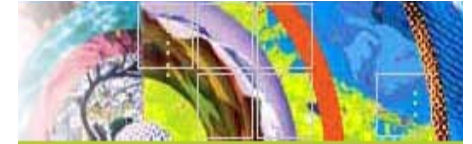# Realizing Spatially Enabled Societies – a global perspective in response to Millennium Development Goals

Building Bridges Between SDI and Spatial Communities
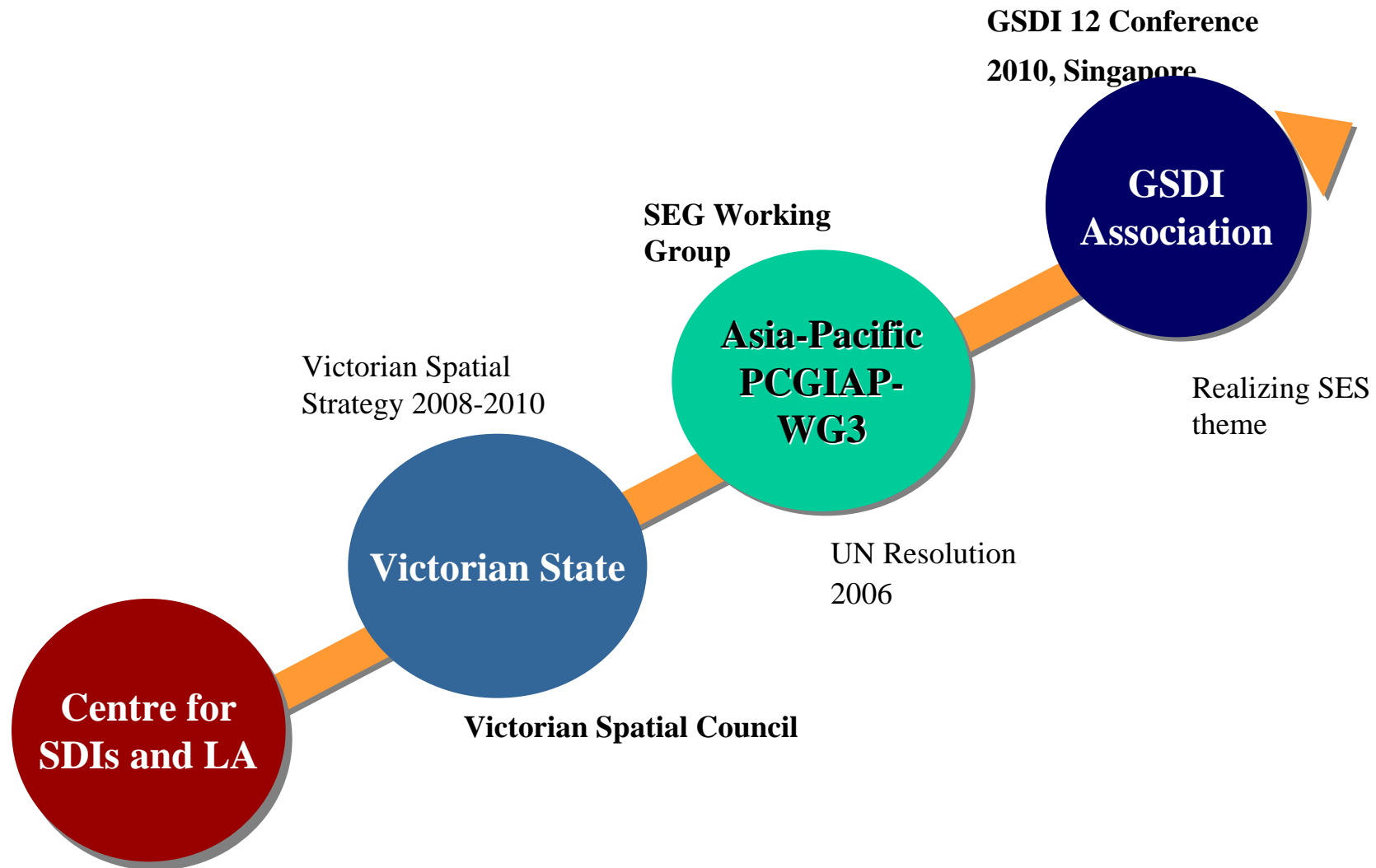
Abbas Rajabifard
President, GSDI Association

