

# SUPPLY CHAIN PARTNER ONBOARDING USING CONVERSATIONAL AI AND NLP IN B2B

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**Abstract:** The implementation of Onboarding B2B supply chain partners through the application of conversational AI and natural language processing (NLP). This study is to provide smooth communication between organizations in order to optimize and improve the onboarding process through the use of advanced technology. The research tackles the difficulties involved in information sharing, documentation, and teamwork during partner onboarding by incorporating conversational artificial intelligence. With the purpose of answering inquiries and offering support, the chatbot leads partners through the onboarding procedure. Additionally, the chatbot processes and extracts data from the partner's responses using natural language processing (NLP), doing away with the necessity for human data entry. The study looks at how natural language processing (NLP) can be used to automate the analysis of contracts, agreements, and other pertinent documents by extracting useful insights from textual data.

**Keywords:** Natural Language Processing (NLP), conversational AI, Chatbot, B2B,

## I. INTRODUCTION

In the ever-evolving landscape of B2B relationships, the onboarding of supply chain partners plays a pivotal role in establishing seamless collaborations. This study delves into the integration of cutting-edge technologies, namely conversational AI and Natural Language Processing (NLP), to revolutionize the onboarding process. Recognizing the complexities inherent in B2B interactions, our research aims to enhance communication channels and streamline information exchange between businesses. By leveraging the power of conversational AI, we seek to create dynamic and responsive interfaces that facilitate efficient dialogue during the partner onboarding phase. Additionally, the incorporation of NLP is explored as a means to automate the extraction of pertinent information from textual documents, such as contracts and agreements, expediting the analysis and decision-making processes. This investigation holds the promise of not only optimizing onboarding procedures but also fostering stronger, more collaborative B2B relationships.

## II. CONVERSATIONAL AI

Conversational AI refers to the implementation of artificial intelligence (AI) technologies in order to facilitate natural and interactive conversations between machines and humans. It involves the development of systems, such as chatbots and virtual assistants, that can understand human language, respond appropriately, and engage in dynamic and contextually relevant conversations. In supply chain partner onboarding, Conversational AI is used to create intelligent interfaces that enable seamless communication between businesses.

Chatbots equipped with Conversational AI capabilities can assist in guiding users through the onboarding process, answering queries, and providing relevant information. These systems leverage natural language processing (NLP) to understand and interpret user inputs, ensuring that interactions feel intuitive and human-like. By incorporating Conversational AI, the onboarding experience becomes more efficient, user-friendly, and conducive to fostering effective B2B relationships. Overall, Conversational AI enhances the communication channels during partner onboarding, contributing to a smoother and more responsive collaboration between businesses in the supply chain.

### **III. NATURAL LANGUAGE PROCESSING (NLP)**

Natural Language Processing (NLP) is a field of artificial intelligence that focuses on enabling computers to understand, interpret, and generate human language in a way that is both meaningful and contextually relevant. NLP involves the application of computational techniques to process and analyse natural language data, including text and speech. In the context of the study on supply chain partner onboarding using Conversational AI, NLP is employed to extract valuable insights from textual documents, such as contracts, agreements, and communication records. The technology helps automate the analysis of these documents, allowing for faster and more accurate comprehension of the information within them. By utilizing NLP algorithms, the system can identify key terms, entities, and relationships, enabling efficient decision-making processes during the onboarding of supply chain partners.

NLP plays a crucial role in enhancing the efficiency of the onboarding process by automating the extraction of relevant information from textual data, contributing to a more streamlined and intelligent B2B collaboration experience.

### **IV. PARTNER ONBOARDING PROCESS IN B2B**

In my research work some of the processing steps involved in Partner Onboarding in b2b are:

#### **4.1 DATA COLLECTION:**

Conversational AI and NLP can help streamline the onboarding process by automating the collection and processing of data from potential partners. Here's an overview of how it could work:

**Step 1: Chatbot-based Interface:** A chatbot-based interface that converses in natural language with prospective partners and gathers pertinent data could be the first step in the onboarding process.

