Criminal Justice Testing and Evaluation Consortium
A Program of the National Institute of Justice

NIJ | National Institute of Justice
STRENGTHEN SCIENCE. ADVANCE JUSTICE.

Chatbots
in the Criminal Justice System

An overview of chatbots and their underlying technologies and applications

This technology brief explores the use of chatbots within the criminal justice system. The goal of this brief is to orient the reader to chatbots, present foundational insights from real-world examples of chatbot use, highlight considerations for implementation, and discuss the future of chatbots in the criminal justice system.

Key Takeaways

- There are numerous benefits to implementing chatbots, including:
  - improved efficiency for users accessing information,
  - enhanced community engagement by creating a 24/7 communications channel,
  - expanded access to justice through multilingual chatbot capabilities,
  - reduced costs by automating FAQ support traditionally done through live chat, and
  - reduced staff workloads.
- Chatbots carry inherent risks that decision-makers need to consider before implementation, including:
  - misinterpretation of user input leading to incorrect responses,
  - biased training data, and
  - vulnerability to hacking.
- Advancements in AI have enhanced and will continue to enhance chatbot capabilities and applications; however, despite these advancements, deploying AI-driven chatbots is not a "plug-and-play" opportunity for criminal justice applications.[1]

Chatbots are computer programs designed to simulate conversation with human users. A chatbot is a conversational interface that communicates in a natural language (written and/or spoken) through different mediums, including websites, mobile and messaging applications, and phone calls. The proliferation of messaging apps and advancements in artificial intelligence (AI), compounded by consumers' expectations for quick answers, has contributed to the rapid development and deployment of chatbots across numerous and varied applications and industries. For the criminal justice system, chatbots present unique opportunities for engagement along with significant security considerations. Chatbots in the criminal justice system have the potential to improve efficiency, redefine engagement, expand access to justice, and reduce costs associated with administrative overhead for various criminal justice stakeholders.

Chatbot Uses and Development in the Criminal Justice System

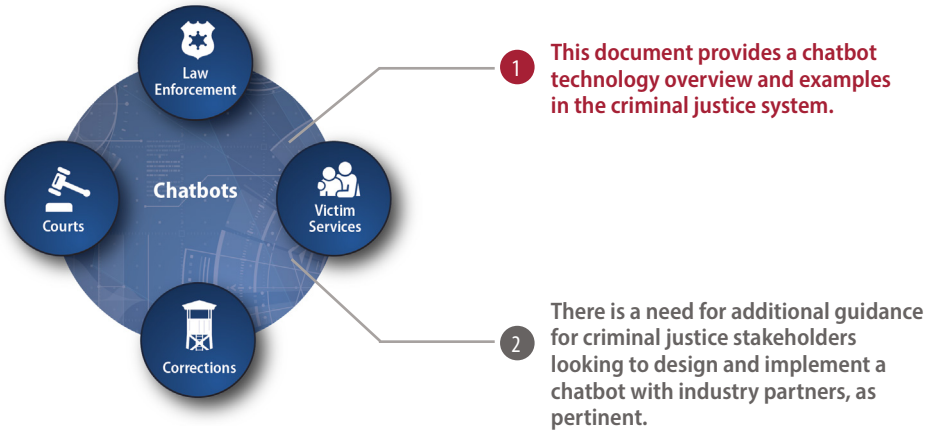


Figure 1: Chatbots have the potential to benefit various criminal justice stakeholders by improving efficiency, expanding access to services, and reducing costs and staff workloads.

1. For further reading on AI in the criminal justice system, reference the previous CJTEC series on AI: Redden, J., Dix, M. O., & Criminal Justice Testing and Evaluation Consortium. (2020). *Artificial intelligence in the criminal justice system*. U.S. Department of Justice, National Institute of Justice, Office of Justice Programs. Retrieved from https://cjtec.org/technology-foraging/

What is a Chatbot?

A chatbot (chat + robot) is a computer program used to conduct an online "chat" or conversation via text or text-to-speech. Sometimes, chatbots are referred to as smart bots, interactive agents, virtual assistants, or artificial conversation entities. Chatbots can be as simple as rudimentary programs that answer a simple query with a single-line response or can perform as sophisticated digital assistants that leverage AI and machine learning to learn over time and deliver increasing levels of personalization as they gather and process information.

Advancements in AI and conversational algorithms have led many people to view chatbots as a relatively new technology. However, in 1950 Alan Turing initially sparked the question, "Can a computer communicate in a way indistinguishable from a human?" in his article "Computing Machinery and Intelligence."[2, 3] Inspired by Turing, Joseph Weizenbaum, while at MIT in the early 1960s, developed ELIZA, which is often regarded as the first chatbot. ELIZA, which simulated a psychotherapist, communicated with humans by accepting textual input and searching for responses through pattern matching and intelligent phrasing.[4] Despite the extensive history of chatbots, recent advancements in AI have created exponential growth in chatbot platforms and deployment across industries with one report estimating that the global chatbot market will reach more than $2.4 billion by 2028.[5]

> **"If you picture the journey of chatbots from the 1960s to now, you can see that what was once a fantasy of being able to communicate with a nonliving virtual being is now part of our everyday lives."[6]**
>
> **—Rashid Khan, IoT Entrepreneur and Author**
> ***Build Better Chatbots: A Complete Guide to Getting Started with Chatbots***

Advancements in technology have driven a communications revolution, transforming how we communicate, what we use to communicate, whom we communicate with, and how quickly we expect a response. With the proliferation of instant communication, chatbots are becoming ubiquitous. Chatbots are unlocking many opportunities for companies in various industries by automating repetitive tasks, responding to frequently asked questions (FAQs), and collecting data. The advent of chatbots has improved customer service in industries like e-commerce, banking, insurance, and hospitality; the criminal justice system could benefit similarly. Chatbots are effective in reducing staff workloads, improving customer service, curating data, increasing access to services, and increasing the efficiency to users.

> **"The chatbots of the future don't just respond to questions. They talk. They think. They draw insights from knowledge graphs. They forge emotional relationships with customers."[7]**
>
> **—Christi Olson, Head of Search Advertising at Microsoft**

2. Zemčík, M. T. (2019). A brief history of chatbots. *DEStech Transactions on Computer Science and Engineering*. Retrieved from https://dpi-journals.com/index.php/dtcse/article/view/31439/0
3. Schwartz, O. (2019). Untold history of AI: Why Alan Turing wanted AI agents to make mistakes. *IEEE Spectrum*. Retrieved from https://spectrum.ieee.org/tech-talk/tech-history/dawn-of-electronics/untold-history-of-ai-why-alan-turing-wanted-ai-to-make-mistakes
4. Shum, H., He, X., & Li, D. (2018). From Eliza to XiaoIce: Challenges and opportunities with social chatbots. *Frontiers of Informational Technology & Electronic Engineering, 19*, 10–26. https://doi.org/10.1631/FITEE.1700826
5. Grand View Research. (2017). *Chatbot market size worth $2,485.7 million by 2028*. Retrieved October 21, 2021, from https://www.grandviewresearch.com/press-release/global-chatbot-market
6. Khan, R., & Das, A. (2017). *Build better chatbots: A complete guide to getting started with chatbots*. Apress Publishing.
7. Csutoras, B. (2018, November 27). The future of chatbots from the experts. *Search Engine Journal*. Retrieved from https://www.searchenginejournal.com/future-of-chatbots/278595/#close

Benefits of Chatbots

Chatbots are highly scalable, allowing users to access services in a more user-friendly way. Although users continue to generally prefer traditional communication channels, chatbots offer various benefits to the criminal justice community, such as:

- **Reduced Staff Workloads and Improved Task Efficiency:** Chatbots can optimize an organization's workflow by automating specific types of repetitive tasks, such as responding to customer requests. Administrative tasks can be time consuming and burdensome on staff. Chatbots relieve this burden by resolving basic requests, freeing staff to handle more complex and individualized questions. Charter Communications, the nation's second largest cable provider, implemented Alme in conjunction with their existing chat application to respond to user inquiries efficiently. Before implementing Alme, Charter Communications had 300,000 live chats per month, 38% of which were for forgotten usernames and passwords. The chatbot was able to handle 83% of all chat communications that came through the system and resolved password and username requests 50% faster than a real person.[8]
- **Improved Customer/Client Service:** Driven by the need to optimize customer service inquiries, chatbots have been leveraged to quickly respond to FAQs, resolve user queries, and deliver answers without the need for users to scour through dense, complex documentation. These bots are fast; tend to be easy to implement; and provide automated, instant support 24/7 all year long. Bank of America's Erica is a financial assistant chatbot that helps customers complete transactions and pay bills. Since its launch in 2018, Erica has assisted 7 million users and has completed over 50 million client requests.[9]
- **Improved Customer Insights:** Compounded by the evolution of big data and analytics, data have become a key operational mechanism for establishing competitive advantage. Chatbots enable organizations to gather troves of customer data each time the chatbot interacts with a user, creating a massive repository of data and delivering significant business value by providing operational experience, customer experience, and analytics.
- **Increased Access to Services:** Chatbots are available online 24/7, expanding access to services outside traditional operating hours and improving access for users in more rural areas. Chatbots provide an alternative means of engagement, allowing users to leverage their mobile device to access information, forms, and services. Moreover, chatbots can respond to many customers simultaneously, provide instant responses, and resolve simple issues more quickly—reducing wait times and increasing access to services. For example, Providence St. Joseph Health, the nation's third largest healthcare system, built an AI-driven COVID-19 assessment chatbot, Grace, to handle the influx of people seeking medical advice amid the COVID-19 pandemic. Users can input symptoms and answer a series of questions to determine if they should be tested.[10]
- **Increased Efficiency to Users:** The capability of collecting and evaluating lots of data improves the interaction and removes the complexity to give users access to relevant information without the need to read through long, dense documents or log into multiple platforms. With capabilities such as natural language processing (NLP) and natural language generation (NLG), chatbots can efficiently direct customers to accurate resources instantaneously. Chatbots provide impartial access to information and offer scalability to handle multiple interactions without the need of extra staff. For example, Amtrak's Julie helps customers book rail travel, assists them in prefilling forms, and provides information on hotel and rental car reservations. Amtrak was able to save $1 million in customer service expenses in a single year. The bot has answered over 5 million questions every year and increased revenue by 30% through automated bookings.[11]

8. Next IT. (n.d.). *Charter Communications improves speed of service*. Retrieved from https://web.archive.org/web/20190125192253/http://nextit.com/case-studies/charter
9. Infosys. (2019). *Power of conversational banking: Best practices for chatbots*. Retrieved from https://www.infosys.com/about/knowledge-institute/insights/Documents/conversational-banking.pdf
10. Vanian, J. (2020, July 15). How chatbots are helping in the fight against COVID-19. *Fortune*. Retrieved from https://fortune.com/2020/07/15/covid-coronavirus-artificial-intelligence-triage/
11. Nelson, R. (2017, November 7). *10 case studies on chatbots*. Overthink Group. Retrieved from https://overthinkgroup.com/chatbot-case-studies/

Examples in the Criminal Justice Setting

In the criminal justice setting, chatbots serve the same purposes (e.g., automation, FAQs, data collection). Chatbots have successfully supported law enforcement recruitment and investigations, automated common court functions and questions, facilitated community supervision, and connected victims to needed information and services. Although these are current uses of chatbots in the criminal justice system, there are many more possibilities for how they could be implemented in the future.

Law Enforcement Recruitment and Investigations

In Los Angeles, the city has set up City Hall Internet Personality (CHIP) to help individuals and businesses in the city find basic information and answer FAQs. CHIP was also adapted to aid police recruitment for the Los Angeles Police Department (LAPD). CHIP was initially set up to answer over 1,000 FAQs for LAPD police recruits and now fields 35 to 45 chats per day, reducing the burden on the department to answer these inquiries via phone or email.[12] The number of questions CHIP can answer has increased over time as the system and its developers have gained more information from users' engagement.

Chatbots have also been used in law enforcement agencies for identification and investigative purposes. In jurisdictions including New York, Los Angeles, Chicago, and Boston, law enforcement agencies have used chatbots in "stings" in which the chatbots pose as minors offering commercial sex services as a campaign to identify buyers and combat sex trafficking.[13] The bot communicates with potential buyers, offering commercial sex and often talking through the details of price, type of service, and location. After these exchanges, the chatbot sends a message alerting the potential buyer that purchasing sex is illegal and the department may investigate further and make an arrest. The goal of these chatbots is to deter the purchase of sex. An officer in the New York Police Department shared that they believe that a warning message such as this may be a deterrent to buyers who are curious and exploring buying sex.

Court System Awareness and Access

In the criminal justice system, courts are the most frequent adopter of chatbot technology. In multiple areas of the country, chatbots are being used to help citizens understand court processes by providing information and answering common questions. Once again, the chatbot is reducing the administrative burden within the court setting by shifting questions to the bot instead of a staff member. This technology is being implemented in California, New Jersey, and Arizona to address questions related to court processes, including basic "how to" inquiries. In Los Angeles, queries about traffic tickets and jury summons processes are addressed by bots. These platforms are available in multiple languages, enabling some community members to get questions answered in the language they are most comfortable using. For example, a chatbot in the Superior Court of Los Angeles County assists with traffic citations and supports more than 5,000 users per week (see the case study on page 7).

Corrections and Community Supervision

The COVID-19 pandemic has advanced the use of a chatbot for a probation department in Louisiana. This chatbot was rapidly deployed in a span of 3 weeks because of difficulties following up with over 500 individuals on probation for substance abuse.[14] The Smart Supervision chatbot communicates via text message with probationers to conduct weekly check-ins. The text message system asks for a yes/no text response to the question: "Are you ok?" Those who respond with no are provided a phone number to call and a notification is sent to their probation officers.

Victim Services and Support

In addition to the criminal justice system, chatbots have also been implemented in victim services settings and at times may help an individual seek support following a crime or document instances of crime to aid future reporting or legal options. Care should be taken to ensure that the development and purpose of the bot is appropriate for use by individuals who have experienced violence. Some tasks or activities may be best handled by a human versus a chatbot. Where these platforms have been implemented, they have been designed to assist a wide array of victim groups, including those who have experienced identity theft, sexual harassment, and domestic violence. In the United States, the Identity Theft Resource Center has created a virtual assistant designed to support victims of identity theft. The chatbot provides access to resources and information after hours when live expert advisors are not available to help (see the case study on page 13). During working hours, the chatbot can still be the first point of contact and offers users the option to request to speak with a human consultant. All conversations with the bot are reviewed by an expert advisor who completes a follow-up to ensure the user's needs were addressed.

Beyond the United States, chatbots are also designed and deployed to assist victims. Chatbots in multiple countries, including Switzerland, Thailand, and the Philippines, assist victims of domestic violence and sexual harassment to identify resources and seek help.

