PREDICTION OF EDUCATIONAL DATA USING DEEP CONVOLUTIONAL NEURAL NETWORK

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Abstract: One of the most active study fields in natural language processing, web mining, and text mining is sentiment analysis. Big data is an important research component in education that is used to advance the value of education by watching students' performance and understanding their learning habits. Real-time student feedback will enable teachers and students to understand teaching and learning challenges in the most user-friendly manner for students. By linking learning analytics to grounded theory, the proposed Deep Convolutional Neural Network (DCNN) analyses students' sentiments and emotions through feedback using a Lexicon-based emotional analysis approach. The sentiment analysis approach is a computer procedure that identifies and classifies subjective information from the source material as good, negative, or neutral.

Keywords - Deep Convolutional Neural Network,Machine Learning,.

INTRODUCTION

Online chat sentiment analysis is a function that examines each chat session for markers of good and negative mood. Contact Lens enables Amazon Connect users to gain insights from contact centre support calls and chats by analysing such interactions in real time using machine learning.

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It takes away time that agents may be spending on other calls, lowering efficiency and call volume. Technology advancements continue to give firms with chances to improve their online service delivery. Many businesses now provide customer service and online help using instant messaging platforms known as 'live chat analysis' systems. Customers can request service-related information from an organisation using online-based synchronous media and a human service professional who responds via such medium. Despite the environment, whether it be online or offline, organizations realize the importance of high quality customer service. Regardless of the context, whether online or offline, businesses understand the value of providing excellent customer service. As a result, online helpdesks and live chat functionalities are being used as customer care platforms in an effort to deliver efficient online customer assistance.

Sentiment analysis on live chat video comments is the technique of automatically comprehending, extracting, and processing textual data to acquire sentiment information contained in a single phrase of a live chat video remark. The text mining technique emerges as the best option for interpreting the meaning of each remark. The categorization of positive and negative material becomes highly essential for the live chat user to determine how valuable the content that has been published is based on user opinion, but the performance differs greatly in all versions, features, and quantities of data gathering. While live chat services have numerous potential benefits, their success is dependent on the experience encountered during use. Customers often have several alternatives for obtaining customer care support, including face-to-face, telephone, social media, and email. Despite this, many consumers increasingly choose to use online live-chat facilities for service-related queries such as product enquiries, orders, shipping choices, and access to customer support. Although the use of online live chat systems in improving customer service, research into the dynamics and determining elements of this notion is lacking in the existing literature.

As a result, understanding the aspects that might influence a customer's service experience with a live chat operator becomes critical. This study investigates the elements capable of affecting a customer's happiness with their experience during an online live chat

service contact with a human service representative using the Information System Success model. Despite the rising number of organisations and consumers using live chat as a customer support function, we are aware of no empirical research that investigate the elements determining satisfaction with the live chat experience. As a result, we combine crucial aspects from both Service Marketing literature and Information Science research, as well as the Information Systems Success model, to better understand consumer views of web-based assistance [1-14].

