

Land Property Market Value Determination Database for Collateral Purpose (Case Study: PT. Bintang Dharma Hurip Pekanbaru)

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Abstract

PT. Bintang Dharma Hurip, as one of appraisal companies already has the land and residential data in Pekanbaru, many data were not stored in organized database, therefore made difficult and delayed tasks of valuer especially to determine the Reproduction Cost New (RCN). The problem would be resolved when researchers proposed a dynamic property database, calculated the market value of land and implementation fuzzy queries so the redundancy data and loss can be minimized. The purpose of the research was to obtain a reference database application of properties in Pekanbaru based on last two years survey by PT. Bintang Dharma Hurip. The development method of research used Rapid Application Development, which were consists of requirements, design, construct, and implementation phases. The application used Visual Basic 6.0 and Microsoft Access 2003 as database tools. The research result was a database application size 6 MB. The user's application divided into three, which are inspector, valuer, and reviewer. In the implementation phase, the researcher asked three reviewers, two valuers and one inspector PT. Bintang Dharma Hurip to conduct tests on the application. Apparently, from the test results, researchers concluded that the application is running well and suitable with company's needs.

Keywords: database, fuzzy, property, market value, PT. Bintang Dharma Hurip

1. Introduction

One of the professions that exist in Indonesia is a professional appraiser. This profession is less known for the ordinary people like any other profession. Thought the profession including professional appraisal is very important in improving the efficiency of national economy and the protection of public interest. Public appraisal profession is engaged in the work area by someone who is based education and expertise to run the assessment and has obtained permission from the Ministry of Finance. Assessment is the process of work to give an estimate opinion and economic value of an object according to Standard Assessment of Indonesia.

PT. Bintang Dharma Hurip as one of appraisal companies is located at Pekanbaru, already has land and residential data, but data is not stored in the form of a computerized database, therefore the researcher propose an database application to simplify and accelerate the work of an appraiser. The application conducted to observe and analyze any data development and supply a property transaction. These properties can be land, houses, shop, gardens, factories, and vehicles. The researcher have develop database application include determine the market value of land property, dynamic property database and fuzzy query implementation for Reproduction Cost New (RCN).

Database is basically a collection of information, usually in a particular order. Database is a collection of data related to each other, is stored outside the computer and used certain software to manipulate it [1]. In many real world conditions such as the process of selecting students who deserve scholarships, vague data needed for decision making, that's why researchers use fuzzy logic for database application [2]. Another research result stated that fuzzy database provide recommendations for academic supervisor to determine the interest field study students refer to their support activities and the assessments of their abilities [3]. Refer to [4], fuzzy database Tahani is also used to support decision to buy a car. Based on previously studies, researchers purposed fuzzy database to determine RCN (Reproduction Cost New) value for collateral purpose.

Value is the economic concept that refers to the price that is likely agreed between buyer and seller of an item or a service in certain time according to value of certain definition. Value is not a fact, but rather a price that is likely to pay for goods or services at a particular time in accordance with a specific definition of value. While the market is an environment in which goods and services traded between the buyers and sellers through the price mechanism [5]. The function of market value is providing a reference for determining collateral value for the appraiser and banks. In addition, the market value is used to sales and financial reports. In general, the market value is useful for determining the fixed assets value [5].

Property is a legal concept that includes the interests, rights, and benefits associated with an ownership [5]. The property consists of rights of ownership, which entitles the owner of specific interest or some interests in what they have [6]. Fuzzy word is an adjective meaning vague, not clear. Fuzziness or vagueness or ambiguity or uncertainty always includes everyday people. Fuzzy logic is an appropriate way to map the input space into an

output space [7].

Tahani fuzzy database models still use the standard relation, only this model using fuzzy set theory to obtain information on its query.

The steps for create Tahani fuzzy database models are: [7]

1. Analysis of system requirements, consist of:
 - a. Input requirements (input fuzzy variable and non fuzzy).
 - b. Output requirement
2. System design
 - a. Data flow diagram
 - b. Database design (table structures and relation between tables)
3. Member function
4. Query formation

Tahani describe a query processing method based on fuzzy with manipulation language called SQL (Structured Query Language).

2. Research Method

The research method consists of two parts, the data collection method and the application development method. Data collection method divided into literature review and field study. The application development method that researchers use in this research is Rapid Application Development (RAD) [8],[9]. Reason to use RAD is because application to be developed is a small-scale/ medium, and focused on a specific scope, which is suitable with PT. Bintang Dharma Hurip Appraisal. (Figure1).