12. Douglas, T. (2018, February 16). *Los Angeles chatbot deputized to help with police recruitment*. Government Technology. Retrieved from https://www.govtech.com/products/Los-Angeles-Chatbot-Deputized-to-Help-with-Police-Recruitment.html
13. Rosenberg, T. (2019, April 9). A.I. joins the campaign against sex trafficking. *New York Times*. Retrieved from https://www.nytimes.com/2019/04/09/opinion/ai-joins-the-campaign-against-sex-trafficking.html
14. Ambrogi, B. (2020, April 21). *Guest post: How we rapidly iterated a chatbot to track probationers during the pandemic*. LawSites. Retrieved from https://www.lawsitesblog.com/2020/04/guest-post-how-we-rapidly-iterated-a-chatbot-to-track-probationers-during-the-pandemic.html

Design and Development of Chatbots

To successfully design and develop a chatbot, decision-makers need to consider the following questions:

- What topics will the chatbot cover?
- What level of sophistication is appropriate?
- What task will it perform and/or what types of questions will it answer?
- What platforms and tools are needed to build the bot based on a chosen function?

Level of Sophistication/Chatbot Maturity

A chatbot maturity framework can help identify ideal features and capabilities for a prospective chatbot. Chatbots are often described as being within three levels of progressive sophistication that build on each other:[15, 16]

Level 1 are rules-based or decision-tree bots that use predefined rules and if/then logic to generate conversational flows. These rudimentary bots do not use NLP,[17] are limited in response generation, and can only respond to specific commands. Los Angeles Superior Court's chatbot, Gina, is an example of a Level 1 chatbot. Gina helps users pay traffic tickets, register for traffic school, or schedule a court date. Gina is multilingual and can help court users in English, Armenian, Chinese, Korean, Spanish, and Vietnamese. Users select from a predefined set of options, including "I need help with paying my ticket." and "What are my options for handling my ticket?" and are given resources to answer their question. Gina helps approximately 4,000 customers per week handle their traffic citations online.[18]

Level 2 extends the capabilities of Level 1 chatbots by incorporating NLP to develop contextual understanding. Unlike Level 1 chatbots, Level 2 chatbots allow users to communicate in their own words, rather than selecting from a predefined menu of options. NLP is leveraged to understand the intent of the conversation. Complexity is driven by needing to find the right NLP tool, training the bot to understand in the appropriate context, and deciding what information to store.[19] New Jersey Courts' Judiciary Information Assistant (JIA) chatbot is an example of a Level 2 chatbot. The chatbot was trained through machine learning on more than 11,000 question/answer pairings.[20] JIA covers numerous topics such as how to file for an expungement, how to contact judiciary personnel, how to request copies of judiciary records, the landlord/tenant process, the foreclosure process, and attorney registration.

Level 3 chatbots incorporate the capabilities of Level 2 chatbots with enhanced AI abilities to develop understanding through the entire context of the conversation, including historical analysis from previous conversations with a particular end user and those of other end users. These chatbots can learn over time and can be developed for conversational listening by leveraging machine learning. The complexity of these chatbots lies in the need to combine variations of user input, historical analysis, training, and NLP to provide an answer.[19] Currently, there are limited examples of Level 3 chatbots in use in the criminal justice system.

When choosing the appropriate level of sophistication, developers consider many factors. Chatbots classified as Level 1, while limited in response generation, are much simpler to build than a bot with additional NLP and AI capabilities (classified as a Level 2 or 3 bot), resulting in faster implementation. Further, they are easy to program, reducing implementation costs. On the other hand, because Level 1 chatbots are limited in response generation, they typically cannot operate on their own, needing some level of human intervention. Level 3 chatbots take longer to train and build but can save time and money in the long run because they have an inherent ability to self-learn. Because AI-driven chatbots tend to be open domain, allowing the user to craft their own query instead of selecting from a predefined list, they can be prone to mistakes. Organizations looking to develop and deploy a Level 2 or 3 chatbot need to consider their risk tolerance to avoid unintended consequences. Because Level 2 and Level 3 chatbots leverage NLP to develop contextual understanding, they are prone to misinterpreting the input and responding inappropriately.

15. Judicial Council of California Information Technology Advisory Committee. (2020, April 20). *Minutes of open meeting*. Retrieved from https://courts.ca.gov/system/files/file/itac-20200521-materials.pdf
16. The taxonomy used here is not universally agreed upon but rather is meant to be illustrative and provide a framework for thinking about chatbot maturity. Chatbot maturity exists on a spectrum; thus, certain bots may not fit exactly in one of these boxes.
17. NLP is a branch of AI that helps computers read and understand natural human language. NLP enables chatbots to understand the user's input and gives them the ability to respond appropriately.
18. Self-Represented Litigation Network. (2021, September 22). *Gina – LA's online traffic avatar radically changes customer experience*. Retrieved from https://www.srln.org/node/1186/gina-las-online-traffic-avatar-radically-changes-customer-experience-news-2016
19. Judicial Council of California Technology Committee. (2020, June 8). *Open meeting agenda*. Retrieved from https://courts.ca.gov/system/files/file/jctc-2020608-materials.pdf
20. Reinkensmeyer, M. W. (2020, April 3). *Public access to court services through artificial intelligence: New Jersey's "judiciary information agent."* American Bar Association. Retrieved from https://www.americanbar.org/groups/judicial/publications/judicial_division_record_home/2020/vol23-3/technology/

Chatbot Classification

Over the last few years, the dynamic landscape of chatbots has included the arrival of new technologies, which has made the precise classification of chatbots subjective to the scope of their use.[21] As illustrated in **Figure 2**, chatbots can be classified into various categories based on several criteria that are employed in developing a chatbot: the knowledge domain, the services the chatbot provides, the goals the chatbot aims to achieve, and the input processing and response generation method of the chatbot. Understanding what the chatbot will offer and what classification category it falls into helps developers choose the platforms and tools to build it.

Chatbot Classifications

Classification Methods	Types of Chatbots
Knowledge Domain Classification based on the knowledge a chatbot can access or the amount of data it is trained on (i.e., if the questions asked to the chatbot are restricted in scope).	**Open domain:** designed to allow users to ask queries about any topic and the chatbots respond appropriately (sometimes referred to as conversational agents). **Closed domain:** designed for a specific task and are restricted to providing responses that help users complete the task (sometimes referred to as dialog agents).[22]
Services Provided Classification that considers the sentimental proximity of the chatbot to users and the amount of intimate interaction that takes place, which is dependent on the task the chatbot is performing.[23]	**Interpersonal:** designed to get information and pass it along to users. These chatbots provide services such as restaurant and flight booking and FAQ bots. **Intrapersonal:** designed to be companions of users and perform tasks that lie within the personal domain of users (e.g., managing users' calendars). These chatbots exist within the personal domain of users, such as chat apps like Messenger, Slack, and WhatsApp. **Interagent:** use two systems to communicate with each other to accomplish a task.[23]
Goals Classification based on the primary goals the chatbot aims to achieve.	**Informative:** designed to provide users with information that is stored beforehand or is available from a fixed source, such as a website's FAQ page. **Chat based/conversational:** designed to talk with users, like another human being, and respond correctly to the input they have been given (e.g., Siri and Alexa). **Task based:** designed to perform a specific task, such as book a flight. These chatbots are intelligent in the context of asking for information and understanding the user's input.[24]
Input Processing/Response Generation Classification that considers the method of processing inputs and generating a response.	**Retrieval based:** leverage techniques like keywords matching, machine learning, or deep learning to identify the most appropriate response from a list of predefined responses. **Generative based:** formulate an original response based on users' input. These chatbots use a combination of supervised learning, unsupervised learning, reinforcement learning, and adversarial learning to train the bot.[25]

Figure 2: Chatbots can be classified according to how they function, which helps in designing chatbots in alignment with the intended outcome.

