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Feasibility Test Analysis on the UPT Humas UNS Information System

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ABSTRAK

The development of the UPT Humas UNS information system is carried out using the analysis, design, development, implementation, and evalution (ADDIE) methods. The evaluation technique used is black box testing involving two programming experts to assess the functional readiness of the information system. The feasibility test was carried out using two methods, namely the usability scale (SUS) system to determine the level of usability and the technology acceptance model (TAM) for acceptance analysis of the UNS Public Relations UPT information system. Based on the evaluation that has been carried out, the UNS Public Relations UPT information system that has been successfully developed can run functionally to serve the 12 existing services with a little record of improvement. Judging from the average SUS score obtained, which is 69.75, it is classified as good overall for the level of usability. For the results of the TAM analysis consisting of 6 TAM research hypotheses, the ease of using SI has a significant effect on the expediency and attitude in using SI. The expediency of SI has a significant effect on the attitude to use and the intention to use SI. The attitude to use SI has a significant effect on the intention to use SI and the intention to use SI has a significant effect on the actual use of the system.

Keywords: Feasibility Test, System Usability Scale, Technology Acceptance

1. INTRODUCTION

The use of information systems in various agencies or institutions has often been found in the current era of digital transformation. All things related to administration can begin to be done digitally, as for the general activity carried out in terms of administration is data management. Data management activities without an information system will use a lot of paper as a medium to record administrative data. Although now there are various types of software available to record data such as Microsoft word and Microsoft Excel. However, the recorded data is still managed manually. In fact, the more developed an agency or institution, the more data that enters the institution. Of course, recruiting additional administrative personnel is not an efficient solution in today's digital era and this will waste the institution's budget. So in order for the data that enters and exits in the institution to be managed properly and correctly, an information system is needed, so that data management activities in and out can be carried out automatically and faster.

The importance of using information systems in an institution is also expressed by Ragowsky et al, information systems can provide benefits by reducing inventory costs, reducing the purchase of raw materials, reducing the duration of work, and increasing the speed of response to clients [1] In addition, information systems can also provide institutional benefits because they can integrate databases, computer applications, hardware and software that can be used for storage purposes, Data Management, Recording, and Delivery [2]

UPT Humas UNS can benefit from an information system if it is implemented for data management. In addition, the use of information systems can also be used to provide services to clients digitally without the need for face-to-face services. This is relevant to the current world conditions where we are still hit by the Covid-19 pandemic so that all human activities and interactions that were previously carried out physically must now switch to digital. However, with the amount of data entering and leaving, of course, a system is needed to manage these data. One form of information system that can be used by users or clients is website-based. By creating a website-based information system, everyone will be able to access the information system for the purposes of using and providing UPT Humas UNS services through various devices that support browsers.

In this regard, researchers will create an information system for UPT Humas UNS for the purposes of managing service data with the aim of making data management and UPT services more efficient and faster.

2. RESEARCH METHOD

The Feasibility Test method used in this study is the system usability scale (SUS) method to determine the feasibility of SI in terms of usability level and test feasibility in terms of acceptability using the technology acceptance model (TAM). The following below is an explanation of the two methods:

4.1. System Usability Scale

In this study, one of the benchmarks for feasibility tests used was to measure the level of usability. SUS is a measuring tool to measure the level of usability of a system [3] Starting from the industry's need to measure the usability of a system, this need not only wants to measure but also requires measurement speed and simplicity of measuring instruments. This is useful for simplifying and speeding up the evaluation process in the field when users visit the system for review. In addition, simplification aims to reduce the effect of momentary emotional reactions because with a large number of questionnaires it will make users feel frustrated and will actually provide a biased effect when filling out the questionnaire. So the SUS questionnaire was designed with a total of 10 statements with a likert scale system to measure the perspective of assessments of usability globally [4]. The following below is an Indonesian adaptation of the statement from SUS english [5][6]:

Table 1. Items of the SUS questionnaire statement

No	Pernyataan
1	Saya berpikir akan menggunakan sistem ini lagi
2	Saya merasa sistem ini rumit untuk digunakan
3	Saya merasa sistem ini mudah digunakan
4	Saya membutuhkan bantuan dari orang lain atau teknisi dalam menggunakan sistem ini.
5	Saya merasa fitur-fitur sistem ini berjalan dengan semestinya.
6	Saya merasa ada banyak hal yang tidak konsisten (tidak serasi pada sistem ini).
7	Saya merasa orang lain akan memahami cara menggunakan sistem ini dengan cepat.
8	Saya merasa sistem ini membingungkan.
9	Saya merasa tidak ada hambatan dalam menggunakan sistem ini.
10	Saya perlu membiasakan diri terlebih dahulu sebelum menggunakan sistem ini.

