

# The Top 7 Considerations Before Choosing a Chatbot for Your Enterprise

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# **Executive Summary**

A chatbot is a software solution that's based on Artificial Intelligence (AI). It automates certain predefined tasks by interacting with a user through a chat interface. In general, these interactions are simple, straightforward, human-like and can be in the form of text or voice. The ubiquitous availability of Internet of Things (IoT) devices and the adoption of AI have boosted the popularity of virtual assistant (VA) chatbots among consumers. Chatbots are also on the rise in the B2B space. Yet, for enterprises about to start their journey into the world of chatbots, there is much to consider. In this paper, we look at seven priorities to consider when planning an enterprise chatbot strategy.

# The Rise of the Chatbots

Chatbots aren't a novelty. According to <u>eMarketer</u>, over 35 million people already use voice-activated virtual assistants and 1.4 billion messenger app users are willing to talk to chatbots. With advancements in deep learning and Natural Language Processing (NLP), chatbots are becoming more human-like. According to inventor Ray Kurzweil, <u>you will be able to have meaningful humanlike conversations with chatbots</u> by 2029. Apart from consumers, chatbots are gaining widespread adoption in commercial use cases as well. According to <u>Grandview Research</u>, 45% of users prefer chatbots as the primary mode of customer support. The global chatbot market is growing at a Compound Annual Growth Rate (CAGR) of 24%. Here are three major reasons for the rise of chatbots:

### Smart devices & IoT

Innovation in the consumer technology space is fueling the growth of chatbots for many use cases. From consulting a physician from the comfort of your home to checking the condition of the food in your refrigerator, IoT has made the impossible happen. Smart homes have accelerated the use of virtual assistants. Speculations around the futuristic 5G network even suggest smart city implementations. Motivated by their successful virtual assistants, tech giants like Google and Amazon are making huge investments in smart home devices. The number of connected devices is expected to reach <u>25 billion by 2021</u>, up from 14.2 billion in 2019.



### The post-app era

Gartner introduced the term "post-app era." Contrary to its connotation, the term doesn't mean the end of mobile apps. It rather defines a change in the way users accomplish vital tasks where a native mobile app is just one channel among many. The customer experience in the post-app era encompasses messaging platforms, social media sites and third-party apps. These separate systems are tightly integrated to provide a unified experience irrespective of the channel of interaction. With the ability to provide instant human-like responses and its ubiquity across multiple channels, chatbots are uniquely positioned to deliver on the promise of the post-app era. That's why enterprises are starting to invest more in chatbots.

According to <u>Gartner</u>, over 50% of enterprises will spend more on bots than on traditional app development by 2021. Considering almost all attention today is focused on delivering native mobile app experiences, we're on the threshold of a big shift in how customer experiences are crafted at the enterprise level. 52% of enterprise respondents expressed that they are already doing something about chatbots and virtual assistants. Gartner also predicts that 55% of all large enterprises will deploy at least one chatbot in production by 2020.

### **Tooling is maturing**

The flourishing ecosystem of chatbot solutions is helping organizations to get started quickly, and scale operations with ease. Today's chatbot builders are flexible. You can develop a bot from scratch, reuse developed components, build a dedicated bot for a single role as well as build multipurpose bots. Intuitive web-based tools ensure consistency in design while tailoring it for different use cases, channels, and compliance requirements. Fortunately, most chatbot platforms are simple enough for non-technical developers to handle.

Predefined knowledge packages make it easier to train your chatbot. Advanced Al systems enable the bot to pick up new words and queries. Also, these platforms allow human intervention at any time. If ever the bot fails to answer any question, you can easily configure it to answer them. Third-party plugins enable developers to add a variety of features with ease. With one-click integration, you can easily deploy your chatbot to your website and mobile apps and get it up and running in minutes. Advanced debugging tools enable developers to test the chatbot build throughout the development cycle.



# Lifecycle of a Chatbot Request



There are three stages in the journey of a chat-based request: input, intent analysis and output. The chatbot gets input from the user through the conversational interface—either text or voice. The user-provided information is extracted in the NLP engine as either intent or entity, and the context is extended with extracted values. Then, according to the business logic built into the conversational flow, the values are used for further actions, such as data update or validation, record registrations and the like.

