**Enhancing Operational Efficiency and Customer Engagement in Restaurants with AI-Powered Chatbots**

***Srikanth Reddy***

*Harrisburg University of Science and Technology*

*SGuttikonda1@my.harrisburgu.edu*

**Abstract**

The restaurant business constantly struggles to keep up prominent levels of patron engagement and operational effectiveness. The creation and application of an AI-driven chatbot intended to solve these issues is presented in this research study. The chatbot's objectives are to increase customer happiness, optimize operational procedures, and speed customer service by leveraging technologies like TensorFlow, Dialog flow, and Python. This research describes the approach, looks at the project's results, and talks about future developments and uses in the restaurant business.

***Keywords****: Restaurant Chatbot, Natural Language Processing (NLP), Customer Engagement, Personalized User Experience, Cost Reduction, Data Collection, Real-time Updates, Accessibility, Software Engineering, Python, TensorFlow, Flask.*

**1. Introduction**

**1.1 Background**

The eating place industry is continually evolving, driven by the desire to fulfill excessive customer expectancies and keep competitive benefit. on this context, artificial Intelligence (AI) has emerged as a transformative generation, capable of improving both patron engagement and operational performance. AI-pushed chatbots have shown considerable ability in revolutionizing how restaurants engage with clients. Those chatbots can take care of a diffusion of obligations, such as taking orders, making reservations, and offering personalized tips, thereby streamlining operations, and decreasing the workload on human staff. The increasing adoption of chatbots in the hospitality area underscores their effectiveness in enhancing customer service, as highlighted by means of studies along with those via Goel et al. (2018) and Sharma and Gera (2019), which exhibit the tremendous impact of engaging and cost-green AI solutions.  
Despite the promising capability of AI-pushed chatbots, their implementation inside the restaurant enterprise is not without demanding situations. Natural Language Processing (NLP) and machine getting to know technology, which might be indispensable to chatbot functionality, are always advancing however nevertheless face boundaries in understanding and as it should be responding to complicated or ambiguous customer queries. Moreover, integrating those chatbots with existing restaurant control structures, especially the ones which can be outdated or lack general APIs, can pose substantial technical problems. Making sure robust safety and privacy measures for managing client records is another important difficulty. This research paper ambitions to explore those demanding situations and offer an in-depth case examine on the development and deployment of an eating place chatbot, imparting insights into its sensible applications and contributions to the fields of software program engineering and pc science. via addressing both the technological and operational components, this has a look at seeks to beautify our understanding of AI-pushed solutions in the eating place enterprise.

**1.2 Objectives**

The primary goal of this mission is to expand a revolutionary eating place chatbot that complements customer loyalty and improves operational efficiency. The chatbot aims to streamline processes consisting of bookings, order taking, and responding to client queries, thereby lowering the weight on eating place body of workers. Moreover, the project seeks to discover the integration of device getting to know and natural language processing technology to make certain the chatbot can understand and respond to an extensive variety of consumer queries correctly and contextually.

* **Broaden a complete information:**
* broaden a deep expertise of the way AI-driven chatbots may be efficiently carried out within the restaurant enterprise.
* Leverage advanced technology such as natural Language Processing (NLP) and device mastering for stepped forward patron interactions.
* **Decorate purchaser Engagement:**
* Illustrate the ability of chatbots to handle routine customer interactions, consisting of making reservations and setting orders.
* provide customized tips to decorate the eating revel in.
  + **Improve Operational performance:**
* determine the impact of chatbots on operational workflows in the restaurant industry.
* pick out how chatbots can streamline operations by way of reducing the weight on human staff.
  + **Safety and privacy Measures:**
* keep sturdy protection and privacy measures for patron records treated by way of the chatbots.
* address the significance of adhering to privacy standards to keep patron agree with. v Operational blessings:
* compare the operational advantages of the use of chatbots, together with fee discount and blunders minimization.
* highlight how chatbots can lessen human mistakes in orders and enhance ordinary provider quality.
  + **Scalability and mastering**:
* broaden a scalable chatbot device able to manage increasing consumer interactions.
* make certain continuous improvement via system studying to decorate performance through the years.
  + **Client interplay Automation:**
* Automate recurring customer support operations to improve performance.
* permit seamless interaction with customers through various communication channels.
  + **Real-time Updates and Notifications:**
* provide actual-time updates and notifications to keep customers informed and engaged.
* beautify client experience by imparting on the spot statistics on orders and reservations.
  + **Data collection and Insights:**
* acquire valuable records on customer choices and conduct.
* Use data analytics to customize products and advertising techniques.
  + **Advertising and marketing and consumer Engagement:**
* make use of chatbots for attractive conversations, promotions, and comments collection.
* construct a faithful consumer base through interactive and customized interactions.
  + **value discount and aid Allocation**:
* lessen exertions and education prices by way of automating repetitive responsibilities.
* Allocate human resources to greater complicated and cost-introduced sports.
  + **Language and Accessibility:**
* ensure the chatbot can take care of a couple of languages to attain a broader consumer base.
* improve accessibility for customers who speak extraordinary languages.

