

# Menstrual-Mi: Mobile Application for Women

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## ABSTRACT

Every month, women experience menstruation or menstrual periods. The menstrual period greatly affects the daily lives of women. This menstruation often causes other symptoms such as menstrual pain, back pain and even acne. Things like this can actually be overcome by women. There are several foods and nutrients that can be consumed to reduce menstrual pain and other symptoms. However, due to lack of information they consider this to be trivial and allow the symptoms to affect their daily lives during menstruation. A mobile application is a computer program designed to operate on a mobile device or device such as a cellphone/tablet or watch. This research has the objectives of (1) knowing the various forms of mobile applications, (2) identifying the content and content required to be included in the mobile application, (3) knowing the effect of social media and mobile applications on user trust. This Andorid-based mobile application was developed using the ADDIE method, the stages carried out in this study were 1) Analysis, 2) Design, 3) Developmet, 4) Implementation, 5) Evaluation. This research will produce (1) various forms of mobile applications, namely: native-app, web-app, and hybrid app (2) mobile application content and content consists of: imagery/photography, video/sound, and text/message, (3) based on selected journals, it is stated that mobile applications are very beneficial for users. The mobile application will provide easier access for users to search and get information. Developers will further improve application development, so that later they will produce useful mobile applications related to information about nutrition and menstruation and be able to compete with other applications.

**Keywords:** Menstruation, Nutrition, Mobile application, ADDIE.

## 1. INTRODUCTION

The rapid development of the times cannot be kept away from the development of technology. The rapid development of technology and information, the development of the times also follows the rapid development of technology. One of them is with the internet. Internet use is increasing every day with increasing human needs. Internet stands for interconnected network, the internet is useful to connect a network of computer networks that exist in dunia, such use becomes one of the reason the development of the internet now [ 1]. The Internet cannot be kept away from everyday people because it has become a form of human lifestyle in modern times. Everything can be made easy and accessible via the internet. In this modern lifestyle there are many tools

that support the use of the internet such as mobile devices, namely: mobile phones, smartphones, laptops, smartwatches, and various other gadgets. With adanya mobile device appearedah technology named mobile application as a form of technological development. This mobile application is a computer system that can be operated on mobile devices. Mobile applications are now increasingly being developed by developers in order to make new breakthroughs that can help human work. In Indonesia, people already use mobile applications on their mobile phones.

The more mobile applications that vary, the more the level of use of mobile applications in Indonesia. The higher the need in this modern era the use of mobile applications is also increasing. Every day almost 10 mobile applications are used

by users from about 1.8 mobile application users who download it. In 2020 mobile app usage increased by 25% from 2019. Based on research by App Annie, on detailed, mobile app consumption in India even increased by 35%, while in Italy grew up to 30% and in the United States rose up to 15% in the same period. The increase in the use of this mobile application also occurs in the world not only in Indonesia [ 2]. As information technology evolves. Information can now be obtained efficiently. However, there is no denying the abuse of the speed at which this information is used to convey inaccurate information. Mobile application can support information to users.

In the field of people using android-based phones, so are more and more emerging android-based mobile applications. Android is an operating system used on linux-based mobile devices that includes operating systems, applications and middleware. This android based mobile application is widely developed because android gives akases for developers can create their own apps. Information applications that are made based on andoid will make it easier to get information related to specific things. The problem now that can be seen is the information in adolescents that is sometimes unfiltered. Especially the teenage girls. They tend to use feelings without thinking first through logic. In adolescence of course they will feel the beginning of the mesntruasi period, where in this period teenage girls will often seek information on things related to menstruation.

