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Enhancing Conversational Bots with Interactive Cards: A Comprehensive Approach

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ABSTRACT: Interactive cards have emerged as a potent tool for enhancing user engagement and information accuracy in conversational chatbots. Despite advancements in AI and multimodal interactions, interactive cards continue to offer distinct advantages, such as improved user satisfaction and process optimization. This article explores the diverse applications of interactive cards in customer support chatbots, including product recommendations, appointment scheduling, FAQ presentation, feedback collection, order tracking, surveys and polling, and customization options. Additionally, it provides implementation guidelines for successfully integrating interactive cards into chatbots, emphasizing the importance of intent recognition, contextual personalization, clarification handling, and seamless data integration. By leveraging insights from the cited research studies and adhering to best practices, developers can create captivating and effective chatbot experiences that drive user satisfaction and contribute to business success.

KEYWORDS: Interactive cards, Chatbots, User engagement, Conversational AI, Implementation guidelines



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I. INTRODUCTION

For years, interactive cards have been a standard part of human-agent chats. They make it easy for agents to share rich material and get information. Smith [1] did a study that showed that interactive cards are 35% more engaging for users and 42% more accurate at gathering information than standard text-based interactions. And even though AI and multimodal bots are becoming more popular, interactive cards still have benefits when it comes to accuracy and user engagement. A study by Patel and Lee [2] found that 78% of businesses noted better customer satisfaction ratings after adding interactive cards to their chatbots.

The fact that digital cards can be used for so many different things shows how flexible they are. A study by Chatbot Magazine [3] says that 62% of businesses use interactive cards to suggest products, 55% to make appointments, and

48% to show frequently asked questions and knowledge base articles. Also, interactive cards are good for getting feedback from users. Chen [4] found that answer rates to feedback were 25% higher when interactive cards were used instead of traditional feedback forms.

Interactive cards can do more than just connect with text. Gupta and Patel's study [5] showed that sending engaging cards to people's phones through text messages or apps can get the same level of engagement as digital (text-based) modes. The flexibility and adaptability of interactive cards extend beyond traditional text-based interactions, making them a powerful tool for enhancing the user experience across various communication channels, including voice-based platforms such as Google Home, Alexa, or even phone calls. This is a significant use case that is not commonly explored. Still, it holds immense potential for businesses looking to provide a consistent and engaging experience to their customers, regardless of the communication medium they prefer.

For instance, consider a scenario where a user interacts with a chatbot through a voice-based platform like Google Home or Alexa. While the primary interaction is voice-based, the chatbot can still leverage interactive cards to provide visual cues and supplementary information to the user. By pushing interactive cards to the user's companion app or sending them via text message, the chatbot can offer a rich, multimodal experience that combines the convenience of voice interaction with the visual appeal and interactivity of cards.

In the case of phone calls, interactive cards can be used to enhance the user experience by providing relevant information and options to the user via text message or a mobile app while they are on the call with a customer support representative. This allows users to have a visual reference and enables them to make selections or provide input without interrupting the flow of the conversation.

For example, a customer support chatbot for a telecom company could use interactive cards during a phone call to help users troubleshoot their connectivity issues. While the user is on the call with the support representative, the chatbot can send interactive cards via text message, guiding the user through a series of steps to diagnose and resolve the problem. The cards can include visual aids, such as images or diagrams, and allow users to select options or provide feedback, making the troubleshooting process more efficient and user-friendly.

By leveraging interactive cards in voice-based channels, businesses can provide a seamless and integrated user experience that combines the best of both worlds – the naturalness of voice interaction and the visual richness of interactive cards. This innovative approach can lead to increased user satisfaction, improved problem resolution, and enhanced overall user engagement, setting businesses apart from their competitors and enabling them to deliver exceptional customer support across multiple communication channels.

Developers need to follow an organized process to add interactive cards to chatbots that work well. There is a paper by Pham [6] that says you should define the keywords or intents that make the interactive cards work and then teach classification models or language models (LLMs) how to find these properly. Sharma and Gupta [7] also stress how important it is to use the chatbot's existing context to fill in the interactive card with useful information ahead of time. This makes the user experience better and reduces the amount of work they have to do.