21. Hussain, S., Ameri Sianaki, O., & Ababneh, N. (2019). A survey on conversational agents/chatbots classification and design techniques. In L. Barolli, M. Takizawa, F. Xhafa, & T. Enokido (Eds.), *Web, artificial intelligence and network applications. WAINA 2019. Advances in Intelligent Systems and Computing, 927*. Springer, Cham. https://doi.org/10.1007/978-3-030-15035-8_93
22. Jurafsky, D., & Martin, J. (2020). Chatbots and dialogue systems. *Speech and Language Processing*. Retrieved from https://web.stanford.edu/~jurafsky/slp3/24.pdf
23. Nimavat, K., & Champaneria, T. (2017). Chatbots: An overview types, architecture, tools and future possibilities. *International Journal for Scientific Research & Development, 5*(7). Retrieved from https://www.researchgate.net/publication/320307269_Chatbots_An_overview_Types_Architecture_Tools_and_Future_Possibilities
24. Adamopoulou, E., & Moussiades, L. (2020). An overview of chatbot technology. In I. Maglogiannis, L. Iliadis, & E. Pimenidis (Eds.), Artificial intelligence applications and innovations. AIAI 2020. *IFIP Advances in Information and Communication Technology, 584*. https://doi.org/10.1007/978-3-030-49186-4_31
25. Fainchtein, L. (2020). *Generative vs retrieval based chatbots: A quick guide*. CloudBoost. Retrieved from https://blog.cloudboost.io/generative-vs-retrieval-based-chatbots-a-quick-guide-8d19edb1d645

Case Study

Superior Court of California in Los Angeles County has implemented chatbots to help drivers follow up on traffic citations and to help answer questions related to remote court hearings.

The Superior Court of California in Los Angeles County—the world's largest court—has several chatbots embedded in their website. Their chatbots are used as part of the "front-end" of the court's interface and support user guides and FAQs, which often go unread by users. Chatbots are able to provide a user-friendly interface for users who may not have the time to scour through lengthy manuals and FAQs.

The court first experimented with chatbots 6 years ago as a way to expand access to justice for individuals who are not proficient in English. Their first chatbot, Gina, is a virtual assistant that helps users handle their traffic citations online. Gina, a decision tree task-based chatbot, is multilingual and can help court users in English, Armenian, Chinese, Korean, Spanish, and Vietnamese. Before COVID-19, Gina was helping about 5,000 customers per week handle their traffic citations online, without the need to travel to the courthouse, wait in long lines, and take up clerk time. The use of Gina during COVID-19 decreased because fewer tickets were written.

More recently, in response to the COVID-19 pandemic, the Superior Court of California in Los Angeles County deployed a chatbot on their LACourtConnect website that supports a virtual or remote court hearing solution. This FAQ informational chatbot was designed to automate the first level of support for hearings that could not be held in person in the courtroom. The goal of the chatbot is to answer users' queries and reduce the volume of calls to support agents. The chatbot essentially sits on top of the LACourtConnect user manual and provides users' answers to FAQs. If the chatbot is unable to answer the user's question, it automatically transfers the user to a live agent. The live agent is provided receipts of the tree of questions the user took prior to reaching the agent so that they do not ask repetitive questions.

Both the Gina chatbot and the LACourtConnect chatbot are Level 1 chatbots. The Superior Court of California in Los Angeles County chose to use decision trees to build their bots instead of NLP. This was a strategic choice because the Court was worried that an NLP-based chatbot may provide the wrong answer because it misunderstood the intent of the inquiry. Before building a chatbot, an organization needs to understand their risk tolerance level (i.e., whether they are comfortable with the possibility of the chatbot providing the wrong answer). The Los Angeles Court System had a risk tolerance level of zero and therefore chose to go down the path of a closed-domain decision-tree chatbot.

The Superior Court of California in Los Angeles County has an IT department of 200 people, enabling them to dedicate the resources internally to develop the chatbot. To build Gina, the operations team spent about 2 months and 240 programming hours loading questions and answers into a preformatted spreadsheet. The IT team then imported the questions and answers into their selected chatbot platform, Azure Cognitive Services offered by Microsoft.

The Superior Court of California in Los Angeles County's use of chatbots is novel and innovative. Their deployment of chatbots simultaneously increases access to court services and reduces burden on staff who were previously tasked with answering questions via live chat or phone. The future of chatbots in Los Angeles County Court is bright. Both Gina and the LACourtConnect chatbot are 1.0 versions. Snorri Ogata, Chief Information Officer of the Superior Court of California in Los Angeles County, envisions the next iteration of their chatbots to integrate more advanced Application Programming Interface (API)[26] features to further enhance the customer experience.

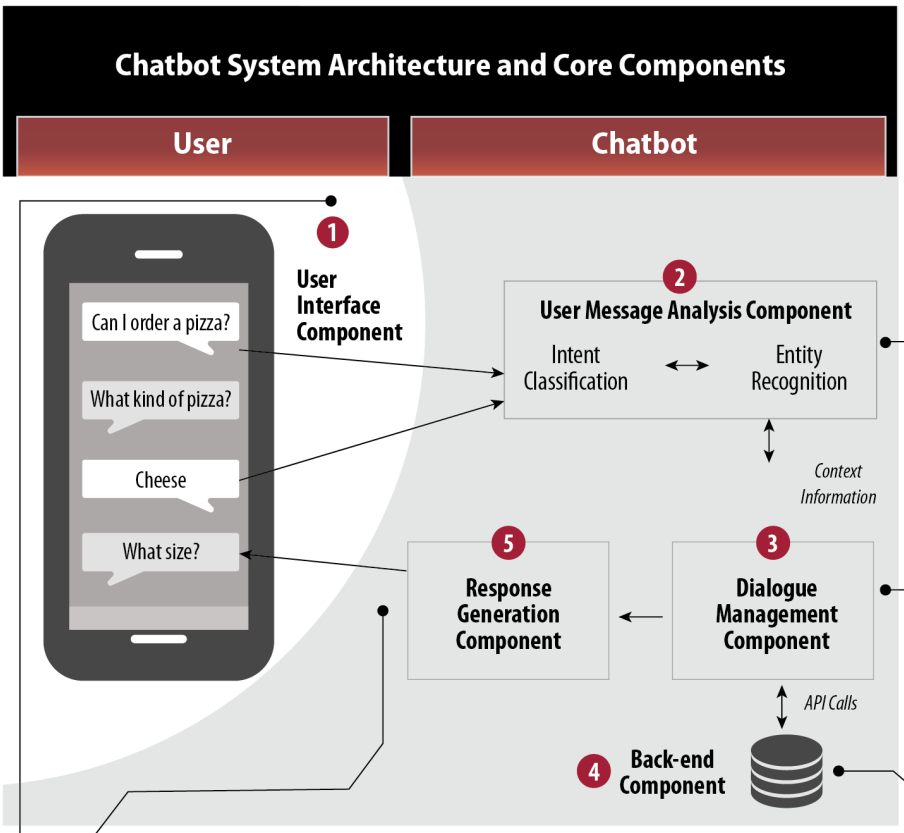
"Our population is over 10 million, so it's easy to find a few 100,000 people that are underserved from a language perspective. Our chatbot serves an important function to help people figure out what to do with their ticket in their native language."

**—Snorri Ogata,
Chief Information Office
Superior Court of CA,
Los Angeles**

26. APIs serve as a "communication link" that allows multiple applications to fetch and send data from connected sources. API conveys your message or requests to the source or application and sends the response back to the user.

Chatbot System Architecture

The architecture of a chatbot is the heart of a development plan. The architecture is decided on based on the core purpose of development. Understanding the purpose of what is being developed helps designers and developers pick the platform to build. The chatbot ultimately sits on top of the platform as an interface. The five core components of a typical chatbot architecture are illustrated in **Figure 3**.



The user message analysis component identifies the user's intention and extracts entities following pattern matching or machine learning approaches. Intent classification reviews the input message and identifies the exact information the user wants to convey. Entity recognition refers to the extraction of keywords or values from the user's input.

