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Evaluation of User Experience (UX) in the MIUI 14 Interface Using User Experience Questionnaire (UEQ) Method in Indonesia

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***Abstract*--MIUI, a widely recognized interface due to its popularity, still has several shortcomings in delivering a good user experience, such as overheating issues, UI lag, battery drain, bloatware, promotional ads, GPS issues, OS & security updates, and conflicts between Xiaomi China and Google. This study aims to assess user experience in terms of attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty as offered by the MIUI 14 interface. A descriptive quantitative approach is used in this study, employing a questionnaire as the data collection method. The questionnaire is designed to assess user experience with MIUI 14 according to the indicators in the User Experience Questionnaire (UEQ) method. Data analysis was carried out using specialized software for user experience measurement, specifically the UEQ tool. The results show that the UEQ dimensions of attractiveness, perspicuity, and dependability received positive impressions, while efficiency received a negative impression. Stimulation and novelty received neutral evaluations. MIUI 14 scored Above Average in attractiveness, Below Average in perspicuity and dependability, and Poor in efficiency, stimulation, and novelty. Suggested improvements include addressing advertising notifications, rearranging the settings layout, enhancing animation responsiveness, removing bloatware, updating security patches, and implementing the Material You design concept.**

***Key words*: MIUI 14; User experience; User Experience Questionnaire (UEQ).**

I. INTRODUCTION

In the current era of rapid technological advancement, it is undeniable that the development of media technology continues to evolve alongside the progression of modern society. One significant example of this evolution is the rise of mobile phone technology, which was relatively uncommon between the 1990s and early 2000s but since then it become an integral part of daily life. Initially, mobile phones were primarily designed for basic communication functions, such as sending text messages and making voice calls. However, with the continuous advancement of technology, the functionality of mobile phones has expanded substantially. Tasks that were once limited to desktop or laptop computers can now be easily performed through handheld devices, commonly known today as smartphones. This transformation reflects not only technological innovation but also the shifting patterns of human interaction with digital devices.

One of the mobile phone operating systems commonly used in smartphones today is the Android-based operating system. Android is specifically designed for devices with touchscreen interfaces, such as smartphones and tablets. One of the main advantages of Android is that it is an open-source operating system, meaning that its source code is accessible to anyone, including developers, designers, and smartphone manufacturers [1]. The open-source nature of Android provides opportunities for enhancing the overall user experience. This flexibility allows various smartphone manufacturers—such as Xiaomi, Vivo, Oppo, Realme, OnePlus, and others to develop their own distinctive versions of the Android operating system. Through this approach, they are able to customize and to optimize Android features to suit their respective devices.

Technological advancements in the modern era have provided significant impetus and innovation for smartphone manufacturers worldwide. This progress has driven smartphone companies to compete in developing their own Android-based interfaces, with the primary goal of delivering a user experience that surpasses anything users have previously encountered. Furthermore, the addition of features and modifications within these interfaces highlights the crucial role of User

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Experience (UX) in ensuring the success of a product or an Android-based interface.

Currently, there are numerous user interface (UI) options available for Android smartphones, each offering its own advantages and disadvantages. Choosing the appropriate UI for a smartphone can significantly enhance the user experience by optimizing the device's overall potential.

MIUI is one of the most popular custom ROMs available for Android [2]. Featuring an appealing user interface with a wide range of colors, customization options, and other useful features, MIUI is designed to be both intuitive and user-friendly. MIUI was developed to simplify the user's interaction with Android by offering various customization features, such as changing themes, icons, and the notification shade, providing dark mode for specific applications, and allowing users to modify the interface according to their preferences.

On the other hand, there are several other interfaces, such as OxygenOS by OnePlus, which emphasizes faster performance and a minimalist design. Samsung's One UI focuses on modern aesthetics and ease of use, while ColorOS by Oppo and Realme offers a user interface that closely resembles stock Android. Additionally, Huawei's EMUI presents an aesthetically pleasing interface with a strong emphasis on icon design and the homescreen layout [3].