This process is challenged for its subjectivity as a non-probability sampling technique. But, aside from being representative, it is maintained that a purposive sample is more practical, needs fewer resources (money and time), and is as good as chance sampling. Prior to data collection, a pilot study with a sample of respondents was done to examine the rationale and design of the questionnaire [15-24].
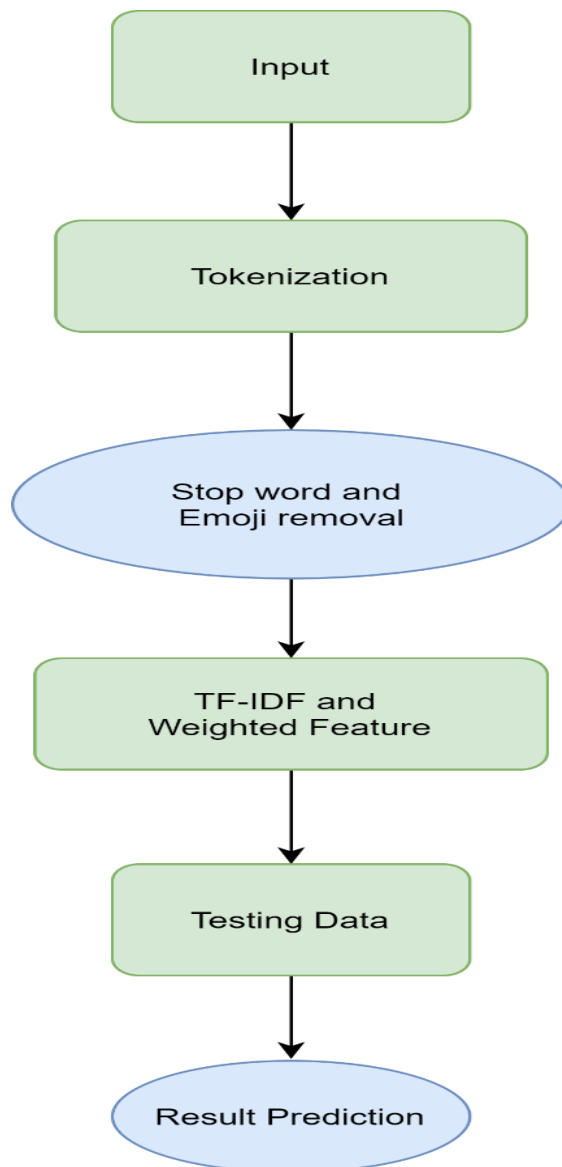
EXISTING SYSTEM

A dataset is a basic text file taken from any of the live chat groups or one-on-one individual chats. The greater the amount of text messages, the greater the accuracy in determining the emotion. The live conversation may be retrieved using a tool called export chat, which will email the compressed contains a text file of the chat from the beginning, including all undeleted chat. A significant amount of pre-processing is required, which is accomplished through the use of a technology known as Natural Language Process (NLP) [25-37].

Disadvantages

It is more difficult to maintain a discussion via live chat than it is through phone assistance or even email, which may make interactions less effective.

• Inadequate work security.

• Concerns about privacy have arisen.

SYSTEM DIAGRAM

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        ┌─────────────┐
        │    Input    │
        └──────┬──────┘
               │
               ▼
        ┌─────────────┐
        │ Tokenization│
        └──────┬──────┘
               │
               ▼
        ╭─────────────╮
        │  Stop word  │
        │ and Emoji   │
        │  removal    │
        ╰──────┬──────╯
               │
               ▼
        ┌─────────────┐
        │  TF-IDF and │
        │  Weighted   │
        │  Feature    │
        └──────┬──────┘
               │
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        ┌─────────────┐
        │ Testing Data│
        └──────┬──────┘
               │
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        ╭─────────────╮
        │   Result    │
        │ Prediction  │
        ╰─────────────╯
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PROPOSED SYSTEM

Data preprocessing is a data mining technique used to convert raw data into a usable and efficient format. Data Cleaning is one of the steps involved in data preprocessing. It entails dealing with missing and noisy data. Data virtualization is a data management strategy that allows an application to receive and alter data without requiring technical information about the data, such as how it was structured at source. A Deep Convolutional Neural Network (DCN) is a

type of artificial neural network in which node connections create a directed graph along a temporal sequence.

Advantages

- Training chatbots
- Identifying key emotional triggers
- Live insights

DATA PREPARATION

Data preparation is the process of cleaning and transforming raw data prior to processing and analysis. It is an important step prior to processing and often involves reformatting data, making corrections to data and the combining of data sets toenrich data.

DATA SET LOAD

The Load method provides a technique for filling a single Data Table with data, retrieved from a Data Reader instance. This method provides the same functionality but allows you to load multiple result sets from an IDataReader into multiple tables within a Dataset.

DATA PRE-PROCESSING

Data preprocessing is an important step in the data mining process. The phrase "garbage in, garbage out" is particularly applicable to data mining and machine learning projects. Data-gathering methods are often loosely controlled, resulting in out-of-rangevalues, impossible data combinations, and missing values.

DATA VIRTUALIZATION AND NATURAL LANGUAGE PROCESS (NLP) SENTIMENTAL ANALYSIS

The link between computers and human language is known as natural language processing (NLP). Natural language refers to speech analysis in both audible and textual forms of a language. NLP systems extract meaning from text input.

