








# Chatbots as Strategic Tools in Organizations

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**Abstract.** The growing importance of artificial intelligence (AI) in the business and scientific context is evident. Organizations must begin to coexist and use AI as any other tool that increases their efficiency and effectiveness. Based on this, this research work focuses on the application of chatbots to improve operational efficiency and transform customer service. The main objective of this work is to have a perception of the real impact that chatbots have on companies, that is, to see the benefits and main challenges associated with their use. The main question of the study addresses the positive and negative impacts of implementing chatbots in companies, focusing on three fundamental areas: the first focuses on customer service, the second on the effectiveness of internal procedures and the third on interpersonal interactions in the business context. This study is justified by the need for companies to adapt to emerging technologies to increase competitiveness and efficiency, in addition to responding promptly to market demands. The study, no matter how much its authors try to reach the whole, is impossible. Thus, limitations of this study are pointed out, as well as suggestions for future work.

**Keywords:** Chatbots · Artificial Intelligence · Technology Acceptance Model

## 1 Introduction

When we talk about the effects of chatbots on organizations, we must consider that these effects/influences go beyond operational effectiveness; they, in strategic terms, advocate significant changes in them. From an operational point of view, chatbots provide a reallocation of human resources, as they automate repetitive tasks, allowing employees to focus on higher value-added tasks.

Literature indicates that chatbots are revolutionizing business operations by providing a scalable solution to enhance service and support. In operational terms, they reduce the demand for human intervention in repetitive procedures, allowing employees to dedicate themselves to strategic and complex tasks [1]. According to productivity research, using chatbots in first customer contact can reduce response time by up to 60%, and daily tasks are managed automatically [2].

From a strategic perspective, chatbots provide competitive benefits by enabling constant service and collecting valuable information about consumer preferences and attitudes. This data is commonly used to improve products, services, and marketing campaigns [3]. However, the growing dependence on chatbots also brings challenges, such as the requirement for technological integration and appropriate training for the human teams responsible for monitoring and updating them, in addition to possible internal resistance, particularly in relation to the fear of replacing functions.

One of the most advantageous features of chatbots is their scalability, allowing companies to expand their service capacity without the need to proportionally increase the number of employees [1]. Chatbots are designed to handle large volumes of interactions simultaneously and efficiently, adapting quickly to spikes in demand that would normally require staff reinforcements in human support. During times of high demand, such as during seasonal sales campaigns or product launches, chatbots have the ability to respond to multiple customers at once, eliminating the problem of queues and improving the user experience [2]. This scalability makes chatbots an economically viable solution for companies that deal with variable customer flows and need flexibility to respond to demand immediately [3].

The continuous availability of chatbots is another aspect that transforms customer service, as these systems can operate 24 h a day, 7 days a week, without breaks or the need for rest – a characteristic impossible in exclusively human service. Studies show that, in the current environment, where customers expect quick responses and immediate availability, the constant presence of chatbots ensures that users' questions and needs are met in real time, which contributes to increasing customer satisfaction and loyalty [4]. Being ready to respond immediately reduces waiting times and creates a standard of service efficiency that aligns with modern expectations of convenience and speed.

In Table 1 we can see a summary of the main benefits of chatbots as seen by some authors.

There are several advantages that can be highlighted in the use of chatbots, the main ones being: reduced expenses, scalability, improved customer experience and the ability to operate 24 h a day, 7 days a week.

On the other hand, as can be seen in Table 2, the implementation of chatbots in organizations brings some challenges. These challenges are multifaceted as they involve both human and technical factors.

Implementing chatbots in organizations presents a number of challenges that can affect their effectiveness and acceptance. These challenges include user acceptance, integration with existing systems in organizations, the need for ongoing maintenance, and adapting interactions to the application environment.

