Title	**LEANNA: A Startup Business Model Chatbot**
Course	CS/QTM/LING-329: Computational Linguistics
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Abstract

Leanna is an innovative chatbot that aims to assist individuals with limited business experience in starting a successful venture by brainstorming a business pitch with them. The chatbot is designed to guide users through the key parts of starting a business to decrease their failure rate. Leanna's main goal is to provide users with a solid understanding of whether their venture is worth the investment, what the business model should look like, and how to potentially solve key problems they wish to address. Our primary target audience is college students who wish to start their businesses. Nevertheless, Leanna is also capable of aiding all who wish to have their own start-up businesses.

Leanna's dialogue flow is divided into two main phases: emotional support and business modeling. During the emotional support phase, Leanna provides comfort to users struggling with the founder's depression and other emotional issues. In the business modeling phase, Leanna helps users develop their business idea by prompting questions and providing factual information in each business plan area while noting and responding according to different sentiments in user responses. Leanna is also able to handle multiple sessions as well and retrieve the answers users inputted previously. Pulling from Alexander Osterwalder's and Yves Pigneur's work on business model ontology, Leanna aims to be comprehensive, touching on the majority of aspects of a business plan [7]. The chatbot utilizes the Emora STDM framework, external NLP models (GPT-3.5), and customized macros to build the chatbot and realize its functionalities. The chatbot is evaluated in 11 aspects and excels in all, gaining above-average ratings. Ultimately, Leanna's novelty lies in her ability to provide both technical and emotional support to entrepreneurs, making her a valuable companion throughout the start-up process. The project is open-sourced in GitHub.

1 Team Vision

Our team realized that there are fundamental elements that a start-up must have in order for it to work. These elements are so important that any start-up incubator program goes through them with the entrepreneur. Still, they are also quite consistent across different types of start-ups in different industries. Traditionally this task is done by having a conversation with the entrepreneur because the incubator has to get the entrepreneur to start thinking about these elements, such as initial money source, team, and market opportunity. After that, the incubator gives advice to the entrepreneur by providing them with past successful examples and connecting them to appropriate resources. We believe this process can be done better through a conversational AI. Leanna can go through all the key elements of a start-up with the entrepreneur, provide successful examples for different key elements in her knowledge base, and direct college entrepreneurs to the right incubator program in their University. The chatbot also has the advantage over a real person in the aspects of availability and information memorization. We envision entrepreneurs can always come back to Leanna when they have an epiphany and Leanna is always there to listen, memorize, and give suggestions, even bring up again their previous idea for them to compare and contrast and provide emotional support. This makes Leanna not only a powerful chatbot full of knowledge in entrepreneurship, but also a good company on people's entrepreneurial journey.

Our team works with The Hatchery department at Emory. One of our team members works at the Hatchery and we consults Hatchery people regarding business knowledge and ways to mimic business-related conversations. Hatchery is also a good place where we and our chatbot can encounter more business proposals, providing us with the opportunities to make our chatbot more encompassing. Finally, our goal is to make this chatbot for Emory students as there is not a good and free start-up bot online. In addition, by limiting the scope, we are able to tailor the conversation in the aspects of emotional support, the complexity of the knowledge, and the accessibility of the resources most relevant to our target audience. If everything turns out well, we will present our chatbot to The Hatchery and hope it can be used there.
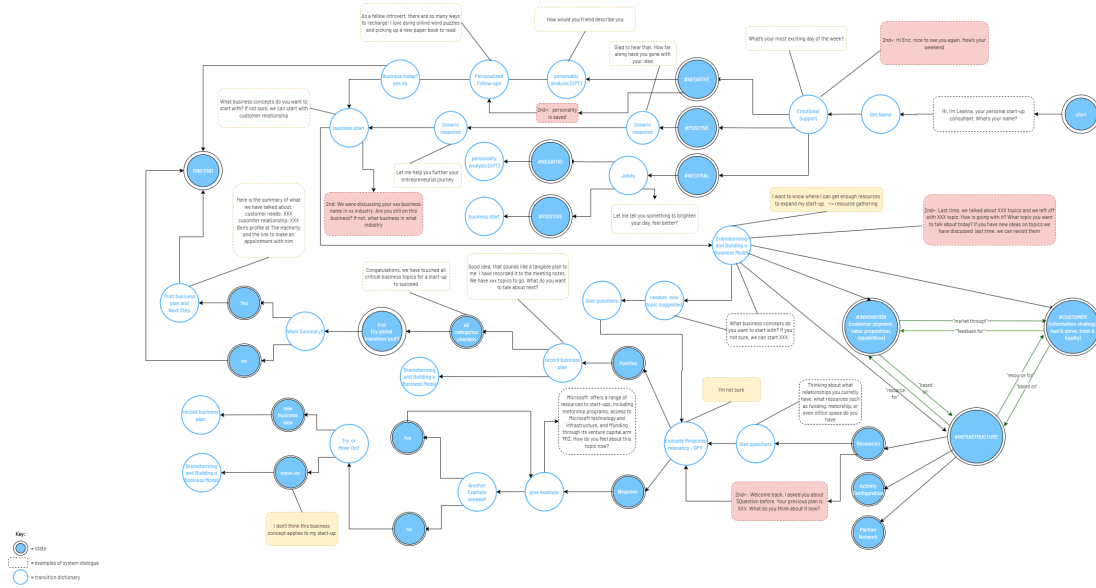
2 Dialogue Flow

