Application of IT in Valuation Process
Valuation & Property Services Department, Ministry of Finance Malaysia

Lim Kim Hoe

State Director of Valuation & Property Services Department, Federal Territory of Kuala Lumpur, Malaysia

Our Reference: JPPH:WP KL/175/431/1/6031

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Tel : 03 -2543131
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15 October 1996.

The Organiser
9th AVA Congress
32/13-15 Asoke Road,
Bangkok 10110,
THAILAND.

Dear Sir,

9th ASEAN VALUERS ASSOCIATION CONGRESS - BANGKOK 1996
CONGRESS PAPER & REGISTRATION FORM

I refer to the abovementioned matter.

I hereby enclose the following :

- Registration form
- One set of Congress paper entitled ' Application Of IT In Valuation Process - Valuation & Property Services Department, Ministry Of Finance Malaysia'.
- One copy of my Curriculum Vitae
- One copy of my photograph.

Thank You.

Yours Sincerely,

.....
(Lim Kim Hoe)

APPLICATION OF IT IN VALUATION PROCESS, VALUATION & PROPERTY SERVICES DEPARTMENT, MINISTRY OF FINANCE MALAYSIA

9TH ASEAN VALUERS ASSOCIATION CONGRESS 7 - 10 NOVEMBER 1996 BANGKOK, THAILAND

Presented by :
Mr. Lim Kim Hoe
VPSD Malaysia

LIM KIM HOE – CURRICULUM VITAE

Valuation & Property Services Department, Federal Territory of Kuala Lumpur
Level 5, Block E South, Pusat Bandar Damansara, 50490 Kuala Lumpur
(Tel 03-2543131)

OBJECTIVE

This c.v. is for the 9th AVA Congress in Bangkok, Thailand–November 1996

EDUCATION

UNIVERSITI TEKNOLOGI MALAYSIA–BACHELOR OF SURVEYING (PROPERTY MANAGEMENT) – 1978

READING UNIVERSITY, ENGLAND – MSc (URBAN APPRAISAL) 1992

PROFESSIONAL QUALIFICATIONS

MEMBER OF INSTITUTION OF SURVEYORS, MALAYSIA.
(TREASURER OF INSTITUTION OF SURVEYORS MALAYSIA – 1995/96)

REGISTERED VALUER WITH THE BOARD OF VALUERS, APPRAISERS & ESTATE AGENTS, MALAYSIA.

PRESENT POSITION

STATE DIRECTOR OF VALUATION & PROPERTY SERVICES DEPARTMENT, FEDERAL TERRITORY OF KUALA LUMPUR, MALAYSIA.

EXPERIENCE

JOINED THE VALUATION & PROPERTY SERVICES DEPARTMENT AS A VALUATION OFFICER IN 1978.

HAVE SINCE THEN ASSUMED A NUMBER OF POSITIONS :-

1. DISTRICT VALUER
2. STATE DEPUTY VALUATION DIRECTOR
3. STATE VALUATION DIRECTOR
4. DEPUTY DIRECTOR OF NATIONAL INSTITUTE OF VALUATION (INSPEN)
5. SENIOR VALUATION OFFICER IN HQ
6. PROJECT MANAGER (till 30 OCTOBER 1994) FOR THE STAGE 1, PHASE II OF VPSD'S COMPUTERISATION PROGRAMME.

APPLICATION OF IT IN VALUATION PROCESS
VALUATION & PROPERTY SERVICES DEPARTMENT EXPERIENCE

1.0 BACKGROUND

The Valuation & Property Services Department (VPSD) of the Ministry of Finance, Malaysia is the biggest valuation agency in Malaysia with 30 branch offices located throughout the country and a total staff strength of 1,412. Its activities comprise mainly the carrying out of statutory valuations[1] on behalf of government and quasi-government agencies. The bulk of its valuations is 'one-off' type or single-property valuation; mass valuations normally done for rating purposes form only a small portion of its workload.

