

A Review On The Impact Of Implementation Of Chatbots-Enhanced Conversational User Experience

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ABSTRACT

“Chatbots are computer programs that interact with users using natural languages” [1]. They work to simulate realistic conversations with website visitors in an effort to help them get what they need quicker and more accurately [7]. The chatbot systems are widely used in fields including business, education, healthcare, and many more [1]. Because of their successful utilization by the consumer, an increasing number of bots are being adopted along with advanced artificial intelligence technologies; by 2020, it is predicted that at least 80% of businesses will implement some type of chatbot [7]. Therefore, in this paper, I present a review of the impact of implementation of chatbots.

Keywords

Chatbots, conversations, communication, customer, business

1. INTRODUCTION

1.1 The Rise of Chatbots

The number and variety of chatbots have strongly increased within the last couple of years. As of April 2017, more than 100,000 chatbots are available in Facebook messenger only, and the potential global annual revenue generated by chatbot transactions is estimated to be up to 32 billion US Dollars. [10]

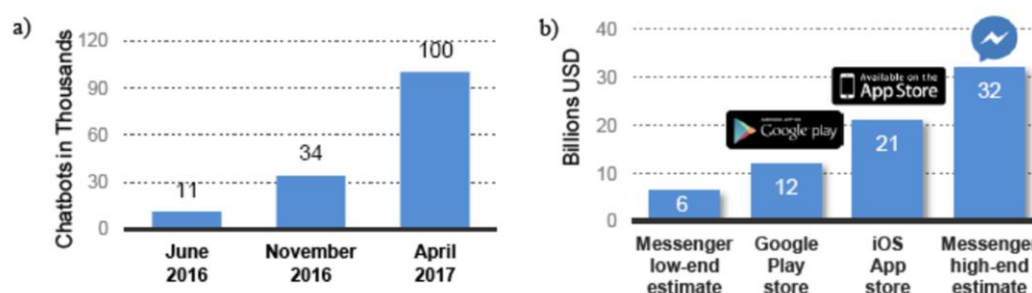


Figure 1. a) Number of chatbots in Facebook messenger and b) Potential global annual revenue of chatbots transactions

(Source Data: a) Facebook 2017 b) Business Insider 2017)

As a personal and interactive channel for information, communication, and transaction, chatbots not only generate high revenues, but also decrease expenses [10]. “The potential annual salary savings created by chatbots is estimated to be 12 billion US Dollars in insurance sale, 15 billion for financial services and sales representatives, and 23 billion for common customer service personnel in the US,” according to Zumstein and Hundertmark [10].

1.2 Discussion Outline

To better understand the use, importance, and the challenges of chatbots, this paper is divided into four sections. After an introduction, the term chatbot is defined, and its technical functioning is explained in Section 2. Section 3 outlines the benefits and challenges of chatbots. In the main Section 4, the study results of the impact of implementation of chatbots are presented. The study was based on surveys conducted by chatbot system developers Drift, NextIT, and Intercom. Finally, Section 5 gives a conclusion and an outlook. [1, 10]

2. MATERIALS AND METHODS

THE USE OF CHATBOTS

2.1 Definition

The word “chatbot” consists of the terms “chat” and “robot.” Originally, the term chatbot was used for a computer program which simulates human language with the aid of a text-based dialogue system. According to Shawar and Atwell [8], “Chatbots contain a text input and output mask, which allows mobile users to communicate with the software behind them, giving them the feeling of chatting with a real person.” Since the introduction of smartphones and mobile applications, shortly apps, the term chatbot is mostly used for messenger apps rather than for pure computer programs [10].