**Table 1.** Benefits of Chatbots.

Benefit	Description
Speed in Customer Service	Reduces waiting time by providing instant responses to customers [5, 6]
Improved Customer Experience	Enables personalized interactions, increasing satisfaction and loyalty [7–9]
Operational Efficiency	Automates processes and frees employees for strategic tasks [7, 10]
Cost Reduction	Lowers operational costs by up to 30% in customer service [2, 11, 12]
Real-time Monitoring and Adjustments	Allows quick adaptation to trends and changes in customer behavior [13–15]
Inventory Optimization	Identifies demand increases and facilitates stock and marketing adjustments [3, 13]
Data Collection and Analysis	Generates insights on consumption patterns, recurring issues, and market opportunities [6, 16]

**Table 2.** Challenges of implementing chatbots.

Challenge	Description
Service Failures	Chatbots often fail to meet user expectations, especially in handling complex queries, leading to negative emotions such as frustration and anger [17, 18]
User acceptance	User resistance to automated systems; trust and familiarity are key to success. Improvements to the interface and personality can facilitate acceptance [19, 20]
Professional training	Lack of adequate training can limit the effective implementation of chatbots. Continuous training is essential [21–23]
Integration with existing systems	Need to connect to databases and management systems; requires adequate infrastructure and planning for interoperability [24, 25]
Continuous maintenance	The evolution of technology requires frequent updates and constant training to ensure effectiveness [21, 23]
Adaptation to the context	Personalization based on demographic and behavioral data increases effectiveness, but requires research and development [26]
Lack of Human Touch	Lack of Human Touch: The inability of chatbots to replicate human interaction fully can result in a less satisfying customer experience [9, 27]

## 2 Chatbot Impact Assessment Models

Chatbot impact assessment models are essential for evaluating the effectiveness and user satisfaction of chatbots across various applications. Several models and methodologies have been proposed and tested in different contexts, each focusing on specific aspects of chatbot performance and user interaction.

The main models and approaches are: Performance and Usability Metrics, User Experience and Satisfaction, Predictive and Computational Models and Behavioral and Interaction Models.

### 2.1 Performance and Usability Metrics

**Performance Metrics:** One approach involves using performance metrics such as performance, humanity, effect, and accessibility to evaluate chatbots. For instance, a college chatbot showed a 20% improvement in performance and a 5% increase in accessibility when these metrics were applied [28].

**Usability Scales:** The Bot Usability Scale (BUS11) measures chatbot usability focusing on accessibility, quality, conversation quality, privacy risk, and response time. This scale helps in understanding how different age groups perceive chatbot usability and their continuous intention to use [29].

### 2.2 User Experience and Satisfaction

**Four-Factor and Two-Factor Models:** In educational settings, user experience and satisfaction can be evaluated using models that focus on information quality, system quality, chatbot experience, and user satisfaction. A simpler two-factor model focusing on “Chatbot Response Quality” and “User Experience and Satisfaction” was found to be more effective [30].

**Customer-Oriented Attributes:** Attributes such as trust, usefulness, satisfaction, readiness to use, and accessibility significantly influence customer shopping behavior and satisfaction with chatbots [31].

### 2.3 Predictive and Computational Models

**Popularity Prediction:** A computational approach to predict chatbot popularity based on features like Intent, Conversation Flow, and Response Design achieved a 77.36% prediction accuracy, providing early-stage feedback before deployment [32].

**Automatic Evaluation:** Methodologies using convolutional neural networks for natural language processing can automatically evaluate chatbot effectiveness, achieving accuracies between 78.95% and 80.18% [33].

## 2.4 Behavioral and Interaction Models

**UTAUT Model:** The Unified Theory of Acceptance and Use of Technology (UTAUT) model is used to study user behavior and intentions towards chatbots, particularly in healthcare and online health communities. Factors like Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions significantly impact users' Behavioral Intention (BI) and Usage Behavior (UB) [34, 35].

**Stereotype Content Model:** This model explores the impact of failure recovery messages on user satisfaction and re-use intentions. Solution-oriented messages elicit stronger competence evaluations, while empathy-seeking messages lead to stronger warmth evaluations [36].

## 3 Research Methodology

Of the models presented in the previous point, considering the objectives of the present study, the choice fell on the UTAUT2 model (Unified Theory of Acceptance and Use of Technology), as we understood that it would be the one that could give us the most guarantees.

