



FIG Pacific Small Island Development States

eKadaster: A learning Experience for Malaysia

Mohd Yunus MOHD YUSOFF et al., MALAYSIA





MALAYSIA



- Total land mass of 329,847 square kilometres (127,350 sq mi)
- Separated by the South China Sea, Peninsular Malaysia and East Malaysian
- Population is 28.33 million, with 22.6 million living on the Peninsular
- Malaysia gained Independence in 1957



Introduction

- Focus of Government of Malaysia where land is concerned:
 - Is to ensure Land security for the people
 - Effective Land delivery system through efficient land administration.
- Poor land administration would hinder investment and good land use.
- This can be achieved by capitalizing on the advancement of ICT, and other technologies.

Malaysian Cadastral system



Torrens System



Indefeasible FT & QT



Land is exclusively a state matter (State Authority)



Cadastral survey – Federal Responsibility



Malaysian Cadastral system (Land Title)

- Details available in Land Title:
 - Title No.
 - Location
 - Owner
 - Registered Rights: who has rights
 - Caveat
 - Type of Title: Registered under Registrar or Land office
 - Type of Land: Freehold/leasehold/malay reserved/
Malay agriculture reserved land (Kampung Baru)
 - Category: Agriculture/residential/Industrial
 - Condition of Use.
 - Restriction in Interest.
 - Lot No.
 - Area
 - Plan

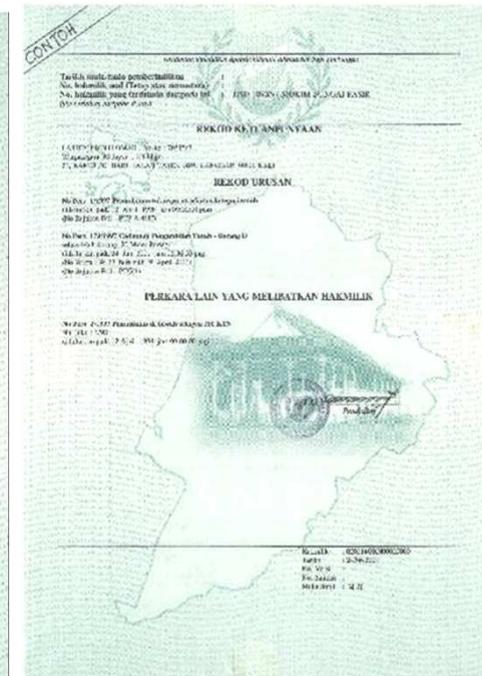


FIG Commission 5 Position and Measurement

United Nations Global Geospatial Information Management – Asia Pacific



Laws Governing Land Matters

National Land Code 1965
(Act 56)

Enactment
(Law passed by State)

Ordinance
(Laws passed by Parliament before
Independent 1957)

Other Related Acts, Regulations
and DG Circulars



Issues in Malaysian Cadastral system

- In the 60s Qualified Tittle (QT) concept were Introduced in accordance to the NLC.
 - Has same properties of FT
 - Recognized as alternatives to confirming security of tenure
 - Issued to owner of land for all intent and purposes minus final (cadastral)survey
- Advantages and Why?
 - To promote growth of Malaysia’s land market
 - Expedite land registration due to slow pace of FT registration
- Drawback
 - More land ownership without final survey
 - Delayed in FT registration
 - Loss in revenue by Federal and State Government by way of survey Fees, quit rents
 - Hinders subdivision, partition and amalgamation for land development



- **Department Of Survey And Mapping Malaysia (Jupem) Is Responsible For:**

- Geodetic
- Topographical
- Mapping
- Cadastral Survey**
- Demarcation of State and International Boundaries



Cadastral Division



Title Survey: 1st Alienation,

**Licensed Land Surveyors Job
Inspection and Approval**

Title Plan Preparation

**Strata Plan Application
Inspection**

**Strata Title Plan Inspection and
Approval**



Cadastral Survey Modernization

- Demand from public for efficient Land delivery system which undermines investor confidence due to slow QT to FT registration
 - Leads to modernization by both JUPEM and State Land Authority
- Changes were made technically, operationally, structurally and institutionally by JUPEM on Cadastral survey to make full use of advancement of ICT and GNSS technology
- Complete transformation through development and implementation of eKadaster



Cadastral Reform

- Studies found that
 - Method of survey and error distribution (Bowditch method) not truly whole-to-part method and unable to handle redundant observations
 - Bearing and distance, as main information in Cassini system do not work well with GNSS
 - RSO projection used in mapping resulted in incompatible database
 - Coordinate comparison is tedious when survey job crosses states border
- A study on CCS was done in Malacca to improve the cadastral survey system.

Cadastral Survey Modernization and Reform



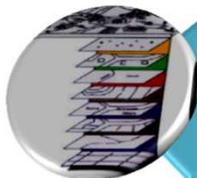
Computerisation



Geocentric Datum



Coordinated Cadastral System with
Survey Accurate Coordinates



National Digital Cadastral
Database (NDCDB) and eKadaster

Computerisation



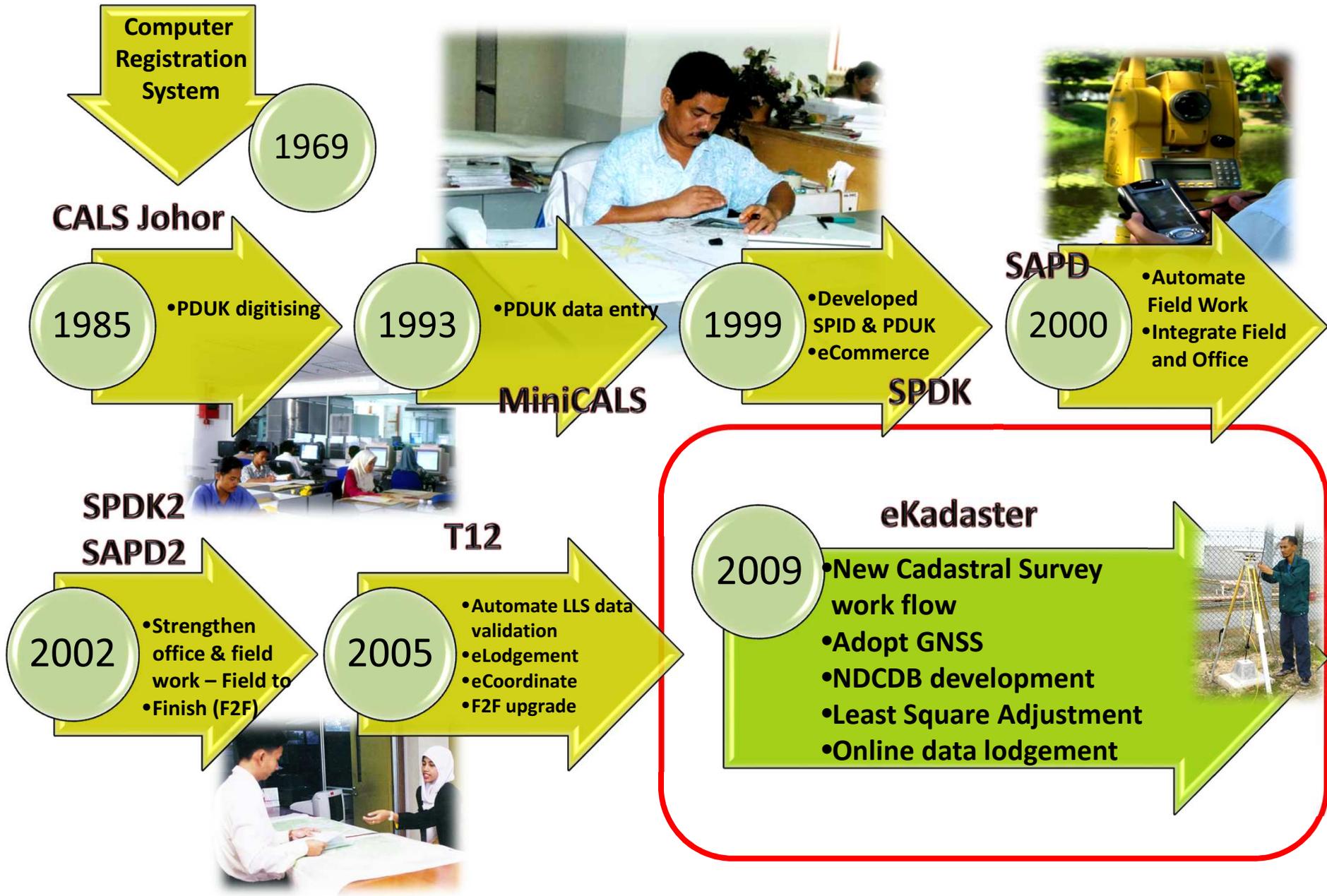
Started as early as in 1969

- To create Digital Cadastral Database (DCDB)
- To computerise computation and plan drafting
- To facilitate fast production and updating of cadastral maps.