The number of Valuation units averages 209,000 for the past 5 years. Values reported totalled RM39.85 billion (US$15.94 billion) in 1995[2]. This is equivalent to about RM 28.2 million (US11.2 million) per staff.

2.0 INTRODUCTION

Back in the 70's , VPSD had already recognised the need to computerise in order to efficiently handle the large volume of data the department encounters in its valuation work. A paper was put up on 1st November 1970 entitled " *Implementation Of A Database For The Treasury Valuation Division (as it was then known as)*". The first concrete step towards computerisation was made in 1979 with the setting up of a steering committee and a working committee to study the viability of computerisation. In September 1980 this Committee came out with a recommendation that a computer database should be set up for the Valuation Division. Approval was granted to carry out a trial run in September 1985 with the database residing in the Treasury's Main Frame and two terminals providing the link to the Department. This arrangement lasted till the end of 1988. It was only in 1989 that the Department managed to secure its first system in the form of a mini computer with the application system known as *Landed Property Information System* (LAPIS) developed. It was placed in Federal Territory, Kuala Lumpur branch office. Experience garnered from the earlier trial run formed the base upon which LAPIS was developed. This development represents Phase 1 of the department's computerisation programme. Apart from LAPIS, another system known as the Integrated System was also developed to complement and supplement it.

3.0 HARDWARE & SOFTWARE OF LAPIS

Configuration of the LAPIS system consists of :

a) Hardware :

- A mini ENCORE MULTIMAX 310 with 16 MB memory, 1.2 GB disk & 11 terminals.

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[1] These are mainly for stamp duty, real property gains, estate duty, compulsory acquisition, premium and capital valuations and rating.

[2] 1995 Annual Report - Valuation & Property Services Department, Ministry Of Finance, Malaysia.

b) Software :

- UMAX operating version
- INFORMIX SQL
- INFORMIX 4 GL RDS
- SAS statistical package
- PC-NFS

4.0 LAPIS

LAPIS is essentially a relational database system developed with the assistance of the Finance Management System Unit of Treasury. Development work began in 1990 and was operationalised in 1991.

LAPIS basically contains details pertaining to land parcels valued by the Federal Territory Valuation Office and agricultural land parcels valued by Selangor Valuation Office since 1990. Up to September 1996, a total of 167,000 transactions had been captured. The data captured encompassed the following:
(a) title details like ownership, tenure, encumbrances
(b) description of land - terrain, shape, size
(c) description of buildings - type of construction, finishes, accommodation
(d) details of transaction - sale price, date of sale, parties of transaction
(e) details pertaining to values arrived.
Fixed enquiry screens were developed to facilitate users to query the database.

4.1 Objectives Of LAPIS

LAPIS has a two fold objectives namely :

1) to provide easy retrieval of information on landed properties for both top management decision making and for the day-to-day valuation operations by the Valuation Department technical staff.
2) to provide data so as to enable the Department to monitor property trends and other form of analytical study on property.

4.2 Structure

It is structured along a relational data format to give it more flexibility to accommodate future expansion in the form of changes in valuation methodologies, new statistics output and other new management requirements.

The database comprises 3 tables namely property, building and index-lot with a total of 170 fields. Each set consists of a group of data within a record. The database structure takes into consideration all the various property type.

4.3 Application System

The system developed provides for 3 main menus that is :

- Query Using Screen formats
- Structured Query Language (SQL)
- Query On File Status

5.0 INTEGRATED SYSTEM

This system was developed in 1991 and operationalised in January 1992. It consists of 3 subsystem that is :

- **Registration module**
  The objective of this module is to register (capture into the computer) all valuation cases received by the branch offices. It will be used to monitor the status of each individual case.
- **Statistics\Workload module**
  To generate monthly statistical reports on the workload of the respective VPSD Branch Offices and the workload of the individual technical officers (Valuation Officer and Assistant Valuation Officers).

- **Sales of property transaction module**
  To generate monthly reports of property sales transactions for the purpose of sale to registered valuers, appraisers and estate agents.

The system is based on a relational database format with four data sets.