2.2 Mode of operation

Generally, chatbots have quite similar technologies and architectures. Figure 2 shows the technical process of a chatbot when a mobile user makes a request until the appropriate answer is sent by the chatbot. [10]

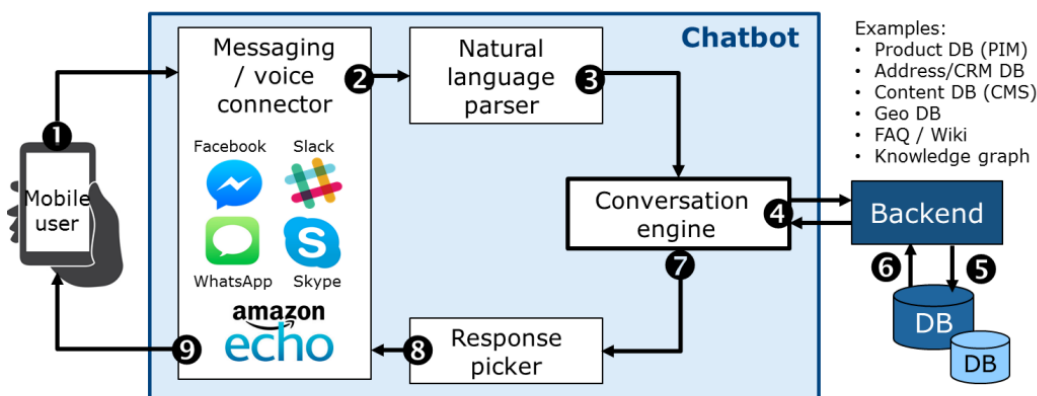


Figure 2. Operating mode of chatbots (Source: Following Weidnauer 2016)

The process starts with a user's request using a messenger app like Facebook, WhatsApp, WeChat or Skype, or an app using text or speech input. The user request is recorded by a so-called Natural Language Parser and is translated into the programming language of the conversation engine. Following translation, the conversation engine analyses the question and redirects it to the backend. “The backend is connected to one or several databases (DB) or information systems (IS), which give the request to the corresponding query” [1, 10].

The answers are retrieved from the Databases or Information Systems. The chatbot matches the given question with the database(s) in the backend. Once the appropriate result is retrieved from the backend, the conversation engine forwards it to the response picker. In the

last step, the answer, which is still in the programming language of the chatbot, is translated into the natural language of the user and is sent to the user interface. [10]

2.4 Application Fields of Chatbots

According to Zumstein and Hundertmark [10], the fields of applications of chatbots are manifold:

- Calendar assistants (chatbots for scheduling meetings and appointments like X.ai, Rhonda)
- Chatbots for reserving or purchasing event tickets (e.g. Morph.ai)
- Chatbots for searching and buying products online (e.g. H&M, chatShopper, eBay).
- Chatbots for booking hotels, trips and flights (e.g. KLM, Swiss, Austrian Airline chatbot).
- Chatbots for news (e.g. CNN, NBC & BBC News)
- Chatbot in the Facebook messenger
- Chatbots for weather Forecasting (e.g. Hi Puncho), traffic (e.g. Traffic News & Traffic Jam) and financial services (e.g. Trading Bot).
- Chatbots used for customer and delivery services.

3. BENEFITS AND CHALLENGES OF CHATBOTS

3.1 Strengths and Benefits of Chatbots

Chatbots change the way of informing, communicating, and transacting between the company and its customers or other external stakeholders. On the other hand, internal chatbots may strongly influence and change the future organization, communication, and collaboration within the company [10]. Using chatbots, consumers and businesses can communicate 24 hours a day, 7 days a week, independent of working or opening hours. Companies can save on personnel costs in customer services, do not take the risk that they cannot be reached outside their business hours, and do not miss customers' requests. [10]

A further advantage is one-to-one communication. So far, users often must search and browse a website for a long time to find the right information regarding, for instance, a product, price, service or contact information. In the case of complaints or other customer service inquiries, chatbots are helpful, straight-forward, and efficient. [10]

3.2 Weaknesses and Threats of Chatbots

Companies should be aware, however, that it will take some time for customers to adapt before getting used to new communication and buying methods. In a transition phase, most classical (offline and online) channels must still be provided and customers should be motivated and incentivized to use new technologies and tools.

Another crucial concern for both providers and users is data protection. If companies offer a stand-alone chatbot app, they are responsible for protecting and handling customer data adequately. Chatbot developers and operators should ensure both data privacy and data protection [10]. Users need to be aware that providers of such platforms involving chatbots will gather personal data about users in order to better provide services. The following table summarizes important strengths, opportunities and risks of utilizing chatbots.