Figure 1: Leanna Dialogue Flow
Link to View

2.1 Emotional Section Walkthrough

Emotional section is the beginning of Leanna. The purpose of this section is to greet the user and respond differently to users based on their responses: 1) positive/affirmative, 2) neutral, and 3) negative. Since the target audience of Leanna is college students who are inexperienced and have a lot of things going on, Leanna only goes directly to business conversations if the user's sentiment is positive. For negative user sentiment, Leanna tries to analyze their personality by asking how their friend describes them and provides customized relaxation advice accordingly. Leanna provides users with neutral sentiment with a joke, if the user's sentiment does not improve after seeing the joke, Leanna treats them like a user with negative sentiment. Leanna will double-check with the user whether they feel like talking business today and will reassure the user if they want to rest then end the conversation. Some generic conversations like "How far along have you gone with your ideas" and "let me help you further your entrepreneurial journey" are provided to users with positive sentiments to keep them more engaged.

2.2 Business Section Walkthrough

Leanna offers practical help to the user by going through all the business concepts that are crucial for any start-up to succeed. Leanna has 23 questions, each corresponding to a business concept such as customer needs and product features. They are under three big business categories which are product innovation, customer relationship, and infrastructure management. This phase of the conversation is based on the business model referenced in this paper[7]. Leanna will ask users what they want to talk about with a suggested business concept that the user has not seen before (this also gives users an idea that Leanna helps with general business concepts instead of specific problems about their business). Users can go with Leanna's suggestion or input their own questions, which Leanna will categorize it using GPT. The user's response to Leanna's question is evaluated by GPT only on its relevancy. For relevant answers, Leanna will record them in the user dictionary, and for irrelevant answers, Leanna will scaffold users with examples to help them brainstorm and understand the question better. Users can request a different example if they don't think the current one fits their business. After users are done requesting more examples, they can decide if they want to try answering it again or move on to the next topic. The try-again answer will always be recorded in the user dictionary.

This marks the end of the discussion of one business concept. The user will be taken back to the beginning where they choose the next business concept

2.3 Multi Visit and Other Supporting Features

Leanna greets returning users differently and is able to memorize the user's progress, including their answers to each question, personality, business name, and a number of topics waiting to be discussed. Leanna will also ask the user if they are still working on the same business idea, as changing ideas can be quite common, especially for college entrepreneurs. If the user is now working on a different idea, their previous progress will be deleted. In addition, at the beginning of the business section, Leanna will quickly recap the business concepts discussed last time and where they left off. User is able to go into any business topic they wish. If the topic was discussed previously, Leanna will output the user's previous plan for reference. User's response on later visits will overwrite their previous response to the same question.

