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Article

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Human – Machine Touchpoints in Marketing

Augmenting Digital Customer Touchpoints

Best Practices for Transforming Customer Experience Through Conversational AI

The capabilities of artificial intelligence (AI) have passed a tipping point, allowing customers to interact with organizational IT systems using natural language and unstructured text. In particular, conversational AI is transforming customer experience. This article demystifies conversational AI and presents two case studies to describe the success criteria for adoption.

Dr. Sean Kask, Dr. René Fitterer, Louis Anselm

Conversational artificial intelligence (AI) is defined as “software systems that allow [...] to simulate real conversations between devices and user” (Di Gaetano and Diliberato, 2018). They are colloquially called chatbots and are now at the forefront of the customer experience agenda. Gartner predicts that by 2020 one quarter of organizations will implement chatbot technology in customer services across engagement channels, up from 2% in 2017 (Alvarez, 2018). The same study found that 20% of companies plan to abandon mobile apps due to lack of adoption and instead reach customers through messaging applications such as WhatsApp, which can deliver much of the same functionality as an app and transform their relationship with customers. For example, people experience comparable emotional effects whether chatting with a computer or a human (Ho et al., 2018). In this way, natural language processing provides important new customer touchpoints (Gollnhofer and Schüller, 2018).

Voice-powered assistants like Alexa, Siri, and Google Assistant function largely in the same manner as text-based chatbots, but simply include an additional AI layer for voice-to-text and text-to-voice transcription. Organizations build a chatbot and then add voice capabilities on top.

In the past few years, the use of conversational AI in customer-facing scenarios has become feasible due to several factors:

- **Ubiquitous adoption of messaging channels.** Messaging channels like WhatsApp and WeChat each claim to have over 1 billion active users. People are comfortable using these channels and would rather chat than install another app or navigate through a portal.
- **Improved performance of conversational AI.** Chatbot accuracy is now at a

level accepted by customers thanks to the recent feasibility of AI, driven largely by powerful hardware, availability of training data, and advances in deep learning.

- **Strong incentives and benefits.** Customers prefer the 24/7 availability and natural interactions afforded by chatbots. Companies achieve efficiencies and cost reduction, while chatbots offer a controlled experience and personality consistent with the brand – a level of reliability rarely achieved by human agents.

The Value and Organizational Impact of Conversational AI

Many thought leaders discuss the potential of AI to automate routine tasks connected to cognitive jobs. Among the jobs most affected are white-collar workers such as accountants, insurance underwriters, or telemarketers (Frey and Osborne, 2013).

While recent studies predict that machines and algorithms will increase their contribution to specific tasks by 57% on average between 2018 and 2022, the next wave of value creation will expand beyond pure automation (World Economic Forum 2018). With the expansion of AI into reasoning and decision-making, administrating, and looking for and receiving job-related information, new ways of human-machine collaboration will enable augmentation rather than simply the replacement of manual work (Wilson and Daugherty, 2018).

In order to significantly improve user experience for both employees and customers, conversational AI applications need to focus on clearly defined areas of concern, rather than expecting a chatbot to completely automate the work of an entire department (Davenport and Ronanki, 2018). This in turn requires companies to decompose complex workflows into discrete independent and fungible skills. On this basis, companies will be

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able to reconfigure these components and embed chatbot capabilities into the overall process, for example to allow a customer to initiate a service request 24/7 and to enable smart routing directly to a human expert, all while providing recommendations on best-fitting solutions to the customer's problem.

While business model innovation will also play a major role in transforming existing companies so they can successfully compete in modern digital markets, the automotive industry exemplifies the required mix of value creation from AI along three domains: automation, human augmentation, and new business models. Despite the high expectations for autonomous driving to disrupt today's automobile industry and lead it into a future of mobile services displacing personal cars, a recent study predicts driver/vehicle features will only contribute around 6% to the AI value pool by 2025 (McKinsey Center for Future Mobility, 2018). Instead, small-grained capabilities that augment human

labor, such as neural networks applied in automating unstructured invoice processing or predicting next-product-to-buy based on customer attributes and sales basket, will have a much higher impact in the short to medium term.

