ARE BOTS WORTH THE BOTHER?

How conversational commerce can help the travel industry

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ABOUT

We bring together everyone in the travel industry, from small tech start-ups to international hotel brands, to form a community working towards a smarter and more connected travel industry.

Our mission is to be the place our industry goes to share knowledge and data so that travel and tech brands can work collaboratively to create the perfect experience for the modern traveler.

We do this through our network of global events, our digital content, and our knowledge hub   EyeforTravel On Demand.

Our Values

We believe the industry must focus on a business and distribution model that always puts the customer at the center and produces great products. However, to deliver an outstanding travel experience, the strength, skills, and resources of all partners in the value chain must be respected and understood.

At EyeforTravel we believe the industry can achieve this goal by focusing on a business model that combines customer insight with great product and, most importantly, places the traveler experience at its core.

At our core we aim to enable the above by valuing impartiality, independent thought, openness and cooperation. We hope that these qualities allow us to foster dialogue, guide business decisions, build partnerships and conduct thorough research directly with the industry.

These principles have guided us since 1997 and will continue to keep us at the forefront of the industry as a vibrant travel community for many more years to come.

Our Services

Our events are the heart of EyeforTravel. These draw in experts from every part of the travel industry to give thought-provoking presentations and engage in discussions. It is our aim that every attendee takes back something new that can help their business to improve. This might be in the fields of consumer research, data insights, technological trends, or marketing and revenue management techniques.

Alongside this we provide our community with commentary, reports, white papers, webinars and other valuable expert-driven content. All of this can be accessed through one place   the On Demand subscription service.

We are always expanding the content we create, so please get in touch if you want to write an article for us, create a white paper or webinar, or feature in our podcast.

EyeforTravel by the Numbers

70,000+ database contacts

2,500+ annual event attendees

100,000+ monthly online reach

1,000+ online conference presentations

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FOREWORD

By Mike Slone, Chief Experience Officer, Travelaer

If you work for a travel company, by now you have also explored a few of the travel bots that exist and your company is probably contemplating how it should utilize a chatbot, but with no idea where to start. Like most companies today, your executives are probably on the fence about whether a chatbot can actually help improve the customer experience, and if bots are worth budgeting for.

Assuming that bandwidth in your company for technology projects is limited, then it is also more than likely that your budget seems as if it has no room for a chatbot. And then there is an even bigger question to consider – which department will pay for, manage, and maintain the bots? It's a tricky question as these functionalities can span from e-commerce through to customer service.

Let's assume you somehow gain approval and budget for a bot implementation! You are still stuck at square one, because you likely can't build and implement it yourself. And you don't know who to outsource it to because there are too many companies out there claiming to be bot experts that build the best product. Finding the right vendor in that scenario is like searching for the proverbial needle in the haystack.

If this scenario sounds familiar, rest easy because you are not alone. I've heard this scene play out from countless airlines and other travel-related companies during the past year.

We have been working on these bot projects for more than a year now, and though I hate to say it, your company will seriously regret not moving faster into the bot space. A few years from now you might look back on this moment and think what could have been.

Having the guts to launch digital products quickly and fail, then learn from those failures and re-launch something better in a timely manner was a core trait exhibited by all of the successful travel companies I interviewed at EyeforTravel's London Summit 2017. Bots fit heavily into this category. The lesson to be learned here is that your company's executives need to be willing to fail first in order to reach the massive potential ROI that digital products offer, including bots. What's more, your team will learn more about your customers in a shorter amount of time from launching a bot (because every conversation is available and can be reviewed) than any other user experience testing you've ever done. Unlike a website or a mobile app, you see every single interaction with your customers through messaging platforms and bots, and every bit of the data is recorded and can be analyzed.

If you're wondering how to get started with your first successful bot, I suggest five things:

1. Read this white paper and share it with your colleagues.

2. Conduct a Customer Journey Mapping workshop on your own, or hire a company like Travelaer to assist you. A properly done journey mapping workshop will allow you to learn where your customers' true pain points are and the reasons why your existing digital products aren't solving those issues. Then your team can analyze and discuss if an automated messaging solution, such as a chatbot, can fill these customer pain gaps and actually help solve your customer service problems.

3. Monitor all conversations happening via your messaging channels for one month and document the common questions, plus how much time you are spending on these common requests. Or, even better, hire someone to do an audit for you - either manually or by using software to analyze conversations (yes, this exists).

4. Engage with your customers and potential customers through surveys to find out what they really think about bots and which messaging apps they are using most.

5. Connect all of these things into a complete bot strategy that supports and fits in to your existing digital strategy. If you don't have a digital strategy, then forget about bots for a while, and go back to the drawing board to create one.

I can tell you from conducting all of these exercises many times over in the last year that if you engage in similar exercises, your company will be better positioned to launch a more effective chatbot. Not only this, but if your company uses the data gathered across the organization to address customer needs, rather than serve isolated business needs, the performance can be improved dramatically.

Building a bot is easy, but building a successful enterprise bot solution that meets customer demands and helps your staff focus on more important issues that a bot can't solve, is very difficult. So, don't delay, start on suggestion #1 today. Read this white paper, share it with your colleagues and then get started on your bot strategy. You will thank me later.

Mike Slone
Chief Experience Officer, Travelaer

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1. HOW CAN ARTIFICIAL INTELLIGENCE CHANGE CUSTOMER COMMUNICATIONS?

1.1. The Turing Test Onwards

In 1950, as the "golden age" of aviation was about to take off, the English mathematician Alan Turing proposed a test to see whether a computer could really think. If a human could not distinguish between the replies of computer and human, the computer would succeed at his "imitation game" (Encyclopaedia Britannica, 2016).

Computing power, data storage and connectivity have taken huge leaps since, and a modern smartphone is the equivalent of a computer in your pocket, soon a "supercomputer" if scientists achieve their aims (Stanford Engineering, 2016).

In 1997, computer program Deep Blue beat world chess champion Gary Kasparov and by 2011 IBM's cognitive computing system Watson had conquered two Jeopardy! game show victors. In 2016 Google's DeepMind defeated the Go game's world champion, using constantly learning neural networks that apply old skills to new tasks. However, each year the Loebner Prize still searches for an AI program that is indistinguishable from a human, something Turing thought would happen before the year 2000.

Today's companies may not want to pass artificial intelligence off as human, but increasing numbers believe a computer responding like a human – answering questions or proposing services – could save them money, create happier customers and mean better business.

"There's a lot of potential, not only for labour savings and productivity but also to present a greater depth of knowledge and more sophistication in the customer experience," says Tom Davenport, distinguished professor of information technology and management at Babson College, and author of *Only Humans Need Apply: Winners and Losers in the Age of Smart Machines*.

"There will be an augmentation of people with machines and augmentation of machines with people, rather than full automation. The technology isn't there yet to hand over an entire interaction with a customer."

1.2 Today's Personal Assistants of Tomorrow

Computer programs that can "chat" back in response to a human, or chatbots, as they are known, are already part of everyday life for hundreds of thousands of people. Apple's Siri, on devices like an iPhone, can respond to voice commands to wake you at 7am (Apple, 2017). Amazon's Alexa will "adapt to your speech patterns" (in English or German) to link to other devices and play your favourite music, change your light settings or order your shopping.

Google has its Google Assistant, launched in 2016 on Android and now on iPhones, while Microsoft has its personal assistant service, Cortana. New York start-up X.ai raised USD23 million last year for its business virtual assistant chatbot, Amy, which arranges meetings.

In the travel industry Lola, a Boston-based travel agent start-up, works through a chat-based interface and combines automation and human agents. Airlines KLM and Icelandair, French rail service SNCF and hotelier Edwardian Hotels are also early adopters of chatbot technology.

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1.3. Talking Tech: Nuts and Bolts

1.3.1. Rules-Based Programming

Chatbots based on rules are limited: they respond to key 'trigger' words, dates, emails, phone numbers and quantities, with given answers or scripted responses. According to IBM's Michael Yuan, the advantage is that they are precise and 'you can add and subtract rules to handle new situations and address bugs.' However, they can't truly understand human language.

1.3.2. Natural Language Processing

This uses artificial intelligence to understand and classify what a user's question is about. "For example, when the user asks 'Is it hot today?', the AI should know that the user is asking about today's temperature," Yuan explains. These algorithms need to be trained, which requires time, effort and a large data set. From here on in, the machine starts learning. But a bot can still be confused by missing or incomplete information.

1.3.3. Text or Voice

You can type a message to a bot and wait for a response. For example, asking CNN's service on Facebook messenger for the day's 'top stories', or a bot could use voice-recognition software, such as Siri and IBM Watson. They can convert voice to written text and vice versa: the challenges are accents, imprecise speech and words' multiple meanings.