To further improve conversation quality, Leanna is capable of doing the following:
  1) Same business question will not appear twice in a conversation
  2) Direct matching 'quit' in global transition, so the user can quit at anytime
  3) Direct matching 'next topic' ... in global transition, for users to change business topics at anytime
  3) Greeting and quitting words are customized if users did not reach the business part of the conversation
  4) Greeting and quitting words are customized if users did not reach the business part of the conversation
  5) Different wording when the user requests another example to make the conversation more huamn-like
  6) Leanna provides an appointment link to experts at The Hatchery as the next step for users

2.4 Sample Dialogue

Please find our sample dialogue in this document.

3 Methodology

Our project aims to utilize the Emora STDM framework [3] as the foundation for our dialogue system development. Our scientific approach will primarily focus on four key components, namely the database, GPT-3.5, customized macros, and multi-visits.

3.1 Database

For this project, we do not rely on any external databases. Instead, we create the database ourselves by conducting interviews with Hatchery staff and experts and utilizing reputable online resources. Our objective is to provide reliable and compassionate suggestions and comments to users. The databases we compile concentrate on two primary areas: emotional support dialogue and business modeling dialogue. Particularly, we have in total three databases, respectively: 1) business data, 2) jokes, and 3) personalities.

3.1.1 Emotional Data

As Leanna is not intended to serve as a mental health chatbot, we will not include any medical resources in this section. Instead, Leanna will provide emotional support to the user as a friend would, sharing personal experiences to comfort them. To achieve this, we created two databases for Leanna to choose responses from: a joke database that contains entrepreneur jokes and a personality database that contains advice for relaxation.

When Leanna finds out that the user is in a neutral mood (neither happy nor sad), she would try to tell the user a joke from the joke database to cheer the user up. The entrepreneur jokes in the joke database are collected from *Upjoke* website [1]. Though the website contains hundreds of business related jokes, the qualities of the jokes are inconsistent. Therefore, the team members have to manually collect funny and appropriate jokes from the website to create the joke database. Thus, the total number of jokes available in the database is limited.

If the user is in a negative mood (sad or stressed), Leanna would try to give suggestions to the user to help the user relax. Leanna would select the suggestions from the personality database based on the user's specific personalities. The personality database contains various suggestions to relax categorized based on the "big-five" personality dimensions [8]. The "big-five" personality dimensions are five concepts that measures 5 distinct aspects of a person's personality: "openness", "conscientiousness", "extraversion", "agreeableness", and "neuroticism" [8]. In the personality database, each of the five categories would have several specific and practical suggestions that aim to help people who fall into the category release their pressure. Similar to the joke database, the exact wordings of the suggestions are written by the team members, and thus the total number of suggestions is limited.

3.1.2   Business Data

We categorize the topics for business modeling dialogue. In Osterwalder and Pigneur [7], the authors proposed an e-Business Model Ontology (e-BMO). E-BMO provides a structured and conceptualized representation of the fundamental elements that comprise a business model in the e-business domain. Although e-BMO was developed with a focus on e-business models, the principles and concepts that it presents can be generalized to all types of businesses. It is structured into multiple levels of increasing depth and complexity. At the first level of decomposition, e-BMO identifies the four main pillars of a business model, which include the products and services offered, customer relationships, necessary infrastructure, and financial metrics that reflect business success or failure. This initial level serves as a foundation for further exploration and refinement of the e-BMO framework.
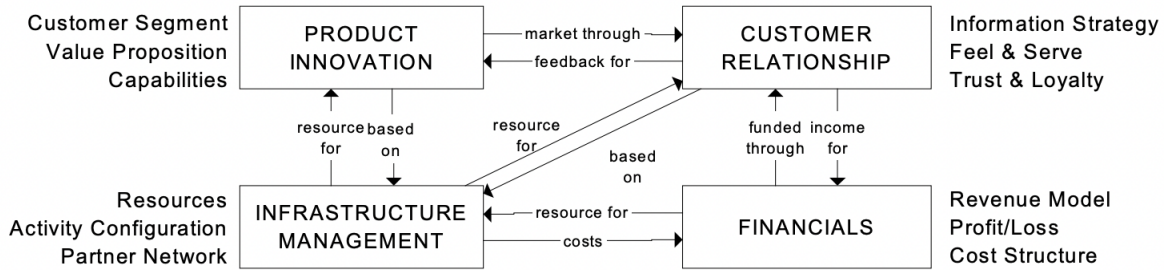

