

Ultra-Micro Lending Eligibility Support System With Exponential Comparison Method (MPE)

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Abstract

The process of providing credit can now be done quickly and closely through the presence of BRILink agents with additional facilities in addition to payment points, namely as partners of ultra-micro loans, which are now popularly called UMi Partners, where BRILink agents can distribute microloans with a loan range of 1 to 5 million. This is done by management as a financial inclusion program and as a revitalization of work in all operational work units (UKO). This research uses the Exponential Comparison Method (MPE) to determine credit granting decisions to optimize all existing information systems by implementing a system that can be used and run by UMi partners to improve the process of providing creditworthiness to their partners. The results of the calculations carried out by the system are manual calculations that have been carried out so that the results of this study can be applied correctly to produce creditworthiness that helps the credit-granting process.

Keywords: Umi Partners; Exponential Comparison Method; Credit Eligibility

Abstrak

Proses pemberian kredit kini dapat dilakukan dengan mudah dan dekat melalui keberadaan agen BRILink dengan fasilitas tambahan selain payment point, yakni sebagai mitra dari pinjaman ultra mikro yang kini marak dengan sebutan Mitra UMi, dimana agen BRILink dapat menyalurkan pinjaman mikro dengan range pinjaman 1 s.d 5 juta. Hal ini dilakukan manajemen sebagai program inklusi keuangan dan sebagai revitalisasi kerja di seluruh unit kerja operasional (UKO). Penelitian ini menggunakan Metode Perbandingan Eksponensial (MPE) untuk menentukan keputusan pemberian kredit guna mengoptimalkan seluruh sistem informasi yang ada dengan implementasi sistem yang dapat digunakan dan dijalankan oleh mitra UMi untuk menyempurnakan proses pemberian kelayakan kredit kepada mitranya. Hasil perhitungan yang dilakukan oleh sistem sudah sesuai dengan perhitungan manual yang telah dilakukan sehingga hasil penelitian ini dapat diaplikasikan dengan baik sehingga menghasilkan kelayakan kredit yang membantu proses pemberian kredit.

Kata kunci: Mitra UMi; Exponential Comparison Method; Credit Eligibility

INTRODUCTION

The national economy is one of the impacts that MSME actors feel, one of the driving factors of the national economy. In addition to being a driver of the national economy, this sector can also help absorb jobs for the community, increase optimal innovation, and help the country grow export activities to other countries (Tandika & Sevriana,

2017). The national economy is one of the impacts that is felt by MSME factors, one of the driving factors of the national economy. In addition to being a driver of the national economy, this sector can also help absorb jobs for the community, increase optimal innovation, and help the country increase export activities to other countries. Micro, Small, and Medium Enterprises (MSMEs) during the pandemic have proven to be able to go through a

crisis period that does not have a significant effect on the global crisis that has hit all countries in the world (Sholihah et al., 2022). This sector is what the government is looking at and is concerned about in the progress of the national economy, which the government is currently developing because it is believed that it can make a tremendous contribution in efforts to catch up with Indonesia compared to other neighboring countries in terms of financing (Sulistiyono et al., 2022).

The current development is the creation of a financing program as one form of government effort in supporting the development of SMEs that has been implemented in the provision of People's Business Credit (KUR) assistance to SMEs, where the distribution is in collaboration with several banks (Cotet et al., 2017). In addition to KUR, Ultra Micro (UMi) financing is a form of credit provision targeted at basic MSMEs with fewer working capital needs. However, it is considered effective in maintaining the national economy. Ultra Micro Financing, abbreviated as UMi, is an advanced program that targets micro businesses at the lowest level that cannot provide banking facilities through the existing program, namely, KUR (Kredit et al.) (Widodo & Gunawan, n.d.).

The purpose of this study is to measure the effectiveness of BRILink agents (lakupandai) as Ultra Micro (UMi) credit distributors by government programs and credit provider institutions in credit financing that can drive the national economy through revitalizing the empowerment of ultra-micro credit channeling partners by Measuring the effectiveness of Ultra Micro (UMi) credit channeling partners with non-IT capabilities to see how much creditworthiness is channeled by UMi partners with risk mitigation that can be detected through the application of the exponential comparison method (MPE) (Suranti, 2018).

Lakupandai agents are the development of Banks that can perform branchless banking services, which are officeless bank services not through office networks but using information technology in their operations and require cooperation from other parties, namely agents, as an extension of the bank to provide banking services to people who do not know, use and or get banking services and other financial services (Auer & Böhme, 2021).