Once the bot understands what the user wants, it tries to match the query with the data in its libraries. According to the values extracted from utterances, the chatbot can "jump" between different conversations or steps and doesn't have to follow a strict flow of programmed if/then statements.





In some cases, the bot asks for additional input to refine the entire process. Finally, the request would result in an action taken, such as renew a subscription, or deliver a list of search results to the user.

# Type of chatbots

Chatbots are classified into two major types:

- 1. Transactional chatbots
- 2. Informational chatbots



### **Transactional chatbots**

Transactional chatbots help users complete a transaction—scheduling an appointment, renewing a subscription, returning a product, or checking their account balance. They are optimized to execute clearly-defined processes with ease and in doing so replace complicated UIs and the need to talk to experts. Most transactional chatbots operate in a sequential manner, like an IVR menu in a call center.

### Informational chatbots

Informational chatbots are contextual chatbots that look to return the most relevant information for a search query. They are trained with huge amounts of structured and unstructured data. Informational chatbots understand and respond to user queries regardless of the sequence they were entered in. This type of bot is ideal to have conversations with. Alexa, Siri, and Google Assistant are prime examples of informational chatbots.

Recent bots utilize more advanced algorithms to simplify the flow in such linear parts of the dialog. For example, some steps can be escaped thanks to the slot-filling algorithm.

Modern chatbots take it further by being a blend of both transactional and informational bots. <u>NativeChat</u> is one such solution that enables you to build modern chatbots.

NativeChat enables you to create a chatbot that doesn't require the user to operate sequentially like a phone menu. Rather, a user can act in a non-linear pattern and still accomplish their goal. They can access information in the form or search results and answers to specific questions and accomplish a task like booking an appointment—all in the same chat conversation, with the same chatbot. Chatbots built with NativeChat are smart enough to detect a switch in context and respond accordingly. This makes for a human-like interaction between the user and the chatbot. Users interact with the chatbot in a more natural fashion and have a better user experience. This is what the seamless, intelligent user experience of the future would look like.



# Intent: BOOK APPOINTMENT 1. Understand Input Hill Can | schedule an appointment with The NativeChat Natural Langu

Entity: DATE

The NativeChat Natural Language Engine supports dynamic training on top of existing enterprise data—like product info, company or contact names. Then it detects these entities, extracts the user intent and passes them to the Cognitive Flow.

#### 2. Process

NativeChat analyzes the current conversation, long-term bot memory and the goals defined by you. Then it dynamically generates the conversation flow on each user input.

### 3. Deliver Response

NativeChat requests needed data from internal systems like SAP, Salesforce, Microsoft SharePoint or any API. Then it displays the response in the user's channel of choice.

# Potential use cases for chatbots

The use cases for chatbots are numerous, spanning multiple functions across all industries. Here is a brief list of the most common use cases for chatbots today:

### Use cases by function

**Virtual Customer Assistants (VCAs):** Besides advising customers, VCA chatbots help customers complete transactions like renewing their car insurance or checking their bank account balance. With the direct value-add that chatbots provide in this use case, they are gaining fast adoption among the innovative and early-adopter organizations looking to optimize every step of the customer experience.

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**Virtual Enterprise Assistants:** VEAs help enterprises automate monotonous and complex tasks like data entry, gathering insights from unstructured data, scheduling meetings and tracking attendance. They enable businesses to use their human capital for more creative, higher-value tasks.

**Training Bots:** Training chatbots provide quick answers to learner queries. Trainees feel more comfortable requesting certain things from bots than humans. For example, asking a chatbot to explain a subject several times can be easier than asking a human trainer. Training bots also give additional insights about the learners that the company can use to improve their training modules.

**Customer Support Agents:** SMBs that don't have a dedicated customer support team have their employees take turns handling customer queries. The multitasking employees generally take some time to answer queries. Customers get frustrated when they don't get an instant reply. This is where chatbots can save the day. Chatbots can easily scale to support a spike in customer interactions, more than a team of human chat agents can. For example, online insurer Lemonade has a chatbot that handles customer claims. The chatbot resolved a customer's claim in <u>three seconds</u> and with no paperwork. In those three seconds, it "reviewed the claim, cross-referenced it with the policy, ran 18 anti-fraud algorithms on it, approved the claim, sent wiring instructions to the bank, and informed the customer of the result."

