



UC Benefits Virtual Assistant

Final

Category: EMERGING & INNOVATIVE TECHNOLOGIES

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EXECUTIVE SUMMARY

The Commonwealth of Pennsylvania's Unemployment Compensation (UC) Benefits System processed an extraordinary number of claims as a result of the COVID-19 pandemic. The disaster created demand greater than any past unemployment crisis in the state, and the legacy mainframe system could not support it. Due to the influx of claimants who had never previously filed for unemployment, the Department of Labor & Industry's (L&I's) UC office needed a solution to help answer basic UC questions as quickly as possible to alleviate some of the load on the UC Service Centers' agents, and reduce demand on the IT system to avoid failure.

IBM, which partners with the commonwealth for select IT products and services, offered a 90-day free trial of the IBM Watson Virtual Assistant, a phone-based voice bot artificial intelligence (AI) solution, to help handle some of the incoming calls. The Watson Virtual Assistant is a conversational AI platform that helps provide fast, straightforward, and accurate answers to customers' questions. By addressing common customer inquiries, the voice bot reduces the cost of customer interactions and helps agents focus on more complex activities instead of repetitive responses. Additionally, to help agencies better address the COVID-19 pandemic, IBM specifically pre-loaded the voice bot to understand and respond to common COVID-19 questions, directly leveraging Centers for Disease Control and Prevention (CDC) guidance, while still allowing agencies to customize unique inquiries using their own information to quickly help customers get answers and stay informed.

IBM's Watson Virtual Assistant was a first in innovative voice bot technology for the commonwealth. It was identified, acquired, and implemented in under three weeks, providing virtual relief for individuals who are unable to reach live agents or who lack Internet access to view UC benefit information online. Incremental enhancements will continue to be released through June 30, 2020, as UC demand is expected to continue to rise. The rapid response and collaboration of the multiple IT and business teams to support Pennsylvania during the COVID-19 crisis had a direct impact on the commonwealth's ability to maintain continuous mission-critical UC services, improve customers' experiences, and extend the capacity of overtaxed customer service agents.

The virtual assistant, known as the PA Unemployment Link Assistant (PAULA), has received an average of more than 120,000 calls per month, approximately 10%-15% of the total calls received by the UC Service Centers. Helping decrease the volume of calls into the main phone line to file for critical UC benefits, calls answered by PAULA are projected to save the commonwealth over \$420,000 in staffing costs during the first year. Based on this success, the commonwealth is now working to implement an encrypted web chat, including a chat bot, for the UC Service Centers. These solutions will provide answers to frequently asked questions (FAQs), much like PAULA, but will do so through a secure chat interface and transfer the chat conversation to a human UC Service Center agent if/when needed.

CONCEPT

The COVID-19 pandemic and subsequent statewide quarantine efforts triggered layoffs in almost every industry in Pennsylvania and led to unprecedented demand on the UC Benefits System and UC Service Centers. The increased number of claims strained the UC intake system as workers filed for unemployment in numbers that were nearly 10x higher than the legacy mainframe-based system had previously experienced and was not scaled to accommodate. As the overtaxed system's capacity limited the number of users who could access it concurrently, those who were unsuccessful joined the vast number of claimants who were calling the UC Service Centers for support. An urgent response was required to alleviate some of the strain on the call centers agents and mitigate the risk of UC system failures.

On April 1, 2020, IBM launched Watson Assistant for Citizens, a new AI-based solution available to government agencies, health care institutions, and academic organizations with a 90-day free trial. IBM planned to tap into AI technologies like natural language processing to triage residents looking for guidance on COVID-19, which has affected 204 countries to date. However, the solution also allows agencies to add custom data sets, like UC FAQs. The Watson Assistant for Citizens virtual agent brought together IBM's Watson Virtual assistant, Watson Discovery services, and AI capabilities from IBM Research to draw on the CDC and local sources like links to school closings, news, and documents on state websites, to answer natural language questions about COVID-19. Watson Assistant for Citizens includes 15 pre-trained inquiries and responses out of the box, is available in English and Spanish, and can be tailored to accommodate up to 13 different languages.

The Pennsylvania Unemployment Link Assistant (PAULA) project began on April 1, 2020 with a signed a letter of intent for the 90-day trial of the Watson Virtual Assistant. IBM also provided a post-trial cost projection for continuing use of the virtual assistant services with up to 100 concurrent users and identified the additional costs the commonwealth would incur if it exceeded the 100 concurrent users limit. Currently, PAULA receives an average of 10,000 calls daily and the maximum number of concurrent users so far has been 28. According to IBM, there are very few customers around the world that exceed 100 concurrent users and, given the current utilization data, it seems unlikely the commonwealth's L&I UC program area could reach or exceed 100 concurrent users. Assuming call volume remains at the current rate of growth and UC does not exceed 100 concurrent users, the ongoing monthly charge for the Watson Virtual assistant after the 90-day trial is over will be \$41,500.

