

INFORMATION TECHNOLOGY OF CREDIT COLLATERALS THAT WILL BE AUCTION BASED ON GOOGLE MAPS

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ABSTRACT

Collateral is an asset owned by the borrower that is promised to the lender if the borrower is unable to repay the loan. If the borrower defaults, the lender can have the collateral at the beginning of the loan. The lack of dissemination of information, and the lack of informativeness of the media for delivering information on credit collateral that will be auctioned off to the general public has resulted in low competitiveness among buyers of collateral to be auctioned off. To solve this problem, an approach is needed in delivering information that is informative and on target. The purpose of this study is to increase prospective buyers, thereby triggering competitiveness against nominal bid prices, the process of delivering information to be more efficient and effective by implementing new innovations in advertising credit collateral information that will be auctioned. The methodology used in this paper is a Mind Map, flowmap and S.W.O.T analysis by developing a Geo-Location application for Credit Collateral that will be auctioned. By using this application, the company's revenue growth increases compared to not using the application.

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1. INTRODUCTION

BNI's credit distribution grew in various segments, both Business Banking (BUMN, Corporate, Medium and Small Enterprises) and consumers. Credit to the business banking segment grew 15.3% to Rp. 231.1 trillion, compared to 2014 which was only Rp. 200.4 trillion. Although credit experienced growth, it was not accompanied by growth in the company's net profit. It was recorded that net profit decreased by 15.9% to Rp. 9.1 trillion, or a decrease compared to 2014 worth Rp. 10.8 trillion. In the provision of credit as stated in the Basic Banking Law, that the granting of credit must be based on the bank's belief in the ability and ability of the debtor to pay off his debts in accordance with the agreement [1]. To obtain this confidence, several stages are required before granting credit, namely character, capability, capital, current economic conditions that affect the debtor's business condition (conditional of economy) and collateral (collateral) [2]. Related to Bank BNI's business process in lending, after the analysis process of the 5C prospective debtor, the ability of the prospective debtor will then be analyzed in making installment payments. as objects financed by credit. Where the object as collateral will be processed at any time if the debtor has problems in making installment payments.

The collateral search process will be submitted to the debtor in advance for 1 to 2 months before it is agreed to be executed by the bank [3],[12]. If the execution process has been carried out by the bank, then the search for the collateral will go through an auction process which is used to obtain loan recovery or credit for the sale of the object being pledged as collateral.

Besides the procedure for delegating sales by the Auction Board takes a long time, the process of selling credit collateral that will be auctioned by BNI itself is only informed through BNI internal forums, mass media, leaflets displayed at the Small Credit Central Office (CCO), Medium Credit Center (MCC), the nearest branch office and several collateral whose advertisements were deposited on the official auction site

owned by Bank Mandiri. So that the target buyers are only in a small scope, and only a handful of people know the information. This has an impact on the auction price that will be released to the buyer, which will result in a decrease in the auction price.

The lack of information dissemination, and the lack of informativeness of the media for delivering information on credit collateral that will be auctioned off to the general public have resulted in low competitiveness among buyers [4],[13]. To solve this problem, an approach is needed in delivering information that is informative and on target, the author proposes to develop an application that can display all the credit collateral being auctioned in the form of a location based on Google Maps, where this application will show where the credit collateral is located, and provide additional information in the form of auction prices, collateral specifications, comparison of local market prices (eg market price of land, around the collateral). This application will also look for a list of credit collateral that is located close to the user's location, through checking the GPS smartphone of prospective buyers. It is hoped that it will make it easier for prospective buyers to search for collateral locations to conduct a direct review.

The development of this application uses the PHP Framework and Javascript, where the development itself does not require a fee (Cost Less) and this application can be accessed via Android, as well as smartphones that have the ability to access the internet through a browser [5].

Based on the background of the problem, it can be identified problems related to the Geo-Location Application Development for Credit Collateral that will be auctioned based on Google Maps, including:

- Lack of information regarding the distribution of credit collateral to be auctioned,
- Less innovative in terms of distribution of credit collateral to be auctioned, so that it is inefficient and ineffective,
- Expenditure costs for agencies related to the process of implementing the auction are very high.