6.0 SHORTCOMINGS OF THE LAPIS & INTEGRATED SYSTEM

Despite the many benefits accruing from the LAPIS and Integrated System, it was soon discovered that the increasing demand for more details and higher efficiency could not be matched by the existing hardware and system design. The memory size of 16 MB and the processing speed of 4 MIPS was found to be wanting when the database grew.

As LAPIS and the Integrated System were developed separately and are independent of each other, data duplication was unavoidable.

7.0 PHASE II VPSD COMPUTERISATION PROGRAMME

Phase II was launched in 1994 to address the shortcomings in Phase I. The first stage known as Stage A was launched as a pilot and is scheduled for completion by year end. The full blown applications of this pilot will be ported to the branch offices in the Klang Valley region by 1997.By year 2000, the other branch offices in the country are expected to be fully computerise.

The system developed in this phase is known as the Valuation Information System (VIS).
It incorporates graphic dimension in the form of Geographical Information System (GIS) to complement the textual form of data. Data redundancy is eliminated by integrating LAPIS and the other modules. A significant development in this phase is the introduction of Computer Assisted Valuation (CAV).

7.1 The aims and objectives of Phase II VPSD computerisation Project are as follows:-

- To provide a reliable database on landed properties at

each Branch Office to serve both the public and private sectors.

- To design an integrated Management Information System (MIS), Landed Property Information System and Geographical Information System (GIS) to support and maintain the main database, as well as the day to day running of each Branch.

- To develop a system for fast and easy retrieval of information to meet the needs of VPSD and staff.

- To develop customised Computer Assisted Valuation (CAV) applications to assist in the day to day operations/valuations carried out by the VPSD personnel.

- To monitor the developments in the property market so as to give insights towards emerging trends.

- To contribute to the nation's property sector by providing data and information to enable property developments and investment decisions.

- To assist in the maintenance of the housing price index

7.2 These objectives can be further summarised into the following:

- **Short Term Objectives**

  The short term objectives that have been identified towards this computerisation project is for a property database that will contain adequate information to enable quick valuations.

- **Long Term Objectives**

  The long term objectives towards the system development and the computerisation project are:

  - Fast and easy retrieval of information
  - More efficient valuation outputs
  - To facilitate research
  - Ability to link with other databases

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  - More efficient valuation outputs
  - To facilitate research
  - Ability to link with other databases

- Ability to do forecasting, modelling and models for multiple regression.

- Development into an expert system.

7.3 Functions

The computerisation programme embodies the following :

a) Establish relevant database to provide for

- fast retrieval of valuation and management data
- constructing models for analytical purpose
- provide the relational textual database tables to link to the spatial data in the form of digital map bases.

b) Application of GIS techniques to store and link geographically reference textual data and graphic data features for

- map presentation and production
- information processing queries
- analyses and modelling display operations.

c) Computer Assisted Valuation (CAV) applications and modelling in the form of customised valuation programmes :-

- to expedite the valuation process
- to assist technical staff to decide/arrive at the valuation figure.

7.4 Important Features Of This System

- It will replace the manual marking of the survey sheets.
- Index cards which are used to track lots valued will no longer be necessary.
- Plan drawings of different scale can now be easily produced.
- Transport routes and utility lines (both existing and proposed) can be captured as spatial data and related to value levels for computing values.
- Graphical display of lot to be valued and surrounding developments.
- Production of *isovals* (lines of level of values).
- Quick calculation of areas remaining after a proposed compulsory acquisition.
- Photographs of property valued can be captured.

7.5 Hardware And Application Systems Configuration

The system is developed on a client server environment hooked onto a local area network. This would allow for greater flexibility to cater for future expansion. The hardware and application systems configuration are as follows :

7.5.1 Hardware

- MIS SERVER HP9000 Series 800
- GIS SERVER HP900 SERIES 700 with 20" colour monitor
- OPTICAL DISK DRIVE
- PENTIUM CLASS PC
- LINE PRINTER

- LASER JET PRINTER
- SCANNER
- PLOTTER

7.5.2 Software

The software packages used are ORACLE 7, ARCINFO 7 and ARCVIEW 2 with UNIX v.10 as the operating system.
(Please see Appendix A).