This research focuses on studying how effective credit distribution is at the credit distribution unit office with the utilization of the BRILink Mobile application, which is the weapon of BRILink agents in lending to their customers, especially UltraMicro credit, which is a new

strategy for improving the economy of MSME players which includes the credit initiative process, prescreening, survey activities, credit analysis, credit documentation, and credit recommendations until the decision process is accepted (Lowry, Wells, Moody, Humpherys, & Kettles, 2006).

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This research focuses on filling the gap in the previous research by exploring a more specific aspect, namely the development of more comprehensive services. Previous research has focused on general services provided through the BRILink Agent application, while this research expands the scope by examining micro-business lending as a new service. As such, this research directs attention to an area previously uncovered in the literature and makes a new contribution to the understanding of microfinance services through such platforms.

RESEARCH METHODS

The research focus of the case under study includes an emphasis on a narrower perspective with the obstacles and challenges in the series of ultra-micro lending (UMi) processes that are an obstacle in the loan initiative process until the decision is received, where the process is less effective and requires time with a relatively longer SLA (Service Level Agreement) (Tandika & Sevriana, 2017).

Types of research

This research utilizes a qualitative approach, delving into exploration and in-depth understanding of the underlying meanings, motivations, and complex nuances within a given context. This research aims to capture the richness and complexity of human experiences, emotions, and social phenomena through interviews, focus groups, content analysis, or ethnographic observation. By immersing researchers in the natural settings of their subjects, qualitative approaches facilitate the emergence of unexpected insights, patterns, and relationships that might otherwise be hidden (Lausch et al., 2011). This approach is invaluable for investigating subjective perceptions, cultural dynamics, and complex behaviors, providing a holistic perspective that

complements and enriches the broader research landscape.

Time and Place of Research

All activities on the object of this research are carried out within a limited area with a location coverage of more than one place or area with supervised supervision within the scope of the BRI Teluk Gong unit office - Kanca Jakarta Jelambar, starting in January to April 2022 with the location studied covering more than 1 location including Branch/Unit Service: BRI Teluk Gong Unit and Branchless Services / UMi Partners: UMi Partners with the location of each UMi Partner's residence.

Research Target / Subject

The subject of research carried out, in addition to involving financial institutions, in this case, the bank and all entities within it, also involves the role of intelligent sellers as UMi partners and customers, both old and prospective new debtors in the zoning area of BRI Teluk Gong Unit as a revitalization area, namely Pejagalan Village, Penjaringan District, North Jakarta City Code - 11450.

Procedure

The decision support system for lending with the Exponential Comparison Method (MPE) is one of the decision-making methods that assess a person's income on a particular scale. This system helps provide consideration for selectors in the process of granting loans so that it can help when selecting loans. To improve the effectiveness and efficiency of the decision-making process for ultra micro loan eligibility (Suranti, 2018).

Another approach used in developing this research process is applying the SDLC method. The SDLC (Software Development Life Cycle) method creates and changes systems and, models and methodologies used to develop software engineering systems. SDLC method using the waterfall method (Chen, Pedersen, Hellesø, & Van Rheenen, 2000).

Data, Instruments, and Data Collection Techniques

The data collection technique used in this study uses primary and secondary data (Wiliani & Zambi, 2017). The data obtained is input data and output data on applications and supporting systems, interviews with users, and other supporting data needed, such as Primary Data

The primary data comes from data on applications and programs the initiator uses, namely the BRISPOT and BRILink Mobile

applications owned by credit officers (Mantri) and Ultra Micro partners (BRILink Agents). Other supporting data are web-based applications such as BRISPOT Web, application portal, Ministry of Home Affairs web portal, and BRINET web (Friedyadie, 2016).

Secondary Data

In secondary data, supporting data comes from the process of observation results and direct interviews with UMi partners, where all data collected is collected as material for evaluating how effective ultra-micro credit distribution is to be channeled to prospective debtors who need business capital financing with easier access without having to go to the bank to increase financial inclusion in today's modern times.

Data analysis technique

Applying the Exponential Comparison Method (MPE) to the decision support system for granting loans, there are several stages. Determination of the criteria or relative comparison of essential decision criteria to be evaluated is shown in Table 1.

