Analyst Commentary: Oracle Digital Assistant democratizing Oracle apps

Omdia view

Summary

When Oracle officially launched its first Oracle Digital Assistant (DA) in October 2019, the company created a competitive advantage over its key rivals. By offering full integration with its software as a service (SaaS) applications, Oracle made it exponentially easier for end users to command and control the capabilities of these applications. The company also opened the door to creating significant additional value for end users' core revenue-generating applications.

Virtual digital assistants and business applications

Omdia conducts regular, in-depth research in the area of virtual digital assistants (VDAs). In our most recent report, *Virtual Digital Assistants for Enterprise Applications* (4Q19), it was noted that business applications were poised to become a significant use case for VDAs:

> *In the last iteration of this report (2018), business application VDAs were strictly the purview of productivity and collaboration applications. VDAs were being developed to help enterprise workers schedule and manage meetings or assist in project management. Today, business application VDAs are assisting with IT helpdesks, automating workflow and are poised to help navigate a broad range of enterprise application software (EAS). Oracle, SAP, and Microsoft have launched platforms with varying degrees of integration into their EAS applications, from productivity apps to CRM [customer relationship management] and ERP [enterprise resource planning] solutions. Look for business application VDAs to grow significantly within the next 2 to 3 years.*

As user-friendly as most enterprise applications such as CRM and ERP can be, they are typically underutilized. Two of the most common reasons for this are as follows:

- Many regular users do not master the application and thus don't obtain optimal results.
- The number of regular users is a small percentage of potential users.

But what if a user could simply speak or type in their own words what they want a business application to do? This capability could significantly reduce or even potentially eliminate the time it takes to learn or master the operation of the application. The business application also becomes more effective and more valuable. VDAs are that natural language interface between users and business applications. Oracle has embraced this idea, and at this point, the company appears to be ahead of its competitors in developing VDAs for business applications.

Oracle's evolved vision and strategy

Note: In addition to integration with Oracle SaaS applications, DA is available to developers and business analysts who want to build their own digital assistants for various purposes and platforms. The developer side of DA is outside the scope of this analysis.

It is interesting to note how Oracle's vision and strategy for virtual assistants has evolved to where the company stands with it in 2020. According to Suhas Uliyar, vice president, Product Management,

Digital Assistants, Cognitive Services and Integration, Oracle launched chatbot capabilities in 2017. It then started building chatbots for its SaaS applications in 2018 but ran into a challenge, as Uliyar describes:

> *We ended up with a large number of chatbots to drive multiple functions across CRM, ERP, HCM, [and the] supply chain … which meant for a customer it would become very complex, confusing and time consuming to discover these chatbots and figure out how to interact with 50 or 60 different chatbots based on their role. Plus, when you are delivering chatbots for applications, those need to be extensible to account for application customization.*

Refocusing on a scalable, no-code mentality, in 2019 the company started building a digital assistant that would enable conversational voice and text access to (and across) different backend applications, offering a pre-built set of chatbots (called skills) for Oracle's own SaaS applications and enabling a broad range of user interfaces.

Figure 1: Oracle Digital Assistant architecture
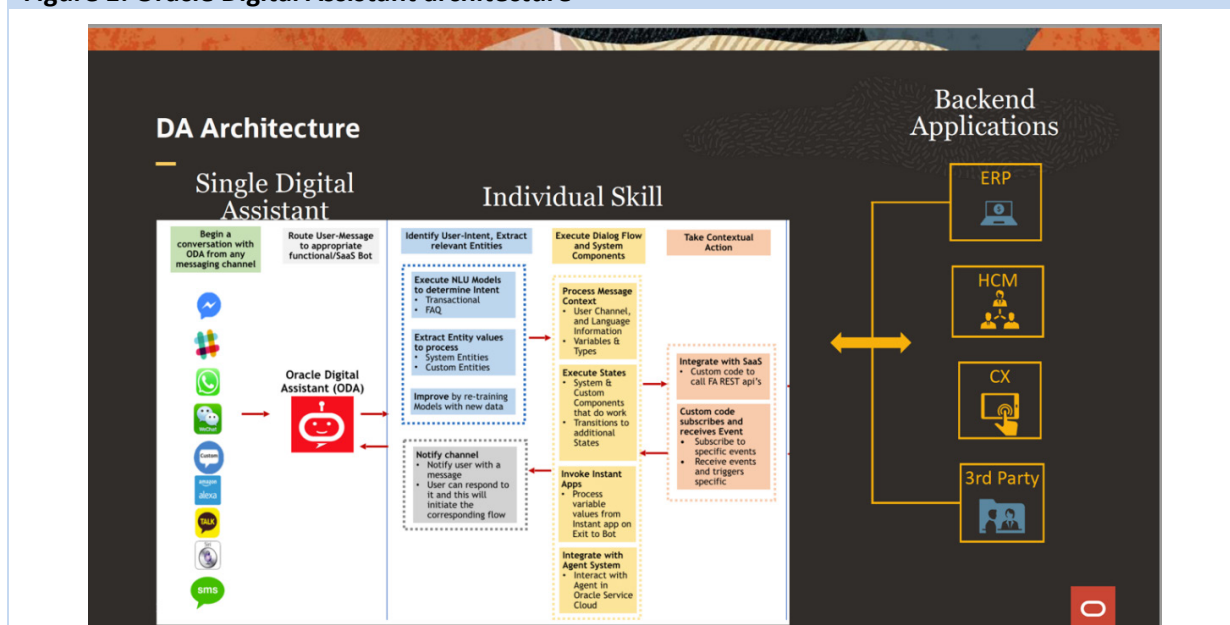
Source: Oracle