8.0 APPLICATION SYSTEMS

Three main systems are developed with submodules to handle the various functions. (Appendix B & C). The systems are as follows:

8.1 Management Information System

- This system revolves around the database which contains information on properties valued by VPSD.

  The application developed provides for:
  - fast retrieval of information
  - information that can be used to develop models for analysis
  - relational textual database tables to be linked with spatial data in the form of digital map bases.

- This system will also have the following sub-modules:

  a. **Registration**
  This sub module will register all valuation requests received by VPSD. Through this system the status of each case can be monitored.

  b. **Statistics**
  This sub-module will generate monthly workload reports of both the branch office and its officers.

  c. **Sale of Property Transaction Details**
  This sub-module will generate reports on property data for sale to registered valuers, appraisers and estate agents.

  d. **Annual Property Market Report**
  This sub-module will generate reports on property market for the purpose of producing the Annual Property Market Report.

e. **Property Indices**
This sub-module will enable the extraction, analysis and presentation of property based indices like House Price Index.

The database for this module comprises 22 relational tables. Please see Appendix D.

The unique parcel identifier is a combination of 8 alphanumeric fields. They are as follows:

State
District
Mukim (County)
Town/Village
Section
Title
Lot /Plot No

8.2 **Computer Assisted Valuation**

This application system uses valuation models and data from the database to enable 'value outputs' to be generated. Valuation models are developed for 4 type of Valuation Methods namely :

a. ***The Comparison Method*** will focus on the adjustment grid for comparisons obtained through pop-up windows. Three submethods namely the Land & Building, Overall Floor Area and Land Area have been developed.

b. ***The Cost Method*** uses a look up table for building costs and the Comparison Method to determine the land value.

c. ***The Investment Method*** will have look up tables for outgoings, rentals, yields and capitalisation rates. The model allows for up to 2 reversions.

d. ***The Residual Method*** is a model with formulae with special reference to gross development value being calculated by the above methods.

The database for this module consists of 15 relational tables. Please see Appendix E.

8.3 **Geographic Information System**

This is a spatial database on data pertaining to landed property information for the purpose of map presentation and production, information processing queries and for analysis and modelling display operations.

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9.0 ADVANTAGES OF VIS

- Helps to expedite Valuation work
  Valuation Officers and Assistant Valuation Officers who are now dependent on Valuation Assistants to compile comparison sales can access such information direct from the computer database. This will ensure a higher level of accuracy.

- Valuation Assistants can now be freed to carry out simple Valuation work thus allowing the Valuation & Assistant Officers to concentrate on the more complex work.

- Quality output
  With valuation models in place a higher level of quality output can be expected

- Map production can be done at a more rapid pace

- Ability to link on line with other data provider - Planning Dept, Land Office, Statistics Department.This will enhance data collection

- Easier for management to monitor progress of Valuation work

10.0 CONCLUSION

LAPIS together with the Integrated System has met its original objective of providing a database to enhance the efficiency of the user branch office. However with ever higher goals being the order of the day, further enhancement of the systems was deemed necessary with the passage of time. These enhancements in the form of full integration and new application modules are being carried out in the subsequent phases of VPSD's computerisation programme. The introduction of GIS based Computer Assisted Valuation application in this phase is expected to expedite work process and enhance the quality of work. With the eventual linking on to the NALIS, the task of collection of external data from Government agencies will be made easier.