As mentioned, it was decided to apply the UTAUT2 model, adapting it to a quantitative perspective through an online questionnaire. Regarding the data collected, an adequate number of participants was reached to ensure the validation of the procedure. Subsequently, analysis methods developed by Prodanov and Freitas [37] were used, employing conceptual principles of questionnaire analysis with the aim of achieving the central purposes of the topic addressed.

The UTAUT model provides a comprehensive framework for evaluating the acceptance of chatbots in various contexts. By focusing on key factors such as performance expectancy, effort expectancy, social influence, trust, facilitating conditions, management support, and personalization, organizations can enhance the effectiveness of chatbots in customer service, internal processes, and personal interactions.

The questionnaire was sent to 228 companies from various sectors of activity, with 188 responding, i.e. 88% of the total number of respondents sent.

In this study, a brief summary of the results obtained will be presented, given the page limitation, focusing only on the main objectives that guide this research work.

## 4 Results

To address the positive and negative impacts of implementing chatbots in companies, focusing on customer service, internal procedures and interpersonal interactions, based on the results obtained through the questionnaires carried out, we present a brief summary of this analysis in Table 3 below.

**Table 3.** Analysis of the impacts of chatbots in companies.

Area	Positive Impacts	Negative Impacts
Customer Service	Efficiency and availability Enhanced customer satisfaction Operational efficiency	Service failures
Internal Procedures	Business agility Data management Employee satisfaction	Job perception concerns
Interpersonal Interactions	Employee satisfaction Enhanced interactions Trust and engagement	Lack of human touch Psychosocial challenges

For a better understanding of the previous table, the points mentioned are developed below.

### 1. Customer Service

- Positive Impacts:
- Efficiency and Availability: The introduction of chatbots has enabled faster service, with instant responses to common questions, increasing service efficiency. Customers can get service at any time of the day, resulting in a more satisfying experience.
- Increased Customer Satisfaction: The ability to resolve queries quickly and the continuous availability of chatbots have contributed to an increase in satisfaction rates among customers, who value speed and easy access to support.
- Negative Impacts:
- Service Failures: Despite their efficiency, chatbots faced challenges in situations that require more complex solutions. Incidents of service failures, such as inadequate responses or lack of clarity, were frequently reported, generating frustration and dissatisfaction among some users.

### 2. Internal Procedures

- Positive Impacts:
- Business Agility: The implementation of chatbots has facilitated the automation of repetitive tasks, allowing human teams to focus on more strategic and creative issues. This resulted in greater operational agility and improved internal workflows.
- Data management: Chatbots have contributed to more effective data collection and management, allowing companies to quickly analyze customer interactions and adjust their offerings as needed.
- Negative Impacts:
- Concerns about Job Perception: The introduction of chatbots has raised some concerns among employees about the security of their jobs and the relevance of their roles. This generated a negative perception among some employees, who feared mass automation.

### 3. Interpersonal Interactions

- Positive Impacts:
- Employee Satisfaction: In some cases, the presence of chatbots has alleviated the workload of employees, allowing them to focus on more meaningful interactions with customers and, consequently, increasing job satisfaction.
- Improved Interactions: Chatbots, when handling simple queries, have allowed employees to dedicate more time to situations that really require a human touch, thus improving the quality of interpersonal relationships.
- Negative Impacts:
- Lack of Human Contact: Automation has brought a decrease in human interaction. Customers expressed that in situations that require empathy, they prefer to speak to humans, which created a feeling of disconnect in some interactions.
- Psychosocial Challenges: Reliance on chatbots for interactions can result in psychosocial challenges, such as increased feelings of isolation for both customers and employees. A lack of human interaction can impact morale and engagement within teams.

These results illustrate a comprehensive picture of the impacts that the implementation of chatbots had on the companies surveyed, highlighting the need to balance technology with the humanization of interactions, especially in sensitive areas such as customer service and interaction between employees.

The results of the study based on the UTAUT 2 model, focusing on the main constructs of the model: Performance Expectancy, Effort Expectancy, Social Influence and Hedonic Motivation, adapting them to the context of chatbots.

