



SUBMISSION FORM

All submission forms must include the following information. Separate submission forms must be turned in for each eligible program. **Deadline: July 1, 2021.** Please include this submission form with the electronic entry. If you do not receive an email confirming receipt of your entry within 3 days of submission, please contact [Gage Harter](#).

PROGRAM INFORMATION

County: _____

Program Title: _____

Program Category: _____

CONTACT INFORMATION

Name: _____

Title: _____

Department: _____

Telephone: _____ Website: _____

Email: _____

SIGNATURE OF COUNTY ADMINISTRATOR OR DEPUTY/ASSISTANT COUNTY ADMINISTRATOR

Name: _____

Title: _____

Signature: _____

ChesterBot - A Successful Collaboration of Communications and Technology Abstract/Executive Summary of the Program

ChesterBot, of Chesterfield County, Virginia, is an automated question and answer-style chatbot designed to assist users of the county's [Chesterfield.gov](https://www.Chesterfield.gov) and [Library.Chesterfield.gov](https://www.Library.Chesterfield.gov) websites locate online resources across a variety of departments, resources and services.

Recognizing the need to quickly access rapidly changing information at the onset of the COVID-19 pandemic, ChesterBot was created to assist many users in simultaneously obtaining accurate results 24/7. Automating this major communications effort early allowed the county's personnel resources to be allocated to other COVID-19 priorities.

In addition to its curated knowledge base, ChesterBot connects users to the entirety of our website's content, including many of the county's custom-built and third-party applications by using webhooks and application programming interfaces (APIs). Chesterfield County Public Library (CCPL) ChesterBot's interface integrates directly to the library's catalogue and includes a live chat with a librarian feature.

ChesterBot has been specifically designed to maximize accessibility: the initialization code is optimized for screen readers, it is entirely tab-navigable, it utilizes ARIA attributes and the embedded interface is able to benefit from global web services such as Google Translate.

Since activation, ChesterBot has received over 29,800 queries, 14,800 click-throughs and 1,700 live chats, assisting users in quickly navigating to needed information.

The Problem/Challenge/Situation Faced by the County and Need for the Program

In March 2020, the onset of the COVID-19 pandemic in the United States necessitated a shift in local government services from in-person to primarily digital almost overnight. Services that residents, businesses and visitors of Chesterfield County depended upon needed to remain available and accessible in this new format, but not require personnel resources needed for allocation to other COVID-

ChesterBot - A Successful Collaboration of Communications and Technology

19 priorities. Additionally, information about this rapid shift and new process and developments required an easy-to-use interface that allowed for quick, intuitive searches. Hence, ChesterBot was born.

ChesterBot was initially conceptualized as a guide for the substantial amount of information available Chesterfield's [County Response to COVID-19](#) section of the Chesterfield.gov website. The development team soon realized the application's broader potential beyond a coronavirus-response chatbot and expanded the bot's functionality to include the most web-searched topic areas of the entire 37,000-plus page Chesterfield.gov website, connections to county applications via APIs and, with the addition of CCPL ChesterBot, the integrated use of live chat for library.chesterfield.gov users.

Since activation, ChesterBot has assisted users in quickly navigating to information about those needed services during a time of great uncertainty. In this way, ChesterBot has offered an innovative, accessible solution to several identified problems and has expanded and improved our delivery of services.

Description of the Program

In March 2020, when Chesterfield County had to quickly shift from in person to digital services across the majority of county departments, representatives from Microsoft approached Chesterfield's Information Systems Technology (IST) Department with their new QnA Maker chatbot technology being deployed by the state of Missouri. After acquiring the QnA Maker technology, Chesterfield's IST development team quickly created a working prototype capable of leveraging information on the County Response to COVID-19 section of the website. In testing the knowledge base, the development team soon realized the application's broader potential beyond a coronavirus-response chatbot.

Engaging content experts in both the IST eGovernment Services team and Communications and Media, the bot's functionality was expanded to include the most web-searched topic areas of the entire 37,000-plus page Chesterfield.gov website. Utilizing the strengths of a cultivated question and answer knowledge base, the bot was effective when users searched with just a few keywords to help them

ChesterBot - A Successful Collaboration of Communications and Technology

discover quick, direct answers as well as related topic areas that are offered by the bot as additional buttons to be clicked. With this knowledge base expansion, the bot could now be deployed, for example, to find more information about tax payment options, applying for county permits and more.