Using SUS as a scoring instrument, ten statements are given to the user with each question assessed using the STS (Strongly Disagree), TS(Disagree), RG(Undecided), ST(Agree), and SS(Strongly Agree) scales. With reference to the research conducted by Sharfina (2016) the results of these questions are assessed using the following formula:

$$SUS = [\sum(Scores_{OddNumbers} - 1) + \sum(5 - Scores_{EvenNumbers})] * 2.5$$

To use the formula above, it can be done by following these steps:

a. For each odd-numbered statement, subtract 1 from the score (X-1)
b. For each even-numbered statement, subtract the value from 5 (5-X)
c. Sum the values of even-numbered and odd-numbered statements
d. Then the result of the summation of the score is multiplied by 2.5
e. Interpret the score with the interpretation table below

The SUS values generated from the 10 statements can then be interpreted into the form of the letters A to E with the following caption [7]:

Table 2. Interpretation of SUS scores

Skor	Grade	Keterangan
> 80.3	A	Excelent
68 – 80.3	B	Good
68	C	Good Enough
51 - 68	D	Not Good Enough
< 51	E	Very Bad

4.2. Technology Acceptance Model

According to Davis (1985) as the inventor of TAM mentioned that TAM is a model to measure the acceptability of a technology. Initially, the TAM model was formed, consisting of four basic aspects of perceived usefulness, perceived ease of use, attitude toward using, and actual system use. The four basic aspects are divided into several measurement dimensions, namely feature design, cognitive response, affective response, and behavioral response. Then over time the TAM model changed to an extention technology acceptance model with the addition of one aspect, namely intention to use. Perceived usefulness (PU) and perceived of use (POU) are influenced by external variables then PU is influenced by PEOU. Attitude toward using (ATU) is influenced by Aditional belief factor, PU, and PEOU. Intention to use or behavior intention to use (BITU) is influenced by ATU, PU, and factors from related models. Until finally the actual system usage (ASU) is influenced by BITU. Then the TAM model is simplified to the model in figure 2

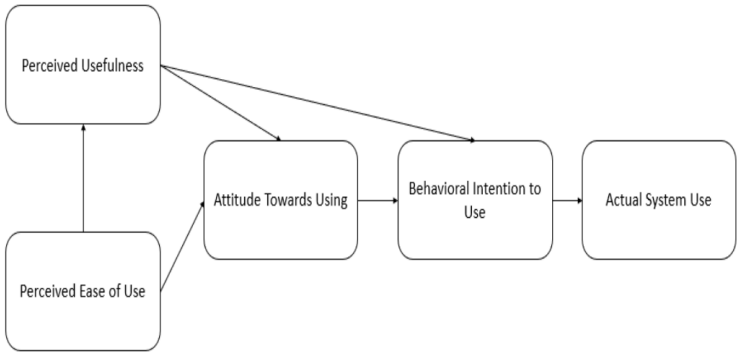

Figure 1. TAM model chart

2.2.1 Perceived ease of use (PEOU)

With regard to the ease of use of a technology, Users when using certain technologies begin with a perception of the ease of using the technology, this component is part of the belief. The more confident a person is that the technology is easy to use, the higher the level of ease of using the technology [8].

2.2.2 Perceived usefulness (PU)

A measure of the level of usefulness of the technology used by the user. Similar to PEOU, PU is a prelude where the technology is used and is part of the belief. It is based on the definition of the word useful which means when used it can provide benefits. The usefulness of a technology can be measured by using indicators of work improvement, ease of work, and overall technological benefits [9].

2.2.3 Attitude toward using (ATU)

Attitudes towards use towards the technology being used with respect to attitudes in the form of acceptance or rejection when using certain technologies [9].