The objectives of this research include:

- Increase potential buyers, thereby triggering competitiveness against the nominal bid price at auction,
- The process of delivering information becomes more efficient and effective,
- Implementing new innovations in advertising information on credit collateral to be auctioned.

2. RESEARCH METHOD

The methodology used in this paper is a Mind Map, flowmap and S.W.O.T analysis. so that the discussion process can be carried out systematically. Mind mapping can be interpreted as a process of mapping the mind to connect the concepts of certain problems from the branches of nerve cells to form a correlation of concepts towards an understanding and the results are poured directly on paper with animations that are liked and easy to understand by the maker [6],[11]. So that the resulting writing is a direct description of how the connections in the brain work.

Mind mapping is a way of developing thinking activities in all directions, capturing various thoughts from various angles. Mind mapping develops divergent thinking and creative thinking. Mind mapping which we often call concept maps is a very powerful organizational thinking tool which is also the easiest way to put information into the brain and retrieve that information when needed [7],[15].

The following is a Mind Map in solving the problems previously mentioned using the "Information Technology for Auctioned Credit Collateral".

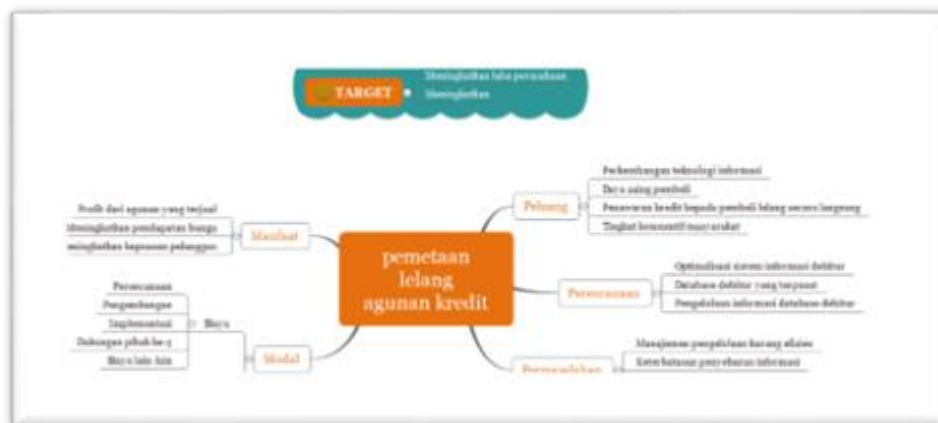


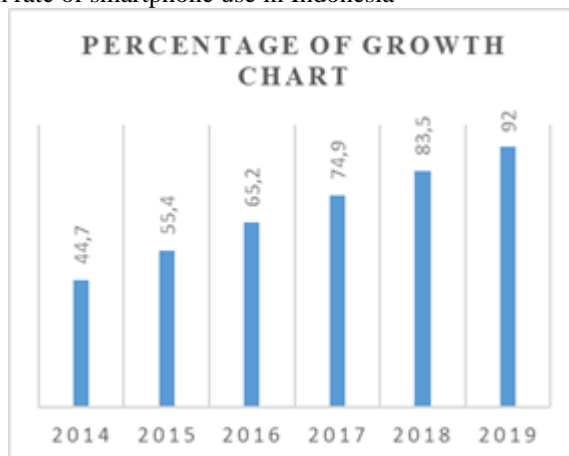
Figure 1. Mind Map

Based on the picture above, the main topic in this paper is the Geo-Location Application of Credit Collateral which will be auctioned. [8] Things that need to be observed in implementing this are some of the content related to the derivatives of the main concept of solving the problem, as well as the relationships that will emerge from the derived themes that are still related to the main concept.

3. RESULTS AND ANALYSIS

3.1 Smartphone User Data

The following is the growth rate of smartphone use in Indonesia



Source: <http://www.emarketer.com/Article/Asia-Pacific-Boasts-More-Than-1-Billion-Smartphone-Users/1012984>

Figure2. Percentage of Growth Chart

Based on the data above, it can be explained that the growth of smartphone use in Indonesia will continue to increase positively. This will have an impact on business growth and opportunities from the smartphone sector. This growth also indicates that the Indonesian people are starting to move towards the world of digital and mobile technology [9]. This is a good opportunity for Bank BNI to develop applications that fully operate on smartphones, and take advantage of all the technology provided in these smartphones.

