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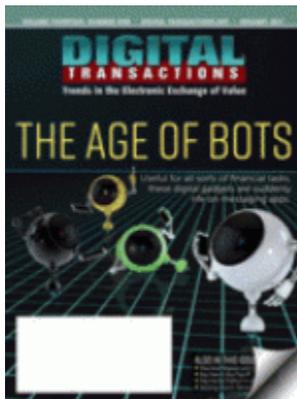
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The Age of Bots

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By John Stewart

They sell products, answer questions, and take payments in a process called conversational commerce. Just how much potential do chatbots really have?



It's been one of those days. You could use a drink. But you're traveling on business, and you're not sure where the local bars are. And you're not too keen about risking a DUI in your rental car on the way back to your hotel.

No sweat. There's a bot for that.

Tell Absolut Vodka's Facebook Messenger chatbot where you are, and it'll generate a code you can use to get a free drink, tell you where the closest bar is that will redeem the code, and arrange a Lyft ride back to your room. What's yours? Fancy an Absolut Lemon drop, an Absolut mule, or an Absolut and soda? Cheers.

It's all part of how brands, banks, and payments companies have begun leveraging clever chunks of code to make it easier than ever for consumers to get what they want—and to spend money. And they're moving fast. "If you don't act quickly, you're missing in action," says Dror Oren, vice president of product and co-founder at Kasisto Inc., a New York City-based developer of chatbots and virtual assistants for financial services.

American Express Co., Mastercard Inc., and PayPal Holdings Inc. are among the major payments companies that have introduced chatbots or plan to soon. Royal Bank of Canada, Capital One Financial Corp., and Bank of America

Corp. are prominent examples of banks that have launched, or plan to launch, virtual assistants, a species of programming closely related to bots.

And merchants are exploring the technology as a bulwark against formidable competition. “Retailers are still very focused on how to live between Amazon and Wal-Mart and not get eaten by them,” says Nels Stromborg, an executive vice president at Retale, a Chicago-based retail-marketing company that hosts clients on its own chatbot.

Closing the Loop

Bots and virtual assistants are forms of artificial intelligence. They are programmed to react to human inputs—typed messages or voice commands—and react fast with information or advice.

The key advantage for consumers is that they can make interactions with banks and merchants less time-consuming and much less frustrating. Bots, for example, can negotiate complicated menus, shorten wait times, and find just the right product. “Chatbots offer solutions for things like customer service or commerce, where the end-user is often subjected to a painful experience,” notes Steffen Sorrell, a principal analyst at Juniper Research who follows the technology.

The advantage for commercial enterprises, besides happier customers, is that bots divert volume away from expensive human operators, at least for less complicated requests. In this way, they are seen as reinforcing brand value and cutting costs, all in one fell swoop.

The underlying technology for bots and virtual assistants has been worked out in labs and in limited commercial use for some time, but the digital gadgets enjoyed a major breakthrough last spring when Facebook opened its Messenger platform to chatbots. The impact of that move was decisive as bots proliferated, not only on Facebook but on other messaging apps like Kik, Slack, Viber, and WhatsApp.

Now, consumer businesses of all kinds could design chatbots that messaging-app users could invoke at any time to search for products, request information—or receive enticing offers for the latest cocktail. By September, less than six months after opening the floodgates, Facebook said there were already 30,000 chatbots operating on Messenger. “2016 was a big year for bots,” declares Juniper’s Sorrell.

And, within a private beta Facebook started that month, any number of those bots could be enabled to accept payments natively using stored credentials, meaning the user wouldn’t have to open another Web page to enter payment details.

It’s called contextual, or conversational, commerce. The underlying idea is that you can present products or services more easily and naturally within the flow of a related conversation. Payment then seems to come just as naturally, particularly if integrated in the chatbot.

“We’re trying to close the loop between discovering a service and then paying without going into a separate Web page,” says Kiki Del Valle, senior vice president with Mastercard’s commerce for every device team.

And that loop seems to be closing pretty fast. Sales through chatbots are expected to grow at an average annual rate of nearly 28% between 2016 and 2024, reaching nearly \$1 billion, according to Transparency Market Research.

'Banks Are Stepping on It'

The swift rise of chatbots stems in part from advances in machine learning, the science that allows the bits of code to ingest new information and use that data to refine its responses. Once confined to academic labs because of its expense, machine learning has become more affordable and hence widely available. "It is now delivered as a service, meaning that customers do not have to own any infrastructure to integrate machine learning into their applications," says Sorrell.

The other big factor in the explosion of bots is the availability of messaging platforms that support their code. Facebook Messenger alone boasts about 1 billion users. Viber, an app that operates in the U.S. but is better known in Europe, links 754 million users (see sidebar).

