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STUDY ON FACTORS AFFECTING THE SUCCESSFUL IMPLEMENTATION OF CONSTRUCTION PROJECTS IN WEST LOMBOK DISTRICT AND MATARAM CITY

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ABSTRACT
A construction project that can be completed properly is the result of a combination and interaction of various related activities, elements and processes, both planned and unplanned and in a changing environment, several factors are more dominant in influencing project success. to help allocate available resources. The purpose of this research is to find out the factors for the success of a construction project and the extent of the influence of these factors on the success of the project, especially the implementation of construction in the district of West Lombok and the city of Mataram. The ultimate goal of this research is to provide tools for parties involved in the implementation of construction, to predict project success and provide useful information in allocating resources to produce satisfactory results. This research consists of two stages, namely the pilot study and the second stage of research. In the pilot study in the form of a questionnaire containing questions referring to Chan's research (1998), it has succeeded in obtaining data from 60 respondents from business practitioners in the construction service sector in the district of West Lombok. Mataram city. The second phase of the questionnaire obtained data for 52 respondents consisting of project owners, professional practitioners, both consultants and contractors. The mean value of the tap factors from a total of 44 variables resulted in the 15 factors with the highest ranking. The fifteen factors were analyzed by step wise multiple regression to determine the extent of the influence of each factor on the project's success criteria. The six most dominant factors influencing project success are the project owner's emphasis on time, quality and cost of supervision, involvement with the implementation team from the start, health & safety programs supported by the parent company, and relationships with fellow business associates.The results of the study prove that the project design factors that are adequate enough to be carried out at the construction implementation stage are the factors that most influence the project's success, followed by supervision at the construction implementation stage running well, the project team's technical ability, communication between the parties involved in the implementation. construction, and regular coordination.

Keywords: *Construction Project Success Criteria, Influencing Factors*

1. Introduction

A construction project can be completed as a result of the combination and interaction of various activities, elements and processes and interrelated, whether planned or not and in a changing environment (Ashley *et al*, 1987). At this time project managers face increasing challenges in completing their tasks, the situation and conditions have developed more dynamically so that it creates a lot of uncertainty and the need to reduce project overhead (Bbryman A cramer, 1997). Things that trigger project uncertainty are changes in technology, the global economy, government regulations and new rules. Faster communication and development of information management (Bubshlt *et al*, 1999; Ingle & Mahesh, 2022; Andiyan, et al., 2021).

Therefore, project managers need something to be able to predict problems will occur. One thing that first needs to be done is to identify and measure the factors that affect the success of the project (Chua *et al*., 1999; Ribeiro, et al., 2021; Irfan, et al., 2021). It is also necessary for the project manager to help allocate available resources (human, equipment and materials). To process and place resources, a detailed and systematic model of the factors that influence project success is needed, so that it can predict project success even before the project starts. In general, this study aims to identify and determine the relationship of the factors that influence

the success of a construction project by using a questionnaire (Istimawann, 1995). Data collection through questionnaires was carried out in two stages, so as to find the relationship between project success factors and project performance. The construction projects in question are construction projects in the form of road buildings, bridges and water structures, which are currently under implementation or those that have been completed (Levin, *et al*., 1998). Respondents are project owners, contractors and consultants who are domiciled in West Lombok district in the city of Mataram, West Nusa Tenggara Province. and experts in their fields (Pinto, *et al*., 1988).

Research will be expected to assist owners, project planning contractors in planning project implementation strategies for maximum results. The results of the research can be useful for further and similar academic research purposes and can be used as input for planning management education programs for project managers.

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Therefore, project managers need something to be able to predict problems will occur. One thing that first needs to be done is to identify and measure the factors that affect the success of the project (Chua *et al*., 1999). It is also necessary for the project manager to help allocate available resources (human, equipment and materials).

2. Research Methods

The sample is part of the population whose characteristics are to be investigated and considered to be representative of the entire population. The idea of sampling is to solve part of the population elements, so that conclusions are obtained about the entire population (Cooper 1997). An element is a subject that indicates where the measurement is made. A population is the entire set of elements that can be used to make some conclusions (Pinto, *et al*., 1988).. Sampling results in better interviews, more closely investigates missing, erroneous and more accurate information, research provides results faster than censuses. The advantage of sampling is reduced when the population is small and the variability is high. An accurate sample if there is no accuracy (accuracy) and precision (precision). An adequate accurate sample is one that has a sampling error within acceptable limits for the purposes of the study (W. Gulo, 2022).