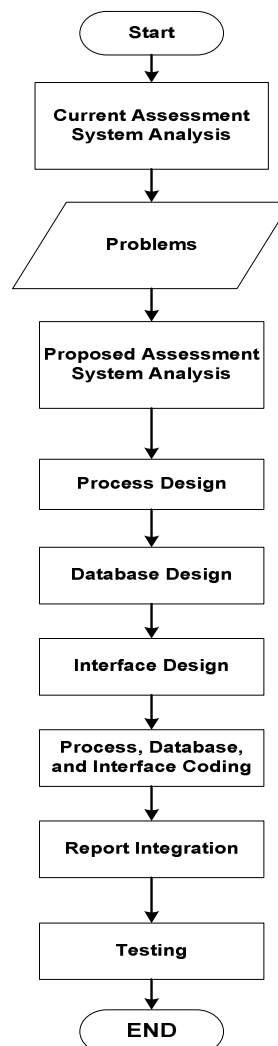


Figure 1. Flow Research

3. Analysis and Results

Before design the application, researchers compare with similar research. There were information system assets (SIMASET) and inventory information system (SIMBADA). These systems only display the following asset inventory value without any calculation of asset value. The proposed research, could find out the variables needed to

calculate the market value of an asset/ property such as land even addition by fuzzy calculations to help the valuer to determine the RCN value from a residential property because the valuers were often hesitate to determine the RCN value. Based on similar research studies, researcher proposed an application to organize comparison data computer based to solve problems there. Next phase is process design, where the researchers create proposed system flowchart, context diagram (Figure 2), data flow diagram, and entity relationship diagram. Database design consist of user's table, land object data's table, land object picture's table, comparison data's table, property object data's table, property object picture's table, building description's table, adjustment table, fuzzzscoring table, item fuzzy's table, and assignment table.

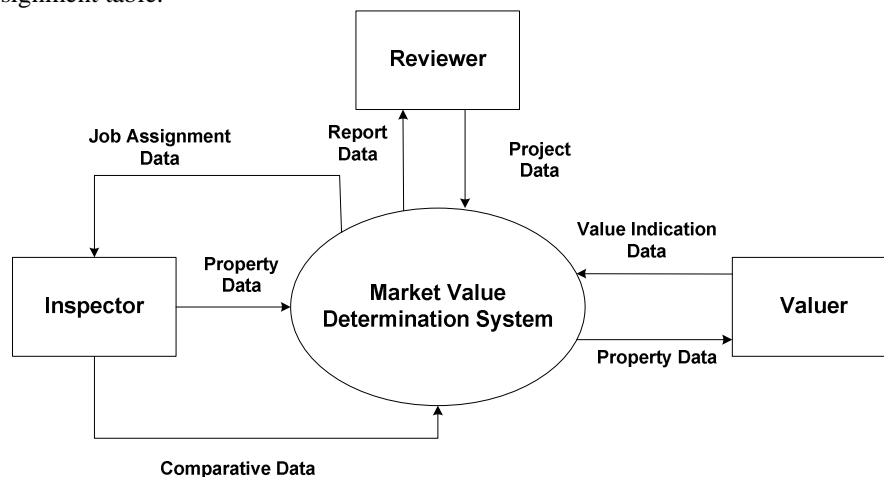


Figure 2. Context Diagram Proposed System

The researcher used market data approach. The approach can be used to all the assets as long as the assets have market data support. Generally, the approaches or methods used in the valuation of land, shops and machines. In this research, we use market data approach. This method in its implementation may be obtained by comparing several sale and purchase transactions of a similar and comparable asset that can be viewed from several parameters, such as location, legality, form type, and its usefulness based on time and many others. The difference of physical properties and assets among them are the comparison to the assets being assessed will be reduced through adjustment proportionally. The adjustments will calculated for each price compare with available data and then a conclusion can be drawn from the asset value. The parameters used for the adjustment factors are time, offering data condition, location, area of land, legal, land form, contours of land and roads. These factors are the percentage calculated in rupiah and have a relationship with an indication of the value of land/m² [5].

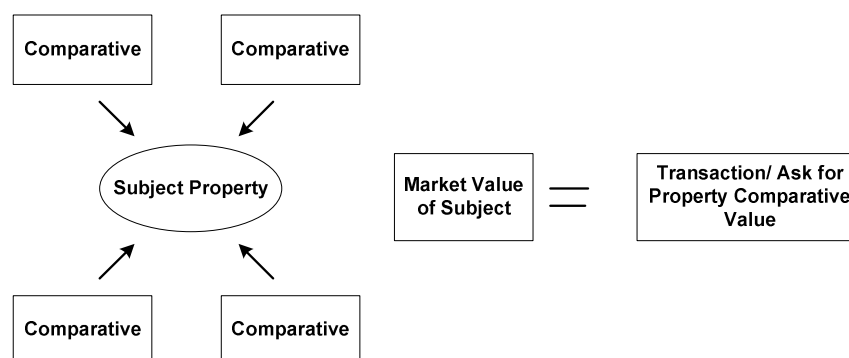


Fig. 3 Market Approach

Input system is represents data needs which associated with data assets that will be assessed and the comparative data consist of identification and its value. Meaning of identification are a location; designated; distance with assets valued; distance between asset and road access; data sources; data conditions; existing roads; land area; building area; legality; land forms; land contour and conditions. While its value is the price of land offers; discounts; prices of land and an indication of the approximate value of the land/m² and the percentage of assets adjustment factors of comparative data. In the fuzzy computation, the valuer must input criteria based on given variable. For example: if the variable selected is roof, the valuer must input the type of roof which is used along with the score. The fuzzy variables used are roof, floor, ceiling, walls and sills. In selection of fuzzy variables which is valuer used, the valuer must give the name of the item. If an item that is used does not exist, then the valuer can enter himself on fuzzy

variables form. For example: if fuzzy variable selected is roof, then its fuzzy item can be metal roof, ceramic tile, zinc, and others in accordance with the conditions found in field.

