

TECHNOLOGICALLY ENHANCED RELATIONSHIP MARKETING BY USING MODERN AUTONOMOUS CONVERSATIONAL AGENTS

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Abstract

Advances in computing and internet fields brought by the digital revolution changed fundamentally the business world, companies that embraced the changes managing to reduce costs and increase innovation. In the last two years, advances in artificial intelligence (AI) together with the increased availability of commercial artificial intelligence systems resulted into a new generation of autonomous conversational agents or chatbots that engage the user directly and in a personal manner. Using these autonomous conversational agents paired with the exponentially increasing instant messaging platforms led to the creation of modern chatbots, a tool to handle two-way communication between company and customer instantly.

This article aims at identifying and exposing the ways companies can use chatbots to empower their relationship marketing efforts and the main aspects to be considered when doing that.

Keywords: relationship marketing, marketing communication, autonomous conversational agents, chatbot, cybermarketing, artificial intelligence, innovation

JEL Classification: M31, D83, C88, L86

Introduction

Communication, according to Mehrabian (1972), is "any act by which one person gives to or receives from another person information about that person's needs, desires, perceptions, knowledge, or affective states. Communication may be intentional or unintentional, may involve conventional or unconventional signals, may take linguistic or non-linguistic forms, and may occur through spoken or other modes". For Stănciulescu (2003, in Florescu et al., 2003) communication implies the transmission of information as symbolic messages by a source to one or more receivers through various channels.

The communication process is defined by numerous authors and the most used representation of it has four major dimensions: Sender - Message - Channel - Receiver (the SMRC Model of Communication - Berlo, 1960). This means that every communication process has an emitter (Sender) that emits a Message, using a Channel to transport that message to its intended destinatory(ies), the Receiver. In a two-way communication process

the Receiver can provide Feedback as a Return Message to the Sender (Stănciulescu, 2003, in Florescu et al., 2003), either using the same channel, if available, or a different one.

In marketing especially, communication is important, as a main component of the marketing mix, playing a primary role in changing the customer's attitude towards the organization brands and products and in relationship marketing. Marketing communication evolved in the 1990's from a one-way emitter to receptor (advertising, sales promotion, direct marketing etc.) into a two-way integrated marketing communications perspective (Schultz, Tannenbaub and Lauterbom, 1992; Schultz, 1996; Stewart, 1996).

Relationship marketing is based on the fact that on top of the value of products and/or services that are exchanged, the existence of a relationship between two parties creates additional value both for the customer and for the supplier or service provider; the *key processes of relationship marketing* being *communication, interaction and value* (Grönroos, 2000).

In today's business, the supplier tries to attract the customer into a two-way communication process, both to spread its own messages and to gather feedback on those messages, while creating value both for the customer by processing feedback into useful information on how to better tailor the products/ services for him, and for the company, by engaging the customer.

Conversational agents and conversational user interfaces (CUI) were developed through the years to try and emulate personal-level interaction. A human computer interface is a "means by which people and computers communicate with each other" (Bonsiepe, 1990), a place at which independent and often unrelated systems meet and act on or communicate with each other.

The CUI is an old concept with a modern implementation, a way for a human to interact with a device, in a familiar, conversational way. While usually the term "conversational interface" is used by some authors when referring to a speech based system (McTear, 2002; McTear, Callejas and Griol, 2016) the term can be applicable to other type of input, not only speech.

The beginnings of conversational user interfaces and their evolution

Early in the beginning of computer development, the limited input types available (keyboard input into the command line) allowed for the development of the *first, limited, CUIs*. The computer was expecting a text input, from a finite list of possibilities, and knew what to respond based on that input. This is how the command line worked, and it hasn't changed a lot over the years. After the arrival of the *graphical user interface* (GUI) in 1973, built by Xerox and the subsequent large scale use of GUIs starting with Apple in 1983 and 1984, which allowed the user to use symbols and full-screen representations to control the computer, there was little interest in CUIs.

A different area in which the CUI was used starting from the 1980's was that of *answering robots*. Although still a finite state machine, this CUI accepted keyboard (tone or pulse) as input and used pre-recorded speech as output. Still in use today, advancement in this area allows now for voice input instead of keyboard, for a better user experience.