The problem studied in this study is the determinant of the success of a construction project and the extent of its influence on the success of a construction project (Pinto, *et al*., 1997). The target population that is the object of this research is the parties involved in project implementation, namely owners, planners, supervisors and work implementation, which are within the scope of the West Lombok Regency and Mataram Municipality. who have SBJUK with Medium (M) and Small (K) qualifications, both private and BUMN, as well as government agencies/related institutions.

Questionnaire Analysis Phase I

To find out the dominant factors influencing the success of a construction project, it is done by giving a score which is then calculated on average, using descriptive analysis on the SPSS menu. From those obtained from the first phase of the questionnaire, they were analyzed by tabulation analysis in order to obtain an average rank (mean range). Based on this average ranking, conclusions can be drawn regarding the ranking of the factors that influence the successful implementation of construction projects.

Questionnaire Analysis Phase II

From the analysis of the first stage of the questionnaire, a table of the dominant factors influencing the success of the project was obtained, which was then processed into questions in the second stage of the questionnaire. Stepwise multiple regression analysis is used to get a better regression equation model, by including the independent variable that has the strongest correlation with the dependent variable and then every time you enter another independent variable, testing is done to keep the independent variable included or remove it from the

regression equation model (Savindo *et al*, 1992).

The first analysis is to determine the level of influence of these factors on each project's success criteria as the dependent variable, namely the criteria for project completion costs, project completion time, speed of work, quality produced, satisfaction of all parties, suitability of functions and job variations. The next analysis is to look at the level of influence of these factors on the overall project success. In this case, all the dependent variable questions totaled 10 questions and then recoded based on a Likert scale of 1-7.

The multiple regression equation that will be modeled in this analysis is as follows:

$Yi = a + \beta_1 X_1 + \beta_2 X_2 + + \beta_i X_i$

Where :

β_1 : Regression coefficient for each variable X

Yi: Successful implementation of construction projects

Xi : construction project success criteria

3. Results and Discussions

The data that have been successfully collected in total are 117 questionnaires consisting of 65 questionnaires for the first stage and 52 questionnaires for the second stage. The respondents consist of project owners, consultants and contractors in the areas of West Lombok Regency and Mataram City. The data is then analyzed according to the research objectives. This research has succeeded in obtaining as many as 65 respondents from the West Lombok Regency Region 27 respondents (41.53%) and the Mataram City Region 38 respondents (58.47%), as shown in the picture.

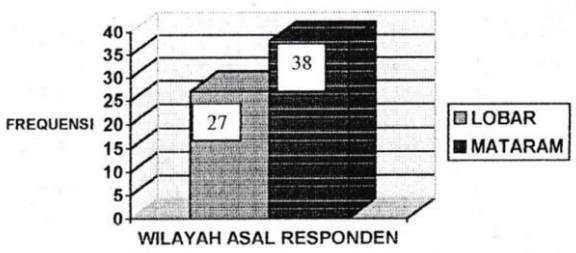

Fig. 1. Data Acquisition of Respondents' Areas of Origin

The type of company respondents consisted of project owners 17 respondents (26.15%), consultants 20 respondents (30.76 %), and contractors 28 respondents (43.09 %) as shown in Figure 1.

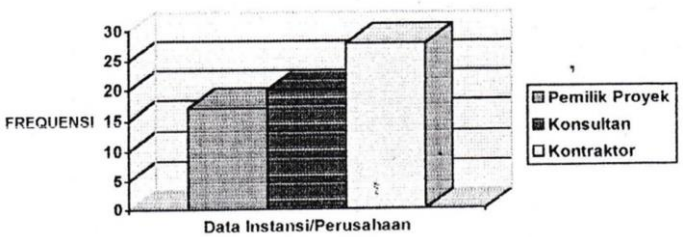

Fig. 2. Acquisition of Agency / Company Data

However, it should be noted that in this study the respondents representing the project owners were all from government agencies. The educational background of the respondents consisted of 8 respondents with a high school background (12.30%), 48 respondents with an undergraduate background (73.84%), and respondents with a master's degree background (13.86%), as shown in:

Fig. 3. Educational Background Data

Analysis of the Dominant Factors Affecting the Project.