Pioneers don't get the benefit of precedents and need to charter a new path, and this was clearly what Oracle needed to do to deliver conversational AI for enterprise use—a fact that is best reflected by Oracle Digital Assistant's own evolution over the last few years:

- **2017**
  - Intelligent chatbot platform
    - NLP engine (intents, machine learning-based entities)
    - Multi channels messaging
    - Enterprise data Integration
    - Dialog framework
    - Validation framework (review intent, entity setup, validate and report on duplicates, errors with recommendations)

- **2018**
  - Support for additional patterns: Transactional and FAQ
  - Multi language support
  - Agent framework integration for human agent handoffs and return
  - Chatbot development by SaaS application teams
  - Dynamic entities: Be able to get value lists from enterprise applications
  - Instant apps: Seamless user experience for structured and unstructured experiences
- **2019**
  - DA framework: One DA to support multiple chatbots (skill)
    - Routing powered by AI
    - Automated disambiguation
    - Non sequitur handling
    - Conversation state management between skills
  - Insights: User adoption, trends, pathing, conversational debugging
  - Assisted self-learning to retrain models
- **2020**
  - NLP engine
    - Deep learning engine built on ensemble of models and contextual embeddings, including MUSE, USE, BERT
    - Model pretrained with large enterprise and open domain datasets
    - Fine-tuning for domain-specific tasks requires little training data, enabling deep learning with minimal customer effort
    - Data augmentation amplifies salient aspects of customer training data and automatically suppresses out-of-domain information
    - Transfer learning adapts generic model to specific customer classifications
    - Machine learning-based named entity recognition
  - Enterprise-grade voice
    - Enterprise domain vocabulary
    - Enterprise extensibility to handle customer-specific vocabulary
    - GDPR and PII compliant—data owned and managed by customer

In a demo given in June 2020 to Omdia analysts, Uliyar ran DA through some of its paces. Particularly impressive was the advanced natural language understanding capability of Oracle's DA, which could pick through tricky, rambling dialog and understand company-specific vernacular. Advanced AI concepts like transfer learning, deep learning, and a cognitive engine built into the dialog engine places Oracle's platform up there with some of the most sophisticated NLP platforms in the world. Offering its own AI-powered voice capabilities, the company's platform manages to avoid the privacy

and security issues associated with most devices' voice and translation services. Why would it be so important to build such a platform at Oracle? According to Uliyar:

> There is no one size fits all in the world of ML … There is no one model that fits all use cases. So we needed to take an ensemble approach where we use an intelligent model to deliver the most accurate result. In addition, we needed this to be extensible to multi domains and customer specific use cases. We had to deal with the reality that a customer might have just a few sets of utterances in their custom skill in contrast to the 500+ utterances supported in the out of the box skills offered with Oracle Digital Assistant.

> The engine must be smart enough to recognize the imbalance and resolve it elegantly such that however sparse the new utterances and intents put in by the customer are, those are given due weight and not discounted against the out of the box skills. In addition, the machine learning powering the engine should be able to maintain conversation context. A user shouldn't have to specify context with every request—rather, the engine should be able to derive it from the conversation. As an example, when a user says "what is the current status?", the engine must be smart enough to provide the response based on the current context and be able to determine that the status being asked is for an expense report, or approval or hiring status, or such, even when the user has been having multiple threads in the same conversation.

Uliyar pointed out that Oracle has expanded its vision for DA with more AI capabilities:

> Digital Assistant has been designed such that it can handle a number of different cognitive inputs, from sentiment analysis, images and document to large text classification … Digital Assistant is, in fact, more than just a conversational AI. For example, you could take a picture of your expense and analyze it, and this could be done either via conversational interfaces, mobile or web-based apps—all supported by Digital Assistant. And, beyond that, it drives predictive engagement where it would recommend or even kick-off the next best action. Having a cognitive platform to make the Digital Assistant a true assistant for this reason is very important.

What's next?

Oracle's Digital Assistant is a sophisticated tool poised to democratize the company's SaaS applications. However, it is early days for the platform and too soon to tell how or when it will help affect Oracle's bottom line. Today, it is set up as a profit center, but one could speculate that in the future there would be scenarios where DA is a bundled feature of Oracle SaaS. Oracle rivals such as SAP, Microsoft, and Salesforce have similar, but less defined business application VDA initiatives underway. It will be interesting to see how significant a role VDAs will play in EAS and how the roles that business software giants play as VDA platforms/solutions providers evolve over the next few years.

Appendix

Further reading

Virtual Digital Assistants for Enterprise Applications (4Q19)

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