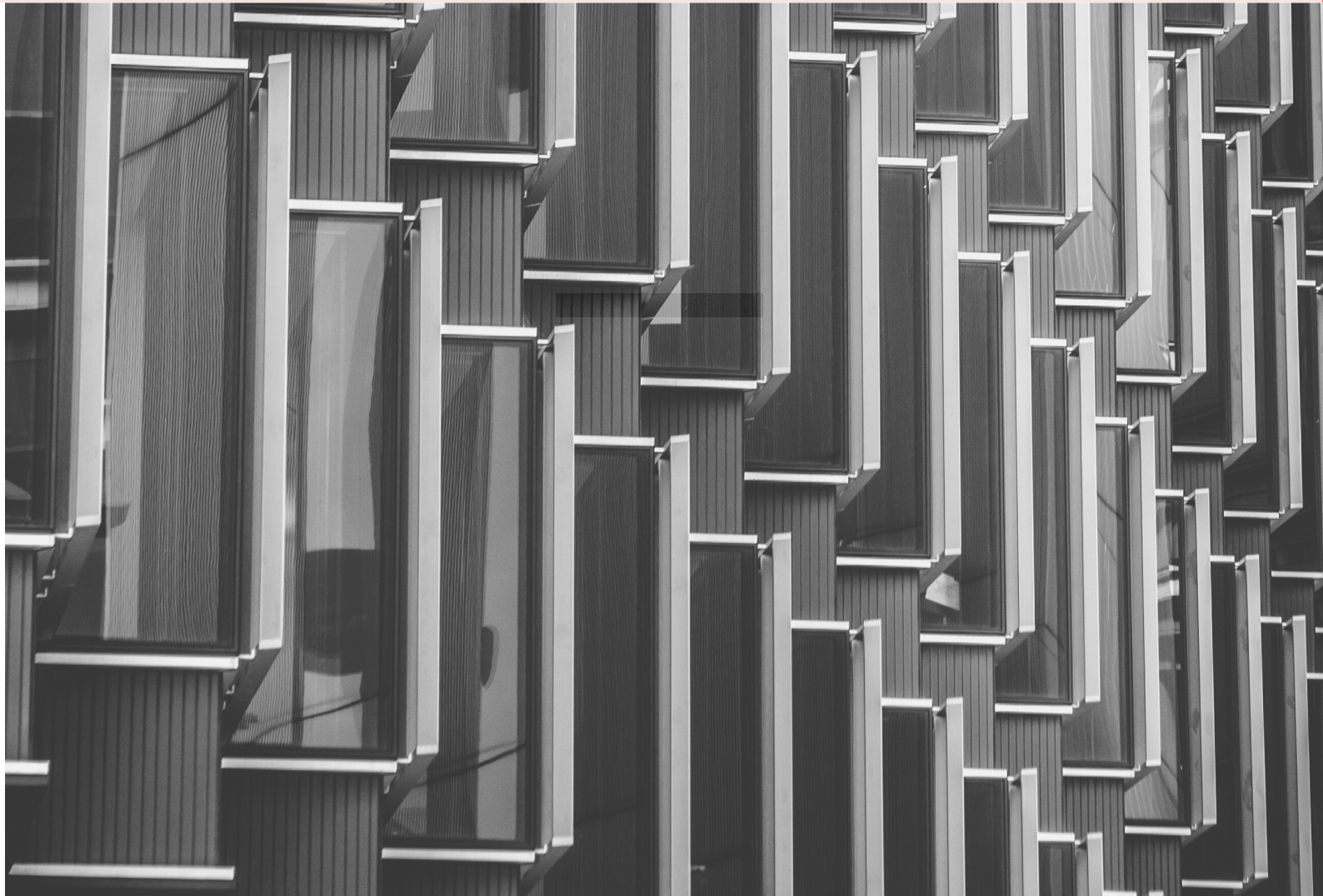


Reinventing the Customer Experience With Real-Time, Voice Responsive Chatbots

Solutions for customer service telephony in
the cloud.

February 2020

Riley.



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About Riley

Abstract

Customers rely on customer service centres for clear, prompt information regarding a business's products and services. Many organisations now rely on the internet, customer relationship management software and chatbots to automate and simplify their customer interactions.

Previous generations of chatbots have been viewed as a cost-saving measure, though also a detriment to the customer experience. Limited by keypads and recorded responses, chatbots lacked access to real-time business information and followed decision trees.

