



**The title should be clear, informative, and no more than 4 lines and 15 words.**

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**Abstract.** *In the era of rapidly evolving mobile technology, memory management is a crucial aspect that determines the efficiency and effectiveness of operating systems, especially Android and iOS. This research aims to analyse and compare the memory management strategies applied to both operating systems, with a focus on resource-constrained mid-range smartphone devices. Using an experimental approach and literature study, various techniques such as cache optimisation, memory compression, and page replacement algorithms are evaluated to determine their effect on system performance and responsiveness. The results show that implementing appropriate memory management strategies can significantly improve operating system performance, extend battery life, and provide a better user experience. This study also discusses the different approaches between open source Android and closed source iOS in terms of memory management and system security. The findings are expected to serve as a reference for app developers and device manufacturers to optimise their products in the competitive smartphone market.*

**Keywords:** *Memory Management, Mobile Operating System, Android, iOS, Memory Optimisation.*

## **BACKGROUND**

In the era of rapidly developing mobile devices, operating systems play an important role in managing device resources efficiently, especially memory. As applications become more complex and physical memory capacity on devices becomes

more limited, memory management strategies become key to maintaining system performance and user experience.

The Android and iOS operating systems, as the two dominant platforms on smartphones, adopt different approaches to memory management. Android, which is open-source and based on the Java Virtual Machine, relies on a Garbage Collector (GC) to manage memory. However, this approach often leads to memory leaks, thrashing, and inconsistent performance, especially on mid-to-low-end devices.

In contrast, iOS uses the Automatic Reference Counting (ARC) approach, which operates during compilation, enabling more consistent memory allocation and deallocation efficiency. This makes iOS superior in maintaining system stability and responsiveness, as well as minimizing application crashes due to memory exhaustion.

Previous research has also shown that techniques such as virtual memory partitioning can be used to improve application performance by isolating native and external application memory, thereby reducing the load on the Low Memory Killer (LMK) and Out-of-Memory Killer (OOMK) commonly used in Android systems.

Given these fundamental differences, this study aims to conduct a comparative analysis of the memory management strategies implemented in Android and iOS operating systems, and to identify the strengths and weaknesses of each approach in terms of performance, stability, and user experience.

## **THEORETICAL REVIEW**

This part presents relevant theories related to the research topic and reviews several pertinent previous studies. It also serves as a reference and foundation for how the research was conducted. If a hypothesis is included, it should be stated explicitly and does not need to be in the form of a question.

## **RESEARCH METHODS**

This part outlines the research design, including the study framework, research population or sample, data collection techniques and instruments, data analysis tools, and applied research model. Commonly used methods do not need to be described in detail; instead, they should be referenced (e.g., F-test formula, t-test, etc.). Additionally,

validity and reliability testing of research instruments should not be elaborated extensively—only the test results and their interpretations need to be presented. Descriptions of symbols used in the model should be provided in sentence form.

## **RESULTS AND DISCUSSION (Sub-heading level 1)**

This part covers the data collection process, timeline, research location, and data analysis results, which may be supported by illustrations such as tables or pictures (excluding raw data or direct screenshots of analysis results). It also includes a discussion of the relationship between findings and fundamental concepts, hypothesis testing results (if applicable), and an evaluation of how the results align with or contradict previous studies, along with their interpretations. Additionally, this part may highlight the theoretical and practical implications of the research findings. Each picture and table must be accompanied by an explanation in the text, proper numbering and source references. The following is an example of formatting for subheadings, sub-subheadings, sub-sub-subheadings, and beyond.

### **First Subheading (Subheading level 2)**

Here is a description of the first subheading.

#### **1. Sub-Subheading (Subheading level 3)**

Here is a description of the sub-sub heading.

##### **a) Sub-Sub-Subheading (Subheading level 4)**

Here is a description of the sub-sub-sub heading.

### **Second Subheading (Subheading level 2)**

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#### **1. Sub-Subheading (Subheading level 3)**

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##### **a) Sub-sub-subheading (Subheading level 4)**

Here is a description of the sub-sub-subheading.

Etc....

## **CONCLUSIONS AND SUGGESTIONS**

The conclusion should directly address the research objectives or problems by presenting the findings or testing the hypothesis, without merely restating the discussion. It must be written critically, logically, and honestly, based on the factual research results, while being cautious about making broad generalizations. The conclusions and recommendations section should be structured in paragraph form, avoiding numbering or bullet points. Additionally, this part allows the author to provide suggestions or recommendations for action based on the research findings. Furthermore, the author is strongly encouraged to discuss the study's limitations and offer recommendations for future research.

### **APPRECIATION OF THANKS (If Required)**

This part allows authors to express their gratitude to research funders, facility providers, or those who assisted in reviewing the manuscript. It can also be used to include a statement or clarification if the article is derived from a thesis, dissertation, conference paper, or research project.