Objectives:

Timeline to eKadaster

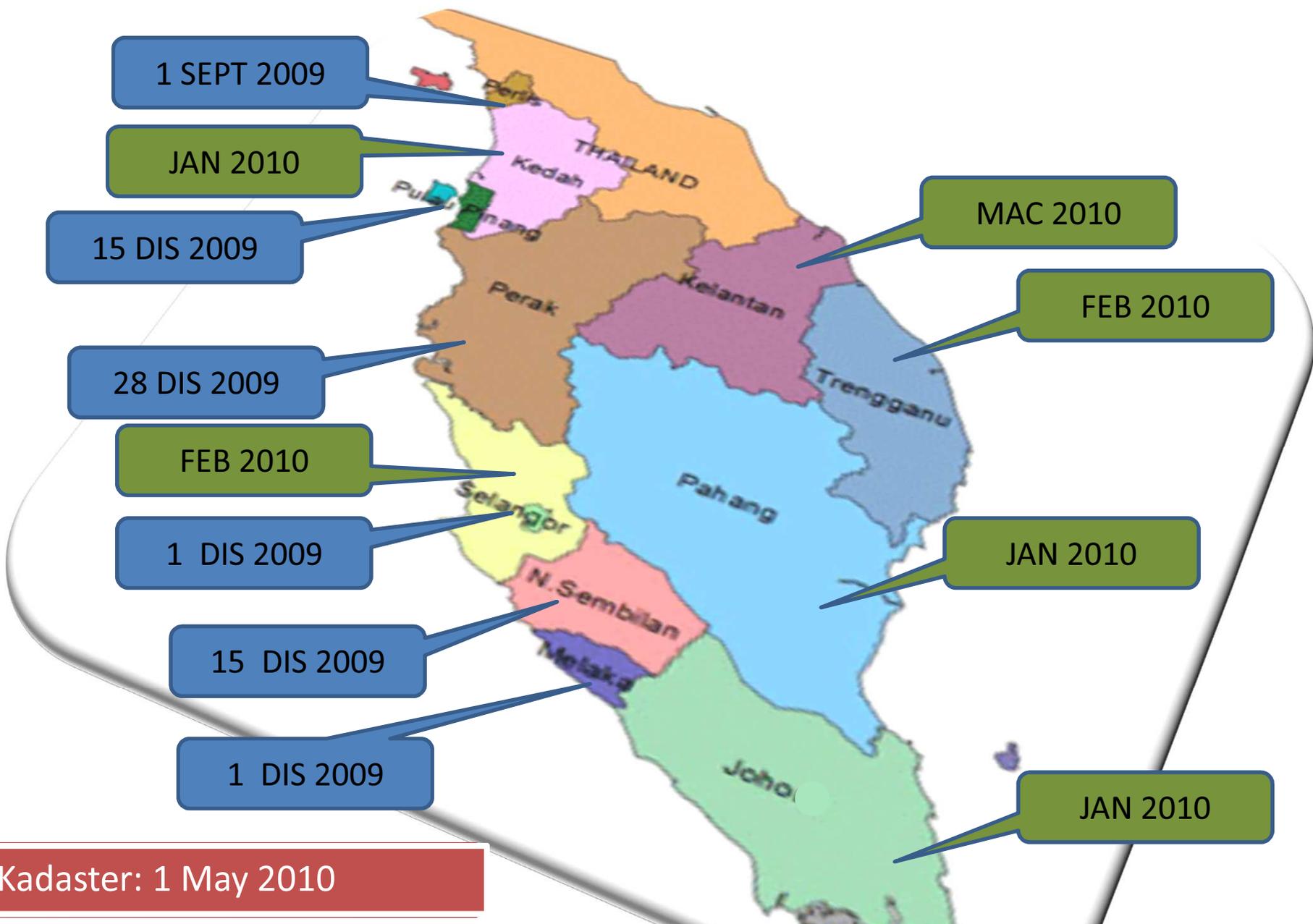


eKadaster Pilot Project

1996*	PRELIMINARY INVESTIGATIONS IN STATE OF MELAKA – test use of least squares adjustment and GNSS for Cadastral Controls.
1997 - 2000*	FEASIBILITY STUDY ON COORDINATED CADASTRAL SYSTEM PENINSULAR MALAYSIA.
2000 - 2003*	DEVELOPMENT OF IMPLEMENTATION PLAN OF COORDINATED CADASTRAL SYSTEM FOR PENINSULAR MALAYSIA
2004-2005*	A PILOT PROJECT TO DEVELOPMENT AND IMPLEMENTATION COORDINATED CADASTRAL SYSTEM (CCS) FOR MELAKA
2006*	STUDY ON ECONOMIC AND SOCIAL IMPACTS OF CCS IMPLEMENTATION
2007-2009	PROJECT eKADASTER JUPEM: DEVELOPMENT OF NDCDB

**JOINT PILOT RESEARCH PROJECTS BETWEEN DSMM-UTM-LS
BOARD: COORDINATED CADASTRAL SYSTEM (CCS) FOR MALAYSIA**

eKadaster Implementation



eKadaster: 1 May 2010

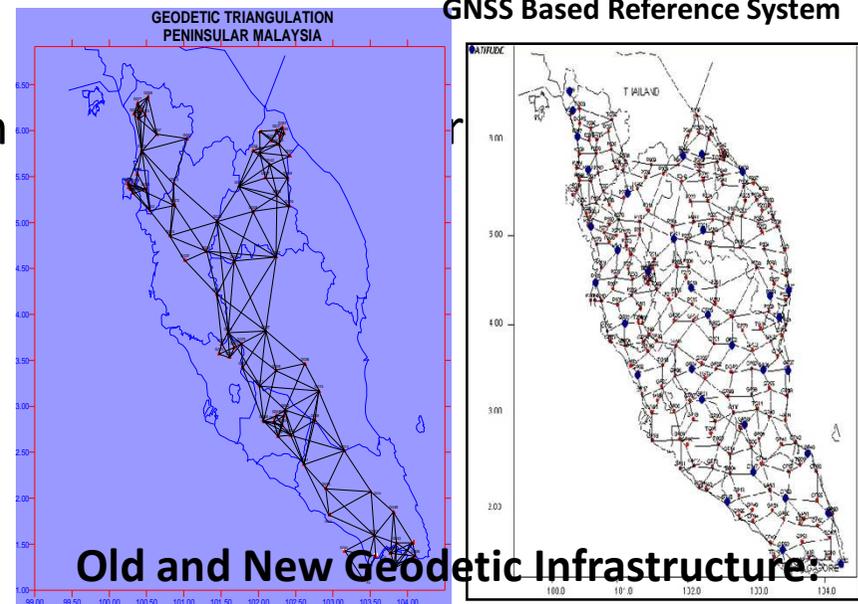


eKadaster

- **There are 3 main components in eKadaster:**
 - **NDCDB**
 - **Virtual Survey system**
 - **Cadastral Data Integrity System**

NDCDB

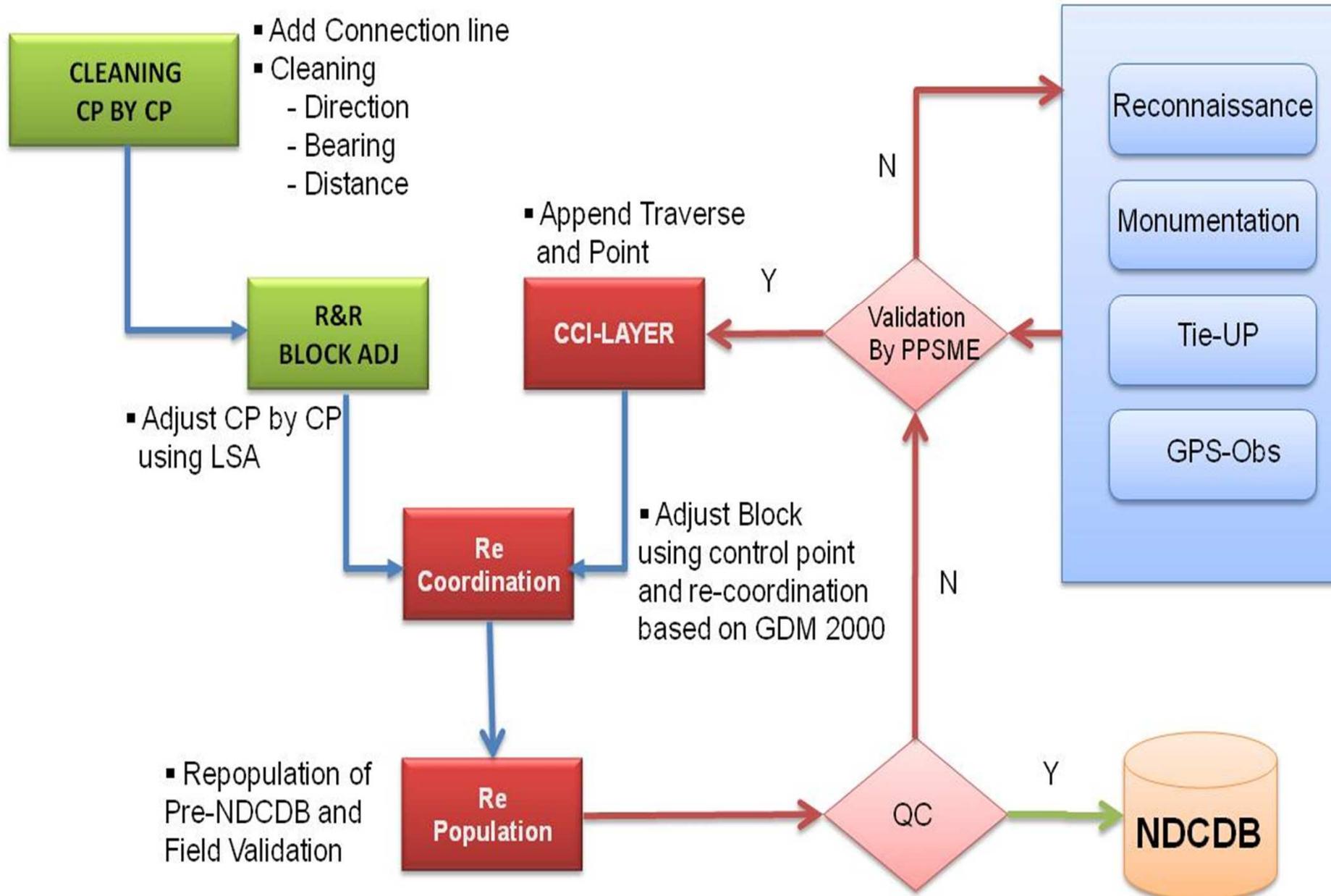
- NDCDB is the outcome of implementing CCS
 - Homogeneous Survey accurate coordinates database
 - Coordinates based on a geocentric datum.
 - Employs Least Squares in adjustments.
 - Uses CCI as control points
 - Spatial accuracy of 5 cm and 10 cm respectively.