3.2 Benchmarking

3.2.1 Mandiri Bank

PT. Bank Mandiri (Persero) Tbk. as a competitor, it has provided services in the form of an online auction site which can be visited at <http://lelang.mandiri.co.id>. In the auction site, Bank Mandiri can display properties/collateral that are ready to be sold through auction. Along with the increasing credit growth at Bank Mandiri, the number of collateral to be auctioned will also increase. As a bank that has a vision of “To be Indonesia's most admired and progressive financial institution”, in the future this website will not only target collateral auction enthusiasts in Indonesia, but also throughout the world, with the hope of expanding the target market and increasing potential buyers/investors who will purchase the auctioned assets.

In essence, many potential buyers/investors are interested in buying auction collateral where the auction sale price is relatively cheaper than the existing market price [10],[14]. However, many of these potential buyers/investors were unable to realize their desire to purchase auction collateral due to limited information on the sale of auction collateral itself. The Bank Mandiri auction site plays an important role in bridging the desires of potential buyers / potential investors with PT. Bank Mandiri (Persero). Tbk. as auction collateral seller or with the debtor as voluntary collateral seller. This website provides convenience to users / potential buyers regarding collateral information and procedures for participating in the PT. Bank Mandiri (Persero). Tbk collateral auction. The following are some interfaces from the Bank Mandiri auction site.

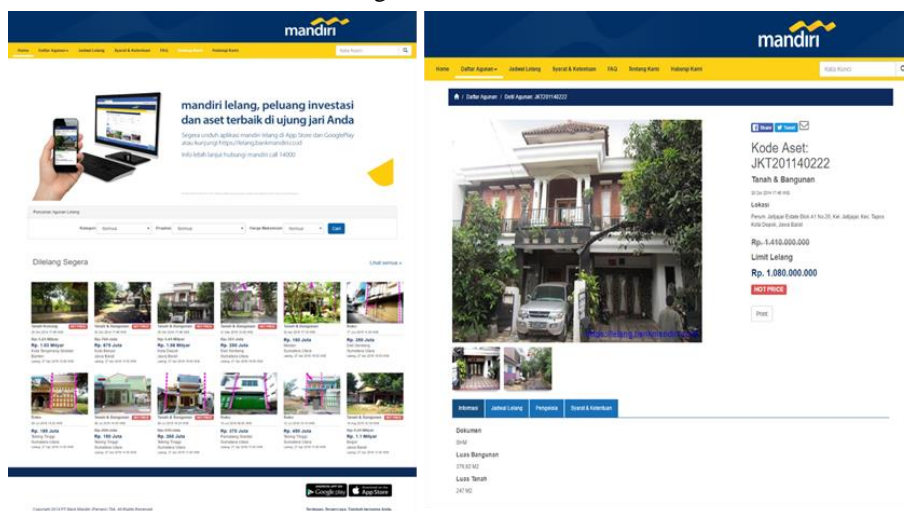


Figure 3. Auction Service Display

3.2.2 Commonwealth Bank Property

Commonwealth Bank Property is a service provided by the Commonwealth Bank of Australia. This service provides a solution for its customers to buy property in the form of an auction or directly in collaboration with Commonwealth Bank. Here are some interfaces from the Commonwealth Property website.