A cross-agency collaboration of teams from the Office of Administration (OA) and UC benefits program planned, built, and executed the deployment of PAULA in just over two weeks. IBM provided software support services to help build the solution quickly and the OA and UC teams worked closely to determine and document the back-end data set with which to configure it.

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To set up the Watson Virtual Assistant for use with Pennsylvania's UC benefits program, OA created business rules, called "intents," through IBM's cloud interface. These intents defined what the UC team felt their customers' intentions would typically be when presenting general inquiries about UC to the virtual assistant. Each intent was then associated with five or more specific questions. Then, OA set up a second set of business rules, also through IBM's cloud interface, called "dialogs." These dialogs established the hierarchy the UC team anticipated conversations would follow when customers called the virtual assistant. In the dialogs, OA defined the specific responses the UC team wished to return to customers for each intent. The solution was originally built and configured in the development environment, then migrated to the production environment when ready to "go live." While the Watson Virtual Assistant was being configured, OA also assigned a dedicated phone number for PAULA.

When PAULA launched on April 16, 2020, the service and phone number were promoted to the public via a press release and on commonwealth UC web pages. PAULA's phone number remains on public-facing commonwealth web pages and continues to be referenced in press releases and public statements issued by Governor Tom Wolf and L&I Secretary Jerry Oleksiak. Efforts to publicize PAULA across web, print, television, and social media channels will be maintained and/or reissued while the pandemic continues to impact unemployment in Pennsylvania. With allowance for solution updates, back-end changes, and conversions that may occur, PAULA is expected to remain available to the public, with the phone number published on commonwealth web pages, indefinitely.

On April 22, IBM provided an additional quote to build a customer survey component to evaluate the services being provided by PAULA. The customer survey involved the development and deployment of IBM Analytics Services for Data Science with DB2 on Cloud Flex. It incurred a one-time fee of \$14,400.00 for IBM to support OA with the solution build and \$2,313.00 in initial costs for the service it provides.

To further support UC customer service, the UC encrypted chat service is being implemented in partnership with Genesys Telecommunications Labs, Inc. (Genesys) in the UC Service Centers via a phased approach with five milestones. The first and second milestones, due for release on June 30, 2020, will equip the UC Service Centers with the encrypted chat capability, providing an additional communication channel for the call center agents to use to interact with claimants. The remaining three milestones will provide an enhanced voice bot solution on July 7 and introduce a chat bot on August 24.

The cost for the encrypted chat capability being deployed on June 30 is \$120,225.00. The voice bot (July milestones 3 and 4) and chat bot (August milestone 5) will cost \$240,625.00 and \$40,075.00, respectively. The total cost for the collection of service enhancements will be \$400,925.00. The encrypted chat and chat bot solutions provide more advanced capabilities than offered with the current implementation of PAULA and will be integrated with the UC Service Centers' telephone system.

SIGNIFICANCE

The importance of emerging technologies like robotic process automation (RPA) and AI is well known in the IT industry, ranking #7 on NASCIO's State CIO Top Ten Priorities: 2020 Technologies, Applications, and Tools, and the Commonwealth of Pennsylvania made its initial foray into automation with the introduction of RPA in 2019.

Recently-updated strategic plans for both business areas and IT in the commonwealth include increasing automation and advanced analytics, for which these technologies are pivotal.

Likewise, the Governor has promoted the value of efficiency, data-driven decision-making, and customer service since he took office in 2015. He doubled-down on those priorities in his second term with Executive Order 2019-04 on July 24, 2019, creating the commonwealth's Customer Service Transformation initiative to facilitate Pennsylvania becoming a Citizen-First Government. It also made the commonwealth CIO responsible for the management and operation of enterprise business and IT services, the specific duties and responsibilities of which can be found in the full content of Executive Order 2019-04, located at <https://www.oa.pa.gov/Policies/eo/Documents/2019-04.pdf>.

The Customer Service Transformation initiative focuses heavily on providing one-stop-shop support to residents and businesses online, over the phone, and in person. This focus, combined with the initiative's data-driven improvement and transparency goals, elevates the commonwealth's need to adopt intelligent and automation technologies. However, getting these solutions through the procurement and security rules and requirements so they can be made available for agency business use is a lengthy process. PAULA proves that these technologies can be acquired and implemented according to a much shorter timeline than they had been previously.