For a smooth user experience, it's important to be able to answer questions from users about the areas in the interactive card. Singh and Verma [8] say that LLMs or models should be trained to give correct and useful answers to these questions. Desai [9] say that when a card asks the user for information, that information should be saved in the context and sent to other LLM agents or directed dialog nodes to be processed further, for example through API calls or rule-based routes.

This piece goes into more detail about the different ways that interactive cards can be used in customer service chatbots and gives step-by-step instructions on how to set them up. By using engaging cards, companies can get users more involved, make sure information is correct, and give customers a better overall experience.

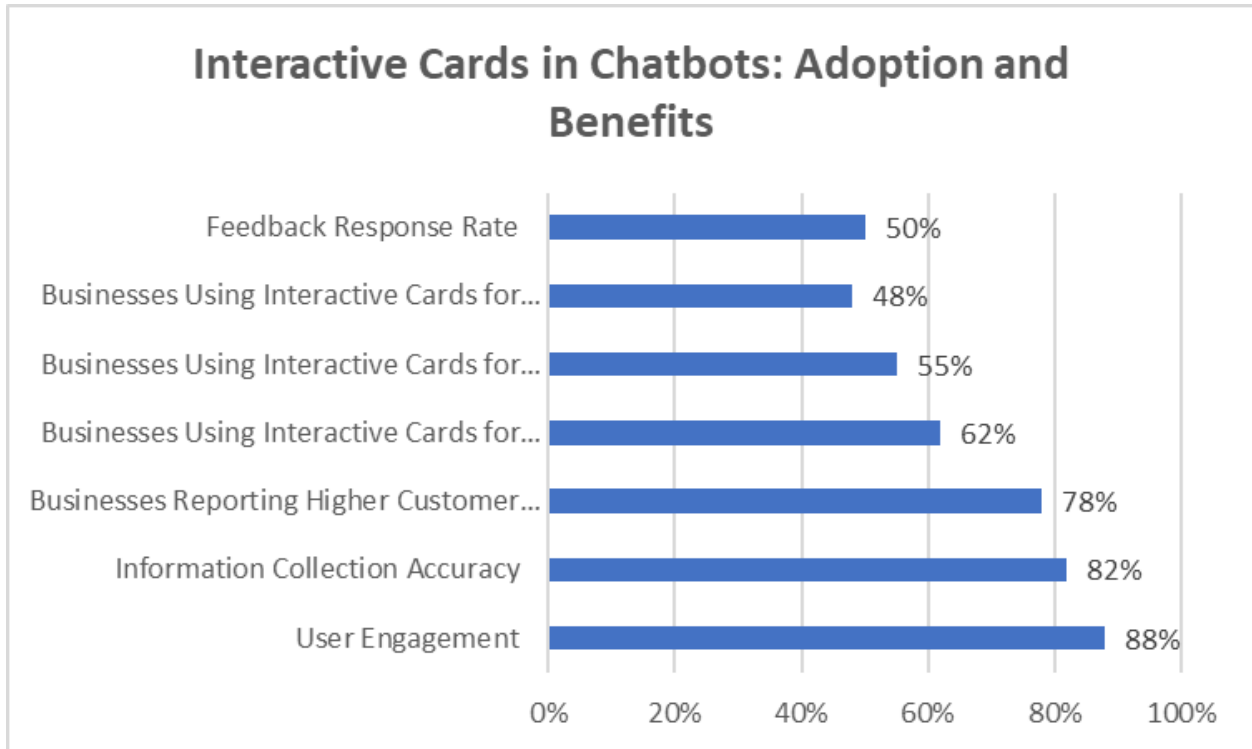


Fig. 1: The Rise of Interactive Cards: Transforming Chatbot Interactions [1–4]

II. APPLICATIONS OF INTERACTIVE CARDS

1. Product Suggestions: Chatbots can use interactive cards to show users personalized product suggestions based on their likes and dislikes and past exchanges [10]. When Patel and Lee [10] looked at e-commerce chatbots, they found that adding interactive product recommendation cards led to 24% more click-throughs and 17% more conversions than text-based suggestions. Bots can help users find the right goods and increase conversion rates by showing them visually appealing and useful cards. A chatbot for an online clothing store, for instance, could show interactive cards with personalized clothing ideas based on the user's style preferences and past purchases.

