

# Sentiment Analysis of Free Online Novel Applications Using the Support Vector Machine Method

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## Abstract

Sentiment analysis is a study to analyze opinions and perceptions of various topics, products, or services. With the advancement of technology, people now have easier access to literary works online, including novels. The shift from offline to online reading has resulted in a large volume of review data, necessitating an automated system to classify this data. This research aims to analyze the sentiment of reviews for online novel applications using the Support Vector Machine (SVM) algorithm. The data used in this study was gathered from user reviews of the Wattpad, Noveltoon, and Joylada applications downloaded from the Google Play Store. The results show that the Wattpad application achieved 63% accuracy, 50% precision, 64% recall, and 56% F1-score, with a 41% positive and 59% negative sentiment distribution. The Noveltoon application achieved 70% accuracy, 69% precision, 73% recall, and 71% F1 score, with a 48% positive and 52% negative sentiment distribution. The Joylada application recorded 67% accuracy, 55% precision, 92% recall, and 69% F1-score, with a 57% positive and 43% negative sentiment distribution. The results of this analysis can help understand user preferences towards online novel applications and provide insights into their impact on the application's image and user interactions.

**Keywords:** Sentiment Analysis, Wattpad, Noveltoon, Joylada, Support Vector Machine.

## 1. Introduction

The rapid development of information and communication technology has driven the emergence of various mobile applications, including online novel applications, which have gained increasing popularity in recent years. Free online novel applications, such as Wattpad, Noveltoon, and Joylada, offer users the convenience of accessing digital literary works. Google Play Store has become one of the leading platforms for online novel applications, where users often rely on reviews from other users to select the most suitable applications. These user reviews can be either positive or negative, influencing potential users' decisions and providing valuable feedback for application developers. However, manually identifying sentiments from many reviews requires time and resources. Therefore, automatic sentiment analysis becomes a more efficient solution [1]. Sentiment analysis is a method used to classify user reviews as positive or negative. It can be done using various machine learning techniques, including the Support Vector Machine (SVM) algorithm. SVM is highly effective in handling complex data and providing accurate classifications, even in non-linear problems using kernels to transform high-dimensional data spaces [2]. This study uses the SVM algorithm to analyze the sentiment of user reviews for free online novel applications on Google Play Store, specifically focusing on the Wattpad, Noveltoon, and Joylada applications. The results of this study are expected to provide insights into user perspectives on these applications and assist developers in improving their application quality. Additionally, this research aims to enrich sentiment analysis methodology in the context of mobile applications and online review platforms. Several studies are related to this research topic, one of which is by Sultan Ariqoh, M. Agus Sunandar, and Yusuf Muhyidin (2023), who analyzed the sentiment of Pixy cushion products on the Female Daily website using 2044 data. After text preprocessing and classification using the SVM algorithm in Google Colab, the results showed an accuracy of 78%, precision of 90%, and recall of 100%, indicating the effectiveness of SVM in analyzing sentiment and reflecting a positive sentiment towards the Pixy cushion product. [3], A similar study was conducted by Dafwen Toresa, Shimphony Rico Francisco Sitorus, Indah Muzdalifah, Fana Wiza, and Rosda Syelly (2024), analyzing sentiment from user reviews of the DANA digital wallet on Google Play Store. Using the SVM classification method, the study processed 1000 comments, resulting in 145 positive, 141 negative, and 714 neutral reviews [4]; another study by Kiki Ahmad Dasuki, Shofa Shofia Hilabi, Fitria Nur Apriani, and Tukino (2023) analyzed the sentiment of online loan services Akulaku and Kredivo on Google Play Store using the SVM method. The results showed that SVM effectively classified user sentiment, with Kredivo achieving a higher accuracy of 88.20% compared to Akulaku's 83.60% [5]. The main difference between this study and previous research is the methods and types of data sources used. The author applied the Support Vector Machine (SVM)



method with a linear kernel and used review data from three online novel applications—Wattpad, Noveltoon, and Joylada—obtained from the Google Play Store.

