

# Chatbot engine and Algorithm for Patent Avoidance Design

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## Abstract

This paper describes a Chatbot engine and its algorithm that propose a patent avoidance plan as well as the corresponding implementation. In general, when a small company or an individual applicant intends to apply for and apply for intellectual property rights related applications and / or intellectual property rights related matters in order to secure intellectual property rights, a small company or an individual applicant may use intellectual property rights (patent, Trademark, design, copyright) in the field of development and research. In addition, small companies and individual applicants are experiencing a lot of difficulties in securing intellectual property rights and acquiring knowledge on them, because they are specialized work areas that require a lot of legal factors.

In addition, a small company or an individual applicant hastily launched new products with the idea that they should quickly market new ideas and new products that could help them to run a business, while ignoring the intellectual property rights. There is a continuing problem of legal problems that can't be promoted by the monopoly rights of a company that prevails intellectual property rights with products similar to new products.

Therefore, this research paper solves the above-mentioned problem by designing the Chatbot engine and implementing the algorithm according to it, and at the same time, it can solve the problems mentioned above. It is one of the researches that have been made to prevent qualitative and material damage without any measures due to the influence of intellectual property rights already prevailed by the invention.

In this paper, we propose a Chatbot engine and an implementation algorithm for presenting an avoidance plan related to intellectual property rights before undertaking all tasks for new products.

**Keywords:** Chatbot engine, Patent avoidance, Core keyword, Information articles, Subject word

## 1. Introduction

As a result of observations in the field of business, consultation on intellectual property rights or consultation on intellectual property rights issues is continuously taking place in off-line mainly with the agreement with the person in charge of the customer company or the individual applicant. In the case of large corporations or midsize companies, not only are there sufficient researchers with sufficient manpower and qualifications in the company, but also have a systematic development infrastructure. In other words, new ideas are being discovered or intellectual property applications - registration and maintenance and maintenance are being carried out smoothly.

On the other hand, in the case of general small-sized companies or individual applicants, neither the president nor the general person of the customer is realistic in all tasks due to the lack of qualitative-quantitative or professional staff. Moreover, it is unfamiliar that the president or general person of the customer is not a field of work that has been continuously carried out in relation to intellectual property rights (patent, utility model, trademark, design, copyright). In particular, the intellectual property field is a specialized business field that needs to know not only the technology but also the legal part, so it has a lot of difficulties in acquiring intellectual property right and acquiring knowledge about it.

In addition, a typical small business or an individual applicant will release a prototype without any action, despite the inability to secure intellectual property rights, even though there are good ideas or new products to launch in order to help the company. As a result, general small-scale companies and individual applicants will have the problem of not being able to release prototypes that have already been prepared due to the influence of monopoly rights already secured by large enterprises or midsize companies that have acquired intellectual property rights.

These problems are frequently occurring. Therefore, this research suggests that a small company or an individual applicant should preempt the intellectual property right before producing the prototype, seeking ways to avoid the monopoly right in relation to the exclusivity of the large or medium enterprise. This is a study on the Chatbot engine and the old implementation algorithm that can provide the patent evasion design [1-3].

## 2. Chatbot Engine Suggesting Patent Avoidance Design

This paper is based on applied theories such as communication theory and artificial intelligence. In this paper, we propose a 5G next generation communication system supporting Big Data and Clouding service, a neural network, deep learning, text mining, natural language processing, Sector. This study and research will help us develop our future science. In other words, the Chatbot

engine and its algorithm implementation, which are the core subjects of this paper, are based on the intellectual property right that large enterprises or midsize companies have pre-empted their job inventions related to outstanding ideas, new products. This is a proposed study to prevent human and material damage. In addition, this research paper aims to minimize the damage by presenting a patent evasion plan to a small company or individual applicant before launching a demonstration product by implementing the Chatbot engine and its algorithm[4-7].

