* **Objective 1: Knowledge Supporting and Explanation**

+ Translate the locale question to English

+ Recognize the attributes of user’s question

+ Process the relationship of these attributes

+ Query the Knowledge Base

+ Show the response to user

Text

Description automatically generated

* **Objective 2: Personalized Problem Recognition based on user’s journal history**

+ Analysis the User behavior (the user’s questions, considerations, time, location, etc.,) by recognizing user’s problems

+ Generate the relevance hints to help user verify his/her problem

+ Verify the problem with Consultant Specialist, support user to find the adorable solution

+ Predict and point out the potential problem based on different context

+ Help user understand his problem by recommending the best context and solution

**Graphical user interface

Description automatically generated with medium confidence**

**Further Research:**

1) Running Experiment to evaluate the algorithm performance

2) Running A/B test with amount of real users

3) Expand the smart conversational service to the other banking product (e.g., bancassurance, asset management, etc.,)

* **Pre Process data**

1. FAQ (<https://www.desjardins.com/ca/FAQ/>)
2. Product, service manual guide, case study, internal training courses
3. User Behavior without the personal information
4. Pre-trained model (openAI, GPT3, etc.,)
5. Wikipedia,
6. Open dataset

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Objective** | **Task** | **Phase** | **Input** | **Output** | **Note** |
| Knowledge Supporting and Explanation | Preprocessing raw data | 1 | The raw data from FAQ, Product manual guide, Case study | Preprocess data: Unicode, Math, Graph, |  |
| Knowledge Supporting and Explanation | Generate the Table score (features) | 1 | The Clean Text | The Table Score (Features) |  |
| Knowledge Supporting and Explanation | Review & correct data - **Language 1** | 1 | The results generated by AI during Model Traning step and Output Templates have the accuracy level lower than 80% | Correct the data and transfer verified accurate results into identification database library of Model Traning (AI) |  |
| Knowledge Supporting and Explanation | Knowledge Component building | 1 | The Correct data | The Machine learning model with knowledge component |  |
| Personalized Problem Recognition | Gather user’s behavior | 2 | Extract the user’s behavior and analysis this data | The statistic model of user’s behavior |  |
| Personalized Problem Recognition | Hints generation | 2 | Product, service banking and their case study | The hints of each relevance product and service |  |
| Personalized Problem Recognition | Collect user’s feedback to recognize user’s problem | 2 | Hints, User’s feedback | User’s problem |  |
| Personal Context Reasoning Identification | Understanding user’s problem deeper | 3 | User’s problem and his/her behavior, feedback | The deeper potential personalized problem |  |
| Personal Context Reasoning Identification | Predict and point out the potential problem based on different context | 3 | The potential personalized problem | The potential personalized problem on the respective context |  |
| Personal Context Reasoning Identification | Recommend the best context and solution | 3 | User behavior, the problem, context | The solution, recommendation, or contact to the consultant specialist |  |
| Human Review | Review & correct data | 4 | Output Templates from AI have the accuracy level lower than 80% | Increase the accuracy of identification and extraction of data  Input accurate data into an AI standard database |  |
| Web APP | Client UI | 4 | Mock screens | Client UI |  |

**Collaboration Proposal**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Activities | Description | Frequency | Tool | PIC | Attendees |
| Communication with Partner | | | | | |
| Research Team vs. Desjardin meeting | Meeting between **Research Team** and Desjardin in case of need | Per request | Zoom | Both sides | All stakeholders |
| Reviews & Meetings in Research Team | | | | | |
| Project kickoff meeting | Meeting to kickoff project | 1 time | Face-to-face meeting | Prof. | All team |
| Daily meeting | Daily meeting to tracking daily task status | Daily | Face-to-face meeting | Prof. | All team |
| Weekly meeting | Project status meeting | Weekly | Face-to-face meeting | Prof. | All team |
| Reports | | | | | |
| Project status report | Report about project status | Weekly | Face-to-face meeting | Prof. | All team |
| Meeting minute | Meeting minute will be sent to all team after each meeting | Per meeting | Face-to-face meeting | Prof. | All team |

**Research Material:**

## Research and Development Environment

Below is the hardware configuration and software needed for development:

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Type** | **Hardware** | **Software** |
| 1 | R&D PC | * Intel Core i7 2.6 Ghz or higher. * 16GB of RAM. * 200GB of SDD. * 27 inches HD monitor * Keyboard, mouse, micro, webcam * Desk, Chair * Internet (60Mbps or FTTH) | * Window 10/ Linux * GIT, SVN. * Pycharm: need license * Google API: need license * Spacy.io: need license * Elmo: need license * MS office: need license * Tableau: need license |
| 2 | Database Server | * Intel Xeon E5 2.4Ghz, 16GB of RAM, 2TB of HDD | * Linux * MongoDB, Cassandra: need license * IEEE account: need license |
| 3 | GPU server | * 1 GPU 16G – Google Cloud | * Linux |

**1.2. Research Experiment:**

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Type** | **Strategy** | **Note** |
| 1 | A/B Test | * Run A/B test with real users | * Recruit at least 100 users to work on the system * Collect the feedback and users behaviors to analysis |
| 2 | Performance analysis | * Run experiment with different algorithms | * Unit tests, multiple processing, GPU * Microservices, Docker |

## Research Confidential

## For the avoidance of doubt, the Non-disclosure agreement will be signed with the proposal