



Ethnomathematics-Based Pancasila Student Profile Strengthening Project Module in the Merdeka Curriculum Phase A in Elementary Schools

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Abstract

The transformation of education in Indonesia after Covid-19 has experienced quite significant changes, namely the latest Merdeka Belajar curriculum. The Merdeka Curriculum develops learning according to interests, learning styles and abilities that are connected to the competence of teachers and students. There are six competencies in Pancasila students formulated as key dimensions that are interrelated and strengthen each other, namely 1) faith, devotion to God Almighty and noble character, 2) global diversity, 3) mutual cooperation, 4) independence, 5) critical reasoning, and 6) creativity which then requires module development. This research aims to produce a product, namely a project module for strengthening the profile of Pancasila students which includes ethnomathematics. Ethnomathematics means a module developed by integrating curriculum, pedagogy, mathematics and local wisdom. The use of local wisdom as an integrated module for the project to strengthen the profile of Pancasila students makes students trained and able to explore mathematical concepts that exist in their cultural environment. In this research, the context is local ethnomathematics wisdom in Tuban Regency, East Java. This research is Research and Development (R&D) research with a 4D model. 4D model design consists of four flows, namely Define, Design, Develop, and Disseminate. This development research was validated with 3 validators, namely design validator, language validator and material validator. The validation results from the design validation were 88%, which means it is suitable for use, the language validator is 94%, which means it is suitable for use, and the material validator is 90%, which means it is suitable for use. Then the module was tested on 48 phase A students. The average pretest result from trial 1 was 62.75, then in trial 2 it was 63.75. Followed by the posttest results from trial 1, namely 90.33 and trial 2, namely 91.58. After carrying out the pre-test and post-test at the trial stage, the researcher calculated the N-Gain Score value, namely N-Gain trial 1, namely getting a score of 0.76 which means high and getting an interpretation of N-Gain effectiveness of 76.78% which means effective. Then students filled out a student response questionnaire, and obtained presentation results of 85% in the very satisfied category. So it can be concluded that the project module for strengthening the profile of Pancasila students based on ethnomathematics in the Phase A independent curriculum in elementary schools that was developed is suitable for use and effective in learning mathematics.

Keywords: Module Development; Project Module; Pancasila Student Profile; Ethnomathematics; Independent Curriculum

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INTRODUCTION

The teaching and learning process that occurs in education takes place effectively and efficiently. Urgency education is a very important element in the dignity of social and state life (Krisna et al., 2020). When the Covid-19 pandemic took place there were many problems in education (Nur, 2022; Parid et al., 2022). Especially the process of teaching and learning activities in schools, so teachers used online and offline learning systems (Maula, 2022; Mutia

et al., 2022; Ramadani, 2022). The transformation of education in Indonesia after Covid-19 has experienced quite significant changes. The change that occurs is that there is a new curriculum, namely the Merdeka Belajar curriculum (Maulinda, 2022).

The Independent Curriculum develops learning according to the interests, learning styles and abilities of students which are connected to the competence of teachers and students (Merta et al., 2022). In this period, the Minister of Education applied the independent curriculum at all levels of schools/educational units. There are 3 phases of the independent curriculum in elementary schools, namely Phase A, Phase, and Phase C. The application of the curriculum in elementary schools will bring a changing effect for teachers, education staff, learning administration, learning strategies, learning methods, and learning evaluation (Rahimah et al., 2022). Curriculum changes occur with the aim of improving the quality of education. The independent curriculum in addition to improving the quality of education is also to produce human resources (Nurohmah et al., 2023). The independent curriculum applies to primary and secondary education. In the independent curriculum that is applied is project learning to strengthen the profile of Pancasila students (Shofa, 2022; Hadian et al., 2022).

The urgency of the project to strengthen the Pancasila student profile is cross-disciplinary learning to observe and solve surrounding problems. There are six competencies in Pancasila students formulated as key dimensions that are interrelated and mutually reinforcing, namely 1) having faith, fearing God Almighty and having noble character, 2) global diversity, 3) working together, 4) independent, 5) critical thinking, and 6) creative (Alanur et al., 2022). These dimensions are important and must be embedded in students in learning, so they are important in developing modules. The competency chart can be seen in Figure 1.