### 2.1. Chatbot Engine Suggesting Patent Avoidance Design: Case 1

The Chatbot engine of this paper is designed to motivate the small business or one company to provide the new power generation business and to propose the patent evasion plan which will help to find the idea, To protect the technological know-how, and to generate profit through the preemption of the niche market. In addition, the Chatbot engine of this paper makes a great contribution to the development of the enterprise and related industries,

Therefore, the processing of the Chatbot engine, which is a key topic of this paper, is easy to proceed as follows.

First, a small company or an individual applicant who needs a patent evasion design should first select key keywords related to the field or company project that he is interested in, and then visit kipris (www.kipris.or.kr), a patent information search site. A person who is connected to the system searches for a plurality of related patents that have already been published or registered as a result of attempting a patent search by inputting a core keyword into a search window displayed at kipris (www.kipris.or.kr). Those skilled in the art will remove unnecessary patents from a number of patent cases extracted from kipris and select only N prior patents that are of interest or that would be helpful in the current business.

From there, the Chatbot engine for evading the design scheme receives key keywords and N prior patents from the practitioner. The Chatbot engine for avoidance design accesses the portal sites (typically Naver, Google, Daumetc.), and then automatically searches the portal sites by putting key keywords in the search box. The Chatbot engine for evading the scheme collects M information articles that contain many key keywords among the many information articles posted through the portal site. The Chatbot engine for presenting the avoidance design scheme sequentially opens the N precedent patents and automatically scans the names, summaries, effects (purpose) or claims of each invention described in each of the N selected prior patents, And the patented keyword is selected.

the Chatbot engine for avoidance design proposal automatically checks the status of patent keywords among the M information articles obtained from the portal site, and the patent keywords among the M information articles (1st, 2nd, ..., M) Or only a relatively small amount of information. The Chatbot engine for avoidance design proposal repeats the same operation as the number of M precedent patents. The Chatbot engine for avoidance design extracts a keyword called "a noun with the purpose of presenting an evasion plan" among the contents described in the information text in which the patent keyword is least or less than the least.

The Chatbot engine for avoidance design suggests the vocabulary (but it is assumed to be a Chatbot with basic linguistic learning ability: equipped with natural language processing technology) so that all the subject words can be entered and expressed in Korean or English. At this time, the Chatbot engine for avoidance design display displays the image (avatar appearance) and voice by using the appropriate human power [8][9][10].

To enable those skilled in the art to better understand this work, the Chatbot engine for evading design is operated by a more specific process as described below.

- ① Core keyword input.
  - ② Patent information search service (www.kipris.or.kr).
  - ③ Search and extract related patents.
  - ④ Selection of preliminary patent for middle manager extracted.
  - ⑤ Enter the core keyword and attach it to the preceding patent (1, 2, 3, ..., N) document file "Chatbot engine for avoidance design proposal").
  - ⑥ "Chatbot engine for Avoiding Designs" will automatically search the portal sites such as 'Google', 'Naver', 'Daum' using core keywords.
  - ⑦ The "Chatbot engine for avoiding design" takes only information articles (rank 1, rank 2, .. , rank M) among the information on the web page.
  - ⑧ "Chatbot engine for avoiding design draft" opens one of the prior patents (1,2,3, .. ,N).
  - ⑨ Repeated terms are selected as patent keywords.
  - ⑩ The "Chatbot engine for Avoidance Design Proposal" checks the description status of the patent keywords among the information articles (rank 1, rank 2, ..., rank M) collected from ⑦
  - ⑪ The "Chatbot engine for Avoiding Designs" is to collect only the information with the least or relatively few patent keywords among the information articles collected in ⑦ (1st rank, 2nd rank, ... , M rank).
  - ⑫ "Chatbot engine for escape design proposal" repeats ⑪ at ⑧ to the number of precedent patents (N).
  - ⑬ "Chatbot engine for Avoiding Designs" extracts keywords from the information in the information obtained through ⑫.
  - ⑭ "Chatbot engine for Avoiding Designs" is a vocabulary (it requires natural language processing and text mining to complete the Chatbot design with language ability) so that it can be entered into the main language and expressed in Korean or English.
- It uses a human-recognizable ability to display video (avatar appearance), voice.
- Therefore, the result of ⑭ is an artificial intelligence solution that meets my idea as a part of efforts to find niche technology or niche market to fit my concept, and suggests a more advanced business model.