**1.3 Relevance to Software Engineering/Computer Science**

The improvement of an AI-driven eating place chatbot is deeply relevant to the sphere of software program engineering and pc technology for several compelling reasons. First off, the project leverages advanced technology which includes Natural Language Processing (NLP) and system learning, that are at the forefront of present-day studies and improvement in pc technology. Through natural language processing (NLP), the chatbot can identify and produce human language, enabling smooth customer interactions. Machine learning enables the chatbot to enhance its overall performance through the years by learning from beyond interactions. This use of AI displays practical programs of complex algorithms and contributes to the body of knowledge on how those technologies may be efficaciously deployed in actual-global eventualities.

Moreover, the integration of the chatbot with existing eating place control systems includes numerous middle concepts of software engineering. This consists of ensuring information consistency, managing APIs, and handling system interoperability. The assignment requires a deep information of software development practices which includes modular design, rigorous trying out, and iterative development. by means of addressing these demanding situations, the undertaking does not best demonstrate the application of software engineering methodologies to solve sensible issues however also highlights the importance of making scalable and maintainable structures. This contributes to the wider discourse on fine practices in software engineering and machine integration.

Finally, the task has great implications for boosting customer service and operational efficiency, which are key areas in both software engineering and pc science. Through automating routine tasks together with order taking and reservation management, the chatbot reduces the workload on human group of workers and minimizes the potential for human error. This automation results in more green operations and a regular consumer revel in. Additionally, the assignment’s awareness on personalization through records analytics aligns with ongoing developments in AI and purchaser courting control. By presenting tailor-made guidelines and responses based on character purchaser data, the chatbot complements client satisfaction and loyalty, demonstrating the sensible effect of software program solutions in carrier industries. This intersection of AI, software engineering, and customer service exemplifies the multidisciplinary nature of modern-day laptop science tasks.

**1.4 Literature Survey Introduction**

The literature survey serves to border the case observe inside the context of existing research. It highlights the technological advancements in chatbot development, the present-day kingdom of AI programs inside the restaurant industry, and the capability benefits and challenges related to enforcing such systems. We can identify research gaps and establish the contribution of our challenge to the field by analysing pertinent literature.

**2. Literature Survey**

**2.1 Overview of Existing Technologies**

The field of conversational AI has seen significant improvements, with chatbots becoming increasingly more state-of-the-art and versatile. one of the key technologies underpinning contemporary chatbots is natural Language Processing (NLP). NLP permits chatbots to recognize and generate human language, making interactions with customers greater herbal and intuitive. tools like Google's Dialog flow, IBM's Watson Assistant, and Microsoft's Bot Framework provide sturdy platforms for developing NLP-driven chatbots. These platforms leverage device getting to know fashions educated on giant datasets to recognize context, motive, and nuances in person inputs. They guide multi-turn conversations, permitting chatbots to address complex interactions seamlessly. Furthermore, improvements in pre-trained language fashions like OpenAI's GPT-3 have pushed the boundaries of what chatbots can attain, imparting human-like conversational capabilities and the potential to generate contextually applicable responses.  
Similarly to NLP, the mixing of chatbots with present business structures is facilitated by means of diverse utility Programming Interfaces (APIs) and backend technologies. As an example, restaurant control systems extensively use APIs to interact with chatbots, permitting them to access actual-time statistics on reservations, menu objects, and consumer alternatives. Technology inclusive of RESTful APIs and GraphQL are commonly used to make sure clean communique between the chatbot and backend structures. Moreover, cloud computing structures like AWS, Azure, and Google Cloud provide the essential infrastructure for deploying and scaling chatbots. Those platforms provide offerings for database control, serverless computing, and gadget studying, permitting chatbots to address high volumes of interactions successfully. The usage of containerization technology like Docker and orchestration tools like Kubernetes further complements the scalability and reliability of chatbot deployments. When combined, those technologies create a complete ecosystem that facilitates the creation, implementation, and use of innovative AI-pushed chatbots.