Prepared By Lim Kim Hoe
VPSD Malaysia 1996

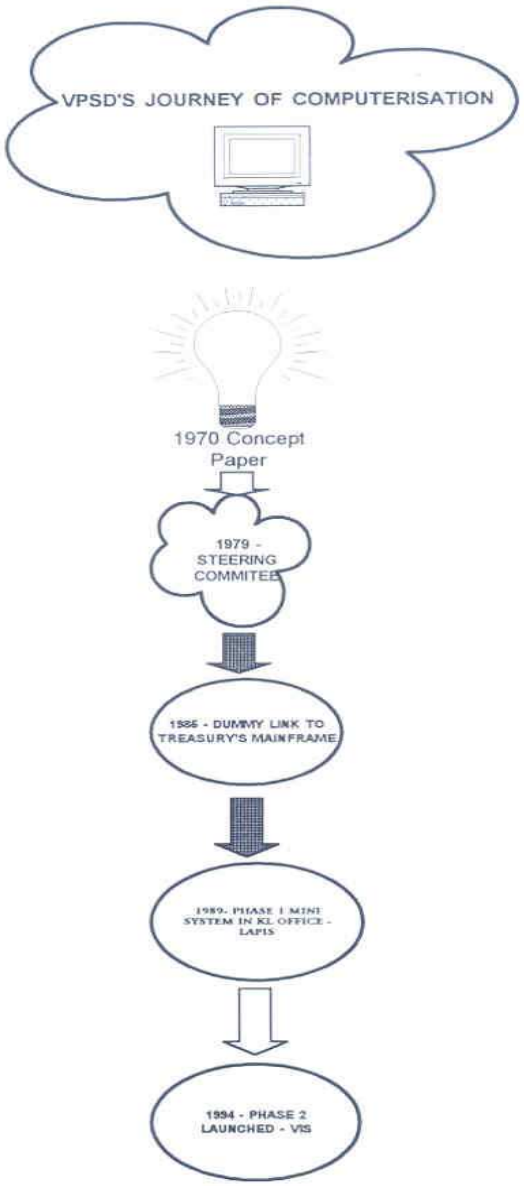
1970 Concept Paper

1979 - STEERING COMMITEE