#### Use cases by sector

**Insurance:** Chatbots are used by insurance companies to guide customers through the insurance policy sign up and renewal process. The 24/7 availability and ability to streamline tedious processes has made chatbots a big success in insurance. According to the Global Trends study, the insurance sector invests an average of \$124 million per company in technologies like AI, and that includes chatbot solutions that simplify the customer journey.

**Healthcare:** In the healthcare industry, chatbots are primarily used as symptom checkers. Bots in healthcare are designed to assist three personas: the caregiver, the potential patient, and the physician. With sentiment analysis technology, chatbots can respond to patients with empathy. When consulting a physician, chatbots ensure a hassle-free experience to book an appointment. The instant response of chatbots is a boon to an industry like healthcare that is filled with emergencies.



**Finance:** Chatbots in the financial services sector help customers access information such as bank account balance, loan-related queries, initiate payment transactions, create deposits, calculate mortgage payments, and for a company to trigger requests that its customer can approve or deny.

**Manufacturing:** In manufacturing, chat-based query systems enable managers to stay updated about inventory status. IoT devices with chatbots can sense when raw materials are low and then ask the manager to replenish the stock. Sensor-integrated chatbots monitor equipment health and notify the manager or the manufacturer about any equipment that requires maintenance.

# Seven Considerations for an Enterprise Chatbot Strategy

There are seven steps to executing a successful chatbot strategy in an enterprise.

# 1. Start with a business need

Requirement gathering is the first step to consider when building a chatbot for your enterprise. It is imperative to identify exactly which parts of your business should be optimized using a chatbot. Here is a list of steps to make your requirement gathering process easier:

- Brainstorm and achieve clarity on who the target customer is, what their pain points are, and what benefits the chatbot solution will give them.
  - Create a list of customer or employee tasks that you would want to automate.
- J. Identify a list of chatbot features that would deliver the functionality identified in step 2.

While this is a bird's-eye view of the process, at ground level this would require multiple meetings with key stakeholders, shadowing frontline workers, and even conducting customer surveys. Many customers find it easier to begin with a call center script or complex data form to begin the project planning. Getting the



right input can guide the rest of your efforts and avoid wasted effort later in the process.

**Pro Tip:** Take care to gather metrics about customer success and satisfaction on the existing process so you will have a baseline with which to compare your chatbot implementation metrics.

# 2. Decide whether to replace or empower existing apps

Digital transformation would largely involve empowering existing apps with added chatbot functionality. Enterprises have to first take inventory of existing apps that perform the functions you've identified and then decide whether to replace (retire legacy apps and create new chatbot-driven apps from the ground up) or empower (enhance the functionality of legacy apps with chatbots using integrations). In both cases, chatbots can add great value to enterprises looking to drive digital transformation. Not all chatbot solutions allow integration with existing enterprise systems, and this is something that should be checked when choosing a chatbot development solution. <u>NativeChat</u> comes with a robust set of data connectors that make it super easy to connect with existing data stores, enterprise SaaS and enterprise authentications. Such functionality reduces project risk, development time and maintenance.

The decision to replace or empower holds true not just for applications, but also for people-powered processes. As mentioned earlier, industries like healthcare, finance and insurance tend to have structured processes that are executed by full-time employees. Automating the entire process may not always be a good idea because the AI technology used in these bots is still in a developmental stage. Instead of replacing humans completely, you simply use transactional chatbots to optimize the workload of the frontline employees by <u>70-80%</u>. This approach has already delivered a competitive advantage to many organizations across industries. Knowing when to replace and when to empower is key to implementing chatbots successfully across your organization.

# 3. Glean value from your backend services and stored data

Your chatbot is as powerful as your backend services and data store are. So you have to take inventory of all your backend datasets, evaluate the active services you have in use and create flowcharts to plan your chatbot functionality at an abstracted level. The next step is to identify the parts of the process where AI



will be required to interpret user input and extract meaningful data.

The conversation flow directs the action of chatbot based on guessed user intent and extracted entity values. The process of mapping of data extracted data from user utterance to concrete entity or intent is called intent mapping. Context is a great way to improve the quality of intent mapping. Context is available in the form of history of previous customer interactions and conversations. It helps to automatically add this information to the customer profile, so it can be used later to personalize the customer's interaction with a chatbot. This is required to build highly sticky and engaging chatbots.