DEEP CONVOLUTIONAL NEURAL NETWORK USING   CLASSIFICATION

A Deep Convolutional Neural Network is a class of artificial neural networks where connections between nodes form a directed graph along a temporal sequence. Deep convolutional neural networks (CNN or DCNN) are most used to identify patterns in images and video. Deep convolutional neural networks are mainly focused on applications like object detection, image classification, recommendation systems. A deep CNN can learn basic filters automatically and combinethem hierarchically to enable the descriptionof latent concepts for pattern recognition

SYSTEM DESIGN

The System Design Document describes the system requirements, operating environment, system and subsystem architecture, files and database design, input formats, output layouts, human- machine interfaces, detailed design, processing logic, and external interfaces. should be followed. Include the following information in the detailed module designs: A narrative description of each module, its function(s), the conditions under which it is used (called or scheduled for execution), its overall processing, logic, interfaces to other modules, interfaces to external systems, security requirements,etc.; explain any algorithms used by the module in detail

Executive summary of the project

This section provides a description of theproject from a management perspective and an overview of the framework within which the conceptual system design was prepared. If appropriate, include the information discussed in thesubsequent sections in the summary.

Process of System overview

This section describes the system in narrativeform using non-technical terms. It should provide a high-level system architecture diagram showing a subsystem breakout of the system, if applicable. Thehigh-level system architecture or subsystem diagrams should, if applicable,

show interfaces to external systems. Supply a high-level context diagram for the system and subsystems, if applicable.Refer to the requirements trace ability matrix (RTM)in the Functional Requirements Document (FRD), toidentify the allocation of the functional requirementsinto this design document.

CONSTRAINTS ON THE DESIGN

This section describes any constraints in the system design (reference any trade-off analyses conducted such, as resource use versus productivity,or conflicts with other systems) and includes any assumptions made by the project team in developingthe system design.

PLANNING FOR SOFTWARE DESIGN

A Software module is the lowest level ofdesign granularity in the system. Depending on the software development approach, there may be one ormore modules per system. This section should provide enough detailed information about logic anddata necessary to completely write source code for all modules in the system (and/or integrate COTS software programs). If there are many modules or if the documentation is extensive, place it in an appendix or reference a separate document. Add additional diagrams and information, if necessary, to describe each module, its functionality, and its hierarchy.Industry-standard module specification practices For COTS packages, specify any call routinesor bridging programs to integrate the package with the system and/or other COTS packages (forexample, Dynamic Link Libraries) Data elements, record structures, and file structures associated with module input and output Graphical representation of the module processing, logic, flow of control, and algorithms, using an accepted diagramming approach (for example, structure charts, action diagrams, flowcharts, etc.) Data entry and data output graphics; define orreference associated data elements; if the project is large and complex or if the detailed module designs will be incorporated into a separate document, then it may be appropriate to repeat the screen informationin this section.

PROCESS OF INPUT DESIGN

Input Screen must be design in such a way togive an easy navigation throughout the screen without the violation of the input validation. Input design is the process of converting the user-originated data into a computer-based format. Inaccurate input data are the most common cause oferror in data processing. The goal of an input data arecollected and organized into a group and error free. Input data are collected and organized into a group of similar data. Once identified, appropriated input media are selected for processing. The design was done with six major objectives in mind

- Effectiveness
- Accuracy
- Ease of Use
- Consistency
- Simplicity
- Attractiveness

The main objective of designing input focuses on:Controlling the amount of input required

- Avoiding delayed response
- Controlling errors
- Keeping process simple
- Avoiding errors
- Producing cost effective method of input.
- Achieving highest possible level of accuracy.

Ensure that the input is acceptable to and understoodby the staff.

The goal of designing input data is to make entry easy, logical and free from errors as possible. The entering data entry operators need to know the allocated space for each field, field sequence and which must match with that in the source document.The processor analyzes the input required. It is then accepted or rejected.

THE FUNDAMENTAL GOAL OF PLANNING INPUT CENTERS ON:

- Controlling the amount of input required

- Avoiding delayed response

- Controlling errors

- Keeping process simple

- Avoiding errors

- Delivering savvy technique for input.

- Accomplishing the most elevatedconceivable degree of exactness.

- Guarantee that the information is satisfactoryto and perceived by the staff.