The dialogue management component of the architecture updates the context of the conversation, requests missing information, processes clarifications by users, and asks follow-up questions.[27]

The back-end component retrieves the information needed to fulfill the user's intent through external API calls or database requests.

The response generation component of the architecture crafts responses based on the intent and context information returned from the user message analysis component. The appropriate responses are produced through the two models mentioned above: retrieval based or generative based. The retrieval-based model selects the most suitable response with the check and analysis of available resources using APIs. The generative model is the smartest in terms of generating a response. It leverages NLG to respond in a human-like natural language based on previous inputs. While smarter, it does encounter difficulties in building because it needs an extensive set of data for training to establish a fruitful conversation.[28]

The user interface component enables users to interact with the chatbot via text or speech input, using messenger applications like SMS, Facebook, Slack, WhatsApp, WeChat, and Skype.

Figure 3: A chatbot's architecture varies depending on the purpose it aims to achieve; however, typically, chatbots deploy five core components.

27. Adamopoulou, E., & Moussiades, L. (2020). An overview of chatbot technology. In I. Maglogiannis, L. Iliadis, & E. Pimenidis (Eds.), Artificial intelligence applications and innovations. AIAI 2020. *IFIP Advances in Information and Communication Technology, 584*. https://doi.org/10.1007/978-3-030-49186-4_31

28. Hien, H. T., Cuong, P.-N., Nam, L. N. H., Nhung, H. L. T. K., & Thang, L. D. (2018). Intelligent assistants in higher-education environments: The FIT-EBot, a chatbot for administrative and learning support. In *Proceedings of the Ninth International Symposium on Information and Communication Technology* (pp. 69–76). New York, NY: ACM. https://dx.doi.org/10.1145/3287921.3287937.

Key Considerations

Agencies need to examine a variety of considerations before implementing a chatbot. Although using this technology affords significant advantages, chatbots are not free of drawbacks and threats. Risks include issues related to safety, security, and the unpredictable adaptability of AI, which can affect the performance of the chatbot, and issues related to user trust and engagement with the system. Considerations discussed in this section can help mitigate associated risks with designing and implementing a chatbot.

A few high-profile chatbot failures demonstrate risks associated with chatbots. Facebook's M, delivered within the Messenger application, was designed to behave as a personal assistant that could make restaurant reservations, change flights, and send gifts. M never reached more than 30% automation, requiring too much human involvement, making it cost prohibitive for Facebook. The complications M experienced were linked to a failure of its NLP engine as simple requests became more complex during conversations.[29] Another chatbot, designed by Microsoft, named Tay interacted with Twitter users to have casual conversations. Tay was designed to interact with human users in a way that mimicked conversation; however, Tay parroted a slew of racist, sexist, and other hateful attacks from human Twitter users.[30] Because Tay was designed to converse about a number of topics, a wide range of unfiltered data were used to build the language model. AI chatbots with the ability to learn over time are prone to coordinated attacks. Tay exposed the need for more research and improved technology before self-learning chatbots are ready for mass deployment.[29]

This section profiles six issues (see **Figure 4**) that should be considered before implementing a chatbot: the purpose of the chatbot, policy and governance, privacy and security, user engagement, role of humans, and ethics. These considerations should be discussed during the design and implementation because continual improvements and adaptations are likely needed as the chatbot engages users and needs to be adapted or, in some cases, learns based on these interactions.

Purpose

Research on why people use chatbots suggests that productivity is a key motivation for users. When people engaged with a chatbot that facilitated easy access to information or provided the ability to ask a sensitive or embarrassing question, users were pleased with their chatbot experience.[31] At the same time, care should be taken to ensure that responses provided by chatbots are appropriate to communicate through text. In some instances, information that may be nuanced or sensitive is best communicated by a human who can express empathy or better understand the complexities of the situation the user is trying to address. Although chatbot developers can consider building social characteristics into the chatbot,[32] caution is needed to ensure that the chatbot does not cause harm, distress, or undue frustration when it is communicating or completing a task that requires understanding nuance or responding to a crisis. To this end, a key consideration of chatbot development is defining the purpose of the chatbot, intended users, and appropriate information for the chatbot to communicate versus information that is better communicated by

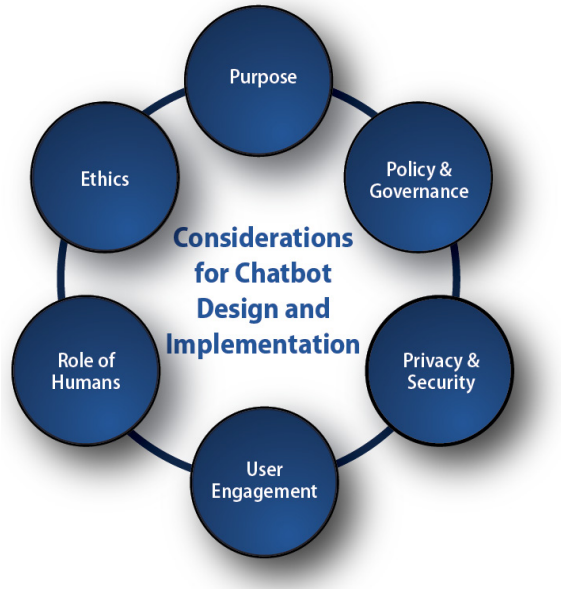


Figure 4: Chatbots should be developed and implemented with these key considerations and issues in mind.

29. Judicial Council of California Technology Committee. (2020, June 8). *Open meeting agenda*. Retrieved from https://courts.ca.gov/system/files/file/jctc-2020608-materials.pdf
30. Council of Europe. (2019). *Responsibility and AI*. Retrieved from https://rm.coe.int/responsability-and-ai-en/168097d9c5
31. Følstad, A., Nordheim, C. B., & Bjørkli, C. A. (2018, October). What makes users trust a chatbot for customer service? An exploratory interview study. In S. S. Bodrunova (Ed.) *International Conference on Internet Science* (pp. 194–208). Springer, Cham.
32. Chaves, A. P., & Gerosa, M. A. (2020). How should my chatbot interact? A survey on social characteristics in human–chatbot interaction design. *International Journal of Human–Computer Interaction*, 1–30.

a human. When defining the purpose and intended users, developers must consider the chatbot's limitations; explore risk mitigation; and, when needed, provide an alternative path for user questions (e.g., connect individuals to a human who may better understand their needs or respond with greater empathy).

Policy and Governance

Agencies looking to develop or implement a chatbot need to have internal policies in place to govern the extent of its permitted activities. Policies may include guidance on oversight, the type of information the chatbot will be trained on, the information it will collect, where the information will be stored, and who will maintain or update the chatbot.