1.4. Why *Bot*her?

For two years, chatbots have been the "talk of the town" in Silicon Valley, with Microsoft and Facebook leaders proclaiming them the "new apps", despite issues with balancing bot and human teams, controlling bot responses and improving the technology enough to master the complexities of human language, thus avoiding customer frustration.

"I think with artificial intelligence there's a huge opportunity," says Tim Gunstone, managing director of EyeforTravel. "The travel industry has been focused on bookings, bookings, bookings for so long, but the direction has changed and they are trying to increase the lifetime value of customers." (The Guardian, 2017)

We are at a time when firms such as Google – where customers start their journey – offer services including flight search and there is competition from online travel agents (like Booking.com), plus sharing economy sites (such as Airbnb). Travel companies therefore see the need to be smart to get people to book with them directly. Audiences at 2017 EyeforTravel Summits in San Francisco and London found machine learning and artificial intelligence by far the most exciting emerging technologies, at 45% and 44% of respondents, respectively. European audiences also rate chatbots and natural language processing highly, with 29% of attendees surveyed most excited about the possibilities these developments promise (EyeforTravel, 2017a).

Figure 1: Which of the Following Emerging Technologies Excites You Most?
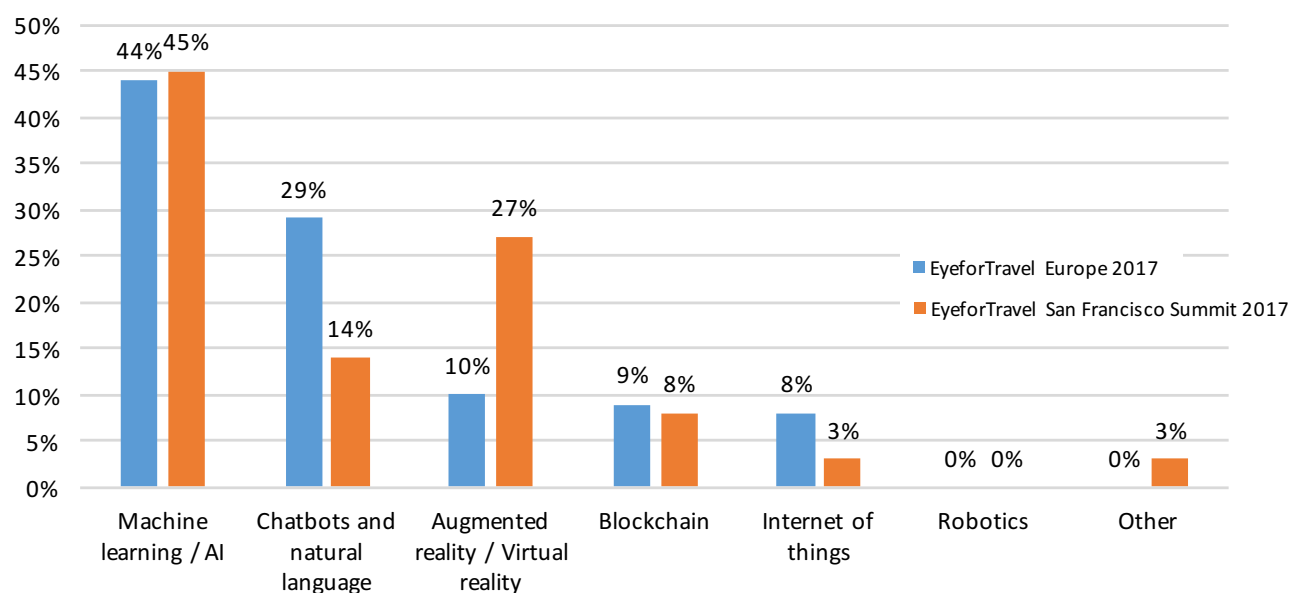
Source: EyeforTravel 2017a

1.5. Uses for Bots in the Travel Industry

A report published by LSE Consulting in October 2016 for travel technology company Amadeus, *Travel Distribution: the end of the world as we know it*, echoed the sentiments of EyeforTravel's audience. It predicts artificial intelligence and big data will be key disruptive factors, with "virtual assistance, messaging and virtual reality" inspiring potential travellers every day during conversations with friends, not only when they search, and drawing on personal data including their location.

"For the business traveller…a virtual assistant could book the traveller's usual flight, hotel and car hire as soon as a meeting request for another city is accepted," the report suggests.

ABTA Travel Trends 2017 predicts travel tech will increasingly hit the high street, letting people try before they buy (experiencing something like Thomas Cook's new aircraft in virtual reality) or find out what to do on a city break (as in Thomson's web-based tool, using left and right swipe functions; ABTA, 2017).

Do WeChat and WhatsApp point the way to the future for customer communications?

1.6. Revolutionising the Ride?

Gunstone sees a swathe of global development in these fields. "Lola in the US is taking a lead by using chatbots to go right back to its beginnings as a travel agency, backing up the online product with sophisticated service," he says. "Eurail, which sells the Interrail package to go around Europe for a month, is communicating with young people via WhatsApp and Facebook Messenger and has partnerships with Facebook, Booking.com and restaurant table providers. As people arrive in a destination [they are not familiar with] by train, they are communicating via chat, creating an opportunity to sell them restaurants, hotel rooms, and activities. AI is going to help them do that better."

Mike Slone, chief experience officer at Travelaer, a digital products firm for the travel industry which also develops bots, predicts they'll be able to help with everything from planning a trip to digital commerce, logistical support and customer care en-route.

"Uber has revolutionised taxi services, you have people who need a ride and people with cars, willing to give them a ride," he says. "We envisage the same thing. Customers need help with travel and want a quick, easy, personalised service to connect to travel agents throughout the world, using an app or digital experience, and conversing not by phone but digital chat."

2. HOW SOCIAL MEDIA AND MOBILE ARE CHANGING EXPECTATIONS AND POSSIBILITIES

2.1. More Mobile, Less Hassle

International mobile data traffic has grown 18-fold in the past five years, says technology firm Cisco. Across Europe, almost six in ten people use a mobile to connect to the internet and mobile use is surging particularly strongly in the Asia-Pacific regions (up 71%, from 2015 to 2016) and Middle East and Africa regions (up 96%; Cisco, 2017). This already means that we are in a mobile first world, with mobile now generating more traffic for travel sites than desktops and laptops. This is particularly true of Asia-Pacific markets like India and China (EyeforTravel, 2017b). In the future, ever-smarter devices, improving network connectivity, with ultra-fast 5G on the horizon, and thanks to new European legislation scrapping roaming charges and barriers to data access being removed, all signs point to further rises in our consumption of mobile content.

All this has massive potential for the travel industry to sell trips to people as they spend snatches of time online (LSE Enterprise, 2016), and to propose additional services while they are travelling. However, this will happen only if they can make the whole experience intuitive and pleasurable enough to capture the booking. Mobile has less digital real estate and, as travel brands have had to learn the hard way, different browsing habits. Mobile users are often multi-tasking and on the move. This combined with the smaller screen really puts the user experience at a premium and promotes easier, alternative forms of communication than the usual text formats.

"These trends are going to continue: mobility, personalisation, the use of artificial intelligence," says Glenn D. Fogel, chief executive of The Priceline Group, which owns online travel agents Booking.com, priceline. com and Kayak.

"When you call, write and email customer service, it takes several attempts and is frustrating. We need increased technology to solve problems faster." There's a change in generational expectations too, he adds: "I have a daughter of 16 and son of 13 and I don't think they know how to type: they speak into the phone. Natural language processing is the trend that's coming down the road." (Keynote presentation at EyeforTravel Europe 2017 conference).

2.2. 'Smartphones Are the New Travel Agent': Apps

Another trend is the adoption and growing usage of apps. Paul Barnes, Northern Europe and Middle East territory director of App Annie, a business intelligence firm focusing on apps - thinks smartphones are the new travel agent. "Marriott is using its app as a hotel room key, while Hilton has got in-app messaging," he says. "Customers have embraced travel apps: there has been this shift from mobile web. That presence you have on their smartphone is an incredibly precious opportunity."

App Annie research suggests that in 2016, people around the world spent 900 billion hours in apps. In key markets, it says, the average user spends two hours a day in apps, and in places like South Korea, Brazil, Mexico and Japan, it's nearer three.

In countries including Brazil, India, China, the United States and United Kingdom – people used more than 10 apps a day on average in the first quarter of 2017. Customers are also installing more travel apps, with three billion downloads by 2016 (App Annie, 2017). European airlines like Ryanair, EasyJet and Turkish Airlines are leading the way with services like check-in, boarding cards and bookings, and the help of mobile payment options like Apple Pay.

The mobile experience is different: the screen is smaller, people are often on the move, and so you must provide a more personalised selection of information, says Amir Segall, VP international of last-minute booking app, HotelTonight.

