

## Why people use chatbots

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**Abstract.** There is a growing interest in chatbots, which are machine agents serving as natural language user interfaces for data and service providers. However, no studies have empirically investigated people's motivations for using chatbots. In this study, an online questionnaire asked chatbot users (N = 146, aged 16–55 years) from the US to report their reasons for using chatbots. The study identifies key motivational factors driving chatbot use. The most frequently reported motivational factor is “productivity”; chatbots help users to obtain timely and efficient assistance or information. Chatbot users also reported motivations pertaining to entertainment, social and relational factors, and curiosity about what they view as a novel phenomenon. The findings are discussed in terms of the uses and gratifications theory, and they provide insight into why people choose to interact with automated agents online. The findings can help developers facilitate better human–chatbot interaction experiences in the future. Possible design guidelines are suggested, reflecting different chatbot user motivations.

**Keywords:** Chatbots, motivations, uses and gratifications.

### 1 Introduction

Chatbots represent a potential shift in how people interact with data and services online. While there is currently a surge of interest in chatbot design and development, we lack knowledge about why people use chatbots.

Chatbots are machine agents that serve as natural language user interfaces for data and service providers [1]. Currently, chatbots are typically designed and developed for mobile messaging applications [2].

The current interest in chatbots is spurred by recent developments in artificial intelligence (AI) and machine learning. Major Internet companies such as Google, Facebook, and Microsoft see chatbots as the next popular technology; Microsoft CEO Satya Nadella said, “Chatbots are the new apps” [3]. In Spring 2016, Facebook and Microsoft provided resources for creating chatbots to be integrated into their respective messaging platforms, Messenger and Skype. One year later, more than 30,000 chatbots have been launched on Facebook Messenger. Other messaging platforms have also seen a substantial increase in chatbots, including Slack, Kik, and Viber. Chatbots are seen as a means for direct user or customer engagement through text messaging for customer

service or marketing purposes [4], bypassing the need for special-purpose apps or webpages.

However, it is not simple to transition from established user interfaces, such as web pages and apps, to chatbots as a common means of interacting with data and services. For example, there is a lack of knowledge regarding how customers react to the substitution of human customer service personnel with chatbots or how the presence of chatbots in online social networks affects multi-party conversations and the spread of information [5].

Since the initial optimism regarding the launch of chatbots by Microsoft and Facebook, a number of commentators have noted that users' adoption of available chatbots is less substantial than hoped [6]. This could be explained by the fact that most available chatbots fail to fill users' needs due to unclear purposes, nonsensical responses, or insufficient usability [7].

Designing a new interactive technology such as a chatbot requires in-depth knowledge of users' motivations for using the technology, which allows the designer to overcome challenges regarding the adoption of the technology [8]. More general knowledge is also needed to understand human–chatbot relationships. To our knowledge, no studies to date have investigated users' motivations for interacting with chatbots.

As a first step towards bridging this knowledge gap, we perform a study addressing the following research question:

RQ: *Why do people use chatbots?*

The study contributes new knowledge regarding individuals' motivations for using chatbots based on an online questionnaire completed by US chatbot users. The questionnaire includes an open question regarding the participants' main motivations for using chatbots. The findings obtained using this approach can inform future designs intended to improve human–chatbot interactions.

Before we present the findings, we will first describe the relevant background for our study. We then present the method and findings of the study. In the discussion, we address the implications of the study's findings for the design and development of chatbots.

## **2 Background**

### **2.1 Chatbots and natural language user interfaces**

Although the last few years have seen increased interest in chatbots, natural language interfaces are not new in the fields of computer science and Internet studies. In the 1960s, Weizenbaum published an innovative study on natural language interaction with ELIZA, a computer program developed to mimic the responses of a psychotherapist in a therapy session [9].

