

**PROTOTYPE HOME LOAN PACKAGES SELECTION
DECISION SUPPORT SYSTEM USING FINANCIAL MODEL**

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**A project report submitted in partial fulfillment
of the requirements for the award of the degree of
Master of Science (Information Technology-Management)**

**Faculty of Computer Science and Information System
Universiti Teknologi Malaysia**

NOVEMBER 2005

To my beloved
Father, Book Poo
Mother, Kwee Eng,
Brother, Chee Keong
and my dearest friend, Kheng Wei.
Thanks for your continuous support and encouragement

ACKNOWLEDGEMENT

I would like to take this opportunity to express appreciation to my friendly and helpful project supervisor, Dr Azizah Binti Abdul Rahman. She has given me a lot of advice, guidance and comments in order to complete the project successfully.

Also, I would like to express gratefulness to my father (Book Poo), mother (Kwee Eng), brother (Chee Keong) and best friend (Kheng Wei) for their valuable understanding and encouragement offered throughout the length of this study.

To my lovely friends, I would like to thank you for their impressive and valuable help during my efforts to complete the project.

Special thanks to my lovely friends, staffs, lecturers in the Faculty Computer Science and Information System, University Technology Malaysia for their help and support.

Once again, thank you.

ABSTRACT

The process of choosing home loan packages is an important process for homebuyers. However, the process of choosing home loan packages is still being done manually. Actually, the traditional method used in the home loan packages choosing process is time consuming and troublesome to the homebuyers. However, the rapid growth of web technology has enabled proposed system to be applied as a competitive method to overcome the problem. Internet has become the channel for people to receive and convey information between each other in the decision making process. Prototype Home Loan Packages Selection Decision Support System Using Financial Model (HSDSS) is support system that using mathematical model (financial method) to allow user to explore the impact of available options. The optimal solution is obtained by using blind search with complete enumeration to check all the alternatives. This searching approach works together with weighted point system, so that the alternatives will have their weight of points after the searching is done. Based on the result of the ranking of the alternatives, HSDSS provides advices to the homebuyers on the matter of selecting suitable home loan packages. The use of this system will speed up and simplify how homebuyers make decision in choosing home loan packages, in addition to improving the competitive advantage for real estate service providers. As a conclusion, this system is capable in solving the current problems associated with choosing best suit home loan packages.

ABSTRAK

Proses pemilihan pakej pembiayaan perumahan merupakan proses membuat keputusan yang penting bagi seseorang pembeli rumah. Walaubagaimanapun, proses pemilihan pakej pembiayaan perumahan masih lagi dilakukan secara manual. Sebenarnya, kaedah tradisional ini bukan sahaja memakan masa malah menyusahkan pembeli rumah semasa membuat keputusan dalam pemilihan pakej pembiayaan perumahan. Perkembangan teknologi web yang pesat telah membolehkan sistem cadangan diaplikasikan sebagai satu kaedah kompetitif bagi mengatasi masalah proses pemilihan pakej pembiayaan perumahan pada masa kini. Internet menjadi media massa kepada orang ramai untuk menerima dan menghantar maklumat antara satu sama lain dalam process membuat keputusan harian. Prototype Sistem Bantuan Keputusan Pemilihan Pakej Pembiayaan Perumahan Penggunaan Model Kewangan adalah sistem bantuan yang menggunakan model matematik yakni kaedah kewangan dalam untuk menyediakan penyelesaian kepada masalah kepada pembeli rumah dalam perihal pemilihan pakej pembiayaan perumahan. Penyelesaian yang terbaik diperoleh dengan menggunakan kaedah carian yang dikenali sebagai *blind search*, di mana carian menyeluruh dilakukan kepada semua alternatif. Kaedah carian ini bekerjasama dengan satu sistem pemberat yakni *point system*. Dengan itu, semua alternatif akan mempunyai markah pemberat masing-masing selepas pencarian dilakukan. Berdasarkan penyusunan kepada alternatif berpemberat ini, sistem ini akan membekalkan bantuan keputusan kepada pembeli rumah dalam menyelesaikan masalah mereka. Penggunaan system ini secara langsungnya dapat mempercepatkan proses membuat keputusan bagi pembeli rumah dalam pemilihan pakej peminjaman perumahan yang bersesuaian. Ini seterusnya dapat meningkatkan daya saingan *real estate service providers*.