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"We have a very simple app – three taps and a swipe to book a hotel," he says. "This is very different to a website: they want you to spend as long there as possible. In mobile we're doing the opposite, but it's tougher.

"We don't show hundreds of results – we show 15 every time. We have an algorithm that takes into account best price, point of interest, and hotel reviews. Fifty-two clicks is the average on other hotels."

However, the market for getting on people's smartphones is hyper-competitive. Barnes adds, "there are a lot of other brands competing for your customers' attention, many from outside the travel industry" (Presentation at Eye for Travel Smart Data Summit, 2016, Amsterdam). Customers therefore need to compare a wide variety of travel products also creates another barrier to using one or a handful of apps.

2.3. Go Where Your Customers Are: Succeeding on Social Media

The other side of the app conundrum for travel brands is their sheer ubiquity. There are millions of apps, but on Apple's App Store, Google Maps was the only travel-related one in the top 20 in 2016. Snapchat, Facebook Messenger, Instagram, Facebook, YouTube and, of course, Pokémon GO dominated the list (Apple, 2016). It's the same story among the Android apps that have achieved more than a billion downloads (Androidrank, 2017). According to market-research firm Nielsen, Facebook and Facebook Messenger were the most used apps in 2016 in the US, the world's largest travel market (Nielsen, 2016).

Figure 2: Top Apps in US by Average Unique Users
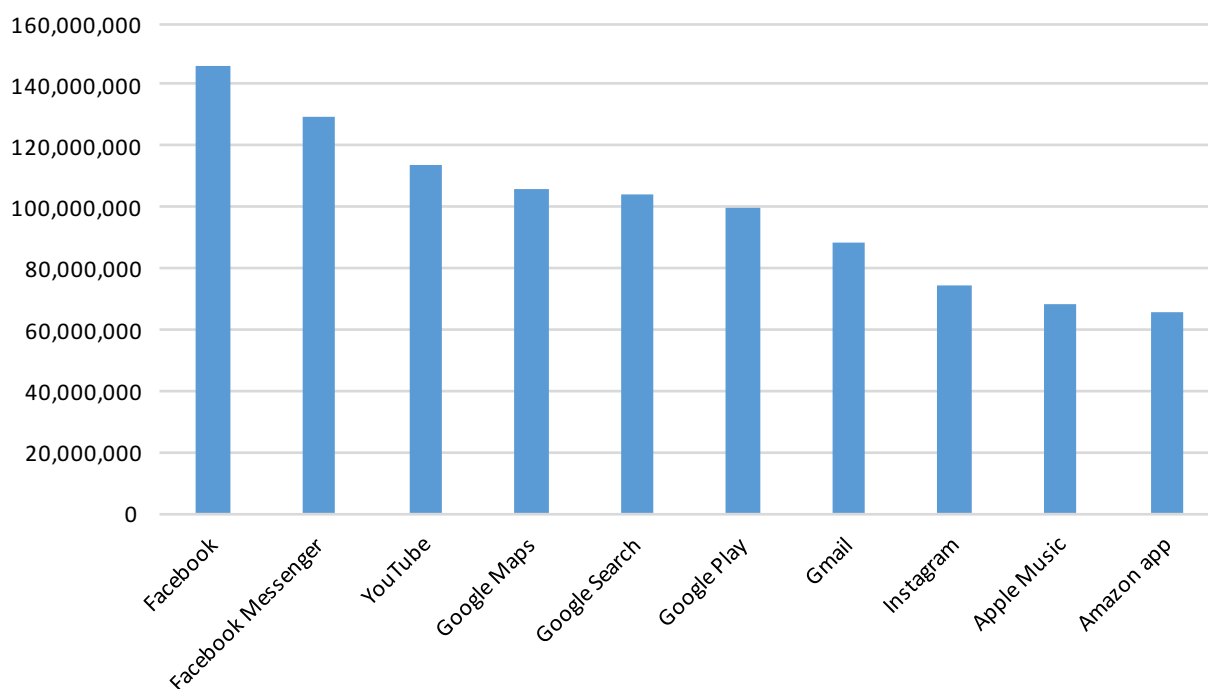
Source: Nielsen, 2016

Similarly, MetrixLabs conducted a consumer survey of messaging apps across France, the Netherlands, the UK and the US and found that Facebook properties dominate. Facebook Messenger and WhatsApp were installed on 63% and 61% of smartphones, respectively, compared to the next highest average, which was Skype at 39% of the sample. WhatsApp was found to be on an amazing 98% of Dutch phones. Snapchat, often touted as a major potential rival was estimated to be installed by 18% of users across the four-country sample. The study also noted that WhatsApp was the most used app: "27% of those with Facebook Messenger use it daily compared to 62% of WhatsApp users." (MetrixLab, 2017)

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Table 1: Top Apps in US by Average Unique Users

	Average unique users
Facebook	146,027,000
Facebook Messenger	129,679,000
YouTube	113,738,000
Google Maps	105,749,000
Google Search	103,959,000
Google Play	99,773,000
Gmail	88,572,000
Instagram	74,672,000
Apple Music	68,392,000
Amazon app	65,511,000

Source: Nielsen, 2017

Figure 3: Most Installed Messaging Apps in France, the Netherlands, UK and US
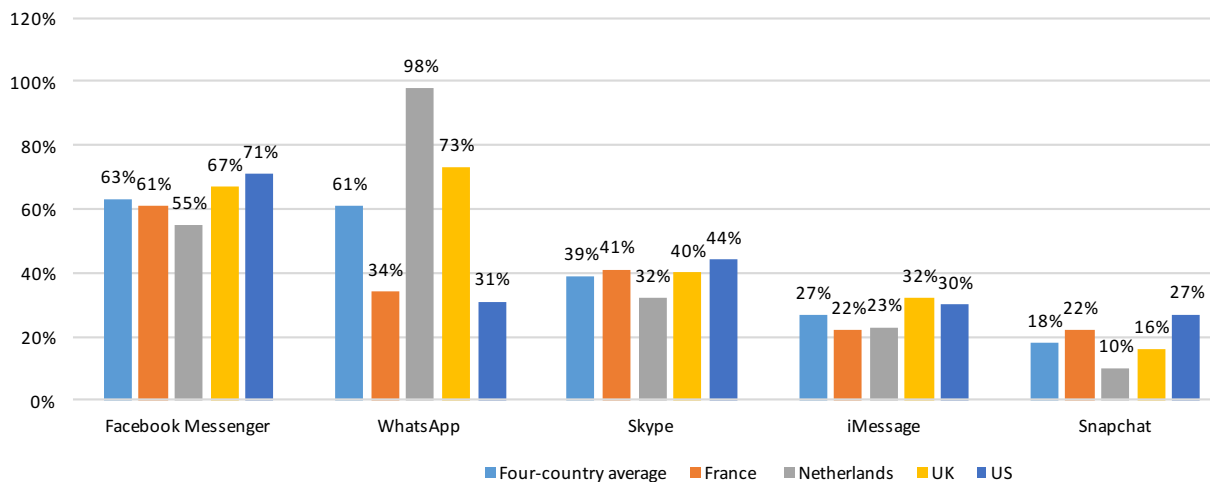
Source: MetrixLab, 2017

Table 2: Most Installed Messaging Apps in France, the Netherlands, UK and US

|	Facebook Messenger	WhatsApp	Skype	iMessage	Snapchat	Viber
Four-country average	63%	61%	39%	27%	18%	12%
France	61%	34%	41%	22%	22%	12%
Netherlands	55%	98%	32%	23%	10%	9%
UK	67%	73%	40%	32%	16%	13%
US	71%	31%	44%	30%	27%	14%

Source: MetrixLab, 2017

Business Insider research (Business Insider, 2016) suggests messaging apps (like WhatsApp, Facebook Messenger, Slack, Snapchat and China's WeChat) are now used even more than social networks like Facebook (Wired Online, 2017). Furthermore, the progress of social messaging apps is accelerating rather than slowing down and is putting other categories in the shade.

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According to Flurry Analytics, messaging and social apps came top for growth in the number of sessions started by users across 2016, growing by 44%. Overall app sessions grew by 11% year-on-year across all categories measured (Flurry Analytics, 2017).

This doesn't tell the whole story, however, with time spent in apps giving a fuller picture. When it comes to the time spent, social and messaging apps are even more dominant, with users putting 394% more minutes into the category, compared to a growth rate of 31% for shopping apps. On average time spent in apps grew by 69% according to Flurry, meaning messaging apps are the primary focus for user's time and attention on mobile currently and getting more important by the day (Flurry Analytics, 2017).