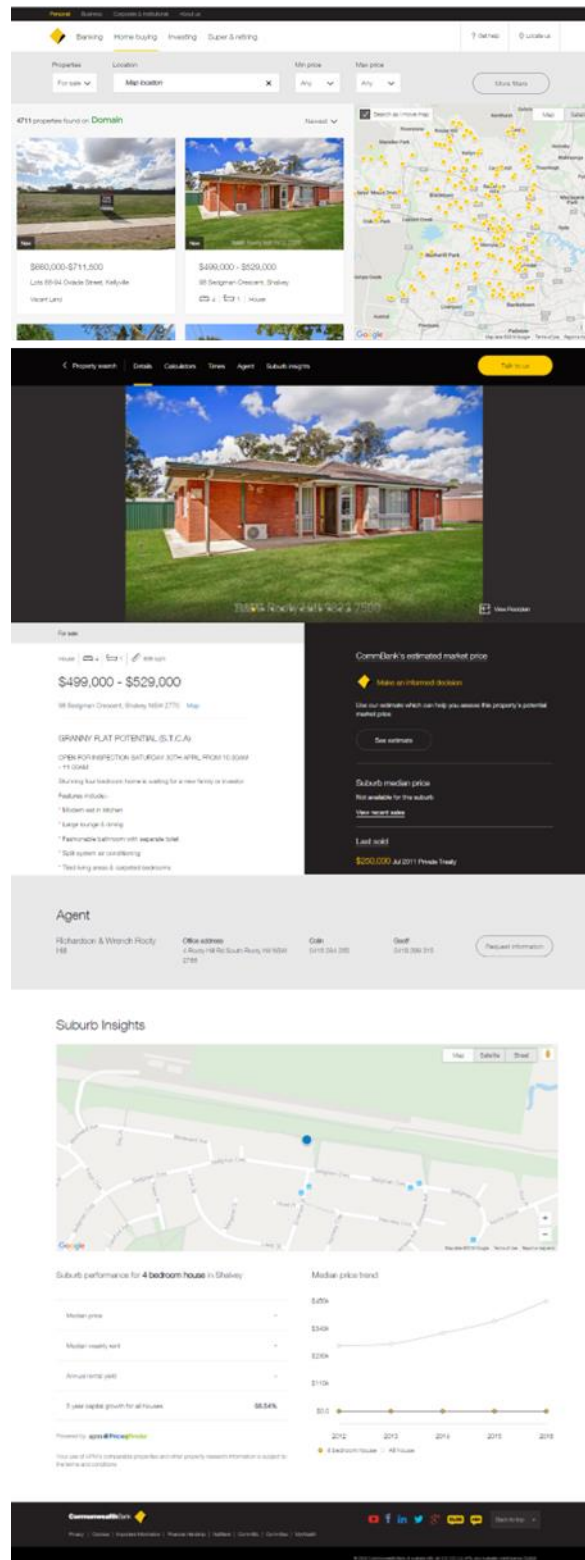


Figure 4. Auction Service Display

3.2.3 Advantages of BNI e-Auction

The following is a comparison of the features of the BNI Auction service owned by BNI with Auctions through Bank Mandiri and Commonwealth Property.

Table 1. Compared Auction service

Bank / Fitur	BNI Auction	Mandiri Lelang	Commonwealth Property
Registration	Online	Online	Online
Guarantee Money	20% - 50%	20% - 50%	-
Auction Process	Online dan Realtime	Offline, at the designated place	Online and Realtime
Ease of Transaction			
Transaction Safety	Money back guarantee 100%	Money back guarantee 100%	-
Auction Payment	14 working days after the auction	5 working days after the auction	-
Ease of Searching Collateral/Property	Display in the form of maps and applicative.	It's just a monotone text.	Display in the form of maps and applicative.
Notification of Nearby Collateral / Property Locations	Notification via mobile notification (Android)	-	-
Website popularity ranking	Worldwide: 6.303 Local: 148	Worldwide: 780.882 Local: 21.495	Worldwide: 1.157 Local: 10

There are several advantages compared to Bank Mandiri. And some of the same features are owned by Commonwealth Bank. However, the comparison with the Commonwealth Bank is still not effective, because the information required requires the author to have a savings account at the Commonwealth Bank.

3.3 Collateral Auction Execution Process

In the process of executing credit collateral to be auctioned off, of course, in accordance with the SOP run by BNI. The non-performing loan collateral will always be rescued first, before the final decision that the collateralized asset will actually be auctioned. This aims to minimize losses, both debtors as users of loan services and BNI as loan providers. The process of delegating credit collateral auction can be seen in the following picture.