Advantages and Risks of Chatbots for Providers and Users

	Strengths & Opportunities	Weaknesses & Risks
For	▪ 24/7 customer service	▪ Malfunctioning chatbots &

providers/ companies	(anytime/anywhere) ▪ New & direct customer contact points ▪ New method & types of data collection ▪ High amount of personal user/usage data ▪ Personalization & automation of communication ▪ Reduction of service & support costs	unanswered questions ▪ Investments in IT infrastructure & chatbot tools ▪ Extension of IT & analytics architectures ▪ Lack of awareness & acceptance by users ▪ Information security & data protection ▪ Image & reputation risks
For users/ customers	▪ 24/7 customer services & support ▪ One-to-one communication on personal device ▪ High convenience & ease of use ▪ Time- & cost-savings ▪ Reduction on relevant information & services ▪ Relevant offers based on user preferences	▪ Privacy ▪ Data protection of personal & sensitive data ▪ Lack of experience & understanding ▪ Biased personalized information ▪ Artificial/non-human conversation ▪ Social isolation & ethical concerns

4. RESULTS/DISCUSSION – IMPACT OF CHATBOT IMPLEMENTATION

Bots can be anywhere at any time - a desktop workstation, tablet, smartphone, or even home computer. Done well, with sophisticated analytics, interacting with bots in the workplace could feel as natural as talking to a friend. The use of chatbots to book travel, deliver documents, explore sales leads, on-board employees, or resolve technical challenges will:

- ✓ Empower Customer Service
- ✓ Simplify Purchases
- ✓ Deliver Workplace and Personal Assistance
- ✓ Advance Banking & Finance
- ✓ Improve Commerce & Retail
- ✓ Update and Improve Healthcare Delivery
- ✓ Simplify Travel & Hospitality
- ✓ Address Insurance
- ✓ Incorporate Media and Entertainment

In this paper, 6 case studies of companies that used chatbots successfully are selected and then reviewed. The key statistics and major takeaways for the companies are studied. The findings are discussed and conclusions are drawn here.

4.1 Six Case Studies of Companies that used Chatbots Successfully: [3,6]

Industry	Chatbot System	Key Statistics	Major Takeaways
1. Amtrak			
Public transportation	NextIT	• 5million questions answered by chatbots annually • 800% return on investment. • Increased bookings by 25%. • Saved \$1,000,000 in customer service expenses in a single	• Chatbots with advanced AI provide site visitors with a “self-service” option.

		- year • Over 5,000,000 questions answered every year. • Bookings through chatbots generate 30% more revenue.	
2. Anymail finder			
Email verification software (SAAS)	Intercom	• 1 in 3 buyers used the chat system before making a purchase. • 9 out of 10 “big buyers” used the chat system before making a purchase. • Estimated 60% of revenue comes from chatbots. • Average response time was three minutes in their first 30 days of using Intercom.	• Chatbots allowed a two-person team to stay on top of support and sales. • Popular customer questions provided content ideas, and eventually prewritten responses.
3. RapidMiner			
Data Science software	Drift	• Replaced all lead capture forms with chatbots • 4,000 leads generated by chatbots • 25% of sales pipeline was influenced by chatbots	• Chatbots can bypass lengthy lead generation campaigns
4. MongoDB			
Database/development platform	Drift	• Increased net new leads by 70% in three months • Increased total messaging response by 100%	• Chatbots are more scalable than live chat services. • Chatbots can help your customer service and sales teams by scheduling meetings and screening inquiries
5. Perfecto Mobile			
Web, mobile, and IOT testing platform	Drift	• Visitor-to-lead conversion rate increased from 6% to 20% in six months.	• Targeted chat let sales reps focus on leads who were likely to buy. • Bypassing forms meant qualified leads could move through the pipeline faster.
6. Charter Communications			
Cable/Internet provider	NextIT	• 500% return on investment within six months. • Reduced live chat volume by 83%. • Decreased time it took customers to reset passwords by 50%.	• Common customer service questions are now handled completely through the chatbot. • Chatbots can resolve issues faster by

			reducing handoffs.
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4.2 General Findings