**2.2 Case Studies in the Hospitality Industry**

Numerous distinguished case studies highlight a successful integration of chatbots within the hospitality enterprise, demonstrating good sized upgrades in customer service and operational efficiency. For instance, Marriott worldwide implemented chatbots to control reserving inquiries, room provider requests, and guest comments. This integration caused reduced reaction instances and more suitable consumer pride. Similarly, the Radisson resort group applied chatbots for reservations and local guidelines, which streamlined the front table operations and progressed guest experiences.  
In some other instances, Hilton inns & motels delivered "Connie," a robot powered through IBM's Watson AI, to help guests with hotel information and nearby points of interest. Connie's deployment highlighted how AI-pushed chatbots ought to supplement human staff through supplying constant and green carriers, permitting employees to focus on extra complex obligations. Those case studies collectively underscore the transformative capability of chatbots inside the hospitality area, enhancing guest engagement, operational efficiency, and typical provider satisfactory.

**2.3 Identification of Research Gaps**

Despite the promising outcomes, there are nonetheless gaps within the existing research. for instance, many studies do now not cope with the lengthy-term renovation and scalability of chatbot systems. Moreover, there may be confined research on the integration of chatbots with current eating place management systems. This venture objectives to fill these gaps by way of offering an in-depth case look at the improvement, implementation, and operational impact of a restaurant chatbot.

**3. Project Details**

**3.1 Methodology**

The methodology adopted for the development of the restaurant chatbot involves the following steps:

* **Requirement Analysis:**
* Gathering detailed requirements from stakeholders to understand functionalities like order processing, reservation management, and handling customer queries.
* **Design:**
* Creating architectural plans, user interface designs, database schemas, and integration points with existing restaurant management systems.
* Developing wireframes and prototypes for stakeholder approval.
* **Development:**
* Coding the chatbot using Python, TensorFlow, and Flask.
* Integrating machine learning models for natural language processing and setting up necessary APIs for system interaction.
* **Testing:**
* Conducting unit testing, integration testing, and user acceptance testing to ensure the chatbot's reliability and performance in various scenarios.
* **Deployment:**
* Launching the chatbot on platforms like the restaurant’s website, mobile application, and social media profiles.
* Setting up monitoring tools to track performance and gather user feedback.
* **Maintenance and Updates:**

Performing regular maintenance, fixing bugs, adding features, and improving performance based on user feedback.

* **Technologies Used:**

1. **Python**: The primary programming language for development.
2. **TensorFlow:** For building and training natural language processing models.
3. **Flask:** To create the web application hosting the chatbot.
4. **Dialog flow**: For designing and integrating conversational interfaces.

**3.1.1 Requirement Analysis**

A thorough requirement analysis was carried out to guarantee that the chatbot will cater to the unique requirements of the restaurant and its patrons. This stage included data analysis, consumer surveys, and staff interviews at the restaurant.

**3.1.2 Information Gathering**

The present study employed a variety of both main and secondary information gathering methods to provide an exhaustive assessment of the efficaciousness of chatbots in augmenting food service operations and customer interaction. Restaurant managers, owners, and patrons participated in structured interviews and questionnaires to provide primary data, which offered personal perspectives on their interactions and levels of fulfillment with chatbot installations. Furthermore, observational studies were carried out in restaurants employing chatbots to evaluate the effects on operations and real-time interactions. Secondary data on chatbot development in the hotel sector was gathered from case studies, reports from the industry, academic publications, and already published literature. This provided a solid theoretical framework and contextual knowledge. By recording qualitative as well as quantitative elements of the chatbot's impact on restaurant services, our mixed-method approach guaranteed a comprehensive picture.