2.2.4 Behavioral intention to use (BITU)

Related to the desire and intention of users in using technology. A desire can be seen from the tendency of users to use technology, whether users tend to want to use technology constantly or vice versa. This can be material for predicting the attitude and attention that users will pay to the technology to be used [9].

2.2.5 Actual system use (ASU)

With regard to the condition where the user has fully used the technology because he has realized the benefits obtained. ASU can be measured by looking at the user's real conditions such as frequency and duration when using a technology [9]

In addition it has been used a TAM questionnaire that is based on research conducted by

Tabel 3. Items of the TAM questionnaire statement

Aspek	**Pernyataan**
Perceived ease of use	Saya tidak mengalami kesulitan menggunakan sistem informasi UPT Humas UNS
	Dengan adanya sistem informasi UPT Humas UNS dapat mencapai tujuan
	Secara keseluruhan saya merasa sistem informasi UPT Humas UNS mudah dipahami.
Perceived usefulness	Sistem informasi UPT Humas UNS menjadikan aktivitas saya lebih mudah dalam menggunakan layanan yang ada.
	Menggunakan Sistem informasi UPT Humas UNS dapat meningkatkan kemampuan saya dalam hal layanan UPT Humas UNS.
	Secara keseluruhan saya merasa Sistem informasi UPT Humas UNS memiliki banyak manfaat
Attitude toward using	Saya menerima penerapan Sistem informasi UPT Humas UNS yang dilakukan UPT Humas UNS
	Saya menolak untuk menggunakan layanan UPT Humas UNS selain menggunakan Sistem informasi UPT Humas UNS.
	Secara keseluruhan saya menikmati penggunaan Sistem informasi UPT Humas UNS untuk membantu menggunakan layanan UPT Humas UNS.
Behavioral intention to use	Saya berharap Sistem informasi UPT Humas UNS akan selalu digunakan di masa depan
	Saya termotivasi untuk tetap menggunakan Sistem informasi UPT Humas UNS untuk dimasa yang akan datang
	Saya selalu menggunakan Sistem informasi UPT Humas UNS dalam kondisi apapun
Actual System use	Saya menggunakan Sistem informasi UPT Humas UNS sesuai dengan prosedur yang telah diberikan.
	Saya menggunakan layanan UPT Humas UNS melalui Sistem informasi UPT Humas UNS secara jujur sesuai ketentuan dan prosedur yang diberikan
	Saya menggunakan Sistem informasi UPT Humas UNS sesuai dengan durasi waktu yang telah ditentukan secara real time

3. RESULT AND ANALYSIS

After conducting a series of research procedures in retrieving data using SUS and TAM questionnaires. So in this section it can be explained into two parts, namely the results and anlysis for each feasibility test using SUS and TAM:

3.1. Result

In this section, the results of data collection from SUS and TAM are obtained

3.1.1 SUS Result

The results obtained by using 10 items of SUS statements are as follows:

Table 4. Tabulation of SUS data to 30 respondents

Responden	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	Jml	Total
R1	2	4	3	3	3	4	3	4	1	4	13	32,5
R2	3	2	4	2	5	1	3	1	4	1	32	80
R3	2	4	3	5	3	4	2	5	2	3	11	27,5
R4	3	2	4	2	4	1	4	1	4	1	32	80
R5	4	2	3	2	4	1	5	1	5	1	34	85
R6	3	1	3	1	3	1	4	1	5	1	33	82,5
R7	3	3	3	2	4	1	4	2	4	1	29	72,5
R8	3	2	4	2	4	1	4	1	4	1	32	80
R9	2	4	3	5	3	4	2	4	2	3	12	30
R10	5	2	5	2	5	2	4	1	4	1	35	87,5
R11	2	5	3	5	3	5	2	4	1	5	7	17,5
R12	4	1	4	2	4	1	3	2	3	1	31	77,5
R13	3	2	4	2	5	2	4	2	4	2	30	75
R14	4	2	4	2	5	2	5	1	5	1	35	87,5
R15	5	2	5	2	4	1	4	1	5	2	35	87,5
R16	5	2	5	2	5	2	4	1	5	2	35	87,5
R17	4	3	4	2	3	3	3	1	3	3	25	62,5
R18	5	2	5	2	5	1	5	1	4	2	36	90
R19	4	3	3	2	4	2	5	1	4	1	31	77,5
R20	3	3	4	3	4	1	5	1	4	2	30	75
R21	4	3	4	3	5	3	4	3	3	3	25	62,5
R22	3	2	4	3	4	2	4	1	4	2	29	72,5
R23	3	3	3	1	4	2	5	1	4	1	31	77,5
R24	2	3	1	5	2	3	2	3	3	4	12	30
R25	3	2	4	1	4	1	5	2	4	2	32	80
R26	3	2	4	1	4	1	4	2	4	2	31	77,5
R27	5	2	4	1	5	3	5	1	4	1	35	87,5
R28	3	2	4	1	5	3	4	2	5	1	32	80
R29	4	1	3	1	5	2	4	1	4	2	33	82,5
R30	3	3	3	3	3	3	3	3	2	3	19	47,5
Rata-rata												69,75