Director, Centre for SDIs and Land Administration
University of Melbourne

GSDI
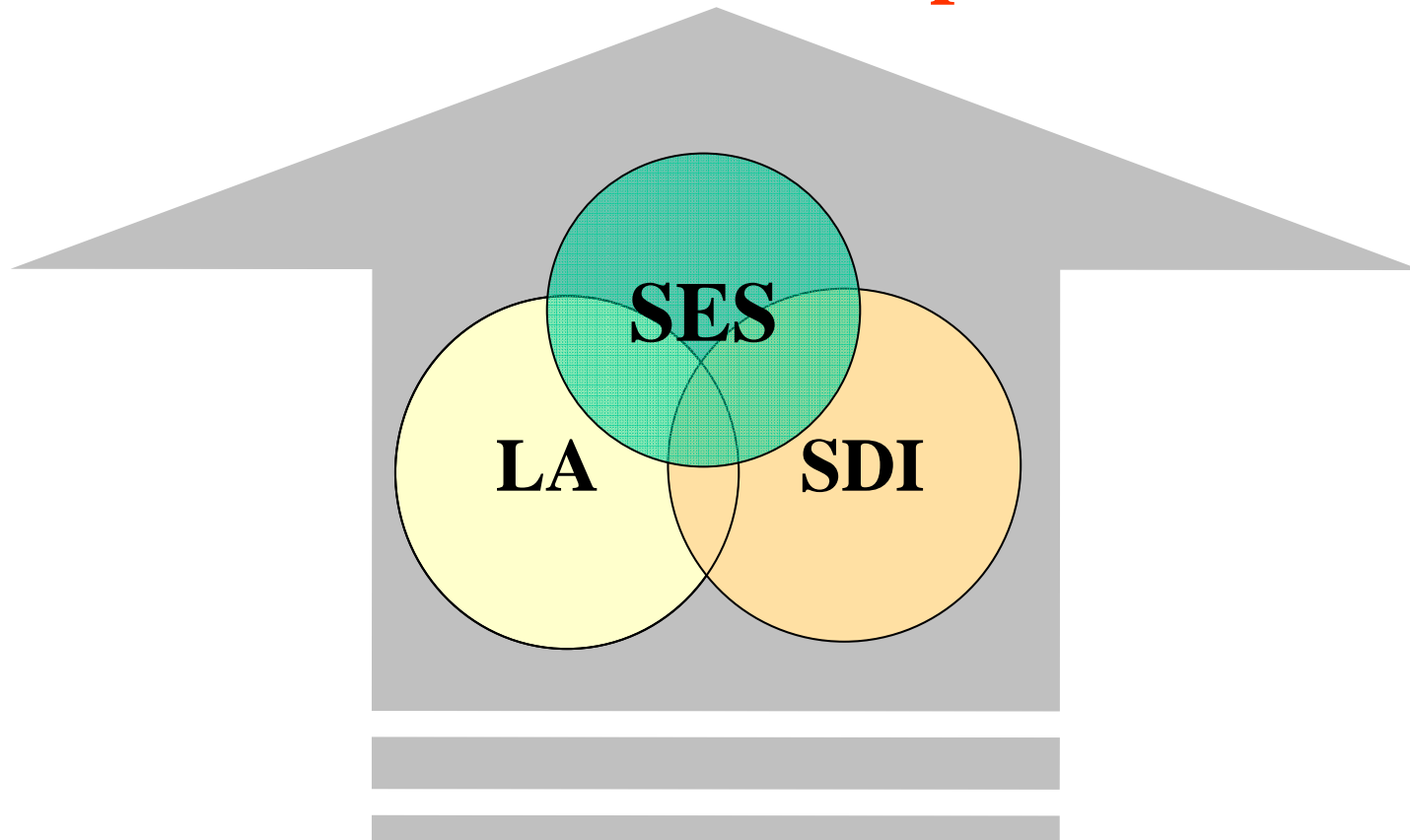Global Spatial Data Infrastructure

Introduce a new **Vision** "**Spatially Enabled Society**"-A Scenario for the Future (*explain SDI design, issues and trends to support this vision*) and also GSDI Association and Vision of Spatially Enabled Society.

Spatial Enablement – Experiences & Activities

GSDI 12 Conference

2010, Singapore

GSDI Association

SEG Working Group

Asia-Pacific PCGIAP-WG3

Victorian Spatial Strategy 2008-2010

Realizing SES theme

Victorian State

UN Resolution 2006

Centre for SDIs and LA

Victorian Spatial Council

GSDI

Global Spatial Data Infrastructure
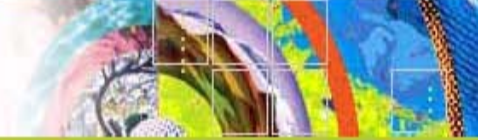
THE UNIVERSITY OF MELBOURNE

Sustainable Development

SES

LA

SDI

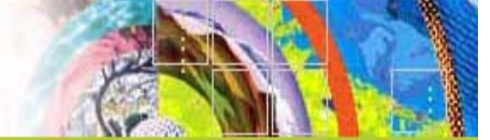**Centre for Spatial Data Infrastructures and Land Administration**
Department of Geomatics, The University of Melbourne

THE UNIVERSITY OF
MELBOURNE

Global Spatial Data Infrastructure

Spatial information is an enabling technology/infrastructure for modern society.
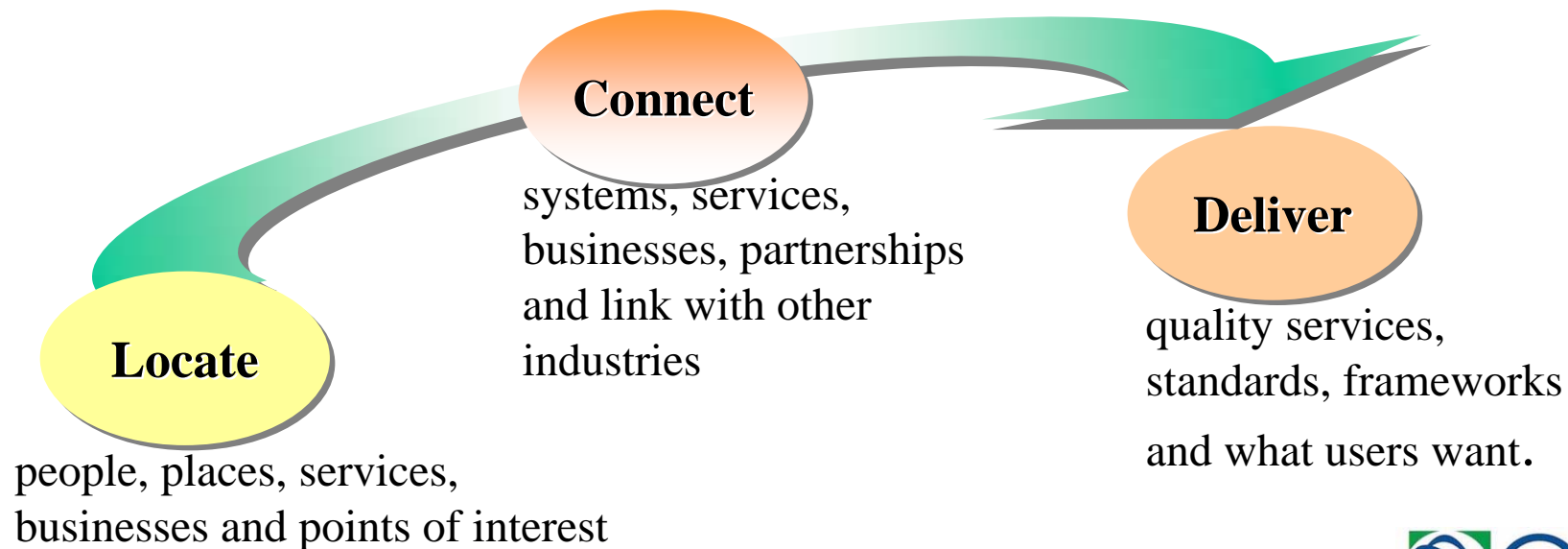
Ready and timely access to spatial information – knowing where people and assets are – is essential for the creation of wealth in any jurisdiction.