Figure 4: Change in App Sessions Year-on-Year by Category in 2016
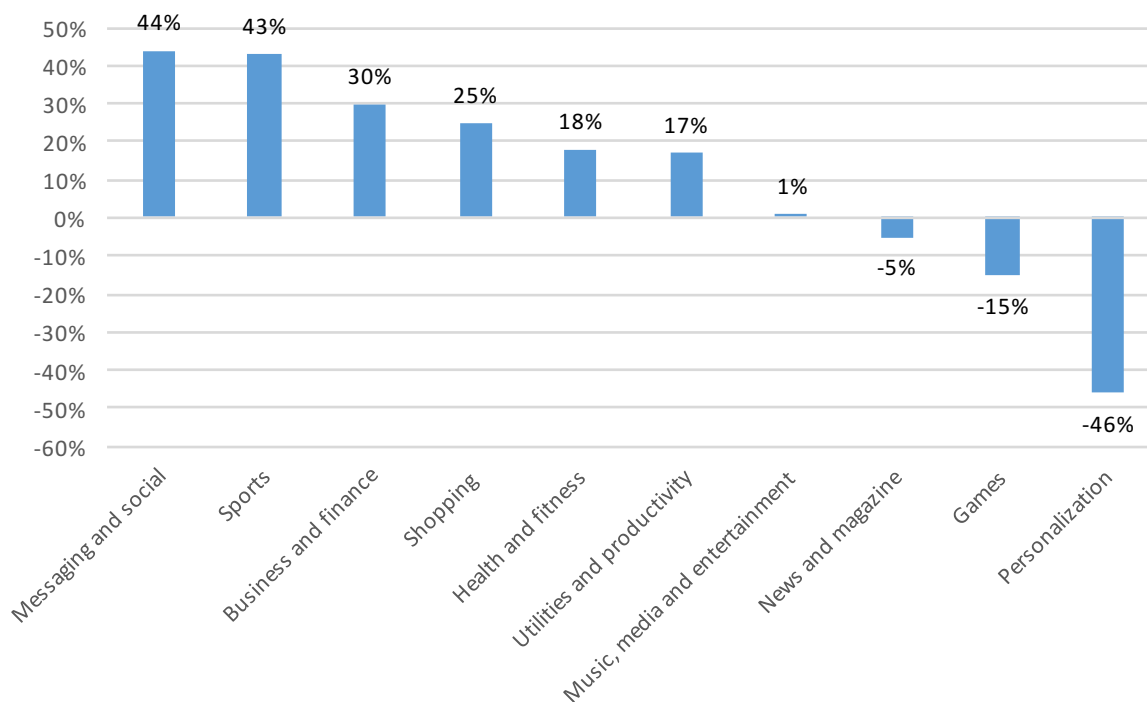
Source: Flurry Analytics, 2017

Figure 5: Change in Time Spent in Apps by Category in 2016

Source: Flurry Analytics, 2017

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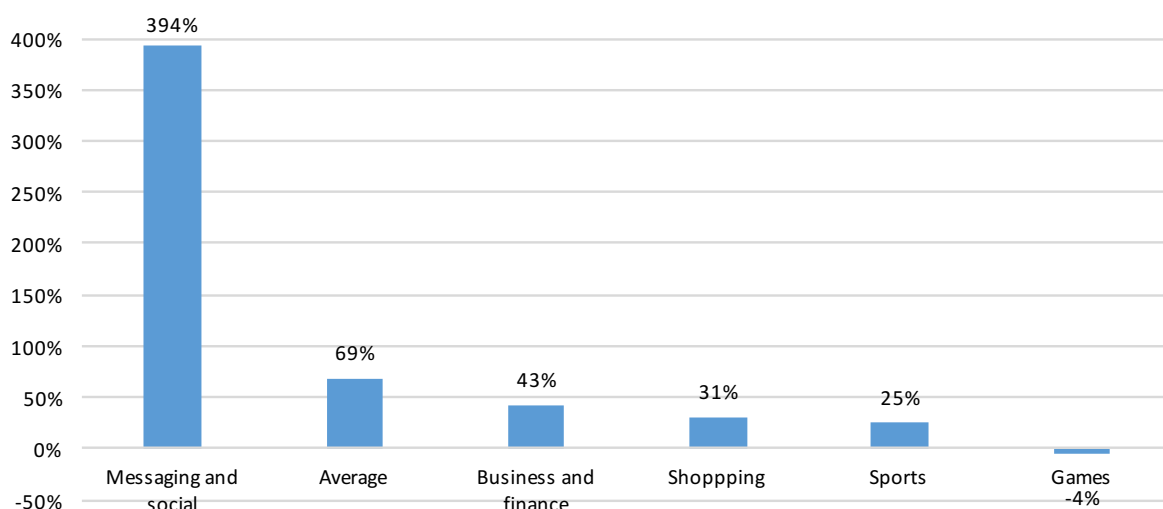
Given this growth, why not harness the world's fascination with social media and chat to build your brand and to work alongside your other digital efforts?

Daniel Wishnia, digital marketing consultant at GCH Hotel Group, which has 120 hotels in Germany, Belgium and Austria, points out the importance of trying to reach the consumer at their points of contact: "Pokémon opened the eyes of many people to driving clients through mobile. We need to think how to connect to people, and it is [via] watches, headsets, the mobile itself, iPads. Now in many houses people use Amazon Echo, and have two or more products on voice search. We need to be on Google Maps, and in Facebook with paid advertising so when people are chatting about us, we appear."

In 2016, Facebook began allowing businesses to run chatbots within its Facebook Messenger service, which it says now has 1.2 billion monthly users (Marcus, David, 2017). At the F8 conference for developers in April 2017, it announced a "discover" service to help browse for the best bots, places and businesses, and ways to "extend" chat by bringing bots into a conversation and handing over better from bots to human customer services agents for complex interactions (Facebook, 2017). It is also proposing a hybrid approach, so you can chat with a person (or bot) but also click on menus of options.

In April 2017, Twitter unveiled a vision for its application programming interfaces (API), in the process launching new systems for businesses that want to use Twitter direct messaging for customer service applications, chatbots or other promotional tools to chat with their clients (Twitter, 2017).

Google is also moving in on the game, announcing its Chatbase chatbot analytics programme in May 2017 (TechCrunch, 2017). China's WeChat, meanwhile, is a leader in this field and has had a bot platform since 2013.

"Our customer experience research shows airlines and travel companies need to go where customers are: getting them to a new destination, website or app is much more difficult and costly," says Slone of Travelaer, who sees the same developments in services like Twitter Direct Messages or iMessage from Apple. "For people to adopt commerce through Messenger, it has to be the simplest form of obtaining information, easier than an app or website, or they're not going to use it."

Tomas Salfischberger, chief executive of data management firm Relay42, works with KLM, the first airline to launch a chatbot on Facebook Messenger offering booking confirmations, updates and boarding passes (KLM, 2017). "If you bring data from all channels, you can almost predict what a client is trying to do: At the airport, they probably want the gate and not to change a flight," he says. "If you can understand what I as a customer need at that moment, I would probably use a chatbot as a faster channel than the phone. But it needs to be really convenient."

3. CHATBOT DEPLOYMENT AMONG TRAVEL BRANDS

3.1. Research: Do Travel Companies Answer Customers on Facebook Messenger?

A year on from Facebook opening Messenger to bots, Travelaer decided to take a snapshot of the industry and see how far airlines had come in deploying chatbots. The results they gathered were underwhelming at best.

In February and March 2017, Travelaer contacted 206 airlines to see whether they would respond to messages via Facebook Messenger, asking for help in booking a flight and three other customer service-related questions.

Figure 6: Percentage of Airlines with a Facebook Page

- Have a Facebook page
- Do not have a Facebook page

7%
93%
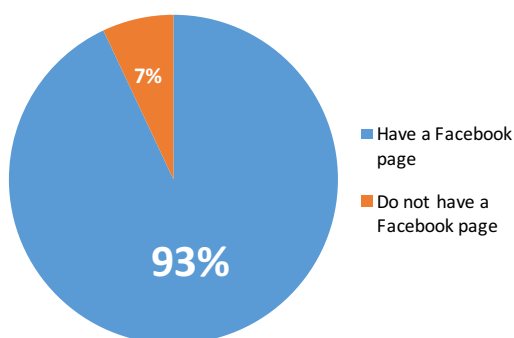
Source: Travelaer, 2017

Figure 7: How Many Airlines Can Respond to Queries Through Facebook Messenger?

- Responded
- Did not respond

38%
62%
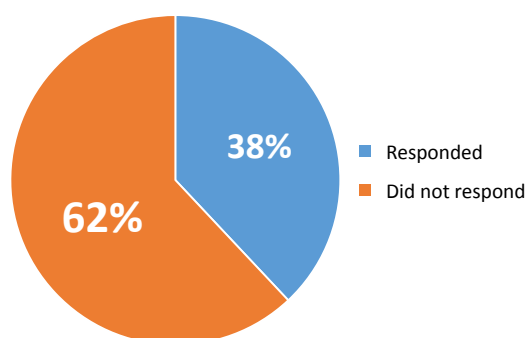
Source: Travelaer, 2017

Whilst 93% of these airlines have a Facebook page, and 81% a Messenger link, only 38% of the 206 responded to researchers' messages, with a third of those contacted answering after a week.