Demystifying How AI Underlies Modern Chatbots

As with any emerging, hyped technology, many sales and marketing executives may have unrealistic expectations about conversational AI. Understanding how conversational AI works helps managers identify appropriate use cases and form a realistic outlook about capabilities and required governance. The first attempts at chatbots relied on a static database of rules, dictionaries, and statistical associations, meaning developers tried to explicitly program all the complexities of language such as syntax, vocabulary, and context. However, modern chatbots primarily leverage a form of AI called deep learning, which consists of various classes of neural networks (Goldberg, 2016). Now developers train the machine on examples of speech. Advanced chatbots may leverage multiple AI algorithms, such as language detection, sentiment analysis, and preprocessing steps to parse and classify parts of text. However, AI allows chatbots to perform three key tasks, chiefly related to natural language understanding (figure 1):

- **intent matching:** assigning a sentence to a meaning. Intents are at the heart of a chatbot because they represent everything the bot understands.
- **entity extraction:** identifying keywords in sentences based on the context.
- **skill execution:** based on the confidence score calculated by the AI for the matched intent and extracted entities, the chatbot executes an action, for example providing a text response or

calling a web service. Skills are normally realized by standard, explicitly programmed software components.

Consider the following phrases:

“Hi. Next week I’d like to book a trip with my wife, Victoria.”

“On Tuesday we’d like to depart to Victoria, B.C. for 1 week.”

Humans easily understand the intent even if it were phrased in multiple ways: the customer wants to book a vacation. Humans also understand from the context that one passenger's name is Victoria, the destination location is Victoria, Canada, and “next week Tuesday” is a specific date. This task is not easy for computers.

Conversational AI would process the above expressions as follows:

- **Intent:** “book vacation”
- **Entities:** Location = Victoria, Canada. Passengers = 2. Duration = 7 days. etc.
- **Skills triggered:** pass on the entities extracted as data points to execute a transaction in the booking system and respond to user with “Great! Here are the possible flights.”

Developers train the chatbot to assign sentences to intents by giving the chatbot examples, typically 30–50 expressions per intent, and labelling entities in each sample sentence. In this way, the chatbot does not need to match each human expression exactly but rather learns the patterns. Through chatbot testing and after launch, an organization can monitor chat logs for what users are asking the chatbot and tune the performance or add new intents.

The skills triggered are realized through software development or pre-programmed text responses. While many managers expect chatbots to be capable of generating their own responses, natural language generation (NLG) is an active area of AI research

Management Summary

Conversational AI, i.e. chatbot technology, is changing how customers interact with organizations. Augmenting human work and automating white-collar tasks will deliver the bulk of the value from AI in the medium to short term. Modern chatbots leverage deep learning to achieve accurate natural language understanding (NLU) and are trained via examples. A chatbot's principal capability is to assign human expressions to a set of intentions (essentially what the chatbot “understands”), extract keywords as data, and execute a response. Successful customer-facing chatbots address straightforward, high-volume tasks, execute a business transaction to solve a precise customer need, and are supplemented by humans where needed. They need to build upon strong governance to continuously improve skills and expand scope.

that is not yet capable of providing reliable results. Companies can use the same chatbot in various messaging channels, whether it be Alexa, a corporate portal, or any number of consumer messaging applications.

Managerial Recommendations for Successfully Adopting Conversational AI

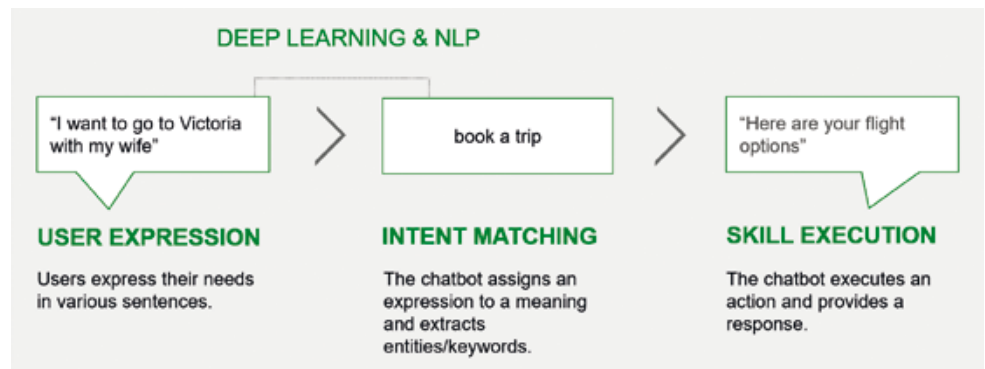
AI-based conversational technology is mature enough for progressive companies to employ chatbots to transform the customer experience (Kirkpatrick, 2017). Rather than aiming for an “advanced” chatbot approaching human-level knowledge, companies should start by establishing small-grained capabilities that serve dedicated purposes. The following set of principles is elementary for chatbot adoption:

- **Start small with a focused scope.** Many failed AI initiatives began with a broad scope and unrealistic expectations,

Main Propositions

1. Conversational AI has achieved significant maturity for progressive companies to employ chatbots to transform the customer experience.
2. Natural language processing promises better user adoption due to positive emotional effects and ease of interaction.
3. Establishing small-grained capabilities that serve dedicated purposes will create superior value over aiming for an “advanced” chatbot approaching general human-level knowledge.

Figure 1: From Expression to Execution (Example)



Source: Authors' illustration.

tations, also called “moon shots” (Davenport and Ronanki, 2018). A first chatbot will not be able to face the complexities customer service agents can handle. However, an analysis by Facebook found that 90% of customer queries fall under ten topics (Barnett, 2018). Of these ten topics, several high-volume, repetitive tasks are appropriate for automation via chatbot, while the rest can be routed to a human or ticketing system.

- **Create a bot that does something specific and otherwise hands over to humans.** In a sense, conversational AI is simply a different user interface on top of existing data and well-defined processes. Many chatbots are launched on portals where customers could already access self-service or service agents. Successfully implemented chatbots can pull data from a system, execute transactions in a business process, and answer very straightforward FAQs. In contrast, complex knowledge bots can be difficult to create. Where the required business process is too complex or human interaction could provide important touch points, such as for sales or handling complaints, the chatbots can hand over to a human. For ex-

ample, using sentiment analysis and interpreting “insults” as an intent can immediately trigger the fallback channel for a human to intervene.

- **Set realistic expectations.** Customers are becoming more accustomed to interacting with chatbots. Make customers aware of the chatbot’s capabilities upfront and that they are conversing with a machine. Chatbots need to hit a sweet spot between being too robotic (e.g. by responding faster than a person could type) and too human-like (Mone, 2016). If the chatbot cannot understand or help the customer, a fallback channel to interact with a human agent or the possibility to create a service ticket should be available.
- **Establish continuous governance.** Standards ensure that chatbots reflect brand image and personality. Content experts train conversational AI by reviewing user chat logs and analytics; the experts can assign the expressions the chatbot does not understand to existing intents or add new capabilities. Once the technical foundation and organizational acceptance are in place, companies can scale chatbots to include additional languages, broader scope, new messaging channels, and new business functions.

Case Studies

Two case studies, selected based on the key characteristics described in the previous section, illustrate best practices of suitable customer-facing chatbots.

Case study 1: Izzy Supports Groupe Mutuel’s Customer Service

Swiss citizens can change their health insurance generally only once per year, meaning that customer support interactions during late fall spike by as much as 400%.

In October 2017, the Swiss insurer Groupe Mutuel added a French- and German-speaking chatbot to its customer portal to serve its more than 1.2 million health plan members (Groupe Mutuel, 2018). The chatbot, named “Izzy”, was developed in just one month. Izzy guides clients through changes or cancellations of their health insurance contracts – high-volume, business-critical transactions. For example, Izzy will provide the customer form required to change the address of a contract or walk a customer through suspending a contract due to military service. Groupe Mutuel focused on these use cases because they are straightforward and easy to automate yet demand much of the call center agents’ time. At Izzy’s launch, Groupe Mutuel successfully set

Figure 2: Chatbot Izzy Introduced in Groupe Mutuel’s Customer Magazine



Source: Group Mutuel Customer Magazine.

customer expectations in their newsletter and portal by explaining that Izzy was still learning and clearly stating the areas where Izzy can help (figure 2).