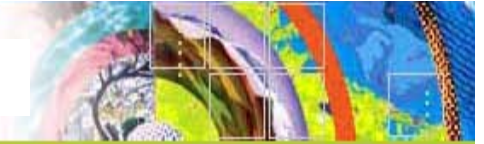It is a critical tool for making informed decisions on key economic, environmental and social issues.

- Spatial Information can be a unifying medium – **linking** solutions to location.

- User demand has shift ed to seeking **improved** services and delivery tools. This will be achieved by creating an environment so that we can:

Connect

systems, services, businesses, partnerships and link with other industries

Deliver

quality services, standards, frameworks

and what users want.

Locate

people, places, services, businesses and points of interest
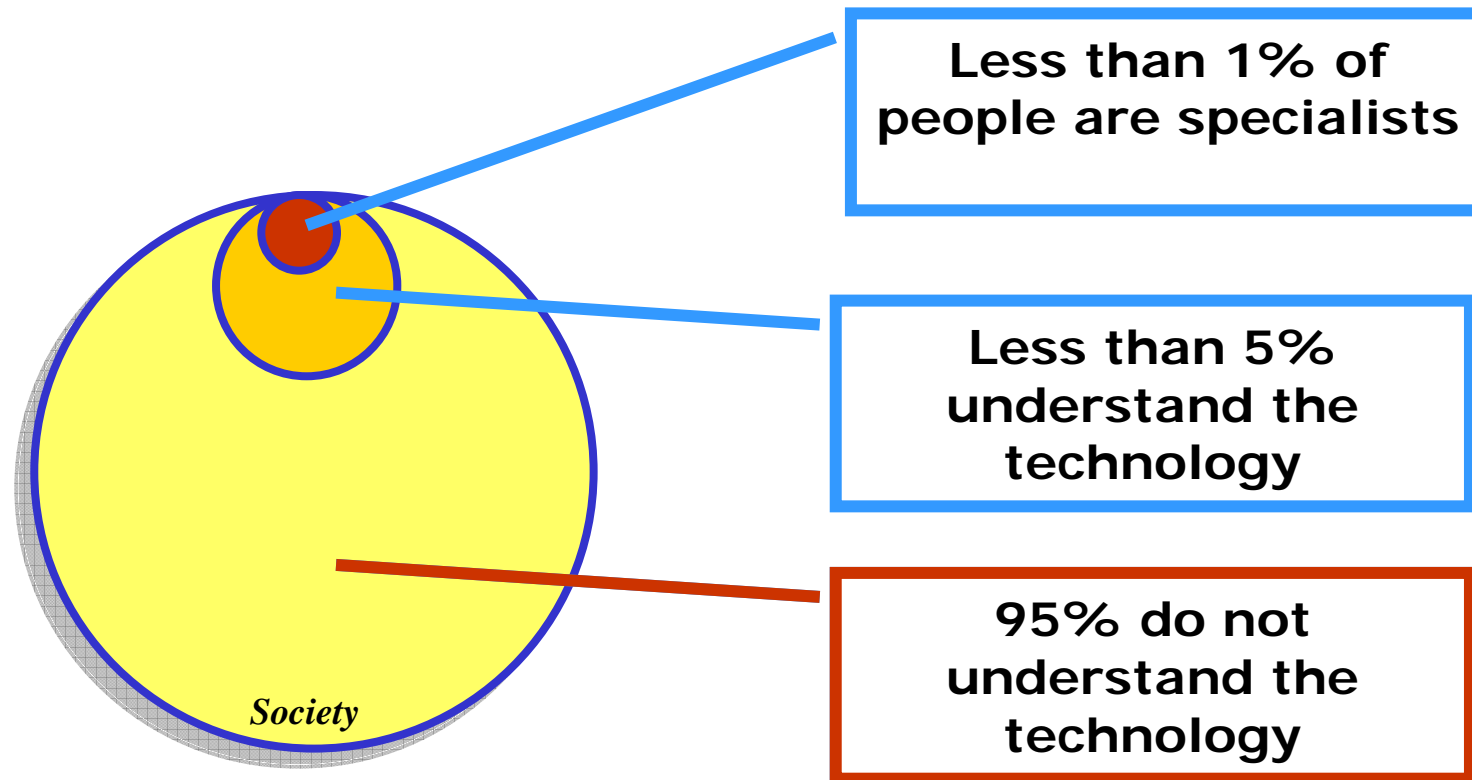
GSDI
Global Spatial Data Infrastructure

Who understands place?

The vast majority of users do not know they are "spatially enabled" – and don't care!