## 2. Literature Review

### 2.1. Sentiment Analysis

Sentiment analysis is a technique for identifying and classifying opinions in text as positive, negative, or neutral. This method obtains data from various online platforms, such as social media or app reviews, to understand the public's perception of a particular entity. Also known as opinion mining, sentiment analysis is a part of data mining that focuses on extracting information and identifying subjectivity in text [6].

### 2.2. Support Vector Machine

Support Vector Machine (SVM) is a machine learning algorithm based on supervised learning that analyzes and classifies data. This method effectively increases accuracy by reducing noise, making it a good choice for public data analysis [7] on Google Play Store, such as Wattpad, Joylada, and Noveltoon. Support Vector Machine (SVM) uses linear functions in a high-dimensional feature space, with training based on optimization theory algorithms. The accuracy of the SVM model is greatly influenced by the selection of the kernel function and parameter settings in training [8]. The choice of appropriate kernels allows for separating more complex data that cannot be separated linearly. In sentiment analysis, the SVM classification method is only applied to datasets with positive and negative classes, while neutral datasets are not used because they are difficult to predict. The final result is a positive or negative classification based on the feature weights in the text document, where a term is considered positive if the weight is more significant than zero and negative if it is less than 0 [9]. This research uses a linear kernel because a hyperplane can separate positive and negative sentiment data well. Although kernel selection is not set explicitly in the program code, SVM, by default, selects linear kernels because this dataset has patterns that can be separated in two-dimensional space.

### 2.3. Text Preprocessing

Text Preprocessing is the first process where documents are extracted into data that will be used later. The text will be separated into small parts to make the final result chunks of words or tokens. In addition, symbols that are not needed will be deleted, and existing numbers will be discarded [10]. Preprocessing is a step to clean data so that it is ready for the next step [11].

### 2.4. TF-IDF

The Term Frequency-Inverse Document Frequency (TF-IDF) method converts words into numbers in vector form to determine the weight of a word in a document collection, helping to assess the importance of that word in a document [12]. Term Frequency (TF) measures how often a word appears in a document. The more frequently a word appears, the higher its TF value, which gives weight to frequently occurring words in the document. Inverse Document Frequency (IDF) measures the importance of a word in an entire collection of documents. Words that appear rarely have higher IDF values. IDF is calculated by dividing the total number of documents by the number of documents containing that word; then, the results are taken logarithmically to adjust the value scale [13].

Below is the formula for calculating Term Frequency (TF) and Inverse Document Frequency (IDF):

#### 1. Term Frequency (TF) stage

Term Frequency uses the following equation:

$$tf = 0.5 + 0.5 \frac{tf}{\max(tf)} \dots\dots\dots(1)$$

Information:

tf = The number of words that appear in all documents

max (tf) = Word length of a document itself

#### 2. Inverse Document Frequency (IDF)

Inverse Document Frequency uses the following equation:

$$idf = \ln \frac{N}{df} + 1 \dots\dots\dots(2)$$

Information:

Ln: Natural Logarithm

N: Number of all documents

df: Number of terms/words in the document

The formula for TF-IDF combines the TF and IDF formulas performed by a multiplication operation. Below is the TF-IDF calculation formula:

$$TF-IDF (t,d) = TF(t,d) \times IDF(t) \dots\dots\dots(3)$$

Information:

TF-IDF (t,d): Bobot TF-IDF

TF(t,d): Term Frequency for word t in document d, namely how often the word t appears in document d

IDF(t): Inverse Document Frequency for the word t, namely how rare it is the word t appears throughout the document

## 2.5. Confusion Matrix

Confusion Matrix is a table used to assess the accuracy of the classification carried out by the system, showing the amount of data that is correctly or incorrectly classified. Confusion Matrix is a method used to evaluate the accuracy by calculating values such as Accuracy, Recall, and Precision [14].