Dale discusses “the return of chatbots” in recent years and discusses how the current interest in this technology is rooted in previous work on natural language user interfaces [1]. In particular, Dale notes the impact of the Loebner Prize, which has driven natural language user interfaces to be more human-like since 1991, and Pandorabots, a chatbot platform that includes more than 200,000 bot developers as of 2016. The best-known chatbots are Cleverbot, which was publicly launched in 1997; A.L.I.C.E., the winner of the Loebner Prize in 2000, 2001, and 2004; and Mitsuku, the winner of the Loebner Prize in 2013 and 2016.

The current interest in chatbots is likely related to substantial advances in computing technology and the wide adoption of mobile messaging applications.

First, recent advances in artificial intelligence and machine learning have led to the recent interest in chatbots. These advances promise vast improvements in natural language interpretation and prediction capabilities, including improvements in machine translation [10]. In addition, progress in conversational modeling suggests that predictions based on recurrent neural networks and sequence-to-sequence models will outperform the rule-based conversational modeling typically applied to traditional chatbots [11].

Second, the increased adoption of mobile Internet and messaging platforms have driven the adoption of chatbots [2]. Through mobile messaging platforms, chatbots are able to reach a large part of the online population. According to *Business Insider* (2016), about 3 billion people worldwide use mobile messaging applications such as Facebook Messenger, WeChat, Skype, Telegram, Slack, Viber, and Kik. For many users of these services, natural language is expected in online interactions, making automated marketing and customer service using natural language a promising business opportunity.

## 2.2 Chatbot applications

Chatbots may serve a number of purposes, such as customer service, social and emotional support, information, entertainment, and ties the user to other people or machines. The great variety of chatbots is exemplified in the BotList (<https://botlist.co/>), a website on which people can find chatbots for a broad range of purposes available on multiple messaging platforms.

In particular, chatbots are seen as a promising alternative to traditional customer service [4]. For customers, conversations with these bots may feel more natural and efficient than interacting with a mobile app as they can obtain answers to questions, receive suggestions for purchases, place orders, and keep updated on shipping through a natural language interface.

A range of chatbots serve as virtual assistants or stewards, helping users to perform specific tasks. The Indian chatbot Nikibot can help users with, for example, booking a taxi and ordering food for delivery [12]. In addition, Do Not Pay, based in the UK, helps users file complaints when they receive parking tickets and Babylon Health’s chatbot interface provides medical advice. In such scenarios, chatbots may be preferable to other means of assistance, such as a phone call or online search, due to their convenience and immediacy.

Chatbots can also help people explore online content or services. For example, Microsoft launched Heston Bot to help users explore food and cooking opportunities. Additionally, the global fashion and clothing company H&M launched a chatbot to provide personal fashion advice based on photos uploaded by users [13].

"Smalltalk" orientated chatbots such as Mitsuku and Jessie Humani can also fulfill people's need for entertainment and social interaction.

### **2.3 User behavior and experience**

Although little is known about what motivates people to use chatbots, there is a substantial body of research on users' behavior and experience with chatbots.

Users' interactions with chatbots often mimic interactions between humans, but there are differences. In a study comparing human-human interactions to human-chatbot interactions, Hill et al. found that human-chatbot interactions tend to last longer than human-human interactions between strangers and involve shorter messages, less complicated vocabulary, and more profanity [14].

Corti and Gillespie investigated whether users seek to repair misunderstandings in conversations with natural language user interfaces, which is important in any type of dialogue [15]. They found that, for chatbots perceived as human, users made more of an effort to repair misunderstandings than did users that perceived the chatbots as automated [15].

Several studies have investigated users' experiences with chatbots. For example, Holtgraves et al. explored how users perceive chatbots' personalities [16], and De Angeli et al. studied how the implied anthropomorphism of chatbots may elicit negative responses among users [17]. Comparing the conversational ability of a chatbot based on the original ELIZA program to newer chatbots, a study [10] found that the participants were able to systematically differentiate the conversational quality of different chatbots. In addition, different demographic groups tended to rate the chatbots' conversational quality differently; specifically, younger users and female users rated the conversations more favorably [10].