Less than 1% of people are specialists

Less than 5% understand the technology

95% do not understand the technology

Society
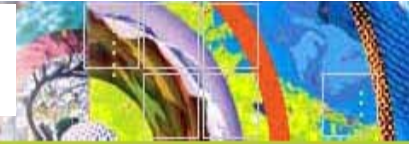
Spatial Data is further shaped by the decision-making process to which it is subject

Decision Making Process

People → *Access Policy Standards* → **Spatial Data** → **Information**
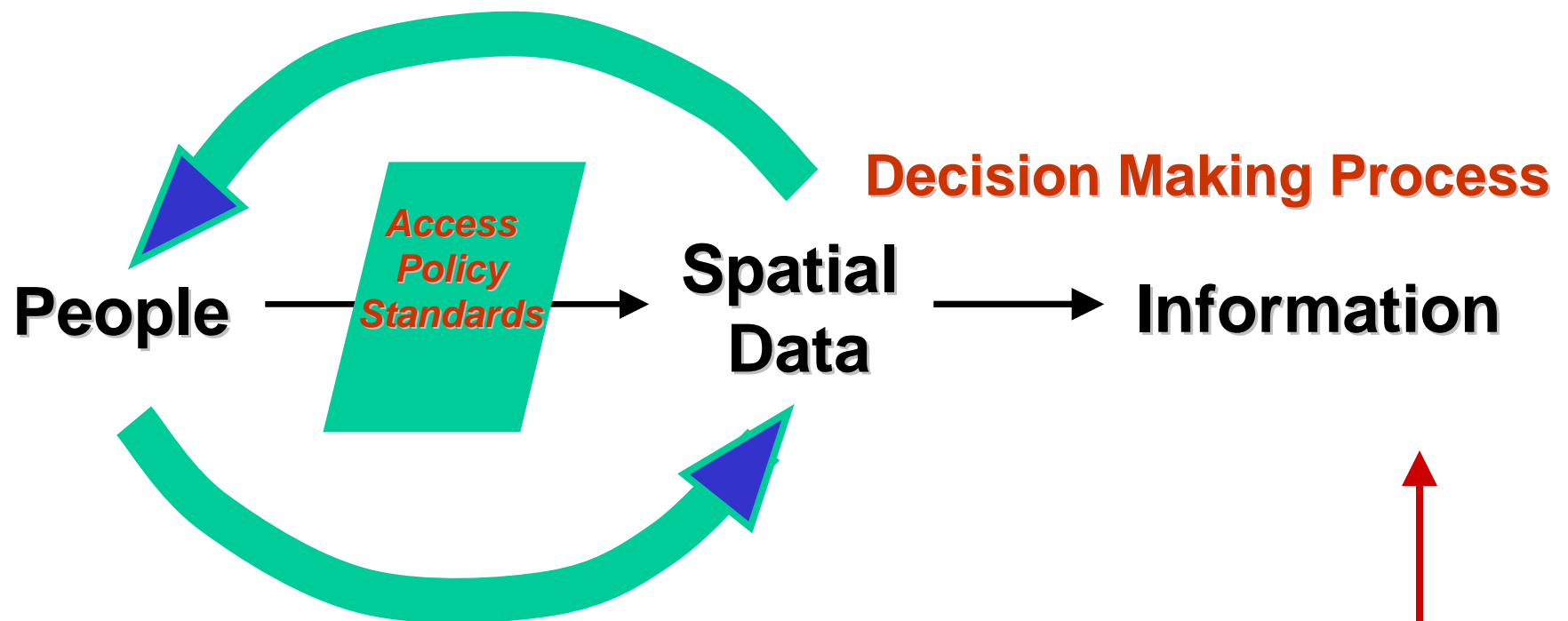
Management / Administration underpinned by access to spatial information.

(Adopted from Feeney 2003)

So Why the Problem?
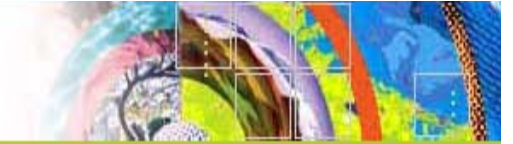
- Immature institutional arrangements

- Immature user/provider relationships

- Poor knowledge of data availability

- Difficulties in assessing data quality

- Inconsistent policies on data access and use

- Lack of best practice in the use of technologies.

Spatial Data Infrastructure
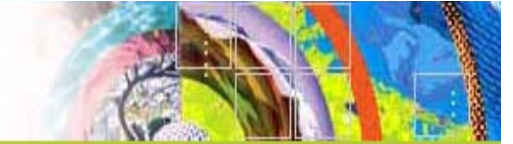
…is an integrated, on-line mechanism to deliver spatial data and services and information for applications, better business and policy decision-making, and value-added commercial activities.
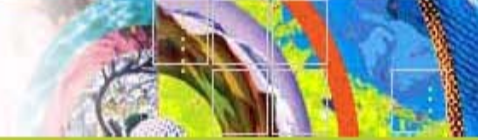
- **SDI** is all about facilitation and coordination of the exchange and **sharing** of spatial data, services and related resources;

- **SDIs** constitute a set of relationships and partnerships that **enable** data sharing, update and integration (start where you are ready to start).

- **Components**-collection of people, policies, networked datasets and enabling technologies and services.