Some chatbot platforms like <u>NativeChat</u> take contextual intent mapping a step further by allowing chatbots to personalize the chat based on the user's real-time activity. This makes for an intuitive and human-like conversation that greatly enhances user experience.

# 4. Choose your technology stack for chatbot development

With your chatbot application requirements complete, it's time to decide on a tech stack with which to implement your plan. You should select the programming language you'll use. This may be something your developers are already familiar with or something they need to be trained on. Python (because of its integration with an artificial intelligence markup language (AIML), and Java (due to it being the most widely used programming language in enterprises) have become the most common languages for chatbot development.

Apart from the programming language, third-party SaaS services are often used as deployment platforms. Facebook and WeChat are two of the most popular deployment platforms for chatbots. Others include Slack, Zendesk, and Twilio.

In terms of a development strategy, you need to decide whether you'll adopt a centralized or decentralized approach to development. Development should be complemented with rigorous testing. Quality checks are essential to make chatbots production-ready. These decisions are important and will play a key role is selecting a platform for chatbot development.

# 5. Select a high-productivity chatbot development solution



With your technical requirements in place, you are now ready to look for a solution to help you develop and manage chatbots at scale. Fortunately, there is a wide range of DIY and off-the-shelf options available. These solutions come with a variety of tools, templates, and conversation flow builders. Also, many of these solutions don't require you to master coding skills. The chatbot solutions are broadly classified into four types:

- a. Open-source frameworks (Rasa)
- b. Software Development Kits (SDKs) for on-premise (<u>Microsoft Bot framework</u> <u>SDK</u>)
- c. SaaS platforms (Salesforce Einstein)
- d. Cloud-based development platforms (NativeChat)

#### **DIY chatbot solutions**

Open source chatbot frameworks are a great option for DIY development. But the chatbot ecosystem is so new that open source tooling is yet to mature. In their current state, they might not be able to offer the kind of security, scale, and wide support required for enterprise-grade chatbots.

SDK solutions are purpose-built around a particular programming language. They would support the most popular languages like Python, Java—which is fine if you only use these languages. In a multi-team setup, it's likely that skill sets will vary beyond these languages. Because of limited support, SDK solutions are not ideal when you want to facilitate collaboration across multiple teams and disparate backend systems.

#### End-to-end chatbot solutions

SaaS platforms make it easy to get up and running with little upfront development. However, they can make it hard to customize in the long run. With point-and-click options aplenty, they are not very developer-friendly. Cloudbased chatbot development platforms that offer more flexibility than SaaS options are the better alternative.

Cloud-based chatbot development platforms operate on a self-serve model where much of the plumbing is available and the platform is ready to build on. They also allow for deep customizing if that's what you want. These platforms either focus on the conversational part (NLP) of chatbots or middleware that deals with data analysis. Some cloud platforms do both, offering an end-to-end solution.







DIY chatbot solutions only allow you to build simple bots with basic functions and contextual high-quality conversations are a challenge for them. Also, their scalability and AI-based capabilities are limited. If your business needs a simple, single-purpose chatbot, go for these off-the-shelf solutions. But, if you need to build a sophisticated bot to automate a call center script, simplify a complex web form, or interact with enterprise and legacy systems, an end-to-end chatbot solution would be the best option. Even within this category, cloud-based chatbot development platforms that include a middleware engine have an advantage over SaaS solutions.

#### Middleware engine

A middleware engine is a central part of a chatbot solution that's built to operate at enterprise scale. It acts as a bridge between the frontend and backend stack, enabling you to put custom integration logic into the different parts of the chatbot lifecycle. Consider the flexibility of the middleware engine when choosing your chatbot development platform. The core features of the middleware engine should include capturing, categorizing and storing messages, automatic logging, and processing user input from various channels. Also, consider whether the solution enables you to build chatbots fast and manage them effectively at scale. That would involve building reusable components both at the backend and frontend.

You should also pay attention to the memory models available. The quickest way to frustrate users is to forget information they have already provided. To do a good job of maintaining the bot-driven conversation, your chatbot will





need to have both a short- and long-term memory. Using the memory sections appropriately delivers a pleasant, efficient experience. The middleware engine provides capability to build this into the application logic.