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LIST OF ACRONYMS

ASP	-	Active Server Pages
BLR	-	Base lending rate
DBMS	-	Database Management System
DSS	-	Decision Support System
EPF	-	Employee Provident Fund
HSDSS	-	Home Loan Packages Selection Decision Support System
HTML	-	Hypertext Markup Language
IIS	-	Internet Information Server
IE	-	Internet Explorer
IT	-	Information technology
MBMS	-	Model Base Management System
MOF	-	Margin of finance
MRTA	-	Mortgage reducing terms assurance
p.a.	-	Per annum
SDLC	-	System Development Life Cycle
SQL	-	Structured Query Language
SWOT	-	Strengths, weaknesses, opportunities and threats
TSD	-	Traditional System Development
UML	-	Unified Modelling Language
WWW	-	World Wide Web

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The rapid growth of information technology (IT) provides a great opportunity in industries. IT becomes critical to the organizations survival or growth. It plays important role as strategic tool for organizations to gain a competitive edge in order to deliver their services to their targeted customers.

The growth of the Internet has created another opportunities for organizations to shift their business to the web in order to deliver their businesses in a competitive method. Therefore, World Wide Web (WWW) becomes one of the popular mass medium.

Decision support system (DSS) is a well-established area for information system applications, which help the decision makers to derive efficient and accurate solution. DSS supports human decision-making process. It provides decision makers with the tools to help them in making decisions in their own way. Therefore, DSS have been applied in many areas of business decision-making.

The web technology with decision support system features will be a competitive tool for service providers to deliver their services to their customers. In today's competitive environment, it is an advantage if service providers able to develop the ability to facilitate decision-making process for their customers.

1.2 Current Real Estate Service Providers' Property Search Engine

From the observations on these five samples of real estate service providers' web page, these search engines do not provide decision support functionality for homebuyers on the housing loan selection decision-making. As a conclusion, it is conclude those enhancements need to be done on current system to meet future business needs.

1.2.1 PropertyCity

PropertyCity links its web site with the banks or finances that provide the home loan packages to the homebuyers. It differentiate the information of banks into three categories which are banks' web site, banks' housing loan and banks' branch location.