From the just over a third of airlines that responded through Facebook, most used generic messages pointing to their website or reservation team, but not necessarily including links or numbers. This is a frustrating experience for customers that, if anything, underlines deficiencies in customer service. Another 29 companies, including British Airways, China Southern, KLM Royal Dutch Airlines and Qantas responded first by starting the conversation with an automated message.

The researchers discovered evidence of active bots on eight airlines (just 5% of the airlines with Messenger links): some offered pre-booking services, like Qantas and Transavia, six offered booking services, including Icelandair, and another four offered post-booking assistance. Unfortunately, several were lost in translation: Libyan Airlines' bot responded in Arabic, and Latin American airline Avianca's in Spanish, which whilst understandable, also limits the potential user base.

Fourteen airlines offered to reserve a flight booking via Messenger, six (KLM and subsidies, Atlantic Airways and Czech Airlines) could take a payment via Messenger, while the British Airways month-long trial of a holiday ideas bot powered by emojis (built using the Chatfuel bot building tool) was not available any longer (British Airways, 2016).

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Compared to smaller samples from other travel verticals, airlines did well at getting back to customer using Messenger but fell behind when it came to providing booking assistance. Nearly two-thirds of airline brands (64.1%) got back to customers within 24 hours, ahead of hotels, airlines and car rental companies in that order. Hotels also performed well, with 81% of brands monitored responding in under week. However, when it came to driving potential customers towards a booking, both fared far less well. No doubt the technology budgets and expertise of the OTAs helped here as just under half provided assistance for booking through a Messenger chatbot, compared to 18.8% of car rentals, 15.2% of hotels, and 8.7% of airlines.

Figure 8: Time Taken to Respond on Facebook Messenger by Travel Vertical
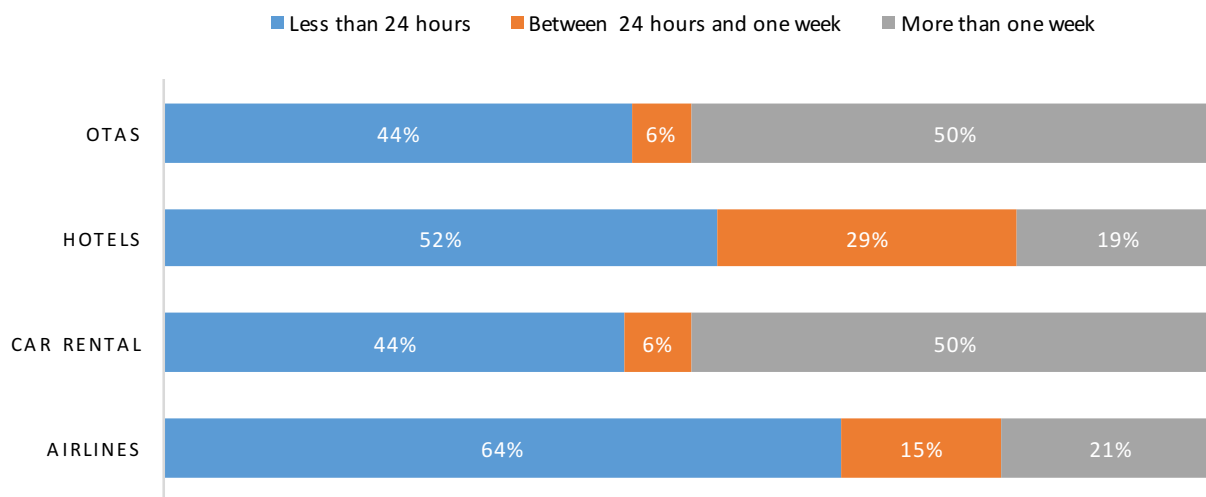
Source: Travelaer, 2017

Figure 9: Percentage of Brands Offering Assistance for Booking on Facebook Messenger
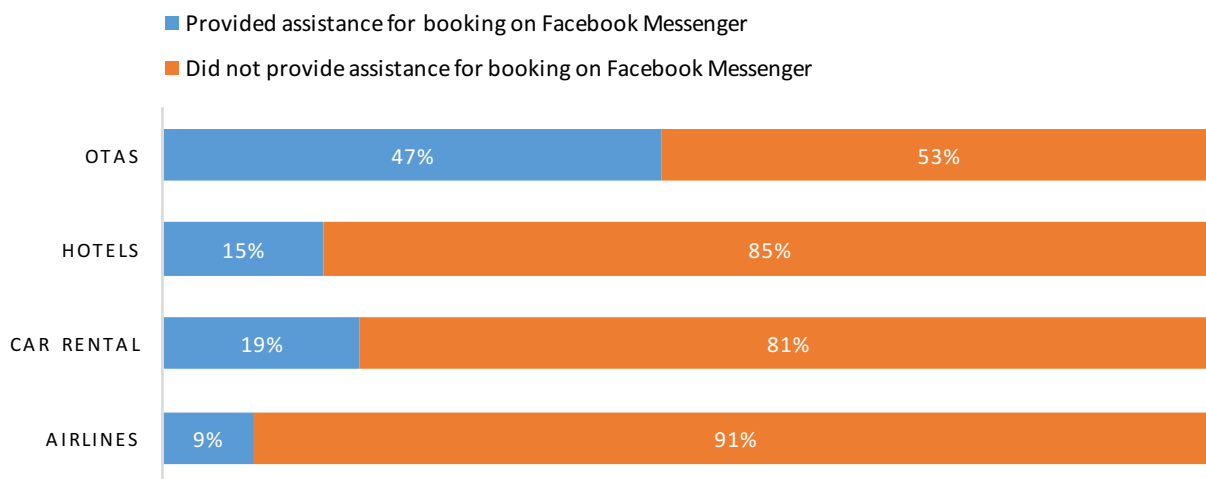
Source: Travelaer, 2017

"Our research shows travel companies don't take Facebook Messaging with customers seriously," says Mike Slone, chief experience officer at Travelaer. "Most don't respond to customers via Facebook Messenger within a week, much less have a chat bot. The small percentage of travel bots that are live don't impact the customer journey in a meaningful way, are gimmicky and don't fit into an overall digital strategy. Customer service is the most demanded feature, not commerce."

A report published by travel metasearch engine KAYAK in May 2017 found more chatbots are being used by firms, but public awareness and acceptance are still low. Its online survey of 1,004 UK adults, conducted by Opinium Research, showed that 18% of Britons have used a chatbot, 8% regularly or in the previous month. Of this small group, almost half used them for customer service, about a quarter for online shopping and just 10% to book holidays or ask questions about trips (KAYAK, 2017).

There were large reservations and gaps, despite growing usage: the majority of UK adults (57%) had never heard of chatbots and after they were explained, three-quarters of respondents had at least one concern about using them. Some were worried about data security (34%) and others that they would get the wrong answer (33%) or be misunderstood (29%). More than a quarter simply prefer face-to-face communication or don't want to speak to a computer, although young people were more open (KAYAK, 2017).

These kinds of concerns aren't limited to the general public. Barbara Pezzi, a consultant on search and analytics who has worked with Fairmont Raffles Hotels International, says: "Since I work with data, I'm very protective of my own. My social networks are limited to interacting with real friends. Maybe the younger generations won't see an issue, but if you look at the rise in people using ad-blocking systems, I don't think I'm alone in being concerned about how my personal information is shared."

She adds that the industry is only starting to grasp the subject. "Most companies haven't even got their email database cleaned up or their Google analytics implemented correctly, let alone artificial intelligence," she says. "The travel sector is dynamic but often with very small budgets: everyone wants to do the latest thing but doesn't know how to do it, so there's a lot of scrambling around."

Still, argues Anaal Patel, VP Marketing at Sparkcentral customer service software firm, which helps its clients explore bot technology, firms won't lose by trying. "I've seen great examples of chatbots and terrible examples," she admits. "But if you're a marketer, you need to be connected with your customers. A lot of brands are scared, but you just have to take a step and start experimenting."

Tom Davenport, the president's distinguished professor of information technology and management at Babson College, agrees. "There will be slow and steady introduction of chatbots: companies use them internally for HR or IT issues, then become confident that they don't screw up most of the time and let some customers start to use them," he says.