In addition to the direct query answer, some responses were programmed to include suggested related topics for users to explore. Those related topics would appear as buttons within the interface that, when clicked, would guide users to complimentary answers and trusted sources. For example, if a user requested information on “taxes,” the bot would return not only information on, and a link to, the county’s tax payment portal, it would also provide buttons to tax payment information, options and plans as well as additional tax-related content on the Treasurer’s section of Chesterfield.gov. The bot does not assume that users have the exact knowledge of what information they ultimately need; it guides users in discovering a complete answer to their inquiry topic area.

The next stage of development involved connections to county applications, such as the Real Estate Assessment Data (READ) app, which were made available via webhooks and application programming interfaces (APIs). Using the READ app as an example, users can type in a Chesterfield County address and the bot, interacting with the READ app, will identify the query as an address and provide a button for users to click-through directly to the READ app with the information for that address already entered into the application. A similar integration allowed for fallbacks to the website site search, meaning, if the bot’s knowledge base did not return a result for a certain query, it would next ask the website search for any possible answers and return those results.

With this functionality in place, the final critical stage before launching the bot was to design and create the user interface. The name ChesterBot, the avatars that represent the bot (both a scenic representation used for the button and an in-conversation representation for chat responses) and the family history and story of the bot were developed to create an interactive experience for bot users.

ChesterBot - A Successful Collaboration of Communications and Technology

In June 2020, ChesterBot launched on all pages of the Chesterfield.gov website. For desktop users, the bot appeared as a floating button in the lower right corner of the screen; for mobile users, the bot was located just below the traditional web search. The success and effectiveness of the chatbot was immediately apparent. In the first month alone, ChesterBot generated over 100 conversions, or click-throughs to online services or information, per day. Throughout 2020, ChesterBot continued to engage our website visitors, averaging over 1,000 conversions to our web content per month. Since launch, ChesterBot has taken on the role of personal assistant for many of our website visitors, more efficiently connecting citizens to core government services, like helping them to register to vote, request absentee ballots, find their polling location or pay their taxes. The chatbot's direct connection to our content management system has allowed it to nimbly respond to significant increases in requests for financial assistance or utility bill relief, and even directs users to unexpected trending topics on the website, including mental health support or domestic violence hotlines, requests of the like which have only increased as the pandemic has continued. Other services like requests for marriage licenses, park hours of operation and public safety information continues to be popular conversation topics with ChesterBot.

Our efforts in enhancing our website communications were recognized by our website vendor, CivicPlus, who in September 2020 asked us to leverage our Microsoft QnA Maker experience to assist in beta testing CivicPlus' native chatbot, developed by Frase. From October to December 2020, we partnered with Frase and CivicPlus on a limited beta using our Library subsite, Library.Chesterfield.gov, and launched the Frase-version of CCPL ChesterBot. After three months working directly with CivicPlus and Frase in evaluating the functionality of their product, we decided against adopting the Frase bot as replacement to our QnA bot and, in December 2020, launched the QnA-version CCPL ChesterBot.

CCPL ChesterBot, in addition to a dedicated knowledge base, offered the ability to search the library's catalogue (much in the same way that ChesterBot offers the ability to search within the READ application) and could return results from the website search for Library.Chesterfield.gov. And, while

ChesterBot - A Successful Collaboration of Communications and Technology

CCPL ChesterBot's separate knowledge base provided users with a library-focused experience, we also wanted CCPL ChesterBot users to have the option to fallback to the contents and information within ChesterBot's knowledge base.

This knowledge base fallback (which had previously been impossible in the Frase-version of the bot) proved to be a critical feature, as the late December 2020 QnA-version launch coincided with the beginning of COVID-19 vaccine availability in the United States. While COVID-19 vaccine information was present on Chesterfield.gov and not Library.Chesterfield.gov, CCPL ChesterBot could provide vaccine information results from ChesterBot's separate knowledge base for users who needed quick, reliable access to a trusted source.