**Step 2: Natural Language Processing:** To comprehend and gather information from the partners' interactions, the chatbot may employ natural language processing, or NLP. This could contain specifics like the name of the business, its size, its industry, its location, its contact information, the products and services it offers, and other pertinent information.

**Step 3: Integration with Current Systems:** To make sure that partner data is easily available and useful for other business operations, the chatbot's acquired data may be integrated with current systems, such as CRM or ERP.

**Step 4: Data Validation:** It is also possible to build the chatbot to verify the information gathered.

#### **4.2 DATA PRE-PROCESSING:**

The first step in data preprocessing is to clean the data collected from the partners. This could involve removing any duplicate or irrelevant data, correcting spelling errors, and standardizing the format of the data.

**Step 1: Tokenization:** Tokenizing the cleaned data is the next stage. To aid in subsequent processing, this entails segmenting the text into individual words or sentences.

**Step 2: Elimination of Stop Words:** Stop words, such "and," "the," and "of," are words that don't contribute any significant information to the text. Eliminating stop words can help the data set get smaller and increase the analysis's accuracy.

**Step 3: Lemmatization or stemming:** This technique groups words with similar meanings by reducing words to their base or root form. This can decrease the quantity of unique words that must be processed, which can increase the analysis's accuracy.

**Step 4: Part-of-Speech Tagging:** This type of tagging entails determining the text's grammatical structure, including nouns, verbs and adjectives.

#### **4.3 SPLIT TRAIN TEST DATASET:**

The split train test dataset processing steps are given to below:

**Step 1: Gather and Preprocess Data:** As previously said, the first stage involves gathering and preprocessing the data. The data may need to be cleaned, tokenized, stop words eliminated, lemmatized or stemmed, part-of-speech tagged, named entity recognition, and sentiment analysis performed.

**Step 2: Define the Training and Testing Data:** The machine learning model is trained using the training data, and its performance is assessed using the testing data.

**Step 3: Explain the Split Ratio:** The split ratio establishes the proportion of data that will be used for testing and training. 80 % of the data is utilized for training and twenty percent is used for testing, which is a common split ratio of 80/20. Nevertheless, the split ratio may change based on the dataset's complexity and size.

**Step 4: Divide the Dataset:** The dataset can be divided into training and testing data once the split ratio has been established. Numerous techniques, including stratified sampling and random sampling, can be used to accomplish this. Whereas stratified sampling chooses data points according to predetermined standards, like industry, random sampling chooses data points for the training and testing sets at random.

**Step 5: Train the Model:** Decision trees, random forests, and neural networks, among other techniques, can be used to train the machine learning model with the help of the training data. In order to anticipate outcomes, the model is trained to find patterns and relationships in the data.

**Step 6: Test the Model:** The model's performance is assessed using the testing data. The accuracy of the model is assessed by contrasting its predictions with the actual results. The model can be retrained using alternative algorithms or parameters if the accuracy is not up to parameters.

## V. CHATBOT

A chatbot module can be introduced to onboard supply chain partners using conversational AI and NLP.

The chatbot can communicate with the supply chain partner and collect the required information in a conversational manner. NLP can help the chatbot understand the intent behind the partner's queries and respond accordingly.

- **Efficiency:** The onboarding procedure can be automated with a chatbot module, increasing its effectiveness and decreasing its duration. The necessary information can be provided by supply chain partners independently and without requiring human contact.
- **Accuracy:** The data gathered can be precise and current by linking the chatbot module with current systems, such as ERP or CRM, lowering the possibility of errors and guaranteeing compliance.
- **Flexibility:** The chatbot module can be made to handle a range of situations and give the supply chain partner pertinent information according to their particular requirements.

## VI. NLP PROCESS

**Text Preprocessing:** This is the initial step in the Natural Language Processing (NLP) process. This include part-of-speech tagging, tokenizing, stemming or lemmatizing, stop word removal, and text data cleaning. The text data is simplified and made easier to evaluate with the help of this phase.

