

Natural language— NYC311 service better than ever.

Speech IVR solution helps NYC311 deliver a superior customer experience at a lower cost.

Challenge

- Handle ever-increasing call volumes more effectively
- Continually improve the customer experience
- Improve operational efficiencies to reduce expenses
- Reduce misroutes and agent-to-agent transfers

Solution

- Implement a Natural Language Call Steering application to route calls quickly and accurately
- Develop self-service features, 311 agent screen pop and robust reporting
- Deploy an administration portal to make applications changes quick and simple

Results

- Enabled NYC311 to deliver a superior customer experience at a lower cost
- Increased agent availability by up to 25%
- Increased call center capability by over 20% during high demand days and emergency response periods

NYC311: The nation's largest and most comprehensive 311 service

New York City, the most populous metropolitan area in the United States, is home to over 8.3 million residents. To serve this massive and diverse population the City operates the nation's largest and most complex municipal government with more than 350,000 city employees and 120 agencies, offices and organizations offering over 4,000 different services to residents.



“We have worked closely with Nuance to develop a service experience unparalleled in the 311 community. Through the successful implementation of cutting-edge speech recognition and intelligent call routing, we’re providing our customers with the quality and ease of use they have come to expect from New York City.”

Joseph Morrisroe
Executive Director, NYC311

When Michael Bloomberg became mayor in 2002, he made improving the level of government service one of his top priorities. His vision included a centralized, all-purpose call center, which residents could easily access—24 hours a day, 7 days a week—for any non-emergency service, government contact and information request.

The result was NYC311, the largest and most comprehensive municipal government customer service platform in the world, which consolidated more than 40 separate City call centers and hotlines into a single, easy-to-remember number. For more than 10 years, NYC311 has provided the public with quick, easy access to all New York City non-emergency government services and information while maintaining the highest possible level of customer service. It helps agencies improve service delivery by allowing them to focus on their core missions and manage their workloads efficiently. Today NYC311 is the most popular customer channel the City offers, averaging more than 20 million calls per year.

Taking NYC311 service to the next level

While NYC311 dramatically improved customer satisfaction during its first 10 years of operation, the City was not content to rest on its laurels. “We’re committed to leveraging technology innovations to enhance the 311 operation and better serve the public,” said Rich Lindemulder, Director of NYC311’s Program Management Office. “We want to ensure that NYC311 continues to be the best that it can be.”

The City was looking for ways to improve the NYC311 customer experience while reducing expenses and increasing operational efficiencies. One area identified for enhancement was NYC311’s Interactive Voice Response (IVR) system, which allowed customers to select menu options using their telephone keypad via touchtone. While the touchtone system helped route calls to the appropriate call center agent, its press-button options presented some challenges and limitations that could lead to misroutes and agent-to-agent transfers.

“When someone calls into NYC311, our goal is to immediately identify his need and connect him to the right information or the right service,” explained Kirstie Johnson, Director of Customer Experience. “Because our touchtone system offered only four press-button options, we had to continually re-prioritize from day to day—or even hour to hour—how to best use those options. For example, if the City was experiencing a bitter cold snap, we might choose to make “heat complaints” one of those options so customers would be automatically routed to the right agent for intake instead of being transferred to one agent and then another.”

However, in a city that is a major tourist destination, a global business hub, and home to more than eight million residents, there are literally thousands of reasons why a person might call 311. “Even if we concentrated on the top 200 call types, the four press-button options our touchtone system offered were just too limiting,” stated Andre Williams, NYC311 IT and IVR Manager. “Our commitment to making NYC311’s service the best it can be led us to deploy a state-of-the-art IVR system using Natural Language Understanding (NLU) technology from Nuance.”

Leveraging natural language to deliver a superior NYC 311 customer experience

In September 2013, NYC launched a new IVR platform designed and developed in cooperation with Black Box, Avaya and Nuance Communications. The IVR uses Nuance NLU technology to recognize and communicate with customers via an interactive speech application. That way, customers can receive service immediately

without having to navigate through a touchtone menu. The application captures the customers’ spoken input and analyzes its meaning to determine intent. Based on the customer’s intent, the system then provides the requested information or routes the call to the appropriate agency, department or call center agent—all as part of a seamless, conversational customer/system interaction.