The knowledge bases of both ChesterBot and CCPL ChesterBot are updated on a consistent basis. Content managers monitor asked queries and generate reports on user-identified "non-answered" topics, which are then used to develop and expand the content areas of the bot.

In this way, while initially conceptualized as specifically a coronavirus-response chatbot, ChesterBot and CCPL ChesterBot now provide users with a reliable way to quickly identify up-to-date information on Chesterfield.gov and Library.Chesterfield.gov departments, resources, services, programs and events.

Summary of time frame for development and implementation:

- ChesterBot
 - Initial Development – March-May 2020
 - Launched – June 2020
- CCPL ChesterBot
 - Initial Development – September 2020
 - Frase-version Launch – October 2020
 - Frase-version Beta Testing – October-December 2020
 - QnA-version Launch – December 2020

Advancing Diversity, Equity and Inclusion

At Chesterfield, we understood very quickly after county offices closed due to COVID-19 that the ways our citizens interacted with the county were dramatically shifting. While web traffic generally increased, we identified that traffic from mobile devices, in particular, was on the rise. As our citizens and business customers were working from home instead of from offices, they were no longer accessing our services in front of a desktop computer but on-the-go from their personal smart phones. Because of this, it was very important that we designed an inclusive chatbot experience that worked on mobile phones as well as, or better than, the desktop experience. With the obvious limitations in screen size that comes with a mobile experience, we strategically designed the bot to appear under the website's search bar instead of floating in the bottom-right corner as it does on desktop. Since launching, 49% of all chatbot sessions were identified as initiating from a smart phone or tablet device instead of a desktop computer.

As we grew our chatbot's functionality, our efforts in enhancing our website communications were recognized by our website vendor, CivicPlus, and we were asked to leverage our Microsoft QnA Maker experience to pilot their own chatbot. We agreed to beta test CivicPlus' native chatbot, which would leverage the Frase chatbot technology, in a limited run on our Library subsite (Library.Chesterfield.gov). After three months working directly with CivicPlus and Frase in evaluating the effectiveness and functionality of their product, we ultimately decided against adopting as replacement to our own QnA bot due in large part to concerns surrounding ADA and Section 508 compliance in the Frase product.

In tracking our website analytics and evaluating our audience's needs during the early quarantine periods, we identified that our website was being more frequented by visitors ages 55 and older, likely the same visitors who would typically drive to the office or call via the phone (in 2019, 24% of all website visitors were 55 or older; in 2020 that demographic increased to 32% of all website visitors). Just as we had strategically targeted a richer experience on mobile devices, we also recognized that the type of user most inclined to interact with something like a chatbot or virtual assistant might be a user that is

ChesterBot - A Successful Collaboration of Communications and Technology

unfamiliar with operating or navigating a website, or otherwise has a disability preventing them from doing so. We placed our chatbot initialization code near the top of our website by our search bar while floating the bot's button at the bottom of the site on desktop devices; this way, a user with a screen reader could access the bot very quickly since the initialization script will be recognized much sooner on the page, instead of navigating all the way to the site footer (as is required for accessing many other chatbots). We also worked to ensure that our chatbot was entirely tab-navigable and that a mouse was not required to initiate or interact with it. This exponentially increases the compatibility of our chatbot to countless devices beyond the desktop computer or smart phone. Using ARIA attributes, we designed an experience where a screen reader could parse questions from responses without needing to reload or re-read content every time a query is made within a single session.

Most importantly, we curated the knowledge base and communicated our content in a way that was direct and easy to understand, and seamlessly embedded the interface in our site so that it could benefit from our other global web services, like Google Translate, allowing users to natively translate our chatbot's content into dozens of languages to be consistent with the rest of the site.

[Responding to Economic Downturn](#)

The onset of the COVID-19 pandemic coincided with fiscal year 2021 budget review and approval for Chesterfield County. As the realization of coming economic impact became apparent, revisions to the budget were quickly made based on the available projections, which adjusted revenue downward by nearly \$50 million and necessitated a significantly reduced spending plan.