**Table 1.** Confusion Matrix

Prediction Class	Actual Class	
	1	2
1	True Positive	False Positive
2	False Negative	True Negative

Information:

1. True Positive (TP): The model predicts data in the positive and genuine class.
2. True Negative (TN): The model predicts data in the negative and actual class.
3. False Positive (FP): The model predicts data in the positive class when it should be in the negative class, which is wrong.
4. False Negative (FN): The model predicts data in the negative class when it should be in the positive class; the prediction is wrong.

The confusion matrix formula is as follows (Dinata et al., 2020)

1. Precision measures how precisely the model is in classifying positive examples [15] :

$$Precision = \frac{TP}{TP+FP}$$

2. Recall measures the number of positive examples that have been correctly identified by the system from all existing positive examples:

$$Recall = \frac{TP}{TP+FN}$$

3. Accuracy measures the extent to which positive and negative predictions are correct compared to the total number of predictions made by the system:

$$Accuracy = \frac{TP+TN}{TP+TN+FP+FN}$$

F1 Score is an evaluation measure that combines precision and recall to measure the balance between the two, used to avoid errors, both false positive and false negative:

$$F1 = 2 \times \frac{Precision \times Recall}{Precision+Recall}$$

## 3. Research Methods

### 3.1. Place and Time

This research uses the scraping method with the Python programming language to collect data on comments from users of free online novel applications such as Wattpad, Noveltoon, and Joylada. The collected data was saved in Excel format and labeled manually. Three hundred comments were collected, 100 comments each from each application. The research was carried out in the period September-November 2023, with a focus on analyzing the sentiment of comments in the application review column available on the Google Play Store.

### 3.2. Research Flow

#### 1. Literature Study

A literature study was carried out to understand the basics of sentiment analysis using the Support Vector Machine (SVM) method and other methods, using sources such as books, journals, and relevant final assignments.

#### 2. System Requirements Analysis

This stage involves a needs analysis, which will become a reference for designing the system to be built.

#### 3. Analysis of Hardware Requirements

The hardware used in this research is the Acer Aspire ES1-432 Laptop with specifications: Intel(R) Celeron(R) CPU N3350 @ 1.10GHz and 2048MB RAM.

#### 4. Software Requirements Analysis

The software includes the Microsoft Windows 8.1 Pro 64-bit operating system and the XAMPP, Sublime Text, and PHP application programs.

#### 5. System Design

System design includes architectural design that produces Context Diagrams and database design that leads to Unified Modeling Language (UML).

#### 6. System Implementation

Implementation is carried out by developing a plan using a programming language. The system will produce positive or negative sentiment classification output based on test data.

#### 7. System Testing

Testing is carried out to evaluate whether the system implementation meets the needs that have been analyzed.

#### 8. Conclusion

Conclusions are made to answer the problem formulation after completing the entire research process.

### 3.3. System Schematic

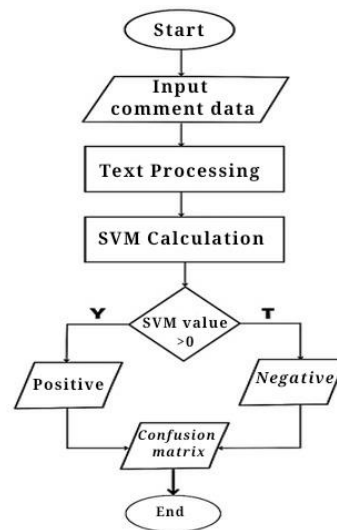


Fig 1. System Schematic

## 4. Result and Discussions

### 4.1. Research Result

This research tests the application of the Support Vector Machine (SVM) algorithm in data mining to analyze sentiment in free online novel applications on the Google Play Store. It evaluates the classification and accuracy of user reviews from the Wattpad, NovelToon, and Joylada applications.