### 2.2. Chatbot Engine Suggesting Patent Avoidance Design: Case 2

CASE 2 is modeled by omitting steps 6 and 7 of CASE 1, so that a person skilled in the art would insert key keywords into the portal site as CASE 1, Information can also be collected. However, the Chatbot engine for evicting the draft design opens one of the N prior patents, such as CASE 2, and the name, summary, effect (purpose) of the invention expressed in the corresponding document, do. The Chatbot engine for the avoidance design proposal puts the patent keywords, which are repeatedly expressed in the title of the invention, the summary, the effect of the invention (purpose) or the claims, directly in the portal site. Therefore, the Chatbot engine for avoidance design draft can extract the subject word through ⑩ through ⑫.

Likewise, To enable those skilled in the art to better understand the present invention, the Chatbot engine for evasive design is operated by a more specific process as described below.

- ① Core keyword input.
- ② Utilization of patent information search service

(www.kipris.or.kr) DB.

- ③ Search and extract the related patented cases.
- ④ Of the extracted patent cases, the manager selects the prior patent.
- ⑤ Insert core keyword and attach the precedent patent (1, 2, 3, N) document file to "Chatbot engine for avoidance design proposal".
- ⑥ "Chatbot engine for presenting avoidance design" opens one of the prior patents (1, 2, 3, N) to search for the name of the invention, summary, effect of the invention.
- ⑦ Repeated terms: Selected as patent keywords.
- ⑧ The "Chatbot engine for Avoidance Design Proposal" checks the description status of the patent keywords among the information articles (rank 1, rank 2, ..., M rank) collected from ⑦.
- ⑨ The "Chatbot engine for Avoidance Design Proposal" selects only the information words with the least or less than the patent keywords among the information articles (rank 1, rank 2, ..., M rank) collected in ⑦.
- ⑩ The "Chatbot engine for avoidance design proposal" repeats ⑨ at ⑥ by the number of previous patents (N).
- ⑪ "Chatbot engine for avoidance design proposal" extracts the main word (objective noun for presenting the avoidance design) among the contents described in the information article obtained through ⑩.
- ⑫ The "Chatbot engine for presentation of Avoidance Design" expresses the vocabulary power (only if it is applied to the Chatbot, which already has verbal learning ability) so that all the main words can be entered.

"Chatbot engine for avoiding design proposal" can display the image (avatar appearance), voice by using appropriate human power perceived by human.

Therefore, the result of ⑫ is an artificial intelligence solution that meets my idea as a part of efforts to find niche technology or niche market to fit my concept, and suggests a more advanced business model.

### 2.3. An example of Chatbot Engine That Proposes a Patent Avoidance Design

In order to facilitate the processing of the Chatbot engine for the avoidance design drafting, and to fully understand the case 1 and the case 2, the following article is attached separately to each worker. It is divided into each and briefly explained. The conceptual understanding of the algorithm for the patent evasion design Chatbot engine seems to be fully understandable even from FIG. 1 to FIG. 3, and since it is a pulse like CASE 1 and CASE 2, the following explanation will be omitted.

**Step 1:** Enter core keywords into Kipris

**Step 2:** Provide a number of related patents

**Step 3:** Selection of prior patent (B1) through selection process

**Step 4:** As a precedent patent (B1) to the patent keyword (★)

**Step 5:** Enter core keywords in the search box

**Step 6:** Providing multiple information articles (A1 to A4)

**Step 7:** Among these, the information writing with few patent keywords is defined as avoiding design plan presentation data (A3)