3.1.2 TAM Result

The table below shows the results of data collection using the TAM questionnaire which was followed by 30 respondents

Table 5. Tabulation of questionnaire data of 30 TAM respondents

Res	PE 1	PE 2	PE 3	PU 1	PU 2	PU 3	AT 1	AT 2	AT 3	BI 1	BI 2	BI 3	AS 1	AS 2	AS 3
R1	2	2	3	3	2	3	3	3	3	3	3	3	3	3	3
R2	3	4	4	4	5	5	5	4	5	5	5	4	4	4	4
R3	4	2	3	3	3	2	3	4	3	3	3	3	2	3	3
R4	4	4	4	4	4	4	4	4	4	3	4	3	3	3	4
R5	3	3	3	3	5	3	3	3	3	3	3	4	4	4	4

R6	5	5	5	5	5	4	4	4	4	4	4	3	4	4	3
R7	5	4	3	4	4	4	4	4	5	4	4	4	3	3	3
R8	5	4	3	4	4	3	4	4	4	3	3	3	3	3	3
R9	3	3	3	3	3	1	4	2	3	4	2	4	3	3	3
R10	4	4	4	4	4	4	4	3	3	4	3	4	3	3	3
R11	2	3	3	3	3	3	3	3	3	3	4	4	3	3	3
R12	3	3	3	3	3	3	3	3	3	4	4	4	3	3	3
R13	3	4	3	4	4	4	4	4	4	3	3	3	3	3	3
R14	4	4	4	4	5	3	4	3	3	4	3	3	3	3	3
R15	3	4	3	4	3	3	3	3	3	3	4	4	5	5	3
R16	3	3	4	4	5	5	4	3	3	4	4	4	5	5	5
R17	4	3	3	3	5	5	3	3	5	5	3	3	4	3	3
R18	4	4	4	3	3	5	5	4	3	4	5	3	3	3	3
R19	4	3	3	4	5	3	5	4	4	5	5	5	5	4	5
R20	4	3	4	4	3	3	5	4	4	5	5	5	3	3	3
R21	5	4	4	4	5	5	3	5	4	4	5	5	3	5	5
R22	4	4	4	3	5	3	4	4	5	5	3	3	4	3	3
R23	4	3	3	3	4	4	5	5	3	5	3	4	3	3	3
R24	3	3	2	3	3	3	4	4	3	3	3	3	3	3	3
R25	4	4	5	4	4	4	4	4	4	4	5	4	5	3	3
R26	3	5	4	5	4	4	4	4	5	4	4	5	4	4	4
R27	3	4	5	4	5	4	5	5	4	5	4	4	4	3	4
R28	3	4	4	5	4	4	4	5	5	5	4	4	4	5	3
R29	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3
R30	3	2	3	3	2	2	3	3	3	3	3	3	2	2	3

The feasibility test is carried out using the TAM method to determine the level of user acceptance of existing technology. The tool used for TAM analysis purposes is SMART-PLS with the SEM-PLS method to make TAM models. The following below are the results of model development using SMRT-PLS

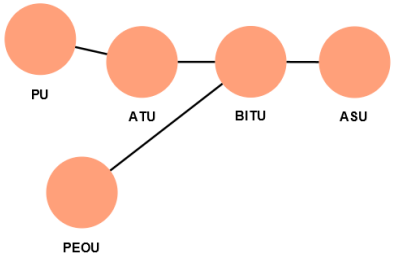

Figure 2. TAM Model of UPT Public Relations Information System UNS

As for the five constructs, each has its constituent indicators represented by the items of the statement attached to the TAM questionnaire. The following below are the indicator items for each of the construct variables:

Table 6. Indicators constituting the TAM model of the UPT Humas UNS Information System

Aspect	Statement

Perceived ease of use **(PEOU)**	Saya tidak mengalami kesulitan menggunakan sistem informasi UPT Humas UNS **(PEOU1)**
	Dengan adanya sistem informasi UPT Humas UNS dapat mencapai tujuan **(PEOU2)**
	Secara keseluruhan saya merasa sistem informasi UPT Humas UNS mudah dipahami. **(PEOU3)**
Perceived usefulness **(PU)**	Sistem informasi UPT Humas UNS menjadikan aktivitas saya lebih mudah dalam menggunakan layanan yang ada. **(PU1)**
	Menggunakan Sistem informasi UPT Humas UNS dapat meningkatkan kemampuan saya dalam hal layanan UPT Humas UNS. **(PU2)**
	Secara keseluruhan saya merasa Sistem informasi UPT Humas UNS memiliki banyak manfaat **(PU3)**
Attitude toward using **(ATU)**	Saya menerima penerapan Sistem informasi UPT Humas UNS yang dilakukan UPT Humas UNS **(ATU1)**
	Saya menolak untuk menggunakan layanan UPT Humas UNS selain menggunakan Sistem informasi UPT Humas UNS. **(ATU2)**
	Secara keseluruhan saya menikmati penggunaan Sistem informasi UPT Humas UNS untuk membantu menggunakan layanan UPT Humas UNS. **(ATU3)**
Behavioral intention to use **(BITU)**	Saya berharap Sistem informasi UPT Humas UNS akan selalu digunakan di masa depan **(BITU1)**
	Saya termotivasi untuk tetap menggunakan Sistem informasi UPT Humas UNS untuk dimasa yang akan dating **(BITU2)**
	Saya selalu menggunakan Sistem informasi UPT Humas UNS dalam kondisi apapun **(BITU3)**
Actual System use **(ASU)**	Saya menggunakan Sistem informasi UPT Humas UNS sesuai dengan prosedur yang telah diberikan. **(ASU1)**
	Saya menggunakan layanan UPT Humas UNS melalui Sistem informasi UPT Humas UNS secara jujur sesuai ketentuan dan prosedur yang diberikan **(ASU2)**
	Saya menggunakan Sistem informasi UPT Humas UNS sesuai dengan durasi waktu yang telah ditentukan secara real time **(ASU3)**

3.2. ANALYSIS

3.2.1 SUS Anlysis

Based on the SUS score data presented in the results section (table 4.2), it can be seen that there are as many as 6 respondents who produce SUS score assessments that are categorized as very poor, then 2

respondents give SUS score assessments that are not good, then 13 respondents give quite good assessments, and 9 respondents give very good assessments. So there were 22 respondents who gave a positive rating while 8 respondents gave a negative assessment. Meanwhile, if you look at the average SUS score obtained, which is 69.75, it is classified as good overall for the level of usability of the UPT Humas UNS information system.

3.2.2 TAM Analysis

After path analysis using SMART-PLS with the SEM-PLS method which produces for the ASU2, ASU3, and PEOU1 indicators, a drop was carried out because it did not meet the SEM-PLS criteria, resulting in the following model.