Figure 2: The 4 Pillars of the Business Model Ontology

In our dialogue system, we divide all the business modeling topics into three main categories as identified by e-BMO, followed by three sub-categories in each main category which we explore further with online resources and experts. We eliminate the financials category in the e-BMO because we believe that category can be better touched in the follow-up consultation with the Hatchery consultants. Although the original e-BMO model only includes 9 subcategories for product innovation, customer relationship, and infrastructure management, our team consulted external sources and experts to expand the number of subcategories to provide a more holistic business plan [4, 6, 5, 2]. In total, we have 21 sub-categories falling into the three main categories, they are: customer needs, product benefits, product features, product experiences, and value proposition in product innovation; before purchase, during purchase, after purchase, intellectual strategy, value chain strategy, architectural strategy, disruption strategy, trust strengths, and values loyalty in customer relationship; team skills, team culture, operations, inbound logistics, outbound logistics, and resource gathering in infrastructure management.

In addition to the categories, the database also includes brainstorming questions tailored to users, along with exemplary answers for those questions. These questions and answers are designed to help users generate innovative ideas and consider various aspects of their business plans. Our team member, Yifei Gao, who runs a consulting company on her own and is a staff at Hatchery, came up with these questions and examples based on her experience. For example, under the "customer needs" category within product innovation, the question asks users to identify the needs of people their business can serve. Exemplary answers may include convenience, such as Amazon's Alexa allowing voice-controlled management of smart home devices and online orders, or time-saving, as demonstrated by Uber's

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quick ride-hailing service. A complete dataset can be found in the Github repository data.csv.

3.2 GPT 3.5

Our chatbot relies on natural language processing (NLP) models to provide an effective dialogue system for guiding users in business start-ups. Specifically, we plan to use commercial NLP models to achieve high levels of accuracy and effectiveness. Among all the models, GPT-3.5 stands out as the best option due to its massive size, state-of-the-art performance, adaptability, and built-in features.

To enable our chatbot, Leanna, to perform the desired functionalities, we focus on the core GPT-3 feature: text completion. Text completion is employed to generate appropriate responses based on the user's input. Particularly, we utilize text completion to perform **sentiment analysis, categorization, keyword extraction, and response evaluation**, and asks the return to be in json format. Through text completion, Leanna can understand and respond to the context of the conversation thoroughly, providing extraordinary emotional and business plan support.

3.2.1 Prompt Engineering for Emotional Part

In the emotional part, the text completion function of GPT 3.5 is used for sentiment analysis, categorization, and keyword extraction.

For sentiment analysis, we ask GPT to analyze the user's input and categorize the user's emotion into one of the three categories: "positive", "neutral", and "negative". Based on the result, Leanna would decide whether to start the conversation of emotional support or to move on to talk about business ideas. This function is achieved through the macro, **SET_SENTIMENT**

The categorization done by GPT can be divided into two parts in emotional section: personality categorization and binary categorization. The personality categorization is used to categorize the user's personality into one of the "big-five" personalities mentioned in section 3.1.1 based on the user's response of how his/her week has been. This is achieved by the macro: **SET_BIG_Five**. As for the binary categorization, GPT would categorize the user's responses to some yes/no questions into "yes" or "no". These functions are achieved by macros:

- **BUSINESS**: This prompt classifies the user's response to if they want to talk about business or relax into "yes" or "no".

- **JOKE_FEEL**This prompt classifies the user's response to if they want more jokes into "yes" or "no".

As for key word extraction, **SET_CALL_NAMES** is used to ask GPT to extract the user's name from the user's response to a question asking his/her name.

3.2.2 Prompt Engineering for Business Part

In the business part, we utilized GPT 3.5 to perform keyword extraction, categorization, and response evaluation.