The convenience offered by the MIUI interface has had a significant impact on Xiaomi. As of May 21, 2023, it was reported that MIUI's monthly active users had surpassed 600 million worldwide [4]. This claim of 600 million users demonstrates that MIUI has become one of the most popular Android interfaces today.

This document is an example of the desired layout for a PES Transactions/journal paper. It contains information regarding desktop publishing format, type sizes, and typefaces. Style rules are provided that explain how to handle equations, units, figures, tables, abbreviations, and acronyms. Sections are also devoted to the preparation of acknowledgments, references, and authors' biographies.

Every smartphone must continue to evolve by improving its capabilities and features in accordance with user experience regarding the user interface it employs. Additionally, it is essential to take into account user feedback and suggestions. No matter how powerful the hardware offered by manufacturers, if the operating system fails to fully utilize the hardware and create a seamless integration between the two, the overall performance will not meet expectations.

Fig. 1. Monthly Active User Data of MIUI 14 as of May 2023 [2]

Despite its popularity, the MIUI interface still has several shortcomings in delivering an optimal user experience, such as overheating issues, UI lag, battery drain, bloat ware, promotional content and ads, GPS inaccuracies, delays in OS and security updates, and conflicts between Xiaomi China and Google services [2].

Therefore, it is necessary to conduct an evaluation of the MIUI 14 interface to enhance the user experience by identifying which aspects require improvement. Through this evaluation, it is expected that Xiaomi will be able to provide a more satisfying and enjoyable user experience for its users. Furthermore, this study serves as an initial effort to measure the user experience of the MIUI interface using the User Experience Questionnaire (UEQ).

II. METHOD

This study employs a descriptive quantitative research design, with data processing conducted using statistical tools. Descriptive statistics are used to analyze data by describing or presenting the collected data as it is, without intending to draw conclusions that apply to the general population or to make generalizations [5].

In this study, the data collection technique employed is a questionnaire, which consists of a series of written questions distributed to respondents to be answered. In addition,

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questionnaires are highly effective when the number of respondents is large and spread across a wide area [5]. This questionnaire will be used to assess the user experience of the MIUI 14 interface based on the indicators provided in the User Experience Questionnaire (UEQ) method.

This study selects active users of the MIUI 14 interface in Indonesia as the research population. Due to the large population size and its inaccessibility to the researcher, Cochran's formula is employed to determine the required sample size for an unknown population. Based on the calculation, the required number of respondents is 96; however, for the purposes of this study, the number has been rounded up to 100 respondents. The sampling technique used in this research is non-probability sampling, specifically convenience sampling. Reference [5] shows that Convenience sampling is a sampling technique based on accidental encounters, meaning that anyone who happens to meet the researcher can be selected as a respondent, provided they are deemed appropriate as a source of data.

The data used in this study are primary data. Reference [5] says that primary data sources refer to data obtained directly by the data collector. In this study, data were collected using a questionnaire instrument provided by the User Experience Questionnaire (UEQ), which employs a 7-point semantic differential scale. This scale uses pairs of opposite adjectives to measure user perceptions. The questionnaire items were formulated in a manner that is easy for respondents to understand [6].

In this study, SPSS version 27 was utilized to analyze the data, specifically for validity and reliability testing. Furthermore, the UEQ Data Analysis Tool was employed to process the questionnaire results gathered from respondents.

III. Result and Discussion

A. *Description of Research Subjects*

The questionnaire in this study received responses from a total of 100 participants. The data collected from respondents' answers can be categorized into several demographic variables, such as age, education level, and place of residence. The following presents the demographic data obtained during the data collection process.