It may be important for chatbots to engage emotionally with users. A recent study by Xu et al. on customer service chatbots found that about 40% of user requests to customer service are emotional rather than seeking specific information [3]. Without the ability to relate to these customers emotionally, a customer service chatbot risks failure.

### **2.4 Uses and gratifications – a theoretical framework**

As a theoretical basis for understanding people's motivation for using chatbots, we apply the well-established uses and gratifications theory (U&G) [18]. U&G explains why and how people use specific media to fulfill specific needs; the specific use of a medium depends on the expected and experienced gratification it will provide. U&G has typically been oriented towards consumers' use of media that is not related to work [19].

The theory assumes that the user is goal-driven in his or her selection and use of a particular medium based on social and psychological needs or gratifications.

In a complex media landscape or so called high-choice media environments, where users can choose to achieve their goals through a number of different media, such as webpages, apps, and chatbots, U&G assumes that the user takes an active stance towards which medium that best suits the purpose. Rubin describes U&G as a highly compatible approach to understanding the uses and effects of electronic media in the current media landscape [18].

The framework classifies users based on the gratification (or motivation) received from a particular medium, and it assumes that media users actively choose a medium depending on what they see as fit to satisfy a particular need [20]. Specifically, “uses and gratifications” refer to the motivation for use of a specific medium and the satisfaction people gain from use [21]. A wide range of gratifications have been suggested as motivators of media use [22], such as the need for information, entertainment, social interaction, and self-expression.

While the fragmentation of the media landscape due to the adoption of mobile Internet may change users’ motivations for choosing certain media, Sundar and Limperos concluded that the gratifications for use of Internet technologies are similar to the gratifications for use of other media [22]. However, there are substantial variations between media contexts, which means that it is important to identify gratifications that are relevant to the context of the medium of interest. Identifying the gratifications that are important to chatbot users will help guide the development and design of new and existing chatbots.

Chatbots are a new technology, and as such, are mostly used by innovators and early adopters. These users might have different needs and gratifications than the rest of the population. The theory of diffusion of innovations explains how such innovations are adopted by a population. One of the insights that might be useful in combinations with U&G theory is the understanding the various user needs and gratifications among different user segments in the population, suggested by Rogers: Innovators: 2.5% Early Adopters: 13.5%, Early majority: 34%, Late majority 34%, Laggards 16%. Early adopters are usually more risk-oriented and curious about new technologies, while the early and late majorities and laggards are more conservative and risk-averse [23].

## **3 Method**

### **3.1 Study design and materials**

To explore why people use chatbots and reach a sufficiently broad sample of chatbot users, a questionnaire was used. The questionnaire included 17 questions regarding chatbot use, including motivations for and experiences with chatbots, and respondents’ demographics (age, gender, and state of residence).

In line with the exploratory aim of the study, the question addressing respondents’ motivations for chatbot use was open: *What is your main reason for using chatbots?* The participants were asked to answer this open question freely. The question was

adapted from a study by Brandtzæg and Heim [24] focusing on motivations for using social networking sites, as it encouraged participants in that study to provide personal descriptions of their motivations for using certain media.

Other key questions regarding chatbot use explored how often participants used chatbots, how long they had used chatbots, and the messaging platforms on which they used chatbots.

### 3.2 Participant recruitment and filtering

To understand users' motivations for chatbot usage, our target group in this study consists of only chatbot users. However, due to the newness of chatbots, most people in the mass market likely have not had any experience with chatbots, and many may not even know what chatbots are. Furthermore, no statistics regarding chatbot usage are available globally or for specific countries. Hence, recruiting participants for this study was challenging, as we had to not only identify relevant participants but also filter out non-relevant participants.