NDCDB – Background of DCDB

- NDCDB would resolve problem with older DCDB which has Inherent issues which limit spatial analysis such as:
 - Discrepancies between the graphical display and the value of bearings and distances (observed) stored within the DCDB as attributes (snapping done to ensure topology integrity)
 - Boundaries defined by polyline instead of vertices and nodes
 - Shared line segment between boundaries are stored twice
 - Not fully “GIS-ready”

Processes in Creating NDCDB



Virtual Survey System (SUM)

- Web based application with centralised least squares adjustment software recited in the system
- To verify and validate the survey ASCII files submitted by field surveyors as well as LLS.
- Work may start using controls from existing marks stored in NDCDB or CRM layer or MyRTKNet services.
- Allows surveyors to lodge survey ASCII files to perform adjustment process, generate report of the adjustment results and send notification to sender.
- Allows interaction to extract information and to assist them in field operation
- SUM reengineered the field process and permitted real time digital submission of completed survey to states JUPEMs for verification.
- Allows real time work environment through web (JUPEM2U). Acceptability informed in near-real time.
- Adjusted coordinates posted to database and title plans generated.

Cadastral Data Integrity System (CDIS)

- Comprises of all office applications which include:
 - Pre-survey verification
 - Field survey data computation and verification
 - Digital title plans generation and approval
- Sub-system is to ensure high integrity of the data and to render them GIS-ready.
- Further checking done on data
- Title (B1) plan generated delivered on-line to Land Offices.

eKadaster Applications

Web GIS

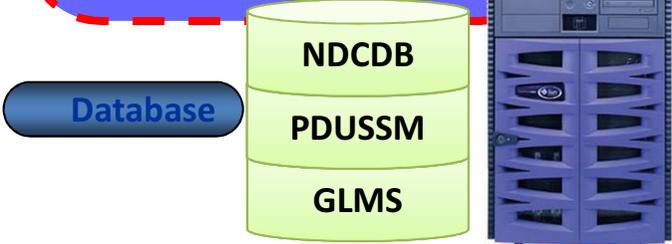


- JUPEM2U
- eLodgement
- eKadasOnLine
- CSRS
- eSIM
- eBorang
- Ecadasonline
- eKiosk
- eReporting
- eMonitoring
- SUM
 - SUM LSA
- notification
 - eNotification

Desktop GIS



- ePU
 - ePU
- DRP
 - ePA
 - ePA(B)
 - ePA(S)
 - ePA(M)
 - ePA(W)
 - eB1
 - eB4
 - ePetakadas
- eGLMS
 - eJalan
 - eTownKg
 - eAdminBdy
 - eHidrografi
 - eBangunan
 - eWarta
 - eGrid
- eSPID
- eFEE
 - eFee



Field



- eTSM
 - eTSM
- eCRM
 - eCRM
- eSSM
 - eSSM

Strata GIS



- Strata
- Strata
- Strata Data Entry LS

Non GIS

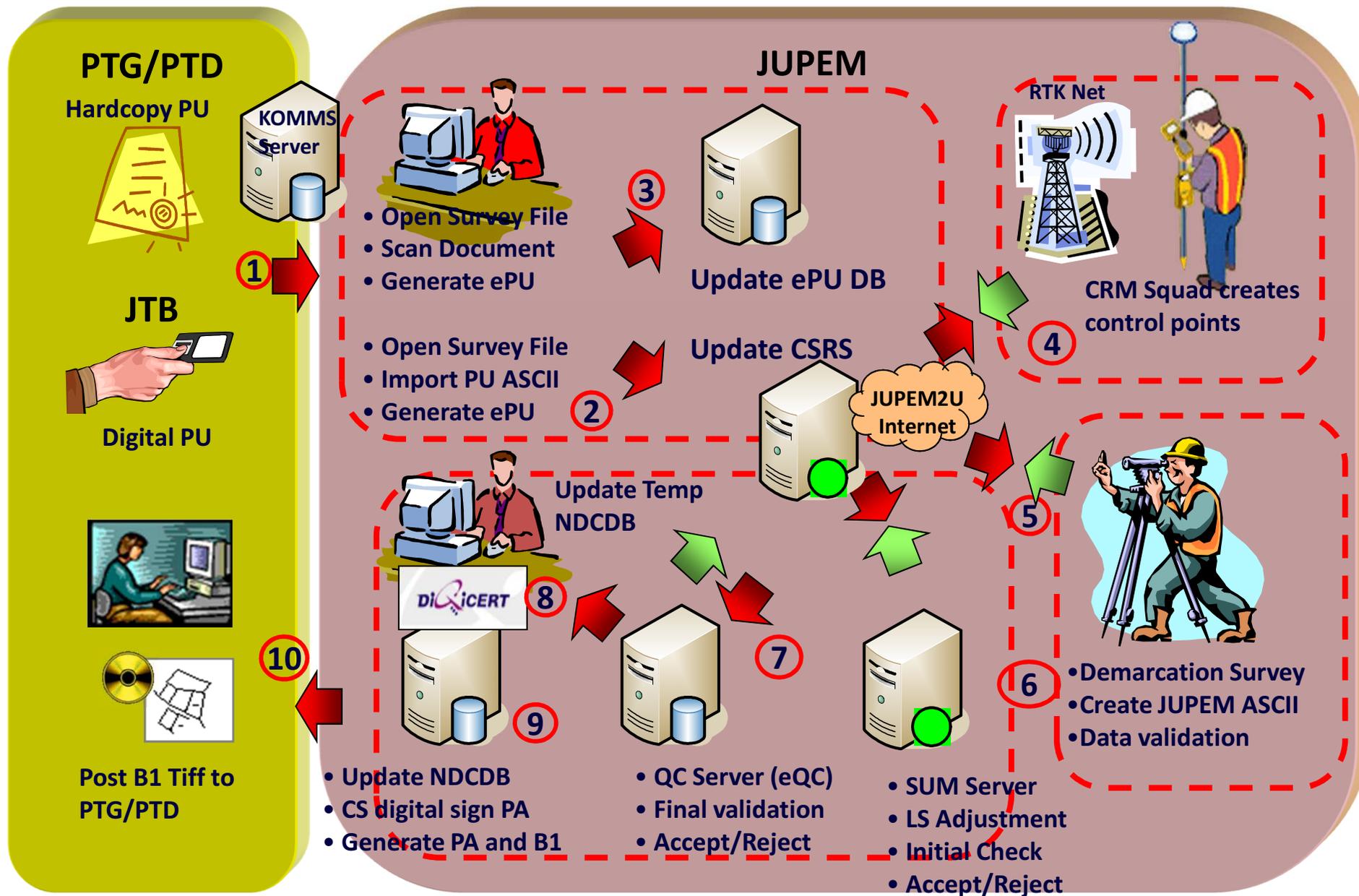
- eMedmAS
 - eMedmas
- eSupport
 - eSupport
- eReporting
 - eReporting
- SPPK
 - SPPK
- ePKI
 - PKI eSigning
 - PKI eVerifier
 - PKI 2D Barcode
 - eAnotation
- SPAK
 - SPAK
 - Kalibrasi EDM/GPS
- Security
 - SSO