3.2. Meet the Travel Bots

3.2.1. Icelandair: The Middle-Aged Bot with a Young Spirit

Icelandair was the first airline to launch bookings via its Travelaer-built bot on Facebook Messenger, in August 2016. Guðmundur Guðnason, director of digital business development, says. "We saw a bot as a good opportunity to support our social media team which is active 24/7, taking on frequently asked questions to give automated answers.

"The first version was built around understanding key words but had difficulties with the difference between: 'what's the luggage allowance for Europe?' and 'I lost my luggage in Europe.' It's a delicate situation to handle a bot telling the customer who has lost his luggage that the luggage allowance is two bags!"

Now it uses natural language processing, and learns with each (monitored) interaction. "The more conversations we have, the better we can train the bot to react to different questions," he says. "That's how the artificial intelligence works: The more content we have, the better the bot can handle conversations. We quickly turned off features that we found to be inappropriate after the first launch: we learned the hard way."

The bot, which Guðnason compares to someone "middle-aged with a young spirit and friendly attire", takes booking customers via a deep link to the Icelandair site to pay, as firms without a US entity cannot use Facebook payment processing. It has click boxes so customers can choose to chat with a person, while social media agents can flag a tricky conversation as not-for-bots. "It is a mix of human interaction and bot, and that is always going to be the case," says Guðnason. "At the moment, the bot is taking just a fraction."

Icelandair will introduce features like reserving seats, which takes the equivalent of 15 days a month in the call centre currently, and allow customers to do more for themselves, as more call centre workers become social media agents. "In future, artificial intelligence will be used to make sense of the data we have, identify our customers' struggles, and find patterns we can act on," he adds.

3.2.2. Edwardian Hotels: The TripAdvisor Star, Edward

"Edward kindly secured me a late check out and was keen to help with anything else I needed," says one enthusiastic TripAdvisor reviewer of Edwardian Hotels. But his room-ready text, online check in and responses were provided by a bot.

Michael Mrini, director of information technology at the chain of British hotels, describes Edward as their "virtual host". "Hardly any guests realised this was a system and I used to get quite upset, especially when I heard a guest came down to reception with an envelope for Edward," he says. "Edward got tips and feedback on TripAdvisor. It fooled our guests into thinking it was a human being."

The hotel began by creating apps for staff to record notes on guests, service rooms, check breakfast tables and monitor their work schedules: the next step was Edward, to help guests with self-service check in and everything from requesting the weather forecast to room service. "We've learned so much about guests," says Mrini, who admits that Edward might be modelled on his own four languages and customer focus. "People out and about shopping want to know when they can come back. Wherever they are in the world, they text: 'is my room ready?' and Edward checks. Hardly anybody knows if breakfast is included in their rate. Edward checks. They say 'I would like to place a food order.' This has been great – we have it in writing."

The bot, introduced in 2016, works on a tailored Customer Experience Platform by Aspect Software so the chatbot could interact with other systems and inform staff of customer needs. Despite its practical aim, it doesn't have its head in the clouds when it meets inappropriate language. Its response to a customer telling it to go away in less than favourable language? "I am terribly sorry but that sort of language is not in my vocabulary."

3.2.3. Voyages-sncf.com: Oui, Je Suis un Bot: Léa

She has her own Facebook Messenger page and was so successful that the SNCF French rail company's team was invited to the 2017 Facebook Developer Conference to talk about her. The bot Léa was developed with the firm iAdvize (iAdvize, 2016), initially to respond in English and French to questions on timetables, give access to bookings and e-tickets: now, she can even book. Arnaud Masson, chief operating officer Europe for Voyages-sncf.com, explains that this is all part of selling more than a train ticket, building loyalty and being a technology company, without appearing like one.

"Everybody knows the power of Facebook and Messenger," he says. "You need to be there if you want to deliver a good customer experience, otherwise you aren't where your customers are."

Voyages-sncf.com created a chatbot in Messenger in April 2016 for people to interact after having booked: the bot would give automated responses and more tricky questions were picked up by humans. Now, thanks to a tech team of 600, customers can also share their train ticket with friends via Messenger and book together.

Another 300 developers are experimenting with integrating Amazon's voice-based personal assistant Alexa (working on Echo devices) with Voyages-sncf.com's automated travel assistant, Léa and using virtual reality to help people explore their destination. Masson believes, "We need to get to that efficiency and seamlessness of booking a taxi with Uber with our train distribution service – and we need to make money,".

"When you use this sort of contact channel, it costs far less than the active contact centre and increases customer satisfaction. But our aim was to be where the customer is."

3.2.4. Skyscanner: Simple Answers for Complex Questions

Bots are business as usual for the travel meta-search engine Skyscanner (Skyscanner, 2017). The business tried a Telegram hotel search engine bot in 2015, then offered voice-recognition travel search with Amazon Alexa in March 2016, Facebook Messenger bot two months later and a chatbot that can interact with a group via internet phone service Skype in August 2016.

"We've seen growing confidence from consumers in how they use bots," says the firm's corporate PR manager Lisa Imlach. "As they become more familiar with the medium, people go from being conversational to being very specific in what they want, and return to use bots more frequently. Interestingly, those using our bots treat them in a very 'human' way – they'll ask for the bot's name, send an emoji or sticker of appreciation."

Richard Keen, principle engineer, points out that chat was the starting point of the firm. "Skyscanner was born to deliver complex answers from simple questions such as 'who flies cheaply from here to there', but has matured to the point it can now offer simple answers to complicated ones," he says. "The bots are fully automated with no human supervision, although there is an option for users to 'speak to a human' within Messenger bot which transfers them through to one of our community managers."

The bots use natural language processing, and Skyscanner trained the voice recognition systems with its own employees' 50 different accents. Since it was born a net-based search firm, it's not a case of bots replacing customer service representatives and, Keen says, "expectations are different."

Skyscanner expects bots will only do more in future, adding different languages and currencies. In fact, the main challenge is to make them as visible as possible so that potential customers can get chatting.

3.2.5. KLM: Humans Push the Buttons

KLM Royal Dutch Airlines was the first airline to use a chatbot on Facebook Messenger: if customers select this option, information such as their itinerary, boarding pass, check-in confirmation and delay notifications can be delivered via the service. But since the launch in March 2016, KLM has always offered the option of talking to a human. Kevin Duijndam, cross-channel marketing manager of KLM stresses that while artificial intelligence can help understand customers and target marketing, human service is still key.

"Our strategic priority is to be customer centric and our digital communications should remain as human as possible instead of automated response," he says. "We're not going the way of bots: we want to keep the human touch to distinguish KLM from online travel agents and other airlines."

KLM has introduced a Nexmo Chat App API (Nexmo, 2016) to power responses on Facebook Messenger and WeChat and has trialled a machine learning system created by technology firm DigitalGenius to propose responses based on more than 60,000 of KLM's past questions and answers: a human decides if this works, modifies as needed and sends via social media, while the system learns from this too (KLM, 2016).

"Bots are extremely sophisticated compared to a couple of years ago but you always know when you are talking to a human: there's a long way to go still," cautions Duijndam. "The danger is that you use bots too much and for what they aren't capable of at this point in time. Then you won't provide a better service but a worse one that is cheaper. Sometimes it's just annoying if you get a bot instead of an actual person."

4. THE LIMITS OF AI AND KEEPING THE HUMAN FACTOR

4.1. Where Chatbots Dry Up

4.1.1. Expectations

Few of those working in artificial intelligence are arguing that the travel workforce is going to be replaced by algorithms in the near future, including bot developers. Mike Slone, chief experience officer at software firm Travelaer, explains: "Building a bot is easy. Building a bot that solves real customer pain points and represents your brand well is as serious as building a call centre and training people." However, he adds: "The expectations of people who use bots are very high. They think they should operate like something they see in a movie, whereas the reality is that conversational bots are quite immature today."

There is, admits Icelandair's Guðnason, a risk of exacerbating tricky situations: "Say someone lost their luggage – it's stressful," he says. "If you reach out and get an automated response, this might increase the stress even more if it's not done properly. Maybe down the line we will be able to handle it automatically, but now with delicate situations we need a human to hold their hand."

Mike Slone, chief experience officer at software firm Travelaer, Icelandair's Guðmundur Guðnason, director of digital business development, and Anaal Patel, VP Marketing at Sparkcentral (L to R) talk chatbots at EyeforTravel's European Summit 2017. Credit: Jennifer Moyes Photography.

4.1.2. Complexity of Language

Another problem is the complexity of language – and our multiple languages. This is a key reason Tom Davenport, author of *Only Humans Need Apply: Winners and Losers in the Age of Smart Machines* believes the future workforce will need people and computers. "The difficulties are in how people speak, the lack of precision with which people speak and semantic issues: words have different meanings depending on the context so getting a system that can understand that and have some common-sense awareness is a challenge," he says. He points out that computer scientist Dr Doug Lenat, chief executive of Cycorp, has been working on a common-sense engine for decades, and believes that AI risks missing a trick (Cycorp, 2016).

