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Comparative Study of Android Smartphone-Based Antivirus Performance Using the TAM Method

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Abstract

Android is a mobile phone that has many advantages. Android has many interesting features and applications. Because the need for Android smartphones continues to grow rapidly at the same time technology is also increasingly sophisticated. This also has a weakness, namely by the presence of people who are not responsible for damaging the Android OS, where they will spread malware, spyware, trojans, and other viruses. To damage and steal data from the victim's android smartphone. The purpose of this study is to know the performance of smartphones when using antivirus. The method used in this research is the TAM (Technology Acceptance Model) method. TAM is one of the models built to analyze and understand the factors that influence the acceptance of the use of computer technology. The results of this study indicate that the appearance of the Avast antivirus and Clean Master has an attractive design, easy to operate, and the features of Avast are easy to understand. While the use of Avast antivirus and Clean Master can save time in operation, meet needs, and is efficient and effective, and its convenience can make it easier for users to use this antivirus more flexible
Keyword : *antivirus, android, performance, smartphone, TAM*

Introduction

Now Android has developed in Indonesia, and now the open source operating system is widely used by smartphones with the Android platform. Because the open source system is Android, it can make it easier for anyone to develop and access Android applications easily, and can be downloaded on the Android App Market. Technological advances that are currently developing, various types of gadgets are starting to launch the latest specifications of their own gadgets, of course supported by several types of operating systems. Smartphone users are now increasingly being used, because of its size that is easy to carry and also not difficult to operate. In line with its development, the android system has now been widely used to support performance on smartphone operating systems.

The operating system used on the Android system itself uses a Linux-based operating system for cellular phones such as smartphones. The advantages possessed by the android system, such as an open source operating system, multitasking, ease of receiving notifications, to various applications or software that can be used in the android system. But there are problems in this android system, which is one of the advantages of the android system being one of its weaknesses. Open access is the superiority of the operating system, where the developers (users) have provided an open platform. The goal is that users can create and develop their own applications, so that they can be used on various mobile devices. However, this will actually make it easier for irresponsible parties to build and develop malware so that these applications can enter the Android system.

Literature Review

• Smartphone Platform Security

Today, smartphones are the preferred device by users for web browsing, email, using social media, and making online purchases. Because the size of the smartphone is easier to carry around. Unfortunately, smartphones are a breeding ground for cyber attackers. The operating system on smartphones does not contain security devices to protect data. Examples of security software found on PCs, such as firewalls, antivirus, and encryption, are not currently available on smartphones (Ruggiero, 2011). Cyber attackers can enter security holes for their own benefit. An example of this gap in security was seen in the Valentine's Day attack in 2011. The cyber attacker spreads images on various mobile phones secretly sending premium-rate text messages from mobile users (Ruggiero, 2011). With this example, it can be illustrated the importance of having a security policy for mobile phones.

Kini telah banyak banyak serangan malware pada smartphone OS. Seiring dengan ini, malware yang menargetkan sistem operasi smartphone terus berkembang. Contoh tersebut dapat terlihat pada "Zeus-in-the-Mobile" (ZitMo), bentuk spesifik malware sangat umum digunakan untuk sistem android. ZitMo telah ditargetkan kedalam aplikasi Bank pengguna android, fungsinya untuk berusaha memotong perbankan otentikasi diantara dua faktor, mencuri kredensial dan mendapatkan akses ke rekening bank pengguna.

Untuk mengantisipasi serangan yang mungkin terjadi maka kita perlu sadar akan kepentingan keamanan pada smartphone kita. Karena apabila terdapat celah keamanan pada smartphone kita maka akan membuka kesempatan bagi para attacker untuk dijadikan sarana penyerangan.

• Android Malware Threats on Smartphones

This malware earned the nickname "Judy" which was taken from a game application titled "Chef Judy: Picnic Lunch Maker". Judy contains malicious code that can harm users, especially smartphone or smartphone users. Judy is part of the adware variant or advertising-supporter software. In simple terms, adware is a program that will send or display advertisements to people who are exposed to it. Technically, the Judy malware works first by registering the infected device on a server that has been set up by cybercriminals.