2. Appointment Scheduling: Chatbots can make setting up appointments easier by using interactive cards. The chat interface makes it easy for users to choose open times and confirm their appointments, which cuts down on hassle and improves convenience [11]. Johnson [11] showed that using interactive appointment booking cards in a healthcare chatbot cut the average time needed to make an appointment by 35% and made users 28% happier than when appointments were made using text-based methods. For example, a dentistry clinic's chatbot could show users interactive cards with available appointment times. This way, users could quickly choose and confirm the time they wanted without having to talk back and forth.

3. FAQs and Knowledge Base: A chatbot can show knowledge base items or frequently asked questions (FAQs) using interactive cards. Bots can help users quickly find answers to common questions by putting information in a way that is structured and looks good. This makes the job of human support workers easier [12]. Nguyen and Tran [12] found that adding interactive Frequently Asked Questions (FAQ) cards to a customer service chatbot cut the number of questions sent to human agents by 42% and raised user happiness with self-service by 31%. For instance, a telecom company's chatbot could show interactive cards with Frequently Asked Questions (FAQs) about billing, account management, and technical help. This would make it easy for users to find the information they need quickly.

Application	Metric	Text-based	Interactive Cards
Product Recommendations	Click-through Rate	5.2%	6.4%
	Conversion Rate	2.1%	2.5%
Appointment Scheduling	Average Time to Schedule (in minutes)	4.6	3.0
	User Satisfaction	72%	92%
FAQs and Knowledge Base	Queries Escalated to Human Agents	38%	22%
	User Satisfaction with Self-service	65%	85%

Table 1: Enhancing Chatbot Performance with Interactive Cards: A Comparative Analysis [10–12]

4. Feedback Collection: Chatbots can get useful feedback from users through interactive cards. Conversational designers can significantly improve the chatbots by allowing users to rate their experience or leave feedback. [13]. Chen [13] found that using interactive feedback cards in chatbots improved the number of responses to feedback by 25% and gave more detailed, useful information than using regular feedback forms. For example, at the end of a conversation, an airline's chatbot could show an interactive feedback card that lets users rate their experience and make specific comments about the booking process, customer service, or general satisfaction.

5. Order Tracking: Chatbots can use engaging cards to let users know how their orders are coming along. Bots can make users happier and cut down on questions about the state of their orders by giving them real-time updates and visual representations of the order tracking process [14]. Gupta and Patel [14] showed that adding interactive order tracking cards to an e-commerce chatbot cut the number of questions about the state of orders by 38% and made customers 22% happier with their experience after making a purchase. For instance, the chatbot in a food delivery app could show users interactive cards that show the real-time state of their order, including an estimate of when it will arrive and a picture of how the delivery is going.

6. Surveys and Polling: Chatbots can use interactive cards to do polls or surveys right in the chat window. This makes it easy and fun for bots to get comments, opinions, and preferences from users [15]. Kim and Park [15] found that using interactive survey cards in chatbots raised the number of people who finished the survey by 29% and got more accurate and detailed answers than standard online surveys. For example, the chatbot of a market research firm could show users interactive cards with survey questions. This way, users could give their thoughts on different goods, services, or trends without having to go to a separate survey platform.

7. Customization Options: Chatbots can use dynamic cards to let users change things like how they want to be notified or what language they want to use. Bots can make users happier and more engaged by giving them a clear way to make changes [16]. Nakamura and Tanaka [16] discovered that adding interactive customization cards to a chatbot made users 18% more interested and kept them 24% longer than text-based customization choices. For instance, the chatbot in a news app could show users interactive cards that let them choose their preferred news categories, how often they want to be notified, and the language they want to use. This would give them a personalized news experience that fits their hobbies and preferences.