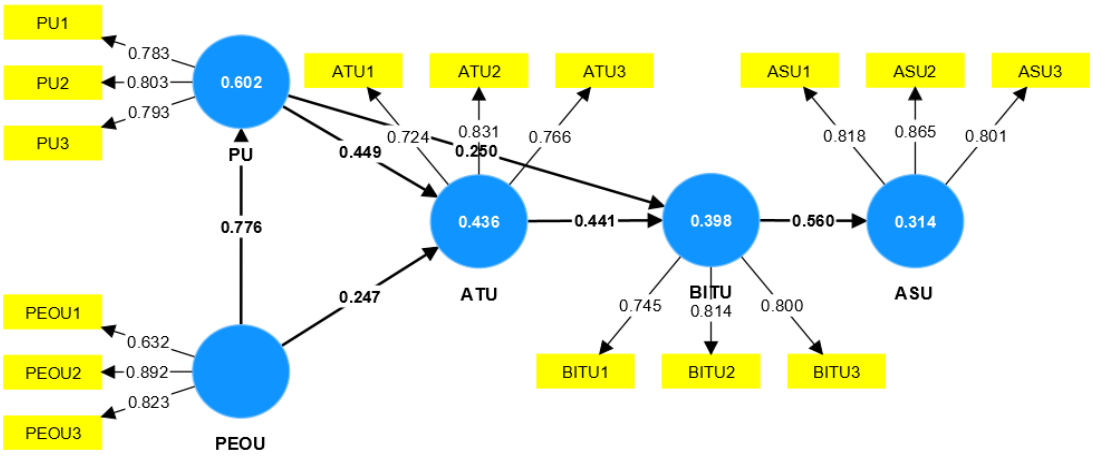

Figure 3. results of path analysis of the TAM model of the UPT Public Relations Information System UNS

Table 7. Results of the TAM analysis hypothesis

Hypothesis	Relation	T Statistic	P Values	Result
H1	PEOU has a significant effect on PU	12,060	0,000	Supported
H2	PEOU has a significant effect on ATU	5,910	0,000	Supported
H3	PU has a significant effect on ATU	1,694	0,090	Unsupported
H4	PU has a significant effect on BITU	2,792	0,005	Supported
H5	ATU has a significant effect on BITU	2,245	0,025	Supported
H6	BITU has a significant effect on ASU	4,002	0,000	Supported

Based on calculations with SMRT-PLS and based on the data in table 4.1 it can be concluded that:

1) The PEOU hypothesis has a significant effect on PU resulting in a Statistical T value of 12,060 where more than 1.96 and a p value of 0.000 then hypothesis 1 is accepted.
2) The PEOU hypothesis has a significant effect on ATU resulting in a Statistical T worth 5.910 where more than 1.96 and a p value of 0.000 then hypothesis 1 is accepted.
3) The PU hypothesis has a significant effect on ATU resulting in a Statistical T value of 1.694 where less than 1.96 and a p value of 0.090 then hypothesis 1 is rejected and hypothesis 0 is accepted.

4) The PU hypothesis has a significant effect on BITU resulting in a Statistical T worth 2.792 where more than 1.96 and a p value of 0.005 then hypothesis 1 is accepted.
5) The ATU hypothesis has a significant effect on BITU resulting in a Statistical T worth 2.245 where more than 1.96 and a p value of 0.025 then hypothesis 1 is accepted.
6) The BITU hypothesis has a significant effect on ASU resulting in a Statistical T worth 4.002 where more than 1.96 and p value 0.000 then hypothesis 1 is accepted.

4. CONCLUSION

Based on the discussion that has been presented, the conclusions that can be drawn to answer the formulation of the existing problem are how the UPT Humas UNS information system is developed and how the acceptance of the UPT Humas UNS information system to users. The conclusion is as follows:

4.1. UPT Humas UNS information system is an information system developed with the integration of the CI framework with wordpress CMS which is useful for making announcements and submissions for UPT Humas UNS services. Using Tidio to provide a live chat platform and chat bot. By adapting the development procedure of the sugiono model, which begins with a needs analysis, it is useful to find out what needs are needed by the UNS Public Relations Unit to be realized in the form of an information system. Then the design is carried out based on the data obtained in the needs analysis, so that when the development is carried out there is a clear direction The boundaries to be developed. Therefore, the results of the development that have been carried out have produced the UPT Humas UNS information system which has been published on the www.humasuns.my.id website.

4.2. After the information system was completed, field testing was carried out to determine the level of usefulness with SUS, there were 22 respondents who gave a positive assessment while 8 respondents gave a negative assessment. So that the feasibility in terms of usefulness of most respondents gave an assessment that the information system of the UNS Public Relations Unit was quite good. Then in terms of acceptance with TAM, the ease of using SI has a significant effect on the expediency and attitude in using SI. The expediency of SI has a significant effect on the attitude to use and the intention to use SI. The attitude in using SI has a significant effect on the intention to use SI. The intention to use SI has a significant effect on the actual use of the system

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