

# Decision Auto-suggest by AI

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## Overview

Application processing is an important part of our system. We are constantly aware of the development of this process system. During the application process, the next statuses are shown from the default process path from which the application will go-to a specific status. In this case, many times the desk officer does not understand which status he will select. To make the system more effective and user-friendly, We will suggest specific status to the desk officer. The next status will be suggested based on the comments of the desk officer earlier.

In this document, we are proposing two methods to auto-suggest the application status.

## Goals

Our goal is to -

1. Make the system more intelligent .
2. Make the system more efficient and user-friendly.

## Decision Auto-suggest methodology

We propose two methods to implement this decision auto-suggest mechanism. One process will result in some predetermined input processing and the other will result through artificial intelligence. The methods are:

1. Status auto-suggest based on sentiment analysis
2. Status auto-suggest based on keyword search

### 1. Status auto-suggest based on sentiment analysis:

This method uses artificial intelligence. Here the decision will be made by **Sentiment Analysis** through **Natural Language Processing (NLP)**.

*Sentiment analysis is the automated process of classifying online text data as positive, neutral or negative, giving businesses the opportunity to gain a deeper understanding of how customers perceive their product, brand or service.*

In the beginning, the application remarks will be taken and the remarks will be processed by sentiment analyzer.

Then all the next status of the application will be taken, and each status will be processed by sentiment analyzer.

The decision will be made on the result of the remarks and status sentiment processing. The highest sentiment results from remarks will be selected and the same sentiment result from the status will be suggested.

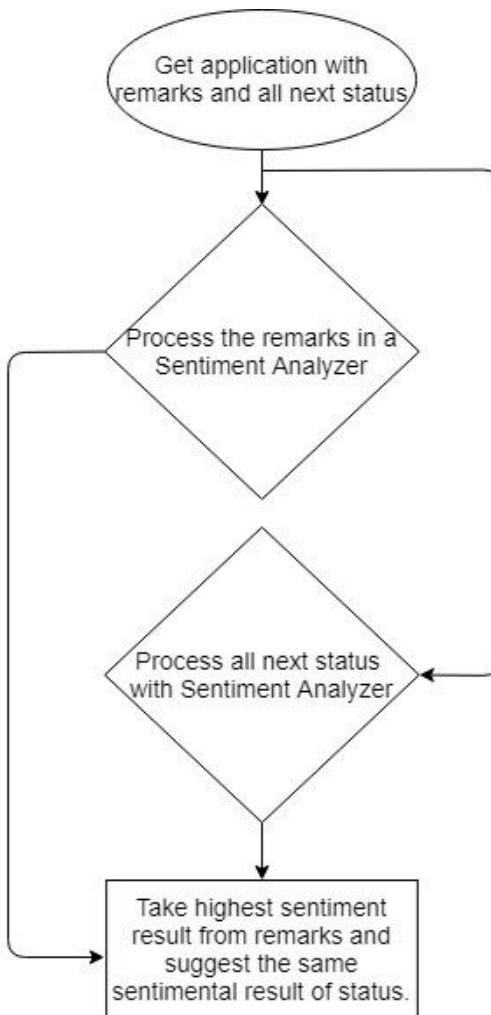


Fig : Status auto-suggest based on sentiment analysis

Here, we will see an **example data-set** of each step of this method:

- Step 1:

Application remarks - This application's information is not perfect..

All next status - Shortfall, Discard, Approve

- Step 2:

Process the remarks with Sentiment Analyzer. After analysing the result will be as like as below -

Sentiment	Rating
Positive	0.0
Neutral	0.2
Negative	0.6
Compound	0.4

Here, the **Negative** sentiment rating is the highest, so status will be suggested based on this sentiment.

- Step 3:

Process all next status with Sentiment Analyzer. After analysing the result will be as like as below -

Status	Sentiment
Shortfall	Positive - 0.0 Neutral - 0.2 Negative - 0.6 Compound - 0.3
Discard	Positive - 0.0 Neutral - 0.11 Negative - 0.7 Compound - 0.2
Approve	Positive - 0.95 Neutral - 0.11 Negative - 0.2 Compound - 0.3

From this result, only **Negative** rating will be considered as the sentiment of the remarks is negative.

- Step 4:

From all negative sentiments, the highest rating will be suggested as the next status. So, suggested status will be - **Discard**.

## 2. Status auto-suggest based on keyword search:

This method provides intelligence based on search keywords. Here the decision will be made by processing the data through some predetermined input.

In the beginning, the application remarks will be taken, then all the stop words will be removed from those remarks. In this case, all the stopwords will be stored in the system's database.

Then all the next status of the application will be taken, and each status will be searched by the name in the remarks to see if the status is in the remarks and how many times. In this case, the status name may be in addition to certain keywords.

The decision will be made on the result of the status name or keyword search. The status of the high frequency will be suggested as the next status.

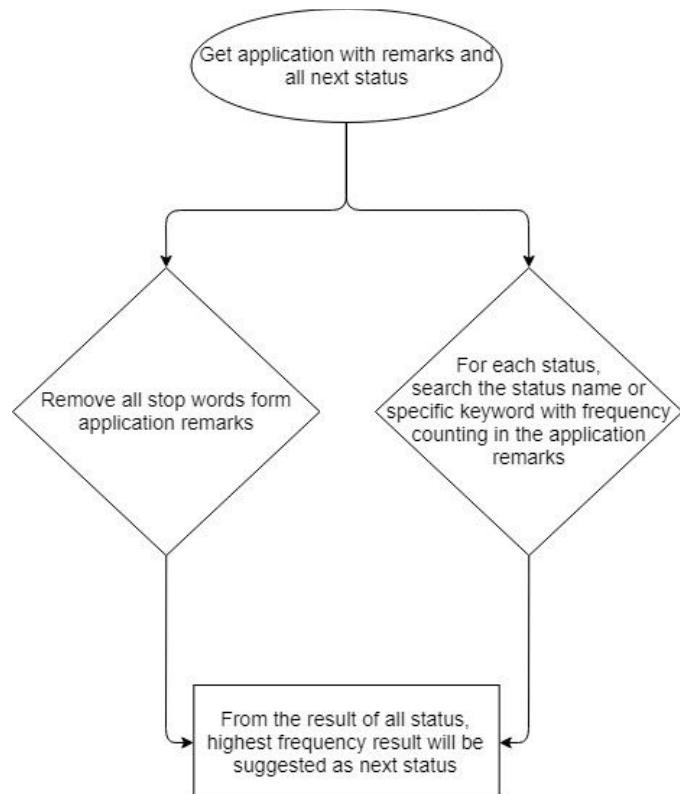


Fig : Status auto-suggest based on keyword search

Here, we will see an **example data-set** of each step of this method:

- Step 1:

Application remarks - This application can be approved.

All next status - Shortfall, Discard, Approve

- Step 2:

After elimination of all stop words the remarks will be as like as below:

application approved

- Step 3:

For each status, search the status name or specific keyword with frequency counting in the application remarks, after searching the result will be -

Status	Frequency
Shortfall	0
Discard	0
Approve	1

- Step 4:

So, suggested status will be - **Approved**.

## Future Work

### I. Point 1

In methodology no 2, we have selected a method of sentiment analysis which is known as **Rule-based** analysis. (*A system that performs sentiment analysis based on a set of predefined rules.*)

In future, we can update the mechanism to **Automatic** systems that rely on machine learning techniques to learn from data.

### II. Point 2

We can use sentiment analysis to understand the criteria of all remarks which are given by desk officers at the time of application processing.

## References

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