SPEK

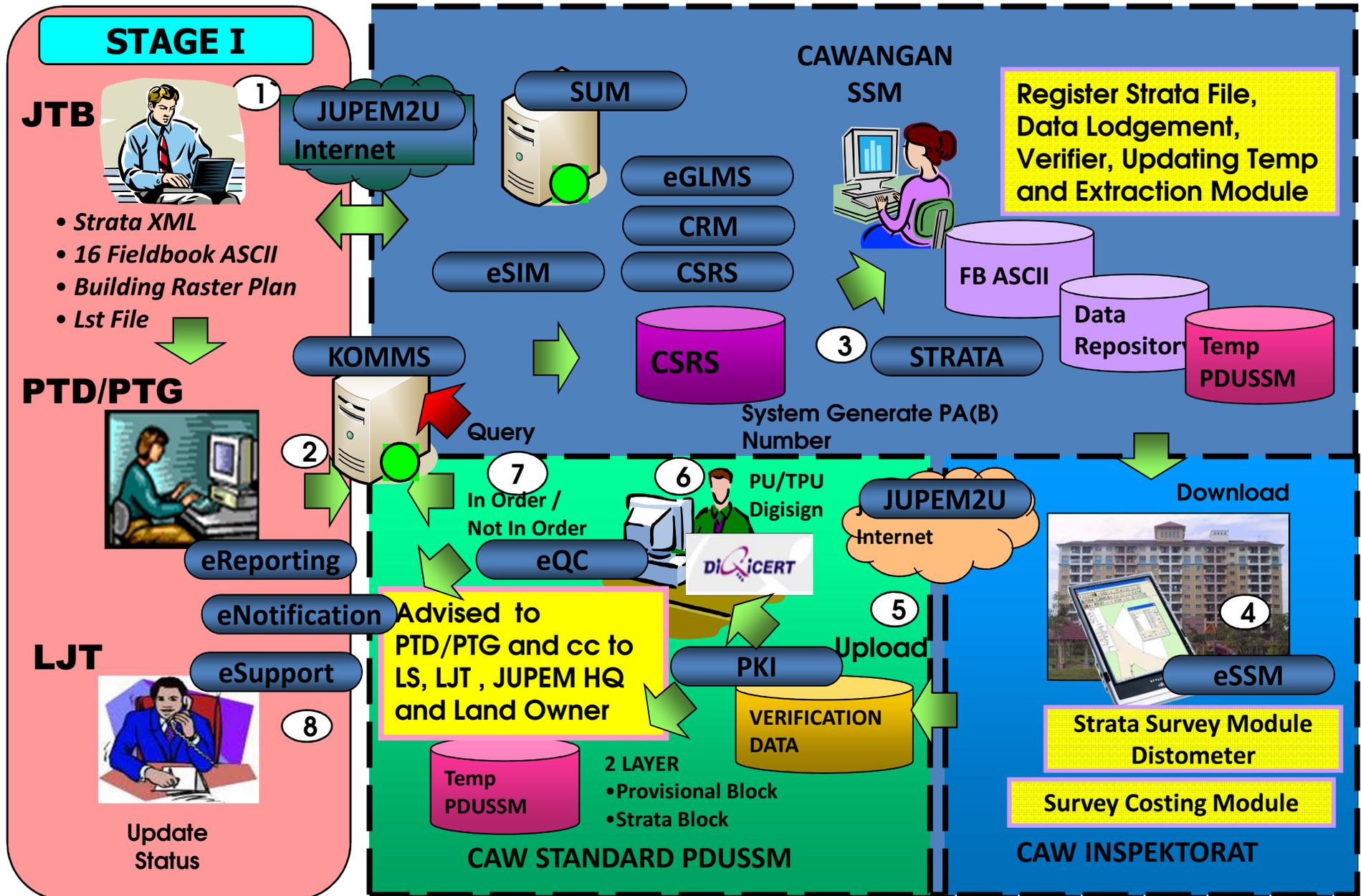


- eSPEK
 - eSPEK
- eQC
 - eQC

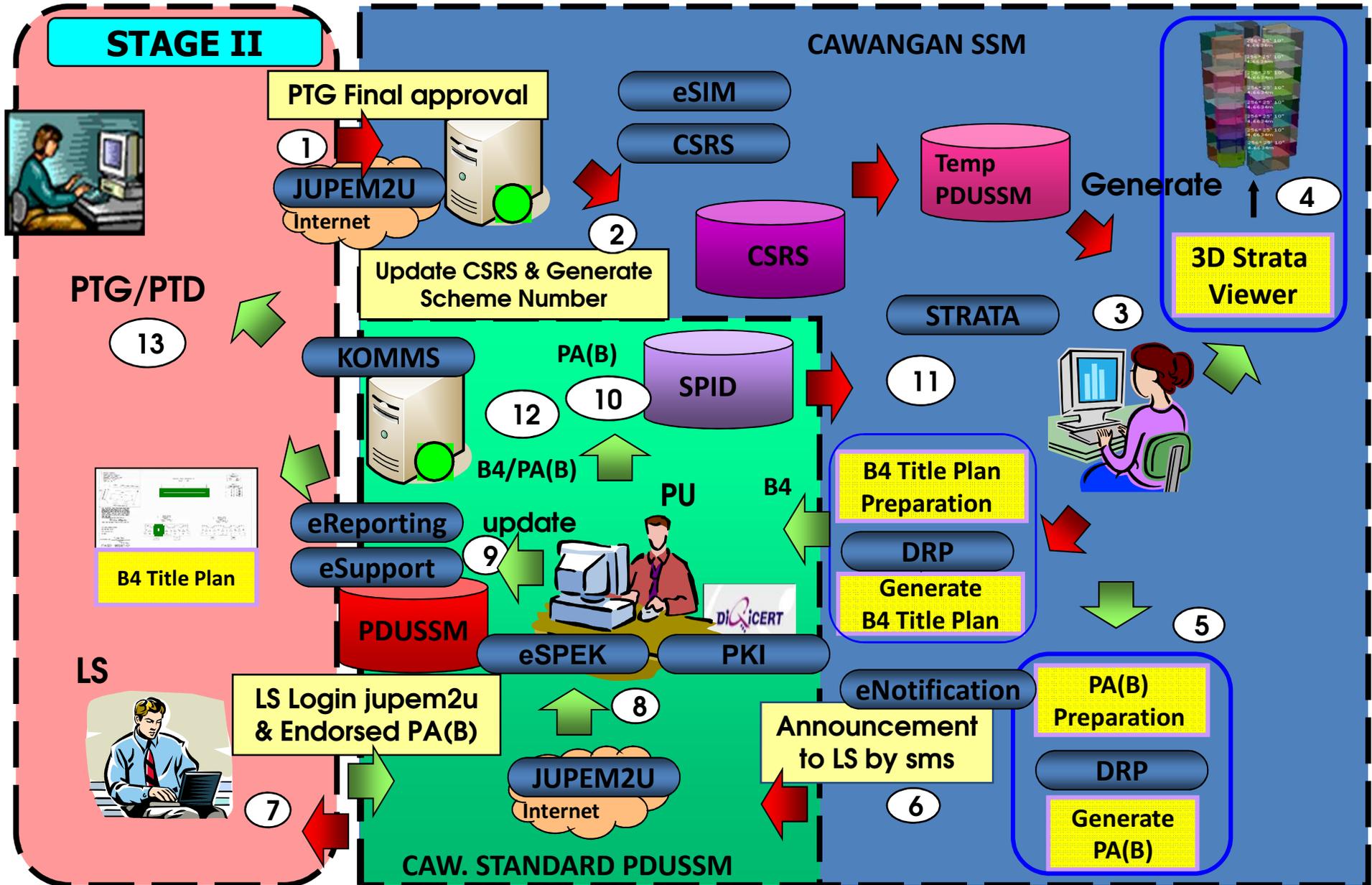
Title Survey Workflow



Strata Survey Workflow



Strata Survey Workflow



eKADASTER Headlines

E-Tanah for two more states

Negeri and Malacca will adopt it next year

BY MANJIT KAUR,
manjit@thestar.com.my

THE e-Tanah system, now available only in Penang, will be introduced next in Negeri Sembilan and Malacca for customers to complete each transaction in 15 minutes instead of up to 10 days under the manual system.

Natural Resources and Environment Minister Datuk Douglas Uggah Embas said the electronic land transaction system at the state Land and Mines Department, which had been under trial in Penang since October 2005, would be fully implemented in Penang by November.

"We hope to introduce the system next in Negeri Sembilan and Malacca for full implementation by end of next year," he told newsmen after meeting the department's heads in Komtar on Thursday.

He said six modules — registration, quit rent, consent, disposal, acquisition and development — were being implemented during the trial period.

He said come November, three more modules (strata, enforcement and auction) would be implemented.

Up to April 30, 56,029 transactions had been processed through the e-Tanah system.

»It will be fully implemented in Penang by November«

NATURAL RESOURCES AND ENVIRONMENT MINISTER DATUK DOUGLAS UGGAH EMBAS



e-Kadaster, e-Tanah ke arah pengeluaran geran segera

14 - Berita Harian - Thursday, March 12, 2009

KOTA BHARU 12 April - Jabatan Ukur dan Pemetaan Malaysia (Jupem) akan melaksanakan sistem e-Kadaster dan e-Tanah sebagai langkah pertama untuk mempercepatkan pengurusan geran hak milik tanah.

melalui kedua sistem itu, kerajaan menyasarkan dapat mengeluarkan geran dalam tempoh sehari sahaja.

14/6 24/4/09

Halde sama pada minggu ini, Presiden Persekutuan Tanah Borneo (Hendri Manan) dan Ketua Jajid Jabatan Tanah dan Galian (JG) berkata, kerajaan perlu mengemukakan cadangan segera untuk melaksanakan tiga teras.

beroperasi yang berbanding dengan sistem manual yang mengambil masa lebih daripada tiga bulan.

490 pemilik tanah dapat geran

di 4 kampung di Larut, Matang, Selama tinggal lebih 40 tahun



“Penduduk dapat hidup lebih selesa dan tenteram kerana ada jaminan terhadap tanah yang sudah diduduki sekian lama”

Dr Zambry
Abdul Kadir
Menteri Besar Perak

e-Kadaster, e-Tanah selesai kes tanah tertunggak



PUTRAJAYA 16 Okt. - Kerajaan akan menyelesaikan kes tanah tertunggak melalui pelaksanaan projek e-Kadaster dan e-Tanah. Menteri Besar Perak, Datuk Sazmi Miah berkata, projek ini akan membantu menyelesaikan masalah tanah tertunggak yang dihadapi oleh penduduk di kawasan-kawasan tersebut.

Kerjasama infrastruktur negeri seluruh Semenanjung telah dilakukan dalam tempoh empat bulan bermula Mei lalu.

Such high-performing governments are not measured purely by inputs and outputs but are based on actual outcomes (see Figure 1)

Jupem laksana projek eKadaster

PUTRAJAYA 25 Jan. - Jabatan Ukur dan Pemetaan (Jupem) akan melaksanakan projek eKadaster bertujuan mempercepatkan sistem pengukuran hak milik tanah daripada dua tahun kepada dua bulan. Setiausaha Parlimen Kementerian Sumber Asli dan Alam Sekitar, Datuk Sazmi Miah berkata, projek yang bernilai RM287 juta itu berupaya meningkatkan keperluan pengguna dan memacu pertumbuhan ekonomi negara.

Achievement

TOPIC RANKINGS	DB 2013 Rank	DB 2012 Rank	Change in Rank
Starting a Business	54	42	↓ -12
Dealing with Construction Permits	96	116	↑ 20
Getting Electricity	28	27	↓ -1
Registering Property	33	62	↑ 29
Getting Credit	1	1	No change
Protecting Investors	4	4	No change
Paying Taxes	15	25	↑ 10
Trading Across Borders	11	12	↑ 1
Enforcing Contracts	33	31	↓ -2
Resolving Insolvency	49	48	↓ -1

- Prior to eKadaster JUPEM took 2 year to complete Request fir survey job. Now reduced to between 2-6 months.
- Have positive impact on national development project under “registering properties” with improved ranking according to “Ease of Doing Business” prepared by world Bank
- NDCDB is being utilised by most GIS users in Malaysia.
- Increasing demand for accurate NDCDB allowed JUPEM to proceed with the NDCDB strengthening project.

New set of Rules & Regulation in Cadastral Surveying are published

Before

After



Data lodgement is done Online

After

Before



Jupem2U
JABATAN UKUR DAN PEMETAAN MALAYSIA

52 PM Search Fail Ukur/Lot

No. Fail Ukur : ex. 100_2009

Negeri :

Daerah :

Mukim/Bandar :

Seksyen :

No. Lot :

No. PA : ex. PA105239

No. PU : ex. 25/2009

No. PT : ex. PT37826

No. Pej. Tanah : ex. PTG/WP11/877/06(10)

No. Skim :

Bil. Petak : ex. (0-9)

Bil. Aksesori : ex. (0-9)

No. PTG :

Map controls: +, -, Hand, Home, Refresh, Info, Print

Overview Coordinate...