The chatbot knows its users like a good friend and offers them appropriate offers, solutions, and services at the right time. Chatbots are very promising for international and digital companies like online retailers or web shops [10]. Apart from communication and transactions with clients, chatbots offer new potentials within the firm. For example, chatbots are used for supporting and training purposes for employees. Another example is the digital onboarding of new staff members [10]. Instead of long onboarding processes of colleagues, chatbots take over the introduction of new team members, internal communication, and standard processes and tasks. [10]

1. **Replacing Mobile Apps:** Chatbots as a new information, communication, and transaction channel enable businesses to reach their target audience through messenger apps like Facebook, WhatsApp, or WeChat. According to Gartner, the world's leading research and advisory company, by the year 2021, 50% of enterprise companies will spend more on chatbots and bot creation than they will on traditional mobile app development. [7,9]
2. **Enhanced Conversational User Experience:** Gartner also reports that by the year 2021, “conversational AI-first” user experience, or CUX, will be adopted by most enterprise organizations. CUX is a newer version of UX design, and it's expected to gain more significance in the next few years. Its main purpose is to help users reach their end goal as quickly as possible, all while delivering the best experience for them.
3. **Mainstream Adoption and Moving beyond Customer Service:** Using chatbots, businesses will dramatically cut response and interaction times via phone and social channels. The best chatbots interact with more people faster than humans will ever be able to.
4. **Retail to Cash in on Chatbot Invasion:** The retail sector will gain the most benefits from chatbot technology; by 2023, over 70% of chatbots accessed will be retail-based [5].

Drawbacks

- **Human validation is critical for chatbot owners:** Although chatbot technology has been around for a while, many businesses do not include human validation to enhance chatbot interaction – and consumers are unhappy with chatbot performance. The lack of integration with human-assisted service was considered to be the biggest pain point in using virtual assistants [3].
- **A chatbot does not begin its tasks fully knowledgeable about the company.** “Over time, the bot becomes better able to serve customers, managing otherwise mundane tasks to free up more of employees' time” [3].

5. CONCLUSIONS AND OUTLOOK

Chatbots are taking the tech world by storm. According to Gadiyar [4], “This technology – which helps humans converse with computers in their native language via a computer interface – is becoming popular in a multitude of scenarios, especially those involving customer service. One issue with chatbots' future viability is developers' focus on enabling more natural and human-like conversations with users. This is a lofty goal, given that AI is not yet able to deliver on the promise of natural language processing.” Another issue is that, over time, chatbot novelty will wear off [4].

To make chatbots effective, keep the design simple, and “conversation” to a minimum. Creating utility bots that specialize in specific tasks, provide recommendations to users and excel at helping users complete those tasks. Rapid, contextual responses will be key to improving outcomes. By incorporating visual aids, chatbots can reduce the time and effort spent on interacting with the chatbot, resulting in a quality user experience.

5.1 The Future of Digital Business

The bots will, without a doubt, greatly save time for personal-consumption activities and simple tasks. In the workplace, artificial intelligence has already created new expectations with real-time feedback, guidance, and innovative workflow solutions [4]. The right balance of bot and human will certainly be different for every company. Nevertheless, an intelligent mix of humans and technology is the future of digital business – and doing it in a way that makes customers happy.

5.2 Chatbots as Replacement for other Communication Methods

Today, thousands of organizations are developing, testing, and providing chatbots for mobile smartphones. In the future, chatbots can complement or even replace traditional information, communication, and sales channels like newsletters, websites, sales desks, or hotlines. With chatbots, both companies and users can initially, directly, and personally contact at anytime and anywhere, something that is not possible in this way with traditional channels like websites, newsletters, or hotlines. In addition, chatbots can communicate to prospects and existing customers based on context and location and allow for personalization as well as one-to-one marketing. [10]

However, it must be ensured in digital marketing and digital business that chatbots can understand and edit most user requests without human help. “If this is not possible,” say Zumstein and Hundertmark [10], “a customer consultant should be available in the background to service the customer.” However, a replacement of apps, websites, and web shops cannot be observed so far. Most users are still used to and bound to conventional communication and transactional channels like mobile apps and websites. This setting will probably continue for a couple of years. “Since current chatbots still are not able to adequately cover all features, chatbot technologies and their applications should be developed and improved by researchers, by the software industry, and by digital businesses” [10]. Chatbots are next generation intelligent information and communication systems which (will) make our lives easier and more convenient [4].

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