We decided to target chatbot users in the US as the technology companies that prioritize chatbots—Google, Facebook, Kik, and Slack—are all focused on the US market. We also decided to target a relatively young user group (those aged 16–55 years). We consider users within this age group to be more likely to be early adopters of chatbots than older users (e.g. [23]) as the former more frequently use messaging applications.

Data were collected in April 2017 by Survata, an independent US-based research company. Survata collect research samples by partnering with online publishers, which allow visitors to take a Survata survey to unlock premium content (e.g., premium articles, e-books, and videos). To identify and avoid invalid survey responses, Survata's technology analyzes respondents' response time, response pattern, and other metadata.

To identify relevant participants, the following screening question was applied: *Chatbots are automated online services that you interact with in text-based conversations, typically in instant messaging platforms such as Facebook Messenger, Kik, Slack, and Telegram. Have you used such chatbots?* Only those who responded positively to this question were allowed to take the survey.

As the screening question may not have been sufficient to filter out all non-chatbot users, we also analyzed users' responses to the open question. Specifically, we scrutinized the answers for indication that the participants discussed general use of messaging platforms rather than interaction with chatbots. This process identified 155 of the 301 participants as non-chatbot users. We are confident that the remaining 146 participants are actually within the target group of chatbot users.

### 3.3 Data analysis

Data obtained from responses to the preset questions were analyzed through descriptive statistics using the SPSS 24 statistical package.

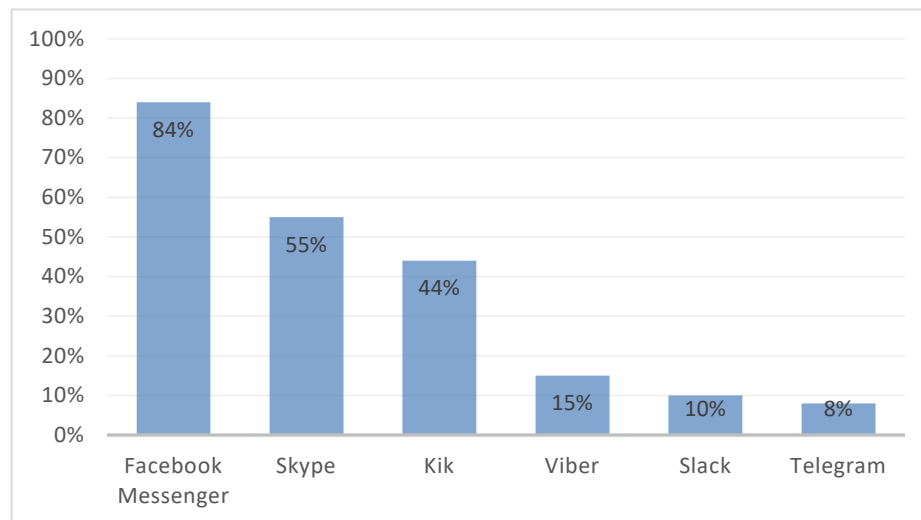
Qualitative data regarding participants' open answers underwent content analysis based on the coding categories established through an initial thematic analysis. Content

analysis has proven to be useful for describing and making inferences about respondents' communications and patterns of usage as well as the consequences of communication [24].

The two authors collaboratively coded the open answer data in order to develop and apply the categories of motivation. Participants' responses to the open question could include more than one such category. These categories were then used by one of the authors to code the entire data set. In total, 16% of the responses were coded as addressing two or more themes. To ensure reliability, the other author reviewed the coding and made suggestions when necessary. The suggestions were reviewed by both authors, and then the final coding was performed. In total, 21% of the initial codes were updated.

## 4 Results

In total, 146 valid responses were gathered. Of these, 94 were written by females, and 52 were written by males. The mean age of the participants was 30 years (min = 16, max = 55, SD = 9.2). As shown in Figure 1, the participants reported use of chatbots on various platforms, with Facebook Messenger being the most common, in line with the broad adoption of this platform in the US.