### 4.2. System Analysis Result

System analysis is an essential initial stage in information system development, which is to understand the components and interactions in the system and identify problems, needs, and solutions. The system aims to analyze the sentiment of comments from users of free online novel applications (Wattpad, NovelToon, Joylada) using the Support Vector Machine (SVM) algorithm. The output is a classification of comments, with users able to upload the dataset via the form provided. This web-based system uses PHP and MySQL and classifies sentiment as positive and negative.

### 4.3. Analysis and Discussion of Research Result

#### 1. Datasets

The dataset used in this research consists of 300 comments taken from three applications. One hundred remarks came from the Wattpad application, 100 from the Noveltoon application, and another 100 from the Joylada application. The following table summarizes the dataset used in this study.

Table 2. Wattpad Dataset

Comments Dataset	Sentiment
Good, really good, but when I wrote the story, then I left, then went back in, the story just disappeared; even though I had written three chapters instead, it disappeared I didn't note the plot; when the story appeared again, only 1 chapter appeared, and it's empty, I don't know whose fault it is, it's clear that the one who runs this world is the wrong one, it just makes people unlucky, if you find me, they'll also be the one who runs the world.	Positive
Why is Wattpad like this now? Advertisements are in every chapter, and the new features are less convenient. Come on, where's the first Wattpad?	Negative
After updating Wattpad, I can't log in or read stories. I've tried reinstalling it, but all the saved stories are gone, and those that have been read and saved can't be clicked or read. We asked Wattpad to review the update again because the more it is updated, the more it can't be used to log in multiple times, and it still won't work to reinstall it.	Negative
The story is that I can't open it even though I'm using WiFi, and it's not slow, but when I open WP, it's prolonged; please help me. Can I open TikTok? I can't open WP.	Negative
Can you please add a video filter from the gallery?	Positive
Is this application perfect?	Positive
I always get errors whenever I want to make a new story or chapter. When I create a new chapter, it always says, "failed to	Negative

	create a chapter." even when I create a new story, the story doesn't exist; the bug is annoying. Even though it's been updated, it's still the same. Can Wattpad fix it, please??	
	Reading JD is even more exciting, but if you're lazy about reading JD books, reading WP is fun.	Positive
	...	...
	Yes, after updating, the last reading position doesn't save. I'm sluggish when I read a story; the chapter is long, and it doesn't save	Negative

**Table 3. Noveltoon Dataset**

No	Comments Dataset	Sentiment
1	The application can't be opened for 1 hour	Negative
2	Exciting	Positive
3	Reduce the advertisements. Can't you just read two chapters straight through the advertisements???	Negative
4	Just lots of ads	Negative
5	If I could return the app to how it was before, after updating it repeatedly, it would get more and more errors from the words I wrote, and a lot of it would change itself. Some didn't pass the review even though they had all been changed; I was confused about how to deal with it even though it wasn't. Some words are fulsome; please fix them back to normal	Negative
6	fix it again. I have two accounts, but my Facebook account can't be logged in because of an error	Negative
7	Advertisement of all contents	Negative
8	Surprise... When LG typed a novel, it came out by itself, so I'm too lazy to type again.	Negative
...	...	...
100	This application is highly recommended. Don't regret downloading it because there are lots of novels available	Positive

**Table 4. Joylada Dataset**

No	Comments Dataset	Sentiment
1	is the app good?	Positive
2	After updating, there is no luckywheel.	Negative
3	why can't the application be installed now?	Negative
4	Good	Positive
5	Excellent	Positive
6	The reading experience is exciting, and writing also becomes fun	Positive
7	Very satisfied with the stories in Joylada	Positive
8	The story is good and good	Positive
...	...	...
100	The story is interesting and not too complicated; the feed is also GX is very long; opening the locked tale is also not that difficult; watch the ad	Positive

## 2. Text Preprocessing

The entire dataset goes through a preprocessing stage, as seen in the following table.