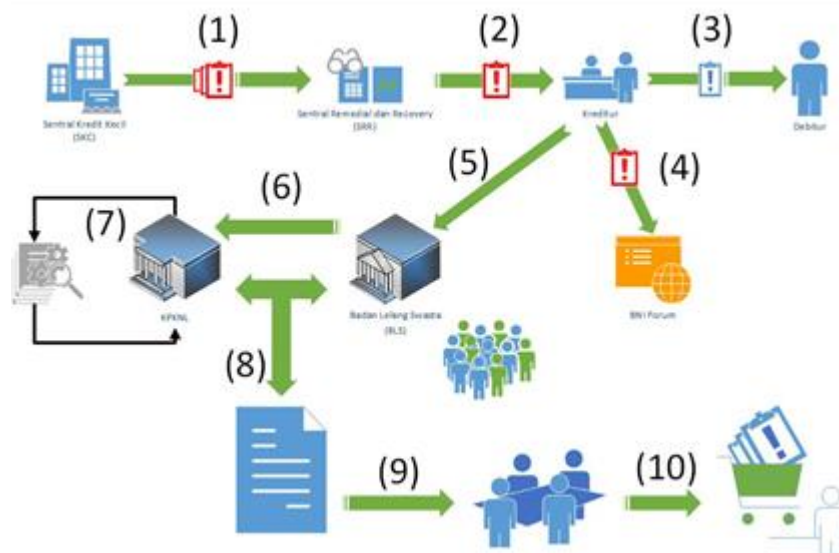


Figure 5. Credit guarantee auction delegation process

Explanation:

1. Transfer of Credit Files

CCO only processes credit collateral that has credit quality in collectibility 1 and 2. If the credit status of the collateral has entered collectibility 3 to 5, then SKC is not entitled to process the credit, then the file is transferred to SRR. Therefore, it is the SRR section that performs credit rescue, the transfer of files can occur many times along with the development of the course of a credit, collectability can go up and then down again and the credit file is returned to the CCO section.

2. File Check

The SRR section will carry out credit rescue, so that the collectibility credit status of 3 to 5 whose collateral is withheld does not end with the execution of an auction for the collateral. If the collectibility drops to 2, it will be handed back to CCO.

3. Collateral Disbursement Process

In this process, the credit cannot be saved, and therefore proceed with the decision to execute the disbursement of the collateral. Bank BNI gives the debtor the option to sell the collateral himself or submit it to the bank for auction. The debtor will be given a grace period of approximately 1 to 2 months to withdraw the collateral, generally the search process is carried out by the debtor, because the

benchmark price set by the debtor is too high from the market price, and there is no advertisement for the sale of the collateral.

4. **Announcement of collateral to be auctioned through the BNI Forum**
At this stage, Bank BNI has taken over the search process, before the collateral to be executed is transferred to the auction agency, the collateral will be first assessed by several vendors/external BNI parties for the appraisal of the collateral. After being offered several nominal values of the collateral, a competitive value is chosen where the price with the collateral object can compete with the market price, usually the use of appraisal services for collateral value is more than 500 million, and the price fixing of the appraisal is only valid for 1 year from issuance price. Then further information will be given in the BNI internal forum. Because this speed up the process of disbursing collateral.
5. **Delegation of the auction process to BLS**
If the collateral previously informed on the BNI internal forum has not been sold. Then the collateral will be forwarded to the Private Auction Center (BLS). The task of BLS is to collect and find potential buyers who have the potential to buy and will participate in the auction process.
6. **Issuance of auction date by KPKNL**
After BLS has obtained several prospective buyers, the collateral files will be submitted to the State Property and Auction Service Office (KPKNL) to prepare the auction date.
7. **Collateral file collection**
In addition to issuing the auction date, KPKNL also collects all credit requirements from the collateral file to be auctioned, usually to issue the auction date it takes 30 working days after the submission of the documents and credit requirements.
8. **Cooperation between BLS and KPKNL**
BLS and KPKNL work together to publish the collateral to be auctioned in connection with the issuance of the auction date, this aims to gather more potential buyers to participate in the auction process.
9. **Auction Process**
The due date for the auction will begin, representatives from several parties such as bidders, the Bank, BLS, and KPKNL must attend the auction process. In the auction process, all credit requirements, both files and original certificates issued by BLS and KPKNL, are shown to see the authenticity that this collateral is officially under a legal entity to be auctioned. Prior to participating in the auction, bidders must deposit cash in a State account belonging to the KPKNL of 50% of the value of the collateral to be auctioned.
10. **Collateral successfully sold**
The auction participant who successfully bids the highest price will be the winner and be entitled to the collateral. Furthermore, completing the payment of the remaining value of the collateral to Bank BNI, usually the process from administrative matters to the transfer of names to land and buildings takes 14 working days. After going through the entire auction procedure, there will be a percentage of profit sharing from all relevant agencies.