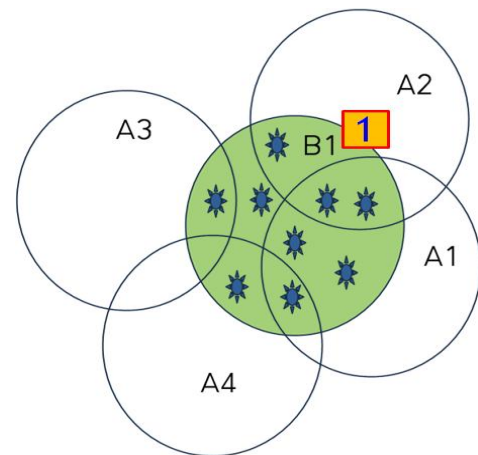


Figure 1: The first process modeling of Chatbot engine

**Step 1'**: Enter core keywords into Kipris

**Step 2'**: Provide a number of related patents

**Step 3'**: Selection of prior patent (B2) through selection process

**Step 4'**: Patent Keyword (★) Retrieval from N prior Patent

**Step 5'**: Enter core keywords in the portal search box

**Step 6'**: Providing a number of information articles (A1' to A4')

**Step 7'**: Among these, a M information article having a small number of patent keywords is designated as avoiding design plan presentation data A1'

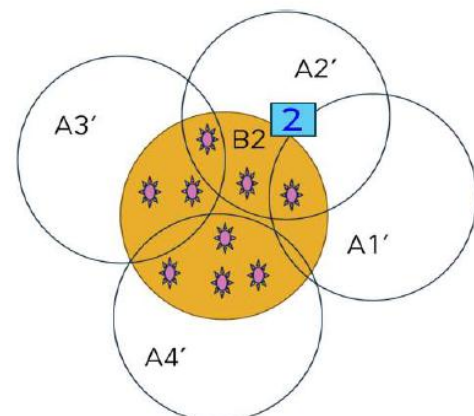


Figure 2: The second process modeling of Chatbot engine

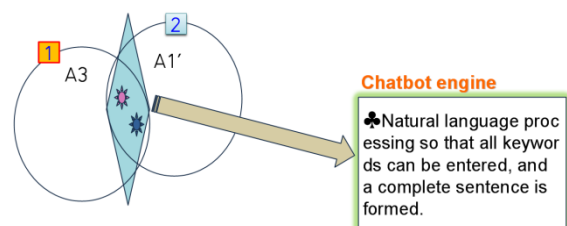


Figure 3: The third process modeling of Chatbot engine

## 3. Algorithm of Chatbot Engine Suggesting Patent Avoidance Design

### 3.1. Model Implementation of Chatbot Engine Suggesting Patent Avoidance Design

As can be seen from FIG. 4, in order to prepare a patent avoidance plan, a person skilled in the art selects a key keyword related to his or her interest field or a company project, and then connects to Kipris (www.kipris.or.kr) Open and search for related patent cases.

That is, a person skilled in the art extracts related patents disclosed or registered by inputting his / her selected key keywords into Kipris and conducting a patent search. Those skilled in the art will select only N prior art patents of interest or interest, with the exception of unnecessary patents that are not relevant among the many extracted patents.

The Chatbot engine for escape design presentation receives key keywords and N precedent patents from the person in charge and then connects to portal sites (Naver, Google, Daum, etc.) and performs automatic search with key keywords. theChatbot engine for avoidance design collects M information articles including many key keywords among many information articles posted on portal site. On the other hand, the Chatbot engine for Avoidance Design presentation automatically opens the N precedent patents one by one and automatically scans the contents of the corresponding documents in the title, summary, effect (purpose) or claims of the invention. The Chatbot engine for Avoidance Design searches out terms repeatedly expressed among the scanned nouns

and selects them as patent keywords. The Chatbot engine for Avoidance Design automatically checks the status of the patented keyword among the M information articles obtained from the portal site.the Chatbot engine for Avoidance Design suggests that only the information words with the fewest or fewer patent keywords among the M information articles (rank 1, 2, ..., M) are selected.

The Chatbot engine for Avoidance Design is defined as a subject word that is a noun that will be easily used in presenting the avoidance design, that is, a word having a purpose, among the M information articles with the least number of patent keywords or relatively few information. the Chatbot engine for Avoidance Design is a platform that runs within the platform by using the vocabulary that includes all the main words (but assuming that it is a Chatbot with basic linguistic learning ability: equipped with natural language processing technology) So that it is easy to understand.