Jupem2U
JABATAN UKUR DAN PEMETAAN MALAYSIA

08 Oct 2016, 12:52 PM

LN SPAHQ1
887)-LS

LS Lodgment

Negeri :

Daripada Role :

Daripada :

Ref. No :

Type :

LIT 800 : Validate *

Tujuan Ukur :

Compulsory Files	File Name	Document Type	In
1.	...	ASCII files (*.pub)	...
2.	...	ASCII files (*.pub)	...
3.	...	ASCII files (*.pub)	...
4.	...	Sjil Akaun LIT	...

Optional Files	File Name	Document Type	In
1.	...	CRM Zip Files (*.zip)	...

Attachment :

Map controls: +, -, Hand, Home, Refresh, Info, Print

Overview

National Digital Cadastral Database (NDCDB) applying Survey Accurate Coordinate

After

Before

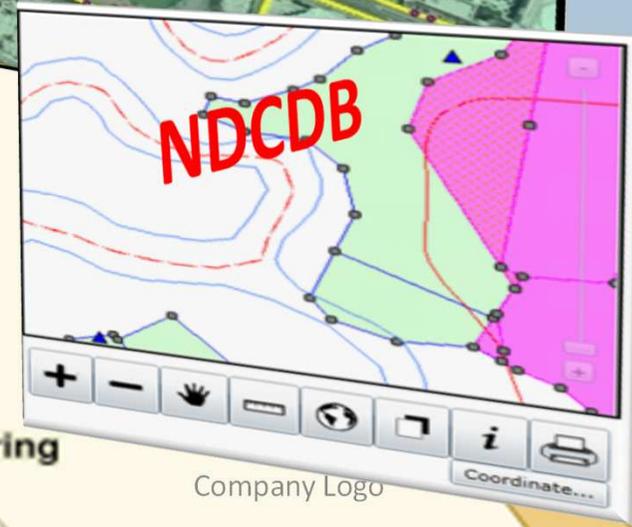


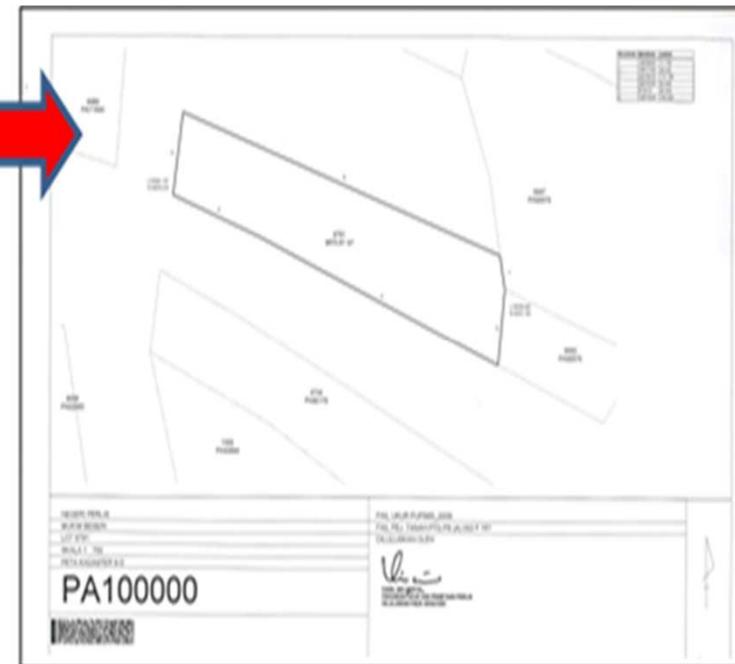
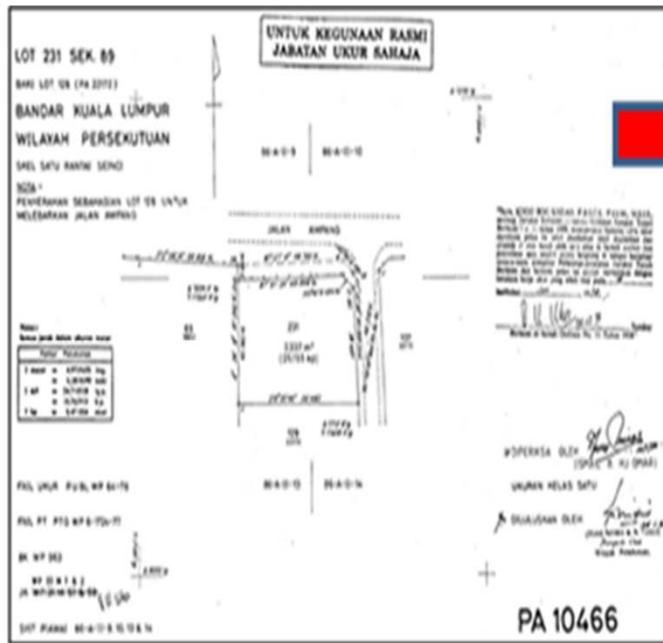
FIG Pacific Small Island Developing States Symposium

Policies and Practices for Responsible Governance



Fiji 18–20 September 2013

CC-BY 2.0 photo by Matt Wright



Move from Conventional Certified Plan to a Certified Plan with 2D barcode generated using the Digital Raster Plan (DRP) Module under the eKadaster system

FIG Commission 5 Position and Measurement

United Nations Global Geospatial Information Management – Asia Pacific





Public Key Infrastructure

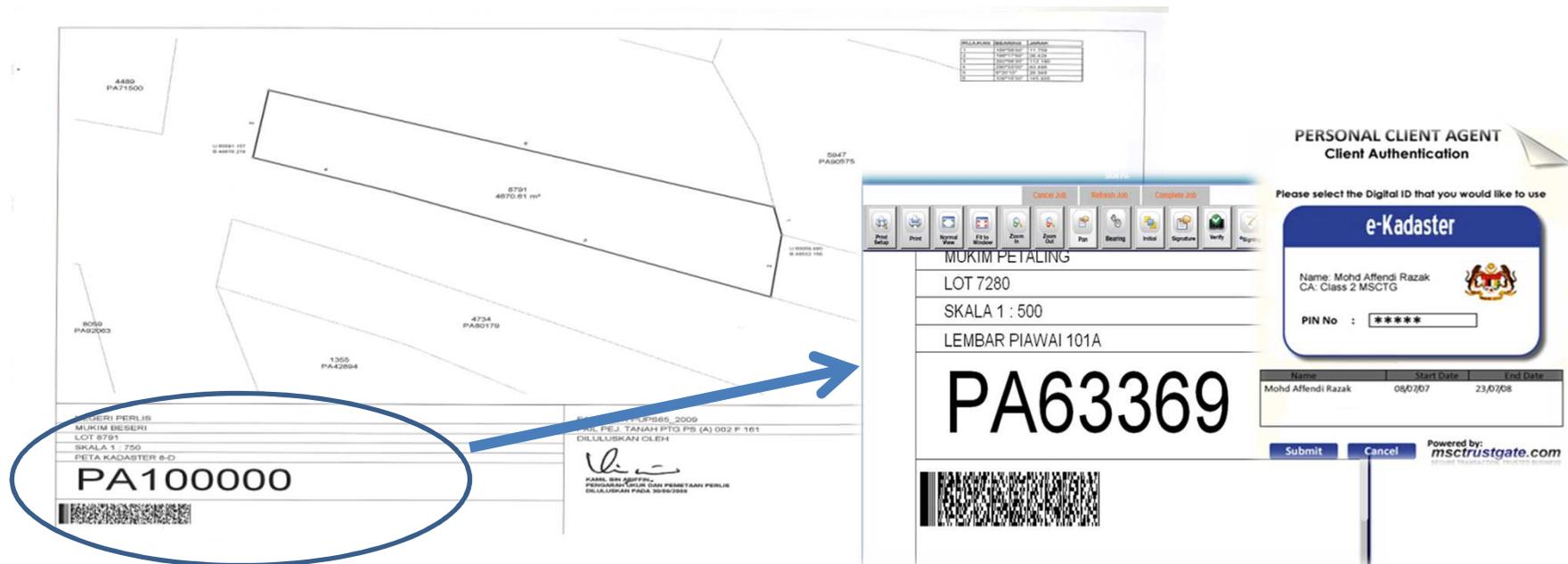


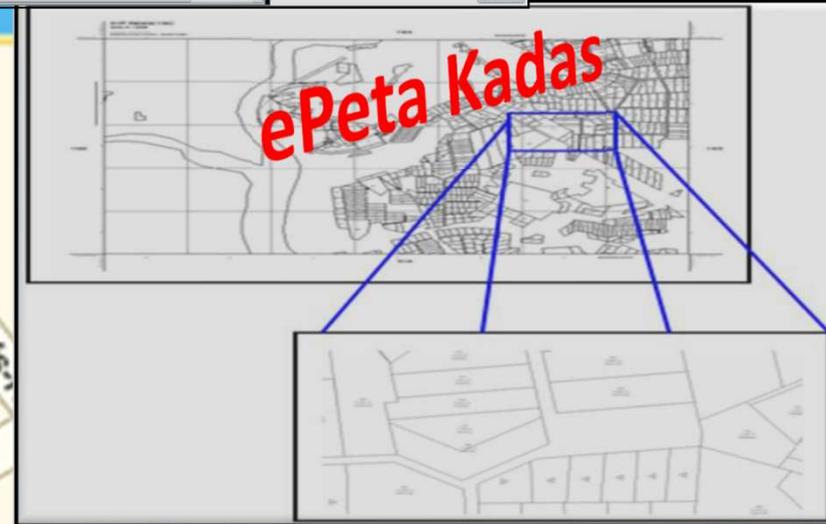
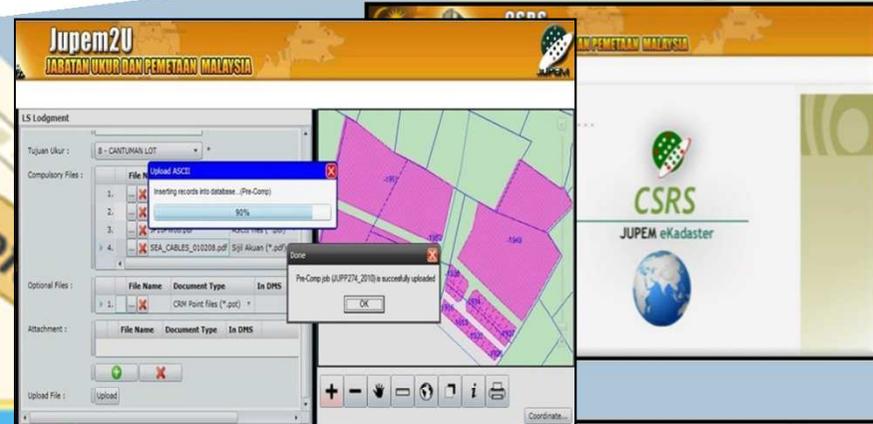
Figure 1: A Certified Plan with 2D barcode generated using the Digital Raster Plan (DRP) Module under the eKadaster system