Privacy and Security

A key concern that chatbot users have is in relation to privacy and security of the information and data gathered through the system. Research into factors that affect user engagement with chatbots has found that clear communication about the privacy and security of data is crucial. Recommendations for chatbot development suggest that chatbots should collect as little personal information as possible.[33] When more personal information is needed, chatbots should clearly communicate why this information is needed, how it will be used, and whether it will be stored. If the chatbot collects biometric data, such as voice or facial expressions, consent may be required. Individuals interested in developing a chatbot within the criminal justice system should also consider and disclose whether chat data and transcripts are discoverable by an attorney on a case. Care should be taken to explore what information would be discoverable and clearly communicate the limitations of confidentiality for users. These considerations are important given that data security and privacy practices were also linked to whether users trusted and engaged with the chatbot.[33]

In the criminal justice system, considerations are needed to ensure information accessed through the chatbot is general or public information and does not identify someone as a victim or offender. Consideration needs to be given to the appropriateness of all information being stated through a chatbot versus a human. Release of information that would require proof of a person's identity in order to meet the request may not be appropriate to program into a chatbot that does not have the ability to verify someone's identity or detect fraudulent users. Design must address fraudulent users and phishing, hacking, or other malicious attacks. Potential safeguards include encryption, user-identity authentication, authentication timeouts, self-destructing messages, and limitation of the chatbot's response generation capability.[34]

User Engagement

Developers can use a variety of design and functionality factors to shape how and to what extent users interact with the bot. The first consideration is that a chatbot should clearly communicate the limits of what it can and cannot address.[33] This information includes the types of questions the chatbot can engage and the extent of confidentiality, privacy, and security the chatbot provides. Clear communication can guide the topics a user raises and the way a user engages with the chatbot, including understanding its limitations. Relatedly, the chatbot should also clearly identify itself as a chatbot to avoid trying to pass as a human. The more humanized a chatbot is in its design and conversational style the higher users' expectations will be for interaction.[35] If chatbots' interactions are more human-like, users may expect interactions similar to those with a person and may come away from the conversation disappointed.

Additional user engagement factors include the "voice" of the chatbot and the quality of its interpretation and responses.[33] The voice, or how the chatbot sounds in terms of sex, speech patterns, and other traits, can shape user expectations and trust in the bot, specifically how the bot expresses empathy and models human-like responses. Guidance on how the chatbot engages socially suggests that the responses that model human-like language and interactions foster higher

33. Følstad, A., Nordheim, C. B., & Bjørkli, C. A. (2018, October). What makes users trust a chatbot for customer service? An exploratory interview study. In S.S. Bodrunova (Ed.) *International Conference on Internet Science* (pp. 194–208). Springer, Cham.

34. Wasserman, T. (n.d.). *Chatbots are all the rage – and something of a risk*. Security Roundtable. Retrieved from https://web.archive.org/web/20191104213930/https://www.securityroundtable.org/chatbots-rage-something-risk/

35. Liu, B., & Sundar, S. S. (2018). Should machines express sympathy and empathy? Experiments with a health advice chatbot. *Cyberpsychology, Behavior, and Social Networking, 21*(10), 625–636.

36. Chaves, A. P., & Gerosa, M. A. (2020). How should my chatbot interact? A survey on social characteristics in human–chatbot interaction design. *International Journal of Human–Computer Interaction,* 1–30.

expectations from users in regard to the chatbot's responsivity and ability to answer questions.[36] While the chatbot should be designed to not be overly humanized, research does suggest that it should express empathy, not providing advice only or expressions of sympathy, which can seem detached when coming from a bot versus a human.[35]

As the proliferation of AI chatbots continues, chatbot developers need to tap into the "right amount" of humanistic features. Humanization of chatbots raises concerns about how to depict sex-based characteristics (i.e., the name of the chatbot and voice of the chatbot). Although giving AI human features and assigning a sex may make it easier for users to relate, it also has the consequence of reinforcing sex-based stereotypes. One report found that of the 620 chatbots that specified a sex listed on the platform chatbots.org, 76.94% of them had female names, 75.56% had female avatars, and 67.40% of the descriptions were classified as female.[37] Chatbot developers should avoid "female by default" chatbot designs and consider generic names. Additionally, developers should consider the use of avatars, because they have been shown to increase credibility, likeability, and user satisfaction.[38, 39]

The design of the chatbot should be as accessible as possible, including language, fonts, and color contrasts. Developers should also consider how the chatbot user interface is accessible to individuals who use screen readers, whose first language is not English, or who have limited or intermittent internet access. One design consideration that could increase accessibility is the bot placement on a web page. Typically, chatbots are placed in the lower right portion of a web page. Most content on a web page sits in the middle of the screen, so chatbot placement in the middle is not ideal. Developers usually opt to place the chatbot on the right side over the left side because most people are right-handed.

Role of Humans

When assessing the adoption of a chatbot to address user needs, the role of humans being "in the loop"[40] is an integral part of the design. A chatbot is not an "off-the-shelf" technology; it requires development to ensure its relevance and human oversight to protect against its misuse or potential privacy and security risks. Risks can be mitigated through a variety of strategies that define human oversight, which can be described in terms of the level of human involvement (see **Figure 5**).

Despite the ability for humans to exert some control over chatbots, human-in-the-loop and human-on-the-loop control are not panaceas. Human–machine interaction issues, such as automation bias, lack of operator situational awareness, and the moral buffer,[41] may inhibit a human's ability to respond appropriately.[42] Organizations considering the use of chatbots will likely see a reduced burden on staff who field questions or provide the information with support from a bot; however, time is still needed to establish, monitor, and refine the chatbot to continually improve performance, relevance, and security.

Ethics

The design of a chatbot must be considerate of bot ethics, including ensuring the chatbot functions without bias, is designed with transparency, and has appropriate oversight.[43] Care should be taken in designing and maintaining the chatbot as related to bias concerns. A chatbot that uses NLP or other forms of machine learning is typically trained using historic data. Social bias could potentially exist in the data that the chatbot is trained on. Addressing bias at the development and maintenance stages of a chatbot is critical. Other studies have found bias within AI systems toward particular marginalized groups, including individuals with disabilities and people of color when implementing AI

37. Feine, J., Gnewuch, U., Morana, S., & Maedche, A. (2020). Gender bias in chatbot design. In A. Følstad, T. Araujo, S. Papadopoulos, E. Lai-Chong Law, O-C. Granmo, E. Luger, & P. Bae Brandtzaeg (Eds.) *Chatbot research and design. CONVERSATIONS 2019. Lecture Notes in Computer Science*, 11970. Springer, Cham. https://doi.org/10.1007/978-3-030-39540-7_6
38. Nowak, K. L., & Biocca, F. (2003). The effect of the agency and anthropomorphism on users' sense of telepresence, copresence, and social presence in virtual environments. *Presence: Teleoperators & Virtual Environments, 12*(5), 481–494. https://doi.org/10.1162/105474603322761289
39. Holzwarth, M., Janiszewski, C., & Neumann, M. M. (2006). The influence of avatars on online consumer shopping behavior. *Journal of Marketing, 70*(4), 9–36. https://doi.org/10.1509/jmkg.70.4.19
40. Human in the loop refers to an area of AI that leverages both human and machine intelligence to optimize machine learning models with the goal of creating more accurate AI systems.
41. The moral buffer is a term used in user interface design to describe when a user interface creates a gap between a person's actions and consequences that results in an emotional distancing from those consequences, resulting in a reduced sense of accountability and responsibility.
42. International Committee of the Red Cross. (2019). *Autonomy, artificial intelligence, and robotics: Technical aspects of human control*. Retrieved from https://www.icrc.org/en/document/autonomy-artificial-intelligence-and-robotics-technical-aspects-human-control
43. Department of Defense. (2020, February 24). *DOD adopts ethical principles for artificial intelligence*. Retrieved from https://www.defense.gov/Newsroom/Releases/Release/Article/2091996/dod-adopts-ethical-principles-for-artificial-intelligence/
44. Ruane, E., Birhane, A., & Ventresque, A. (2019). Conversational AI: Social and ethical considerations. *ACIS*, 104–115. Retrieved from http://ceur-ws.org/Vol-2563/aics_12.pdf