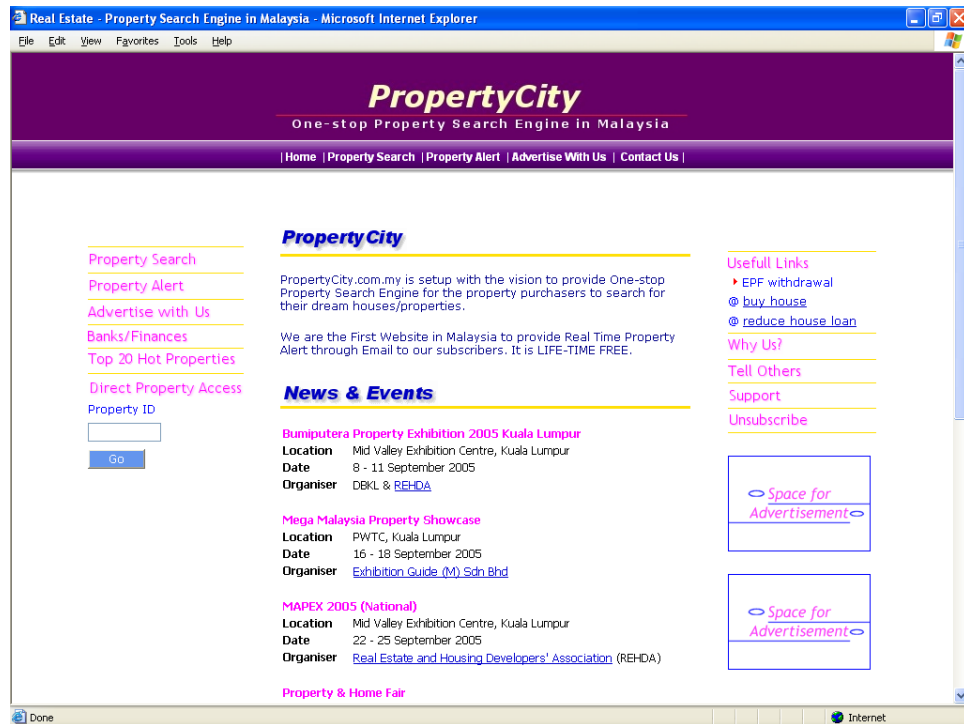


Figure 1.1: PropertyCity main page

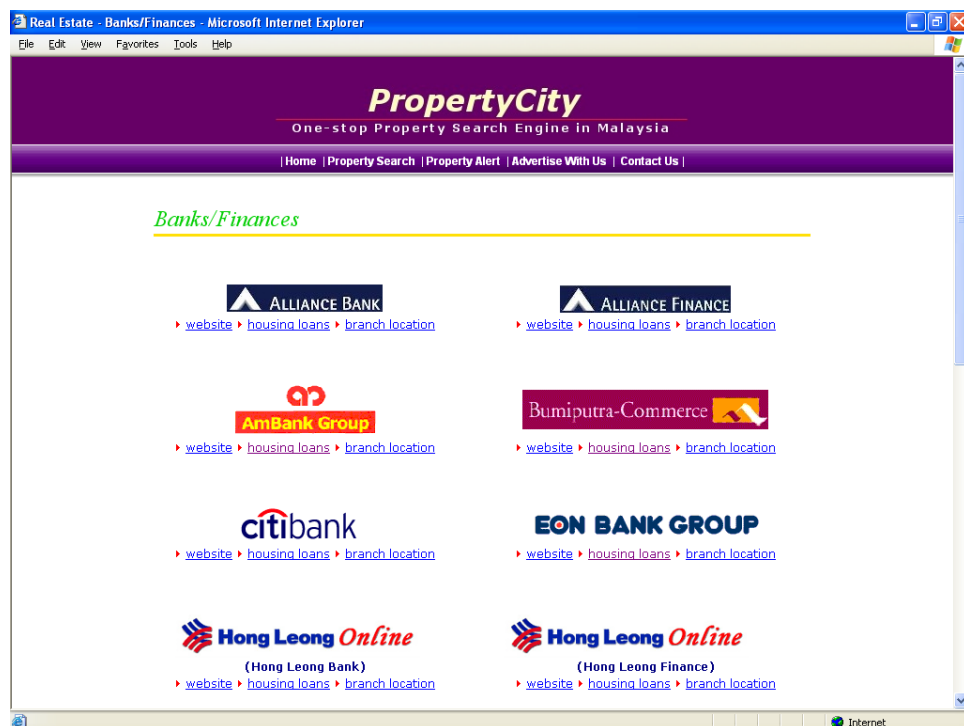


Figure 1.2: List of banks/finances links at PropertyCity

1.2.2 PropertyInside.com

PropertyInside.com only listed the rate offered by the banks or finances that provides the home loan packages to the homebuyers. It does include the contact number for the banks in the list such as telephone number and fax number.

The screenshot shows the PropertyInside.com website interface. The main content area displays property listings under the heading "Second hand property in Kuala Lumpur, SELANGOR for sale". The listings are organized into several sections:

- 2nd Hand Property Search:** A table with columns for Date, Area, Property Type, and Price. Listings include properties like "Makim Batu/Kepong" (Shop, RM 2,100,000) and "Jalan Toeh" (Apartment, RM 165,000).
- Search For Buyer:** A section with filters for State (Selangor/KL), Type (All), and Area. It lists properties such as "Jin Pawang, KL duplex townhouse" (Townhouse, RM 350,000) and "Wangsa Maju, KL 2300ft perhouse new" (Condominium, RM 495,000).
- Buy / Sell Corner:** A section with links for "List Property For Sale/Let", "Request To Purchase/Rent", and "New Project Search".
- Best Deal:** A section titled "They want to purchase property in Kuala Lumpur, SELANGOR" listing properties like "Kuala Lumpur" (Double Storey, RM 300,000) and "Selangor" (Single Storey, RM 160,000).
- Financial:** A section with links for "Bank Rate", "Loan Calculator", and "Activities".
- Member Area:** A section with a link for "Launching & Road show".

Figure 1.3: PropertyInside.com main page

The screenshot shows the PropertyInside.com website interface. The main navigation bar includes links for Main, Property, Legal & Finance, Tips, Shop, Member, and About Us. A search bar is present with fields for Username and Password, and a Login button. The page is dated Saturday, October 08, 2005.