Content and Elements

......   Silo problem

SDI & SES, Governance

GSDI, Digital Earth, Global Map, UNSD

SDI & LA

SDI Governance

SDI development strategies and models

Benchmarking   Financing

SDI concept and principles

Spatial data management

SDI Road map

Development of appropriate policy

Managing RRRs

SDI assessment models

Web delivery services

Visualization

Spatial data: importance and challenges

Capacity building

Custodianship,

Interoperability

Related initiatives & issues

collaboration and institutional arrangements

Open Systems and Network

Data catalogue

Concepts & Principals

Policy and privacy issues

Metadata

Partnerships

SDI Platform

Access and security   Clearinghouse

Technical

Institutional & Policy

Legislation or collaboration

Spatial computing

Sensor network

Data, Platforms, Applications

Data integration

Web Mapping Services (WMS, WFS WCS)

Data integration models

Standards   **Tools**

Standards

Data integration web service

Metadata Entry Tools

UML Modeling

SDI related Tools

SDI and Google

XML, XML Schema, GML and SVG

SDI and Virtual Earth

Web services

Data models within SDI framework

ASSETTA

Seamless SDI Marine SDI

Ubiquitous

Data Standards

Spatially Enabled Property data

SDI and emergency management

ICA, ISO, OGC

SDI and UML modelling

Visualization Tools and Models

Metadata standards

Data Integration Tool

GSDI
Global Spatial Data Infrastructure

SDIs have no role, are meaningless and cannot be justified unless they support business processes or applications.

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Changing Role of SDI

- **Starting from** the current initiatives to implement SDI as a mechanism to facilitate access/sharing of spatial data hosted in distributed GISs (the conventional concept);

- **through** the access and chain of **web services** offered by distributed GISs, making use of Internet technologies;

- **To a new business paradigm** where '**SDI**' is emerging as a '**virtual jurisdiction**' or '**virtual enterprise**' to promote the partnership of SI-organisations (Public/Private) to provide wider scope of data and services, of size and complexity that is beyond their individual capacity;

- The development of such SDI requires an **integrated platform** to support the chaining of services across participating SI-organisations.

SDI as an Enabling Platform

- Individual organisations work as a collaborative network,

- Based on common standards and business understanding,

- Combines distributed functions provided by participating organisations to deliver services,

- Structured and managed as to be seen by third parties as a single enterprise.

Spatial Enabled Government & Broader Goals

- More effective and more transparent coordination;

- The creation of economic wealth through the development of products and services based on spatial information collected by all levels of government; and

