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The Development of "Domi Kids" Android Based Application for Children

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ABSTRACT

The process of teaching religious values in early childhood can be done in various ways, such as an Android-based application. The use of android-based learning media makes the learning process more practical, effective, and efficient. Domi Kids application is designed to make it easier for children to learn to memorize daily prayers and short surah and assist parents in providing positive content during the child`s learning process using technology. The purpose of this research is to produce a mobile learning application product that contains daily prayers, short surah, and mini game to stimulate the ability of children ages 5-6 years to comprehend language, specifically memorizing daily prayers and short surah that are effective, efficient, and attractive. This study uses development research, which uses a simplified development model from ADDIE which includes: 1) Analysis, 2) Design, 3) Development, 4) Implementation, 5) Evaluation. The results showed that the Domi Kids application obtained a score of 97.02%, which means that the validation results are included in the very valid and usable level of validity.

ARTICLE INFO

1. INTRODUCTION

In the era of globalization, the use of technology is a major need for everyone. In today's world of technology, Android is a mobile operating system where users have easy access to system features such as data transfer, data processing, and open information sharing (Mawardani et al, 2021). In addition, the main function of smartphone which are media for communication has now expanded to become a learning tool that can be used by children, that is through the many applications available on the Playstore. In carrying out a certain command in a smartphone there is an operating system, one of which is Android. Android is an operating system for Linux-based mobile devices that includes an operating system, middleware (virtual machine), and several main applications that can power billions of smartphones and tablets (Rana, 2021).

Mobile learning (m-learning) is a combination of mobile computing and electronic learning (e-learning), mobile learning can be interpreted as a means which provides various electronic information to students as well as educational content that is useful in achieving knowledge regardless location and time (Theis and Wong, 2017). Giving mobile learning to children aims to distribute information from various features provided in the application to children with a display that is tailored to the child's characteristics so that children are able to easily receive the information which is then processed into long-term memory. To overcome the negative impacts of mobile learning (m-learning), parents are advised not to use information and communication technology as the only media or means of learning (Raja and Nagasubramani, 2018).

The development of religious values is the most important aspect to instill good values from an early age. The moral values of religion are defined as two different but interrelated things. Religious values are a benchmark for how humans relate to the abstract or the supernatural, between humans and their God. While morals are more defined as actions or behavior that are associated with all the habits of human life (Anggraeni and Maryanti, 2021). Children's development will be good if they are equipped with or given good religious knowledge from the early age (Mutathahirin et al, 2022).

Memorizing daily prayers and short surah, both at school and at home is a small part of inculcating religious values in children's lives. According to Thompson and Zamboanga (2004), the process of remembering starts from obtaining information through the senses of sight or hearing, then proceeds with storing information through repetition and re-generating the information.

There are various ways to memorize daily prayers and short surah, but during the golden age, the best way for children to learn is by learning through play. In addition, within the scope of language, children ages 5-6 years have developmental tasks that are expected to be achieved which are divided into three parts: understanding language, expressing language, and literacy, this is stated in Regulation of the Minister of Education and Culture No. 137 of 2014 concerning the National Standard of Early Childhood Education in the section on understanding language, one of the achievements of its development is repeating more complex sentences, the sentence in question can be interpreted as a sentence composed using Indonesian or foreign languages such as English, Arabic, and so on. In this case the complex language refers to the daily prayers and short surah that children learn at school or at home. So as the development of religious and moral values can be trained simultaneously with the development of language in children.

To form a strong memory, the memorization process can be carried out as early as possible because these are the right years for children (Sabri, 2020). In accordance with the indicators

of developmental achievement, children ages 5-6 years as stated in Regulation of the Minister of Education and Culture No. 146 of 2014, that states children are able to say prayers and carry out worship according to their religion. Therefore, one of the ways to introduce religion to children is to familiarize children to reading and memorizing daily prayers and short surah which are then applied in children's daily activities, both when they want to start and end their activities as well as to carry out daily worship. This was done based on the consideration that children learn through play, so the researchers inserted prayer materials and short surah in the form of mini game.

In his research proves that the use of technology-based children's learning media can increase creativity and effectiveness in learning in early childhood. This study aims to improve children's ability to use technology but still refers to a fun learning process. Based on the analysis needs, the researcher tries to offer a solution by developing an application that contains daily prayers, short surah, and mini game for children.