**Figure 1.** Proportion of participants reporting use of different messaging platforms for chatbot interactions (N = 146).

In general, the participants were fairly new to using chatbots; 64% reported using chatbots for two years or less. Thirty-four percent of the participants reported using Google Assistant, a chatbot assistant available for select Android operating systems as well as on the Allo messaging platform.

In the open question regarding participants' motivations for using chatbots, all participants provided an answer. The thoroughness of the answers varied substantially, with the longest answer being 390 characters and the shortest being 5 (mean = 76; SD = 66).

The thematic analysis of the answers revealed four main categories of motivation. An overview of the categories is provided in Table 1. In the remainder of the results section, we present the detailed findings for each category.

**Table 1.** Categories of motivation for chatbot use (N = 146). Note: 16% of the responses were coded as addressing two or more themes.

Category	Description	Frequency
Productivity	The comment concerns the convenience of using chatbots (whether they are easy or fast to use). Participants typically report using them to obtain assistance or information.	100
Entertainment	The comment concerns the entertainment value of using chatbots (whether they are fun to use). Some report that they use chatbots when bored to kill time.	29
Social/relational	The comment concerns the use of chatbots for social or relational purposes. Typically, chatbots are seen as a personal, human means of interaction that may have social value. Some also use chatbots to strengthen social interactions with other people.	18
Novelty/ Curiosity	The comment concerns the use of chatbots out of curiosity or because they are a novelty. Often, the stated aim is to investigate chatbots' capabilities.	15
Other	The comment concerns motivations that do not fit in the above categories and are not sufficiently frequent to justify a separate category.	12

#### 4.1 Chatbots for productivity

The vast majority of participants (68%) reported productivity to be the main reason for using chatbots. These participants highlighted the ease, speed, and convenience of using chatbots. Also, they noted that chatbots provide assistance and access to information.

##### **Ease, speed, and convenience**

Forty-two percent of participants reported ease of use, speed, and convenience as their main reasons for using chatbots. These motivations are exemplified in the following statements:

*To get answers quickly. It's important. (P40)*



*It saves me the hassle of having to place a call, have to wait to speak to a person, then trying to get the information from that person. It also saves time in having to look through tons of text to find answers. (P58)*

*They are fast and almost as fast as searching on the internet. (P252)*

As reflected in the above examples, the participants' responses suggested that they highly appreciated when chatbots helped them save time or made it easier and faster to obtain help or information, such as by providing efficient assistance in a customer support situation or by pointing to an easy-to-use manual or FAQ. Five percent of the participants explicitly stated that they use chatbots to avoid waiting for assistance, such as the following participant:

*There is no wait time to talk to a representative to find out basic info I'm looking for. The chatbot can answer basic questions and is ready whenever I need an answer. (P83)*

Another five percent reported that they preferred to obtain help from a chatbot rather than a human assistant, such as in the following example:

*Chatbots are important because you won't feel stupid asking important questions. Sometimes talking to someone can be a bit intimidating. Talking to a chatbot makes that a lot easier! (P82)*

#### **To obtain help and information**

Many participants (41%) also reported that the ease of obtaining help or accessing information were main motivations for using chatbots. These people perceived chatbots as useful in their daily online activities, as exemplified by the following statements:

*I use chatbots instead of a search engine to help with daily tasks. (P67)*

*I like to travel and find many different places to visit and chatbots give me great advice. (P113)*

*Finding information about weather and news stories. (P251)*

Eighteen percent of participants reported ease, speed, and convenience as well as help and information as motivation for using chatbots, including the following participant:

*I believe the main reason for using chatbots is to give you help if you have any questions anytime when you need it, because the thing is when you ask a friend for help on kik or any time of messaging app they won't reply as quick as chatbots do. (P151)*

Three participants reported that they appreciated being able to configure chatbots to receive better help with their personal tasks, as in the following statement:

*I use chatbots because I can tailor them to find things, styles, weather, or orders that are specific and unique to me, so I can shop, research, or just chat with ease. The more input I put into them about me, the more they will serve efficiently. (P176)*

#### **4.2 Chatbots for entertainment**

A substantial proportion of participants (20%) reported using chatbots for entertainment. Though much smaller than the proportion of participants that use chatbots for increased productivity, this motivation category was the second most frequent.