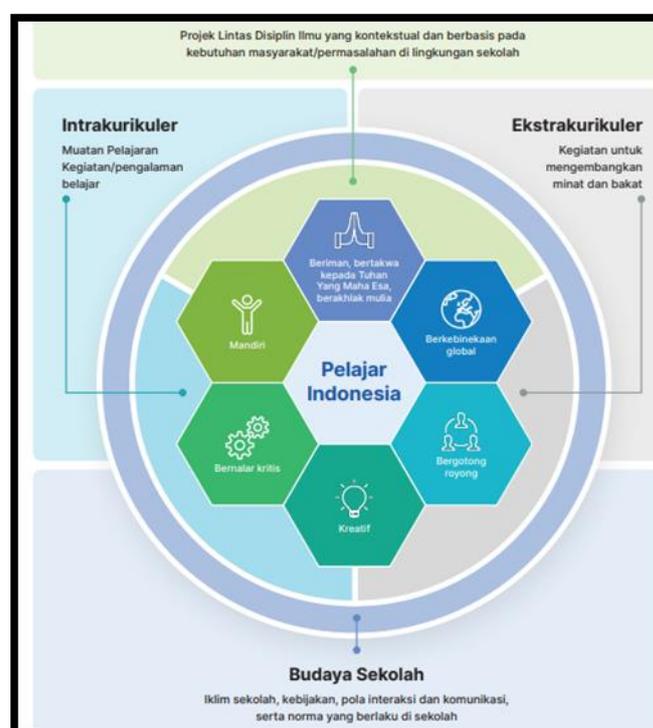


Figure 1. Interrelated key dimension competencies

This research focuses on developing a project module to strengthen the profile of Pancasila students based on ethnomathematics in the independent curriculum phase A in elementary schools. Ethnomathematics is used as an integration of curriculum, pedagogy, and mathematics (Islam & Rahmat, 2023). The use of local wisdom as an integration project module to strengthen the profile of Pancasila students makes students trained and able to explore mathematical concepts that exist in their cultural environment (Irawan et al., 2019; Widiyanti et al., 2022). Local wisdom will make it easier for students to learn because this

culture exists in the students' environment (Suciawati et al., 2021; Ditasona, 2018; Oktiningrum et al., 2020). In this research, the context is local wisdom in Tuban Regency, East Java. The use of modules in learning has a major effect on student achievement (Andi, 2023; Khairiyah, 2019) especially in dealing with an independent curriculum, new teachers and students must develop independent learning (Sulastri et al., 2023). This means learning naturally to achieve independence. In essence, modules are needed to explore the greatest potential of teachers and students to innovate and improve the quality of independent learning.

Previous research that has been carried out regarding the project module for strengthening the profile of Pancasila students was carried out with variables that are still common, namely, it has produced research results including regarding student character (Kurniawaty et al., 2022), strengthening strategies (Jamaludin et al., 2022), Pancasila character (Lubaba & Alfiansyah, 2023), emerging values. (Traditional et al., 2023), as well as its application in the profile of Pancasila students (Permatasari et al., 2023). However, it has not added ethnomathematics. This is important because students are trained and able to explore mathematical concepts that exist in their cultural environment. This makes it easier for them to learn because the culture exists in the students' environment. Mathematics is a science related to the study of abstract structural forms (Syahputri, 2018). The learning developed meets the effective criteria in developing the Ethnomathematics module (Widiyasari et al., 2023). Mathematics learning is important in developing an independent learning curriculum. The module developed aims to develop project activities to strengthen the profile of Pancasila students based on ethnomathematics in the Phase A independent curriculum in elementary schools, which means the module developed is an integration of curriculum, pedagogy, mathematics and local wisdom.

METHOD

1. Development Model

This research is Research and Development (R&D). Development is carried out using a 4-D model with the Define, Design, Develop, and Disseminate stages.

a. Define Stage (Definition)

The define stage is carried out by field observation with curriculum analysis, student analysis, task analysis, concept analysis, and learning objectives.

b. Design Stage (Designing)

The design stage is carried out by selecting the design and format of the project module for strengthening the profile of Pancasila students based on ethnomathematics which is prepared based on curriculum references with the coverage in it of the title, objectives, material presented in the form of a module that matches the students' experience in comics, evaluation. The comic teaching materials themselves contain characters, characters, subject matter, conversation balloons, ethnomathematics storylines that suit the students' experiences, as well as colors that the students like.

c. Development Stage (Development)

This development stage aims to find a product, namely a project module for strengthening the profile of Pancasila students based on ethnomathematics which has been revised and improved based on input from experts, colleagues, and the results of trial 1 (limited) and trial 2 (field) for students.

d. Dissemination Stage (Dissemination)

This dissemination stage aims to disseminate the final research product. Products developed and tested for use by others. The research development procedure can be seen in Figure 2 as follows:

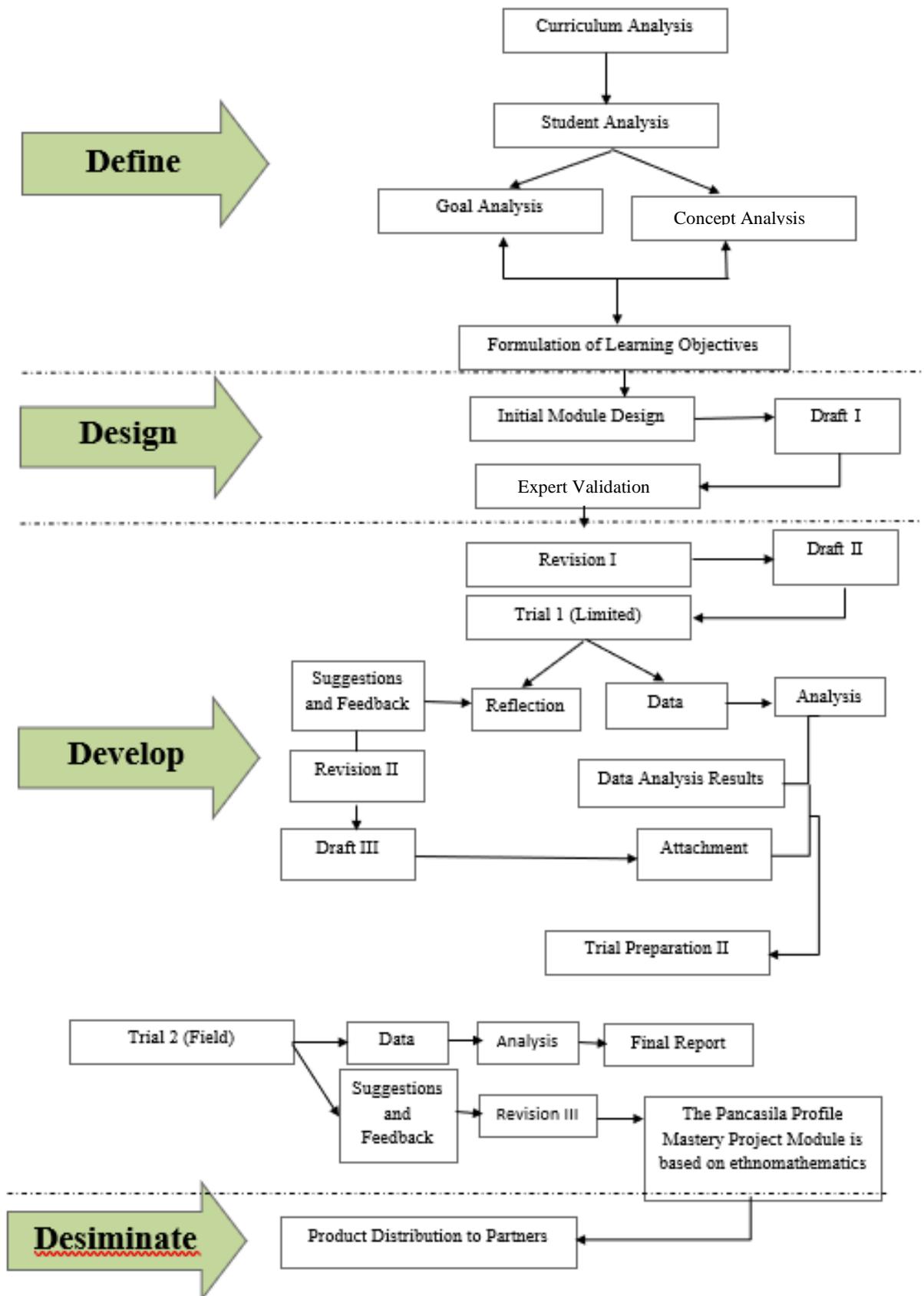


Figure 2. 4D Research Flow

2. Data and Data Sources

The data in this research is divided into two, namely qualitative and quantitative data. Qualitative data in the form of suggestions for improvement, criticism, comments provided by 1 material expert, namely Suharti, SP.d, Gr; 1 design expert, namely Mr. Imam Ja'far Shodiq, M.Pd; 1 language/readability module expert, namely Mr. Sahri, M.Pd.I; 48 students and 1 teacher, namely Mrs. Sriyatni, M.Pd; both written in the questionnaire and stated during the interview. Quantitative data is data obtained from questionnaires filled out by material experts, design experts, language/module readability experts. In addition, quantitative data is also data derived from students' scores when taking cognitive learning outcomes tests .