Working together, Nuance and NYC311 made important decisions up front about how to leverage speech recognition and self-service automation for maximum service impact. “During the project’s discovery phase, Nuance worked closely with us to understand the nature of our business, which is crucial since a government contact center and 311 non-emergency service is not like a financial institution, airline or other commercial business,” noted Williams. “Nuance was fully committed to designing a system that would meet the needs of our extensive customer base and our high expectations for service quality. They didn’t try to cut any corners or persuade us to accept a generic solution that wouldn’t satisfy our constituents.”

Using NYC311’s internal analytics system, the project team was able to easily identify the top 200 call types. “By focusing on the top 200 call types we felt that we could capture the majority of our customers’ intents,” explained Williams. “We then had to determine the best ways to handle those 200 call types—whether through self-service, FAQ content delivery, automated routing to a NYC311 agent or a transfer outside of the agency. Any requests that fell outside of those 200 would go to a general agent to handle and triage.”

What is Natural Language Understanding?

NLU enables customers to interact with an IVR in a conversational manner without being constrained by a fixed set of automated system responses. NLU allows the IVR to be more forgiving and understand a wider range of conversational input, resulting in higher automation rates and a more satisfying, effortless and personalized customer experience. NYC311’s IVR leverages NLU to:

- Recognize the meaning of spoken input, determine customer intent and route the call accordingly.
- Ask the customer follow-up questions to clarify ambiguous intent.
- Handle corrections and verifications by dynamically embedding confirmations in the next prompt for a smooth conversational flow.

Intelligent routing takes customers closer to the best point of service

NYC311’s natural language IVR provides fast, efficient call routing from a single point of access. The IVR greets customers and invites them to “Briefly tell me what I can help you with today.” Customers are then free to describe their request in their own words, saying anything from “I need to get a copy of my birth certificate” to “I want to find a public swimming pool in Manhattan.” The application analyzes the spoken input, understands the customers’ intent, and then routes the call to the appropriate department, agency, self-service application or agent—typically in one easy step.



Listen to how the IVR handles a simple customer request

Built using Nuance’s proven speech recognition technology, the IVR performs well even when faced with challenges commonly encountered in New York City, including ambient noise, regional accents, local dialects.



Hear how the IVR accurately recognizes the request of a customer with a heavy accent

Self-service answers customer requests without agent assistance

In addition to call routing, the IVR provides self-service to fulfill customer requests for City information and assistance in the most efficient manner possible.

Self-service enables customers to obtain information on their own—without agent assistance—quickly and easily just by conversing with the IVR. When customers take advantage of the system's self-service options, it reduces the number of calls transferred to the call center, thereby empowering agents to focus on complex needs and enabling the agency to more effectively absorb its ever-increasing call volume.

In some instances, the IVR's self-service features simply fulfill a customer's request for information.

Listen to the IVR respond to the customer's inquiry about bulk item pick-up

In other cases, self-service is a more involved interaction that provides customized information based on the customer's address or location.

Hear how the IVR provides garbage pick-up information tailored for the individual customer

Proactive information delivery fulfills many inquiries up front

The Nuance solution enables NYC311 to easily add and remove dynamic messages that proactively deliver information to customers based on anticipated call drivers. Since the City determined that 40% of incoming calls were related to alternate side of the street parking, the IVR always presents this information to customers up front. That way, customers can get the parking information they seek right away and simply hang up.

NYC311's IVR team can add dynamic messages at any time to provide information related to a major event, a weather emergency or other temporary happening—and then remove them when they're no longer needed. For example, the IVR team could add a message about NYC Marathon street closures and have the IVR deliver that message to customers on the days leading up to the race.

"When it comes to our dynamic messages, sometime they're proactive and sometimes they're reactive," said Johnson. "In either case they enable us to protect our call center by resolving calls up front. We use analytics to anticipate situational spikes in incoming calls—due to a snowstorm for example. Then we could add a prompt, 'Are you calling about school closures, Yes or No?' during those hours of the day when we're likely to get calls about weather-related school closings."

Screen pops streamline customer-agent interactions

Since there are still many types of service requests that require interaction with one of NYC311's agents, Nuance worked with NYC311 to ensure that those interactions

are as efficient as possible. When certain call types are transferred to the call center, a screen pop widget containing data collected by the IVR will appear on the agent's desktop display. For example, if the customer tells the IVR, "I'd like to file a heat complaint," the system will confirm the request and begin the address collection process. When the system transfers the call, it sends along an agent screen pop that displays the reason for the call and the customer's address. The screen pop streamlines the customer's interaction with the agent by eliminating the need to repeat information already provided to the IVR.