All told, the number of users of mobile messaging apps worldwide is expected to climb 36% from 2016 to 2020, reaching 2.19 billion, according to projections from eMarketer.

Each of those users is a potential customer, linked to a common, bot-friendly platform. That market size, combined with a readily available technical architecture, has juiced bot development.

When Kasisto spun out of SRI International in 2014, says Oren, virtual-assistant technology like Apple Inc.'s Siri was available "but there was no messaging platform. Banks were getting it, but there was no way to pull the trigger. Now, banks are stepping on it."

So much so that Kasisto, which has built a chatbot for PayPal's Venmo peer-to-peer payments app, is focusing on financial institutions. In October, Mastercard announced it is relying on Kasisto's technology to develop chatbots for issuers that will run on Messenger and handle routine queries from cardholders. The bots should become available later this year.

Messaging apps' huge audiences serve another useful purpose: the sheer volume of transactions accelerates chatbots' education. "You need volume to improve your machine-learning tools so it gets better and better," observes Tim Sloane, vice president for payments innovation at Mercator Advisory Group, a payments consultancy in Maynard, Mass.

'Smarter And Smarter'

As they get smarter and smarter, chatbots could begin to replace apps and messaging platforms could suck traffic out of the wider Web, argue some observers. Reinforcing this possibility is the way we communicate with bots. Right now, it's mainly by typing on little keyboards. But voiced conversations, akin to the ones we have now with virtual assistants like Amazon.com Inc.'s Alexa or with Siri, may not be too far behind.

Remember, Facebook Messenger already hosts at least 30,000 bots. "Companies are building layers and layers on top of these chat and messaging apps so they can keep you inside that ecosystem as long as possible," says

Retale's Stromborg. "Those [messaging apps] will get smarter and smarter and you'll find yourself going outside those less and less."

But for financial services including payments, companies right now are content to exploit the potential that chatbots offer within those messaging "ecosystems" to reach, inform, protect, and ultimately win more business from, consumers.

American Express Co., for example, started last fall with a chatbot on Messenger that lets you know when and where your card has been used. Last month, it introduced a capability called Add a Card that lets cardholders add their AmEx card details for purchases on Facebook in games and in the Shop sections of merchants' Facebook pages.

PayPal is also working with chatbots on Messenger, but while it is providing a wallet for users interacting with specific merchants, it is not providing the chatbots themselves. These come from PayPal-accepting businesses seeking to leverage Messenger to reach PayPal accountholders. Overall, some 4 million businesses and counting advertise on Facebook.

The new arrangement extends a relationship PayPal announced in 2015 that lets users order and pay for rides on Uber through Messenger. Earlier, Facebook adopted person-to-person payments for Messenger users. That service allows users with a debit card to send funds to any other user who also has a debit card.

'Joke of the Day'

Few payments companies so far, though, exceed Mastercard's ambitions for chatbots, which, along with artificial intelligence in general, "rank pretty high" in priority at the company, says Del Valle.

Mastercard is working with Kasisto and interested issuers to deploy bots on Messenger that will simplify banking chores. Once these bits of code become available early this year, Facebook users will be able to instruct the bots to retrieve such data as spending history, account balances, and available offers near the user. The banking bot will even have a sense of humor, of sorts. "I can ask it to give me the joke of the day," laughs Del Valle.

A second bot wave coming later and developed within Mastercard will allow Messenger users to interact with merchants that advertise on Facebook to buy goods through Mastercard's Masterpass digital wallet.

Consumers will use the bots to specify parameters for such products as clothing or airline tickets—destination, range of airlines, type of seat, price tolerance, and so on. The bots will crawl data made available by Facebook advertisers and generate results fitting the instructions.

James Anderson, group executive for platforms and emerging payments, views Mastercard's decision to exploit bot technology as a tryout, but one with promise for the company's digital wallet. "There's not much bot commerce today, so it's a great time to be experimenting," he says. "We'll make sure Masterpass is fit and ready."

Part of that promise involves the long-awaited ability to push the payment function off center stage. Instead, the consumer's wants, as expressed through the bot, take precedence. "You'll invoke a chat session with a merchant you want to do business with through Messenger. Payment as a background service is becoming real," says Anderson.

Key to the chatbot experience for Mastercard is tokenization. The Mastercard Digital Enablement Service masks cardholders' account numbers with tokens that only the network can map back to the actual credential.

"Now we can put the token in all kinds of places," Anderson says. "As we saw the power of the mapping table in the network, we saw other use cases. MDES is spreading in all kinds of directions we hadn't anticipated."

Quick-service eateries, too, see potential in chatbots, particularly for the popular order-ahead feature many have already introduced within their mobile apps. "All of our clients are looking into it," notes Jon Squire, chief executive of Cardfree Inc., a San Francisco company whose technology powers many of those order-ahead apps. "If you could have yet another mechanism to get an order in, why wouldn't you do it?"