Enter the plan objective is to make the information section simple and legitimate as conceivable from errors and opportunity. In enteringthe information passage, the administrator has torealize each field's space, the field dispersion of the request, and source documents should coordinate. The processor breaks down the information requiredat that point, and it is acknowledged or dismissed.

THE MAIN OBJECTIVE OF DESIGNING INPUT FOCUSES ON

- Controlling the amount of input required

- Avoiding delayed response

- Controlling errors

- Keeping process simple

- Avoiding errors

- Producing cost effective method of input.

- Achieving highest possible level of accuracy.Ensure that the input is acceptable to and understoodby the staff.

The purpose of creating input data is to make entry as simple, logical, and error-free as possible. The data input operators must be aware of the assigned space for each field, as well as the field

sequence, which must match that in the source document. The processor examines the needed input. After that, it is either accepted or refused.

OUTPUT DESIGN

In most cases, while building a system, the output is designed first, followed by the input. Views and reports will be generated as output. The system output is necessary to transmit the results of processing to the users. They are also utilised as a backup copy for future verifications.

OUTPUT DESIGN CONSIDERATION

The purpose of outputs has been understood and the efficiency of informationcontained should be analyzed and confirmed.Then the output have been defined in terms of

- Name of the Output
- Content
- Format
- Frequency

OUTPUTS

This section describes of the system output design relative to the user/operator; show a mapping to the high-level data flows described in Section. System outputs includereports, data display screens and GUIs, queryresults, etc. The output files are described in Section 3 and may be referenced in this section. The following should be provided, ifappropriate:

- Identification of codes and names forreports and data display screens
- Description of report and screencontents (provide a graphic representation of each layout and define all data elements associatedwith the layout or reference the data dictionary)
- Description of the purpose of the output, including identification of theprimary users
- Report distribution requirements, ifany (include frequency for periodic reports)
- Description of any access restrictionsor security considerations

CODE DESIGN

A design pattern is a standardized solution to a software design issue or problem which is encountered daily in real-world application development. A pattern focuses on class design and object interaction. Knowledge of design patterns not only prevents having to re-invent the wheel, itallows developers to discuss their work at a higher level of abstraction.

Design patterns have been the bane ofmy programming existence. I have trouble learning and remembering them. On the one

hand, I feel like I have always been followingsuch patterns throughout my career—evenbefore object-oriented languages. On the other hand, I haven't been able to get a good enough handle on patterns and the terminology to be able chat freely about themwith my colleagues

where a longer and more targeted sales pitch may lose the offender's interest.

DATABASE DESIGN

The database design involves creationof tables that are represented in physical database as stored medical information. Theyhave their own existence. Each table constitute of rows and columns where each row can be viewed as record that consist of related information and column can be viewed as field of data of same type.

FRAMEWORK FOR SYSTEM DESIGN

The design effort transforms the detailed, defined requirements into complete, detailed specifications that direct development and testing. Design decisions detail how the system will meet thedefined functional, physical, interface, security, and data requirements. At the end of the design process the design is base lined.

The general system characteristics are defined during design. The operating system is established and the automated system packaged intomajor design subsystems. Inputs and outputs of each subsystem are defined, interfaces to external systemsare designed, and administrative activities are established. Security and auditing needs are also addressed.

A more detailed structure of the system is thencreated based on the subsystems identified by thegeneral characteristics. Each subsystem ispartitioned into one or more design units, or modules.The process is described in a structure chart,flowchart, action diagram, pseudo code, or otheracceptable format for each design unit, or module.Detailed logic specifications are written for each module described and data usage is physicallydefined to the elemental level. Functions requiringuser input and approval are completed in thisactivity.

Throughout the design phase there are a series ofcheck point and review processes. The design is reviewed to verify that it has the following characteristics:

- Is directly traceable to the requirements.
- Describes how the capabilities defined by therequirements will be implemented.
- The SDD includes
- User, human/computer interface design
- System architecture
- Detailed system design
- Data base design including a physical datamodel and data dictionary.

SYSTEM TESTING

Before applying method to design effective test cases, a software engineer must understand the basic principles that guide software testing. Davis (DAV95) suggests a set of testing principles which have been adapted for use in this book.

- All tests should be traceable to customer requirements.
- Test should be planned long before testing begins.
- Tests pare to principle applets to software testing. Testing should begin "in the small" and progress towards testing "in the page".
- Exhaustive testing is not possible.