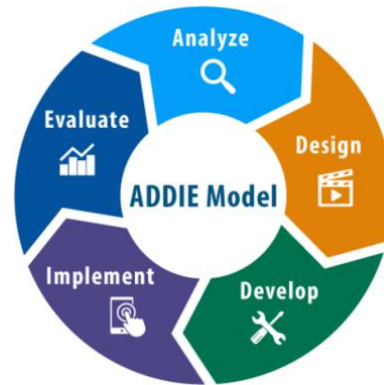
Menstruation itself is the discharge of blood because it does not fertilize the ovum which is also with the decay of the uterine wall. Bleeding menstruation is the result of complex interactions involving the hormonal system with organs of the body, namely the hypothalamus, pituitary, ovaries and uterus [4]. During menstruation, women need appropriate food to illuminate the symptoms caused by mesntruasi in the form of menstrual pain, back pain, messy mood and dizziness. It is necessary to have tapat information about the consumption of foods containing appropriate nutrients. Nutrients are the content of foodstuffs that can improve a person's nutrition. Food contains nutrients that can prevent the body from disease. One of them is from menstrual pain during mesntruasi. Why nutrients are needed, this is because aspects related to the basic function of these nutrients are producing energy, growth and maintenance of tissues, as well as regulating metabolic processes in the body [5]. Therefore, the need for proper information about the consumption of food to meet the nutritional content during menstruation. The use of mobile applications as a medium of information related to nutrients during menstruation is expected to be a source of information used by women. Android-based mobile apps should be seriously developed for usage optimization

From the explanation above there are three purposes in this article: 1) to know what are the various forms of mobile applications that can be used for the application "Menstrual-Mi"? , 2) how is the content that needs to be included in the mobile application "Menstrual-Mi" to support its use?, 3) how does social media affect the use of the mobile application "Mesntrual-Mi"?. The developer is expected to strive to

redevelop the form and information contained in the mobile application "Menstrual-Mi" and will be able to increase the user's trust in capturing information as well as in the use of the application.

## 2. METHODS

In the assessment of mobile application development used addieassessment method (*Analysis, Design, Develop, Implement, and Evaluate*). ADDIE is a concept used in product development. ADDIE (*Analysis, Design, Develop, Implement, and Evaluate*) has stages to determine application development. Each stage in ADDIE has its own function.



**Figure 1** Stages of addie method development (*Analysis, Design, Develop, Implement, and Evaluate*).

Research questions or Research *Questions* (RQ) should be tailored to the needs of a predetermined topic, here is the RQ of this study:

RQ1. What are the various forms of *mobile* applications that can be used for the "Menstrual-Mi" application?

RQ2. How is the content needed to be included in the *mobile* application "Menstrual-Mi" to support its use?

RQ3. How does social media affect the use of the *mobile* application "Mesntrual-Mi"?

Here are the stages of addie model recruitment method that includes *Analysis, Design, Develop, Implement, and Evaluate*:

### 2.1. Analysis

At this stage, the needs analysis and system analysis for *the* development of andorid-based mobile applications are carried out. This stage of analysis will have a description of the error that the solution wants to find and its purpose. Also described information and system that will be included in the application. So that later can be made improvements in application development to achieve the maximum purpose of application development according to needs.

## 2.2. Design

This stage can also be called the planning stage (design). In the development of mobile applications based on android this stage is an overview of the appearance of the application system "Menstrual-Mi". The design of this system is done so that users can easily use the *mobile* application, so that information can be conveyed to the user. The need to design so that users also easily access the application. The look of this android-based *mobile* app is developed as attractively as possible to lure its users.

## 2.3. Develop

At this stage the design has been designed towards the embodiment process. Arguably this stage is the execution of the application design. The design that has been prepared and designed will be realized in the form of a *mobile* application that is ready to be used. This stage can also be called the coding stage, the user analysis of the system and what each user does to the system.

## 2.4. Implement

At this stage, a trial of the use of android-based *mobile* application "Menstrual-Mi". It is presented a test to test whether this mobile application is up to standard in the software or has provided a system that uses the standard application.

## 2.5. Evaluate

This stage is the last step to know the level of application success and feasibility as the implementation of the application that has been designed. To find out if the android-based mobile application is up to the standard that has been set.

From the explanation above related to addie development method can be concluded that the addie model development method is a development process in the application with its stages that have their own objectives. In the ADDIE development period there are five stages, including *Analysis, Design, Develop, Implement, and Evaluate*.

# 3. RESULTS AND DISCUSSION

There are several stages in the use of ADDIE method as the development of android-based "Mesntrual-Mi" Mobile Application, here are the stages of development:

### 3.1. Analysis

- a. Mobile application form analysis
- b. Analyze how glides apps is used as a web application creation
- c. Analysis of the information that women need during menstruation.