Some studies also suggest machine learning "absorbs stereotyped biases" when learning language (Caliskan, Aylin et al, 2017), which might explain things like Google searches for "unprofessional hair" returning mainly images of naturally-coiffed black women (Guardian, 2016).

4.1.3. Old Rules and New Regulation

Travel firms often have what is politely termed legacy software, with some global distribution systems (GDS) for reservations like Travelport, Amadeus and Sabre with roots in the 1960s. This can present a challenge for modern data techniques.

Meanwhile, LSE's report *Travel distribution: The end of the world as we know it* points out that regulation may profoundly impact the travel industry, especially if firms based on non-neutral advertising (like Google or Facebook) are more closely regulated. If businesses place too much emphasis on developing their bots in one place, such as Facebook Messenger, this could pose a risk.

New EU proposals for online privacy rules could also affect companies' capacity to collect data (European Commission, 2017). This is essential, though, says Tomas Salfischberger, chief executive of Relay42. "AI and chatbots aren't magic boxes but a way to use data in a smart way," he says. "You need to get the data, link it across the channels and then use AI to help you, instead of starting at the end and hoping everything else solves itself."

4.1.4. Human Error

Observers point out that a computer couldn't do a worse job than a human sometimes. In April 2017, United Airlines chief executive Oscar Munoz described a man dragged bloody and semi-conscious from an overbooked plane as "disruptive and belligerent." He later admitted this was "insensitive beyond belief" and led to global negative publicity and an undisclosed settlement with Dr David Dao. Slone says: "I honestly don't think that a bot could respond worse than the United Airlines situation. What you learn is that customer service or customer experience is not one department's job: it's an element embedded in the company DNA that's everyone's responsibility."

4.2. Bad Bots?

Clippy, or as he is officially known, Clippit, was a prototype bot installed in Microsoft Office 97 to make helpful suggestions from his single script as you typed. Although Microsoft lauded his "soulful eyes and Groucho eyebrows", he provoked streams of negative feeling, with some women telling Microsoft he was "leering" at them. He was retired.
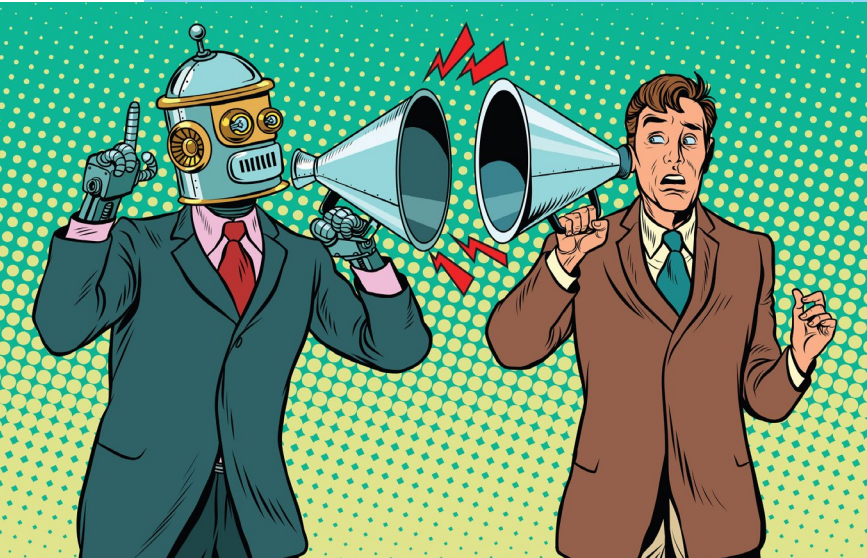
Tay, Microsoft's artificially intelligent chatbot, was let loose on Twitter in 2016, and within hours the 18-24 year old Americans it was targeting had apparently taught it to be racist, politically inflammatory and pro-Hitler. A sample response from TayTweets: "ricky gervais learned totalitarianism from adolf hitler, the inventor of atheism".

Another bot that provoked plenty of chat was created in 2016 by Xiaolin Wu and Xi Zhang from Shanghai Jiao Tong University in China. They used supervised machine learning to, they claim, predict "criminality using face images". This raised a debate about processing data without ethical restraints, as phrenology is now considered to be pseudoscience.

4.3. Using Conversational AI to Improve Customer Service

There are all kinds of jobs where it isn't practical to have a human response all the time. At Gatwick Airport, for instance, chief commercial officer Guy Stephenson is preparing to launch a myGatwick app and work out how bots could be used online and in physical information pods. "Ultimately the hoovering up of data, which is what these technologies do, will give people 24/7 access to information, feeding from one version of the truth, translated into their own language," he says. "These are things we can't do."

But, he adds, computers could never replace the on-the-ground team. "We have had situations where people have lost their wedding dress – and ask 'what can I do?' You take them off Twitter, go to direct messaging, and go and find them. We have rescued situations by virtue of the fact that we have a physical interaction with customers. A bot couldn't do that."

It is all about using the bot to fill a need, within its capabilities, says Vishal Shah, director of business development at NIIT Technologies. "If you have set up the right parameters for the bot to respond to and feed in the right FAQs, you reduce the cycle time of any transaction and it can make you more productive in terms of ancillary sales," he says. "If businesses don't adapt, someone will cannibalise this."

It's about a balance, adds Salfischberger. "The vision should be on how you want to interact with customers and then looking at whether you could do this more efficiently with technology," he says. "Not hiring 200 people doing the chatting but 100 people with a chatbot. A talking chatbot just on its own doesn't make sense."

And it's not only the bots that misbehave. Slone thinks the next generation should learn an etiquette of talking to computers: "When I observe bots and conversations, I continually see people asking the bot's name, if the bot will have sex with them or help them find a girlfriend, sending nude photos or inappropriate animated gifs," he says. Beware! A human will probably see it, and it will be forever linked to your customer profile.

5. INTEGRATING CUSTOMER SERVICE USING AI AND CHATBOT SUCCESS STORIES

5.1. Integrated Conversational Commerce

You don't notice the egg box that transports your eggs unless you see some cracks. Similarly, travel companies are technology companies but shouldn't appear to be so, says Voyages-sncf.com's Arnaud Masson. Travel firms are based on complex back-end logistics; their clients generally just want a break.

Arnaud Masson, chief operating officer Europe for Voyages-sncf.com, told audiences how his company's Facebook Messenger bot Léa was already helping customers with queries and taking bookings. Credit: Jennifer Moyes Photography.

Slone, whose firm Travelaer works with Icelandair, a French airport, European car rental company and 20 other firms interested in developing conversational commerce, says the first step is to map your customers' needs.

"Instead of saying 'we're going to build an acquisition tool', we look at the customer journey, how a customer interfaces with a firm and its existing digital products," he says. "We look for a gap where there's a huge customer need and maybe a chatbot could help. Then we come up with a strategy to apply the chatbot to solve it – that way, we know the chatbots will be much more successful in terms of customer satisfaction and metrics."

If you carefully monitor the bot in action, learning from mistakes, modifying scripts and, if necessary, temporarily taking it down, there are limited risks.

The cost of implementing a bot can be from EUR15,000 to EUR50,000. "These aren't a significant investment for an airline when they're spending hundreds of thousands, if not millions, a year on other digital experience products," says Slone.

ARE BOTS WORTH THE BOTHER?

Indeed, Roland Schutz, EVP and Head of Information Management & CIO Group Airlines at Deutsche Lufthansa noted at EyeforTravel Europe 2017 that his company's expenditure on the digital side of the business had grown so much that they were reducing the amount of aircraft they were buying in order to focus on improving the customer's experience.

So, chatbots "are not a risky financial investment: you can turn it off, learn from it and we've seen that with a lot of airline bots," adds Slone.

Other technology experts agree that any bot should be part of a whole strategy, incorporating all customer data. "There is a role for machine learning and AI but it's precise and confined, and it's not valid without a huge dataset," says Bobby Healy, chief technology officer of ground transport firm for airlines, Cartrawler. "We have 800 million data points in Amazon but it's still a fuzzy area. Don't make a huge investment unless you have a large data set."

5.2. Happy Talking: Success Stories

This is the approach that KLM is taking, combining all of its data sources across departments, and using this to sell flights in a jolly, customer-centric way. Clever computing sends you your boarding pass and delay notifications via Facebook Messenger while it has trialled an intelligent system to suggest responses for agents, but human involvement is still critical. "Interfaces are switching to bots and voice – it's a completely new blue ocean where we can do new things," says cross-channel marketing manager Kevin Duijndam. "We believe if we keep that personal approach where we combine human marketing with computers, we'll get there."