Most of the participants reporting use of chatbots for entertainment value (14% of the total sample) described this as a positive value, with chatbots perceived as “fun” and “entertaining”:

*It's fun and entertaining. I like chatbots that have funny things to say. (P99)*

*Usually to ask a question and be entertained with an answer. (P301)*

Others reported using chatbots for entertainment in a more negative fashion, to kill time:

*I usually use chatbots when I am bored or have nothing to do so I use them to waste some time. (P61)*

*I am bored and want to talk to someone. (P232)*

About one-third of the participants within this category (7% of the total participant sample) reported both productivity and entertainment as motivations to use chatbots, as reflected in the following statement:

*Chatbots can help me with simple tasks on the app I'm using. Also, they give me fun tips and make my experience a lot better. It gives me something different to do when I'm bored. (P199)*

#### **4.3 Chatbots for social and relational purposes**

The third most frequently reported reason for using chatbots is the potential social and relational benefits they can provide. This category of motivation was reported by 12% of participants.

It is noteworthy that, while chatbots can enhance interactions between humans, most of the participants addressing social and relational motivations commented on the social experience of interacting with the chatbot (10% of the total participant sample). For example, the chatbot is perceived as a way to avoid loneliness or fulfill a desire for socialization:

*At the time i was bored and i didnt have anyone to talk to and i feel like sometimes their good to make friends with if your lonely and just want a chat with someone else. (P141)*

*I use them when I feel bored or rather when I feel down and have no one else to go to, it just relaxes me in a way. Gives me someone to vent to without getting judged, I know they aren't real but it feels like it is. (P264)*

*Always open to talk and I live in country and not many people around me to talk too. (P234)*

Some participants (3% of the total sample) reported that chatbots enhanced their social experiences with others, such as when including a chatbot in a group chat, using a chatbot with a child, or to improve one's own conversational skills:

*To have a little extra fun in the chats I'm in. (P268)*

*Normally to get information, but I also like using them for my kids to talk to characters. (P60)*

*To build conversation skill. (P80)*

More than one-third of the participants reporting social and relational motivations (5% of the total participant sample) also mentioned productivity. The ability for chatbots to meet one's social and relational needs and improve productivity is seen as a benefit, as in the examples below:

*So I can have someone to talk to AND it searches for me. Without me using the net. (P243)*

*They are like personal assistants and easy to use because they are built into the apps themselves. I don't need to download extra apps I just talk to them directly on the app that I'm using, i.e. Facebook Messenger. I like that because it's a hassle using so many different apps. Also there's a sense of talking to someone when I use them. It's almost like you are talking to a real person. (P116)*

#### **4.4 The novelty of chatbots**

The fourth main category of motivation for using chatbots is the novelty of chatbots, reported by 10% of participants. These participants typically stated that they are curious to explore chatbots and the limits of their abilities:

*Trying something new. (P104)*

*[...] I'm also curious to see what they'll say or how realistic they seem. (P59)*

[...] *It's interesting to see what people can come up with, how lifelike they will become. Sadly, very few pass the test. They are all repetitive in some way.* (P88)

Some of these participants seem to be attracted to the fact that chatbots are still in an early phase of development, suggesting that they enjoy being early adopters of technology:

*They're new and intriguing.* (P66)

Others were skeptical of the new interactive technology:

*Curiosity, mostly, because I have skepticism about the privacy of it and the evidence based knowledge that it is assuming is accurate when answering a question.* (P69)

#### **4.5 Other motivations**

A small proportion of the participants discussed motivations that did not fit into the four main categories presented above and were not sufficiently frequent to justify separate categories.