In keyword extraction, we asked the model to extract the business name and industry from the user response so we can refer to the name and industry in the future to acknowledge users that the chatbot understands the topic. The macro we used to implement this feature is **SET_BUS_NAME**.

For categorization, we employed various prompts to classify user inputs into 1) binary categories (yes/no questions) and 2) business categories. These prompts help in guiding the chatbot to accurately identify the context of the conversation. Below are the categorization macros:

- **SET_BIG_SMALL_CATE**: This prompt classifies the input sentence into three large business categories and the corresponding small category within each large category. The large categories include product innovation, customer relationship, and infrastructure management.

- **MOVE_ON**: This prompt determines if the user wants to move on to the next topic based on the input sentence. It returns a binary answer, either 'yes' or 'no'.

- **SET_YES_NO_Topic**: This prompt identifies if the user wants to continue on the current topic or not. It returns a binary answer, either 'yes' or 'no'.

- **SET_YES_NO_S**: This prompt checks if the user wants a summary of the conversation. It categorizes the input sentence as either 'yes' or 'no'.

- **SET_YES_NO_B**: This prompt determines if the user wants to keep working on their business plan. It categorizes the input sentence as either 'yes' or 'no'.

- **SET_YES_NO_E**: This prompt identifies if the user wants to work on their business plan today. It categorizes the input sentence as either 'yes' or 'no'.

- **SET_IDEA_EX**: This prompt checks if the user wants another example, either because the current example does not apply to their business or they directly request another one. It categorizes the input sentence as either 'yes' or 'no'.

- **SAME_BUS**: This prompt determines if the user is still working on the same business as before. It categorizes the input sentence as either 'same business' or 'new business'.

For response evaluation, we asked the model to find if the user response is relevant to a question prompted by the chatbot to evaluate whether we can record the user response directly to the business plan or to provide some examples. If the user response is irrelevant (as determined by GPT), then the chatbot will give user examples; otherwise, if the model finds the response relevant, it will record the response to the business plan. The specific macro we used is, **SET_USER_KNOW**, which evaluates if the user's answer is relevant to the given question. It provides a binary answer, either 'yes' or 'no'.

3.3 Customized Macro

To achieve the desired functionalities, our plan involves creating several customized macros in addition to the ones that utilized the GPT's text completion function.

3.3.1 Emotional Part

In the emotional part, these macros are:

- **TIME**: This macro returns the current system time.

- **JOKE**: This macro randomly select and return a joke from the joke dataset that has not been presented to the current user before.

- **EMO_ADV**: This macro randomly select and return a suggestion that has not been presented to the current user before from the personality dataset based on the current user's personalities.

- **DEL_ADV**: This macro deletes the current user's previous relaxing suggestion from the user's profile.

3.3.2 Business Part

In the business section, these macros are:

- **GET_PROG**: This macro updates the progress of the conversation and gives the user the number of subcategories left to give them a sense on how many topics are left.

- **GET_QUESTION**: This macro fetches a question based on the current subcategory from the business data file.

- **GET_EXAMPLE**: This macro retrieves an example related to the current subcategory, making sure not to repeat examples that have already been used. If there's no more available examples, it also prints that there's no more examples.

- **GET_AVAIL_CATE**: This macro selects a random available subcategory that has not been discussed yet. This macro is called when users do not provide a specific topic they would like to discuss.

- **UPDATE_BP**: This macro updates the user's responses in the chatbot's memory on the specific subcategory. For instance, this macro stores user response for the question to each subcategory's question.

- **GET_SUMMARY**: This macro prints a summary of the user's responses. Specifically, it prints out the user responses stored for each category.

By using these custom macros, we ensure that the chatbot can track the user's progress, offer relevant examples, and maintain a summary of the user's responses, enabling a more productive and engaging conversation.