In the recent years, the appearance of mobile smartphones allows for a revitalisation of the conversational user interface. The limited usable screen space, much less than that of a computer, brought the necessity of compressing user interfaces into steps, that could be followed by the user, and user input deciding the next steps. Now, touch was added as a

new input method, smartphones being able to respond with a plethora of output methods: text, graphics, images etc.

The last, and maybe the most important development in the evolution of CUIs is the advent of *machine learning*. The classical finite state machines are now replaced by *conversational agents*, built using state of the art machine learning techniques like *natural language processing* and *trained models* to understand input in form of text, images or speech. This allows the user to speak as he would speak to another human, the agent being able to interpret the user's intention with a high degree of success.

Components of conversational user interfaces

CUIs have a well determined anatomy. For human - computer interaction to take place, a few components need to be well defined:

The input source

The input source represents how a human can signal the computer his requests, using various input methods. The commonly used input sources are:

- *Text input*, either directly from a keyboard or by selecting predefined texts from a list;
- *Speech input*, usually using a microphone and speech recognition software, that translates speech to text;
- *Visual input*, images or video, usually from a camera.

The output source

The output source is the way the conversational agent responds to human interaction. There are three main output types:

- *Visual output*, using a screen, on which images and text are shown to the user;
- *Audio output*, using voice synthesizers and audio devices;
- *Mixed output*.

The conversational agent

The conversational agent is the machine controlled entity which processes user input and decides, based on its computational algorithms, which information is the most adequate to output back to the user, thus being the "brain" of the CUI. Multiple types of conversational agents can be identified depending on the type of control the user has over the conversation:

- *System initiative* - when the agent proactively asks questions to understand what the user wants;
- *User initiative* - when the user inputs his message and the agent, using advanced parsing techniques, like *natural language processing*, tries to understand from the input what the user means;
- *Mixed initiative*.

Conversational agents powered by natural language processing are very powerful in interpreting user input from natural, every day sentences. This allows for a better and more immersive user experience and even an emotional link between the user and the agent.

Even if the local computing power and storage power grew exponentially in the last period, most, if not all, of the modern conversational agents also use the internet to return relevant output, either by accessing backend APIs or by executing searches on the internet.

Particularities of speech based conversational user interfaces

In speech based CUIs, where input by speech should be validated before producing output, McTear, Callejas and Griol (2016) identified three main types of spoken dialogue systems:

- ◆ *finite state based* - in which the user is walked through a sequence of predetermined steps or states. Usually after each step a confirmation or verification is required from the user. This is somewhat like the way people are used to fill forms today, field by field.
- ◆ *frame based* - or template based system, can accept more than one piece of information in one single input, identifying helpful information, extracting it before checking if additional items of information are necessary before producing output.
- ◆ *agent based* - or AI based is much more complex, using the artificial intelligence to return output based on the input and infer alternatives and additional information based on the input. Usually the user input is tokenized, removing particles and stemming words, to be able to process the input. The tokenized input is then run through a natural language processing algorithm, and, based on a training set, through machine learning algorithms. the AI chooses the most likely output, based on resulting scores and returns the output to the user.

Modern usage of conversational agents - harnessing the internet

In the last two years, there has been an increase in the number of conversational agents employed. The improvements in machine-learning and AI allowed mass availability of AI services, used to power conversational agents. Both machine learning and agent building platforms had been released (table no. 1), and conversational agents had been used as part of personal assistant standalone products (e.g. Google Home, Amazon Echo).

Table No. 1: Modern, commercial platforms, conversational agents ,and backends

Platforms	Agents	Backend services
Facebook Messenger	Apple Siri	Amazon Alexa
Slack	Google Assistant	IBM Watson
Telegram	Microsoft Cortana	wit.ai
Discord	Microsoft Tay.ai	Dexter
Amazon Echo / Fire TV	Microsoft Zo	converse.ai
Google Home		Octane AI

Source: authors

Since the 1990's, internet has been a useful communication platform, with multiple channels available, each with multiple advantages and disadvantages (table no.2). With the advent of instant messenger platforms, the latest communication channel over the internet, one-to-one communication with instant feedback is possible at a large scale.

The mix of marketing and internet is widely known as cybermarketing, meaning the process of creating and maintaining a relationship with the customer through online activities, facilitating an exchange of ideas, products and service with the goal of fulfilling the needs of both parties (Imber, 2000, in Orzan and Orzan, 2007). Thus, cybermarketing is the embodiment of relationship marketing supported by the internet.