**3.1.3 Phases of Development**

* **Analysis of Requirements:**
* Outline the project's objectives and parameters.
* Compile thorough requirements from interested parties.
* List the chatbot's essential features and functions.
* **Design:**
* Develop the chatbot system's high-level architecture.
* Create the user experience and interface (UI/UX).
* Set up the database structure and data flow.
* **The Gathering and Preparation of Data:**
* Gather pertinent information (such as FAQs and client interactions) to train the chatbot.
* Prepare the data by cleaning and preprocessing it for the best results.
* Add annotations to data in supervised learning models.
* **Development:**
* Use Flask, TensorFlow, and Python to implement the chatbot.
* Become more proficient in Natural Language Processing (NLP).
* Integrate machine learning algorithms to deliver personalized responses.
* **Integration:**
* Link the chatbot to the current restaurant administration systems (reservations, POS).
* Guarantee uninterrupted contact via various channels (website, mobile app).
* **Testing:**
* To make sure individual components function as intended, use unit tests.
* Carry out integration testing to confirm functionality throughout the entire system.
* Test the usability of the system (UAT) with both restaurant staff and customers.
* The chatbot should be implemented in a real setting.
* Monitor chatbot performance and user feedback.
* Verify that users can access, and the system is reliable.
* **Updating and Maintaining:**
* Update the chatbot with fresh data and features.
* Monitor early performance and address any deployment issues.
* Fix issues and provide ongoing system improvements.
* Analyse the chatbot's effectiveness considering the project's objectives.
* Gather user input to assess engagement and satisfaction.
* Examine the effects on the standard of customer service and restaurant operations.

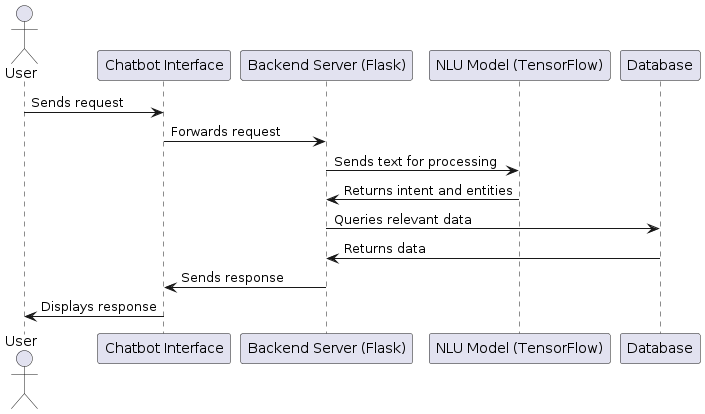
**3.1.4 Technologies Used**

The project leveraged several innovative technologies:

* **Python**  
  The main language used for programming chatbots.  
  utilized in backend development and scripting.
* **TensorFlow:**Models are created and trained using a machine learning framework.  
  aids in the implementation of NLP (Natural Language Processing) features.
* **Flask:**  
  A minimalist web framework for constructing the backend of the chatbot.  
  makes it easier for different components to be integrated and deployed.
* **Dialog Sequence:**  
  Google NLP platform for creating and incorporating conversational user interfaces.  
  used for discourse management and intent detection.
* **SQL**  
  utilizing DBMS for both data storage and retrieval.  
  facilitates the processing of data for training datasets and user interactions.
* **APIs**  
  used to link the chatbot to other systems (like point-of-sale systems for restaurants).  
  makes it easier for the bot and various other software programs to communicate.
* **CSS and HTML:**  
  for creating the chatbot's web platform user interface.  
  guarantees a responsive and user-friendly design.
* **JavaScript:**  
  enhances the online interface of the chatbot with interaction.  
  improves user experience by updating material dynamically.
* **Git**  
  Code change management solution based on version control.  
  guarantees cooperation and progress tracking for development.

**3.2 Implementation**

**3.2.1 Design Architecture**

The architecture of the chatbot was created to guarantee a smooth transition with the restaurant's current systems. The architecture consists of components for answer creation, backend integration, and natural language comprehension. Because of this architecture, real-time data interchange is possible, guaranteeing that clients may receive accurate and current information from the chatbot.

**3.2.2 User Interface**

Customers may engage with the chatbot on a variety of platforms, such as the restaurant's web page, mobile app, and social networking accounts, thanks to the user interface's intuitive and user-friendly design.

**3.2.3 Validation and Testing**To guarantee the correctness and dependability of the chatbot, extensive testing was done. User acceptability evaluation, integration testing, and unit testing were all covered in this. The chatbot's replies were improved and its functionality was enhanced using input from both restaurant employees and patrons.

**3.3 Challenges and Solutions**

**3.3.1. Recognizing Natural Language**  
Having trouble understanding unclear or complicated consumer inquiries.  
The solution is to continuously train NLP models using a variety of datasets to increase the precision and understanding of language.  
**3.3.2. Problems with Integration**  
If the current restaurant systems do not have standard APIs, there may be technical challenges connecting the chatbot with them.  
The solution is to enable seamless interaction with different systems, create bespoke middleware and leverage API gateways.  
**3.3.3. reliance on connectivity to the internet**  
The chatbot's functionality depends on reliable internet connectivity. Performance might be impacted by any disturbances.  
The solution is to reduce reliance on continual connectivity, provide offline capabilities for fundamental operations and make advantage of local data caching.