The success factors of construction projects in this questionnaire consist of 44 variables and are grouped into: client, project, project environment, project team leaders, project procurement procedures and project management. However, the analysis used as a whole does not look at the division of the group. The analysis used is descriptive statistics, by looking at the mean value to determine the most dominant rank. From a total of 44 variables, the overall average is calculated, the results of the analysis are arranged in table 4.1 and ranked based on the mean value.

Table 1 - Analysis of Factors Affecting the Successful Implementation of Construction Projects in West Lombok Regency and Mataram City

No.	Variable	Mean	Standard Deviation	Rank
1	The nature of the project owners organization	3.95	0.81	20
2	Types of project-owned business activities	3.53	0.63	38
3	The size of the company owned by the project	3.63	0.60	35
4	Project owner's emphasis on time, cost, quality	4.66	0.50	1
5	The ability of the project owner to provide information about the work	3.83	0.54	24
6	The ability of the project owner to make decisions	4.24	0.70	9
7	Emphasis on project owners to create rules	3.98	0.85	17
8	Involvement of project owners at the planning stage	3.93	0.94	23
9	Involvement of the project owner at the project implementation stage	3.78	0.64	27
10	Project type/type	3.43	0.86	42
11	Project nature	3.70	1.07	30
12	Project cost	4.04	0.86	16
13	Project completion schedule or time	3.81	0.76	25
14	Overall project area	3.44	0.98	41
15	Access to project site	3.76	0.99	28
16	Field conditionS	4.18	0.80	11
17	Complexity of project design/planning	3.95	0.75	21
18	Design coordination complexity	3.58	1.04	37
19	Quality management complexity	3.49	0.79	40
20	Physical conditions in the project environment	3.66	1.00	34
21	Economic environmental conditions	3.75	1.11	29
22	The condition of the socio-political environment	3.96	0.61	19
23	Relationships with fellow business relations	4.29	0.78	6
24	Communication	4.10	0.77	13
25	Planning from start to finish	4.04	0.54	15
26	Supervision	4.55	0.72	2
27	Management structure development	3.69	0.96	31
28	Supervision on sub-contractor	3.81	0.96	26
29	Occupational health and safety program	4.44	0.81	4
30	Administration system development	3.50	1.16	39
31	Implementation of regular meetings/coordination	4.07	1.06	14
32	Implementation of quality assurance	3.93	0.60	22
33	Soup development (work standard)	3.67	0.83	33
34	The technical capability of the project implementation team	4.13	0.80	12
35	Team managerial ability	4.24	0.79	7
36	Team commitment	3.98	0.85	18
37	Team motivation	4.24	0.75	8
38	Availability of resources from parent company	3.67	1.03	32
39	Project leader team experience and abilities	4.23	0.91	10
40	Easy to adapt to any changes	3.27	1.03	43
41	Support from parent company/central	4.35	0.62	5
42	Engagement with the implementation team from the start	4.50	0.53	3
43	Determination of the type of contract used in the project	3.60	1.12	36
44	Method of determining the winner of the auction	3.15	1.50	44

Description :

No. 1 s/d 9 : project owner group No. 10 to 19 : project group

No. 20 s/d 23 : project environment group

No. 24 s/d 33 : project management group

No. 34 s/d 42 : project team leader group

No. 43 s/d 44 : project procurement procedure group

The mean statistical calculation results show that the factors that most influence the success of the project are, respectively, “The project owner's emphasis on cost, quality and time” (mean = 4.66). “Supervision” (mean = 4.55). “availability of resources from the parent company” (mean = 4.50) and so on until the last 44th rank is “the method of determining the winner of the auction” (mean = 3.15). The results of statistical calculations show that the mean value of each factor has a slight difference. This shows that each of these factors has the opportunity to become a dominant factor.

From a total of 44 variables, the overall average was calculated, and 15 variables were taken that had an average value greater than 4.04. From the table, it can be separated according to the group, namely the project owner group, project, project environment, project management, project team leader and project procurement procedures, so that it can be investigated what factors are the most dominant influencing project success in each group.