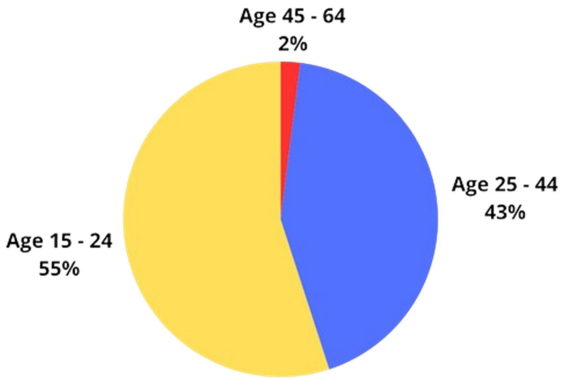

Fig. 2. Respondent Age

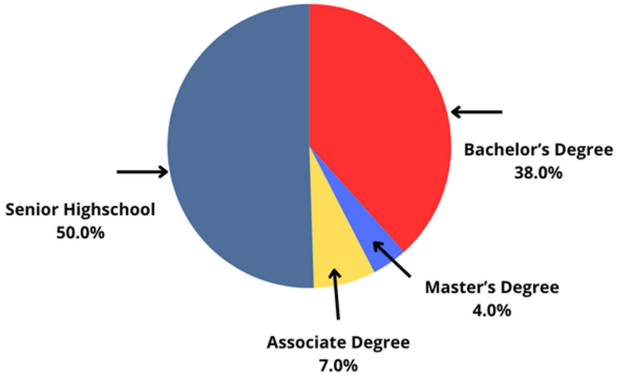

Fig. 3. Educational Background of Respondents

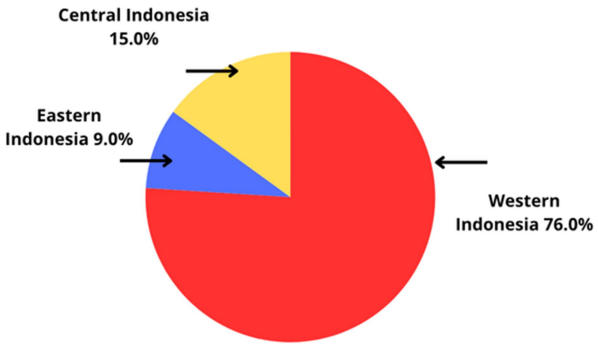

Fig. 4. Domicile Respondents

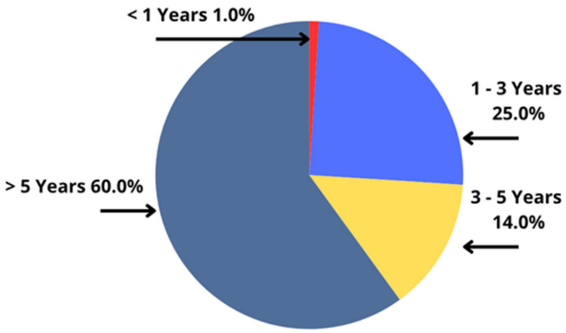

Fig. 5. Duration of Using Xiaomi/POCO Devices

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Based on the categorization results, it was found that the majority of Xiaomi/POCO smartphone users are aged between 15 and 24 years, have a senior high school or equivalent level of education, reside in the western region of Indonesia, and have been using Xiaomi/POCO smartphones for more than 5 years.

B. *Validity and Reliability Testing*

Table I presents the results of the validity test for 26 questionnaire items distributed to respondents. Each item is considered valid because the calculated correlation coefficient (r-calculated) is greater than the r-table value of 0.195.

TABLE I
Validity Testing Result

Question Indicators	Correlation Coefficient (r)	Critical Value (r_{tabel})	Result
1	0.673	0.195	Valid
2	0.661	0.195	Valid
3	0.573	0.195	Valid
4	0.557	0.195	Valid
5	0.716	0.195	Valid
6	0.584	0.195	Valid
7	0.769	0.195	Valid
8	0.476	0.195	Valid
9	0.464	0.195	Valid
10	0.388	0.195	Valid
11	0.488	0.195	Valid
12	0.507	0.195	Valid
13	0.737	0.195	Valid
14	0.778	0.195	Valid
15	0.596	0.195	Valid
16	0.696	0.195	Valid
17	0.408	0.195	Valid
18	0.622	0.195	Valid
19	0.635	0.195	Valid
20	0.598	0.195	Valid
21	0.712	0.195	Valid
22	0.429	0.195	Valid
23	0.351	0.195	Valid
24	0.272	0.195	Valid
25	0.756	0.195	Valid
26	0.747	0.195	Valid

Table II presents the results of the reliability test, showing that all 26 questionnaire items, distributed across the various UEQ dimensions, obtained Cronbach's Alpha values above 0.6. Therefore, each item within the respective dimensions can be considered reliable.