Table No. 2: Advantages and disadvantages of marketing communications channels over the internet

Channel	Advantages	Disadvantages
Email	<ul style="list-style-type: none"> * Cheap to use * Can address many customers * Can carry a large amount of information * Can have multimedia information * Can provide direct customer feedback 	<ul style="list-style-type: none"> * Can be perceived as spam if it is unsolicited * An email can easily be lost in the large number of email we are receiving every day
Website	<ul style="list-style-type: none"> * Can address many customers * Can have multimedia information * People expect companies, products, brands etc. to have presentational websites, so they usually look them up 	<ul style="list-style-type: none"> * One way communication * People don't return to check for changes often * Can be difficult to get direct feedback from the customer
VoIP	<ul style="list-style-type: none"> * Allows for true one to one communications using voice 	<ul style="list-style-type: none"> * Customers are not used / willing to be called and talk directly, preferring to use the phone for that
Social networks	<ul style="list-style-type: none"> * Many customers have a social network account * Can get information about the customer from his social network profile (name, date of birth, preferences, hobbies etc.) * Messages are public, addressed to everyone * A comment system provides two-way communication and direct feedback 	<ul style="list-style-type: none"> * Customer must connect to the company using the social network * Cannot create a one to one communication channel
Search engines	<ul style="list-style-type: none"> * Almost 60.000 searches every second on Google. People search for everything from desktop or mobile 	<ul style="list-style-type: none"> * One way communication * Usually expensive
Push notifications	<ul style="list-style-type: none"> * Push notification have a large opening rate * Can provide the customer with a link for a detailed message 	<ul style="list-style-type: none"> * Works only if the customer consented to push notifications * Push notifications are usually short and can't carry multimedia messages
RSS	<ul style="list-style-type: none"> * Cheap, usually paired with a website, allows new website content to be delivered to subscribed users 	<ul style="list-style-type: none"> * Customer must subscribe * The technology is losing traction with the advent of alternative communication channels (social media)

Instant messengers	<ul style="list-style-type: none"> * Large customer base * Large opening rate * Instant two-way communication * Instant feedback from customer * Can function unattended with an autonomous conversational agent (chatbot) * Can carry multimedia messages 	<ul style="list-style-type: none"> * Customer must consent to receiving messages
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Source: authors

In the last 5 years, the number of internet connected people reached over 3.5 billion (Statista.com, 2017a). The number of monthly active users on Facebook was over 1.86 billion in the 4th quarter of 2016 (Statista.com, 2017b). Estimations (Zenith, 2017) show that 75% of the internet traffic is going to be done from mobile devices in 2017.

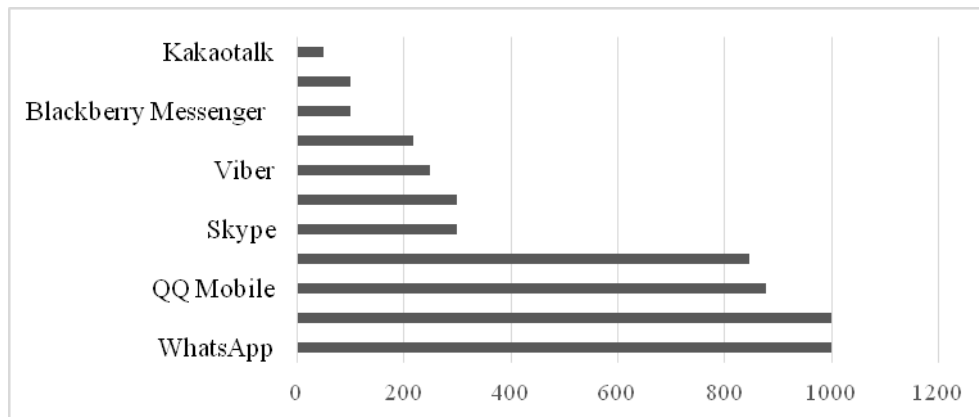


Figure No. 1: Most popular mobile messaging applications worldwide as of January 2017, based on number of monthly active users (in millions)

Source: Statista.com, 2017c

In this context, people started using *messaging applications* (fig.no.1), instead of traditional phone calls and SMSs. Messaging applications have become predominant in the main "app stores", with the largest of them having over 1 billion monthly active users as of January 2017 (Statista, 2017c).