1986 - DUMMY LINK TO TREASURY'S MAINFRAME

1989- PHASE 1 MINI SYSTEM IN KL OFFICE - LAPIS

1994 - PHASE 2 LAUNCHED - VIS


VPSD'S JOURNEY OF COMPUTERISATION
1970 Concept Paper
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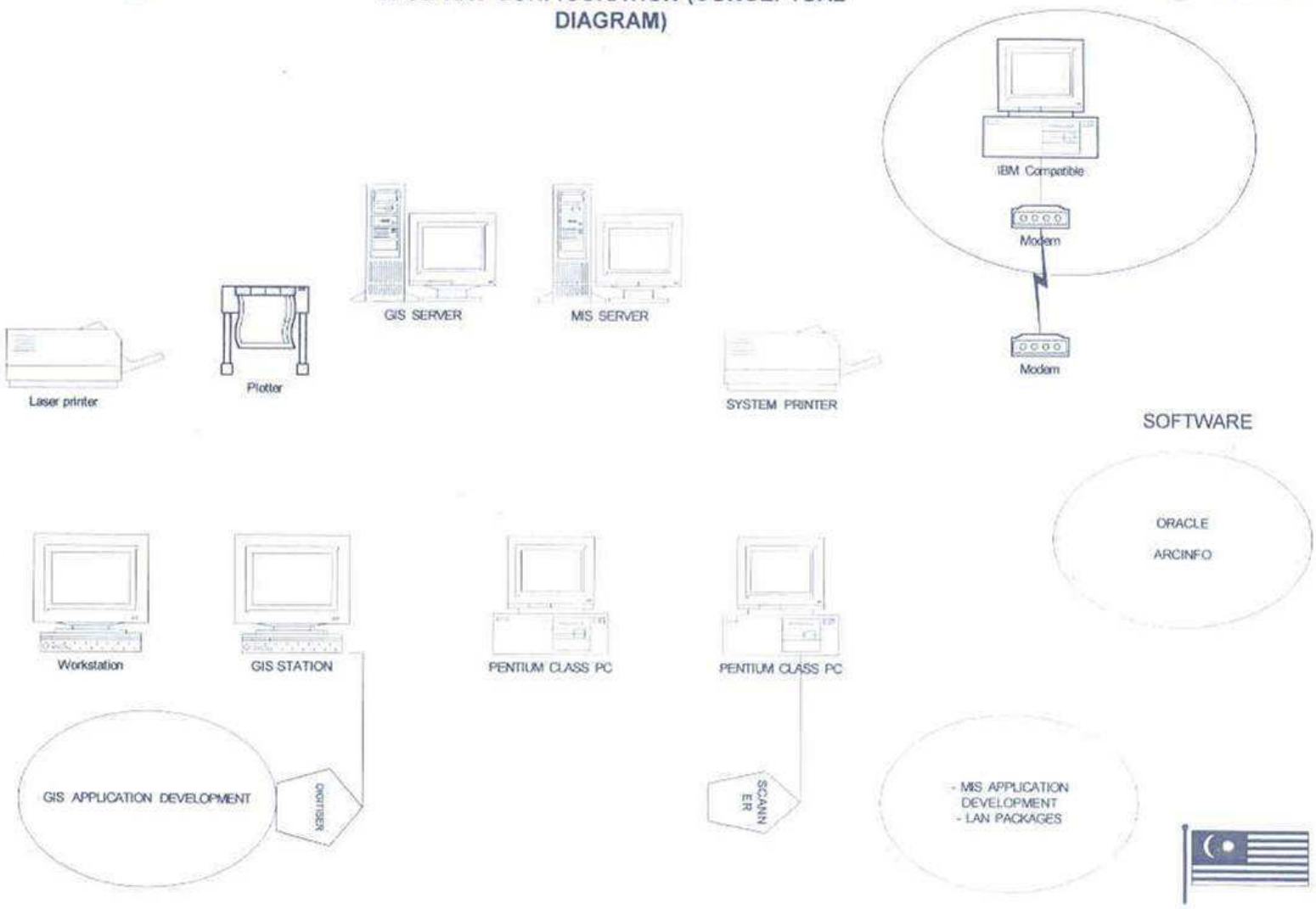
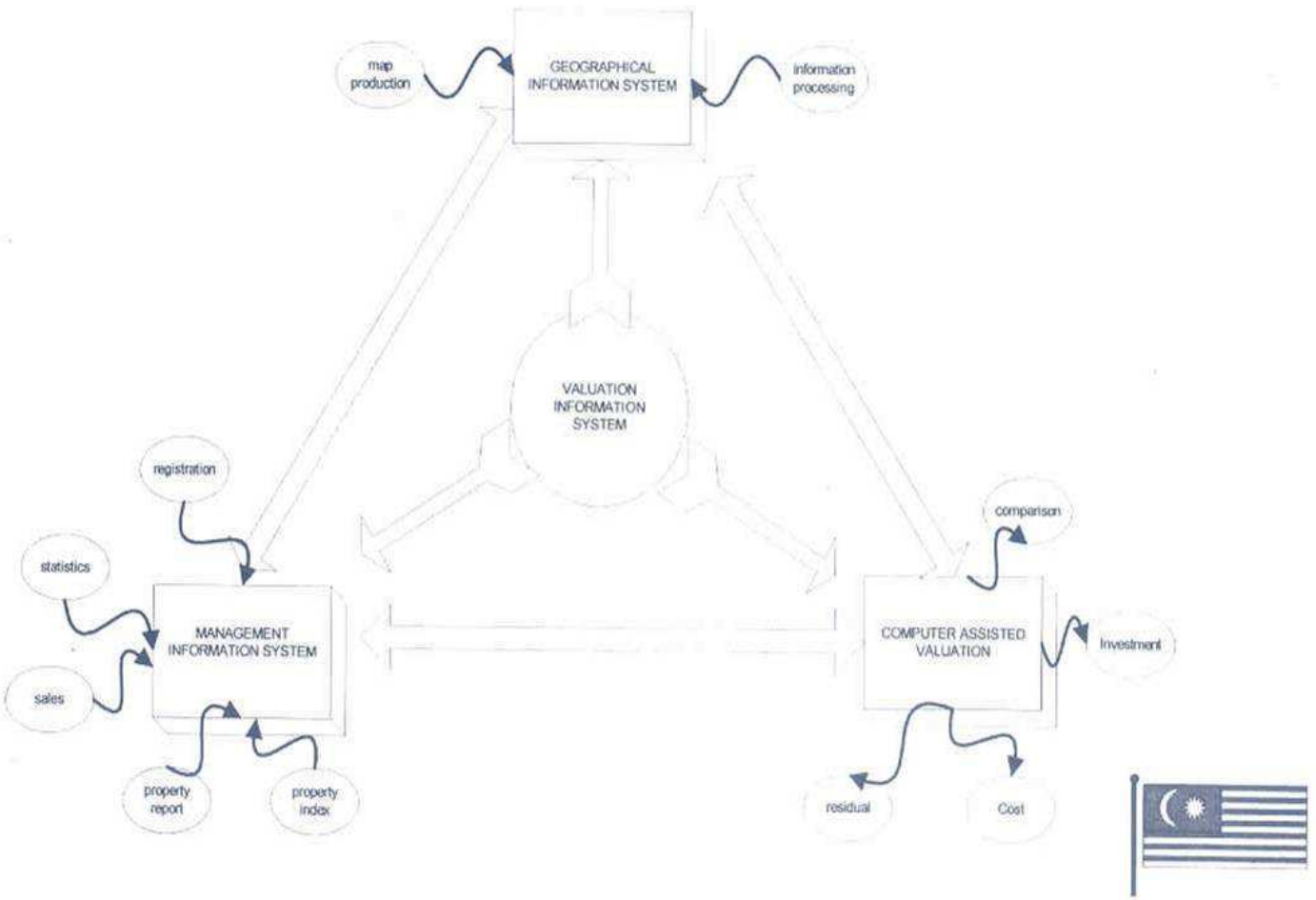
APPENDIX A