Examples of such motivations (all of which were reported by only one participant each) include the following:

- It is easier to talk to a chatbot than to talk to people about important issues.
- Chatbots can provide automatic responses when others are not available.
- One can more easily identify an account as a bot and subsequently block it.
- Chatbots can be a default method of customer support.

Three of the comments coded as “other motivations” were difficult to comprehend.

## **5 Discussion**

We have provided an overview of why people use chatbots and listed participants' responses to an open question regarding their motivations for using chatbots. In this section, we will discuss the findings in terms of U&G. We will then consider the implications of our findings for the future design of chatbots. Finally, we will discuss the study's limitations and possible avenues for future research.

### **5.1 Productivity is important**

Productivity was the most frequently reported motivation; thus, the majority of chatbot users seek quick and consistent feedback when searching for information or assistance. This finding might reflect the use of chatbots in the customer service domain. This

finding may also reflect a general trend for users to gravitate toward immediate communication channels. The broad adoption of private messaging platforms such as Facebook Messenger, WhatsApp, and Snapchat reflects users' interest in more instrumental or goal-directed communication with fewer interruptions compared to regular communication on Facebook and Twitter.

Information has been recognized as an important category of gratification in previous U&G studies, [22]. Yet, the typical chatbot user's need for information may require more immediacy and interactivity than the information needs associated with other media. This hypothesis is in line with recent research identifying young social media users' need for instant gratification. For example, Brandtzaeg [25] suggest that youths communicating with organizations through social media crave immediate feedback and dialogue and action-oriented engagement in order to achieve a clear goal.

Other studies have highlighted the fact that many people, particularly those from Western cultures, seek to spend time productively and may feel guilty when they waste time [26]. Similarly, users in this study often referred to the quick response and productivity of chatbots as key motivations for using them. The need for productivity might be specific to certain cultures, and so it may be worth investigating in this user group.

Instant need for informational feedback may also be related to the concept of usefulness. Usefulness concerns the extent to which a service is perceived as beneficial by performing a specific task quickly and reliably [27]. For chatbots to be successful in the studied user group, they must help users resolve a task or achieve a concrete goal in an effective and efficient manner; in other words, they need to be easy, fast, and convenient. Also, they need to fulfill a valued productivity goal, such as getting help or access to information on the fly.

## **5.2 Entertainment and social motivations motivate fewer people but are important to some**

Entertainment and fun are important aspects of social relations between humans. Likewise, entertainment and socialization may be seen as aspects of the relationship between humans and chatbots. The need for entertainment and a sense of social relationship is also highlighted in U&G and recent U&G studies on social media in particular [24] and online media in general [22].

Many activities in our daily life involve socialization and entertainment. Consequently, Thackara [28]. argues that systems should provide users with a social platform or sense of community to generate good user experiences. Similarly, Monk suggests that interactive systems should be designed to support enjoyable social interactions [29]. Sensitivity to this need for entertainment and social relations might be even more important in the context of chatbot design because chatbots are more humanlike than other interactive systems. Thus, users may expect chatbots to be entertaining or social.

Yet, it should be noted that entertainment and social motivations do not exclude productivity motivations. On the contrary, more than one-third of the participants reporting entertainment or social motivations also reported productivity motivations. People want to get their jobs done, but many prefer to do so in a social and enjoyable manner.

### 5.3 Novelty is a motivator for some

Curiosity as a motivation related to news consumption or information-seeking behavior has been identified as a key gratification in previous U&G studies. For example, McQuail [30] argues that “satisfying curiosity and general interest” (p. 87) is a key gratification associated with media use. Such U&G studies have, however, focused on gratifications related to information and content in the context of older mass media such as television and newspapers, not on motivations related to the novelty of interactive technologies such as chatbots.