## 3.2. Design

In the creation of an android-based mobile application named "Mesntrual-Mi" through *Web-apps* named Glideapps. So in the creation of the design is available a variety of templates for easy use and we change according to the desired application form. Thus in the creation of the application is very easy with the features provided simply. Here is a view of *web-apps* named Glideapps in the creation of android-based "Menstrual-Mi" mobile applications, which we can access via the web:

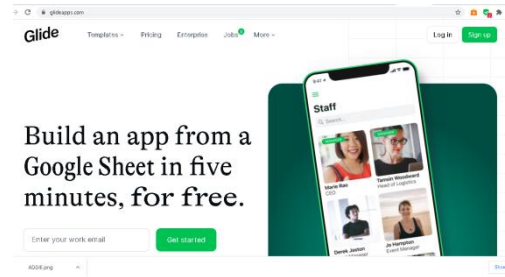


Figure 2 Glideapps Application Website Home.

Source: (<https://www.glideapps.com/>)

### 3.3. Develop

- Enter information
- Organize sheets in the application
- Set user permissions and behavior in app usage

### 3.4. Implement

- Test your mobile app directly with users by sharing app links
- Conduct eligibility assessments by app users

### 3.5. Evaluate

- Create and process questionnaires about the feasibility of *mobile* applications that have been created
- Make revisions to the application if it feels that there is something inappropriate

### 3.6. Testing and Questioners

The purpose of this test and questionnaire is to know the quality of the *mobile* application that has been created, whether the application has reached the level of eligibility according to standards. These tests and questionnaires are given to app users as respondents. Respondents in this test were conducted by students of S1 Nutrition study program as many as 90 students.

In this study questionnaire and grid were taken based on ISO 9126-1 standardization there are several characteristics in testing the quality of the software consisting of variable *Understandability, Learnability, Operability, Functionality, and Content*. Here is the characteristics of ISO 9126-1 in the table along with the criteria and results [7].

**Table 1** Testing Grid.

| No. | Variable                           | Information   |
|-----|------------------------------------|---|
| 1   | Understandability (Understandable) | Capabilities in software that are easy for us to understand   |
| 2   | Learnability (Studied)             | Capabilities in software that are easy for us to learn  |
| 3   | Operability (Operated)             | Easy-to-optimize software capabilities  |
| 4   | Functionality (Function)           | Capabilities in software that provide accurate function, security, appearance, and data management at the time of use |
| 5   | Content (Contents)                 | Ability to define the truth, adequacy, conformity of the content contained therein                                    |

**Table 2** Eligibility Criteria.

| Information | Answer  |
|-------------|---------|
| Excellent   | 81%-99% |
| Good        | 61%-80% |
| Pretty good | 41%-60% |
| Less Good   | 21%-40% |
| Very Poor   | 0%-19%  |

**Table 3** Questionnaire Results.

| No. | Validate By   | Result | Information |
|-----|---|--------|-------------|
| 1   | Student Management 2020A/Field Test                     | 65.2%  | Good        |
| 2   | Students outside the Classroom and General / Field Test | 71.1%  | Good        |

The results of the application feasibility test above are conducted analysis of the results of the application eligibility. It can be concluded that the application of the development of android-based "Menstrual-Mi" *mobile* application is good for use and can improve information on users related to menstruation and nutrient consumption. User trust is good enough to be able to use this app.

RQ1. What are the various forms of *mobile* applications that can be used for the "Menstrual-Mi" application?

In the development of android-based mobile applications in the field of health is indispensable. In order to obtain quality health data and information, a good health information system is required. The development of a health information system that is adequate in destroying quality information in the field of health decision making requires

knowledge of the basic concepts of the health information system itself and the basics in its development. [8].

In the use of existing technology and media must be able to create an application system that can provide information in a detailed manner. So it can attract users to keep using android-based information apps. The information in it must also represent the problem that exists in order to be effective for use by users of the application as a source of information.

There are various forms of *mobile* applications that can be found, the following kinds are classified in the form of the Table 4. There are several forms of mobile applications that can be used on android as described above. In the manufacture of mobile applications "Menstrual-Mi" more precise use of hybrid-apps. With this form the developer can easily create the application via the web and the speed of use depends on the speed of the browser used by the user or user. Thus, it must be considered periodically the application to make updates whether it is the display, information or the application system to still be able to attract the interests of the user.

RQ2. How is the content that needs to be included in the *mobile* application "Menstrual-Mi" to support its use?