**Table 5. Wattpad Text Preprocessing Results**

No	After Preprocessing	Sentiment
1	very good, very good, the story goes into the story, it's gone, that's all, I wrote the chapter, lost the plot, I didn't take notes, the story appears, the chapter seems, it's empty, it's wrong to set up the world, it's wrong, make people unlucky, if you find it, I'll cut it off, set up the world	Positive
2	This Wattpad is like an advertising chapter, but the new features are convenient. Come on, Wattpad first	Negative
3	Wattpad is finished, then it won't enter the story and can't read; I've tried reinstalling the tale, saving, losing, reading, saving, clicking read, please Wattpad, review, login, reinstall it, you can	Negative
4	The story is that it doesn't use WiFi, it doesn't work when	Negative

	I open WP, it doesn't work, please open TikTok, it doesn't work. Open WP, it doesn't work	
5	please add a gallery video filter	Positive
6	good app	Positive
7	every chapter of the story likes to have an error when writing the chapter; the chapter fails when writing the story, the story doesn't work, and the bugs are annoying; update it; please fix Wattpad	Negative
8	Reading is fun, but if you're lazy, reading in books is fun	Positive
...	...	...
100	When I finished updating my reading position, it didn't save; I was sluggish about reading the story, and the chapter didn't save	Negative

**Table 6.** Noveltoon Text Preprocessing Results

No	After Preprocessing	Sentiment
1	the application doesn't open at any time	Negative
2	Exciting	Positive
3	fewer ads, read chapters directly with ads	Negative
4	just lots of ads	Negative
5	if the app comes back, update again, error, write, change, pass, review, change, confusion, solve it, vulgar, please be good	Negative
6	OK, the Facebook account has a login error	Negative
7	content advertising	Negative
8	I'm typing a novel; I'm too lazy to type	Negative
...	...	...
100	The recommendation application regrets downloading the novels available	Positive

**Table 7.** Joylada Text Preprocessing Results

No	After Preprocessing	Sentiment
1	good app	Positive
2	Has Lucky Wheel updated	Negative
3	the application doesn't install	Negative
4	Good	Positive
5	Excellent	Positive
6	nature read, fun write, have fun	Positive
7	Very satisfied with Joylada's story	Positive
8	good good story	Positive
...	...	...
100	The fascinating story is that the end can't open the key story, and watching ads is hard.	Positive

### 3. Test data

Of the total 100 comments for each of the three applications, 70 comments were used as training data, while 30 comments were used as testing data by the general division used in the Support Vector Machine method.

Example of calculating comment documents in the Wattpad application

Term Frequency (TF) Stage

To calculate Term Frequency, you can use equation 1:

`['this,' 'Wattpad,' 'rich,' 'gin,' 'chapter,' 'ad,' 'sih,' 'then,' 'feature,' 'new,' 'comfortable,' 'come on,' 'Wattpad,' 'was']`

$$\text{this} = 0.5 + 0.5 \frac{1}{14} = 0.0714$$

$$\text{wattpad} = 0.5 + 0.5 \frac{2}{14} = 0.1428$$

$$\text{rich} = 0.5 + 0.5 \frac{1}{14} = 0.0714$$

$$\text{gin} = 0.5 + 0.5 \frac{1}{14} = 0.0714$$

$$\text{chapters} = 0.5 + 0.5 \frac{1}{14} = 0.0714$$

$$\text{ad} = 0.5 + 0.5 \frac{1}{14} = 0.0714$$

$$\text{hell} = 0.5 + 0.5 \frac{1}{14} = 0.0714$$

$$\text{trus} = 0.5 + 0.5 \frac{1}{14} = 0.0714$$

$$\text{feature} = 0.5 + 0.5 \frac{1}{14} = 0.0714$$

$$\text{new} = 0.5 + 0.5 \frac{1}{14} = 0.0714$$

$$\text{comfort} = 0.5 + 0.5 \frac{1}{14} = 0.0714$$

$$\text{come} = 0.5 + 0.5 \frac{1}{14} = 0.0714$$

$$\text{wattpad} = 0.5 + 0.5 \frac{2}{14} = 0.1428$$

$$\text{was} = 0.5 + 0.5 \frac{1}{14} = 0.0714$$

To calculate Inverse Document Frequency, you can use equation 2:

**Table 8.** DF Calculation

Terms/words	DF
This	4
Wattpad	17
Rich	2
Gin	6
Chapters	8
Ad	29
Hell	6
Trus	2
Feature	2
New	5
Comfort	1
Come	2
Wattpad	17
Was	3

$$\text{this} = \ln \frac{100}{4} + 1 = 4.2188$$

$$\text{wattpad} = \ln \frac{100}{17} + 1 = 2.7719$$

$$\text{rich} = \ln \frac{100}{2} + 1 = 4.9120$$

$$\text{gin} = \ln \frac{100}{6} + 1 = 3.8134$$

$$\text{chapters} = \ln \frac{100}{8} + 1 = 3.5257$$

$$\text{ad} = \ln \frac{100}{29} + 1 = 2.2378$$

$$\text{hell} = \ln \frac{100}{6} + 1 = 3.8134$$

$$\text{trus} = \ln \frac{100}{2} + 1 = 4.9120$$

$$\text{feature} = \ln \frac{100}{2} + 1 = 4.9120$$

$$\text{new} = \ln \frac{100}{5} + 1 = 3.9957$$

$$\text{comfort} = \ln \frac{100}{1} + 1 = 5.6061$$

$$\text{come} = \ln \frac{100}{2} + 1 = 4.9120$$

$$\text{wattpad} = \ln \frac{100}{17} + 1 = 2.7719$$

$$\text{was} = \ln \frac{100}{3} + 1 = 4.5065$$

The following are the results of calculating the Term Frequency (TF) \* Inverse Document Frequency (IDF) in the Wattpad document above using equation 3:

$$\text{this} = 0.0714 * 4.2188 = 0.30134827320487$$

$$\text{wattpad} = 0.1428 * 2.7719 = 0.3959938345617$$

$$\text{rich} = 0.0714 * 4.9120 = 0.35085878610201$$

$$\text{gin} = 0.0714 * .8134 = 0.27238647976857$$

$$\text{chapters} = 0.0714 * 3.5257 = 0.25183776030773$$

$$\text{ad} = 0.0714 * 2.2378 = 0.15984816828583$$

$$\text{hell} = 0.0714 * 3.8134 = 0.27238647976857$$

$$\text{trus} = 0.0714 * 4.9120 = 0.35085878610201$$

$$\text{feature} = 0.0714 * 4.9120 = 0.35085878610201$$

$$\text{new} = 0.0714 * 3.9957 = 0.285409448111$$

$$\text{comfort} = 0.0714 * 5.6061 = 0.40036929899915$$

$$\text{come} = 0.0714 * 4.9120 = 0.35085878610201$$

$$\text{wattpad} = 0.1428 * 2.7719 = 0.3959938345617$$

$$\text{was} = 0.0714 * 4.5065 = 0.32189699266571$$

After the calculation above, the final result is 0.31863612247449 with negative sentiment.

After calculating the TF \* IDF, a final calculation is carried out. All the TF \* IDF results are multiplied and then divided according to the number of words in each comment data. Next, it will be classified into two classes, namely the positive and negative classes, with the condition that if the word weight/score >0 is positive, if <0 is negative.

**Table 9.** Wattpad Test Results

No.	Dokument	Results	Sentiment
1.	Good, really good, but when I wrote the story, then I left, then went back in, the story just disappeared, even though I had written three chapters instead it disappeared I didn't note the plot when the story appeared again, only 1 chapter appeared, and it's empty, I don't know whose fault it is, it's clear that the one who runs this world is the wrong one, it just makes people unlucky, if you find me, they'll also be the one who runs the world.	0.15835675792981	Negative
2.	Why is Wattpad like this now? Advertisements are in every chapter, and the new features are less convenient. Come on, where's the first Wattpad?	0.31863612247449	Negative
3.	After updating Wattpad, I can't log in or read stories. I've tried reinstalling it, but all the saved stories are gone, and those that have been read and saved can't be clicked or read. We asked Wattpad to review the update again because the more it is updated, the more it can't be used to log in multiple times, and it still won't work to reinstall it.	0.22627415341268	Negative
4.	...	...	...
30.	Add lots of bugs! When the order of the chapters written is correct, does it become a complete mess?? It's allowed to be still messy	0.49162860488302	Negative