The left sidebar contains several search and utility sections:

- 2nd Hand Property Search:** Includes dropdowns for State (Selangor/KL), Type (All), and Area, with a 'Go!' button.
- Search For Buyer:** Similar to the 2nd Hand search, but with a 'Buy' dropdown.
- Buy / Sell Corner:** Includes links for 'List Property For Sale/Let' and 'Request To Purchase/Rent'.
- New Project Search:** Includes links for 'Search by Map', 'Search by Project List', and 'Search by Developer List'.
- Best Deal:** Includes a link for 'Best Buy'.
- Financial:** Includes links for 'Bank Rate' and 'Loan Calculator'.
- Activities:** Includes a link for 'Launching & Road show'.
- Member Area:** A link at the bottom of the sidebar.

The main content area is titled 'Current Rate Of Various Finance Institute' and lists several banks with their current rates and contact information:

Bank Name	Current Rate	TEL NO	FAK NO
ABN AMRO Bank	6.90 %	03-241 6800	03-241 7087
Affin Bank	6.80 %	03-241 0000	03-242 8197
Alliance Bank Berhad	%	03-42917740	
Arab Malaysian Bank Berhad	6.80 %	03-2063939	03-4978899
Arab Malaysian Finance Berhad	7.95 %	03-2382100	03-2387514

Figure 1.4: List of banks' rate at PropertyInside.com

1.2.3 homesearch.com.my

homesearch.com.my is one of the examples that provide the service that link to the particular banks web site. Homebuyers need to click on the banks in order to get all the information that they need during decision-making for housing loan selection.

http://www.homesearch.com.my - HomeSearch.com.my : Your One Stop Malaysia Property Web Portal. - Microsoft Internet Explorer

WELCOME FOR SALE FOR RENT ADD LISTING HOME LOAN ADVICE CENTER FAQ

Quick Search

Sale ID : Go
Rent ID : Go

Member Login

Username:
Password:
Login

Forget Password? or
Signup now

Featured Sale

Tanjung Park

Featured Rent

Free Newsletter

Home Loan

This is where you can find up to date interest rate from major banks around Malaysia.

1. Ambank
2. Alliance Bank
3. Standard Chartered Bank
4. Bank Muamalat Berhad
5. Affin Bank Berhad
6. Bank Islam Malaysia Berhad
7. United Overseas Bank Berhad
8. Maybank Berhad Berhad
9. Public Bank Berhad
10. BumiputraCommerce Bank Berhad
11. Citibank Malaysia
12. Hong Leong Bank Berhad
13. RHB Bank Berhad
14. Bank Pertanian Berhad
15. HSBC Bank Berhad
16. OCBC Bank Berhad
17. EON Bank Berhad
18. Southern Bank Berhad
19. Bank Kerjasama Rakyat (M) Berhad
20. Bangkok Bank Berhad
21. Bank Of Nova Scotia Berhad
22. Bank Simpanan Nasional BSN
23. Public Finance Berhad

Download useful software / applications to systematically perform your daily Real Estate administrative work.

RealData Real Estate Calculator
Here is a fully-functional real estate program, and it's yours **free**. What's in the calculator? In version 3, there are now a total of 35 calculators in 14 sections:

Township/Garden	District	State	Asking Price	Property type
Tanjung Bungah	Tanjung Bungah	Penang	RM235,000.00	Apartment/Condo
Taman Melawati	Ulu Klang	Kuala Lumpur	RM510,000.00	2-sty Terrace
University Heights	Sungai Dua	Penang	RM220,000.00	Apartment/Condo

Figure 1.5: homesearch.com.my main page

http://www.homesearch.com.my - HomeSearch.com.my : Home Loan - Microsoft Internet Explorer

WELCOME FOR SALE FOR RENT ADD LISTING HOME LOAN ADVICE CENTER FAQ

Quick Search

Sale ID : Go
Rent ID : Go

Member Login

Username:
Password:
Login

Forget Password? or
Signup now

Featured Sale

Desa Samudera

Featured Rent

Home Loan

This is where you can find up to date interest rate from major banks around Malaysia.