The IBM Analytics Services for Data Science customer survey launched several weeks after PAULA and includes a dashboard with charts showing how customers respond to the survey. PAULA is proving itself fit for purpose, which is to provide general information about UC, and provides some targeted information about special pandemic-related UC programs.

The planned release of the Genesys voice bot will enable PAULA to transfer a call to a UC Service Center agent when appropriate, which will connect the customer with someone who can provide them with individualized UC Claims updates. The commonwealth's AI General Policy, available at https://www.oa.pa.gov/Policies/Documents/itp_bus012.pdf, requires AI solutions rely on pre-determined data sets to complete their assigned processes. This policy ensures the commonwealth's careful stewardship of data and protects the security and privacy of personally-identifiable information (PII). This, however, does not reduce the influence and impact of this initial voice bot implementation. PAULA has increased awareness of and interest in the potential benefits that conversational and cognitive computing could provide for the commonwealth and its residents and businesses.

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The implementation of PAULA was a significant undertaking that is pushing the commonwealth to review the AI General Policy and is prompting several agencies and program areas to plan to employ voice bot and chat bot solutions to support their operations. These solutions are being deployed in ways that will enable simplified integration with business solutions and shared data in the future, while still complying with existing policy. PAULA opened the door for an enterprise-wide proposal to introduce a conversational technology standard for the commonwealth. This proposal anticipates an interactive solution that could ultimately replace statewide Interactive Voice Relay (IVR) systems, potentially saving ongoing resource management costs.

In alignment with NASCIO's #2 priority on its State CIO Top Ten Priorities: 2020 Strategies, Policy Issues, and Management Processes, PAULA and the UC encrypted chat both support the commonwealth's continued pursuit of digital government. In fact, combining voice bot or chat bot technology with already-standardized and available RPA, even at the simplest levels of intelligent automation, will enable the commonwealth to provide improved customer experiences and enhanced services, such as:

- Chat bots on every webpage providing the public quick answers or clarifications about government-related topics or administrative procedures.
- Basic customer support like initiating the processes for driver's license renewals, UC claims submissions, tax filings, and tax payments.
- Enhanced experiences for tourists, guiding visitors to local attractions and helping them plan their itineraries.
- A channel for increasing awareness about laws and regulations.
- Increased organizational capacity by executing routine tasks, allowing staff to be reallocated to functions with greater complexity and larger-scale individual value.
- Opportunities to grow citizen participation in government.
- Internal user technical support for transactional functions like setting/resetting passwords, setting up Wi-Fi or VPN connections, or tier I trouble-shooting support.
- Automated initiation of HR actions like absence and expense management.
- Translation support for commonwealth services.

IMPACT

Prior to the implementation of PAULA, UC-related FAQs were only available on the L&I website. Residents without Internet access had no choice but to call a UC Service Center to talk to an agent. This created longer wait times, contributing to excessive delays in being able to open new UC claims and the enormous burden on the UC Service Centers' agents.

Within the first day of PAULA's services being activated, claimants had the ability to call PAULA and ask common UC questions like, "how do I apply for benefits?" or, "when can I expect to receive my check?" If the claimant called from a cellular device, they could receive text messages with additional information, including the toll-free number for filing a UC claim

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or a link to the UC website to complete an online application. PAULA provides easy, fast customer service by answering questions that help them navigate the UC process.

During the peak of Pennsylvania's pandemic unemployment crisis, UC was receiving over 70,000 calls per day. Between mid-March and June 15, 2020, L&I UC staff had worked more than 110,000 hours of overtime, nearly \$14.2 billion in benefits had been paid to UC claimants, and 2.5 million total UC claims had been filed. UC staff had responded to more than 390,000 emails during that time period, with 4,428 UC email responses sent on June 15 alone.

L&I has taken several steps to improve UC customer support for its commonwealth claimants since March. UC Service Centers' staffing levels have increased 80% and 312 new employees brought the total number of UC Service Centers staff to 1,491. More than 350 state employees have been reassigned from other offices or agencies to help process UC claims, and 70 experienced UC retirees returned to work.

On April 30, 2020, PAULA had been live for only two weeks and had already handled over 110,000 calls. By June 10, PAULA had answered more than 220,000 calls. Since the solution was implemented, PAULA has received an average of more than 120,000 calls per month, approximately 10%-15% of the total calls received by the UC Service Centers. By helping to decrease the volume of calls into the main phone line to file for critical UC benefits, calls answered by PAULA are projected to save the commonwealth over \$420,000 in staffing costs during the first year.