

Oracle Digital Assistant

Over 4.1 billion users around the world are on instant messaging and chat apps at any moment in time. People want and expect the instant engagement that only messaging apps can provide, and they're rushing to these platforms in droves, at an adoption rate far greater than even social networks saw at their peak. Organizations need a platform to enable them to harness the power of instant messaging and engage intelligently and contextually with customers and employees.

THE CONVERSATIONAL APP ERA

The last few years have seen a massive growth in the mobile usage of instant messaging and chat applications such as Facebook Messenger, Microsoft Teams, WeChat, and Slack, particularly with Millennials and digital natives. In addition, there has been an explosion in virtual private assistants (VPAs) with Amazon Dot / Echo, Google Home and Apple HomePod and with voice recognition such as Amazon Alexa, Google Assistant, and Apple Siri becoming common place in people's cars and homes.

What makes these channels the default choice is the expected instant response if the other person is online, or the push notification that triggers the person on the other side to respond immediately. Instant messaging users who use these channels to converse with their friends and family also want to use the same channels, with the same familiar user experience, to instantly communicate with the enterprise. These channels are doing to apps what browsers did to client server applications; these channels are rapidly becoming the next browser.

DIGITAL ASSISTANTS AND SKILLS

A Digital Assistant, like a chatbot, is a computer program designed to simulate a conversation with human users, especially over the Internet. End users can easily discover and connect to assistants through many of the popular messaging apps, without the need to individually download and install them from an app store. Digital Assistants have a distinct advantage over conventional device-resident



Conversational AI for
Your Business

With Oracle Digital Assistant, you can develop and combine skills that can create a more natural conversational user interface, through text or speech, to your enterprise systems and perform valuable actions on behalf of your end-users.

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mobile apps in many circumstances. With a Digital Assistant, your service can be readily available through the messaging app that is most likely already has installed on their mobile device.

Unlike a simple chatbot, a Digital Assistant can be equipped with multiple skills covering a broad range of domains and topics all from one conversational interface. There's no need to search for the appropriate chatbot that supports a specific service. Your Digital Assistant becomes the single point of contact for all the conversational experiences you wish to provide to your employees and customers.

Digital Assistant skills, powered by Artificial Intelligence (AI), dramatically improve the conversational experience, providing a very natural conversation between the assistant and the end user. Instead of the end user having to learn a fixed set of keywords that the assistant would respond to, a Digital Assistant is able to understand the user's intentions, however they are expressed and respond accordingly. A Digital Assistant will ensure your users stay engaged and keep coming back to your service.

ORACLE DIGITAL ASSISTANT

With Oracle Digital Assistant, you can develop assistants with skills that can benefit from a more natural conversational user interface, through text or speech, to your enterprise systems. By using Artificial Intelligence (AI) and Natural Language Processing (NLP) powered by Neural Networks and Machine Learning, Oracle Digital Assistant can more easily detect what the user is trying to achieve (their intent) and respond appropriately with information or results of transactions from API connections to any of your back-end enterprise applications and information sources. The platform makes it simple and easy to build and train your Digital Assistant without the need for specialist AI skills. Your assistant can then be exposed through many Chat and Voice channels, a custom mobile app or even your web site.