Table 2 - Factors in the “project owner” group

No	Variable	Mean	Standard deviation	Rank
1.	The project owner's emphasis on quality, time and cost	4.66	0.50	1
2.	The ability of the project owner in make decision	4.24	0.70	2

The dominant factor in the project owner group that proved to have the most influence on project success was the project owner's ability to make decisions, and the project owner's emphasis on achieving cost, quality and time targets (table 2). This shows that the ability of the project owner to make decisions, related to the determination and speed of decision making, is needed so that project implementation runs smoothly. Slow and inappropriate decision making will result in stalled projects and result in increased time and cost.

Likewise, the project owner's emphasis on achieving the target cost, quality and time of project implementation, is closely related to the position of the project owner as the assignor of tasks/work for consultants and contractors (R.C.G, 1997). Judging from the scope of this research, the majority of respondents are providing services for government projects (both consultants and contractors) and representatives from government agencies in this case represent project owners. Respondents who represent project owners in general are those who have adequate technical capabilities and are quite experienced in their fields. However, the bureaucratic structure and the large number of projects that must be handled in one implementation period have resulted in the role of the project leader as a decision maker and an emphasis on achieving cost, quality, time targets to be very instrumental in project success.

Table 3 - factors in the “project” group

No	Variable	Mean	Standard deviation	Rank
1.	Field conditions at the initial stage of construction were adequate sufficient to start the execution of the work	4.18	0.80	1

The factors that most influence the success of projects in the project group can be seen in table 3, namely the field conditions at the initial stage of construction were sufficient to start the implementation of the work. This shows that of the overall project variables, this factor has an important role in supporting the success of the project. Field conditions in the early stages of construction proved to greatly affect the implementation of further work. Field conditions can be in the form of land readiness (mature soil or original conditions). Likewise, the implementation team is obliged to review the previous field conditions, so as to anticipate difficulties that may occur at the construction stage.

Table 4 - factors in the "project environment" group

No	Variable	Mean	Standard deviation	Rank
1.	Relationships with fellow business relations on the project	4.29	0.78	1

The influencing factor in the project environment group is the relationship with fellow construction service business relations (table 4). The most obvious thing experienced and felt by construction service actors in Indonesia at this time is the harmony between work partners, suppliers of goods and sub-contractors, this can also affect the work completion process.

Table 5 - factors in the "project management" group

No	Variable	Mean	Standard Deviation	Peringkat
1.	Supervision	4.55	1.13	1
2.	Occupational health & safety program	4.44	0.81	2
3.	Communication	4.10	0.77	3
4.	Team coordination on a regular basis	4.07	1.06	4
5.	Planning from start to finish	4.04	0.54	5

The factors in the project management group that became the dominant factors in influencing the success of the project in this study were supervision, occupational health and safety programs, communication and periodic coordination (table 5) different emphases on different projects.

However, in this study it was found that communication between parties related to planning from start to finish, supervision and periodic coordination meetings was again a key factor because with the emphasis on these five factors, all problems in the field could be resolved quickly and quickly. appropriate, with the involvement of all interested parties, so that project implementation runs smoothly.

Table 6 - Factors in the "Project Team Leader" group

No	Variable	Mean	Standard Deviation	Rank
1.	Engagement with the implementation team from the start	4.50	0.53	1
2.	Support from parent company	4.35	0.62	2
3.	Project team managerial skills	4.24	0.79	3
4.	Project leader team motivation	4.24	0.75	4
5.	Experience & ability of project team leader	4.23	0.91	5
6.	The ability of the project implementing technical team	4.13	0.80	6

The factors that most influence the project's success in the project team leader group are as shown in table 6. This shows that the project team leader is required to give their best so that

the project implementation runs smoothly with satisfactory results. The performance of the project team leader (design team leader, construction team leader and supervisory consultant team leader) is greatly influenced. By technical ability, project management ability and experience and problems that occur in the field. Experienced project team leaders will understand that involvement with the field implementation team from the start of the work will make it easier to plan, implement and supervise further work (Santoso, Singgih, 2001). However, all of this requires the support of a strong team motivation, so that the project team leader's performance will be better.

The factors in the project procurement procedure group in this study did not have a major influence on the success of the construction project (Rondinelli, Dennis a., 1990). From table 6, a new table is obtained of the dominant factors that affect the success of construction projects with a rating of one to 15, which are used as material in the second phase of the questionnaire and processed by different data analysis techniques.