In this document, we outline an architecture for a dynamic, voice-responsive customer service chatbot. Our solution has a focus on simplifying the user story and taking advantage of recent innovations in machine learning. It operates in the cloud with AWS' Cognitive CX suite.

Introduction

Phone chatbots are a source of highly available and accurate customer support that frees sales teams the burden of answering repetitive queries. New generations of chatbots offer superior service and enhanced capabilities.

Improving Customer Experience

Historically, a severe user experience deficiency of previous chatbots is listing keypad options. In an environment limited to keypad input, a bot reads options and corresponding keypad entries, while a user waits until their selection is listed.

For example, chatbots may need to prompt the caller to specify a business location or branch. However, the [primary chatbot use-case for customers](#), getting a quick answer, is degraded if the service delays the customer by listing many options or asking questions of elimination.

Despite the availability of automated speech recognition (ASR) and text-to-speech (TTS) services, a fifth of customers [cited a slow conversational interface](#) as a reason to reach out to agents instead. To address this, Riley suggests businesses take advantage of these technologies and implement voice AI.

Fetching Real-Time Information

The high ROI potential of chatbots stems from the [15 to 90% cost reduction](#) in handling common customer queries. However, this benefit is reduced when staff are instead occupied with data entry to keep chatbot information relevant. Not only is this a cumbersome task, but chatbots with recorded responses cannot handle applications that require live updates.

New informational chatbots will be expected to query business data on customer demand and dynamically generate responses. This requires a chatbot infrastructure connected to the organisation's existing endpoints and data stores.

