium save anywhere from 73-100% in manual labor costs by automating chatbot QA testing.**<sup>13</sup>





Cyara Botium, part of Cyara’s Automated CX Assurance Platform, provides you with quality assurance for your chatbot solutions, and does it while saving you the money that manual testing would have cost you. Customers who use Botium save anywhere from 73% to 100% of their manual labor costs by automating chatbot QA testing.<sup>13</sup>

By choosing Botium for chatbot quality assurance, you can maximize your investment in this important CX technology and turn visitors into lifelong customers.

**Learn more** about how Cyara Botium can help you build, test, train and maintain smarter chatbots!

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**TALK TO AN EXPERT**