**Index Map or Standard Sheets
are kept digitally**

After



Before



Company Logo

Survey data handling and storage

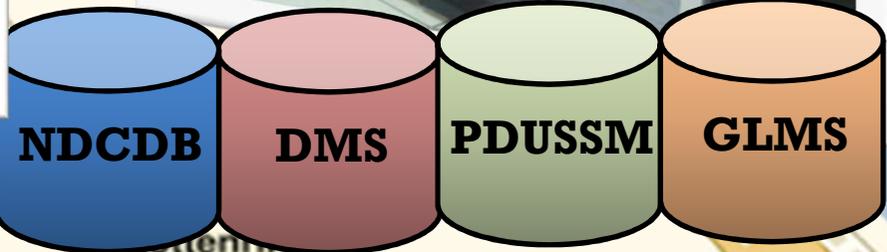
Before



www.jupem.gov.my



After



Company Logo

Zelinkagasse



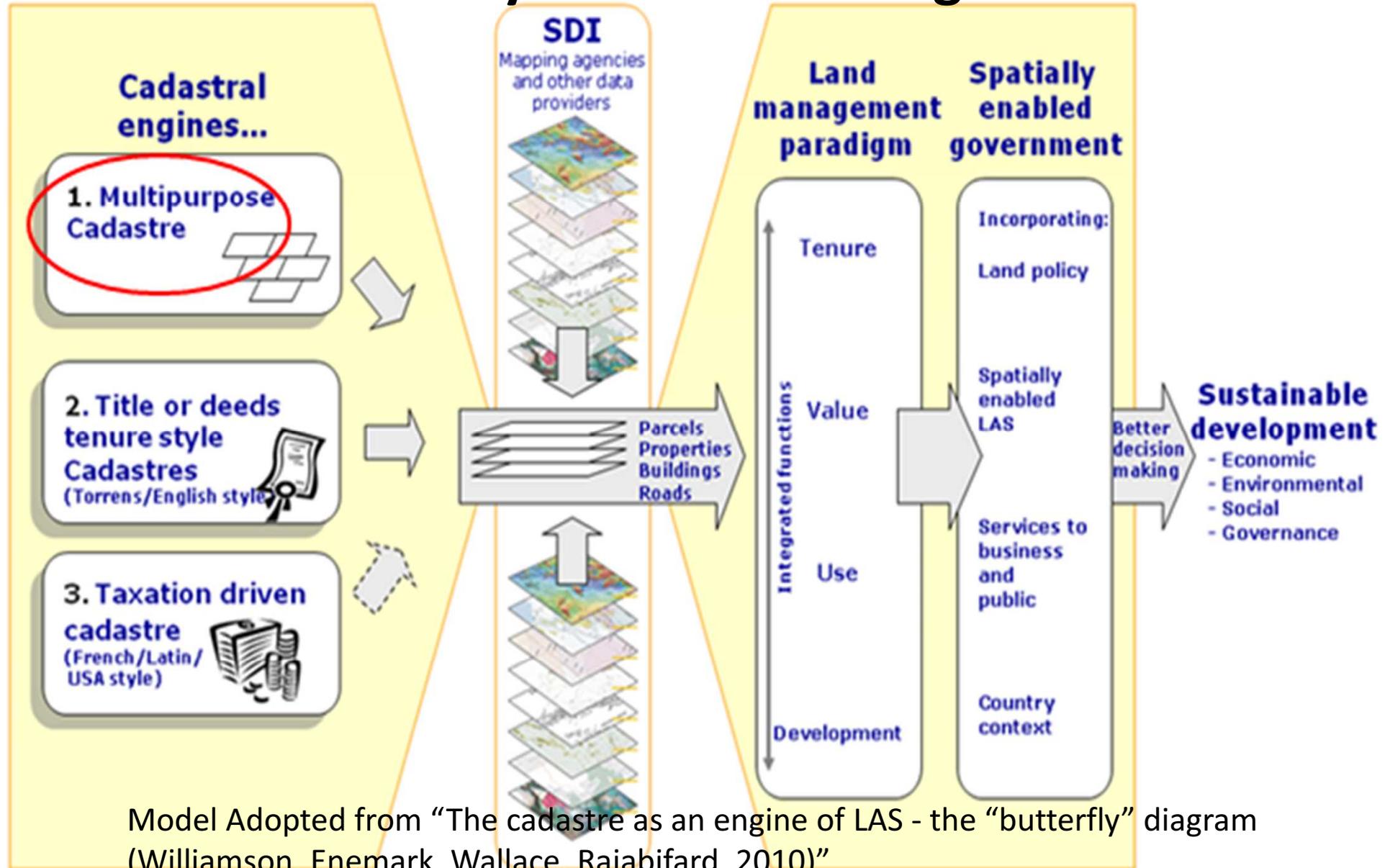


Future Directions

FIG Commission 5 Position and Measurement
United Nations Global Geospatial Information Management – Asia Pacific