**Table 10.** Noveltoon Test Results

No.	Dokument	Results	Sentiment
1.	The application can't be opened for 1 hour.	0.97449804201942	Negative
2.	Exciting	3.995732273554	Positive
3.	Reduce the advertisements; how come you read two chapters straight through the advertisements???	0.71121825478236	Negative
4.	...	...	...



No.	Dokument	Results	Sentiment
30.	Why can't it be opened when using Telkomsel	0.78729872458983	Negative

**Table 11.** Joylada Test Results

No.	Dokument	Results	Sentiment
1.	Is the app good?	2.0536520246055	Positive
2.	After updating, there is no luckywheel.	1.0611414395894	Positive
3.	Why can't the application be installed now?	0.93713322947219	Negative
4.	...	...	...
30.	It's fun, but unfortunately, it takes a long time to collect the candy HHHhH	0.62460549847333	Negative

## 4. Confusion Matrix

**Table 12.** Confusion Matrix Wattpad

Sentiment	Positive	Negative
Positive	7	7
Negative	4	12

$$accuracy = \frac{7 + 12}{7 + 12 + 7 + 4} = \frac{19}{30} = 0.6333 \times 100\% = 63\%$$

$$precision = \frac{7}{7 + 7} = \frac{7}{14} = 0.5 \times 100\% = 50\%$$

$$recall = \frac{7}{7 + 4} = \frac{7}{11} = 0.6363 \times 100\% = 64\%$$

**Table 13.** Confusion Matrix Noveltoon

Sentiment	Positive	Negative
Positive	11	5
Negative	4	10

$$accuracy = \frac{11 + 10}{11 + 10 + 5 + 4} = \frac{21}{30} = 0.7 \times 100\% = 70\%$$

$$precision = \frac{11}{11 + 5} = \frac{11}{16} = 0.6875 \times 100\% = 69\%$$

$$recall = \frac{11}{11 + 4} = \frac{11}{15} = 0.7333 \times 100\% = 73\%$$

**Table 14.** Confusion Matrix Joylada

Sentiment	Positive	Negative
Positive	11	9
Negative	1	9

$$accuracy = \frac{11 + 9}{11 + 9 + 9 + 1} = \frac{20}{30} = 0.6666 \times 100\% = 67\%$$

$$precision = \frac{11}{11 + 9} = \frac{11}{20} = 0.55 \times 100\% = 55\%$$

$$recall = \frac{11}{11 + 1} = \frac{11}{12} = 0.9166 \times 100\% = 92\%$$

## 5. Conclusion

Based on the research and system testing results, data was obtained from the Google Play Store application with 100 comments each from Wattpad, Noveltoon, and Joylada. The classification using the Support Vector Machine (SVM) method resulted in two classes, positive and negative, with the following outcomes: Wattpad (Positive 41%, Negative 59%), Noveltoon (Positive 48%, Negative 52%), and Joylada (Positive 57%, Negative 43%). Evaluation results for accuracy metrics with 30 test data, including precision, recall, and F1 score, showed that Wattpad achieved an accuracy of 63%, precision 50%, recall 64%, and F1 56%; Noveltoon attained an accuracy of 70%, precision 69%, recall 73%, and F1 71%; while Joylada achieved an accuracy of 67%, precision 55%, recall 92%, and F1 69%.

Noveltoon performed the best with the highest accuracy and F1 score, while Joylada excelled in the recall. Although Wattpad had relatively good accuracy, it ranked last due to its lower recall and precision values than Joylada and Noveltoon.

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