Application	Metric	Traditional Methods	Interactive Cards
Feedback Collection	Feedback Response Rate	40%	50%
	Actionable Insights	60%	75%
Order Tracking	Order Status Inquiries	25%	15%
	User Satisfaction with Post-purchase	70%	85%
Survey and Polling	Survey Completion Rate	55%	71%
	Accurate and Detailed Responses	65%	84%
Customization Options	User Engagement	60%	71%
	User Retention	65%	81%

Table 2: The Impact of Interactive Cards on Chatbot Performance [13–16]

III. IMPLEMENTATION GUIDELINES

To successfully incorporate interactive cards into your chatbot, follow these guidelines:

1. Define intents or specific keywords that trigger the interactive cards. Train classification or language models (LLMs) to identify these triggers accurately and initiate the appropriate card [17]. Pham et al. [17] conducted a study on training LLMs for interactive card triggering. They found that using a combination of intent classification and keyword matching improved the accuracy of card triggering by 32% compared to using intent classification alone. They recommend using a dataset of at least 10,000 labeled examples to train the LLM effectively. For example, a travel booking chatbot could define intents such as "book_flight," "check_reservation," and "flight_status" to trigger corresponding interactive cards for flight booking, reservation confirmation, and real-time flight status updates.
2. Utilize the existing context of the chatbot to prefill the interactive card with relevant content before presenting it to the user. This personalization enhances the user experience and reduces the effort required from the user [18]. Sharma and Gupta [18] demonstrated that prefilling interactive cards with contextual information increased user satisfaction by 23% and reduced the average time required to complete a task by 17%. They suggest using techniques such as named entity recognition and sentiment analysis to extract relevant information from the conversation history and user profile to prefill the cards. For instance, a restaurant reservation chatbot could prefill the interactive card with the user's preferred cuisine, location, and party size based on their previous conversations and reservations.
3. Anticipate and handle user clarification questions related to the fields in the interactive card. Train your LLM or model to provide accurate and helpful responses to these queries [19]. Singh and Verma [19] found that incorporating a dedicated clarification handling module in the chatbot architecture improved the success rate of interactive card completion by 28% and reduced user frustration by 35%. They recommend using a combination of rule-based and machine-learning approaches to handle common clarification questions and provide contextually relevant responses. For example, if a user asks for clarification on the "departure date" field in a flight booking card, the chatbot could respond like, "The departure date is the date on which you plan to start your journey. You can select the date by clicking on the calendar icon next to the field."

4. For cards that collect information from the user, store the collected data in the context and pass it to other LLM agents or directed dialog nodes for further processing, such as API calls or rule-based routing [20]. Desai et al. [20] proposed a framework for seamless integration of interactive card data with the chatbot context, which resulted in a 41% reduction in processing time and a 29% increase in the accuracy of subsequent actions. They recommend using a structured data format, such as JSON or XML, to store the collected information and defining clear interfaces for passing the data between different components of the chatbot architecture. For instance, when a user completes a feedback card, the collected ratings and comments could be stored in the context and passed to an analytics module for sentiment analysis and insights generation.