Chatbots - engaging users through messaging platforms

"Chatbots are automated services, powered by rules and machine learning, that allow consumers to interact with brands online via a messaging interface without having to download an application" (Zenith, 2017). Modern chatbots can provide an unattended communication channel, allowing efficient communication and interaction with the users (fig.no. 2).

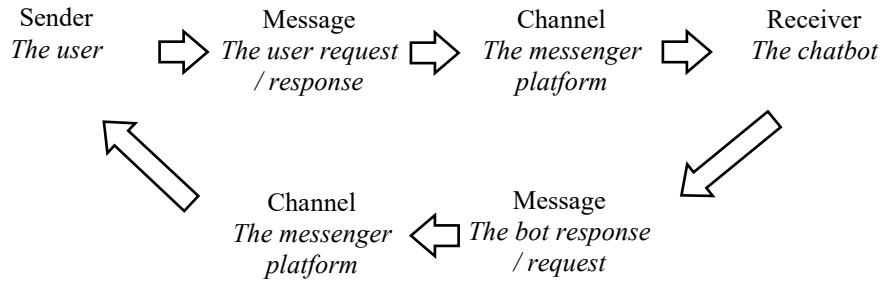


Figure No. 2: The communication process model applied to the chatbot communication
 Source: authors

Advances in machine learning technology and the availability of chatbot building platforms like Octane.ai or Talkbot allow marketing people to design their own interactions through a chatbot without the need for a programmer.

For example, the KLM messenger bot, available at messenger.klm.com, allows the airline to send to the user booking confirmation, check-in notifications, the boarding pass and flight status update using Facebook Messenger.

A chatbot can be used to enhance relationship marketing because of the following features:

- ✓ **Always available** - the chatbot is connected to the messaging application permanently on the company's account. Whenever a customer sends a message, the chatbot can respond immediately, whereas a normal human response could have taken even a few hours. The chatbot can spawn multiple instances at once, being capable to run an unlimited number of conversations at the same time.
- ✓ **Autonomous** - depending on its backend, the chatbot can respond to any frequently asked question, and even learn from one response to another the degree in which the answer was useful based on user feedback.
- ✓ **Self-improving** - Microsoft's Tay.ai used machine learning to learn from each conversation, continuously improving its training set and available data. This had a downside too, as Tay.ai became racist and vulgar in one week from launch.

Especially in customer support a chatbot can help reduce expenses by resolving most of the requests fast, based on previous experience and training. While the normal customer/ user might not be willing to search websites for responses to a question and prefer instead to speak/ chat with a support person, a chatbot can emulate a conversation, even at an emotional level, making the customer feel safer and more willing to participate in the conversation.

Chatbots can also be useful in sales, allowing the customer to fill forms in a conversational manner making the experience more personable (checkout forms, contact forms etc.).

The next step in using chatbots would be active direct selling, with the AI selecting most likely candidates to buy a product based on their purchasing history/ personal profile and contacting them through messaging platforms starting a conversation in order to convince the user to buy the product.

When designing a chatbot, a few main points should be considered (Zamora, 2017):

- People expect chatbots to provide an experience that is smart, high performing and personable.

- Design for a supportive relationship to build trust - there is initial distrust with computer-based systems (Muir, 1987) which can be alleviated with an emotional experience.
- Casual conversations should be relatable - conversations in the user's native or preferred language are easier reproduced;
- Input modalities should be based on context and goals - for example voice is preferred when hands are occupied.

Conclusions

Modern autonomous conversational agents, or chatbots, are not a new concept, but only in the last two years, the artificial intelligence needed to power them has been made available for mass utilization, thus allowing any company to build an autonomous conversational agent that can communicate with users on their preferred instant messaging platform. This is a personal communication, at an emotional level, building trust between the customer and the company, replacing the need to train personnel for the job, providing instant and consistent answers to the customer. Chatbots can filter and answer basic requests, and even to proactively contact customers to sell products and services.

Instant messaging platforms became the preferred internet communication method for most users and this is seen especially in the mobile internet world. Companies should be looking towards chatbots as a good investment to technologically enhance their relationship marketing efforts. Future research should be constantly conducted to evaluate the effectiveness of autonomous conversational agents and the quality of user experiences they provide.

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