### **REFERENCES**

*The references section includes a list of journals, books, or other sources cited in the manuscript, with at least 75% of all references coming from publications within the last 10 years. The majority of the references should be scientific articles or conference proceedings. A minimum of 20 references is required, with at least 75% sourced from published scientific articles or research-based conference proceedings. References should be listed alphabetically and formatted according to the American Psychological Association (APA) style, at least the 6th edition. Managing references and citations using the Mendeley application or other reference management software is strongly recommended. An example of reference formatting following APA 6th edition is as follows:*

#### **Journal Articles (one, two, or more than two authors)**

- Hidayati, S.N. (2016). Pengaruh Pendekatan Keras dan Lunak Pemimpin Organisasi terhadap Kepuasan Kerja dan Potensi Mogok Kerja Karyawan. *Jurnal Maksipreneur: Manajemen, Koperasi, dan Entrepreneurship*, 5(2), 57-66. <http://dx.doi.org/10.30588/SOSHUMDIK.v5i2.164>.
- Risdwiyanto, A. & Kurniyati, Y. (2015). Strategi Pemasaran Perguruan Tinggi Swasta di Kabupaten Sleman Yogyakarta Berbasis Rangsangan Pemasaran. *Jurnal Maksipreneur: Manajemen, Koperasi, dan Entrepreneurship*, 5(1), 1-23. <http://dx.doi.org/10.30588/SOSHUMDIK.v5i1.142>.
- Bator, R. J., Bryan, A. D., & Schultz, P. W. (2011). Who Gives a Hoot?: Intercept Surveys of Litterers and Disposers. *Environment and Behavior*, 43(3), 295–315. <https://doi.org/10.1177/0013916509356884>.

#### **Proceedings Article**

Norsyaheera, A.W., Lailatul, F.A.H., Shahid, S.A.M., & Maon, S.N. (2016). The Relationship Between Marketing Mix and Customer Loyalty in Hijab Industry: The Mediating Effect of Customer Satisfaction. In *Procedia Economics and Finance* (Vol. 37, pp. 366–371). Elsevier B.V. [https://doi.org/10.1016/S2212-5671\(16\)30138-1](https://doi.org/10.1016/S2212-5671(16)30138-1).

### **Working Paper**

Armand, F. (2003). Social Marketing Models for Product-Based Reproductive Health Programs: A Comparative Analysis. *Occasional Paper Series*. Washington, DC. Retrieved from [www.cmsproject.com](http://www.cmsproject.com).

### **Dissertation/Thesis/Research Paper**

Belair, A. R. (2003). Shopping for Your Self: When Marketing becomes a Social Problem. *Dissertation*. Concordia University, Montreal, Quebec, Canada.

Lindawati (2015). Analisis Faktor yang Mempengaruhi Perilaku Ekonomi dan Kesejahteraan Rumah Tangga Petani Usahatani Terpadu Padi-Sapi di Provinsi Jawa Barat. Institut Pertanian Bogor. Retrieved from <http://repository.ipb.ac.id/handle/123456789/85350>.

### **Textbook**

Kotler, P., & Lee, N. R. (2009). *Up and Out of Poverty: The Social Marketing Solution*. New Jersey: Pearson Education, Inc.

### **Agency/Institution/Organization/Company Report**

LPPSP. (2016). *Statistik Indonesia 2016*. Badan Pusat Statistik, 676. Jakarta. Diakses dari <https://www.LPPSP.go.id/index.php/publikasi/326>.

### **Newspaper/Magazine Articles**

Risdwiyanto, A. (2016). Tas Kresek Berbayar, Ubah Perilaku Belanja? *Kedaulatan Rakyat*, 22 Februari, 12.

### **Sources from the Internet with the Author's Name**

Chain, P. (1997). Same or Different? A Comparison of the Beliefs Australian and Chinese University Students Hold about Learning's Proceedings of AARE Conference. Swinburne University. Available at: <http://www.swin.edu.au/aare/97pap/CHAN97058.html>, diakses tanggal 27 Mei 2000.

### **Sources from the Internet without the Author's Name (write down the name of the organization/company)**

Contoh : STRATEGI PEMASARAN YANG DILAKUKAN DI PLAZA TUNJUNGAN III  
SURABAYA DALAM MEMASARKAN SEMUA PRODUKNYA

StatSoft, Inc. (1997). Electronic Statistic Textbook. Tulsa OK., StatSoft Online.  
Available at: <http://www.statsoft.com/textbook/stathome.html>, diakses tanggal 27 Mei 2000.

### Footnote

*Footnotes should not be used for citing references; they are only intended to provide additional information or general clarifications related to the content on a page. Footnotes must be written in single spacing, using Times New Roman font, size 10 pt, and numbered sequentially. They should be placed at the bottom of the corresponding page.*

### Table Placement

**Table 1. The frequency distribution of the age of persons**

Umur (dalam tahun)	Frekuensi
15 – 19	3
20 – 24	6
25 – 29	10
30 – 34	5
35 – 39	2

Source: SOSHUMDIK (2022).

### Picture Placement



Description: Images must be clear (not blurry).

Source: SOSHUMDIK (2022).

**Picture 1. Graph of visitors on a website.**

### How to Write References in the Manuscript

*In-text citations must follow the American Psychological Association (APA) standard, at least the 6th edition. Here is an example of an in-text citation within a paragraph, referring to the sample reference list provided above.*

According to the Law of the Republic of Indonesia Number 20 of 2003, Chapter 1, Article 1, regarding the national education system, education is defined as a deliberate and structured effort to create a learning environment and process that enables students to actively develop their potential. This includes fostering spiritual and religious values, self-discipline, character, intelligence, moral integrity, and the essential skills required for personal growth, as well as for society, the nation, and the state (Sukmadinata, 2009).