3.4   Multi-Visits

Leanna allows user to have multi-visits, which means that it can save user data. The multi-visit functionality is a crucial feature for Leanna, enabling Leanna to provide a personalized conversational experience for users to come back and update their ideas and business plan at anytime. Specifically, we use the **save** and **load** functions in Emora-STDM to achieve the multi-session functionality, using user's name as their unique ID. The save and load functions facilitate the storage and retrieval of the conversation state and variables which are saved in a pickle file using the **pickle** module. Additionally, we have include checks for multi-visits in the dialogue flow and several customized macros that are designed to handle the multi-visits. These macros and additions in the dialogue flow are:

- **USER_PROFILE**: This macro is responsible for identifying users and distinguishing between first-time and returning users. It uses variables such as 'first_ex' and 'VISIT' to determine users states on whether it is their first visit. Based on the user's history, the macro generates an appropriate greeting message for the user. For example, if the user is a returning user, it will say 'nice to see you again'.

- **CHAR_CHECK**: This macro checks if Leanna has recorded the current user's personalities before. It will return "True" if Leanna indeed has the current user's personalities and "False" otherwise.

- **CHECK_TALK**: This macro checks if a user has previously answered a question in the same subcategory. If the user has answered the question before, it provides the previous response to the user and ask user their new thoughts about the question. If not, it presents a new question for the user to answer. This macro ensures that users can continue their conversation from where they left off during their previous visits and also gives user the opportunity to update their previous response.

- **Checks in Dialogue Flow: Same Business?**: Returning user has another layer of dialogue when entering the business section. They will be ask whether they are still working on the previous saved business idea. If so, Leanna will continue; if not, Leanna will delete the user's profile and ask about their new business idea.

- **DEL_PROFILE**: The purpose of this macro is to delete the user's responses if needed. This is used where the user wants to start a new conversation or discuss a different business idea.

- **talked_sub**: This macro retrieves information about the subcategories that the user has previously discussed. Based on this information, the macro helps Leanna to suggest new topics for discussion and also gives user the last topic they have discussed with Leanna. Thus, it makes the conversation flows more naturally and tells the users that they can revisit the previously discussed topics.

4   Challenges

During the implementation of Leanna, the team has faced several challenges.

4.1   Limitations of GPT and Emora STDM

Though GPT is one of the state-of-the-art NLP models and often generates amazing outputs, it has some features that have made the team decide to limit the usage of the GPT model.

One major challenge is that GPT's output has a level of randomness, and thus we would not have control over what GPT would generate. Because of this, we decide only to use the GPT model to analyze the user's input and give directions to the conversation, instead of directly presenting GPT's output to the user. In this way, though

we would lose some flexibility to react to unexpected user inputs, we can fully control the contents of the conversation to make it more professional and business-related and also avoid making talking to Leanna feel like talking to GPT.

Another challenge brought by using the GPT model is its conflicts with Natex used by Emora STDM. Because of the mechanism of Emora STDM, when using GPT to analyze a user's inputs, the user's inputs would be sent to GPT even when a matched Natex exists. Furthermore, the GPT model would try its best to give a result even when the input message has nothing to do with the prompt, which would result in a completely wrong analysis result. As a result, the usage of the GPT model has conflict with the global transition in Emora STDM. To fix this problem, the team decides to give global transitions a high score and at the same time use only direct matching with global transitions. In this way, we can let the user quit the conversation with Leanna whenever he/she wants by directly typing "quit".

4.2 Preliminary User Testing Feedback

We did a preliminary user testing while implementing Leanna to see if we were on the right check. Based on the feedback collected, we realized many problems with our initial design and have improved Leanna in many aspects.

Some of the common complaints about Leanna in preliminary user testing included not emotionally supportive, unable to evaluate user's business plan, and low flexibility for user to lead the conversation. To tackle these problems, we improved Leanna in various aspects. We designed and implemented a more complex dialogue flow that has an extended emotional support section and allows more flexible transitions of topics. Then, we rewrote many of Leanna's responses to make it more natural, professional and engaging. We also improved our error case handling to make it more smooth. As for the problem that Leanna cannot evaluate user's business plan, this is actually not included in the scope of Leanna. The goal of Leanna is to help the user come up with a more complete business plan and prepare him/her for a more in depth and personalized conversation with a real-person business consultant. We decide to leave the evaluation of the user's business plan to his/her future discussion with the real-person business consultant. Instead, we will provide the user with the contacts of business consultants in Hatchery at the end of the conversation.