- The maintenance of environmental sustainability through the regular and repeated monitoring of a wide range of spatial indicators distributed throughout the country as a whole.
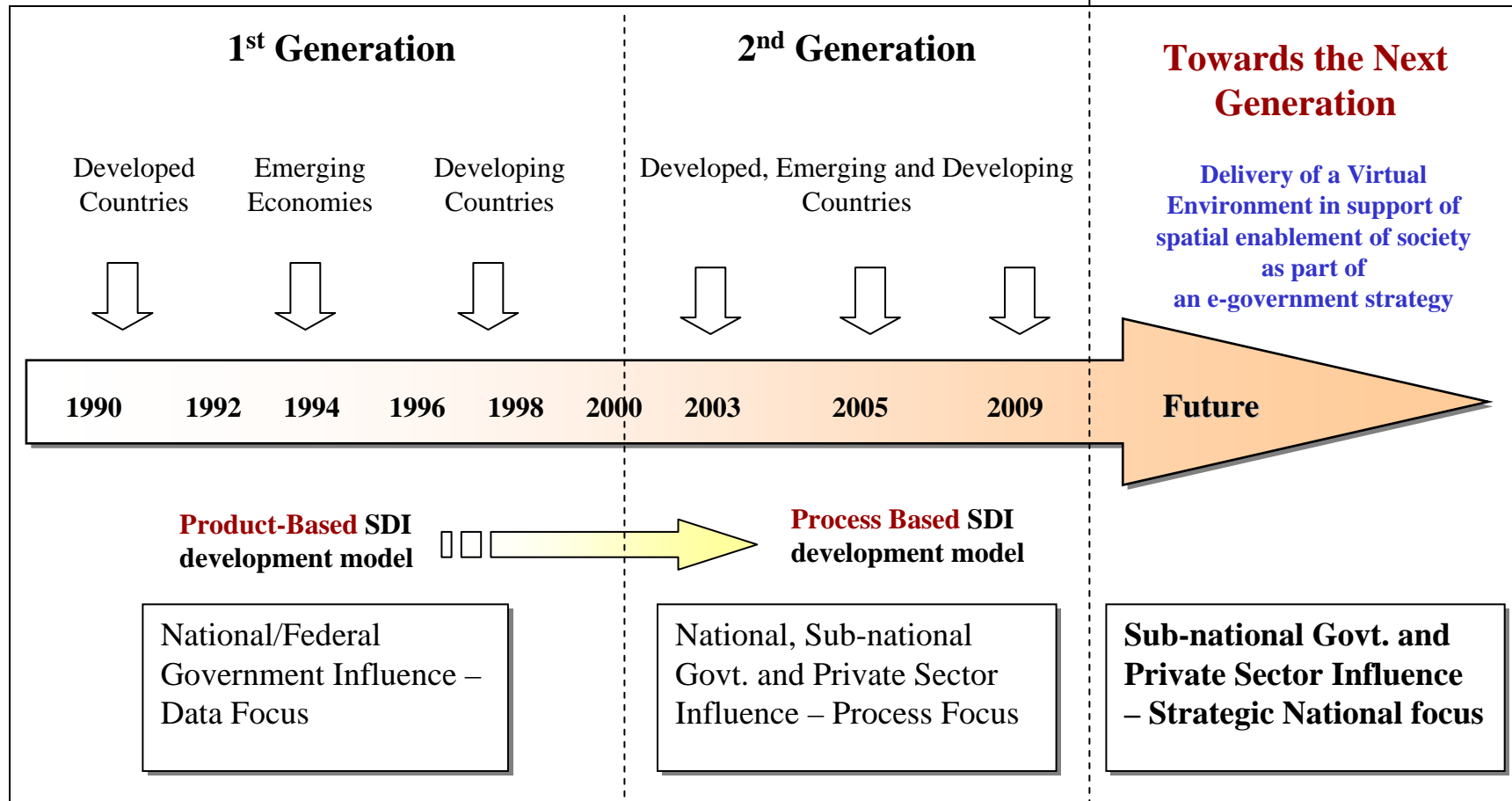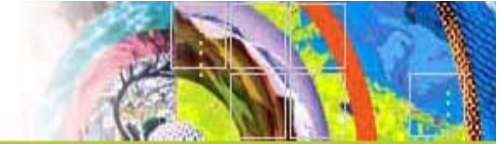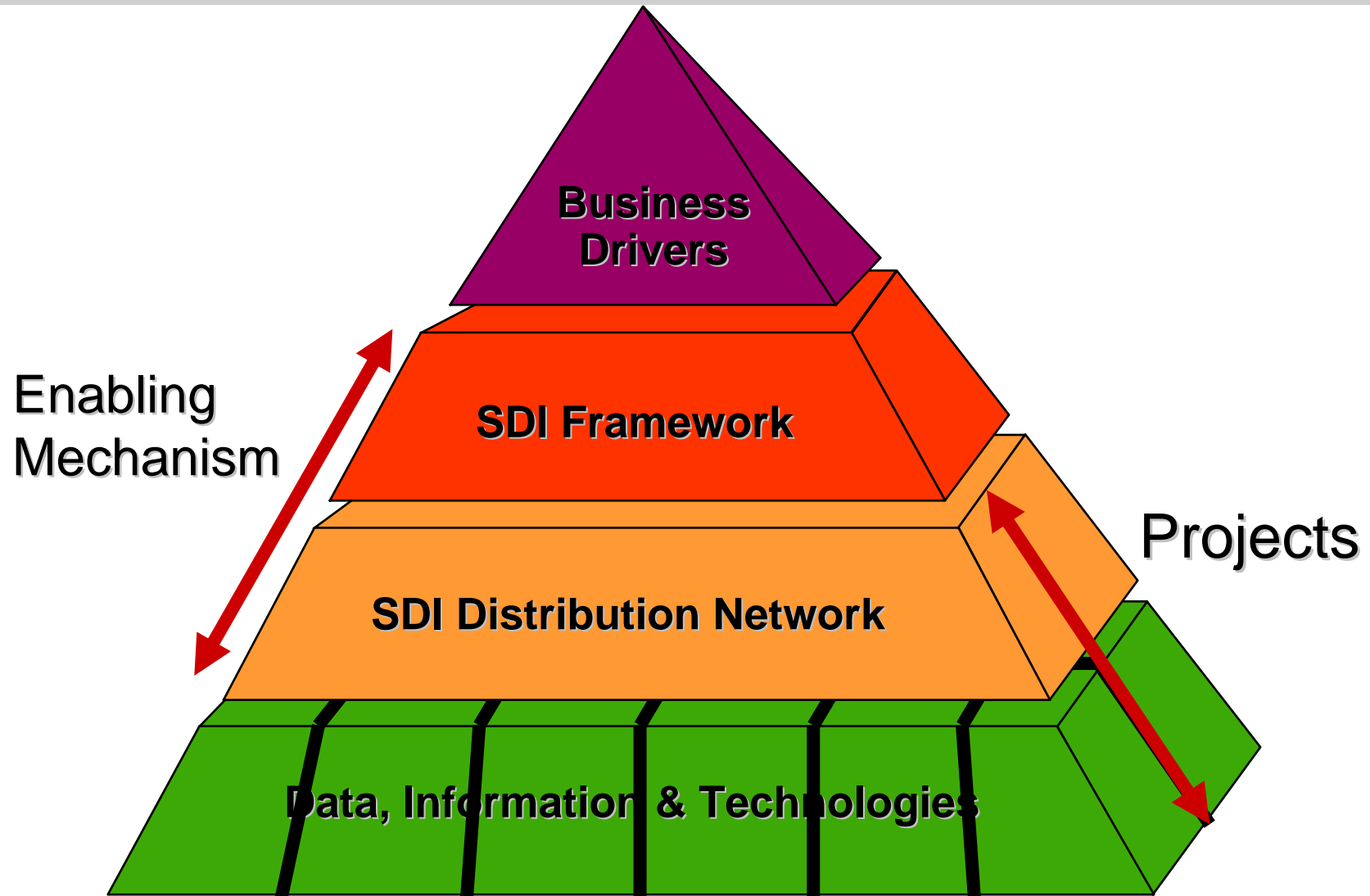
- ## Increase effectiveness
  - Better access (reduce barriers)
  - New services
  - Exploit data better
  - Get data on time
  - Avoid duplication of data

- ## Increase efficiency
  - Avoid duplication of effort
  - Avoid duplication of infrastructure
 - Commodity access arrangements

Connecting Drivers with Enablers

Business Drivers

SDI Framework

Enabling Mechanism

SDI Distribution Network

Projects

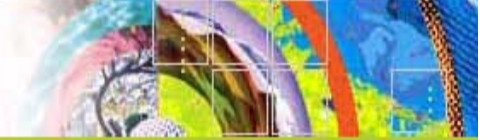Data, Information & Technologies

(Busby 2003)

What is Spatially Enabled Government- SEG?

- Location or place is used
  - initially to organise government information,
  - then to **re-engineer** government processes to deliver better policy outcomes,
  - Spatially enabled will ensure better productivity and efficiency,

- Place is used in a transparent manner.

- **SEG** means far better delivery of government services and sustainability better decisions by government.