The daily prayer application has previously been developed by several researchers, one of which is (Cooke, 2020), this application focuses on improving children's ability to memorize short surah through motion and story methods. The results of the validation of media experts obtained a percentage of 97.5%, and material experts obtained a percentage of 85%. Based on this research, it can be concluded that in general the valid and effective Android application is feasible to use and shows high effectiveness.

Regarding the discussion above, the researchers made observations in PAUD Terpadu Anak Saleh, An Nur Kindergarten, and Syuhada' Kindergarten, based on the results of observations made by the researchers in the three kindergartens having a program of memorizing prayers and short surah through method of reading and imitating which is done in the morning as an opening activity before learning begins.

However, in the use of this method, not all children can focus their attention when the memorization activity takes place. This is because the class conditions are not conducive so that there are some children whose attention is divided, which makes them unable to participate in the memorization activities and even less able to participate in the prayer activities. Meanwhile, not a few of them are only used to memorizing when they are at school and not repeating it when they are at home. The activities of memorizing daily prayers and short surah can train children's memory.

Therefore, the researchers are trying to develop an application "Domi Kids" daily prayers and mini game, this intended so that children can learn daily prayers and short surah not only when they are in school, but they can also learn and memorize daily prayer anywhere. Not only that, this application will contain 30 daily prayers, 20 short surahs and a mini game which is a modification of the Super Mario game which was developed according to research needs. For this reason, the researchers will conduct research and development entitled "Domi Kids Application Development for Children Ages 5-6 Years based on Android".

The researchers present alternative solutions to the problem of using smartphones for more practical, effective, and efficient learning where this application is designed to make it easier for children to learn to memorize daily prayers and short surah also make it easier for parents to provide positive content in children's learning processes using technology. This application will be developed by the researchers and can be downloaded via Playstore.

2. METHODS

The type of research used is Research and Development (R&D). This type of research is used to produce a tool that can be used in educational practice. This research and development will produce a product in the form of daily prayer applications and mini game

for children ages 5-6 years, in which the research and development model used is ADDIE (Analysis, Design, Development, Implementation, and Evaluate) (See **Figure 1)**.
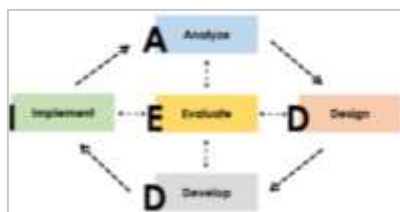
Figure 1. ADDIE Research Model (Source: Widyastuti, 2019)

3. RESULTS AND DISCUSSION

This research and development resulted in an Android-based learning media that is the Domi Kids application which was used to stimulate the ability of children ages 5-6 years to memorize daily prayers and short surah. After the Domi Kids application was developed, a formative evaluation was carried out to find out the shortcomings and errors in the development process. Formative evaluation is obtained from expert validation and user validation. In this study, the validation process was carried out by 4 experts; they are 2 material experts and 2 media experts, while the validation process by users was obtained through trials involving 12 subjects (small group trials). The presentation of the data obtained from the validation process is as follows.

3.1. Presentation of Material Expert Validation Data

Material expert validation was carried out by Rosyi Damayani T., S.Psi., M.Pd. (material expert 1) and Eny Nur Aisyah, S.Pd.I., M.Pd. (material expert 2) as an expert lecturer on religious values and morals for early childhood at State University of Malang. The validation carried out by material experts is viewed from the aspect of the effectiveness of the Domi Kids application in achieving the expected indicators. This validation is in the form of a questionnaire that has 8 indicators as well as questionnaires, comments, criticisms, and suggestions. The following is a presentation of data obtained from the results of material expert validation.

The validation data of material expert in **Table 1**. after being converted, the total empirical score is 59 and the expected score is 64. Because the material expert validation is viewed from the aspect of effectiveness, the empirical score for the effectiveness aspect is 59 as well. Moreover, this material expert validation also has qualitative data in the form of comments, suggestions, and conclusions. The following are qualitative data provided by experts (see **Table 2.).**

Table 1. Material Expert Validation Quantitative Data.