3.4 Innovation from Current Process

In the previous process, it was known that in conducting the auction, the number of participants was important, competition from price offers would make the selling price of the collateral more expensive. For this reason, additional methods are needed so that there will be more search for prospective buyers, this aims to accelerate the disbursement of collateral, and minimize losses, both debtors as users of loan services and BNI as loan providers. The following is a description of the innovation from the process of delegating credit collateral auction.

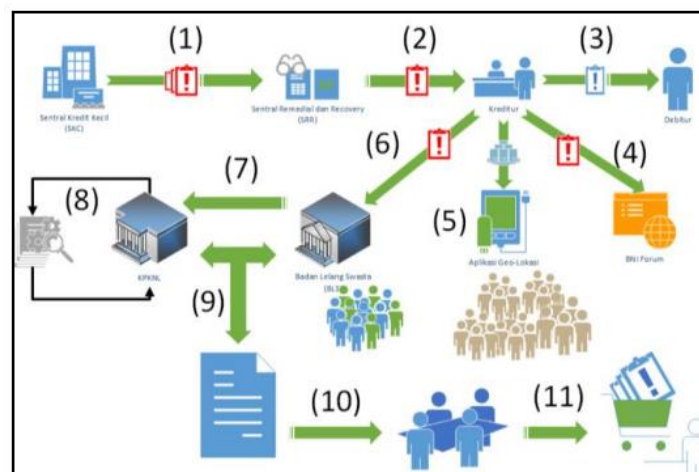


Figure 6. Credit Guarantee Auction Delegation Process

Based on Figure above there is 1 additional process, namely at number 5. After the collateral file is distributed through the BNI Forum, BNI Bank also disseminates the collateral information through the GeoLocation Application, where this application is used by anyone, with a more informative and communicative display, and ease of use.

The flow of the appearance of collateral information that will be auctioned so that it can be displayed in the form of Geo-Location is as follows.

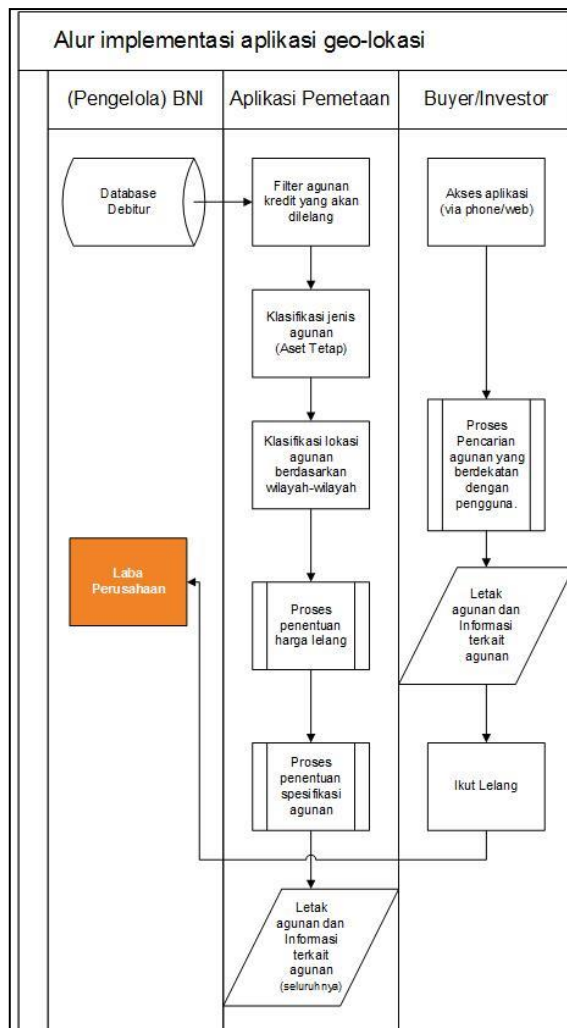


Figure 7. application implementation flow

Based on Figure above regarding the process flow, it can be explained as follows:

a. Application stages.

1. The application will access the BNI debtor database, then filter debtors based on non-performing credit status.
2. Then manage the information from these debtors, and classify the types of collateral based on the type of collateral for fixed assets (land and buildings).
3. Then classify the locations of the collateral based on the regions.
4. Then determine the auction price according to the specifications of the collateral.
5. Then display the entire list of collateral, to make it easier for admins to manage.

b. Stages for buyers/investors.