#### Pricing model

Finally, consider the available pricing models. Free and open source software can be the cheapest initial investment. However, they may include a hidden maintenance tax on your teams in the long run. This would require lots of low-level infrastructure plumbing and take time away from chatbot development.

Commercial solutions are priced based on the resources used and enable you to scale up or down easily. Cloud-based development platforms likely have project accelerators allowing you to create a tailored chatbot and ship in just a few weeks. If development time is an important factor, make sure to know the commercial options out on the market. Cloud-based options have the deployment and scalability options solved for you and not just during development.

### 6. Craft a human-like user experience

Now that the foundational parts of your chatbot strategy is ready, it's time to think of the user experience. It's easy to get narrowly focused on just the technical aspects of the chatbot and ignore the human element involved. However, user experience matters if you want to have a conversation that is less robot-like and more human-like. It starts with being present on the right messaging channels, and should evolve to sentiment analysis, and multilingual support.

#### Design for various channels

The first step to crafting a great user experience is to consider how and where your chatbot will be used. Some user tasks are best performed on a mobile device while other tasks need a different form factor for better usability. For example, filling out a five-page mortgage application is likely not a good fit for a mobile device.

You need to consider what should happen if the user starts a transaction on one device and then wants to move to a different channel to complete the task. Imagine using a chatbot to find apartments. A user could start their search on



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mobile with a chatbot, reserve the apartment, then use the web to fill out the application form. This way the user gets to interact with the application on their terms and uses the best capability of each channel. Make sure the chatbot technical stack can store information entered by the user and also make that information available to other channels, like a web application or downstream system of record.

#### Understand the customer

Empathy is imperative for customer support. Sentiment analysis can help your chatbot produce human-like responses. Chatbots that are capable of sentiment analysis can identify customer frustration, and even positive moods and act accordingly. Advanced Natural Language Processing capabilities can recognize common spelling and grammatical errors and make the chatbot interpret the user's intended message. Predictive analytics can offer the user with suggestions based on customer behavior patterns.

#### **Multilingual support**

With chatbots, language matters. The capacity of chatbots differs based on languages. Today, most chatbots support only English. According to Forbes, <u>60%</u> of consumers do not (or rarely) buy from English-only sites. Multilingual support can greatly increase the adoption of bots especially within regions where multiple languages are spoken. If targeting a global audience, leveraging a chatbot that supports the ten most common languages will open up conversations to more than three billion people worldwide. <u>NativeChat</u> for example, can understand 72 different languages.

Your chatbot should be able to understand different languages and not just mechanically translate back and forth. It is necessary to plan for a conversational workflow (not sequential). This would involve a variety of responses that are human-friendly—for example, "Got it", "Ok, makes sense", and "Perfect." For chatbots that speak, things like pauses, whispering, speed of speech, and intonation/tone matter to make the bot sound human. The chatbot should be able to maintain content-rich two-way conversations using both text and speech. Apple Siri and Google Assistant are great examples of this blend of text and voice conversations.

# 7. Manage the chatbot after creation

Creating a chatbot is the easy part, the harder and more important part is



maintaining and evolving it to a mature, human-like agent over time. Two areas of focus here are security and monitoring.

#### Chatbot security

Starting with data privacy, it is critical to ensure information shared in the chat interface is accessed only by the user. This includes putting measures in place to ensure developers don't have access to private chat data. Take proactive measures to prevent phishing. Robust voice recognition and two-factor authentication are powerful ways to combat phishing. When it comes to backend databases, securing data at rest and in transit is essential. Data encryption should be available at a granular level, and access to data should be given via access keys that expire after a specified time. Going further, users should be educated that they should never share sensitive data in a chat interface. This is especially relevant in the case of chatbots deployed in the banking and finance sector.

#### Monitoring a chatbot

Once created, you need end-to-end visibility into performance issues affecting chatbots. Fortunately, there are well-defined metrics to measure your bot's performance. The top key performance indicators (KPIs) include number of active users, session length, user ratings, fallback responses, and confusion triggers.

Chatbots invoke fallback responses when they cannot find an appropriate response to a user's query. Monitoring the frequency of fallback responses will help you to identify knowledge gaps and faulty NLP. You can then train your chatbot NLP to recognize the variances in which users phrase an inquiry.