Table 1. Determination of Criteria and sub-criteria for assessment

Criteria	Sub-Criteria
Neighbourly Life	- Mingle - Not mingling
Purpose of Applying for Credit	- Business Capital - Investment - Consumptive
Source of Income	- From Business - Salary - Retired
Income per month	- > 10m to 50m - > 5m s.d 10m - S.d 5 m
Home Ownership Status	- Owned - Parent-owned - Rent
Collateral/Collateral	- Immovable Goods - Movable Goods - None
Business Legality	- Kelurahan business legality - RT/RW business legality
Borrowing Plan	- 1 to 5 million - >5m s.d 10m
Side Business	- There is - None
Marital Status	- Single - Married

These criteria were obtained from interviews with UMi Partners. From the results of this data collection, criteria, and sub-criteria are obtained in determining the granting of loans, and there are additions to these criteria, as in the previous Table.

1. We are determining the relative importance of each decision criterion, determination of values and weights based on the degree of importance in UMi partners, and primary data available at the initiator's BRISPOT in the fostered work unit, as in Table 2.

Table 2. Determination of Sub-Criteria

Criteria	Sub-Criteria	Value
Neighbourly Life	• Mingle	-3
	• Not mingling	-2
Purpose of Applying for Credit	• Business Capital	-3
	• Investment	-2
	• Consumptive	-1
Source of Income	• From Business Salary	-3
	• Retired	-2
		-1
Income per month	• 10m to 50m	-3
	• 5m s.d 10m	-2
	• s.d 5 m	-1
Home Ownership Status	• Owned	-3
	• Parent-owned	-2
	• Rent	-1
Collateral/Collateral	• Immovable Goods	-3
	• Movable Goods	-2
	• None	-1
Business Legality	• -Kelurahan business legality	-2
	• -RT/RW business legality	-1
Borrowing Plan	• 1 to 5 million	-2
	• - >5m s.d 10m	-1
Side Business	• There is	-2
	• - None	-1
Marital Status	• Single	-2
	• - Married	-1

2. Calculate the total score value of each alternative and rank them.

The total value of each alternative is categorized into feasible, considered, and not feasible. The total value range is as in Table 3.

Table 3 Categories of Alternative Values Level Description

Level	Description	Value
1	1 Not feasible < 50	< 50
2	2 Considered 50-100	50 – 100
3	3 Feasible > 100	> 100

3. Creating a Usecase

One of the interrelated design stages is the creation of use cases to describe the scenario of a process that runs, the actors involved, and their duties and relation to the system used and the following is a use case diagram of the initiative process carried out by UMi Partners shown in Figure 1.

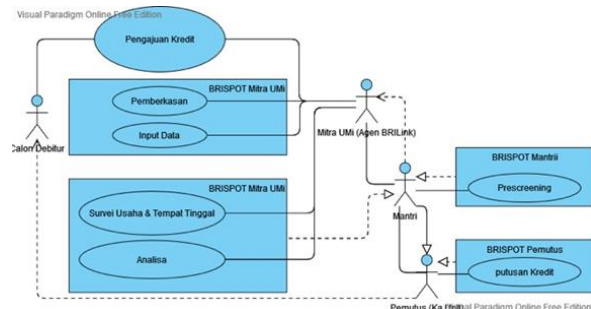


Figure 1. Use case on credit initiatives carried out by UMi Partners

4. ERD Diagram of Exponential Comparison Method (MPE).

ERD diagram illustrates the entity-relationship model, which combines the concepts of entities, attributes, and relationships between entities and entities in ERD that represent the credit initiative process carried out by UMi partners to prospective credit debtors shown in Figure 2

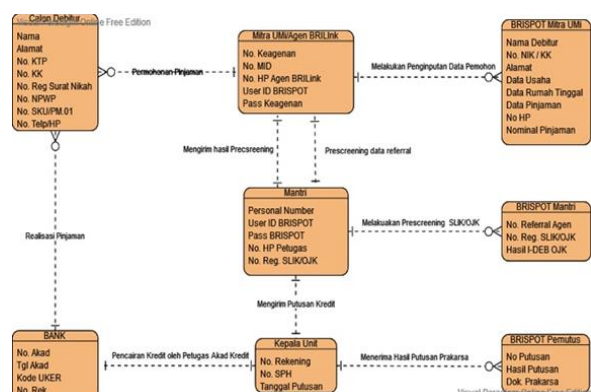


Figure 2. ERD on credit initiatives carried out by UMi Partners

5. Interface design

The following design stage in Figure 3 is the interface design, where this design will appear as an interface display of the program. This interface makes it easier for the design process to be better understood by the author and can be operated easily by its users (user-friendly).