Second Stage Questionnaire General Data Respondents

This study has succeeded in obtaining data as many as 52 respondents from the West Lombok Regency area, 21 respondents (40.38%) and the city of Mataram (59.61%).

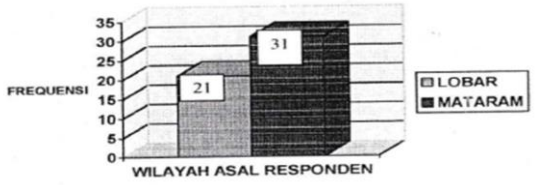

Fig. 4. Data from Respondents' Areas of Origin

The type of company respondents consisted of project owners 16 respondents (30.76%), consultants 14 respondents (26.92 %) and contractors 22 respondents (42.30%) As shown in Figure 4.4. It should be noted that in this study, the respondents representing the project owners were all government agencies.

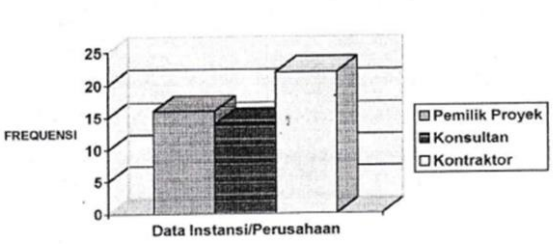

Fig. 5. Agency/Company Data

The educational background of the respondents consisted of 5 respondents with a high school background equivalent (9.61%) 39 respondents with an undergraduate background (75.00%) and 8 respondents with a master degree background (15.38%).

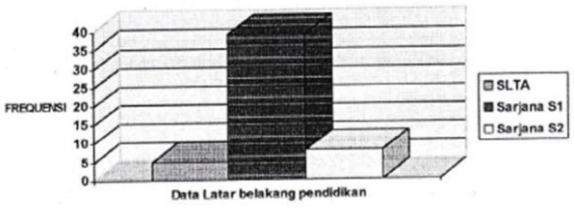

Fig. 6 Educational Background Data

The results of the Stcpwise multiplc regression analysis of project success factors on the accuracy of project completion costs are presented in table 7 below.

Table 7 - Results Of Stepwise Multiple Regression Analysis Of Project Success Factors On The Accuracy Of Project Completion Costs.

Model	Variable	Pearson Correlation	Significant	Regression Coefficient (B)
	(Constant)	-	-	1.678
	Planning from start to finish	0.541	0.000	0.588
R^2 =	0.279			

From the results of the stepwise multiple regression analysis, project success factors have a significant effect and have a strong correlation on the success of construction projects. From table 4.7 it is known that the variables that have a significant influence are: "The planning from the beginning to the end of the project does not change" (sig = 0.000). The R^2 value generated in the regression analysis of 0.279 explains that 27.9% of independent factors, while the rest (100% - 27.9% - 62.10) are caused by other causes.

The regression equation model obtained from the stepwise multiple regression analysis is as follows:

$$Y = 1.678 + 0.588X_6$$

X_6 = “Planning from start to finish”

The variables that have a significant influence are: "Supervision at the construction implementation stage is going well" (sig = 0.000. The R2 value generated in this regression analysis of 0.541 explains that 54.10% of the dependent factor for project completion costs can be explained by factors in the independent variable while the rest (100%-54.10% - 45.90%) are caused by other reasons. The regression equation model obtained from the stepwise multiple regression analysis is as follows:

$$Y = 1.030 + 0.741X_7$$

with :

X_7 = “Supervision at the construction stage is going well″ .

From the results of the multiple regression equation, the project performance related to the cost criteria for project completion will be good/successful if the supervision at the construction implementation stage goes well.

Analysis of the level of influence of project success factors on the speed of work.

The variable success of the project which includes 15 questions is the independent variable and the criteria for the speed of work as one of the criteria for the success of the project is the independent variable. The results of the stepwise multiple regression analysis of project success on the speed of work projects are presented in table 8 below.