TESTING STEPS

- Unit testing

- Integration Testing

- Whitebox Testing

- Acceptance testing

- Alpha Testing

- Beta Testing

- Blackbox Testing

UNIT TESTING

Unit testing focuses on verification errors onthe smallest unit of software design-the module. Using the procedural design description as a guide, important control paths are tested to uncover errors within the boundary of the module.

The module interface is tested to ensure that the information properly flows into and out of the program unit under test. Boundaries conditions are tested to ensure that the module operates properly atthe boundaries established to limit of restrictprocessing.

INTEGRATION TEST

Integration testing is a systematic technique for constructing the program structure while conducting test to uncover errors associated withinterfacing. The objective is to take unit tested modules and build a program structure that has beendictated by design.

WHITEBOX TESTING

White box testing is some time is called glass boxtesting, is a test case design that uses a control structure of the procedural design to drive the test cases. Using white-box testing methods, the softwareengineer can drive test cases that

- Guarantee that logical decisions are on thetrue and false sides

- Exercise all logical decisions are on the trueand false sides

- Execute all loops at their boundaries andwithin their operational bounds
- Exercise internal data structure to assure thevalidity

ACCEPTANCE TESTING

Finally, when the software is completely built, a series of acceptance tests are conducted to enable the client to validate all requirements. The user conducts these tests rather than the system developer, which can range from informal test drive to a planned and systematical executed series of tests.These acceptance tests are conducted over a period of weeks or months, there by uncovering cumulative errors that might degrade the system order time. In this process alpha testing and beta testing are used touncover the errors that only the end user seems able to find.

ALPHA TESTING

The customer conducts the alpha test at the developer's site. The client notes the errors and usage problems and gives report to the developer. Alpha tests are conducted in a control environment.

BLACK BOX TESTING

Black box testing focuses on the functional requirements of the software. That is black box testing enables the software engineer to drive a set of input conditions that will fully exercise the requirements for a program. Black box testing is not an alternative for white box testing techniques. Rather, it is a complementary approach that is likely to uncover different class of errors. Black box testing attempts to find errors in the following categories:

- Interface errors.
- Performances in data structures or externaldatabase access.
- Performance errors.
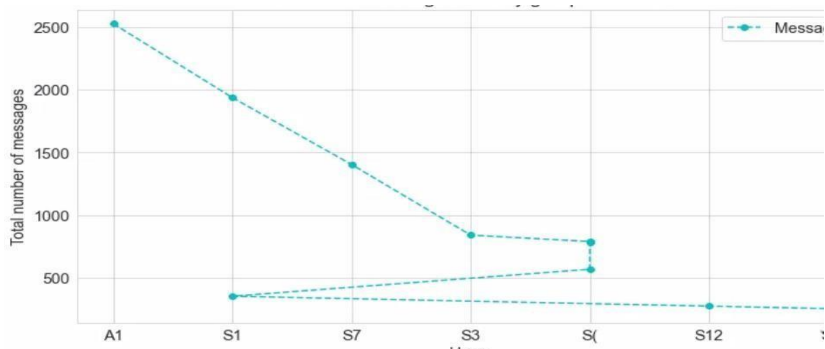- Initialization and termination errors.
- Incorrect or missing functions.