Apps and games containing the Judy malware have been downloaded between 4.5 million and 18.5 million times. Based on a Check Point report, Judy has been on the Google Play Store for quite a while, without being caught by Google as the owner of Android. It is also estimated that it has infected 36 million smartphone users.

Method

In this section, the stages or steps that will be made and used as guidelines for this research method will be explained, using the TAM (Technology Acceptance Model) method. TAM is one of the models

built to analyze and understand the factors that influence the acceptance of the use of computer technology which was first introduced by Fred Davis in 1986.
TAM positions two beliefs, namely perceived usefulness and perceived ease of use as the main factors for computer acceptance behavior.

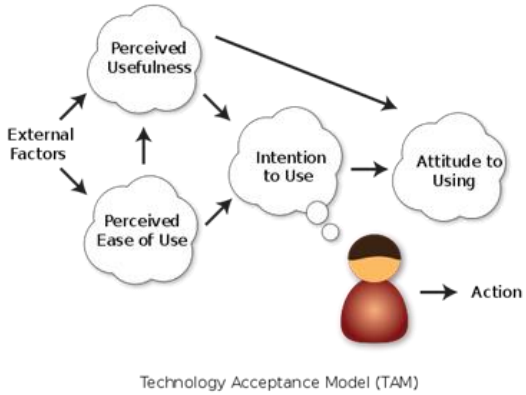


Figure 1. Illustration of TAM

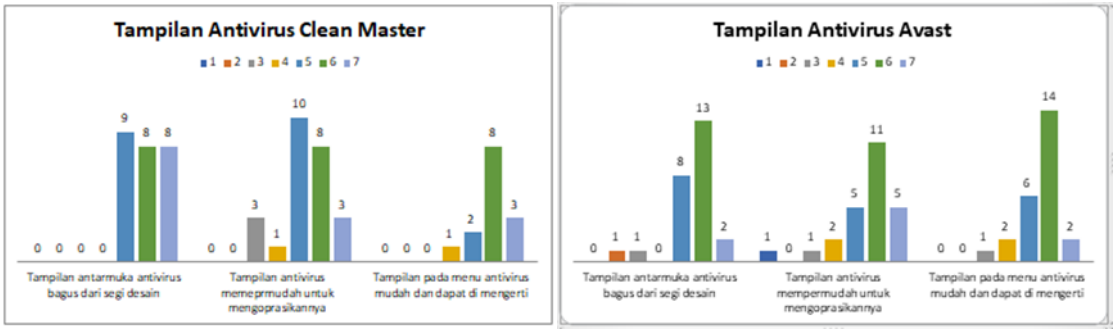
In the Technology Acceptance Model (TAM) it is known that there are 5 constructs (Davis et. Al, 1986), as shown in the picture above. Here's the explanation:

1. Perceived ease of use, defined as the extent to which a person believes that using a technology will be free from effort.
2. Perceived usefulness, defined as the extent to which a person believes that using a technology will improve their performance.
3. Attitude toward using technology, defined as the user's evaluation of his interest in using technology.
4. Behavioral intention to use is defined as a person's interest (desire) to perform certain behaviors.
5. Actual technology usage, measured by the amount of time spent interacting with technology and the frequency of use.

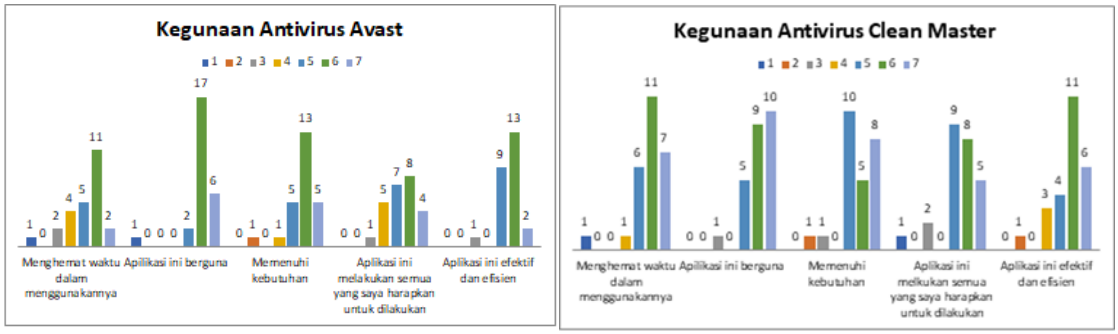
Results and Discussion

The results of the study can be seen in the graphs that draw the characteristics of the respondents, which can be seen in the following diagram:

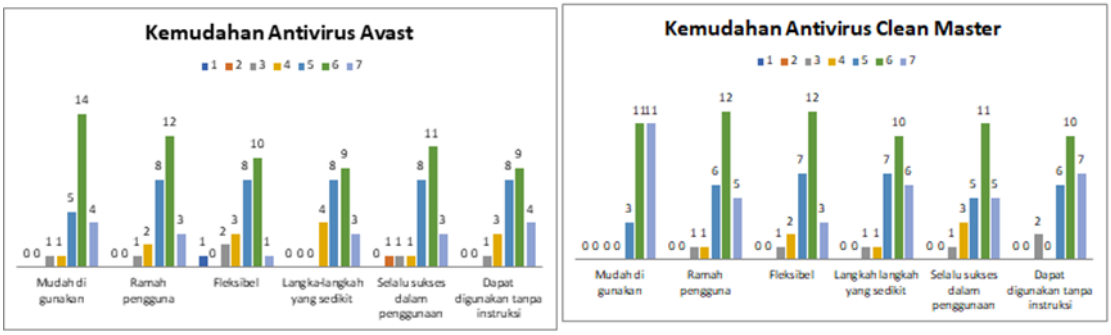
Respondents: Display of Avast Antivirus and Clean Master



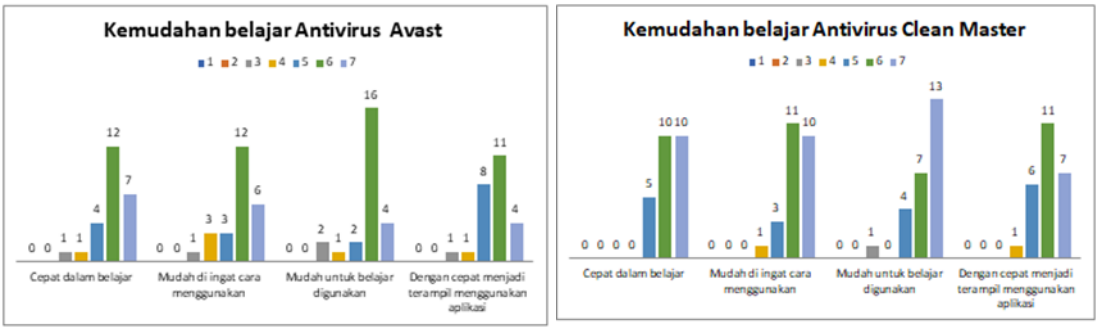
Respondents: Use of Avast Antivirus and Clean Master



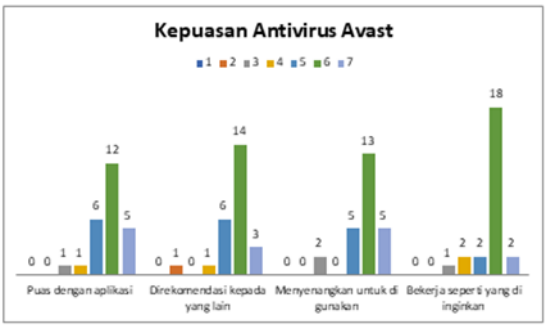
Respondents: The convenience of Avast Antivirus and Clean Master

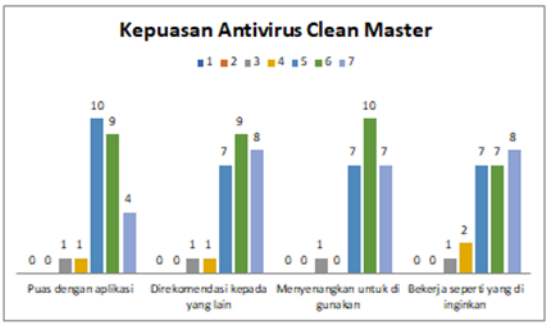


Respondents: Ease of Learning Avast Antivirus and Clean Master



Respondents: Satisfaction with Avast Antivirus and Clean Master





Each antivirus has different features according to its capabilities

1. Display Avast Antivirus and Clean Master on Android

Avast

No	Question	Description
1	The antivirus interface is good in terms of design	13 out of 25 agree
2	Antivirus display makes it easy to operate	11 out of 25 agree
3	The display on the antivirus menu is easy and understandable	14 out of 25 agree