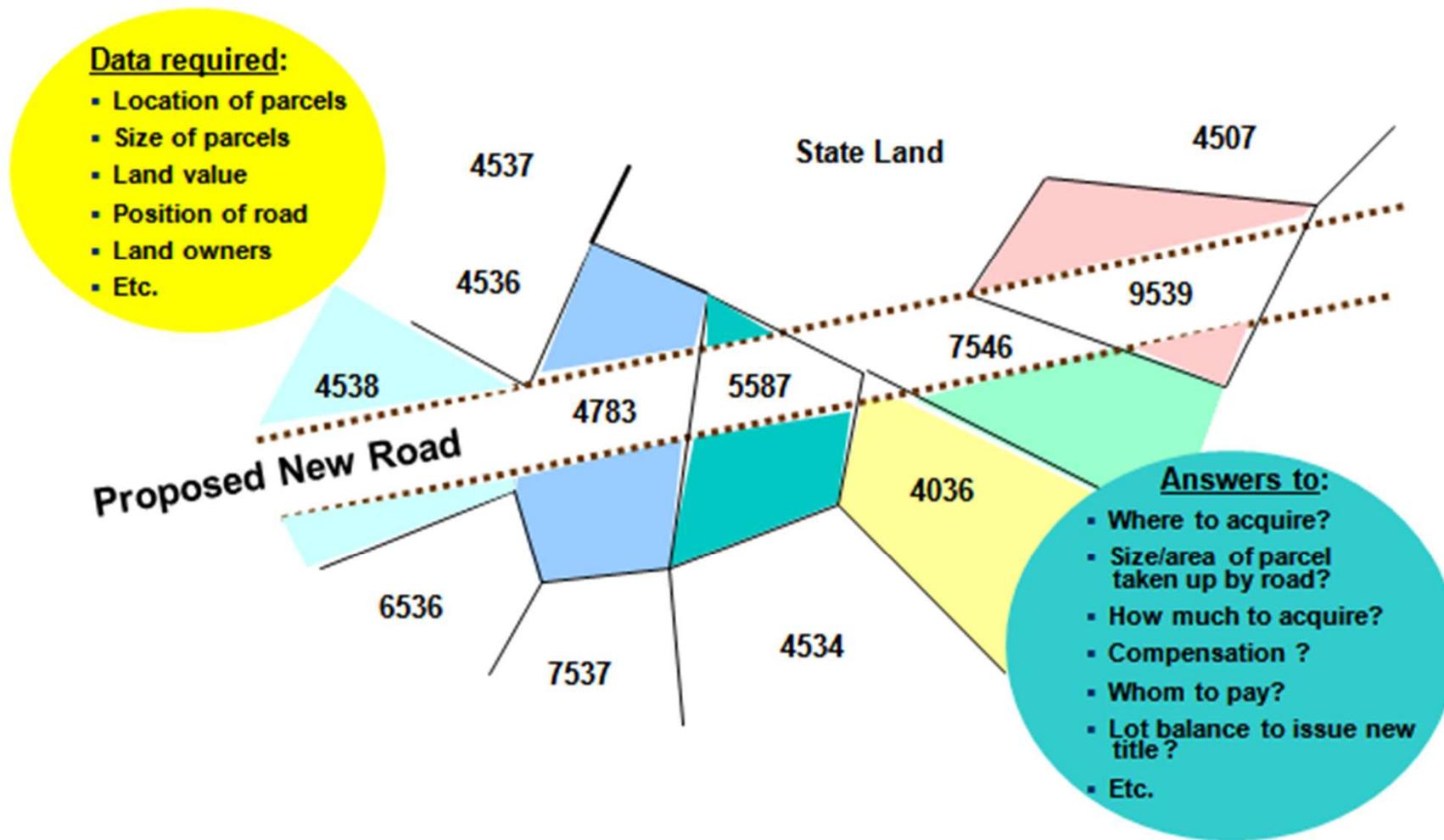


Multipurpose Cadastre Catalyst for economic growth

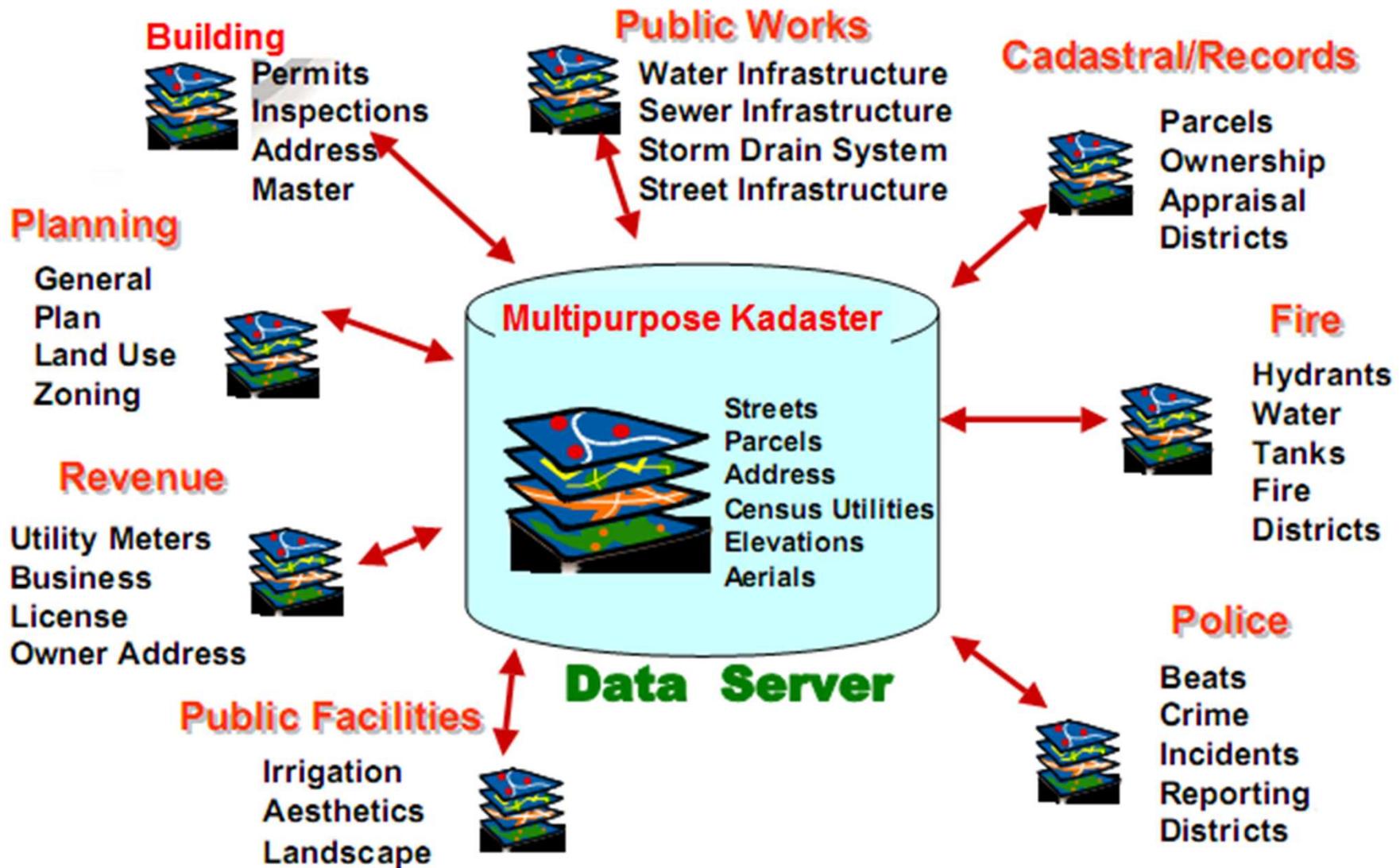


Model Adopted from “The cadastre as an engine of LAS - the “butterfly” diagram (Williamson, Enemark, Wallace, Rajabifard, 2010)”

Multipurpose Cadastre : 'A Decision Making tool'