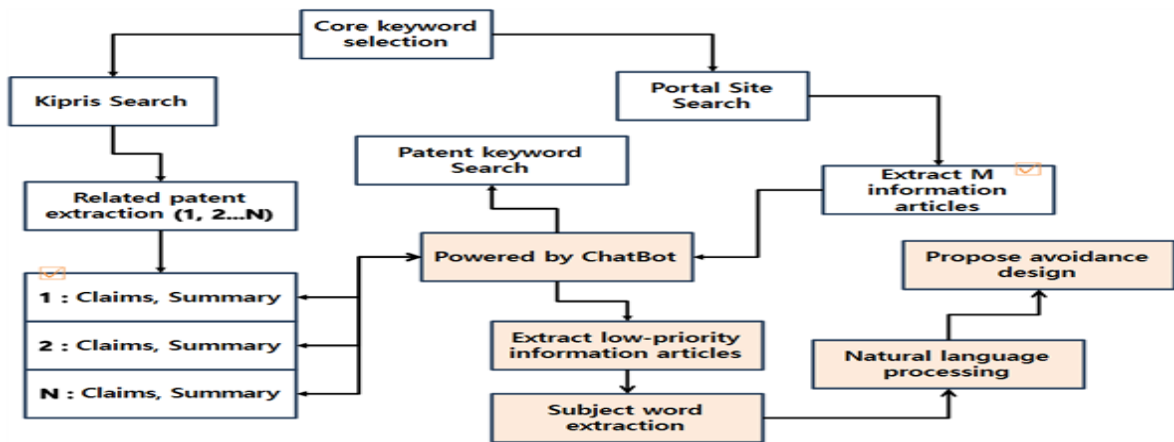


Figure 4.: The first flowchatof Chatbot engine

More specifically, as shown in Fig. 5, the Chatbot engine for evading the design scheme sequentially opens the N precedent patents one by one to automatically display the names of the inventions, summaries, effects of the invention (purpose) Scan. The Chatbot engine for avoidance design is used to retrieve the terms repeatedly expressed in duplicate and select them as patent keywords. At this time, it is assumed that the Chatbot engine for presenting the avoidance design sets the name of the invention, the summary, the effect (purpose) of the invention described in the selected prior patent, and the claim block as an independent claim.

Under this assumption, the Chatbot engine for evicting the draft design starts the extraction operation. In this case, the patented keyword extracted from the independent claims should have the

same [O: object] and (2): [O: object] written five times or more. Then, the Chatbot engine for presenting the avoidance design scheme performs an operation of 1: 1 matching the extracted patent keywords to the M information texts. The Chatbot engine for avoidance design suggests (1): an information article in which the same [O: object word] is expressed in 2 or less, (2): [O: object] Perform sorting operation under the condition that only letters are selected. Accordingly, the Chatbot engine for evading the design plan continues to carry out two details processing, which is divided into the information extracting only the information words in which the patent keywords are relatively few, and the information extracting only the lowest priority information.