After the testing period, most clients reported that Izzy answered their questions adequately while call center agents found more time to interact with clients

and prospects seeking personal advice. The tasks of changing and cancelling contracts previously produced 400% workload at peak times; up to 75% can now be handled by the chatbot, allowing the agents to focus on higher value tasks (UKSUG TechSelect, 2018). Groupe Mutuel is steadily expanding Izzy’s capabilities with further use cases.

Lessons Learned

1. Focus chatbot use cases on simple, high-volume, repetitive tasks (following the 80/20 rule), and then gradually expand the scope.
2. Create chatbots that can do something specific, e.g. execute a business transaction or solve a narrow customer need.
3. Tell users upfront what the chatbot can and cannot do to manage expectations. Chatbots and human agents supplement each other.
4. Put governance in place: chatbots, like employees, need continuous training, monitoring, and upskilling.

Case study 2: Large Telecom Provider Cuts Customer Service Effort with Chatbot

One of Europe’s largest telecom providers faced issues scaling customer support. The requests agents dealt with were repetitive, leaving little time for value-adding interactions, and half of the customers spoke to multiple agents. The provider faced the prospect of ad-

ding new call centers and increasing the headcount.

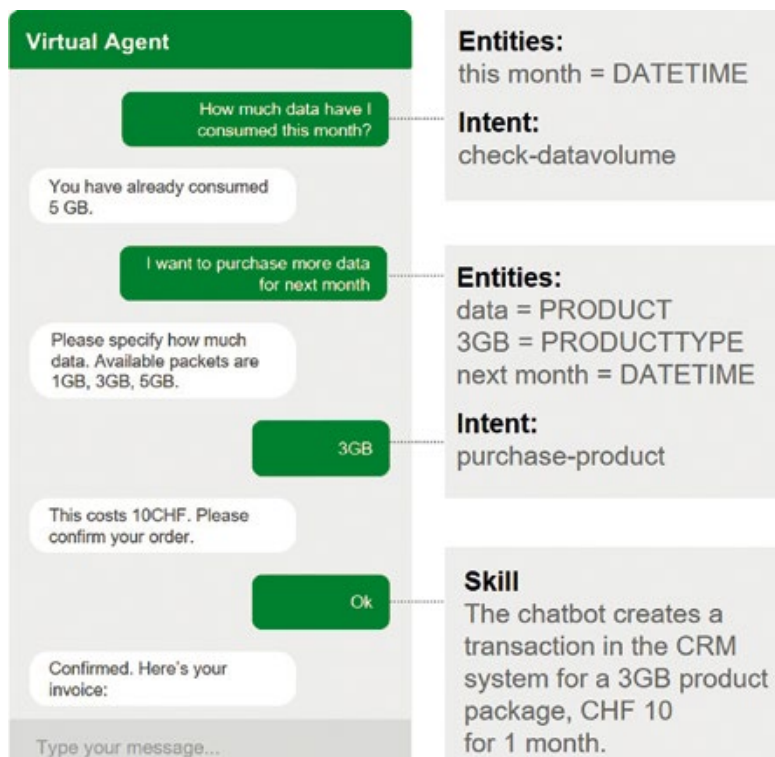
In 2017, the company successfully launched a customer support chatbot on its portal. The chatbot was first released on a small scale to several hundred testers and users to collect chat logs that served to enhance its training data set and determine the most important intents to include. Now the chatbot handles 5,000 customer interactions per day. It autonomously resolves more than 20% of the interactions and, when a human agent is required, correctly hands over more than 90% of customers to the appropriate agent on the first attempt.

Resulting conversations with human agents now take half as much

time, and agents can focus on value-added tasks like sales or personalized assistance.

The initiative has been successful because the company started with high-volume requests that were straightforward to address. Customer interactions result in three outcomes: the chatbot autonomously handles simple requests, such as “reset SIM card PIN”, “send me last month’s invoice”, and “add a data package for 1GB” (cf. figure 3); the chatbot collects information and then routes customers to the correct service department; or the chatbot provides standard answers to simple customer FAQs. The chatbot is now the main entry point for customer requests. 🌱

Figure 3: Example Conversation



Source: Authors' illustration.

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