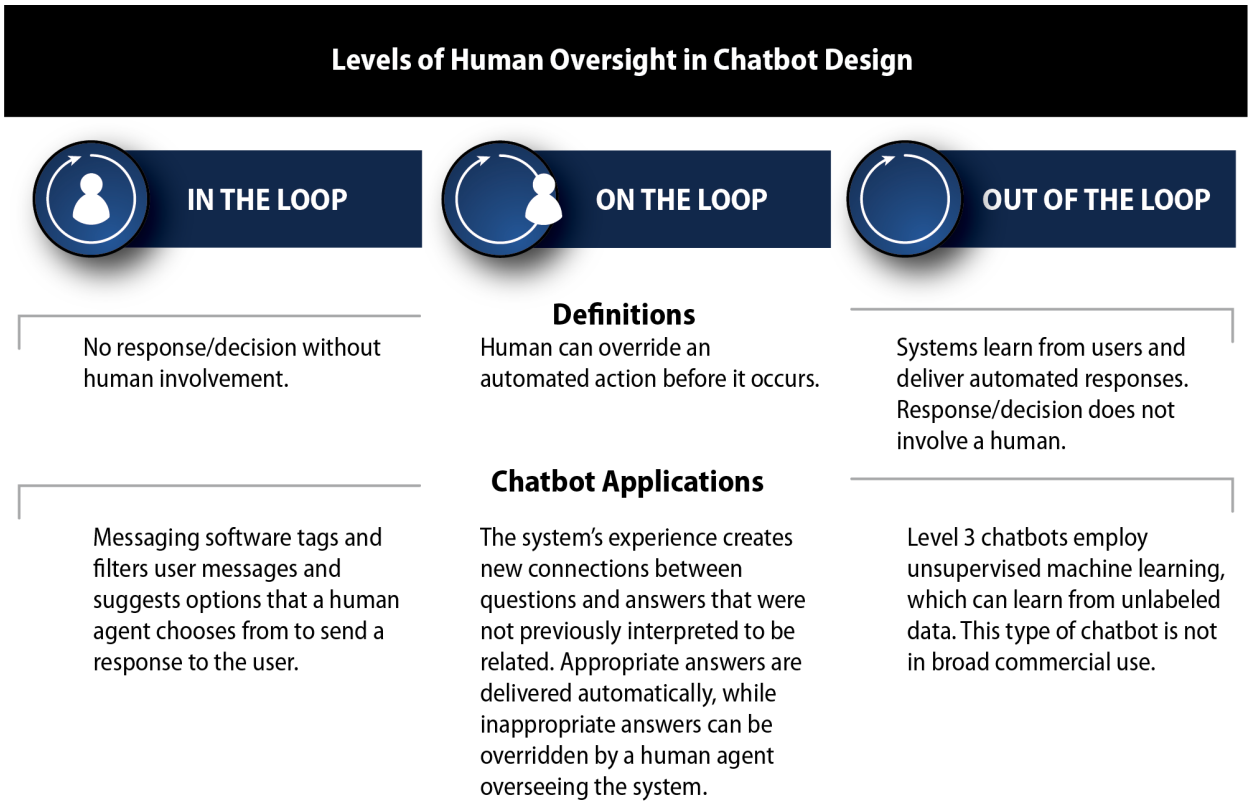


Figure 5: Human involvement in the monitoring of chatbots helps mitigate potential risks.[45]

technology such as facial recognition, speech recognition, and recidivism calculations.[44] When bots are developed based on biased information, such as limiting testing to a set of individuals who may speak or be educated differently than those who will use the bot, it can lead to decreased performance of the bot in correctly predicting intentions for these already marginalized groups. Related to chatbot design and oversight, developers can use a variety of ways to prevent or stop bots from engaging in harmful responses, including building in a user "end chat" function and establishing filters to identify the specific language a bot may pick up. This kind of function enables a live person to intervene and mitigate future, harmful responses.[46] Additionally, developers should test the responses with the bot's target population to ensure that the programmed responses are not harmful or insensitive to the population's experiences.

A Department of Defense report on the ethical uses of AI emphasizes the importance of considering transparency, fairness, accountability, privacy, and security when using AI tools (for a longer discussion of the use of AI in the criminal justice system, please see CJTEC's brief on the topic).[47] Determining whether it is appropriate to use a chatbot for a given purpose or for a specific population is an ethical question worthy of discussion. When a chatbot is deemed appropriate and then employed, policies should be crafted to ensure that the chatbot system is implemented in an ethical and responsible manner.

Chatbots have the potential to expand access to justice, enhance community engagement, and reduce costs by improving efficiency. Despite these advantages, design and implementation must be done carefully to mitigate potential risks. For each design consideration mentioned above, the key questions presented in **Figure 6** can aid agencies in successfully using chatbots.

45. Chatbot applications in the graphic are from Joint Technology Committee. (2020, March). *Introduction to AI for courts*. Retrieved from https://www.ncsc.org/__data/assets/pdf_file/0013/20830/2020-04-02-intro-to-ai-for-courts_final.pdf
46. Reddy, T. (2017). *The code of ethics for AI and chatbots that every brand should follow*. IBM. Retrieved from https://web.archive.org/web/20201029154115/https://www.ibm.com/blogs/watson/2017/10/the-code-of-ethics-for-ai-and-chatbots-that-every-brand-should-follow/
47. Department of Defense. (2020, February 24). *DOD adopts ethical principles for artificial intelligence*. Retrieved from https://www.defense.gov/Newsroom/Releases/Release/Article/2091996/dod-adopts-ethical-principles-for-artificial-intelligence/

Case Study

The Identity Theft Resource Center's ViViAN chatbot addresses a gap in service by providing victim support after hours.

The Identity Theft Resource Center (ITRC) created a virtual assistant designed to provide victims of identity theft with resources and information after hours when their staff are not available. Developed in partnership with SAS Institute and with a federal grant award from the Office for Victims of Crime, Office of Justice Programs, and the U.S. Department of Justice, ViViAN, the Virtual Identity Theft Assistant, provides basic after-hours identity theft victim support. Originally, ITRC intended for ViViAN to be available all day as the first step to answer questions and, if needed, route someone for further support to a live expert. However, through further discussion, ITRC realized that with the unique circumstances and needs of each victim, it would be best to design the chatbot to be available after hours when live experts were not available, addressing a gap in their service hours and the lack of funds to support 24/7-hour staffing. Instead, ViViAN is now available after work hours and provides individuals with the option to address their questions via chat or to leave a message for a live advisor to follow up in the morning. All chatbot transcripts are reviewed and followed up on by a live expert to ensure user questions are addressed. ViViAN has characteristics of both Level 1 and Level 2 chatbots—the system has some limited NLP capabilities to help a user navigate to appropriate decision trees.

To develop ViViAN, SAS set up the environment to program the chatbot, and ITRC provided the schematic about the types of identity theft the chatbot should address and the typical first steps to be taken to remediate the user's concerns. A staff member at SAS then reorganized the schematic for its integration in a virtual chatbot environment and subsequently developed the framework. One key issue that ITRC experienced in developing the chatbot was the challenge of training the chatbot to assess users' needs. In a chat with a live expert, ITRC noted how much nuance and interpretation go into understanding a user's intent. When trying to translate this capability to a chatbot, they found that the chatbot had to ask a lot more questions to understand the user's key concerns. After building the platform, ITRC provided guidance on workflow and processes, going back and forth with the SAS programmers to ensure the process would address the primary concerns users had based on chat transcripts from previous interactions with live experts. Following this initial build, ITRC and SAS then explored additional functionality, such as offering users one or two options through preprogrammed radio buttons, that would make user engagement easier. SAS worked with ITRC to build up staff capacity to use the software and adapt the code to improve responses and the user experience.