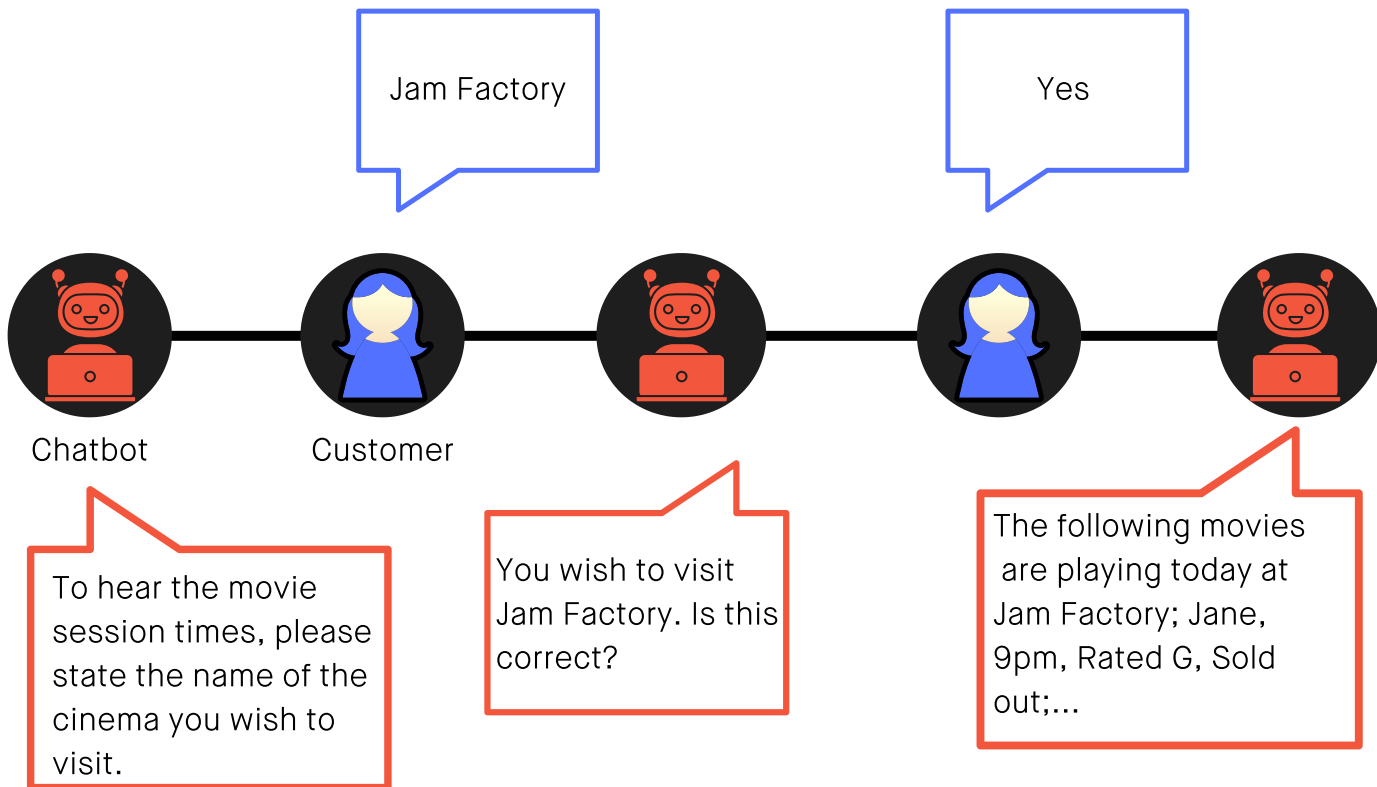
Riley Chatbot Solution

In Riley’s proposed solution, a customer can speak directly into the telephone and is understood by the chatbot, eliminating the need for keypad entries. The performance of current ASR and TTS algorithms is sufficient to seamlessly engage in conversation with customers.

A chatbot that has taken advantage of speech recognition and text-to-speech can generate unique responses on request. The information in these responses can be direct from existing Application Programming Interfaces (APIs) or database queries, transforming a recorded bot into a real-time support agent.

Sample Call Flow

Below is an example call-flow, for a voice operated, real-time movie session time chatbot.



Architecting Chatbots with AWS

The [Amazon Web Services](#) (AWS) platform offers a diverse range of cloud computing and storage services. A subset of their services can be used to develop a chatbot as described.

AWS allows organisations of any size to migrate their technology services into a shared global infrastructure, avoiding the expense of in-house server management. Within the cloud model, businesses only pay for what they consume and scale as they grow.

Critical AWS Services

AWS Lex

[AWS Lex](#) is an AWS service dedicated to conversational interfaces, such as facilitating automated speech recognition for chatbots. Once established, Lex can enable a bot to take advantage of leading machine learning algorithms that have already trained on massive amounts of data.

AWS Polly

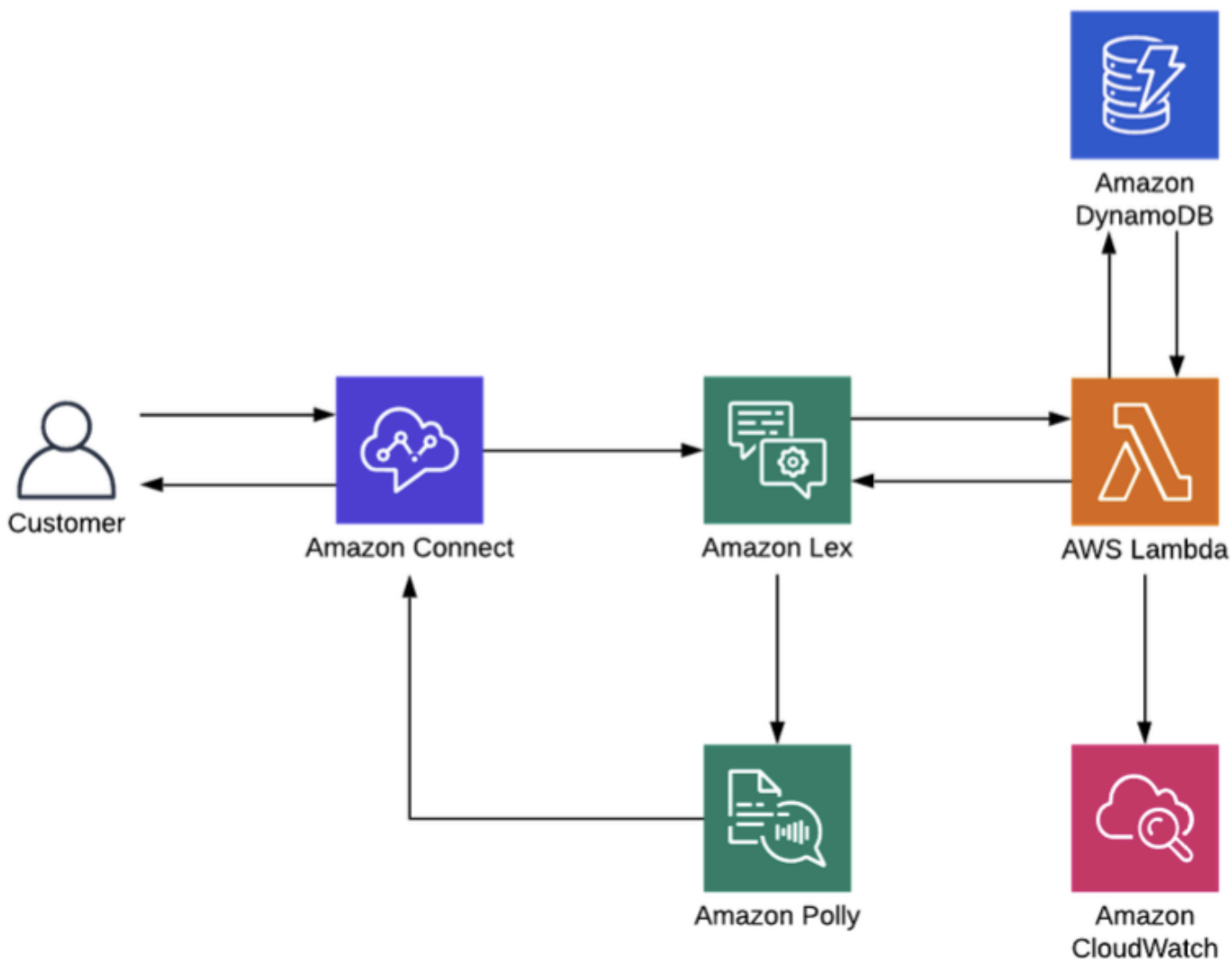
The opposite side of the conversation with a customer can be handled by [AWS Polly](#). Polly's text-to-speech service generates voice responses. Each request is fulfilled nearly instantaneously on-demand. The speech can be in a range of male or female artificial voices and multiple languages are available. Together, Lex and Polly allow organisations to utilise advanced voice algorithms without licensing or development costs.