No. Items	Expert Material 1		Expert Material 2		Amount per indicator	
	Tse	Tsh	Tse	Tsh	ΣTse	ΣTsh
1	4	4	4	4	8	8
2	4	4	4	4	8	8
3	4	4	3	4	7	8
4	3	4	4	4	7	8
5	4	4	3	4	7	8
6	4	4	3	4	7	8
7	3	4	4	4	7	8
8	4	4	4	4	8	8
Total score	30	32	29	32	59	64

Table 2. Material Expert Validation Qualitative Data.

Component	Expert Material 1	Expert Material 2
Comment	No comment	• On the condition that many children are directed to interact with this application • Still in the form of knowledge while habituation requires communicative language • For verbal is effective, for non-verbal is not yet effective unless game appreciation is expressed in a non-verbal way (expression)
Suggestion	• Instructions for moral messages and the achievement of the ability to memorize prayers and short *surah* need to be poured •Insert motivational words when the children can answer correctly or vice versa, to keep their enthusiasm and willingness to learn	• It would be more fun if the appreciation of game answers was made in the form of an expression image plus a clapping sound effect or something similar. • For activity instructions, there should be a narrator
Conclusion	Worth testing with revisions as suggested	Worth testing with revisions as suggested

3.2. Presentation of Media Expert Validation Data

Media expert validation was carried out by Dr. Henry Praherdhiono, S.Si., M.Pd. (media expert 1) and Eka Pramono Adi, S.I.P, M.Sc. (media expert 2) as an expert lecturer in early childhood media at State University of Malang. The validation carried out by media experts is viewed from the aspect of efficiency and the attractiveness of the Domi Kids application in achieving the expected indicators.

This validation is in the form of a questionnaire sheet that has 10 indicators consisting of a questionnaire, comments, criticisms, and suggestions. There are 5 indicators of efficiency aspects and 5 indicators of attractiveness aspects. The following is a presentation of the data obtained from the validation results:

The validation data by media experts in **Table 3**. after being converted obtained a total empirical score of 79 and the expected total score is 80. Because this validation of media experts is viewed from the aspect of efficiency and attractiveness, it can be seen in Table 3. that the empirical score from the efficiency aspect is 39 and the expected total score for the efficiency aspect is 40, while the total empirical score from the attractiveness aspect is 40 and the expected attractiveness aspect score is 40. Besides that (see **Table 4.)**, the results of this media expert validation also have qualitative data in the form of comments, suggestions, and conclusions. The following is a presentation of qualitative data provided by media experts:

Table 3. Media Expert Validation Quantitative Data.

No. Items	Media Expert 1		Media Expert 2		Amount per indicator	
	Tse	Tsh	Tse	Tsh	∑Tse	∑Tsh
Efficiency Aspect						
1	4	4	4	4	8	8
2	4	4	4	4	8	8
3	4	4	4	4	8	8
4	4	4	4	4	8	8
5	3	4	4	4	7	8
Total	**19**	**20**	**20**	**20**	**39**	**40**
Attractiveness Aspect						
6	4	4	4	4	8	8
7	4	4	4	4	8	8
8	4	4	4	4	8	8
9	4	4	4	4	8	8
10	4	4	4	4	8	8
Total	**20**	**20**	**20**	**20**	**40**	**40**
Total score	**39**	**40**	**40**	**40**	**79**	**80**

Table 4. Media Expert Validation Qualitative Data.

Component	Media Expert 1	Media Expert 2
Comment	No comment	No comment
Suggestion	No suggestions	There must be assistance from parents when children use the *Domi Kids* application
Conclusion	Worth testing without revision	Worth testing without revision

3.3. Presentation of User Expert Validation Data

The trial phase carried out by the researchers was a small group trial which aims to determine the validity of the developed android-based application and to identify product deficiencies that will be used in the learning process of children ages 5-6 years. This small group trial involved 12 subjects ages 5-6 years (Group B) and was carried out at the residence (at home) of each subject.