1. The user accesses the application via a smartphone or through a web browser.
2. The system will take the user's GPS coordinates, and search the database for collateral located close to the user's GPS coordinates.
3. The system will display all information related to collateral.
4. Users can participate in the auction of the collateral, according to the applicable provisions.

c. Stages in BNI.

1. Contacting prospective buyers/customers regarding the continuation of the collateral auction.
2. Carry out the auction process, until the collateral is sold

3.5 Implementation

3.5.1 Main Page via Browser

3.5.4 Collateral Info Page via Android Smartphone

Similar to the desktop version, the mobile version also provides a detailed information page regarding collateral.



Figure 10. First Display of Application Via Smartphone Android

With a minimalist appearance, easy to use, and there is a photo gallery to provide all aspects of the collateral so that potential buyers can find out an overview of the collateral that he wants to buy, before coming to visit the location of the collateral.

3.5.5 Analysis

The following is an analysis related to the Geo-Location Application of Credit Collateral that will be auctioned. The analysis carried out is SWOT analysis (Strength, Weakness, Opportunity and Threat) and cost & benefit analysis. This analysis was conducted to obtain a more objective and detailed hypothesis, so that the results of this study can be considered in future realization.

SWOT Analysis			
	Helpful		Hamful
Internal	Strengths	Tampilan Geo-Lokasi, lebih menarik Pemetaan Lokasi, untuk analisis lokasi strategis Mengetahui Agunan Terdekat Mudah mencari lokasi Mudah Mengikuti Proses Lelang	Memerlukan bandwidth yang stabil untuk load Maps Notifikasi akan semakin sering jika berdekatan di daerah yang banyak terdapat agunan
			Belum memungkinkan untuk melakukan lelang langsung secara online dan realtime
External	Opportunities	Permintaan yang luas Agunan cepat terjual Memungkinkan dilakukan analisis lain berdasarkan pemetaan agunan Meningkatkan daya saing dengan Bank Kompetitor dalam pengembangan teknologi terkini	Bank kompetitor meniru teknologi ini, sedangkan mereka telah memiliki sistem lama yang sudah mumpuni
			Threats

Figure 11. SWOT Analysis

3.5.6 Cost and Benefits

In every system development, or improvement, an assumption is needed that can describe the effect of the implementation of this innovation, so as to know the benefits that may be obtained in the future after implementation.

Table 2. Cost and Benefits.

Assumption of Expenditure	Cost
Application Development	Rp. 5.000.000
Upload Google Play Store	Rp. 350.000
Total expenses	Rp. 5.250.000

Based on the calculation table above, it can be concluded that, making this application is fairly cheap. By utilizing BNI e-Auction, which makes it easier to bring together prospective buyers with collateral that is ready to be auctioned, this will shorten the auction execution time, thereby suppressing the decline in the value of the collateral due to depreciation expense. Which means that BNI e-Auction also provides benefits for BNI Bank.

Based on the 2015 Bank BNI annual report, the report on the sale of collateral is contained in the Consolidated Financial Statements, in the Other Assets – Net account, as follows.

Revenue in 2015 from the sale of collateral:

Sales = IDR 524.590 million/365 collateral
= Rp.1.437.232.876/collateral

Depreciation = Rp.159,693,000,000/365 collateral
= Rp.437,515,068/collateral

Income = IDR 524.590 million – IDR 159.693.000.000
= Rp.364.897 million/365 collateral
= Rp.999,717,808/collateral

Then, assume the income from the sale of collateral in 2016 with 379 collaterals as follows:

Revenue in 2016 from the sale of collateral:

Sales = IDR 1,437,232,876 * 379 collateral
= Rp.544.711.260.004

Depreciation = Rp.437,515,068 * 379 collateral
= Rp.165,818,210,772

Income = Rp.544.711.260.004 - Rp.165,818,210,772
= Rp.378,893,049,232

After implementing BNI e-Auction, there was an increase in prospective buyers in the auction, so that the value of the collateral increased in the range of 10%. Then the income assumption in 2016 is as follows:

Revenue in 2016 from the sale of collateral:

Sales = IDR 1,437,232,876 + (IDR 1,437,232,876 * 10%) * 379
= Rp.599,182,386,004

Depreciation = Rp.437,515,068 * 379 collateral
= Rp.165,818,210,772

Income = Rp. 599,182,386,004 - Rp.165,818,210,772
= Rp.433.364.175.232

So it can be concluded, 2016 revenue for collateral sales increased by 10% when using BNI e-Auction, compared to sales without using BNI e-Auction.