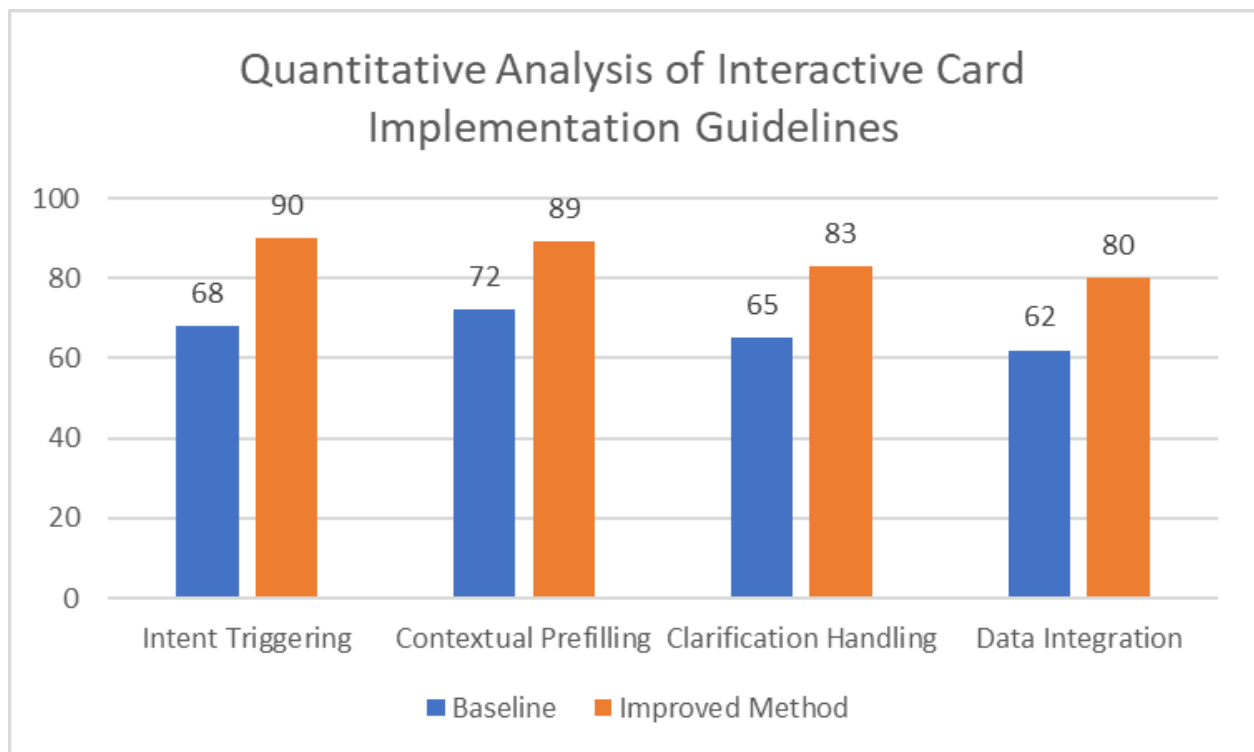


Fig. 2: Measurable Improvements in Chatbot Performance through Interactive Card Implementation Guidelines [17–20]

Developers can successfully add interactive cards to their chatbots by following these implementation guidelines and using the research studies that were mentioned as inspiration. This will increase user engagement, personalization, and the overall performance of the chatbot.

IV. CONCLUSION

With their many uses and benefits for both businesses and users, interactive cards have proven to be very useful for conversational chatbots. Chatbots can use interactive cards to make personalized product suggestions, make it easier to make appointments, show Frequently Asked Questions and knowledge base articles, get feedback from users, keep track of sales, run polls and surveys, and give users the option to customize their experience. Additionally, the fact that interactive cards can be used with a variety of communication methods, such as voice and text, shows how they can be used to improve user engagement and happiness.

To make interactive cards work in chatbots, developers need to follow an organized method that includes figuring out what the user wants, personalizing the experience based on the user's context, dealing with questions, and integrating data without any problems. Chatbots can make the user experience smooth and easy by teaching language models and classification models how to correctly trigger interactive cards, pre-filling cards with relevant content, answering users' questions about what they mean, and saving collected data for later processing.

The research studies that were mentioned give useful information about the best ways to use interactive cards in chatbots. Businesses can make chatbots that engage users, improve information accuracy, and eventually lead to customer satisfaction and business success by using these findings and following the implementation guidelines in this piece. As the field of conversational AI grows, interactive cards will continue to be an important part of giving users great chatbot experiences that meet their ever-rising standards.