C. *UEQ Evaluation Results*

The evaluation analysis of the UEQ dimensions in this study was conducted by calculating the mean score for each dimension or question indicator based on responses from 100 participants. Table III uses index values to represent the average scores.

TABLE II
Reliability Testing Result

Cronbach's Alpha	N of Items
.920	26

TABLE III
Range of Average Values in the UEQ

Range of Average Values	Description
> 0,8	Positive Evaluation
-0,8 – 0,8	Neutral Evaluation
< -0,8	Negative Evaluation

Table IV shows the results of the questionnaire analysis, presenting the average (mean) responses for each dimension examined in this study.

TABLE IV
UEQ Mean Score

UEQ Scales (Mean and Variance)		
Attractiveness	1.295	1.13
Perspicuity	0.956	1.65
Efficiency	-1.286	1.57
Dependability	0.898	1.20
Stimulation	0.461	2.00
Novelty	0.174	1.42

The average scores obtained for each UEQ dimension varied. The attractiveness dimension received a score of 1.295, perspicuity scored 0.956, and dependability scored 0.898 — all of which fall within the positive evaluation category. The efficiency dimension scored -1.286, indicating a negative evaluation. Meanwhile, the stimulation dimension scored 0.461, and novelty scored 0.174, both of which are categorized as neutral evaluations.

The UEQ scale can be grouped into three categories: Attractiveness, Pragmatic Quality (comprising Perspicuity, Efficiency, and Dependability), and Hedonic Quality (comprising Stimulation and Novelty) [7]. Pragmatic Quality

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reflects the user's sense of 'practical satisfaction' by focusing on the functionality and efficiency of the system or product. In contrast, Hedonic Quality represents the user's perception beyond functionality, such as aesthetics and emotional engagement, which are non-task-oriented. Based on the previously mentioned mean scores, the Attractiveness dimension achieved a score of 1.30, Pragmatic Quality scored 0.19, and Hedonic Quality scored 0.32, as presented in Table V.

TABLE V
UEQ Scales Pragmatic and Hedonic Quality Result

Pragmatic and Hedonic	Quality
Attractiveness	1,30
Pragmatic Quality	0.19
Hedonic Quality	0.32

D. Benchmark Result

After analyzing the mean scores, the next step is to compare them with the benchmark data. This comparison aims to evaluate the quality of the MIUI 14 interface. Based on Table VI the MIUI 14 interface achieved an above-average benchmark rating in the attractiveness dimension. In contrast, the perspicuity and dependability dimensions received below-average benchmark ratings. Meanwhile, the efficiency, stimulation, and novelty dimensions were rated as bad in the benchmarking results.

TABLE VI
UEQ Scale Benchmark of the MIUI 14 Interface

Scale	Mean	Comparison to benchmark	Interpretation
Attractiveness	1.23	Above average	25% of results better, 50% of results worse
Perspicuity	0.90	Below Average	50% of results better, 25% of results worse
Efficiency	-1.28	Bad	In the range of the 25% worst results
Dependability	0.82	Below Average	50% of results better, 25% of results worse
Stimulation	0.41	Bad	In the range of the 25% worst results
Novelty	0.15	Bad	In the range of the 25% worst results

E. Discussion

The following is an explanation of each User Experience dimension of the MIUI 14 interface:

1. Attractiveness

The benchmarking result for the Attractiveness dimension was categorized as 'Above Average'. This indicates that the attractiveness quality of the MIUI 14 interface is fairly good; however, improvements are still needed in terms of user-friendliness. The Attractiveness dimension focuses on the impressions given to users — whether positive or negative, comfortable or uncomfortable, and whether the interface appears appealing or unappealing. Several factors that may influence this dimension include the relatively large number of advertisements encountered while using the MIUI 14 interface, as well as disruptive notifications from pre-installed system applications.