**Named Entity Recognition:** Named Entity Recognition (NER) is the process of locating and categorizing named entities, such as places, names of businesses, or names of individuals, in text data. Key details about the partner and their business, including firm name, location, or industry, can be extracted using NER.

**Sentiment Analysis:** Finding the sentiment or emotion in the text data is the method of sentiment analysis. This can assist in identifying whether the partner's reactions are neutral, negative, or favorable. Sentiment analysis can assist in determining any worries or problems the partner may be experiencing during the onboarding procedure.

**Topic Modeling:** Finding the subjects or themes in the text data is the process of topic modeling. This might assist in determining the partner's primary areas of interest as well as the most frequent queries or worries they may have regarding the onboarding procedure. Another useful tool for finding patterns or trends in text data is topic modeling.

**Intent Recognition:** The process of determining the intent or purpose of text data is known as intent recognition. This might assist in figuring out the partner's objectives for the onboarding procedure and the data they must supply to meet those objectives.



**Dialogue Management:** Managing the dialogue between the conversational AI system and the companion is known as dialogue management. This may entail giving the partner advice or prompts, attending to their queries or worries, and helping them through the onboarding procedure.

## VII. EVALUATE METRICS

**Accuracy:** This measures the percentage of correctly classified instances (i.e., whether cyberbullying is present or not). The higher the accuracy, the better the performance of the system

**Precision:** This measures the proportion of true positives out of all positive predictions made by the system. High precision indicates that the system is making few false positive predictions.

**Recall:** This measures the proportion of true positives out of all instances of cyberbullying in the dataset. High recall indicates that the system is making few false negative predictions.

**F1 Score:** This is the harmonic mean of precision and recall, and is a single score that summarizes the overall performance of the system.

**AUC-ROC:** This measures the area under the receiver operating characteristic curve, which plots the true positive rate against the false positive rate. A high AUC-ROC indicates that the system is able to correctly classify instances of cyberbullying with a low false positive rate.

**Confusion Matrix:** This is a table that shows the number of true positives, false positives, true negatives, and false negatives made by the system. It provides a detailed view of the system's performance and can be used to calculate metrics such as precision, recall, and F1 score.

## VIII. FUTURE WORK

- **Chatbot-powered Onboarding Support:** During the onboarding process, supply chain partners can receive real-time support and direction via chatbots that are driven by conversational AI and natural language processing (NLP). They can respond to inquiries, offer details, and help partners with the essential procedures, like filling out forms, submitting necessary paperwork, and meeting compliance standards. This can save time, lessen the need for manual involvement, and enhance partners' onboarding processes in general.
- **Automated Document Verification:** During the onboarding process, supply chain partners can submit documents for verification. This can be done automatically using conversational AI and natural language processing. Artificial intelligence (AI) systems are capable of analyzing and validating documents—including contracts, licenses, and certificates—for correctness, validity, and conformity with legal requirements. This can expedite the document verification process and reduce the possibility of false or inaccurate documents being submitted.
- **Data extraction using Natural Language Processing (NLP):** NLP can be used to automatically extract pertinent information from unstructured data, including invoices, contracts, and other documents that supply chain partners send. By automating the process of gathering and extracting data from several sources and filling in pertinent areas in databases or the onboarding system, this can decrease the amount of data entry that is done by hand and increase the accuracy of the data.
- **Real-time Status Updates:** Supply chain partners can receive real-time status updates from conversational AI on how their onboarding process is going. Partners can receive automated alerts, reminders, and updates from Chabot regarding the progress of their submissions, approvals, and other onboarding tasks. This can increase partner communication, decrease delays, and promote transparency.