AWS Connect

The final essential product to build a complete chatbot is [Amazon Connect](#). Along with inward and outbound telephone management, Connect provides a declarative interface to direct the call from start to end. As business requirements change developers will need to adjust the call flow, so Connect provides an interface to modify responses and information without writing code.

Architecture Diagram

To deliver real-time business information the aforementioned services can call upon data from APIs or Lambda functions that query existing databases.



Presented above is an architecture diagram for an interactive informational telephone chatbot. The use case scenario is:

1. Customer calls into Amazon Connect. Connect initiates its call flow logic and asks the user question(s).
2. Customer responds through voice.
3. Connect forwards the message to Lex for automated speech recognition.
4. Lex interprets the customer's response and validates it against known answers through Lambda and DynamoDB.
5. Lambda now queries DynamoDB for the information requested by the customer.
6. Lex outputs to Connect through Amazon Polly's text-to-speech services.
7. All actions are logged on CloudWatch.

Case Study: Village Entertainment

[Village Cinemas](#), part of Village Roadshow Group, is one of Australia's largest cinema operators. Village plays movies for its patrons on 704 screens, across 74 sites in all Australian states and territories.

The chain runs a '1300 VMOVIE' business phone service for movie session times. Previously, when users dialled the phone service for session times, they were presented with a recorded message. They were required to wait for their cinema of interest to be announced before selecting a two-digit number in their keypads. This degraded the user experience; customers listened as tens of cinemas were read out by the bot.

Village, on its end, had to generate recordings for all session times at all cinemas every day. Updating the bot was a costly and time-consuming task.

In succession to Riley's chatbot solution was a drastic 30 hour (per week) reduction of laborious manual data entry for staff, in addition to streamlining the customer experience from upwards of 10 minutes down to 30 seconds.

When the phone service is dialled, customers are now prompted to state their required cinema directly to the chatbot. The system then sources and responds with real-time information from the Village Cinemas website API. It further assists the customer by now indicating sold-out session times.

Village was able to reduce the costs of running the service, receiving an immediate positive ROI, whilst simultaneously improving customer satisfaction.

Conclusion

The AWS platform helps organisations and chatbots deliver voice conversations and real-time business data. New chatbots have the power to address the customer experience deficiencies of previous iterations. Initiatives to invest now will take advantage of the increasing availability of innovative text-to-speech and voice recognition services.

There are sufficient services on AWS to engineer an entire chatbot in the cloud. This allows businesses to start small, experiment and build fast. Once a chatbot demonstrates its ability in testing, a business can scale and serve any number of new customers.



ABOUT RILEY

OUR PURPOSE

Our purpose is to seek a positive return on creativity. We recognise the only actions worth taking are those that move toward building a better future.

WHO WE ARE

Riley is an Australian technology company with a primary focus on digital transformation, data and analytics, and infrastructure modernisation.

Our highly skilled team specialise in the design, deployment and management of enterprise workloads on customised AWS infrastructures. We help customers realise the true potential of public cloud by providing tested, proven and trusted solutions.