'A Measured Rollout'

Actually, there may be a few reasons why you wouldn't do it. For all their advantages in connecting customers with commerce, chatbots aren't always as smart as they should be. Numbers are hard to come by, but several observers say error rates are still high, for example. "Bot development has largely been rushed, leading to a situation where many bots on the [messaging] platforms were half-baked," says Juniper's Sorrell.

The ready availability of machine-learning tools helps, says Mercator's Sloan, "but that's not the challenge. The challenge is that the chatbot actually works in a contextual environment and doesn't create havoc that floods your service desk."

That could change in the coming year or so as investment in the technology increases. Banks, for instance, "are likely to invest in companies where they see themselves as having a technology gap," Sorrell says.

But not too quickly. Banks may make investments, but the natural conservatism of financial-services companies could also chill the chatbot trend. "They don't want to jump into anything too quickly," says Rick Oglesby, principal at Mesa, Ariz.-based consultancy AZ Payments Group LLC. "I would see a measured rollout."

A more serious issue lies in what some see as the technology's vulnerability to baleful influences. Mary Ann Miller, senior director and fraud executive advisor at NICE Actimize, a Hoboken, N.J.-based fraud-solutions company, says chatbots can be commandeered by criminals who know what they're doing, and without the user being any the wiser.

"It wouldn't be impossible for a sophisticated criminal to get into the middle of a conversation or maybe even take over the bot," she says.

Hackers have already shown they can hijack bots used to help run objects networked in an Internet of Things configuration, such as thermostats or even garage-door openers ("How Fragile?" December).

Miller doesn't know of any specific instance of this so far with chatbots. But what likely has been protecting these conversations is that bots are just starting to emerge as a hot commodity, and therefore just starting to draw fraudsters' attention. Also, when she says "sophisticated," she means it. "This isn't going to be your crook who's kiting bad checks," she says.

Strong Allure

Still, the potential latent in this technology is such that few brands or banks are apt to be deterred for long. And the allure for consumers—particularly the much-coveted, device-addicted Millennials—is strong and getting stronger.

“On Facebook, you can message to a merchant and have your product arrive, and you never had to look up from your text message,” says Oglesby.

Indeed, as Cardfree’s Squire points out, the irony of mobile phones is that, with chatbots doing the talking, the devices now enable a way to conduct business, as in the case of that vodka cocktail, without actually carrying on a real conversation. For many, palavering with a bot is so much easier. Says Squire: “People don’t want to talk to other people any more.”

Not All the Chatbot Action Is on Facebook Messenger

It may be called artificial intelligence, but the potential this technology opens up for payments and banking is turning out to be very real.

In November, yet another major messaging platform agreed to support chatbots that would let its users transfer funds, check their bank balances, and perform other account functions without leaving a digital conversation.

The platform, called Viber, is a unit of the Japanese online retailer Rakuten and links 754 million unique users around the world for chatting and voice calling. With the chatbot technology, which comes from Slovenia-based Comtrade Digital Services, users whose banks agree to participate will be able to instruct the bank to send money through the messaging app to another Viber user. The recipient can claim the funds using a QR code at an ATM.

Crucially, the transaction occurs within the context of the chat, and the transfer is real-time, says Oliver Lynch, business development director at Comtrade. “This solution is just ideal for micropayments or for when you want to send money to your kids quickly,” he says.

Comtrade planned to have its first bank, an Austrian institution that Lynch won’t name, live on the chatbot technology within a few weeks of the November announcement. The company already supplies software and services for some 20 financial institutions in Europe. “Bots have been used in other industries for quite some time, in online gaming, for example,” Lynch says. “It seemed like a natural fit for banking.”

Financial institutions in the U.S. have begun deploying or exploring the technology for such functions as account opening and person-to-person payments. And messaging apps hold allure for payments companies even without the addition of chatbots. The Western Union Co. made its own deal with Viber to enable money transfers within chats for U.K. users, following a similar arrangement in the U.S.

Most of messaging-app users fall into the coveted Millennial generation, experts say. That's one big reason Comtrade decided to develop chatbots for messaging. "After talking to our customers in financial services, it became clear this is something we should focus on," Lynch says. That decision made, it remained to find a messaging platform. "Viber has a global reach and a proven platform, and it's open to working with partners," he says. "It fitted the bill."

The link with Viber also appeals to financial institutions looking to accelerate innovation in payments and customer service, Lynch says. "Most banks have legacy systems that are 20 to 30 years old. For them to release products quickly is a real challenge," says Lynch. "We help to get our clients into a situation where they can release products on a weekly basis."

With that in mind, he adds, chatbots are "a natural progression for us. We see the partnership with Viber as an exciting opportunity for banks to compete."