5 Evaluation Plan

The chatbot was evaluated based on the following 11 categories: Effectiveness, Satisfaction, Interpretability, Coherence, Natural, Ethical, Empathetic, Informative, Engaging, Personalization, and Correctness by the team members, who chose at least five evaluation categories each. 50 users evaluated the chatbot in total. The evaluation categories were graded on a Likert scale of either 1-3 or 1-5, which was normalized to 1-5 for the aggregate results, which 1 meaning disagree and 5 meaning agree.
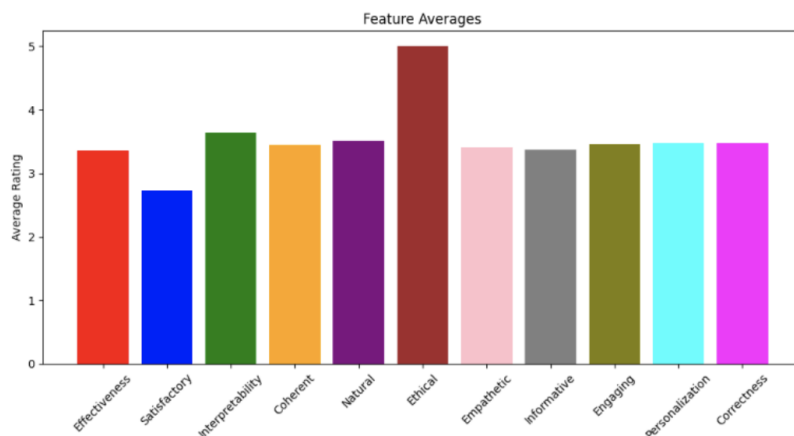

Figure 3: Team Member Evaluation Results

5.1 Tester Demographics

The demographics of the testers were college students with an average age of 21.5. There were roughly equal numbers of male and female students, with ethnicity being primarily Asian.

5.2 Evaluation Categories

- **Effectiveness**: This is the extent to which Leanna successfully guides users through the process of completing a business plan and provide examples to help better understand each business subcategory.

- **Satisfaction**: This is the extent to which users felt satisfied with Leanna's guidance and the extent to which they felt the conversation met their expectations.

- **Interpretability**: This is the extent to which users can easily understand and make sense of Leanna's responses and actions. Leanna is designed to use clear, understandable, and concise language while taking into account users' level of knowledge on the business topics.

- **Coherence**: This is the degree to which Leanna's responses are logically consistent, connected to each other, and relevant to the context of conversation. Leanna should have a smooth flow of conversation, including in error stages.

- **Natural**: This is the degree to which Leanna's contributions to the conversation flow felt natural in terms of language and tone. This category evaluates whether Leanna's interaction is fluent, realistic, and human-like.

- **Ethical**: This is the degree to which Leanna's responses avoid causing harm or offense to users and adhere to ethical principles and standards.

- **Empathetic**: This category evaluates Leanna's ability to understand and respond compassionately to users' emotions and feelings and providing emotional support or encouragement when appropriate.

- **Informative**: This category is achieved if Leanna provides accurate and useful information to users in response to inquiries for examples and business definitions.

- **Engaging**: This is the degree to which Leanna captures and maintains users' attention by generating interesting contents and conversation topics and by using engaging language.

- **Personalization**: This is the degree to which Leanna creates tailored responses and recommendations based on user preferences, needs, and past interactions. Leanna should provide personalized advice for users based on personality evaluation and should remember content from previous conversations.

- **Correctness**: This is the accuracy and relevance of the information provided, specifically the categorizations of user input (in business aspects and personalities), and recommendations provided by Leanna. Leanna should give accurate guidance, examples, and ask appropriate questions regarding different aspects of a business plan and offer appropriate advice based on users' specific needs.