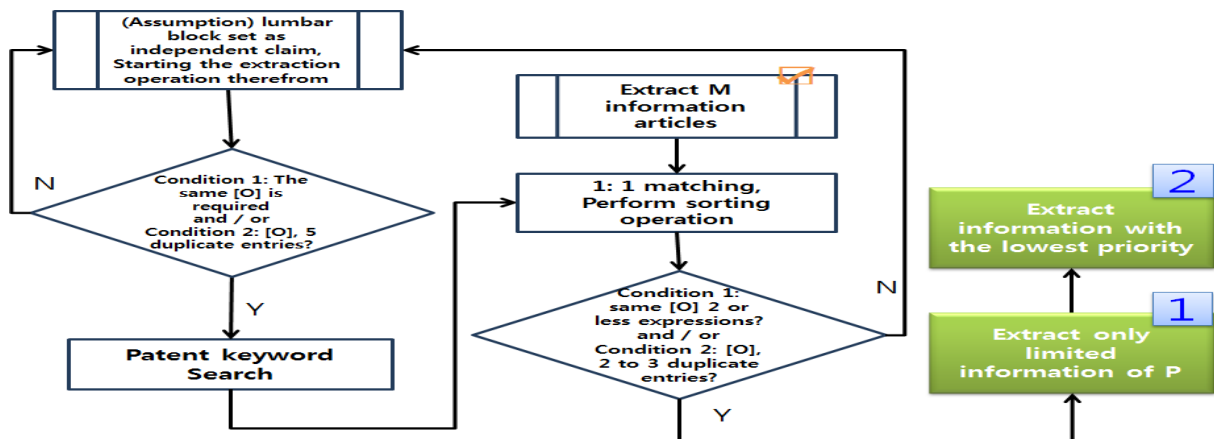


Figure 5.: The Secondflowchatof Chatbot engine

As shown in Fig. 6, the Chatbot engine for avoidance design proposal (1) carries out the detailed processing for extracting only three relatively small information words. In other words, the Chatbot engine for avoidance design excludes the patent keywords and the overlapping nouns and the key keywords among the nouns described in the three information articles as a part of extracting the main keyword which is the most important key point for the

avoidance design. The Chatbot engine for avoidance design proposal verifies through the database whether the rough keyword extracted from this field is correct in the field of interest of the person skilled in the art or the subject word related to his / her work in actual company. Accordingly, the Chatbot engine for presenting the avoidance design finally selects the optimum subject word desired by the person skilled in the art.

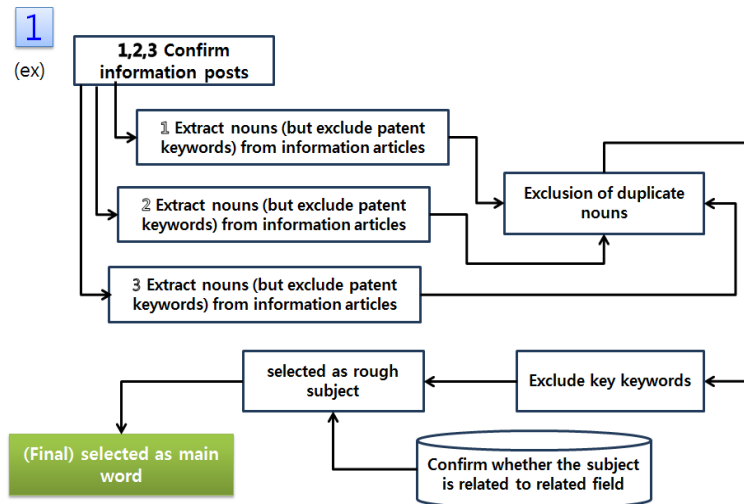


Figure 6.: The third flowchat of Chatbot engine

As shown in Fig. 7, the Chatbot engine for avoidance design process proceeds to (2) the detail processing of extracting only the information word with the highest priority. In other words, the Chatbot engine for avoidance design is a part of the most important key point to conduct the avoidance design, and it recognizes both the patent keyword and the overlapping nouns and the key keyword give. The Chatbot engine for avoidance design

proposal verifies through the database whether the rough keyword extracted from this field is correct in the field of interest of the person skilled in the art or the subject word related to his / her work in actual company. Accordingly, the Chatbot engine for presenting the avoidance design finally selects the optimum subject word desired by the person skilled in the art.