Table 8 - The Results of The Stepwise Multiple Regression Analysis of The Determinants of Project Success on The Quality of Work

Model	Variable	Pearson correlation	Significant	Regression coefficient(B)
2	Constant	-	-	2.852

TL Engagement with Implementation Team	0.353	0.016	0.163
Coordination periodically	0.343	0.020	0.193
R^2 = 0.185			

From the results of the stepwise multiple regression analysis, project success factors that have a significant influence and have a correlation that the variables that have a significant influence are: "Team Leader Coordination with the Project Implementing Team" (sig = 0.016) and "regular coordination" (sign - 0.020).

The R^2 value generated in the regression analysis of 0.185 explains that 18.50% of factors in the independent variable, while (100%-18.50% = 81.50%) are caused by other causes. The regression equation model obtained from the results of the stepwise multiple regression analysis is as follows:

$$Y = 2.852 + 0.163\ X\ 15 + 0.193\ X$$

Table 9 - Results of Stepwise Multiple Regression Analysis of The Determinants of Project Success on The Suitability of The Plan Function.

Model	Variable	Pearson correlation	Significant	Regression coefficient (B)
3	(Constant)	-	-	1.823
	Communication between the parties involved	0.664	0.000	0.677
	Relationships between fellow relations	-0.067	0.003	-0.234
	Team managerial ability	0.078	0.013	0.196
R^2 =	0.523			

From table 9 it is known that the variables that have a significant influence are: "relationships between relations" (sig - 0.003) "communication between parties involved in the implementation of construction" (sig = 0.000) and the managerial ability of the project leader team "(sig = 0.013). The R2 value generated in the regression analysis of 0.523 explains that 52.3% of the dependent factors of project completion costs can be explained by all factors in the independent variable, while (100% -52.3% = 47.7% is explained by other causes. The regression equation model that obtained from the results of the stepwise multiple regression analysis are as follows:

$$Y = 1.823 + 0.677\ X_5 + 0.196\ X_{11} - 0.234\ X_4$$

With :

X_4 = Relationships between fellow relations

Table 10 - The Results of The Stepwise Multiple Regression Analysis of The Determinants of Project Success on The Decisions of All Parties

ModeI	Variable	Pearson correlation	significant	Regression coefficient (B)
2	(constant)	-	-	1.198
	Communication between the parties involved	0.649	0.000	0.592
	Coordination on a regular basis	0.220	0.044	0.165
R^2 0.445				

From table 10 it is known that the variables that have a significant influence are: "communication between the parties involved" (sig-0.000) "regular coordination (sig = 0.044)

The R2 value generated in the regression analysis of 0.445 explains that 44.50% the dependent factor of the total satisfaction of the parties involved can be explained by all the factors in the independent variable. while the rest (100% 44.50% = 55.50%) Explained by other reasons, the regression equation model obtained from the results of the stepwise multiple regression analysis is as follows:

$Y=1.198 + 0.592\ X_5 + 0.165\ X_9$

With :

X_5 = communication between related parties in the implementation of construction

X_9 = regular coordination.

From the results of the multiple regeneration equation, project performance related to the satisfaction of all parties involved can be achieved if communication between the parties involved in the construction and coordination is carried out on a regular basis and carried out and fulfilled properly.

Analysis of the level of influence of the project success factors on the variation work criteria

The project success factors variables which include 15 questions are independent variables and the variation work criteria as one of the project success criteria is the dependent variable from the stepwise multiple analysis results which is the dependent variable from the step wise multiple regression analysis of the project success factors on the variation work presented in table 11 below.

Table 11 - The Results of The Stepwise Multiple Regression Analysis of The Factors That Affect The Success of The Project on Variation Work

Mode1	Variable	Pearson correlation	Significant	Regression coefficient (B)
2	(Constan)	-	-	4.038
	Team leader managerial skills	0.353	0.001	0.384
	Relationships between fellow relations	-0.171	0.015	-0.269
R^2	0.193			

From table 11 it is known that the variables that have a significant influence are; managerial ability of the project leader team " (sig = 0.015).

4. Conclusion

From a series of analyzes and discussions that have been carried out, it is hoped that conclusions will be obtained regarding the most dominant project success factors, as well as knowing the factors that have the most significant influence on project success or project performance. The conclusions that can be obtained in this study include two important things, namely the factors that influence the success of the project against the project's success criteria. The dominant factors that affect the success of the project.

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