4. CONCLUSION

The conclusions that can be drawn from the development of geo-location applications for the auction of collateral are as follows: (1). In the auction procedure, there is often a long lag time for each process, this has an impact on the length of time for the collateral to be disbursed; (2). Strict regulations in conducting auctions are considered to reduce the income of the seller/collateral owner, because of the procurement and implementation costs to related parties; (3). The application of the Geo-Location method in displaying the location and information on collateral is considered very helpful in the process of finding prospective buyers and increasing sales revenue.

REFERENCES

- [1] Basri, Nurmala, and S. Syamsia. "The effect of applying mind mapping method in writing descriptive text." *Lingua: Journal of Linguistics, Literature, and Language Education*, pp. 36-56. 2020.
- [2] Chandra, Y. (2022). Non-fungible token-enabled entrepreneurship: A conceptual framework. *Journal of Business Venturing Insights*, 18, e00323.
- [3] Filomeni, Stefano; Baltas, Konstantinos. Senior-subordinated structure: buffer or signal in securitisation? *The European Journal of Finance*, pp. 1-34. 2022.
- [4] Hadi, Samsul, et al. "The difficulties of high school students in solving higher-order thinking skills problems." *Problems of Education in the 21st Century*, pp. 520, 2018.
- [5] Hasanah, Uswatun; Hamzah, Mohammad Amir. "Protection Of Debtor Customer's Rights As Consumers In The Execution Of Mortgage Object Auction In Indonesia." In: 1st International Conference on Social Sciences (ICSS 2018). Atlantis Press, pp. 1307-1310, 2018.
- [6] Incekara, Ahmet, and Harun Çetinkaya. "Credit risk management: A panel data analysis on the Islamic banks in Turkey." *Procedia Computer Science* 158, pp. 947-954, 2019.
- [7] Junita, Imelda. "Transformational leadership in digital era: analysis of nadiem makarim (founder of go-jek indonesia) leadership figure." pp. 80-92, 2019
- [8] Khairani, Muthia, and Vera Diyanty. "Analysis of the Implementation of Credit Risk Management at PT BPR X." *International Conference on Economics and Business Studies (ICOEBS 2022)*. Atlantis Press, pp. 128-131, 2022.
- [9] Muhlisin, Ahmad. "Reading, mind mapping, and sharing (rms): innovation of new learning model on science lecture to improve understanding concepts." *Journal for the Education of Gifted Young Scientists*, pp. 323-340, 2019.
- [10] Prihartanto, M. D. (2021). Settlement of Auction Disputes over Land and Building Collateral Objects. *Journal of Law and Legal Reform*, 2(2), 197-210.
- [11] Rotondi, Valentina; Stanca, Luca; Tomasuolo, Miriam. Connecting alone: Smartphone use, quality of social interactions and well-being. *Journal of Economic Psychology*, pp. 63: 17-26. 2017.
- [12] Swestyani, S., Masykuri, M., Prayitno, B. A., Rinanto, Y., & Widoretno, S. (2018, May). An analysis of logical thinking using mind mapping. In *Journal of Physics: Conference Series* (Vol. 1022, No. 1, p. 012020). IOP Publishing.
- [13] Swestyani, S., Masykuri, M., Prayitno, B. A., Rinanto, Y., & Widoretno, S. (2018, May). An analysis of logical thinking using mind mapping. In *Journal of Physics: Conference Series* (Vol. 1022, No. 1, p. 012020). IOP Publishing.
- [14] Thornton, Alec. "City Case Studies in Urban Governance and Urban Activism." *Space and Food in the City*. Palgrave Pivot, Cham, pp. 49-100, 2019.
- [15] Zhang, Y., Wang, L., & Duan, Y. (2016). Agricultural information dissemination using ICTs: A review and analysis of information dissemination models in China. *Information processing in agriculture*, 3(1), 17-29.