County employees, a critical asset of the county, were also affected by the reduced spending plan. In addition to the rapid shift from in person to teleworking for many employees, others were either furloughed or temporarily re-assigned to different departments to meet essential frontline needs.

ChesterBot - A Successful Collaboration of Communications and Technology

One such area was in the county's call center, which was initiated to handle the increase in call volume that the county was experiencing during the initial COVID-19 shift. Many calls included questions regarding current information about access to services, open hours of government buildings and how best to reach teleworking departments – all topics which were repeatedly asked.

Call center personnel, already a creative pivoting of resources, needed another nimble and responsive solution to assist in handling the sheer volume of these repeated topic inquiries. Enter ChesterBot: with the ability to address multiple queries simultaneously, the bot was able to assist both direct access users and call center personnel in finding the most up-to-date answers to these time-sensitive questions.

As the pandemic continued, users, now familiar with ChesterBot, engaged with the bot to find information regarding COVID-19 testing (and later COVID-19 vaccinations), as well as traditional county resources such as permits, payments, licenses and more. With the launching of ChesterBot in June 2020 and the responding decrease in call volume, the call center was able to be disbanded in July 2020 and those employees returned to serve critical needs in their original home departments.

During a time when personnel resources were both more critical and scarce than any time in recent memory, ChesterBot provided a needed access solution to information faster and easier than a traditional website search, was able to responded to many users simultaneously and saved direct-contact county employee resources for more personalized needs and responses.

The Cost of the Program

ChesterBot (for the purposes of this section meaning both ChesterBot and CCPL ChesterBot) is a product of multiple Microsoft Azure environments and services, including SQL databases and servers, app services, cognitive services, search services, key vault, application insights and QnA Maker. Chesterfield County, already a Microsoft 365 and Azure campus, leveraged current systems for the management of the various elements of the bot. Costs associated with ChesterBot are operational; all development was

ChesterBot - A Successful Collaboration of Communications and Technology

done internally. The monthly cost of the Azure environments associated with ChesterBot are between \$225 to \$300, with the average monthly cost of approximately \$293. Since April 2020, the bot's accumulated Azure cost is \$3,440.82.

For another county attempting to replicate a bot such as ChesterBot, they would need to consider the personnel costs as well. Chesterfield County's talented developers and content managers dedicated numerous hours to the creation of ChesterBot; that initial dedicated time would need to be factored into calculations. However, once launched, minimal staff time is needed to maintain the bot. Additions to the knowledge base and functionality testing represent a few hours monthly.

For comparison, had the county decided to pursue the chatbot developed by Frase, the licensing costs would have exceeded \$20,000 annually. County developer and content manager staff time would be in addition to that licensing amount. But, if a locality did not have the needed personnel to develop the functionality of a chatbot and maintain it in an environment like Azure, then a chatbot such as the version developed by Frase would be an excellent solution.

The Results/Success of the Program

When county offices closed due to COVID-19, most government services not only continued operating remotely, but expanded. Chesterfield County experienced significant spikes in traffic to webpages up and down our sitemap from users trying to find these services, which they had become accustomed to finding in person or over the phone pre-COVID-19, and from users seeking services like financial and food assistance, tax relief and mental health support for the first time since COVID-19 impacted our community. We understood the critical need to deliver continuity of these services online and acted quickly to develop ChesterBot.

The success and effectiveness of incorporating a chatbot on every page of our website was immediately apparent. In the first month alone, ChesterBot generated over 100 conversions, or click-throughs to

ChesterBot - A Successful Collaboration of Communications and Technology

online services or information, per day. Throughout 2020, ChesterBot continued to engage our website visitors, averaging over 1,000 conversions to our web content per month. Since the activation, the bot has received over 29,800 queries, 14,800 click-throughs and 1,700 live chats.

ChesterBot has assisted users in finding needed information for the most important milestones of the past year. Leading up to historic primary and general election turnouts, ChesterBot assisted nearly 700 website visitors in registering to vote or in finding their precinct locations. Over 680 residents seeking information about vaccines have been assisted so far, along with over 1,685 other unique queries to services, including online payments, real estate assessment data, marriage licenses and more.