3. Data Collection Techniques and Instruments

Data collection was carried out in three ways , namely questionnaires, interviews, and tests. Questionnaires are used to collect data regarding the validity and practicality of the instrument. The questionnaire was addressed to materials, design experts, linguists/student module readability experts and teachers. Interviews were conducted with materials, design experts, language/module readability experts, and teachers to obtain data regarding validity and practicality. The tests used during trial 1 and trial 2 were conceptualized with ethnomathematics. The test is in the form of short answer ethnomathematics phase A with a total of 15 and the test is in the form of an ethnomathematics description of phase A to obtain data which is then analyzed.

4. Data Analysis

The qualitative data obtained was analyzed through three stages, namely data condensation, data presentation, and data conclusion (Yang & Kaiser, 2022) . Conclusions regarding suggestions for improvement, criticism and comments are then applied in follow-up module improvements. Quantitative data from the use of the module is analyzed using test theory where the percentage of feasibility is obtained from the following formula:

$$\text{Percentage} = \frac{(\text{Achieved value})}{(\text{The total value that must be achieved})} \times 100\%$$

After that, the average score is calculated using the following formula:

$$\text{Completeness} = \frac{(\text{Achieved value})}{(\text{The total value that must be achieved})} \times \text{Maximum score}$$

The validation eligibility criteria can be seen in table 2 as follows:

Table 2 . Validation Eligibility Criteria

Classification	Information
76 – 100 %	Valid / Eligible
51 – 75 %	Enough Valid / Decent Enough
26 – 50 %	Less Valid / Less Appropriate
0 – 25 %	Invalid / Ineligible

The division of N-Gain value acquisition categories can be seen in table 3 as follows:

Table 3 . Validation Eligibility Criteria

N-Gain Value	Category
$G > 0.7$	Tall
$0.3 \leq G \leq 0.7$	Currently
$G < 0.3$	Low

Then the categories for interpreting the effectiveness of N-Gain in percent (%) can be seen in table 4 as follows:

Table 4 . Validation Eligibility Criteria

Percentase (%)	Category
< 40	Ineffective
40 – 55	Less effective
56–75	Effective enough
> 76	Effective

Then the categories for obtaining student response questionnaires can be seen in table 5 as follows

Table 5 . Student Response Questionnaire

Classification	Information
76 – 100 %	Satisfied
51 – 75 %	Enough Satisfied
26 – 50 %	Less satisfied
0 – 25 %	Dissatisfied _

RESULTS AND DISCUSSION

The product was obtained with validation results from design validation of 88%, language validator of 94%, and material validator of 90%. Thus, the average percentage value of 90.6% can be seen in table 6 as follows:

Table 6 . Validation Results

Validators	Results
Design Validator	88 %
Language Validator	94 %
Material Validators	90 %
Average	90.6 %

The average pretest result of trial 1 was 62.75 then in trial 2 was 63.75. The posttest results from trial 1 were continued, namely 90.33 and trial 2, namely 91.58. The following are the results of the trial phase:



Figure 3. Pretest and Posttest Results

After carrying out the pretest and posttest at the trial stage, the researcher calculated the pretest average in trial 1, namely 62.5 and the posttest average in trial 2, namely 90.333. then the N-Gain Score value, namely N-Gain trial 1, namely getting a score of 0.72 which means high and getting an N-Gain effectiveness interpretation of 72.2% which means effective. This can be seen in table 7.

Table 7. N-Gain Score (Trial 1)

No.	Initial	Score		Post – Pre	Ideal Score (100 – Pre)	N – Gain Score	N – Gain Score Percent
		Pre	Post				
1	A	68	92	24	32	0,75	75
2	B	48	100	52	52	1	100
3	C	66	82	16	34	0,470588235	47,05882353
4	D	72	82	10	28	0,357142857	35,71428571
5	E	54	70	16	46	0,347826087	34,7826087
6	F	48	90	42	52	0,807692308	80,76923077
7	G	46	100	54	54	1	100
8	H	78	100	22	22	1	100
9	I	64	98	34	36	0,944444444	94,44444444
10	J	58	94	36	42	0,857142857	85,71428571
11	K	58	100	42	42	1	100
12	L	72	94	22	28	0,785714286	78,57142857
13	M	54	90	36	46	0,782608696	78,26086957
14	N	48	98	50	52	0,961538462	96,15384615
15	O	78	100	22	22	1	100
16	P	64	82	18	36	0,5	50
17	Q	58	70	12	42	0,285714286	28,57142857
18	R	64	98	34	36	0,944444444	94,44444444
19	S	64	94	30	36	0,833333333	83,33333333
20	T	64	100	36	36	1	100
21	U	56	82	26	44	0,590909091	59,09090909
22	V	72	70	-2	28	-0,07142857	-7,142857143
23	W	78	82	4	22	0,181818182	18,18181818
24	X	74	100	26	26	1	100
Total		1506	2168	662	894	17,329489	1732,9489
N - Gain Score (All over) Trial 1						0,722062042	72,20620415
Average		62,75	90,333				