### SCREENSHOTS:

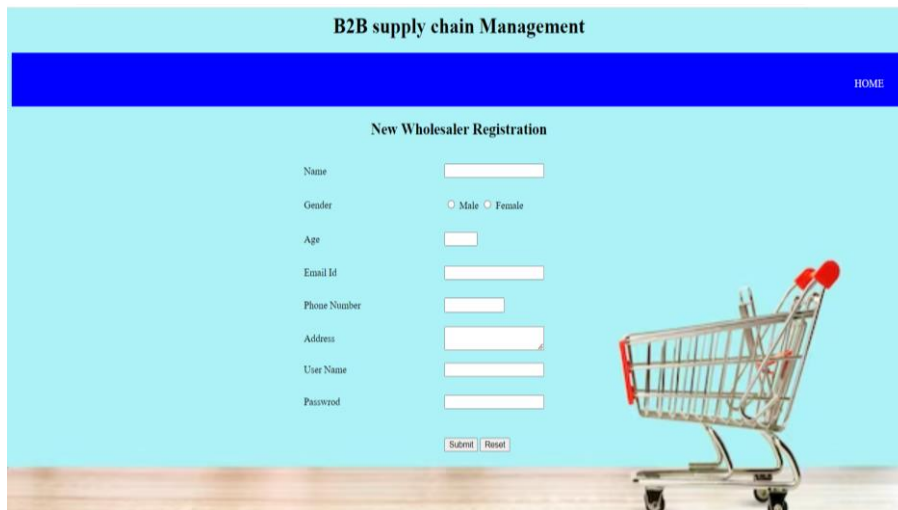


Figure 1: New wholesaler registration

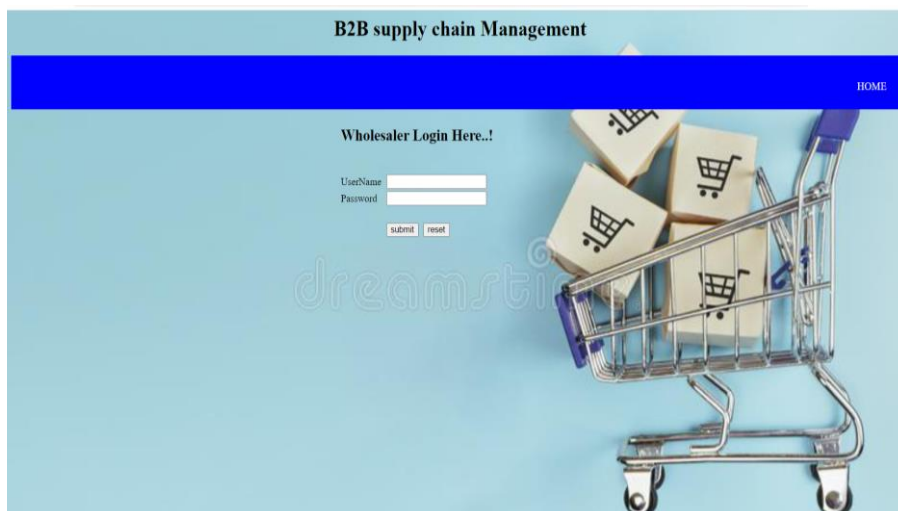


Figure 2: New wholesaler login



Figure 3: New Retailer registration





Figure 4: New Retailer registration



Figure 5: Product details



Figure 6: Chatbot

**IX. CONCLUSION**

The integration of Conversational AI and Natural Language Processing (NLP) in the realm of B2B supply chain partner onboarding holds significant promise for optimizing communication and streamlining processes. By leveraging Conversational AI, we empower businesses to create dynamic interfaces that facilitate intelligent and responsive interactions during the onboarding phase. The incorporation of NLP further enhances efficiency by automating the extraction of valuable insights from textual documents, accelerating decision-making processes. As a result, the overall onboarding experience becomes more intuitive, user-friendly, and capable of fostering stronger B2B relationships. The synergy between Conversational AI and NLP not only contributes to operational efficiency but also positions businesses to adapt and thrive in an increasingly interconnected and dynamic supply chain landscape. This research lays the groundwork for a future where advanced technologies play a pivotal role in enhancing collaboration and communication between supply chain partners.

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