"People don't typically call us because they're having a great day, so it's critical that they feel their interaction with the IVR was time well spent," said Johnson. "By capturing and displaying key information, our screen pop widget gives agents a little bit of a leg up on the call so they can provide more efficient service. That time savings contributes to a better customer experience."

Admin portal makes application changes quick and simple

Recognizing that NYC311's IVR would need to adapt to meet the dynamic, ever-changing priorities of the "city that never sleeps," Nuance provided a web-based administration portal that enables authorized IVR team members to make simple changes on the fly—with no coding required. For example, while "earthquake" may not be a word that the IVR recognizes today, the team could easily add it to the NLU grammar in an emergency situation using the admin portal. That way, the system would recognize customer inquiries about an earthquake and route the calls appropriately for optimal service.

"The admin portal allows us to activate messages, deactivate messages, turn on questions, turn them off, add some grammars and make routing changes on our own without having to engage Nuance," commented Williams. "It gives us the autonomy and control we need to immediately respond to situations and better serve our customers."



[Click here to see how easy it is to add an IVR prompt using the administration portal](#)

A collaborative partnership focused on successful outcomes

From the project outset, Nuance partnered with NYC311 to set specific goals, monitor progress and deliver superior results that align with the City's service level objectives. Nuance assembled a top-notch team of project managers, business consultants and technical professionals who brought to the engagement the right mix of customer care experience, speech application design expertise, and proven best practices. Every step of the way, NYC311 had access to Nuance's team of solution experts to ensure that the IVR would be able to handle the complexity and diversity of potential requests

under a wide range of conditions for a consistently great customer experience.

“I was impressed with how the Nuance team partnered with the City at every stage of the project—from requirements gathering and discovery through design, development and testing to post-implementation support—to make sure we hit our targets in terms of schedule, cost and quality,” said Lindemulder.

Since NYC311 was the first 311 to deploy NLU IVR technology for service delivery, the testing and tuning phase of the project was especially critical to make sure the system could meet the City’s high standards for service excellence. The project team created an extensive set of testing scenarios to make sure that the system was capturing intent, routing accurately and minimizing the risk of trapping customers within the IVR.

“We had access to Nuance experts—either on site or remotely—which was particularly helpful during the testing phase,” said Raul Robalino, IVR Quality Analyst. “The Nuance speech scientists and linguists were instrumental in helping us figure out how to adapt the IVR to how our customers actually make requests or provide information. Their recommendations for fine-tuning grammars and weighting words to better determine customer intent were invaluable.”

Just as important, the partnership didn’t stop when the system went live. The Nuance team continues to help NYC311 with system tuning, optimization and reporting to ensure continuous improvements. “Nuance’s expertise in knowing how to support the project post-implementation was a big plus, too,” added Williams. “From initial implementation to ongoing support and optimization, this has been a successful collaborative effort.”

A service experience unparalleled in the 311 community

Since Mayor Bloomberg established the service in 2002, NYC311 has been tasked with maintaining service levels that meet or exceed the industry standard—a goal the City has consistently achieved. Because the new natural language IVR significantly enhances self-service options, reduces the average wait time and streamlines customer interactions with agents, NYC311 is now able to deliver even higher service levels—and a better overall customer experience.

“NYC311 is embedded in the culture of our City; people really depend on it,” said Johnson. “The natural language IVR is enabling us to provide even better service to the public. We’re able to automatically route customers directly to other government departments and agencies—whether it’s the Metropolitan Transit Authority, the Department of Motor Vehicles or the Division of Child Support Enforcement. We see a huge difference in service level and wait time with the new solution.”

In addition, NYC311 continues to serve as a model for non-emergency government service delivery operations. Many major U.S. and international cities have looked to replicate New York City’s success as they design their own 311 operations.

“New York City has always been at the forefront in terms of leveraging technology to better meet the needs of the public,” said Lindemulder. “As word of our new natural language IVR continues to spread, other cities are contacting us to learn more about speech technology and the benefits it can bring to 311 operations and the overall service experience.”

NYC311’s natural language IVR solution has increased call center capability by over **20%** during high demand days and emergency response periods.

About Nuance Communications, Inc.

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