Title	
Variable 1	Sub Variable 1
Variable 2	Sub Variable 2
Variable 3	Sub Variable 3
Variable 4	Sub Variable 4
Variable 5	Sub Variable 5
Variable 6	Sub Variable 6
Variable 7	Sub Variable 7
Variable 8	Sub Variable 8
Variable 9	Sub Variable 9
Variable 10	Sub Variable 10
Process	Finish

Figure 3. Display interface of the prospective debtor analysis process

Information
Result
Confirmed

Figure 4. Calculation process interface

The interface shown in Figure 4 is the final process of calculation where at this stage, the system will display the results of the existing calculation process according to the input (input) on the data of prospective debtors who will be given credit (Sugawara & Nikaido, 2014).

In this process, eligibility indicators will appear by the predetermined numerical vulnerabilities that will help Umi partners determine whether the prospective debtors who come to this credit granting process are deemed eligible, considered, or not eligible to be processed to the next stage.

RESULTS AND DISCUSSION

Implementing the Exponential Comparison Method (MPE) uses the criteria of attendance at work, timeliness in completing tasks, responsibility and professionalism at work, honesty, and customer communication. The reports generated in this system are the best employee

print, which will be submitted directly to the employee selected as the best employee. The best employee results report displays the value of employee data along with information on whether the employee is selected as the best employee or not, employee value history reports, and best employee history reports from each period.

1. Develop decision alternatives that will be selected.

For example, three alternatives have the potential to get a loan, and the following is a list of alternative prospective debtors who will get a loan, as in Table 4

Table 4. Categories of Alternative Values Level Description

Criteria	Potential debtors		
Neighbourly Life	2	3	2
Purpose of Applying for Kredit	1	2	2
Source of Income	2	3	3
Income per month	2	3	3
Home Ownership Status	1	2	2
Collateral/Collateral	2	1	3
Business Legality	3	3	3
Borrowing Plan	2	2	2
Side Business	2	3	2
Marital Status	2	2	2

2. Calculating the total value score of each alternative and ranking them

This calculation process is based on the formula :

Total score for prospective debtor 1:

$$TS1 = (2^3) + (1^3) + (2^3) + (2^3) + (1^2) + (2^2) + (3^2) + (2^1) + (2^1) + (2^1) \\ = 8 + 1 + 8 + 8 + 1 + 4 + 9 + 2 + 2 + 2 = \underline{45}$$

Total score for prospective debtor 2:

$$TS2 = (3^3) + (2^3) + (3^3) + (3^3) + (2^2) + (1^2) + (3^2) + (2^1) + (3^1) + (2^1) \\ = 27 + 8 + 27 + 27 + 4 + 1 + 9 + 2 + 3 + 2 = \underline{110}$$

Total score for prospective debtor 3:

$$TS3 = (2^3) + (2^3) + (3^3) + (3^3) + (2^2) + (3^2) + (3^2) + (2^1) + (2^1) + (2^1) \\ = 8 + 8 + 27 + 27 + 4 + 9 + 9 + 2 + 2 + 2 = \underline{98}$$

From the above calculations, it can be ranked based on the scores obtained. The order of value acquisition is as follows:

1. Prospective Debtor 1, with a score of 45
2. Prospective Debtor 2, with a score of 110
3. Prospective Debtor 3, with a score of 98

From the total score, 451 tis obtained:

Prospective Debtor 1 is considered not eligible for a loan with a total score of <50
Prospective Debtor 2 is considered eligible for a loan with a total score of >100,
Prospective Debtor 3 considered getting a loan with a total score between 50-100

Information on the results of the calculation process of the following prospective borrowers is summarised in Table 5.

Table. 5 Assessment result with Kredit initiative eligibility statement

Level	Noted	Value	Potential debtors
1	Not worth it	< 50	1
2	Considered	50-100	3
3	Worth	> 100	2

Testing and Verification Stage

In the last stage of the information system design method, the testing of the program made must be able to run correctly by the design and design written. This stage is also an indication of the calculation of this program, whether it runs as expected or whether there are still errors that need to be corrected. If yes, it must be rearranged, and stages must be corrected. On the other hand, if the program that has been made runs well, then this research is called successful (running), so it can be used to continue to the next stage, namely testing on users.

Furthermore, it will be expected to continue to be evaluated to be more mature and complex again as a stage of improvement of this system is made. Figure 5 is a look at the testing stage or the testing stage of the program that has been made.