Spatial Information in Society
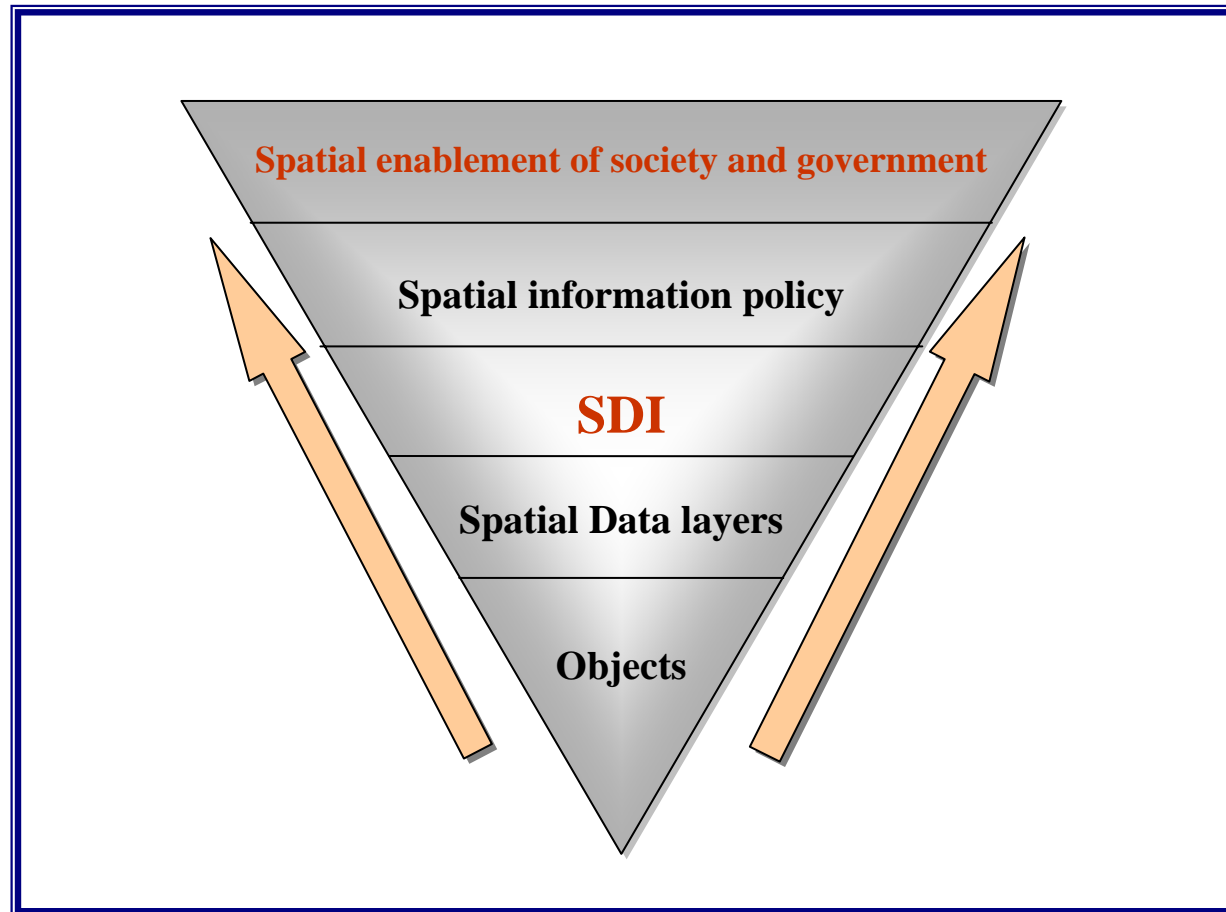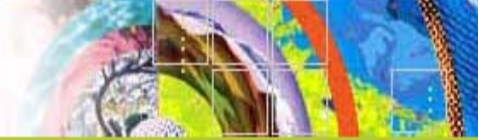
Spatially Enabled Society – A Scenario for the Future

The 'spatial enablement' can reshape our lives.