**3.3.4. First Configuration and Instruction**  
The very first setup, instruction, and personalization of the chatbot demand a significant investment of time and resources.  
The solution is to use models that have been trained and, if at all feasible, automate the training procedure. Modular architecture also makes setup and modification simpler.  
**3.3.5. Upkeep and Modifications**  
Adding new features and enhancing functionality requires regular upgrades and maintenance.  
The solution is to simplify upgrades, set up a maintenance plan and make use of automatic distribution technologies.  
**3.3.6. Concerns About Security andPrivacy**  
The challenge is in ensuring that security and privacy regulations are followed while managing client data.  
The solution is Adopt robust encryption procedures, conduct frequent security assessments, and abide with laws pertaining to data protection, such as the GDPR.

**4. Theoretical and Practical Contributions**

**4.1 Alignment with Existing Research**

Conformity with Current Research Software computer science and technology research streams are in line with the creation and application of chatbots in the restaurant sector. This connection is visible in several areas, including the incorporation of natural language processing (NLP), machine learning applications, and automated customer support.

**1. Automation of customer service**

Studies on customer service automation demonstrate how chatbots may save costs and increase productivity. Goel et al. (2018) conducted studies that show how chatbots may increase customer loyalty by interacting with customers in a courteous and consistent manner, which lessens the strain for human workers. Our project, which attempts to automate standard customer service duties like collecting orders, making bookings, and responding to commonly asked queries, is closely aligned with this study.

**2. Applications of Machine Learning**  
In academic literature, the use of machine learning (ML) in chatbots is extensively documented. Sharma as well as Gera (2019) highlighted how ML-powered chatbots may save costs and improve operational efficiency. Our research uses machine learning to create a chatbot that can improve its consumer interactions by learning and adapting over time. Sustaining elevated levels of accuracy and relevance in answers requires this continuous learning process, which is consistent with the larger artificial intelligence study's emphasis on adaptive systems.

**3. NLP, or natural language processing**  
Research has also been done a lot in the field of integrating NLP with chatbots. Kim et al. (2020) talked about how a chatbot's comprehension and responsiveness to client requests are improved when NLP and machine learning are combined. Using natural language processing (NLP), our initiative seeks to answer unclear and complicated questions with precision and suitability for the given context. The significance of sophisticated NLP approaches in creating successful customer service solutions is shown by this study.  
  
In conclusion, our investigation is in line with previous research in several key areas. It makes use of the well-established advantages of customer service automation, modern NLP techniques to guarantee excellent client interactions, and sophisticated machine learning approaches to improve chatbot performance. This connection places the project inside the existing conversation in computer science and software engineering and justifies its methodology.

**4.2 Divergence from Existing Research**

Although a substantial portion of the current study on chatbots and their use in customer care is in line with our project, there are a few notable differences as well:  
**Integration with Particular Restaurant Management Systems**:

Our study focuses especially on the integration of chatbots with current restaurant management systems, in contrast to most studies that concentrate on general chatbot frameworks. This emphasis guarantees smooth data consistency and efficient operations that are specific to the restaurant business.  
**Focus on Multi-Channel Accessibility*:***

A key component of our project is ensuring that the chatbot can be accessed via a variety of platforms, including social media, mobile apps, and websites. The research that is currently available, which frequently concentrates on single-channel solutions, seldom examines this multi-channel technique.

**Real-Time information and alerts:**

One of our project's standout features is the availability of real-time information and alerts regarding order statuses, booking confirmations, and exclusive specials. The incorporation of such dynamical updates is not well addressed in the literature, even though previous research recognizes the significance of timely information.  
  
Through the exploration of these domains, our study not only expands on previous findings but also presents fresh components that improve the operation and user experience of chatbots within the hotel sector.