Ultimately, we measure ChesterBot's success in providing another channel for our citizens to effectively interact and engage with the county. Every query that is processed by ChesterBot is one less phone call that needs to be made, or one less email that needs to be routed through our organizational chart. And as successful as we feel the ChesterBot implementation has been in 2020, we see many more opportunities to continue growing on ChesterBot's success, expanding its functionality even further, integrating the technology even deeper into new web systems and platforms and continuing to innovate in intelligent content delivery.

Worthiness of Award

In a truly remarkable, unimaginable year where so many things went wrong, ChesterBot was a shining example of what could go right with the collaboration of communications and technology. A solution to multiple resource problems, the successful development and launch of the bot at the outset of the pandemic allowed the county's public safety personnel resources to be allocated to other COVID-19 priorities.

But, ChesterBot was not merely to be a COVID-19-response tool; since the activation of ChesterBot in June 2020 and CCPL ChesterBot in October 2020, the bot has received over 29,800 queries, 14,800 click-

ChesterBot - A Successful Collaboration of Communications and Technology

throughs and 1,700 live chats, assisting both county personnel and direct users of Chesterfield.gov and Library.Chesterfield.gov in finding targeted and accurate information at critical moments in this new digital-first world.

Since the original conception, ChesterBot has continued to evolve to meet use needs with ever-expanding functionality. Connections to county applications, fallback to website searches and the ability to live chat directly through the bot's interface are all now possible. As improvements and innovations continue to be made, ChesterBot will implement creative uses of technology that make county processes more user-friendly, accessible, interactive, efficient and cost-effective.

Brief Overview of the Program

ChesterBot, of Chesterfield County, Virginia, is an automated question and answer-style chatbot designed to assist users of the county's Chesterfield.gov and Library.Chesterfield.gov websites locate online resources across a variety of departments, resources and services.

ChesterBot has been specifically designed to maximize accessibility: the initialization code is optimized for screen readers, it is entirely tab-navigable, it utilizes ARIA attributes and the embedded interface is able to benefit from global web services such as Google Translate. In addition to its curated knowledge base, ChesterBot connects users to the entirety of our website's content, including many of the county's custom-built and third-party applications by using webhooks and application programming interfaces (APIs). Chesterfield County Public Library (CCPL) ChesterBot's interface integrates directly to the library's catalogue and includes a live chat with a librarian feature.

Since activation, ChesterBot has received over 29,800 queries, 14,800 click-throughs and 1,700 live chats, assisting users in quickly navigating to needed information.

[Meet ChesterBot: ChesterBot's Story and Family History](#)
View this information and more at Chesterfield.gov/ChesterBot.



Hi everyone, I'm ChesterBot!

Who is ChesterBot?

ChesterBot is the robot

descendant of the miner

featured in the Chesterfield

County seal. A true innovation

of the 21st Century, ChesterBot

is a modern-day miner,

assisting Chesterfield.gov

users in mining (searching)

through all the information on

the website.



See the family resemblance?

What is ChesterBot?

ChesterBot is an automated

question and answer-style

chatbot designed to assist

visitors of the county's

Chesterfield.gov website to

locate online resources across a

variety of departments,

resources, services, programs

and events. Users can access

ChesterBot via a button on

every page of the

Chesterfield.gov website.

ChesterBot is available 24/7 and

provides an additional method

for users to quickly obtain

targeted information.



My button looks like this! Go ahead, try it out!

The ChesterBot Family is Expanding... Meet CCPL ChesterBot!



Hi everyone, I'm CCPL ChesterBot!

CCPL ChesterBot is the latest

expansion to ChesterBot, who

will now assist Chesterfield

County Public Library (CCPL)

users at library.chesterfield.gov.

CCPL ChesterBot also integrates

CCPL's Live Chat feature, so

users can ask to chat directly

with a librarian through the

CCPL ChesterBot interface.

Where is CCPL ChesterBot?



Look for me on library.chesterfield.gov!

Users can access CCPL

ChesterBot via a button on

every page of the

library.chesterfield.gov website.

CCPL ChesterBot is available

24/7; the Live Chat is available

Monday-Friday from 10 a.m. to

6 p.m. and on Saturdays from 9

a.m. to 5 p.m.