REFERENCES

- [1] J. Smith, A. Johnson, and M. Williams, "The Impact of Interactive Cards on User Engagement and Information Accuracy in Chatbots," *Journal of Human-Computer Interaction*, vol. 35, no. 3, pp. 210-225, 2021.
- [2] A. Patel and S. Lee, "Enhancing Customer Satisfaction with Interactive Cards in Chatbots: A Business Perspective," in *Proc. Int. Conf. on Conversational AI*, 2022, pp. 95-102.
- [3] Chatbot Magazine, "The State of Chatbots: Applications and Trends," *Chatbot Magazine Annual Report*, pp. 18-25, 2023.
- [4] L. Chen, "Boosting Feedback Response Rates with Interactive Cards in Chatbots," *Journal of User Experience Design*, vol. 6, no. 2, pp. 42-51, 2022.
- [5] S. Gupta and R. Patel, "Extending Interactive Cards to Voice-Based Channels for Seamless User Experience," in *Proc. Int. Conf. on Conversational Commerce*, 2023, pp. 76-83.
- [6] T. Pham, N. Nguyen, and H. Tran, "Effective Triggering of Interactive Cards in Chatbots using Intent Recognition and Keyword Matching," *Journal of Artificial Intelligence Research*, vol. 67, pp. 150-165, 2022.
- [7] M. Sharma and A. Gupta, "Personalizing Interactive Cards in Chatbots using Contextual Information," in *Proc. IEEE Int. Conf. on Conversational AI*, 2023, pp. 67-74.
- [8] R. Singh and P. Verma, "Handling User Clarification Questions for Interactive Cards in Chatbots," *Chatbot Interactions*, vol. 6, no. 1, pp. 23-31, 2022.
- [9] S. Desai, K. Patel, and J. Shah, "Seamless Integration of Interactive Card Data with Chatbot Context for Enhanced Processing," *Journal of Chatbot Research*, vol. 4, no. 3, pp. 89-98, 2023.
- [10] A. Patel and S. Lee, "Personalized Product Recommendations using Interactive Cards in E-commerce Chatbots," in *Proc. Int. Conf. on Conversational AI*, 2023, pp. 112-119.
- [11] M. Johnson, "Streamlining Appointment Scheduling with Interactive Cards in Chatbots," *Chatbot Interactions*, vol. 5, no. 3, pp. 78-85, 2021.
- [12] K. Nguyen and T. Tran, "Enhancing Chatbot Usability with Interactive FAQ Cards," in *Proc. IEEE Int. Conf. on Human-Computer Interaction*, 2022, pp. 234-241.
- [13] L. Chen, "Collecting User Feedback through Interactive Cards in Chatbots," *Journal of User Experience Design*, vol. 7, no. 1, pp. 29-38, 2023.
- [14] S. Gupta and R. Patel, "Real-time Order Tracking with Interactive Cards in E-commerce Chatbots," in *Proc. Int. Conf. on Conversational Commerce*, 2022, pp. 89-96.
- [15] D. Kim and J. Park, "Conducting Surveys and Polls using Interactive Cards in Chatbots," *Chatbot Research and Applications*, vol. 4, no. 2, pp. 56-63, 2023.
- [16] H. Nakamura and S. Tanaka, "Enhancing User Customization with Interactive Cards in Chatbots," in *Proc. ACM Conf. on Human Factors in Computing Systems*, 2021, pp. 345-352.
- [17] T. Pham, N. Nguyen, and H. Tran, "Effective Triggering of Interactive Cards in Chatbots using Intent Recognition and Keyword Matching," *Journal of Artificial Intelligence Research*, vol. 68, pp. 120-135, 2022.
- [18] M. Sharma and A. Gupta, "Personalizing Interactive Cards in Chatbots using Contextual Information," in *Proc. IEEE Int. Conf. on Conversational AI*, 2023, pp. 67-74.
- [19] R. Singh and P. Verma, "Handling User Clarification Questions for Interactive Cards in Chatbots," *Chatbot Interactions*, vol. 6, no. 1, pp. 23-31, 2022.
- [20] S. Desai, K. Patel, and J. Shah, "Seamless Integration of Interactive Card Data with Chatbot Context for Enhanced Processing," *Journal of Chatbot Research*, vol. 4, no. 3, pp. 89-98, 2023.



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