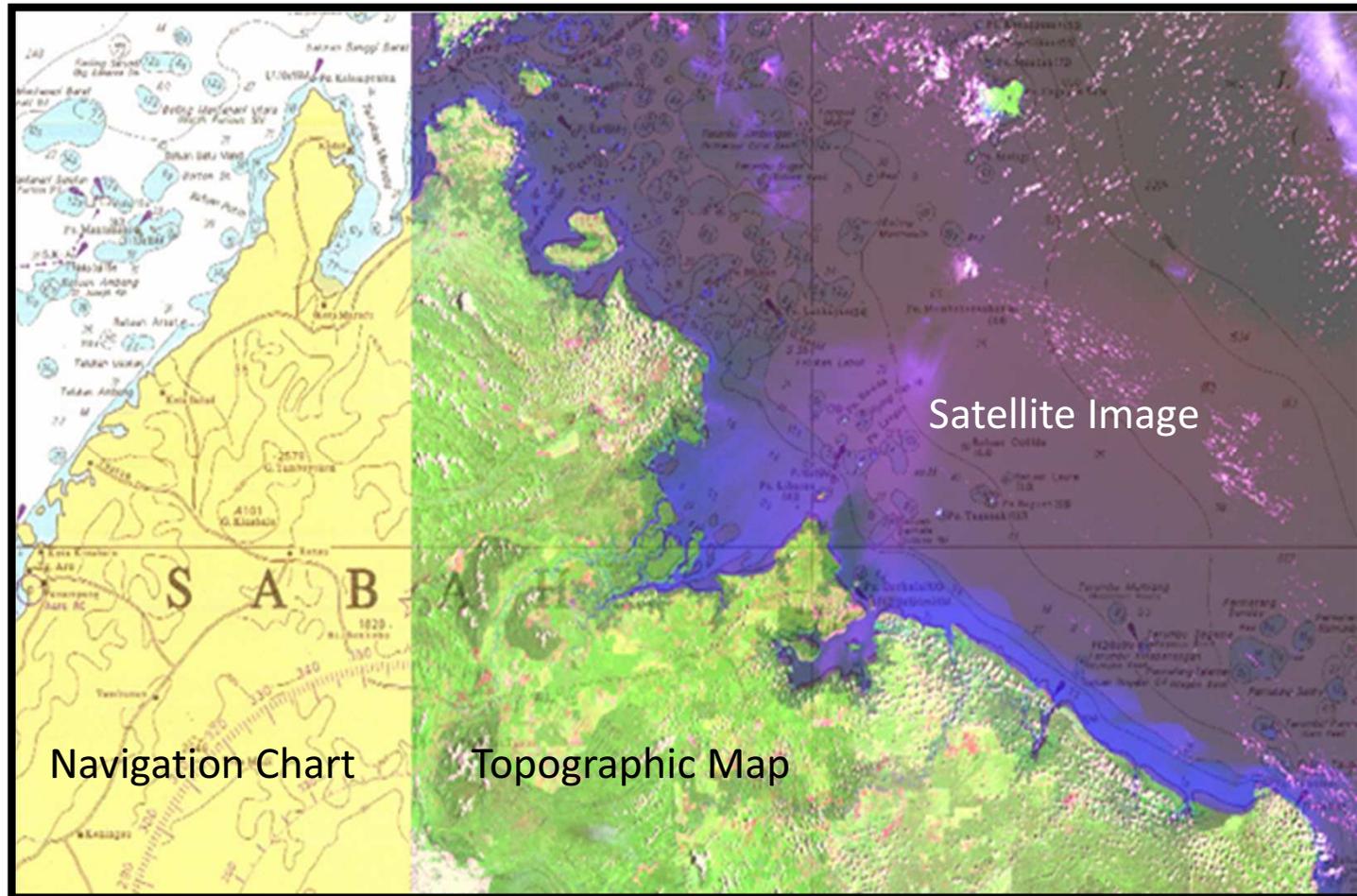


Multipurpose Cadastre – From Single Purpose To Multipurpose Cadastre

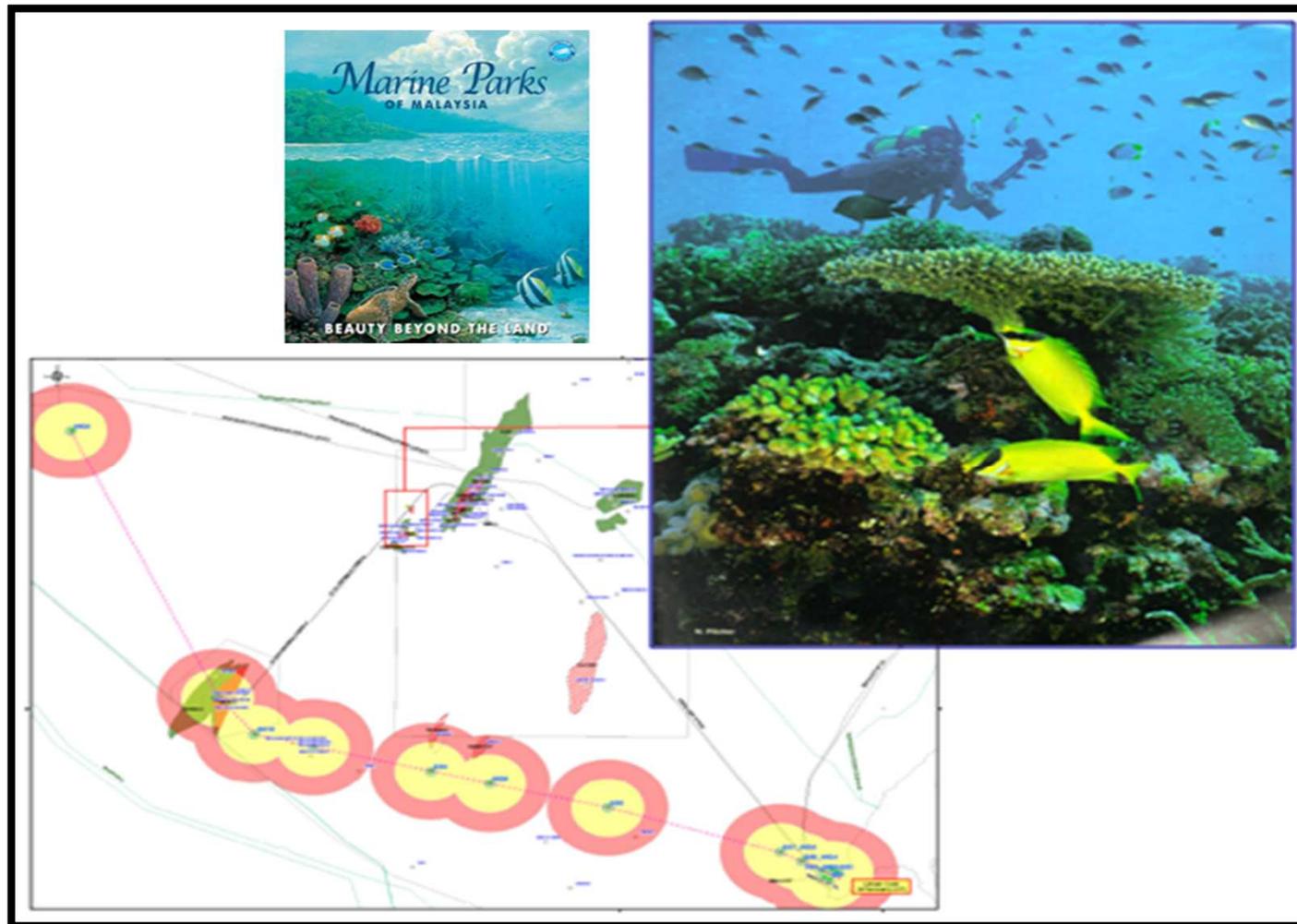


Marine Cadastre

JUPEM aims to Extend Cadastre offshore due to increase interest



Marine Cadastre: To Sustainably Administering The Marine Environment



Management of Marine Activities

- ❖ Sand Mining Industries
- ❖ Fisheries, Marine culture and Aquaculture Industries
- ❖ Conservation and Tourism Industries



FIG Commission 5 Position and Measurement
 United Nations Global Geospatial Information Management – Asia Pacific

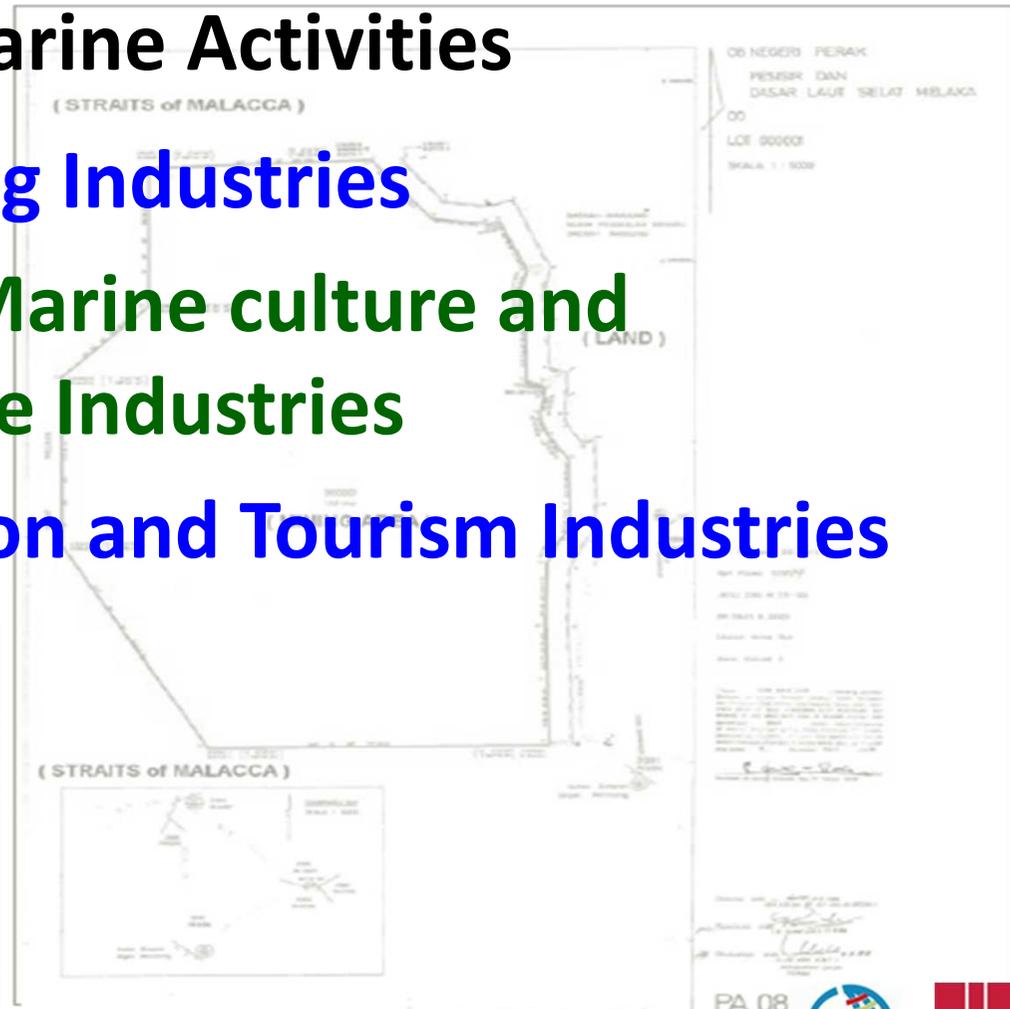
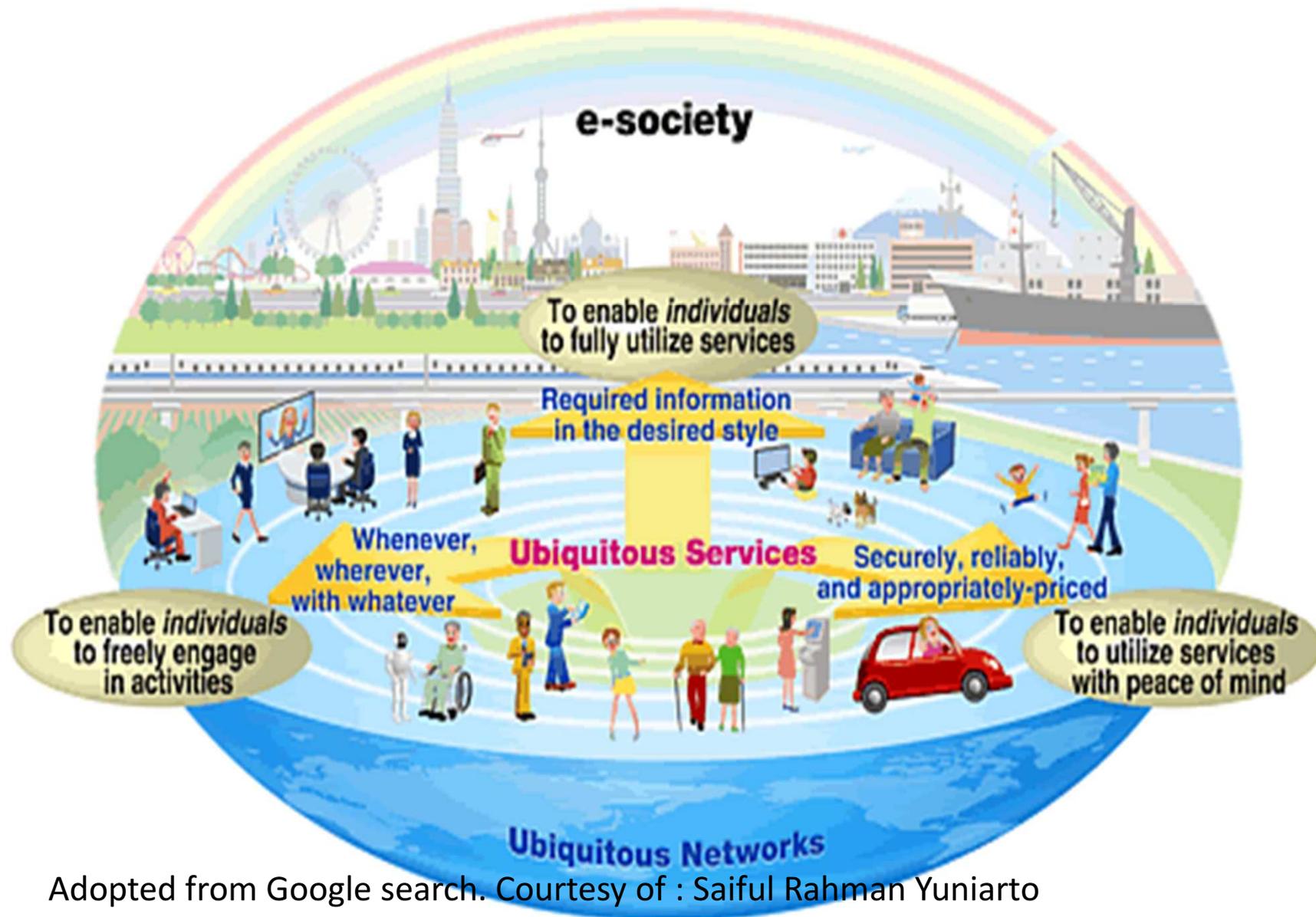


Figure Mining area at Straits of Malacca

“Ubiquitous Environment”



Adopted from Google search. Courtesy of : Saiful Rahman Yuniarto

Final Remarks

eKadaster;

- a paradigm shift to a friendlier Cadastre, fulfilling current requirements and relevant to spatial enablement.
- Problems encountered were addressed appropriately.
- Reduction in land title survey processes from 2 years to 6-2 months with the used of ICT, GNSS and GIS technology

**Thank
You**

Terima Kasih

Mahalo
Kiitos

Tack

Grazie

Obrigado

Toda

Thanks

Takk

Gracias

Merci



Hope to see you in Kuala Lumpur