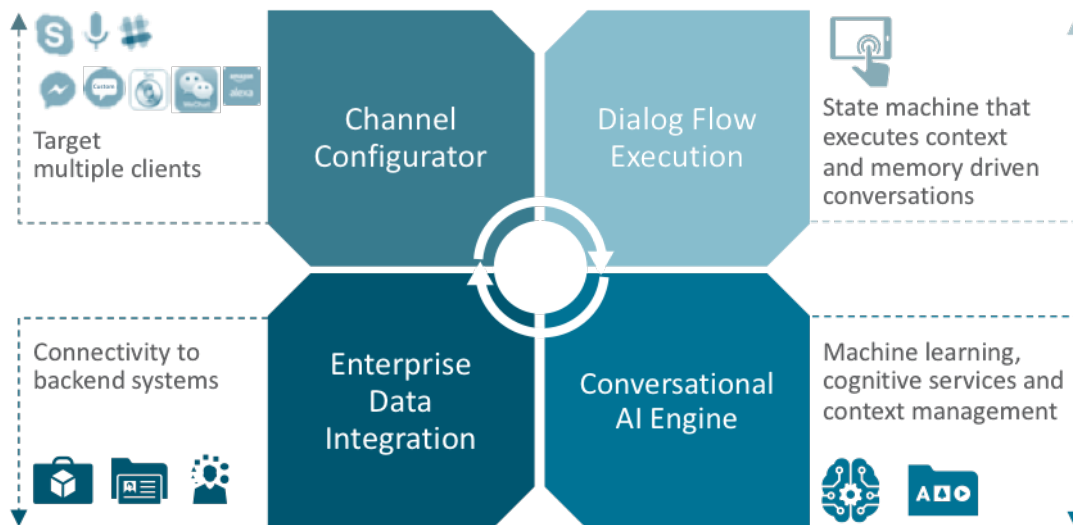


Figure 1. The four main components of an Oracle Digital Assistant Skill

Benefits

- Create **Digital Assistants** with skills that respond to how users want to converse, not by having them learn keywords or phrases.
- Equip your Digital Assistant with multiple skills giving your users a single point of entry to the broadest set of capabilities and services
- Surface assistants inside popular **messaging apps** like Facebook Messenger, Microsoft Teams, Slack, your existing web portals, or inside popular **voice assistants** like Amazon Alexa and Apple Siri
- Deliver unprecedented **security** and **privacy** with Oracle Digital Assistant's own voice technology, giving customers full control of conversational data

NATURAL LANGUAGE PROCESSING BACKED BY ARTIFICIAL INTELLIGENCE

Oracle Digital Assistant allows you to focus on building your skills with a declarative interface to set up intents, entities and dialog flow without having to worry about the algorithms to process and understand the natural language and classify these inputs. It employs a series of technologies based on Neural Networks that use language and linguistic modelling to increase the accuracy of processing natural language from the end user. This leaves the Digital Assistant developer to focus on building the assistant's skills instead of fine tuning these algorithms.

Oracle Digital Assistant provides multiple Natural Language Understanding (NLU) training models to predict user-intent from incoming end-user requests and accurately execute the required dialog flow.

- For use cases where the volume of data is low, the Trainer HT model derives a combination of generative rule templates from NLP-based linguistics to help you get started very quickly with a small set of data (corpus) for the model to train on. The user-intent prediction using the model is highly accurate for incoming requests that are similar to the utterances provided in the assistant's corpus.
- For use-cases that have large volume data sets and require better generalization of intent prediction (i.e. higher accuracy of intent classification with regard to incoming queries not in the corpus data), and when you have built a high quality initial data set tuned on Trainer HT for conversation flows, the Digital Assistant platform provides a more advanced Machine-Learning based model for user intent prediction. The second model (Trainer TM) utilizes a combination of algorithms that learn unsupervised from large amounts of unlabelled text (e.g. WSJ, NYT, Wikipedia, Reuters etc.) to then produce context sensitive mappings or vectors for user-intent prediction based on the corpus of data provided by the end-user in an assistant (e.g. "river bank" and "JPM Chase bank" to differ vectors based on context of sentence in corpus).

With these dual approaches, you can get started quickly and then build on the initial corpus with a powerful Machine-Learning model to predict use-intent more accurately as your data sets grow.

CONVERSATIONAL FLOW AND CONTEXT

The AI powered intent detection is combined with a powerful state machine that maintains the context of the conversation and allows you to define the appropriate conversational flows and sub-flows. Oracle Digital Assistant provides an easy way to define a context aware conversational dialog - a conversation with the end user.

End users by human nature can potentially branch off into different states and context in the course of a conversations. For example, if a user wanted to transfer funds from Account A to a friend. They can start by asking the assistant – “Pay Tom for dinner”. The assistant responds with – “from which account”. They pick their Checking Account but then realize they are not sure how much money they have in the account. They switch context to ask for the current balance and further ask what transactions there have been recently - in other words change the state from transferring money to someone to checking balance and transactions. At some point, they decide to return to Paying Tom. The Oracle Digital Assistant platform makes it very easy to model this with built in state management, so the developer does not have to code and maintain the solution.

Key Features

- AI powered **Natural Language Processing** (NLP) for Intent and Entity detection
- Context aware deployment of assistants to multiple channels, abstracting the differences
- Multiple **Natural Language Understanding** (NLU) training models to predict user-intent from incoming end-user requests
- Rapid development of Digital Assistant Skills with **QnA** combined with Intent based interactions
- Integrated **Live Agent handover** with Oracle Service Cloud, allowing human and Digital Assistant collaboration
- Connect any Skill to any backend system using **industry standards** such as REST and SOAP
- Use **JavaScript** and **Node.js** to connect to backend APIs and extend using popular open-source node.js modules
- Sophisticated usage and performance analytics providing **actionable Digital Assistant Insights**

ORACLE VOICE

Voice activated assistants such as Apple's Siri and Amazon's Alexa have become commonplace among consumers. Conversational interfaces are naturally gravitating to becoming more common for enterprise applications. Oracle offers its own voice capabilities to meet enterprise requirements.