VPSD H/W CONFIGURATION (CONCEPTUAL DIAGRAM)



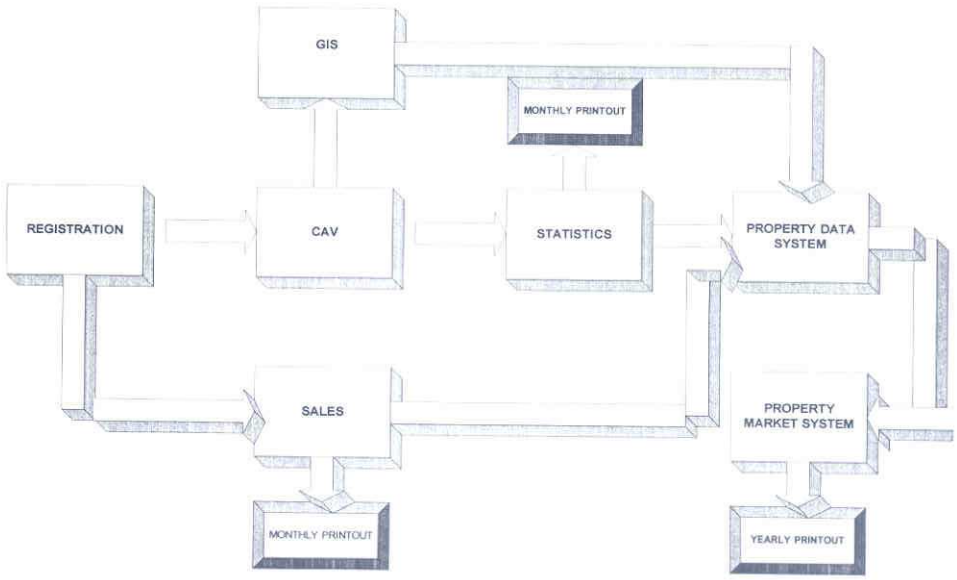
APPENDIX B

VALUATION INFORMATION SYSTEM
VALUATION & PROPERTY SERVICES DEPARTMENT
MALAYSIA



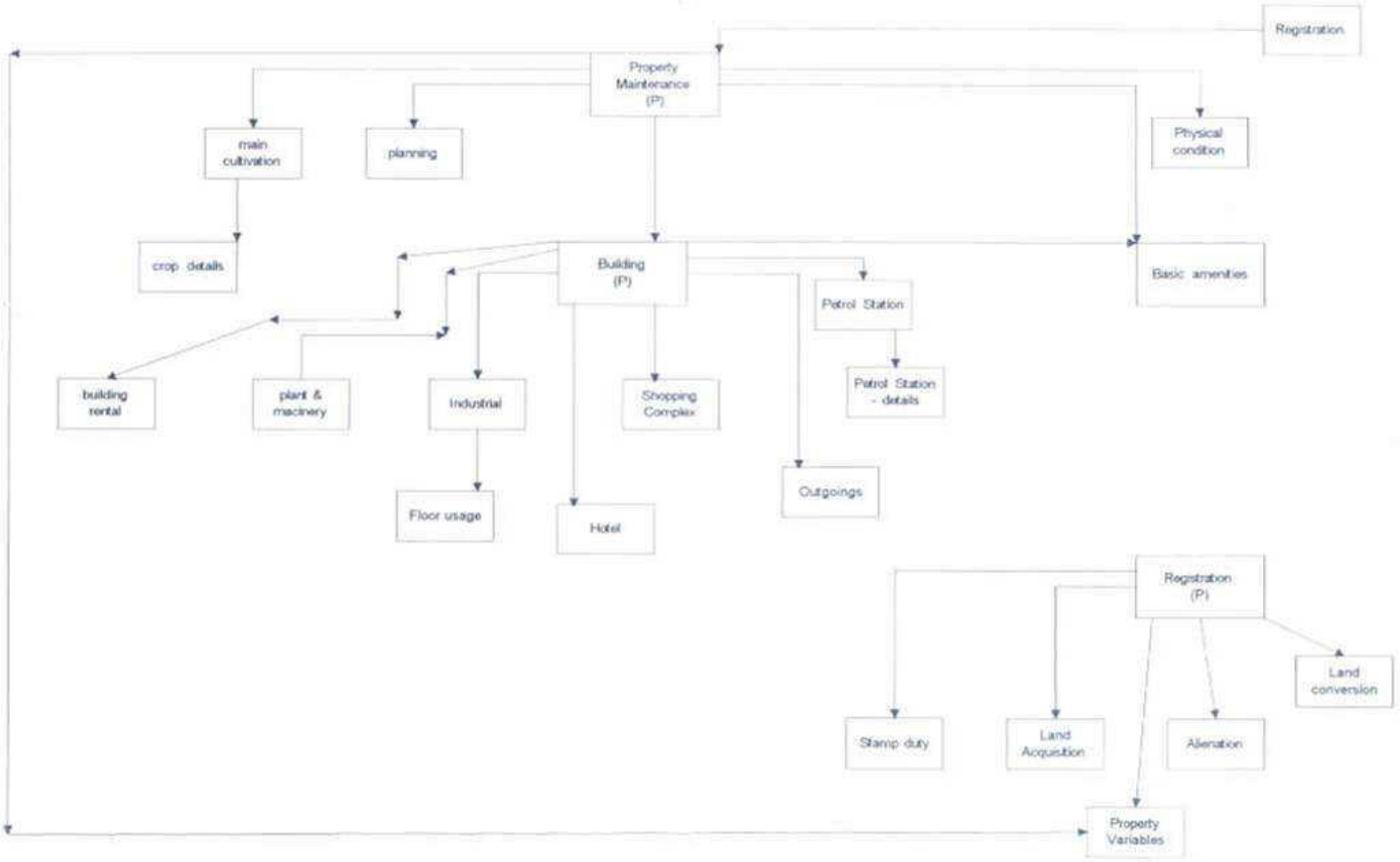
APPENDIX C

VIS APPLICATION SYSTEMS



MANAGEMENT INFORMATION SYSTEM TABLES

APPENDIX D



APPENDIX E

COMPUTER ASSISTED VALUATION (CAV) MODULE TABLE RELATION