**4.3 Lessons Learned**

**Significance of Design Focused on Users:**  
Creating a chatbot for restaurant needs underscored the essential requirement for design focused on the user. Understanding customer behavior and preferences is essential for developing a chatbot that is intuitive and responsive. The final product was shaped to meet user expectations effectively with insights from user feedback during testing phases.  
**Scalability and efficiency:**  
A major takeaway was making sure the chatbot could manage growing user interactions without sacrificing performance. Key lessons included developing scalable solutions and optimizing code for improved efficiency. We understood the importance of using stress testing and making iterative improvements to ensure high performance under diverse levels of workload.  
**Challenges in Natural Language Processing (NLP) technologies:**  
Despite progress in NLP, the chatbot sometimes faced difficulties comprehending intricate or unclear user inquiries. This incident emphasized the importance of ongoing NLP education and enhancement. It was discovered that the integration of rule-based strategies with machine learning techniques can improve the chatbot's comprehension and accuracy in responding.  
**Ongoing maintenance and updates:**  
The project highlighted the importance of continuous maintenance and updates. We discovered that implementing a chatbot is an ongoing process; it necessitates constant monitoring, upgrades, and improvements to keep up with evolving user requirements and technological progress. Consistent updates are necessary to ensure continued relevance and efficiency.  
**Concerns regarding security and privacy:**  
Dealing with customer data via the chatbot raised concerns about security and privacy matters. We understood the significance of putting in place strong data protection methods and following privacy regulations. This encounter highlighted the importance of secure data management and clear privacy policies.

**Multichannel Accessibility:**

We learned the importance of connecting with clients through their chosen channels by offering multichannel accessibility, which encompasses online, mobile apps, and social media platforms. We discovered that user engagement and satisfaction depend heavily on a smooth and uniform experience across all devices.**Real-Time Information and Notifications:**

By introducing real-time information and alerts for reservations, orders, and promotions, it was possible to get insight into the associated logistical and technical difficulties. We gained knowledge about the significance of dependable real-time communication technologies and their beneficial effects on client satisfaction.

**4.4 Best Practices**

Several best practices were created by the project, including:   
• **Frequent input Loops*:***

To enhance chatbot functionality, gather and apply user input continuously.

• **An Architecture that is Scalable*:***  
scalability was taken into consideration when designing the chatbot to accommodate more user interactions.   
***•* All-encompassing Testing:**   
carrying out extensive testing to guarantee accuracy and dependability.

**5.** **Conclusion and Future Work**

#### **5.1 Summary of Key Insights**

This study shows how AI-powered chatbots may improve customer interaction and operational effectiveness in the restaurant business. By combining machine learning and natural language processing (NLP) technology, the chatbot may respond to users in a tailored and precise manner, increasing their pleasure and loyalty. In order to maintain excellent service quality and lower human error rates, restaurants can automate repetitive operations like processing orders and reservation management, freeing up workers for more complicated work.

#### **5.2 Future Research Directions**

Subsequent investigations may examine the enduring effects of chatbot integration on eatery operations and patron conduct. The possibility of using cutting-edge AI technologies, such sentiment analysis, to improve the chatbot's skills should be explored in more research. Furthermore, investigating predictive analytics and multilingual assistance may improve the chatbot's capabilities and increase its use in the hospitality sector.

**Keywords**

* AI-driven Chatbot
* Customer Engagement
* Operational Efficiency
* Machine Learning
* Natural Language Processing
* Sentiment Analysis
* Restaurant Industry
* Personalized Responses
* Customer Satisfaction
* Data Analytics

**6. References**

* Chatbots Development Using Natural Language Processing: A Review. (2022, July 1). IEEE Conference Publication | IEEE Xplore. <https://ieeexplore.ieee.org/document/10017592>
* Enhancing User Experience Through Chatbots in Restaurant Businesses (Singh & Singh, 2018) [Google Scholar]
* Scuotto, I. (2022, February 22). Natural Language Processing Chatbots: The Beginner's Guide. Landbot.io. https://landbot.io/blog/natural-language-processing-chatbot
* Leveraging Chatbots for Table Management in Restaurants: A Case Study (Lial., 2019) [Conference Proceedings]
* Improving Efficiency in Restaurants Through Chatbot Order Processing (Kim, 2018) [Journal of Hospitality Management]
* Natural Language Processing for Chatbots in the Restaurant Industry (Baptista, 2018)
* Lalwani, T., Bhalotia, S., Pal, A., Rathod, V., & Bisen, S. (2018, January 1). Implementation of a Chatbot System using AI and NLP. Social Science Research Network. <https://doi.org/10.2139/ssrn.3531782>
* A Deep Learning-Based Framework for Sentiment Analysis in Restaurant Reviews (Hassan, 2020) [IEEE Access]
* Context-Aware Chatbot for Personalized Restaurant Recommendations (Luo, 2019) [IEEE Access]
* AI Chatbot Applications in Restaurant Management (Smith & Jones, 2021) [Google Scholar]
* Customer Service Automation in Restaurants Using Chatbots (Johnson, 2018) [IEEE]