In android-based mobile application named "Menstrual-Mi" was developed with the aim to add information related to nutrient consumption and mesntruasi. In the development of content in the application should be made as interesting as possible so that users can easily understand the material in the application. As an information application, this mobile application must not only be interesting but the material in it must also be easily understood by the user. The content or content in the application varies greatly according to the material that you want to share or deliver to the user. There are several forms of content needed to be able to create a *mobile* application information based on android, here is the content for the application "Menstrual-Mi":



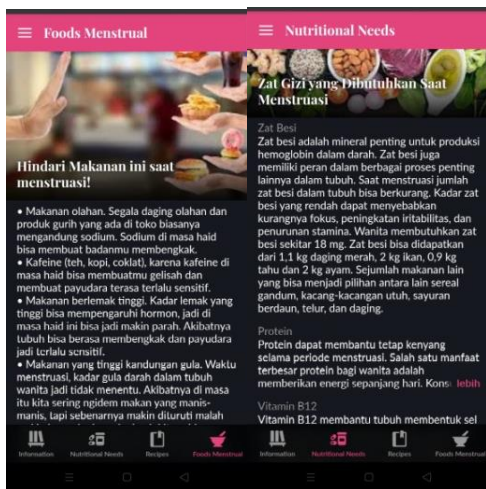
**Table 4** Classification E-commerce.

| Type E-commerce | Information   |
|-----------------|---|
| Web-apps        | Web application is an application program that can be used by accessing the internet through a Smartphone web browser. The Web application allows information processing functions to be started remotely on the server. [9]  |
| Native-apps     | Native Android-based applications are developed using <i>eclipse Android Development Tool</i> (ADT) plugin with Java programming language. At any point in time the user's response is transferred to a secure server when a connection is available, or if there is no internet connection, data can be stored in the phone's memory. Common user interface elements ( <i>Buttons, TextView, Radio Buttons, Message Notification (Toast) and Activity</i> ) are used from the Android Library. [9] |
| Hybrid-apps     | This technology allows app developers to bridge each different smartphone platform with the cordova framework. A <i>hybrid</i> form of <i>mobile</i> application can run on browser components ( <i>cross-platform</i> support) on smartphones. A <i>hybrid mobile</i> application can run on several platforms such as Android, iOS, Windows Phone, and other platforms that support HTML5 browsers because it runs on WebView components owned by those platforms. [10]                           |

**3.7. Text**

The use of messages /text in this *mobile* application aims to write down details ifrmasi to be delivered through the application. Text is the main content of the application to be able to provide understanding to the user.

Writing or messages in this application in the form of materials or information related to the purpose of the application is the consumption of nutritional needs and menstruation. Users can read the information carefully. *Themessage* / text used will use a language that is easy to understand because as the purpose of the information application. Posts or messages in the app will always be reviewed to find out andupdatethe informationtothe user.

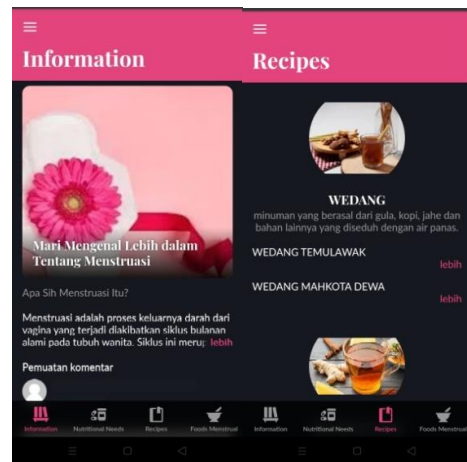


**Figure 3** Menstrual-Mi application. Source: (<https://overjoyed-celery-7989.glideapp.io/>)

**3.8. Image**

This image is a content that strongly supports the content of the application. Where visuals greatly affect the user of the application. In this section will be displayed images that are sesuai with the content of information that has *been* delivered in the form of text. This image will support the delivery of information to the user through visuals. Karean visaul users can retrieve information through visual 60% of the overall information.

The photos/images in the application will be like pictures of drinks that match the recipe in the form of text and other images *that* better explain the information. The level of user trust will increase with the display of images as evidence that the information submitted is true.