- Security and privacy are of top concerns, and many customers require full control over the end-to-end user data and experience, including what's being said through voice interfaces. That means third-party consumer grade voice technologies, will not meet their requirements. With Oracle Digital Assistant, using Oracle's own voice technology, the customer is in full control of the conversation.
- Many industries have their own unique terminology. A successful digital assistant will understand specific industry terms, apply them in the appropriate context, and provide the correct response, per industry applications. Oracle SaaS (ERP, HCM, CX, etc.) and on-premises application teams are building their own application specific digital assistant skills, using Oracle Digital Assistant that will automatically understand their own unique application specific terminology.

QNA SKILLS

One of the most common uses for an assistant is to answer frequently asked questions. Oracle Digital Assistant makes it easy to incorporate QnA skills by importing a set of existing questions and answers from a simple spreadsheet. When a user types a phrase that can be matched to a search term within the QnA, the matching questions and answers are displayed to the user. QnA and Intents can be combined within the same conversational flow within a skill to provide the best of both styles of interaction.

INSTANT APPS

While unstructured conversations come naturally to people, there are times when a structure form is the best means of capturing structured information. (name, address, etc.) Structured forms can be created with Oracle Visual Builder, Oracle JET, or other Web frameworks like React. The forms can

Channels

- Facebook Messenger
- Microsoft Teams
- Slack
- WeChat
- Web SDK
- iOS SDK
- Android SDK
- Siri, Alexa, Google
- Partner solutions

Plus many more via the open Webhook interface

Multiple Conversation Styles

- Transactional
- FAQs
- Live Agent Handover
- Bot Alerts
- Complex Policies

then be incorporated into the conversational flow, allowing your assistant to combine both structured and unstructured interactions with the end user.

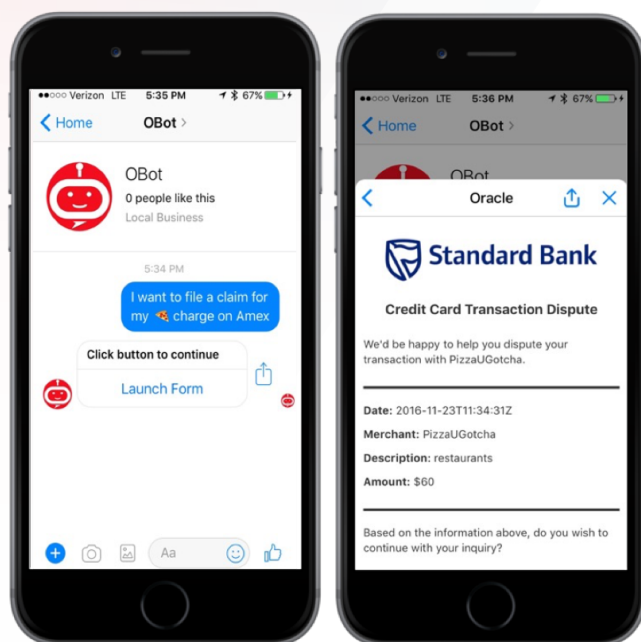


Figure 2. Instant Apps – combining structured data capture with unstructured conversational flow

The Instant App appears to the user as a link in the conversation and depending on the channel capabilities, can pop-up right inside their chat application. Once they complete the form, the data captured is passed back to the assistant to carry on the conversational flow.

LIVE AGENT HANDOVER

On occasions when users need to speak to a human agent, Oracle Digital Assistant offers an integration with Oracle Service Cloud and can be configured to automatically handover the conversation to a live agent. The history of the conversation between the user and the digital assistant is delivered to Oracle Service Cloud allowing the agent to quickly get up to speed on the task at hand and pick up where the digital assistant left off. The transition is seamless, bidirectional, and shows an ideal collaboration between human and digital assistant, providing improved customer service and greater scalability.