The small group trial of *Domi Kids* application was carried out by the researchers giving directions to parents as users regarding the use of the application, then the researcher gave an assessment questionnaire and an observation sheet in the form of a soft file, after conducting a small group trial of users then filling out a small group test sheet in the form of a questionnaire to determine the level of validity of *Domi Kids* application in terms of three aspects, they are aspects of effectiveness, aspects of efficiency, and aspects of attractiveness. Based on the results of the small group trial, the following data were obtained:

The validation data of small group trials by users in Table 5. obtained a total empirical score of 840 and the number of expected scores was 864. This validation is viewed from the aspect of effectiveness, efficiency, and attractiveness. It can be seen in **Table 5.** that the total empirical score for the effectiveness aspect is 372 and the expected total score for the effectiveness aspect is 384.

Table 5. Quantitative Data Small Group Trial Sheet.

No. Items	∑Tse	∑Tsh
Effectiveness Aspect		
1	48	48
2	48	48
3	48	48
4	44	48
5	44	48
6	48	48
7	44	48
8	48	48
Total	**372**	**384**
Efficiency Aspect		
9	48	48
10	40	48
11	48	48
12	48	48
13	48	48
Total	**232**	**240**
Attractiveness Aspect		
14	48	48
15	48	48
16	48	48
17	44	48
18	48	48
Total	**236**	**240**
Total score	**840**	**864**

Then the total empirical score for the efficiency aspect is 232 and the expected total score for the efficiency aspect is 240, while the total empirical score for the attractiveness aspect is 236 and the expected total score for the attractiveness aspect is 240. The small group trial validator does not provide comments or suggestions (see **Table 6.**)**.** Due to the observation carried out by parents at home, as an observer the parents provided observation data to the researcher and accumulated it in the experimental observation table as follows.

Table 6. Observation Data for Small Group Trials.

No. Items	Number of Subjects Reaching Indicator	Total Number of Subjects
1	11	12
2	11	12
3	12	12
4	12	12
5	10	12
6	10	12

Notes:

1. The use of the *Domi Kids* application is effective enough to help children memorize daily prayers and short *surah*. Even mini game make children more enthusiastic about repeating memorization, but parental assistance is needed considering the device used is a smartphone.
2. Sometimes the maximum time to use an application, which is only 30 minutes, is deemed insufficient if it is used to repeat rote memorization, but as a parent, you must remain wise in limiting children, considering that using gadgets for too long will have a bad impact on children.
3. The number of games determines the child's motivation to continue using this application.

Data Analysis

1. Descriptive Quantitative Data Analysis

Descriptive quantitative data analysis is the processing of data obtained through questionnaire scores, the results of which are descriptive percentages. The results of this analysis are to determine the percentage validity of the Domi Kids application from the aspect of effectiveness, efficiency, and attractiveness according to experts and users. The data was analyzed quantitatively and descriptively with the formula adapted from Blair and Imai (2012) as follows.

$$Vah = \frac{\Sigma Tse}{\Sigma Tsh} \times 100\%$$

Description:

V_{Ah} = Expert validity

TSe = Total score empirical

TSh = Total expected score

100% = Constant

The score obtained from data analysis using the above formula will then be categorized based on the criteria for achieving the values in the table below. Thus, it can be concluded that the level of validity of the *Domi Kids* application (see **Table 7.)**.

Table 7. Percentage of Validity Criteria by Experts.

Criteria Achievement Value (Validity)	Validity Level			
	Whole	Effectiveness	Efficiency	Attractiveness
81.00%-100.00%	Very valid	Very effective	Very efficient	Very attractive
61.00%-80.00%	Quite valid	Quite effective	Quite efficient	Quite attractive
41.00%-60.00%	Not valid	Not quite effective	Not quite efficient	Not quite attractive
00.00%-40.00%	Invalid	Not effective	Not efficient	Not attractive

Source (Blair and Imai, 2012) has been modified by researchers.

a. Descriptive Quantitative Data Analysis by an Expert

1) Descriptive Quantitative Data Analysis by a Material Expert

The presentation of the data by material experts based on **Table 1.** obtained a total empirical score of 59 and the number of expected scores of 64, so that the results obtained:

$$V_{Ahmt} = \frac{\sum Tse}{\sum Tsh} \times 100\%$$

$$V_{Ahmt} = \frac{59}{64} \times 100\%$$

$$V_{Ahmt} = 0.9218 \times 100\%$$

$$V_{Ahmt} = 92.18\%$$

Based on data analysis using the above formula, a score of 92.18% was obtained. Based on **table 7.**, this percentage score is included in the achievement criteria of 81.00%-100%, which means the results of the analysis are included in the very valid validity level and can be used without revision. Because the validation of the material expert is viewed from the aspect of effectiveness, the validity of the effectiveness aspect according to the material expert is the same as (=) the validity of the material expert. Based on this equation, the effectiveness of the Domi Kids application, according to material experts is 92.18%.