1. Ambank
2. Alliance Bank
3. Standard Chartered Bank
4. Bank Muamalat Berhad
5. Affin Bank Berhad
6. Bank Islam Malaysia Berhad
7. United Overseas Bank Berhad
8. Maybank Berhad Berhad
9. Public Bank Berhad
10. BumiputraCommerce Bank Berhad
11. Citibank Malaysia
12. Hong Leong Bank Berhad
13. RHB Bank Berhad
14. Bank Pertanian Berhad
15. HSBC Bank Berhad
16. OCBC Bank Berhad
17. EON Bank Berhad
18. Southern Bank Berhad
19. Bank Kerjasama Rakyat (M) Berhad
20. Bangkok Bank Berhad
21. Bank Of Nova Scotia Berhad
22. Bank Simpanan Nasional BSN
23. Public Finance Berhad

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Here is a fully-functional real estate program, and it's yours **free**. What's in the calculator? In version 3, there are now a total of 35 calculators in 14 sections:

Figure 1.6: List of banks at homesearch.com.my

1.2.4 Fullhouse.com.my

Fullhouse.com.my only provides the service of searching property for homebuyers. It does not provide any facility to get the housing loan information for homebuyers. Therefore, homebuyers need to put more effort on searching best suit housing loan for themselves.

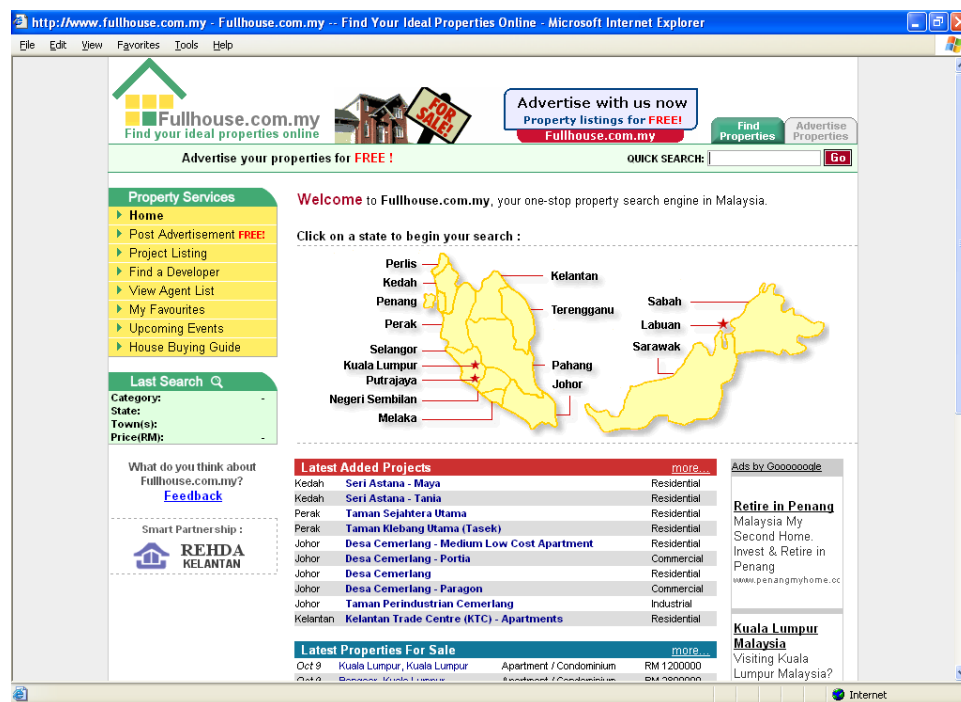


Figure 1.7: Fullhouse.com.my main page

1.2.5 metrohome.com

metrohome.com is one of example whereby real estate service provider provides the home loan calculator to their homebuyers once they have make their decision on buying the property. However, the loan calculator only provide the

monthly payment information based on loan amount, interest rate and loan tenure information from homebuyers. Hence, it does not provide the decision on the best suit home loan package for homebuyers for the property that they have selected and it is not flexible enough to handle multiple layer interest rate of the housing loan.