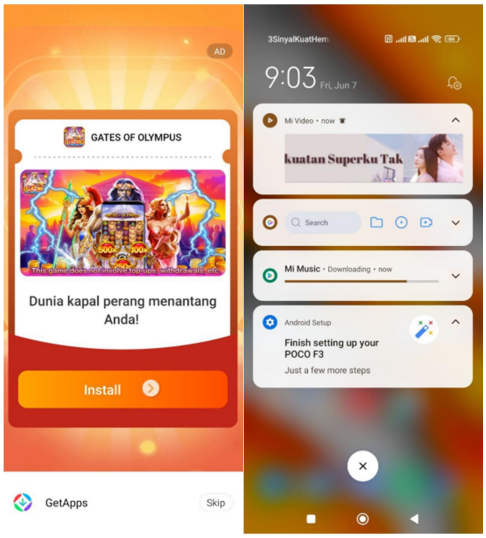

Fig. 6. Ads and Notification MIUI 14

When users interact with the MIUI 14 interface, the presence of numerous advertisements and excessive notifications can result in a less user-friendly experience. This may cause both new and existing users to feel disturbed or distracted, as illustrated in Fig. 6.

2. Pragmatic Quality

a. Perspicuity

The benchmarking result for the Perspicuity dimension was categorized as 'Below Average'. This indicates that, while the interface performs moderately well, there is still significant room for improvement in this area. The Perspicuity dimension focuses on the clarity of a system

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or product — specifically, whether users can easily learn and understand how to use it.

Several factors influence and can be improved to enhance the benchmarking score of the Perspicuity dimension, which was rated as 'Below Average', as illustrated in Fig. 7. The MIUI 14 interface presents certain configuration options that may be confusing for users. The sequential and nested arrangement of settings can create difficulties, particularly when attempting to modify basic system preferences, such as changing the default browser from Mi Browser to Chrome.

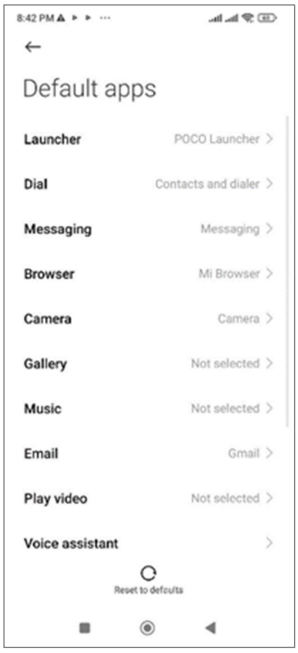

Fig. 7. Default Apps Settings on MIUI 14

b. Efficiency

The benchmarking result for the Efficiency dimension was rated as 'Bad', indicating that the efficiency quality provided by the MIUI 14 interface is significantly lacking. The Efficiency dimension focuses on how easily and quickly users can achieve their goals. Several factors influence this rating and should be addressed to improve the benchmarking score.

These include: enhancing animation responsiveness by removing unnecessary animations; improving multitasking capabilities by providing an option to disable advertisements within the MIUI 14 interface, which would reduce RAM usage and lighten the system load; and removing the memory extension feature that utilizes internal storage, as shown in Fig. 8. This feature, in fact, leads to reduced system performance. The use of memory swap is sufficient and more efficient compared to imposing additional load on internal storage. It's better to minimize lag and delays in animations or transitions to ensure that users can interact quickly. For example, the delete application animation transitions between applications, particularly on Xiaomi smartphones with less than 6 GB of RAM.

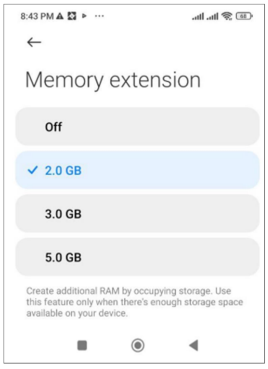

Fig. 8. Memory Extension Feature MIUI 14

c. Dependability

The benchmarking result for the Dependability dimension was rated as 'Below Average'. This suggests an acceptable performance, but one that still requires considerable improvement. The Dependability dimension focuses on non-functional properties of the interface, particularly whether users can trust the product. Another perspective on dependability is whether the product can avoid system failures that are more frequent or severe than what users would consider acceptable.