Figure 5. Display of a successfully executed (compiled) program

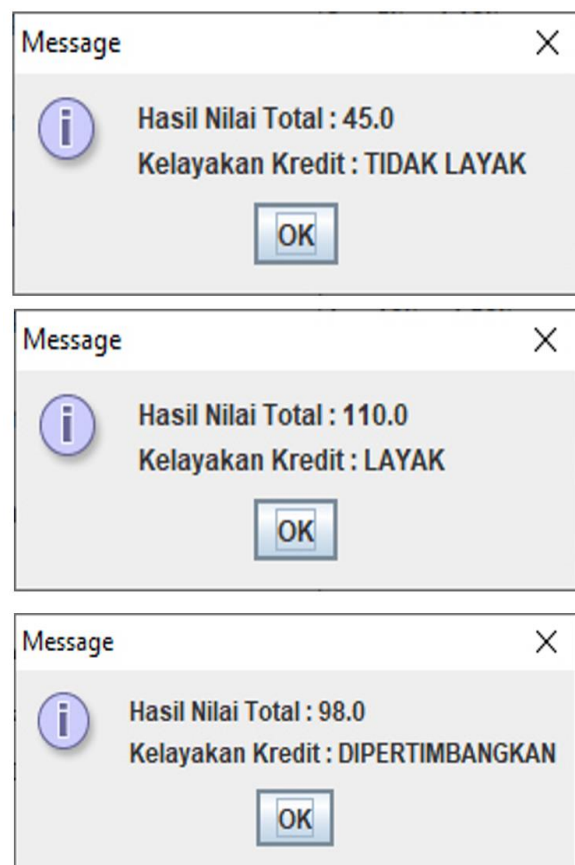


Figure 6. Display of calculation results and creditworthiness indicators

Display on Figure 6 are rank based on the scores obtained.

The order of value acquisition is as follows:

1. Prospective Debtor 1, with a score of 45

2. Prospective Debtor 2, with a score of 110
3. Prospective Debtor 3, with a score of 98

From the total score, it is obtained:

Prospective Debtor 1 is considered not eligible for a loan with a total score of <50. Prospective Debtor 2 is considered eligible for a loan with a total score of >100, Prospective Debtor 3 considered getting a loan with a total score between 50-100

CONCLUSIONS AND SUGGESTIONS

Conclusion

Based on the results of research that has been done, it can be concluded. 1) To increase financial inclusion among Micro, Small and Medium Enterprises (MSMEs), a pilot decision support system has been developed. This innovative system uses the exponential comparison method (MPE) to determine the creditworthiness of partners engaged in the Microfinance Institution (UMi) sector. The core focus of the system revolves around a carefully designed set of criteria. This covers a wide range of factors, including aspects such as community integration, credit objectives, main source of income, total income, property ownership status, available collateral, business legality, intention to borrow, additional business, marital status, and a. several other related criteria that can be used as additional variables. 2) The conceptualization and construction of this decision support system are carefully described through a systematic and structured methodology. This approach ensures the development of a robust decision-making tool that assesses creditworthiness and serves as an early warning system (EWS) for potential borrowers. This system seeks to simplify the decision-making process for UMi partners through its complex framework. This system reinforces the mission to increase financial inclusion in the MSME sector by aligning individual financial needs with customised solutions. 3) The functional application of this system is evidence of effectiveness and alignment with research objectives. Smooth execution of applications developed by predetermined objectives as described in Table 4.33. This system introduces a systematic and organized workflow by successfully integrating it into the existing lending landscape. Hence, it facilitates expedited lending procedures while upholding a shorter Service Level Agreement (SLA). The culmination of these advances has been increasing the efficiency of the lending process and placing it in competition with informal lending sources such as moneylenders and other unregulated institutions. 4) This sophisticated

decision support system goes beyond the boundaries of conventional credit scoring methods. This marks a significant step in driving financial inclusion by empowering UMi partners with sophisticated tools that assist in decision-making. This system has become a beacon of progress in MSME lending through comprehensive evaluation criteria and simplified processes, poised to catalyse positive change and facilitate economic growth.

Suggestion

The research yields several noteworthy suggestions. Firstly, it calls for the active engagement of system developers who recognize the socioeconomic significance of lending initiatives, urging their contribution through disseminating information technology knowledge and education. This support would empower UMi partners in expanding Ultra Microcredit, subsequently enhancing societal economic stability. Secondly, the application's user-friendly design is a catalyst for digital empowerment. By enabling easy access for UMi partners, including those unfamiliar with technology, it encourages adopting technological skills, aligning with their mission to become proactive UMi partners. Lastly, the research aims to serve as a foundational resource, offering insights and guidance for future studies that aspire to propel the national economy while educating the public about banking products. Ultimately, it strives to foster cooperation between the community and financial institutions, driving Indonesia toward comprehensive financial inclusion.

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