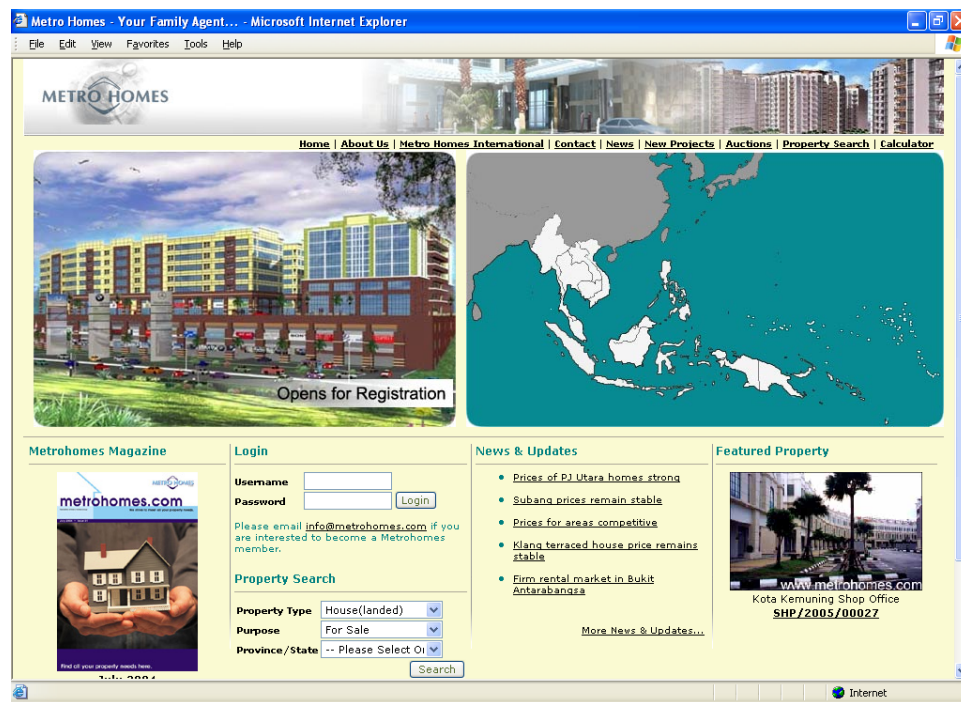


Figure 1.8: metrohome.com main page

http://www.metrohomes.com - Metro Homes - Your Family Agent... - Microsoft Internet Explorer

METRO HOMES

There are various fees and duties imposed on different property transactions. **Choose** a calculator that best describes your transaction from the pull-down menu below:

When considering a loan (monthly payment) ▾

Loan Calculator

The loan calculator helps you calculate your monthly payments. Just fill in the property price, term of loan, interest rate and down payment.

Property Price : 10000

Term of Loan : 10 years ▾

Interest Rate : 10 %

Down Payment : 1000

Monthly Payment : 119

Calculate Clear Close

Copyright © 1998 - 2005 Metro Homes. All rights reserved.
Best viewed with Internet Explorer 6 and above
Designated trademarks and brands are the property of their respective owners.

Done Internet

Figure 1.9: Home loan calculator at metrohome.com

1.3 Current Home Loan Package Selection Process

As a result of the data collection from the banks' mortgage officer, there are three major trends in recent home loan packages selection, which show that homebuyers are still doing manually for process of making decision on the best home loan packages. Firstly, there are financial advisors in the bank who can sit down with potential homebuyers and help them to help design and customize a home loan scheme which best suit the homebuyers' financial capacity.

Secondly, there are also mobile mortgage sales officers who can provide financial advices to the homebuyers anytime and anywhere. The mortgage sales

officers will collect information from homebuyers and then personalize the home loan package according homebuyers financial needs or requirements based on their knowledge and experience.

Another approach that helps homebuyers to make their decision themselves on selecting a home loan package that matches their requirement is through the information that provided at banks' web site.

1.4 Problem Statement

Once homebuyers make their decision to get the property from real estate service providers, they have to find their solutions to get the best suit home loan package themselves since real estate service providers' current systems do not provide this functionality to help them on decision-making on suitable housing loan.

In this competitive world, banks offering their various home loan packages in the market. Therefore, homebuyers will have choices on selecting a suitable home loan package for themselves. Homebuyers who are interested on the home loan packages need to contact to banks or mortgage sales officer or through banks' web pages in order to get information before they can make their decision on choosing appropriate home loan package which meet their requirements.