As discussed in the background of this paper, the curiosity and sense of novelty associated with new technologies and features may be relevant at least for early adopters or innovators, and perhaps specific to these groups. The rest of the population will often view trying out novel technologies as a higher risk and therefore require assurance from trusted peers. This is thoroughly discussed in literature on theory of diffusion of innovations [23], but not in the literature on U&G.

According to Rogers, early adopters and innovators are risk-takers because trying new things may result in failure [23]. Many are interested in novel technologies because of personal entertainment, but early adopters and innovators are more interested in new experiences and learning things before others. For chatbot users, the perceived novelty of chatbots may drive some to use and experiment them. However, to establish a sustainable pattern of usage, chatbots must increase productivity for the late majority for this group to adopt chatbots as a preferred means of interaction.

### 5.4 Implications for chatbot design

A main challenge of user research on this topic is the rapid change in technological developments and user preferences [24]. related to chatbots [24]. However, some of the main motivations to use chatbots may be stable over time because they reflect basic needs, such as productivity and social interaction.

Our main findings relate to the key gratifications identified in earlier U&G literature: productivity, entertainment, social and relational purposes, and novelty. The importance of productivity as a motivation for chatbot use is striking, particularly because chatbots for socializing and small talk, such as A.L.I.C.E, Cleverbot, and Mitsuku, have been available for longer than the productivity-oriented chatbots on messaging platforms. Hence, chatbot designers should focus on designing and developing chatbots that are perceived as useful because they provide necessary help or information in an effective and efficient manner. To do so, chatbot designers must identify cases in which chatbots fulfill users’ need for productivity more efficiently than what is possible through other methods of interaction. The success of chatbots as personal assistants and health advisors exemplifies the need to design for productivity.

In addition to considering productivity, the chatbot interaction experience can be significantly strengthened by catering to entertainment and social or relational motivations. For example, a productivity-oriented chatbot may benefit from a friendly or empathic appearance. Leading chatbot platforms like Google's Api.ai, include components to support small talk, such as to start a conversation. While the overall purpose of a

chatbot may be productivity-oriented, including socialization or entertainment as a feature will be appreciated by a substantial proportion of chatbot users.

The need to balance productivity with entertainment and relational aspects indicates that the relationship between humans and chatbots may be different than the relationships between humans and other tools, such as dishwashers or refrigerators. Thus, chatbots may need to be designed as a tool, toy, and friend.

### **5.5 Limitations and future work**

The present study is subject to limitations. First, the chatbot users that participated in this study were both self-selected and filtered by some initial questions. They are, therefore, not representative of the population at large. The participants consisted only of chatbot users, and should therefore be regarded as early adopters, comprising about 14 percent) of population which, is first to try new ideas, technologies, and services. This may explain why a lot of respondents perceived chatbots to be helpful and efficient. Early adopters may be fundamentally optimistic about future technologies. Hence, this part of the population may focus on the future potential chatbots rather on the current limitations. This also highlight the importance to include a broader part of the population in future studies. However, a strength of the present study is that the sample was large and included users from all over the US. Future studies may benefit from including chatbot users from other countries to determine how users' motivations change across cultures.

Second, the present study involves only a preliminary analysis of the presented data set. We plan to expand the results of this study with additional data collection and analysis in future work. We also plan to investigate how different motivational patterns are linked to age and gender and different chat platforms, as well as analysis of specific chatbots being used. Further, future work should analyze other aspects related to motivations and end-user loyalty, such as why people reduce or stop their use of chatbots.

## **6 Conclusions**

Chatbots potentially represent a new paradigm in how people will interact with data and services in the future. Currently, there is a lack of empirical investigations into why people use chatbots. This study provides needed insight into the motivational factors related to use of conversational interfaces. Its results can guide future research on this topic, which may provide new insights and guide future design and development of chatbots.

## **Acknowledgment**

This study is funded by the research project Human-Chatbot Interaction Design, supported by the Research Council of Norway, IKTPLUSS (p.nr 270940).

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