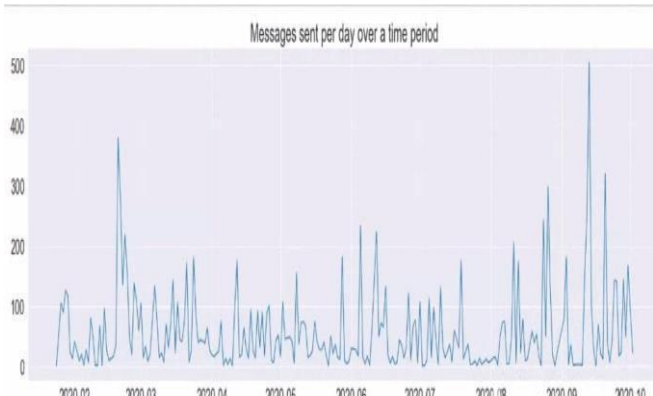**Figure A.1.1 Message sent per day over a time period group**
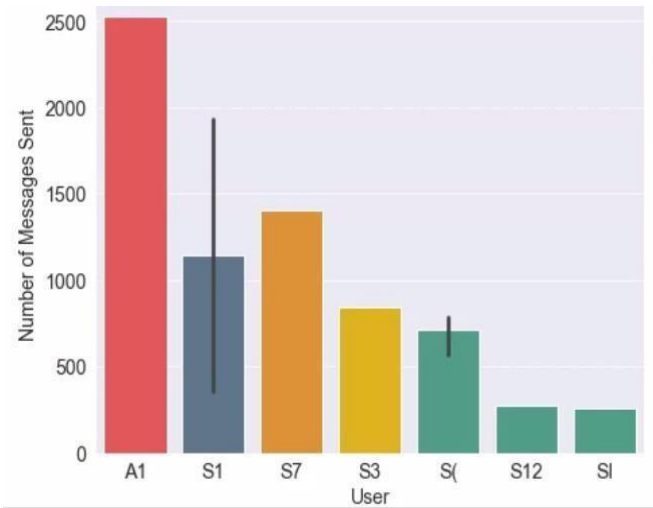

Figure A.1.2 Number of Message sent by

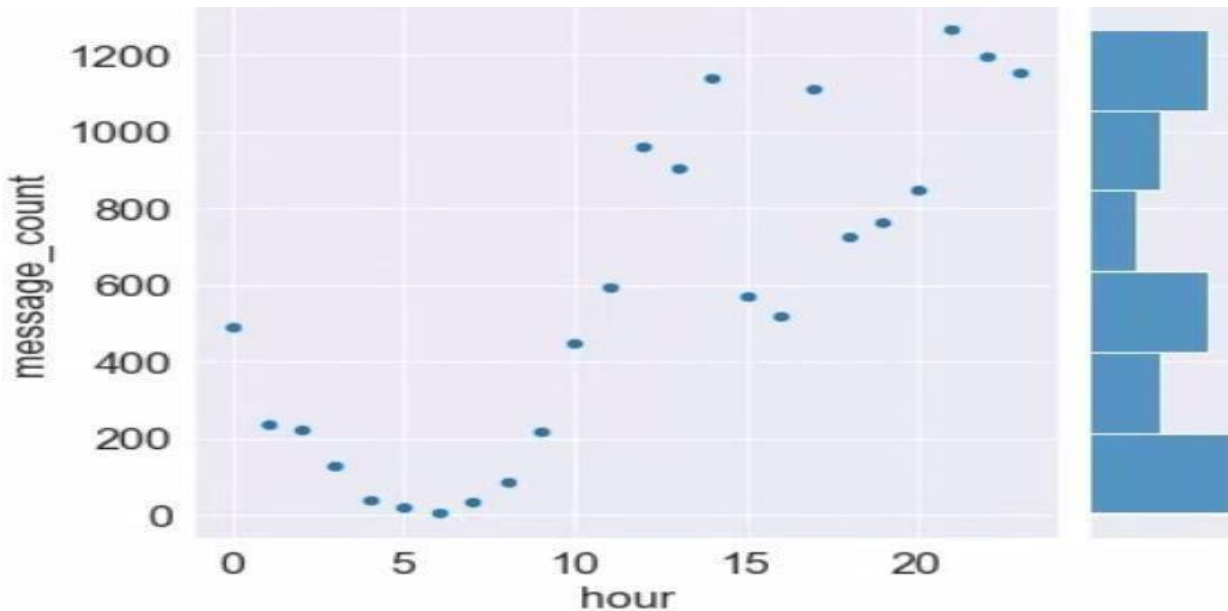**Figure A.1.3. Total Message sent**

Figure A1.4. Most active user

CONCLUSION

Using the performance of Deep Convolutional Neural Network, live chat will be able to chat categorization. For phone calls and e-mail, live chat is best. All visitors need to do is put their email address in the chat box. If you are utilising, interview web-based survey, is the reality, including enhancing the experience of real-time chat service, and the presence of mobile phone network provider to adopt the whole structural equation model between the Natural Language Processing (NLP). The suggested method for online live chat service categorization employs DCNN. As a result, for Deep Convolutional Neural Network performance, preprocessing data and data analysis are required.

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