In developing ViViAN, ITRC faced unanticipated costs and challenges. First, the time needed to tweak the code for the chatbot was more intensive than originally estimated. ITRC staff learned to code and manage the software, with support from SAS. Although ViViAN will require less staff time than hiring live experts to cover the chat system 24 hours a day, the maintenance and improvement of ViViAN is a full-time job for a technical expert. Although the current staff at ITRC are learning how to maintain ViViAN, resources and funding are needed to sustain the chatbot in the future. Related to funding, the hosting costs were also more expensive than anticipated, which may also affect sustainability. Given the nuance needed to interact with victims and their unique needs, ITRC is continuing to explore proper uses of the chatbot to ensure ViViAN addresses users' needs without causing further frustration or burden. It may be that a chatbot is best used for situations where similar questions are asked frequently. For instance, ITRC noted that when Equifax experienced a large data breach, a chatbot like ViViAN would have been helpful to address the high volume of victims who were asking the same types of questions and to offer a solution that every victim of the event could follow. ITRC plans to use the information and data gathered through ViViAN to explore what types of issues or needs users are coming to the chatbot for after hours and define the next iteration of their chatbot.

ITRC
IDENTITY THEFT
RESOURCE CENTER

"The ITRC assists identity crime victims across the country, which means we need to be able to help victims at times convenient for them, not us. The facts of every identity crime are different, but a chatbot gives victims access to immediate information—at all hours—that helps them start the process of response and recovery until a live expert advisor can assist them."

**—Mona Terry,
Vice President,
Victim and Business Services,
ITRC**

Key Questions to Ask Prior to Chatbot Design and Implementation

Considerations	Questions to Ask
Purpose	☐ What is the purpose of the chatbot? ☐ Who is the target user/population for the chatbot? ☐ Is it appropriate to create a chatbot for this target population? ☐ Is it appropriate to create a chatbot to address the primary needs or concerns of the target population? ☐ What are the limitations of the chatbot? Do they significantly impact user well-being or engagement? ☐ Do the limitations outweigh the benefits?
Policy & Governance	☐ Who will maintain oversight and update the chatbot? ☐ What information/data set will the chatbot be trained on? ☐ What information will the chatbot collect? ☐ Where will the information collected by that chatbot be stored?
Privacy & Security	☐ How does the security of the system mitigate possible safety concerns identified above? ☐ Are privacy rights protected with the use of the chatbot? ☐ Does the tool provide users with more or less privacy than the law demands? ☐ How have the designers and engineers thought about ways to satisfy the chatbot's purpose while maximizing user privacy? ☐ How will data be collected and stored? What types of information will be accessible through the chatbot? Is it public information? ☐ Could this information be used in any way to learn the identity or location of an individual that should not be public knowledge (e.g., whereabouts of victims, addresses of individuals released from incarceration)? ☐ Does information intended to be provided through the bot typically require proof of identity to release this information?
User Engagement	☐ How will the bot communicate the privacy and security limitations outlined above? ☐ How will the bot be able to interpret and respond to user requests with limited personal data collected? ☐ How does language used by the bot express empathy versus sympathy? ☐ How will the chatbot clearly communicate what it can and cannot do? ☐ How, if at all, will the chatbot be able to identify proactive information that can be shared with users to improve their experiences with the bot? ☐ Is the design of the chatbot too human-like or does it attempt to pose as a human? ☐ How will the chatbot be accessible to a variety of individuals, such as complying with the Americans with Disability Act?
Role of Humans	☐ Who is responsible for ensuring that the decisions made by chatbots are appropriate and fair? ☐ What protections will be put in place to ensure that the tool is used appropriately (e.g., auditing procedures)? ☐ Who is responsible for the post-deployment evaluation, monitoring, and auditing of the chatbot? ☐ Does the chatbot relay information to a human for follow-up?
Ethics	☐ Are there any concerns about the ethics of the purpose or target user group (e.g., significant privacy or safety risks)? ☐ Do the data that were used to train the system involve any statistical or social biases? ☐ How did the chatbot developers educate themselves and seek out diverse evaluations and perspectives about the different ways that bias can penetrate the bot's decision-making? Did the developers create pathways to overcome those biases? ☐ Are the data and methods used to create the chatbot transparent? ☐ Are the tool's design, architectures, and training data open to research, review, and criticism?

Figure 6: Criminal justice leaders and decision-makers should consider these questions when designing or exploring the use of chatbots within the criminal justice setting.[48]

48. Some of these questions draw on another CJTEC brief on AI in the criminal justice system: Redden, J., Dix, M. O., & Criminal Justice Testing and Evaluation Consortium. (2020). *Artificial intelligence in the criminal justice system*. U.S. Department of Justice, National Institute of Justice, Office of Justice Programs. Retrieved from https://cjtec.org/technology-foraging/

Future of Chatbots

Advancements in AI will continue to drive forward developments in chatbots. One area that has particular promise is empathetic technology. Empathetic technology[49] is progressing into our daily lives with companies striving to provide better human–machine interactions that take into account the emotional context of a user. For example, Affectiva's Emotion API, IBM's Watson Tone Analyzer, and Empath's Vocal Emotion Recognition API are a few such products that offer emotion recognition by analyzing speech paralinguistics, tone, and other characteristics of the speaker. Advancements in empathetic technology through emotion recognition has potential applications for chatbots used in the criminal justice system. For example, a number of engaging, fully automated mental health intervention chatbots exist today.[50] These chatbots may have the potential to improve the delivery of mental health and recovery services for state and local government diversion programs that may seek to augment traditional services. Advancements in research and accompanying technological developments that further equip chatbots to respond with empathy have the potential to increase applications for victim services chatbots. This technology could equip chatbots to be able to assist victims outside of working hours or to handle straightforward FAQs that individuals may have about victimization, available services, or next steps. Empathetic chatbots may be useful for victims to understand the steps needed to prepare for or respond to the impacts of a crime.

5 Things Decision-Makers Should Know About Chatbots

1. Chatbots have the potential to improve efficiency, reduce costs and workloads, expand capabilities, and aid users across many criminal justice use cases; however, capturing these gains requires forethought and may require significant investment and time.
2. Stakeholders should consider the economic, operational, legal, safety, and privacy implications of implementing chatbots.
3. Despite advances in AI, deploying AI-driven chatbots is not a "plug-and-play" opportunity for criminal justice applications; access to high-quality data for training the chatbot is critical for success.
4. Chatbots have the potential to reduce administrative burden by freeing up staff to work on higher value tasks; however, the organization needs to consider how it will ensure human oversight of the chatbot to mitigate any potential risks.
5. The continuous advancement of AI, machine learning, and NLP will expand chatbot use cases and applications in the criminal justice system.

49. According to the *Wall Street Journal*, "Empathetic technology combines AI and quantifiable measures of our physical and mental state to begin dabbling in quintessentially human territory, reading a situation and addressing what really matters to people." Retrieved from https://deloitte.wsj.com/articles/ais-next-act-empathetic-tech-01599850925

50. Sachan, D. (2018). Self-help robots drive blues away. *Lancet Psychiatry, 5*, 547. https://doi.org/10.1016/S2215-0366(18)30230-X

Published: **October 2021**

More Information

Steven Schuetz
Senior Science Advisor/Physical Scientist
National Institute of Justice
U.S. Department of Justice
Steven.Schuetz@usdoj.gov
Tel +1-202-514-7663

Jeri D. Ropero-Miller, PhD, F-ABFT
Project Director, CJTEC
RTI International
jerimiller@rti.org
Tel +1-919-485-5685

Jim Redden
Innovation Advisors
RTI International
jredden@rti.org
Tel +1-919-248-4222

Suggested Citation

Camello, M. L., Houston-Kolnik, J. D., & Planty, M. (2021). *Chatbots in the criminal justice system.* Research Triangle Park, NC: RTI International.

This publication was made possible by Award Number 2018-75-CX-K003, awarded by the National Institute of Justice, Office of Justice Programs, U.S. Department of Justice. The opinions, findings, and conclusions or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect those of the Department of Justice.

https://cjtec.org/