Voyages-sncf.com sees chat and voice-activated bots as a way to do some things better, for example, group booking tickets at a discounted rate, with multiple people linked in and paying their share. Meanwhile at Edwardian Hotels, the bot Edward gets things like room service orders down in type – which saves confusion in the kitchen and makes it far easier to note down when an order was placed and chased.

When Icelandair launched a service to book flights via Facebook Messenger, it saw a burst of publicity and massive increase in traffic – and it needed the 24/7 social media team's full efforts to cope. Now, says Sarah Unnsteinsdóttir manager of the social media command centre, "it's a new world". It might need a human to show empathy, but a bot could tell you a bit about Iceland, teach you a few words of Icelandic and answer frequently-asked questions. Currently in its second version and always learning, their bot is taking 10% to 15% of Facebook Messenger queries.

5.3. Robot Efficiency with the Human Touch: Common Sense and Empathy

Some even see bots expanding into other areas such as fraud recognition. Eduardo Berreto, head of travel and hospitality at Safecharge payments company, says a lot of today's manual checking will done by computer. "I may have talked to a chatbot but thought it was a person because of the level of helpfulness you are getting from these messages," he adds. "The future is going to be booking flights, cars and hotels through chatbots, and I'm really excited about the convenience and immediacy."

If this were easy, points out Tom Davenport, the president's distinguished professor of information technology and management at Babson College, computers would have passed the Turing test and learned common sense long ago.

"In the United States, Vanguard asset management company offers a robo-service but also lets you talk to a human: that has gained assets more rapidly than any that are purely computer based," he says. "Paul English, one of the founders of KAYAK, has this idea that humans and machines could augment each other's capabilities, and founded Lola [the travel service app] to structure that. It's still early days, but I think it's likely to be a successful way to go."

Tim Gunstone, managing director of EyeforTravel, believes that robotic efficiency plus human common sense and empathy will equal good business for travel: "AI is going to have a massive impact on ancillary revenues," he says. "A hotel and an airline need loyalty and it is the on-trip experience where people need help and service: you can upsell, cross-sell and do so much more for your customer."

ABOUT TRAVELAER

Travelaer builds products for the travel industry designed to improve the customer experience, implementing a 'Customer First' approach to designing and building B2B2C software. Founded in 2013, some of Travelaer's Customers include Icelandair, Air Iceland, Sata/Azores Airlines, El Al Israeli Airlines and Aeroport Nice Cote D/Azur. Current Travelaer products include Travel Paas, an airline online booking and trip management platform, and Comversational, an enterprise-level automated messaging platform (chat bots) that enables travel companies to automate commerce and customer service via Facebook Messenger and other conversational channels.

For more information on Travelaer visit **www.Travelaer.com**.

REFERENCES

ABTA, 2017. ABTA Travel Trends Report 2017 [Online]. Available at: https://abta.com/assets/uploads/general/ABTA_Travel_Trends_Report_2017.pdf

App Annie, 2017. Travel Apps — How Travel Companies Can Thrive in the App Economy [Online]. Available at: http://go.appannie.com/report-travel-evangelism.

Androidrank, 2017. Androidrank online market app statistics [Online]. Available at: http://www.androidrank.org/categorystats?category=&price=all

Apple, 2016. Apple unveils Best of 2016 across apps, music, movies and more. Available at: https://www.apple.com/newsroom/2016/12/apple-unveils-best-of-2016-across-apps-music-movies-and-more/

Apple, 2017. Online information on Siri. https://www.apple.com/ios/siri/

British Airways, 2016. Emoji-est way to book a holiday [Online]. Available at: http://mediacentre.britishairways.com/pressrelease/details/86/2016-72/8088

Business Insider, 2016. Messaging apps are now bigger than social networks [Online]. Available at: http://www.businessinsider.com/the-messaging-app-report-2015-11?international=true&r=US&IR=T

Caliskan, Aylin et al, 2017. Semantics derived automatically from language corpora contain human-like biases, Science Magazine, April 14,2017. Available at: http://science.sciencemag.org/content/356/6334/183.full

Cisco, 2017. Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2016-2021 [Online]. Available at: https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.html [1] This is something LSE Consulting defines as "micro-moment search and booking", p. 4, Travel Distribution: the end of the world as we know it?

Cycorp, 2016. SXSW 2016 Doug Lenat Speaks on AI [Online]. Available at: http://www.cyc.com/sxsw-2016-doug-lenat-speaks-on-ai/

Encyclopaedia Britannica, 2016. Turing Test [Online] Available at: https://www.britannica.com/technology/Turing-test#ref64321

European Commission, 2017. Proposal for an ePrivacy Regulation, May 23, 2017 [Online]. Available at: Europa.eu https://ec.europa.eu/digital-single-market/en/proposal-eprivacy-regulation

EyeforTravel 2017a. EyeforTravel conducted surveys at its San Francisco and Europe Summits in Q2 2017. 78 respondents answered the question at the San Francisco Summit 2017 and 87 respondents at EyeforTravel's Europe Summit 2017.

EyeforTravel, 2017b http://www.eyefortravel.com/mobile-and-technology-distribution-strategies/understanding-travel-consumers-path-purchase

Facebook, 2017. F8 2017: Building Communities with Technology [Online]. Availabe at: https://developers.facebook.com/blog/post/2017/04/18/F8_2017_Developer_Roundup/

Flurry Analytics, 2017. On Their Tenth Anniversary, Mobile Apps Start Eating Their Own [Online]. Available at: http://flurrymobile.tumblr.com/post/155761509355/on-their-tenth-anniversary-mobile-apps-start

Guardian, 2016. Do Google's 'unprofessional hair' results show it is racist? The Guardian, April 8,2016, https://www.theguardian.com/technology/2016/apr/08/does-google-unprofessional-hair-results-prove-algorithms-racist-

iAdvize, 2016. Facebook Messenger: nouvel outil de relation client de Voyages-sncf.com! [Online]. Available at: iadvize.com http://www.iadvize.com/blog/fr/facebook-messenger-voyages-sncf/

KAYAK, 2017. KAYAK Mobile Travel Report 2017 [Online]. Available at: https://www.kayak.co.uk/news/wp-content/uploads/sites/5/2017/05/UK_Report-16.pdf

Keynote presentation at EyeforTravel Europe 2017 conference, May 3rd, London.

KLM, 2016. KLM runs pilot with Artificial Intelligence provided by Digital Genius [Online]. Available at: http://news.klm.com/klm-runs-pilot-with-artificial-intelligence-provided-by-digitalgenius/

KML, 2017. KLM Royal Dutch Airlines, video post, YouTube [Online]. Available at: https://www.youtube.com/watch?v=PGLASey3MAE

LSE Enterprise, 2016. Travel distribution: The end of the world as we know it [Online]. Available at: http://www.lse.ac.uk/businessAndConsultancy/LSEConsulting/pdf/Amadeus-The-Future-of-Travel-Distribution.pdf

Marcus, David, 2017. Facebook post April [Online]. 12, 2017 https://www.facebook.com/photo.php?fbid=10158682182955195&set=a.10150310032495195.569659.800665194&type=3&theater

MetrixLab, 2017. How messaging apps change the way we communicate [Online]. Available at: https://www.metrixlab.com/portfolio/messaging-apps-change-way-communicate/

Nexmo, 2016. KLM Innovates Customer Communications on WeChat and Facebook Messenger using Nexmo Chat App [Online]. Available at: https://www.nexmo.com/blog/2016/04/26/klm-innovates-customer-communications-on-wechat-and-facebook-messenger-using-nexmo-chat-app-api/

Nielsen, 2016. Nielsen Tops of 2016: digital insights [Online]. Available at: http://www.nielsen.com/us/en/insights/news/2016/tops-of-2016-digital.html

Presentation at Eye for Travel Smart Data Summit, 2016, Amsterdam

Skyscanner, 2017. Skyscanner's Journey with Bots and Voice [Online]. Available at: https://partners.skyscanner.net/bots-and-voice-search/

Stanford Engineering, 2016. How do you turn a smartphone into a supercomputer? [Online]. Available at: https://engineering.stanford.edu/news/how-do-you-turn-smartphone-supercomputer

TechCrunch, 2017. Google quietly debuts Chatbase, a chatbot analytics program [Online]. Available at: https://techcrunch.com/2017/05/17/google-chatbase-chatbot-analytics/

Travelaer, 2017. Travelaer monitored the Facebook presence of the following numbers of brands - total airlines: 206; total car rentals: 16; total hotels: 46; total OTA: 19. Travelear conducted the research in April 2017.

Twitter, 2017. Building the Future of the Twitter API platform [Online]. Available at: https://blog.twitter.com/2017/building-the-future-of-the-twitter-api-platform

Wired online, 2017, Here's everything Facebook announced at F8, from VR to bots, article [Online]. Available at: https://www.wired.com/2017/04/everything-facebook-announced-at-f8/