#### 1. Performance Expectation and Customer Satisfaction

The results of the study indicated that performance expectation plays a crucial role in the acceptance and use of chatbots in companies. Research has revealed that managers and customers have seen a significant increase in operational efficiency and customer satisfaction as chatbots have enabled quick responses and automated solutions to common problems. This improvement in performance not only increased customer satisfaction, but also contributed to the positive perception of the added value that chatbots offer, reflecting that the adoption of this technology can indeed meet the performance expectations set by users.

#### 2. Effort Expectation and Technology Adoption

Another relevant finding of the study was the relationship between effort expectation and adoption of chatbot technology. Most respondents indicated that the ease of use of automated systems was a determining factor in their acceptance. When chatbots were perceived as intuitive and accessible, employees were more willing to interact with them. However, some complaints have emerged about the complexity of programming and adjusting chatbot settings, which suggests that the need for accessible technical support is critical to ensuring successful implementation and continued use of the technology.

#### 3. Social Influence and Hedonic Motivation

The aspects of social influence and hedonic motivation also proved to be essential in the adoption of chatbots, as evidenced by the responses collected. Managers reported that the opinions and feedback from their peers positively influenced their adoption decisions. Furthermore, hedonic motivation, which refers to the pleasure and satisfaction that users obtain when interacting with technology, was observed as a significant motivational factor. Employees who reported pleasant experiences using chatbots were more likely to support their continuation, suggesting that user experience is a critical component that must be considered when developing and implementing automated technologies into business operations.

In conclusion, while companies generally find chatbots beneficial for improving customer satisfaction, operational efficiency, and cost savings, there are significant areas that require ongoing improvements to address technical limitations, personalization, and ethical concerns.

## 5 Conclusions

While chatbots offer significant benefits in terms of efficiency, cost reduction, and customer satisfaction, they also present challenges such as service failures, reduced human interaction, and potential negative impacts on employee morale. Balancing the use of chatbots with human agents and addressing these challenges is crucial to maximizing their positive impacts.

One aspect that deserves special attention when considering the adoption of chatbots is the need for ongoing training and support for users, both for company employees who interact with chatbots and for customers who use them. Proper training can increase the acceptance and effectiveness of chatbots by allowing users to better understand how to interact with them and how these systems can complement human support. Additionally, accessible technical support can minimize resistance to change and increase employee confidence in technology, ensuring that the benefits are fully realized.

Another fundamental point to be considered when adopting chatbots is the ethical issue and transparency in automated interactions. Consumers are increasingly concerned about privacy and the use of personal data, which demands that companies adopt transparent practices in the collection and use of this information. Establishing clear guidelines on how user data is handled, as well as ensuring that chatbots are programmed to respect ethical interaction issues, can reinforce consumer trust. This ethical approach not only improves customer experiences, but can also translate into a competitive advantage in the marketplace.

Furthermore, the rapid evolution of AI technologies and the demand for innovative solutions in business indicate that the implementation of chatbots can be seen as a starting point for broader transformations in business operations. Companies must be prepared to adapt their systems and operations in response to new technological opportunities that arise, such as the use of chatbots with emotional intelligence or integration with other digital tools that improve the user experience. Investing in innovation not only enhances the positive impact of chatbots, but also positions organizations ahead in an increasingly competitive and dynamic market.

In summary, companies utilize chatbots to enhance operational efficiency, improve customer engagement, and achieve significant cost savings. While there are challenges

to their implementation, the benefits often outweigh the drawbacks, making chatbots a valuable tool in modern business operations.

Finally, we can consider that the adoption of the adapted UTAUT2 model provided a solid structure for the analysis, but it is important to note that other models and theories could also be applied to assess the benefits and limitations of chatbots in companies. The choice of a specific model can influence the factors considered and, therefore, the results obtained. Therefore, we can consider this choice as a limitation of this study.

As future work and since we are dealing with emerging technologies that are constantly evolving, it would be interesting to apply the same survey again a few years later and compare the two.

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