ENTERPRISE ASSISTANT SKILLS

Many of the Oracle SaaS teams, including Oracle ERP, Oracle HCM and Oracle CX, as well as on-premises app teams like PeopleSoft and JD Edwards, have built and continue to develop their own digital assistant skills that are specific to their applications. That means customers can readily get out-of-the box digital assistants that can interact with their related applications. These digital assistant skills are built on Oracle Digital Assistant and can be further extended and customized to a customer's own unique needs – while maintaining compatibility with the originally developed skill. The extended

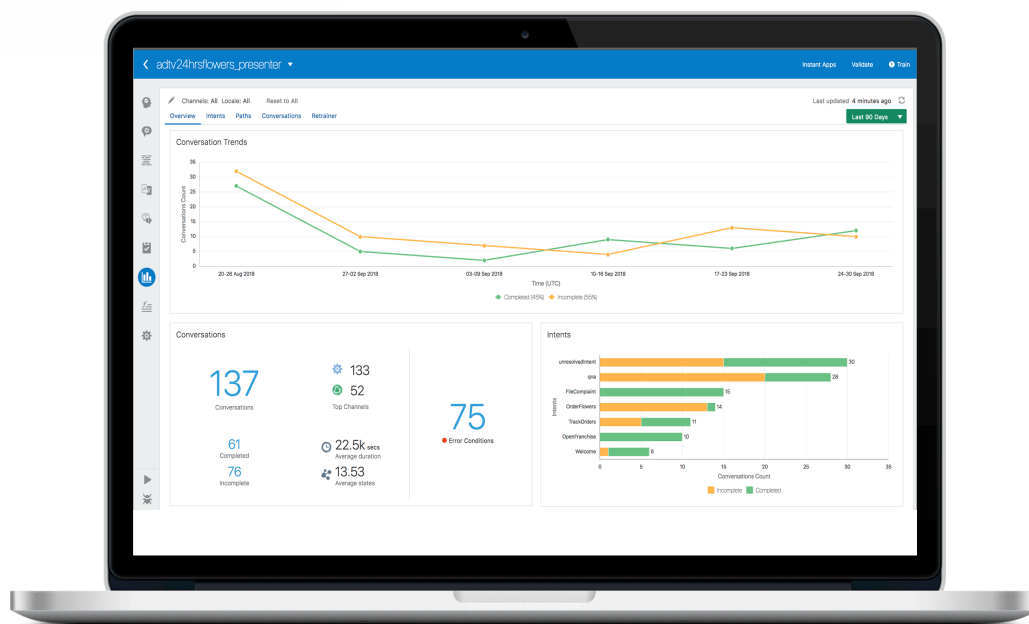
skills are also upgrade safe, as the platform automatically tracks the changes customers make, to let customers merge these changes into a new version of delivered skills.

ENTERPRISE INTEGRATION

The value of the Digital Assistant is to provide real actionable services to the end users. Custom components allow developers to create modules that can be invoked during the dialog flow to fetch information or perform transactions through your APIs to your backend systems. Your assistant can be programmed to carry out any task that your available APIs allow it to perform. APIs built for your existing apps and your assistants can be shared across all application types, maximizing reuse and productivity. Oracle Digital Assistant provides a ready-made SDK to enable you to deploy these components directly onto a node.js server using your developers existing JavaScript skills.

BOT INSIGHTS

Oracle Digital Assistant includes built-in analytics to offer insights into conversational bottlenecks and utilization metrics, which can then be used to improve accuracy of the digital assistant and craft a better user experience.



Key Features

- Routing analytics (conversation metrics, completion/error rates for constituent skills, popular skills by invocation) across the Digital Assistant.

- Developer-oriented analytics to pinpoint issues with skill execution so you can address them before they cause problems. Track conversation trends over time, identify execution paths, determine the accuracy of your intent resolutions and access entire conversation transcripts.
- Operational view across all the skills in the Digital Assistant to measure ROI using deflection rates, analyze usage patterns/popular channels, identify key problems and reasons for failures.
- Moderated self-learning to augment and enhance digital assistant efficiency. Users often employ a wide variety of phrases to ask for a specific intent. We automatically categorize these phrases (using word clouds) and suggest options to tune the digital assistant.
- Archiving and export capabilities to manage data storage; use third party tools for additional analysis.
- Automatic data collection; reports are populated during execution. Fully integrated with the Tester UI, so you can generate analytic events during testing.

ONE INTEGRATED SOLUTION

Oracle Digital Assistant provides everything that customers need to build an assistant with channel integration, dialog flow, AI engine, integration and an easy to use Skill builder UI. It provides you with a complete solution that is predictable in terms of cost, ease of use, level of effort and with a rapid time to market. But above all, it provides you with a solution that can enable you to deliver the next generation of customer engagement.

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