2) Media Experts' Descriptive Quantitative Data Analysis

Data presentation of media experts based on **Table 3.** obtained a total empirical score of 79 and the number of expected scores of 80, so that the results obtained:

$$V_{Ahmd} = \frac{\sum Tse}{\sum Tsh} \times 100\%$$

$$V_{Ahmd} = \frac{79}{80} \times 100\%$$

V $_{Ahmd}$ = 0.9875 × 100%

V $_{Ahmd}$ = 98.75 %

Based on the data analysis using the above formula, an achievement score of 98.75 % was obtained. According to **Table 7.**, this percentage score is included in the achievement criteria of 81.00%-100%, which means that the results of the analysis are included in the **very valid validity level** and can be used without revision. Because the validation of media experts is viewed from the aspect of efficiency and attractiveness, it can be seen that the data presentation of media experts based on **Table 3.** shows that the total empirical score for the efficiency aspect is 39 and the expected score is 40. So **the level of efficiency,** according to media experts, can be known as follows.

V $_{AEfsMd}$ = $\frac{\sum Tse}{\sum Tsh}$× 100%

V $_{AEfsMd}$ = $\frac{39}{40}$× 100%

V $_{AEfsMd}$ = 0.975 × 100%

V $_{AEfsMd}$ = 97.5%

The results of the data acquisition above show that the efficiency level of the *Domi Kids* application, according to media experts, is 97.5%. This means that the *Domi Kids* application is included in the achievement criteria of 81.00%-100% which means it is **very efficient** to be tested without revision.

Based on the data presented by media experts, based on **Table 3.**, the number of attractiveness aspects empirical scores is 40, and the expected score is 40. So **the attractiveness level**, according to media experts, can be known as follows:

VAMnrk $_=$× $\frac{\sum Tse}{\sum Tsh}$100%

VAMnrk $_=$× $\frac{40}{40}$100%

VAMnrk $_=$ 1 × 100%

VAMnrk $_=$ 100%

The results of the data acquisition above show that the level of attractiveness of the *Domi Kids* application, according to media experts, is 100%. This means that the *Domi Kids* application *is* included in the achievement criteria of 81.00%-100% which means it is **very attractive** to be tested without revision.

3) Experts' Descriptive Quantitative Data Analysis Accumulation

The accumulation of descriptive quantitative data analysis by experts is a combination of the results of the validation percentages, which are then averaged. It aims to determine the validity of the media in terms of all aspects according to material experts and media experts. The formula to find out the accumulated results was adapted from Blair and Imai (2012) as follows.

$$V_{Ah} = \frac{V_{Ahmt} + V_{Ahmd}}{2}$$

The formula above can produce the percentage validity of the *Domi Kids* application according to the experts as a whole, so that the results are:

V $_{Ah}$ = $\frac{92,18\% + 98,75\%}{2}$

V $_{Ah}$ = $\frac{190,93\%}{2}$

VAh = 95.46 %

Based on data analysis using the above formula, an achievement score of 95.46% was obtained. According to **Table 7.**, this percentage score is included in the achievement criteria

of 81.00%-100%, which means that the analysis are included in the **very valid validity level** and can be used even without revision.

b. User-Descriptive Quantitative Data Analysis

User-descriptive quantitative data analysis was carried out through small group trials. The presentation of small group trial user data based on **Table 5.** obtained a total empirical score of 840 and the number of expected scores was 864. The data was then analyzed quantitatively and descriptively with the formula adapted from Blair and Imai (2012) as follows.

$$V_{UCP} = \frac{\sum Tse}{\sum Tsh} \times 100\%$$

The formula above can produce the percentage of media validity in terms of the effectiveness, efficiency, and attractiveness of the *Domi Kids* application that has been developed, so that the results are:

$V_{UCKK} = \frac{\sum Tse}{\sum Tsh} \times 100\%$

$V_{UCKK} = \frac{840}{864} \times 100\%$

$V_{UCKK} = 0.9722 \times 100\%$

$V_{UCKK} = 97.22\%$

Based on the data analysis using the above formula, an achievement score of 97.22% was obtained. According to **Table 7.**, this percentage score is included in the achievement criteria of 81.00%-100%, which means the results of the analysis are included in the **very valid validity level** and can be used without revision. User expert validation is viewed from the aspect of effectiveness, efficiency, and attractiveness.

c.   Overall Descriptive Quantitative Data Accumulation

The accumulation of validation results from experts and users has previously been known that the effectiveness aspect of 8 indicators was validated by 2 expert validators and 12 user validators, while the efficiency aspect, which consisted of 5 indicators, was also validated by 2 expert validators and 12 user validators, as well as the attractiveness aspect. A total of 5 indicators were validated by 2 expert validators and 12 user validators, so that the accumulated validation data resulted in the following data.

Based on the data in **Table 8.**, it can be seen that the overall validation data obtained a total empirical score of 978, which is lower than the total expected score of 1,008, so to determine the level of validity of the Domi Kids application as a whole, it was analyzed in the following way.

Table 8. Accumulation of Validation Data.

Aspect of Validation	Score from Validator		Score	
	Expert	User	Tse	Tsh
Effectiveness	59	372	431	448
Efficiency	39	232	271	280
Attractiveness	40	236	276	280
Total	**138**	**840**	**978**	**1.008**

$$V = \frac{\sum Tse}{\sum Tsh} \times 100\%$$

The formula above can produce the percentage validity of the *Domi Kids* application as a whole, so that the results are:

V= $\frac{\sum \text{Tse}}{\sum \text{Tsh}}$× 100%

V= $\frac{978}{1.008}$× 100%

V= 0.9702× 100%

V= 97.02%

Based on data analysis using the above formula, it was obtained that the validity score was 97.02%. According to **Table 7**., this percentage score is included in the achievement criteria of 81.00%-100%, which means that the results of the analysis are included in the **very valid validity level** and can be used even without revision. However, the researchers still carried out several revision processes before being tested according to the advice of experts.

2. Descriptive Qualitative Data Analysis

a. Material Experts' Qualitative Data Analysis

Based on the results of material expert validation, the input provided was in the form of improvements to the application to use a more communicative language, as well as the addition of appreciation effects and motivational words in mini game when children answer correctly or vice versa. It is best to add a narrator's voice in the usage instructions. So, based on the findings of this material expert validation, it can be concluded that the application is worth testing with a few changes.

b. Media Experts' Qualitative Data Analysis

Overall, the two media experts' input and suggestions were related to the usage of android-based learning media where parents must assist children when they use smartphones to open the Domi Kids application. This is due to the fact that not all children are able to read the instructions for use correctly, children must be explained about the values that are loaded, and parents or guardians should always supervise and limit the use of smartphones by children. The conclusion is that the Domi Kids application is worth testing without revision.

c. Small Group Trial Qualitative Data Analysis

The results of the validation of the users of the small group trial did not have comments or suggestions and concluded that they were suitable for usage without revision. However, based on the findings of small group trial observations, there are several points to consider:

1) the Domi Kids application is quite effective in helping children memorize daily prayers and short surah, the presence of mini game makes children more enthusiastic to repeat memorization; however, parental assistance is required, considering the device used is a smartphone;

2) the maximum time to use the application, which is only 30 minutes, is sometimes deemed insufficient if it is used to repeat memorization, but as a parent, you must remain wise in limiting children's use of gadgets, considering that using gadgets for an extended period of time has a negative impact on children;

3) the number of games determines the child's motivation to continue using this application.

4. CONCLUSION

Domi Kids, an Android-based mobile learning application, is the product of this research and development. This application is designed to meet the research needs of children ages 5–6 years old in the process of instilling religious and moral principles, as well as stimulating children's capacity to grasp expressive language when memorizing daily prayers and short surah. The data processing results obtained a score of 97.02%. This indicates that the Domi Kids application meet the criteria of being very valid, effective, efficient, and attractive. It can be said that the Domi Kids application is well-suited for usage in the learning process of children ages 5-6 years.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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