Several factors influence the 'Below Average' benchmarking score of the Dependability dimension in the MIUI 14 interface, and improvements can be made to address these issues. These include: ensuring that MIUI 14 regularly receives monthly Security Patch Level updates; verifying that all features function properly as expected by users; and

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conducting thorough testing to identify and fix bugs before releasing updates to users. By implementing these measures, users are more likely to feel secure for instance, by consistently receiving the latest Security Patch Level updates and confident in the developers' commitment to reliability, knowing that new features are tested in advance before being officially released.

3. Hedonic Quality
   a. Stimulation

The benchmarking result for the Stimulation dimension was rated as 'Bad', indicating that the stimulation quality provided by the MIUI 14 interface is significantly lacking. The Stimulation dimension focuses on how appealing, motivating, and enjoyable the product appears to users.

There are several contributing factors that have led to the 'Bad' rating in the Stimulation dimension of the MIUI 14 interface, and addressing these issues could help enhance the overall user experience in this area.

Creating a more dynamic and engaging interface design by avoiding monotonous visuals, for example, through the implementation of the 'Material You' concept, in which the system's theme or color palette automatically adjusts to the user's wallpaper, as shown in Fig. 9.

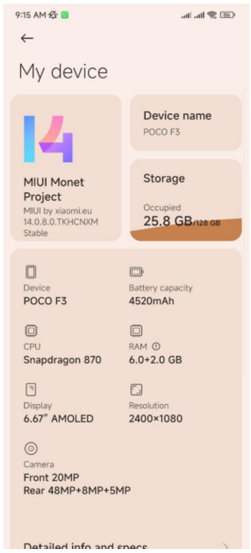

Fig. 9. The Material You Concept Design in the MIUI 14

By applying the Material You design concept to MIUI 14, including a redesign of the quick settings panel that has remained unchanged since MIUI 13, the interface can become more dynamic and visually appealing, as shown in Fig. 10.

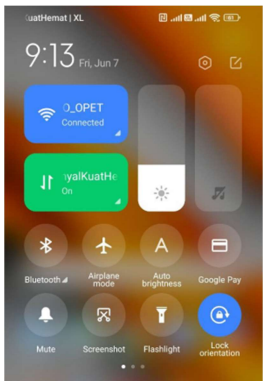

Fig. 10. Quick Settings in the MIUI 14 User Interface

The implementation of these two enhancements is expected to provide users with a more pleasant experience. A deeper application of the design concept in MIUI 14, along with layout modifications such as the redesigned quick settings panel, may significantly improve the visual appeal and perceived freshness of the interface.

   b. Novelty

The benchmarking result for the Novelty dimension was rated as 'Bad', indicating that the novelty quality of the MIUI 14 interface is significantly lacking. The Novelty dimension focuses on whether the product is able to attract user interest. This aspect also plays a role in assessing a product's level of innovation and the extent to which it is designed creatively.

For improving the 'Bad' benchmarking score in the Novelty dimension of the MIUI 14 interface, several enhancements can be considered. These include integrating advanced AI features for creative tasks (e.g., photo/video editing and wallpaper generation), offering customizable dark mode options, applying smoother and minimal animations, refreshing the interface design to avoid monotony, encouraging user engagement through design contests, and ensuring that

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upcoming features remain user-friendly and easy to understand.

III. CONCLUSION

This study assessed the user experience (UX) and user perception of the MIUI 14 interface through the User Experience Questionnaire (UEQ), consisting of 26 items across six dimensions: attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty. Based on descriptive statistical analysis using the UEQ Data Analysis Tools, MIUI 14 received positive evaluations in attractiveness (mean = 1.23), perspicuity (mean = 0.89), and dependability (mean = 0.82); a negative evaluation in efficiency (mean = -1.27); and neutral evaluations in stimulation (mean = 0.41) and novelty (mean = 0.15).

Benchmarking results revealed that attractiveness was rated 'Above Average', perspicuity and dependability were rated 'Below Average', while efficiency, stimulation, and novelty were categorized as 'Bad'. These findings indicate that the MIUI 14 interface does not yet deliver strong performance or impressions for users, highlighting the need for significant improvements to enhance its overall UX benchmarking outcomes.

IV. ACKNOWLEDGMENT

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