Even bots with the most advanced NLP might not understand everything that a user says. Fortunately, "confusion triggers" is a metric that identifies when a chatbot is unable to understand a message and indicates how and where the chatbot needs to be improved. Confusion triggers can be used to automatically delegate the task to a human agent after a failed interaction with a chatbot.

Considering the niche nature of these metrics, it makes sense to pick a chatbot platform that comes with built-in analytics to avoid the hassle of setting up analytics on your own using third-party services.





# Key takeaways:

Building a chatbot is no mean task as it requires a chatbot strategy that is deliberate, considers complexities at the enterprise level, and finally results in an intelligent human-like chat experience for the end user. By adhering to the seven best practices outlined in this paper, you can ensure your organization sets the right tone with its chatbot strategy. Here is a summary of the seven considerations when building a chatbot for your enterprise:

**Start with a business need:** Make a list of tasks to be automated or optimized, and a parallel list of features required for a chatbot to perform these tasks.

2. Decide whether to replace or empower existing apps: Enterprises depend on legacy applications and manual processes that can be replaced or empowered by chatbots. Decide which route you will take.

Glean value from your backend services and stored data: Conversation flow is determined by guessed user intent and extracted entity values which can be verified with backend services and persisted in data stores. According to the collected context data, chatbots deliver a relevant response.

**Decide your technology stack for chatbot development:** Whether it's programming in Python or Java, and deploying on Slack or WeChat, technical requirements are unique to each organization. Take stock of your tech stack before choosing a chatbot solution.

Select a high-productivity chatbot development solution: DIY chatbot

solutions such as open source frameworks, and SDKs are free to use. Endto-end chatbot development solutions are commercially available and are a step up from the DIY options. Choose the right solution based on the level of control, and speed you need to move at. Cloud-based development platforms like NativeChat stand out as the ideal solution for building large scale enterprise chatbots.

 Craft a human-like user experience: Beyond a prototype, your chatbot should be made available across multiple channels, speak the language(s) of your users, and be aware of user sentiment during a chat conversation.

Manage the chatbot after creation: In the long run, securing the chatbot helps build user trust, and monitoring its performance help to bring it to maturity.





# NativeChat



### About the Author Dan Wilson

Dan Wilson is the Senior Product Marketing Manager for Mobility technology at Progress. Dan has extensive experience growing technology focused products and services. He got his first taste of fast-moving bleeding edge tech when he joined his first start-up in 1999. An avid participant in technology communities, he contributes to a variety of open-source projects, and presents at numerous developer conferences worldwide. Prior to joining Progress, Dan founded and directed a consulting practice for 10 years.

NativeChat is an innovative artificial intelligence-driven chatbot for rapidly creating and deploying purpose-built chatbots as virtual agents. NativeChat can automate processes and guide users to the correct answer to their questions using natural conversation. It includes rich, specially designed UI components for conversational interaction that makes it easy to select dates, times, or items.

The NativeChat Natural Language Engine supports dynamic training on top of existing enterprise data—like product info, company or contact names. NativeChat detects these entities, extracts the user intent and passes them to the Cognitive Flow. NativeChat then analyzes the current conversation, long-term bot memory and the goals defined by you. Then it displays the response in the user's channel of choice.

NativeChat provides rich integration options like RESTful API connectivity and single sign-on providers. Chats are created using declarative syntax for the quickest time to implementation and the lowest maintenance cost. NativeChat also empowers non-technical subject matter experts to participate in conversation creation, training, and maintaining.

When you are ready to take a look at NativeChat, schedule a call with one of our experts. We'll help you evaluate your chatbot needs and decide which features are most important to you. We can help with implementation needs as well.

Talk with an Expert

#### **About Progress**

Progress (NASDAQ: PRGS) offers the leading platform for developing and deploying strategic business applications. We enable customers and partners to deliver modern, high-impact digital experiences with a fraction of the effort, time and cost. Progress offers powerful tools for easily building adaptive user experiences across any type of device or touchpoint, the flexibility of a cloud-native app dev platform to deliver modern apps, leading data connectivity technology, web content management, business rules, secure file transfer, network monitoring, plus award-winning machine learning that enables cognitive capabilities to be a part of any application. Over 1,700 independent software vendors, 100,000 enterprise customers, and two million developers rely on Progress to power their applications. Learn about Progress at www.progress.com or +1-800-477-6473.

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