After calculating the results of the trials, the researchers calculated that the pretest average in trial 2 was 63.75 and the posttest average in trial 2 was 91.583. then the N-Gain Score value, namely N-Gain trial 2, namely getting a score of 0.77 which means high and getting an N-Gain effectiveness interpretation of 77.78% which means effective. This can be seen in table 8.

Table 8 . N-Gain Score (Trial 2)

No.	Initial	Score		Post – Pre	Ideal Score (100 – Pre)	N – Gain Score	N – Gain Score Percent
		Pre	Post				
1	AA	68	96	28	32	0,875	87,5
2	BB	52	78	26	48	0,541666667	54,16666667
3	CC	70	100	30	30	1	100
4	DD	76	88	12	24	0,5	50
5	EE	56	88	32	44	0,727272727	72,72727273
6	FF	52	96	44	48	0,916666667	91,66666667

No.	Initial	Score		Post – Pre	Ideal Score (100 – Pre)	N – Gain Score	N – Gain Score Percent
		Pre	Post				
7	GG	48	90	42	52	0,807692308	80,76923077
8	HH	78	100	22	22	1	100
9	II	48	68	20	52	0,384615385	38,46153846
10	JJ	66	100	34	34	1	100
11	KK	76	92	16	24	0,666666667	66,66666667
12	LL	56	100	44	44	1	100
13	MM	52	82	30	48	0,625	62,5
14	NN	46	96	50	54	0,925925926	92,59259259
15	OO	78	90	12	22	0,545454545	54,54545455
16	PP	64	100	36	36	1	100
17	QQ	58	68	10	42	0,238095238	23,80952381
18	RR	64	100	36	36	1	100
19	SS	78	82	4	22	0,181818182	18,18181818
20	TT	64	96	32	36	0,888888889	88,88888889
21	UU	56	96	40	44	0,909090909	90,90909091
22	VV	72	94	22	28	0,785714286	78,57142857
23	WW	78	98	20	22	0,909090909	90,90909091
24	XX	74	100	26	26	1	100
Total		1530	2198	668	870	18,4286593	1842,86593
N - Gain Score (All over) Trial 1						0,767860804	76,78608043
Average		63,75	91,583				

Then at the end of the trial activity using the project module for strengthening the profile of Pancasila students based on ethnomathematics, students filled out student response questionnaires, and obtained presentation results of 85% in the very satisfied category. This can be seen in table 9.

Table 9 . Questionnaire Recapitulation (Students)

Statement	Total	Average	Percentage
Statement-1	18	0.83	78%
Statement-2	22	0.96	96%
Statement-3	17	0.74	74%
Statement-4	18	0.78	78%
Statement-5	21	0.91	91%
Statement-6	19	0.983	83%
Statement-7	22	0.96	96%
Total			596%
Average			85%

Based on the data presented above, it shows that it can be concluded that the project module for strengthening the profile of Pancasila students based on ethnomathematics in the Phase A independent curriculum in elementary schools that was developed is suitable for use and is effective in learning mathematics. However, according to (Mahanani et al., 2023), the characteristic of an independent curriculum is the instillation of the character values of the Pancasila Student Profile Strengthening Project, the actualization of which is packaged in project-based learning. This is because project learning is the main activity in the independent curriculum. This is in line with research by (Susilawati et al., 2023). that the preparation of project modules is in line with student phases which can be adjusted to the achievement of student characteristics in the class.

CONCLUSION

In this research, there were obstacles experienced in implementing the research process. This obstacle is the adjustment of hours in activities carried out at school, because it happens to be held in August where schools hold many activities to commemorate the independence day of the Republic of Indonesia. However, this can be handled well by arranging the right time and schedule. Then another obstacle is the need for a definite understanding regarding the understanding of the chosen theme in project learning and this can be overcome well.

RECOMMENDATIONS

Suggestions from researchers to all stakeholders to ensure that project learning in the independent curriculum is very important, especially regarding ethnomathematics with the aim of forming a Pancasila student profile. In addition, all school members must cultivate and familiarize positive behavior in realizing learning goals.

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