5.3 Evaluation Results

Based on the responses collected by each of the team members, Leanna was rated most effective in Interpretability and Ethical. The lowest-rated category was Satisfactory. Each team member computed an average score for the categories they evaluated. The average scores for each of the categories are as follows:

- **Effectiveness**: 4, 2.5, 2.8, 4.14
- **Satisfactory**: 2, 2.2, 2.7, 4.0
- **Interpretability**: 2.7, 3.8, 4.43
- **Coherence**: 3, 3.5, 3.86, 4.67
- **Natural**: 3, 3.6, 3.0, 4.43, 5
- **Ethical**: 5

- **Empathetic**: 3, 3.3, 3.2, 4.14, 5
- **Informative**: 2.9, 3.2, 4, 4.25
- **Engaging**: 2.5, 4.43
- **Personalization**: 2.8, 4.14, 4.75
- **Correctness**: 2.8, 4.14

These results are displayed in Figure 3.

6   Novelty

Our target audience not only struggles with the knowledge of how to found a business, but they also struggle with loneliness and the founder's depression. Studies show that founders of start-ups are 30% more likely to develop depression than those people that are not entrepreneurial [9]. The key problems of lack of knowledge and the lack of a companion are negative factors of early-stage innovation and we believe Leanna's potential goes beyond aiding our target customer through providing business-related information and resources– which is what most of our competitor bots do. Leanna's strength lies in her ability to communicate, so she can ask questions that provoke inspiration, help build a business model, have a personal touch, and also remember the conversations that occurred so that she is alongside the entrepreneur every step of the way– ensuring our audience is not alone and thoroughly supported in chasing their passions.

	ChatGPT	Leanna
Can talk about your business & technicals & give you resources	⊘	⊘
Can brainstorm business ideas + build a business model through conversation	⊗	⊘
Has a personal touch acknowledging the difficulty for founders	⊗	⊘
Asks questions that provoke additional brainstorming and thought for founders	⊗	⊘

Figure 4: Comparison of ChatGPT and LEANNA capabilities

Besides ChatGPT as our main chatbot competitor, Leanna is designed to be a substitute for initial conversations with business consultants such as the employees at the Hatchery. Leanna is equipped to handle all aspects of the business plan as a business consultant would be able to, but in addition, is able to provide a more in-depth conversation about the emotional well-being of the user and is able to readily provide personalized suggestions for restorative niches as well as targeted examples for aspects of a business plan. Additionally, users are able to work at their own pace, with the ability to return to Leanna for multiple visits and the option to print out their business plan as they're working on it. Leanna solves the issue of availability of consulting appointments as well, as users can talk to her 24/7 at their convenience and receive the guidance they require.

References

[1] Entrepreneur jokes. URL https://upjoke.com/entrepreneur-jokes.

[2] Steve Blank. How to build a web startup – lean launchpad edition, September 2011. URL https://steveblank.com/2011/09/22/how-to-build-a-web-startup-lean-launchpad-edition/.

[3] James D. Finch and Jinho D. Choi. Emora STDM: A Versatile Framework for Innovative Dialogue System Development. In *Proceedings of the 21th Annual Meeting of the Special Interest Group on Discourse and Dialogue*, SIGDIAL'20, pages 261–264. Association for Computational Linguistics, 2020.

[4] Joshua Gans, Erin L. Scott, and Scott Stern. Strategy for start-ups, May 2018. URL https://hbr.org/2018/05/strategy-for-start-ups.

[5] Ryan Hamilton, Leslie John, and Michael I. Norton. 4 questions to measure and boost customer trust, November 2022. URL https://hbr.org/2022/11/4-questions-to-measure-and-boost-customer-trust.

[6] Wilhelm Lerner, Markus Leopoldseder, and Hanna Karki. Why investing in procurement makes organizations more resilient, June 2020. URL https://hbr.org/2020/06/why-investing-in-procurement-makes-organizations-more-resilient.

[7] Alexander Osterwalder and Yves Pigneur. An ebusiness model ontology for modeling ebusiness. In *Bled eConference*, 2002.

[8] S. Rothmann and E. P. Coetzer. The big five personality dimensions and job performance. *SA Journal of Industrial Psychology*, 29(1), 2003. ISSN 2071-0763. doi: 10.4102/sajip.v29i1.88. URL https://sajip.co.za/index.php/sajip/article/view/88.

[9] Jordana Valencia. How founders can recognize and combat depression. In *Harvard Business Review*, 2017.