**Figure 4** Menstrual-Mi Application Information Page. Source: (<https://overjoyed-celery-7989.glideapp.io/>)

RQ3. How does social media affect the use of the *mobile* application "Mesntrual-Mi"?

To attract users the design of the app look should be made as attractive as possible. With the information contained in the application in the form of text messages may be very tedious if the appearance of the application is just simple. In the application first impression information becomes a point for the sustainability of the use of the application. Where if the user is already comfortable with the look of the application they will have more reasons for the user to keep using the app. Now there is a rise in information applications with increasingly varied appearances. They come with views and content as diverse as images, videos there is even content to chat.

"Menstrual-Mi" is an application that runs to provide information related to the consumption of nutrients and menstruation. The main point of application is the delivery of information. The information contained in the content must be made simple and use language that is capable of understanding by the user. Considering that there are now many applications that convey material or information in a variety of ways such as using video and audio. This "Mesntrual-Mi" application uses *hybrid-apps* form where developers easily create applications through the *web* and users can also easily access the app, but the speed is adjusted to the user's *browser*.

This "Menstrual-Mi" application is used to give more knowledge to women especially when they are in their menstrual period. The look of the app is made as simple as possible with the selection of fanta pink color that strongly represents women. This basic color selection to provide contrast to fanta pink color to make the app look more elegant for female users.

Social media, web and application "Mesntrual-Mi" is expected to be able to increase the knowledge of the public especially women related to menstruation with the content displayed. The application will be well managed and quality starting from the display and system.

Utilizing social media as a medium of information distribution related to applications and content to increase user confidence in using the application. The development of technology and information is increasing rapidly, making information can be spread quickly to consumers. The use of the internet as a modern lifestyle is getting bigger and bigger coupled with various forms of *mobile* applications that appear among the public for the software they use such as *smartphones*.

The development of "Menstrual-Mi" application is also a proof of developments in the field of information and technology. The developer wants users to be able to get information that matches the *konsidi* they are currently feeling. Through the application "Menstrual-Mi" with features such as a calendar to fill the user's schedule, information consisting of information about

menstruation, information related to nutrients that must be met and recipes containing drink recipes to reduce menstrual pain. Users of the app can easily access the "Menstrual Mi" app by themselves via a link or scan a QR code.

Menstrual-Mi Application Link:

<https://overjoyed-celery-7989.glideapp.io/>



Figure 5 Menstrual-Mi App QR Code Display.

Thus the application "Mesntrual-Mi" will prioritize the update of information on the application and the security of the user so that it will get more users who start accessing the application.

#### 4. CONCLUSION

- a. The form of mobile application that can be used to float android-based *mobile* applications for applications "Mesntrual-Mi" ie (1) web-apps in the form of applications that run using a browser that runs on various *operating systems* and written in *HTML5*, *JavaScript* or *CSS*. (2) *native-apss* in the form of applications running on certain *operating systems* and cannot run on other *operating systems* (3) *hybrid-apps* in the form of *native-apps* and *web-apss* combination applications.
- b. Konten needed to create a *mobile* application based on andoird in the delivery of information related to menstruai on the application "Menstrual-Mi": (1) *text/* message, in the form of writingor *text* written by the developer contains information about the content of applications related to menstruation and nutrients to be delivered to users. (2) *quality imagery* with good and attractive image capacity.
- c. Based on the results of the questionnaire, that the application of the application "Menstrual-Mi" as an android-based *mobile* application for android-based leather bag information application, according to the user is good and this can increase the user's knowledge related to menstruation and nutrients. The user's trust in the application and the information conveyed in it will be a good image for the new user.

## 5. SUGGESTION

Technology continues to evolve and produce new tools that make it easier for people to do so. It also produces a new lifestyle called a modern lifestyle. Where humans can't be kept away from gadgets. App developers who are just starting out developing an app can use android-based *mobile* apps to develop.

Mobile applications that are now makin varied appeared and began to compete in the world of information and technology. Giving knowledge to the community can use a simple application so that the community can access it. This can increase public awareness related to information submitted especially about mesntruasi and improve public understanding of the use of technology. Especially for these young people this forging can provide new experiences and give new knowledge that the application is not only in the form of social media to connect with others, but also to provide information. Thus, it is expected that with the increasing cangginya technology, human knowledge is also increasing.

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