Clean Master

No	Question	Description
1	The antivirus interface is good in terms of design	9 out of 25 say neutral
2	Antivirus display makes it easy to operate	10 out of 25 say neutral
3	The display on the antivirus menu is easy and understandable	8 out of 25 agree

2. Usefulness of Avast Antivirus and Clean Master on Android

Avast

No	Question	Description
1	Save time in using it	11 out of 25 agree

2	This app is useful	17 out of 25 agree
3	Make ends meet	13 out of 25 agree
4	This app does everything I expect it to do	8 out of 25 agree
5	This application is effective and efficient	13 out of 25 strongly agree

Clean Master

No	Question	Description
1	Save time in using it	11 out of 25 agree
2	This app is useful	10 out of 25 strongly agree
3	Make ends meet	10 out of 25 say Neutral
4	This app does everything I expect it to do	9 out of 25 say Neutral
5	This application is effective and efficient	11 out of 25 agree

3. Kemudahan Penggunaan Antivirus Avast dan Clean Master di Android

Avast

No	Question	Description
1	Easy to use	14 out of 25 agree
2	User friendly	12 out of 25 agree
3	Flexible	10 out of 25 agree
4	It takes the least number of steps to achieve what I want to do in this application	9 out of 25 agree
5	Always success when using it	11 out of 25 agree

6	Can be used without written instructions	9 out of 25 agree

Clean Master

No	Question	Description
1	Easy to use	11 out of 25 agree and strongly agree
2	User friendly	12 out of 25 agree
3	Flexible	12 out of 25 agree
4	It takes the least number of steps to achieve what I want to do in this application	10 out of 25 agree
5	Always success when using it	11 out of 25 agree
6	Can be used without written instructions	10 out of 25 agree

4. Ease of learning to use Avast Antivirus and Clean Master on Android

Avast

No	Question	Description
1	Fast in learning to use this application	12 out of 25 agree
2	Easy to remember how to use	12 out of 25 agree
3	Easy to learn to use	16 out of 25 agree
4	Quickly become skilled at using the app	11 out of 25 agree

Clean Master

No	Question	Description
1	Fast in learning to use this application	10 out of 25 agree and strongly agree

2	Easy to remember how to use	8 out of 25 agree
3	Easy to learn to use	11 out of 25 agree
4	Quickly become skilled at using the app	13 out of 25 agree

5. Satisfaction with using Avast Antivirus and Clean Master on Android

Avast

No	Question	Description
1	Satisfied with the app	12 out of 25 agree
2	Recommended to others	14 out of 25 agree
3	Fun to use	13 out of 25 agree
4	Work as desired	18 out of 25 agree

Clean Master

No	Question	Description
1	Satisfied with the app	10 out of 25 say neutral
2	Recommended to others	9 out of 25 agree
3	Fun to use	10 out of 25 agree
4	Work as desired	8 out of 25 strongly agree

In this section, it can be seen that the results of data collection by distributing questionnaires to 50 respondents with each antivirus getting 25 respondents, will see the feasibility and comparison of each use used on the antivirus.

Conclusion

After seeing the comparison as well as the results and discussion of the model used, the following conclusions can be drawn :

- The appearance of the Avast antivirus and Clean Master, they tend to choose the Avast view over Clean Master. Because the appearance of Avast in terms of attractive design, easy to operate, and the features of Avast are easy to understand.
- Use of antivirus Avast and Clean Master, they are more likely to agree. Because of the usefulness of these two antiviruses, they can save time in operation, meet needs, and are efficient and effective.

- For convenience, it can make it easier for users to use this antivirus more flexibly.
- 90 to 100 of them said they were satisfied with using Avast antivirus and Clean Master.

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