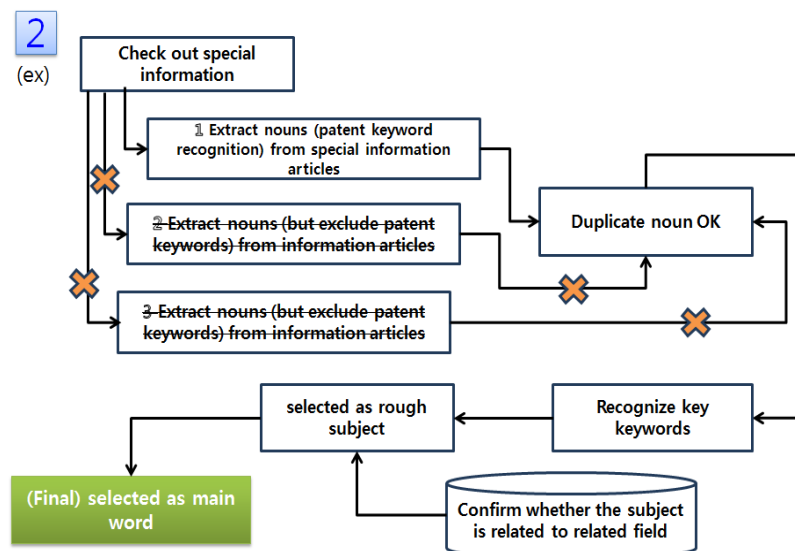


Figure 7.: The fourth flowchat of Chatbot engine

## 4. Conclusion

In this paper, we propose a Chatbot engine and its implementation algorithm that suggest a patent avoidance design that small companies or individual applicants need by using various information provided in patent literature and portal site. For this purpose, this study finds useful information through patent literature and portal site, and selects the most important "main word" in designing patent avoidance considering the frequency of key keywords and patent keywords.

In addition, this research suggests a robot engine and its implementation algorithm that interprets and combines the

selected subject words with various natural language processing techniques and interprets them in a language that can be understood by a person, and presents a customized patent avoidance design from this.

this paper can't prevent qualitative and material damage cases by neglecting preliminary investigation and avoiding design though small company and individual applicant have fully devoted research and efforts related to idea development, new product or new product development I hope to be there.

In other words, the Chatbot engine and its implementation algorithms of this paper are concerned about the enormous damages that small companies and individual applicants will have to suffer in the future due to forgetting the exercise of monopoly

rights by intellectual property I think it will be possible to solve the problem.

In other words, this research paper is a solution to the problem of qualitative and material damage seen from the standpoint of small companies and individual applicants who can't prepare a preliminary investigation or avoid design in advance.

In this paper, we propose a Chabot design which is proposed to overcome the qualitative and quantitative damages that can't be experienced frequently by small companies or individual applicants, And implementation algorithms.

## 5. References

- [1] Choi, Min Yong, Yongsoon Choi. (2017).A Study on Payment Order Interface of Artificial Intelligence Chatbot based on Mobile Messenger, Proceedings of the HCI Conference, Vol.2017 No.2,
- [2] Kang, Hee-Joo, Kim, Seung-in.(2017). Evaluation of user experience of messenger-based mobile service- Focusing on Google and Facebook, The Fusion Society Journal, Vol.8 No.9,
- [3] Kim, Kwon, Kim, Tae-Min, Lee, Chang - Hwan, Kim, Ji - Eun, Hong, Jung – Hee. (2017).Chat Bot with Drug Information through Image Recognition and Dialogue, Korea Simulation Society, 17th Fall Conference.
- [4] Jong-Hwa Lee, Hyun-Kyu Lee.(2016). A Study on the Natural Language Processing Package Using Open Source Software, The Korea Information Science Society, Vol.25 No.4
- [5] Park, Dae-Min. (2016).Natural Language Processing of News Articles: Focused on <News Source Beta>, Korean Journal of Society
- [6] Yoo Jae-Won.(1999).Classification of Subcategories of Investigation for Natural Language Processing, Hankook University of Foreign Studies.
- [7] Jung Sun-sun, Kim Yong-gyun. (2017). Artificial Intelligence (AI) Voice Secretary, IITP ICT Spot Issue, Vol. 2,
- [8] Kim,SH, Kim, Haksoo. (2016). A Sentence Chatting System with a Sentence Morpheme, Proceedings of 28th Hangul and Korean Information Processing Conference, pp. 263-267.
- [9] Jean kiwak.(2001). Technology Competitiveness in Korea Related to the Protection of Patents in the New Technology Area, Ph.D. Thesis, Seoul National University.
- [10] Chatbots.org, (2018), Retrieved from <http://www.Chatbots.org>