Domain fuzzy set used are:

1. Simple (5, 25)
2. Moderate (20, 50)
3. Intermediate (45, 75)
4. Luxury (70, 100)

The calculation process of market value is calculation for properties such land. The process can be done if the identification of assets that will be assessed on the form object is already filled with the land. In calculating the market value of land needed three comparative data. The comparative data will be used must be inputted on the comparison form. By using comparative data, the valuer can find comparative data are needed then add it in the form of adjustment computation process. The assets id and adjustments will be displayed on the form id of the assets which is being valued and comparison id which used for. The comparative data parameter adjustments with assets to determined here in order to obtain a value comparison indication. Indication of comparison value will be as benchmark against indication of assets market value which is being assessed.

Before calculate member degree (μ), we should determine member degree (μ) or also called membership function. It is a curve that showing the points of mapping input data into the interval with a membership value between 0 and 1. One way that can be used to obtain the membership value is through a function approach.

The process of calculating μ (degree of membership) according to fuzzy set domain:

1. Simple (5, 25)

$$\mu[x]=\begin{cases} x \leq 5 & \text{then } \mu=1 \\ x \geq 5 \text{ and } x \leq 25 & \text{then } \mu = (25-x) / (25-5) \\ x \geq 25 & \text{then } \mu=0 \end{cases}$$

2. Moderate (20, 50)

$$\mu[x]=\begin{cases} x \leq 20 \text{ or } \geq 50 & \text{then } \mu=0 \\ x \geq 20 \text{ and } x \leq 50 & \text{then } \mu = (x-20) / (50-20) \\ x \geq \text{peak limit and } x \leq 50 & \text{then } \mu = (50-x) / (50-\text{above top value}) \end{cases}$$

3. Intermediate (45, 75)

$$\mu[x]=\begin{cases} x \leq 45 \text{ or } \geq 75 & \text{then } \mu=0 \\ x \geq 45 \text{ and } x \leq \text{peak value} & \text{then } \mu = (x-45) / (\text{above peak value} - 45) \\ x \geq \text{peak limit and } x \leq 75 & \text{then } \mu = (75-x) / (75-\text{above peak value}) \end{cases}$$

4. Luxury (70, 100)

$$\mu[x]=\begin{cases} x \leq 70 & \text{then } \mu=0 \\ x \geq 70 \text{ and } x \leq 100 & \text{then } \mu = (x-70) / (100-70) \\ x \geq 100 & \text{then } \mu=1 \end{cases}$$

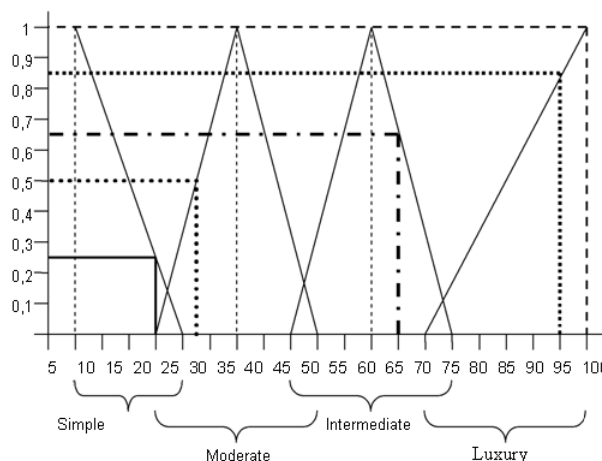


Figure 4. Fuzzy Set Domain

The function that the researchers use is a triangular curve representation function (Fig. 4). At output system, the researchers have developed an application that provides output to user in the form of reports containing the calculation of the market value of land and assets following their identification with comparative data. This application using Visual Basic 6 as platform [10],[11],[12]. For the fuzzy output process is a process of displaying the results of a search query from house id which is use a specific fuzzy variable that can be viewed on a computer screen. For making the report, carried out by using Active Reports software. At construction phase, all design integrated and build coding.

4. Conclusion

The application will keep data stored neatly in the form of a database which is uses Microsoft Access 2003 and Visual Basic 6.0 platform, so that it can facilitate the inspector and valuer in the data input and operation. Determination the market value of comparative data needed as many as three similar items. Indication of comparative land values obtained from the estimated price of land divided by total land area. After that, the adjustment can be done to adjust the data for comparison with the assets being evaluated. The sum of weight data from the third comparative data after going through the process of adjustment will be an indication the market value of land/m² of the assets being evaluated. Fuzzy query is applied to help the valuer to determine RCN value (Reproduction Cost New) by considering the variables roof, floor, ceiling, walls, and frames used in the house. The application was tested by three reviewers, two valuers and one inspector PT. Bintang Dharma Hurip to conduct tests on the application. Apparently, from the test results, researchers concluded that the application is running well and suitable with company's needs.

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