Possibilities provided by Spatial Enablement

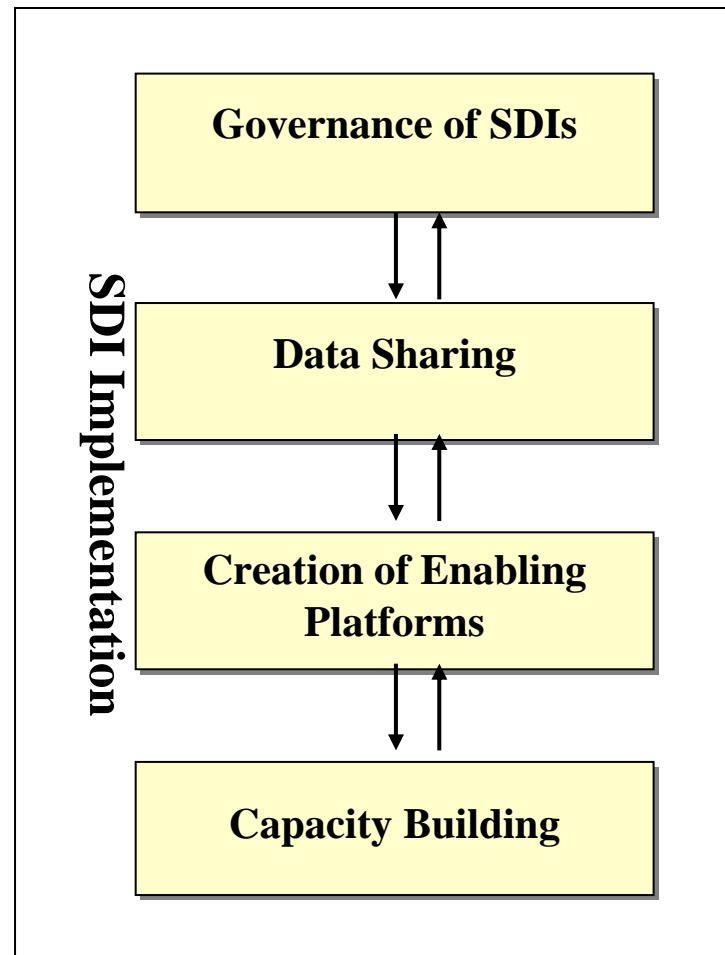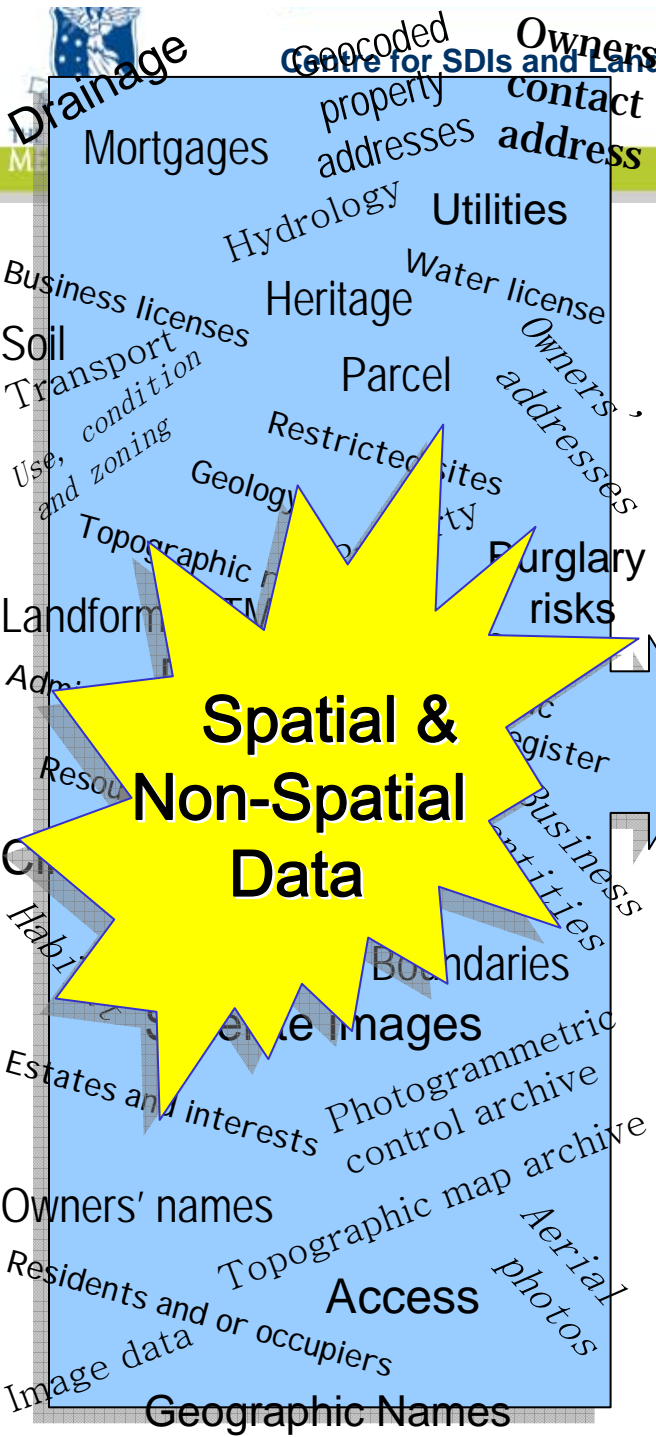Spatial enablement can contribute to dealing with the challenges we face as a society. At the same time, however, it brings its own challenges.

- Expanding government services — 'consultation & participation'
- Policy & Administration
- Public Safety
- Utilities
- Health
- Sustainability and our environmental footprint
- Land Administration
- The economics of production
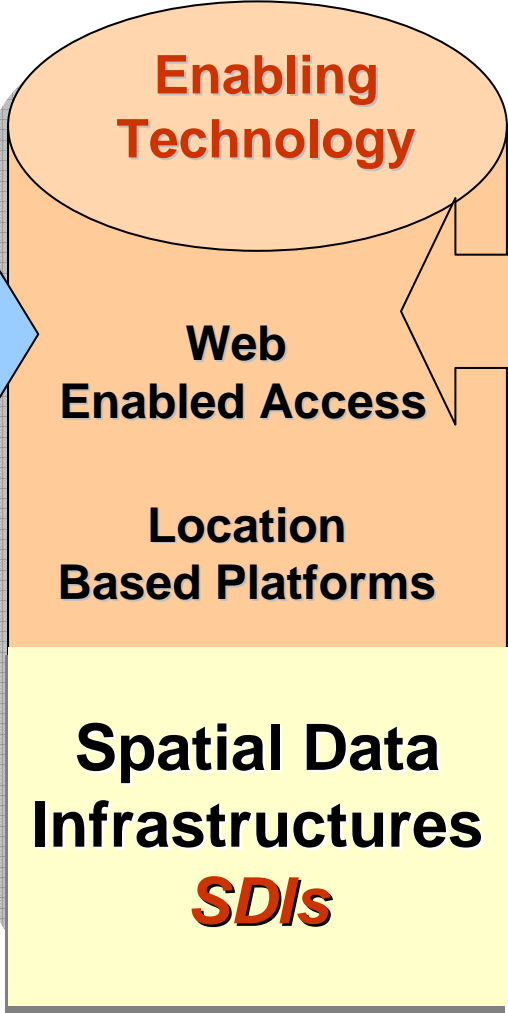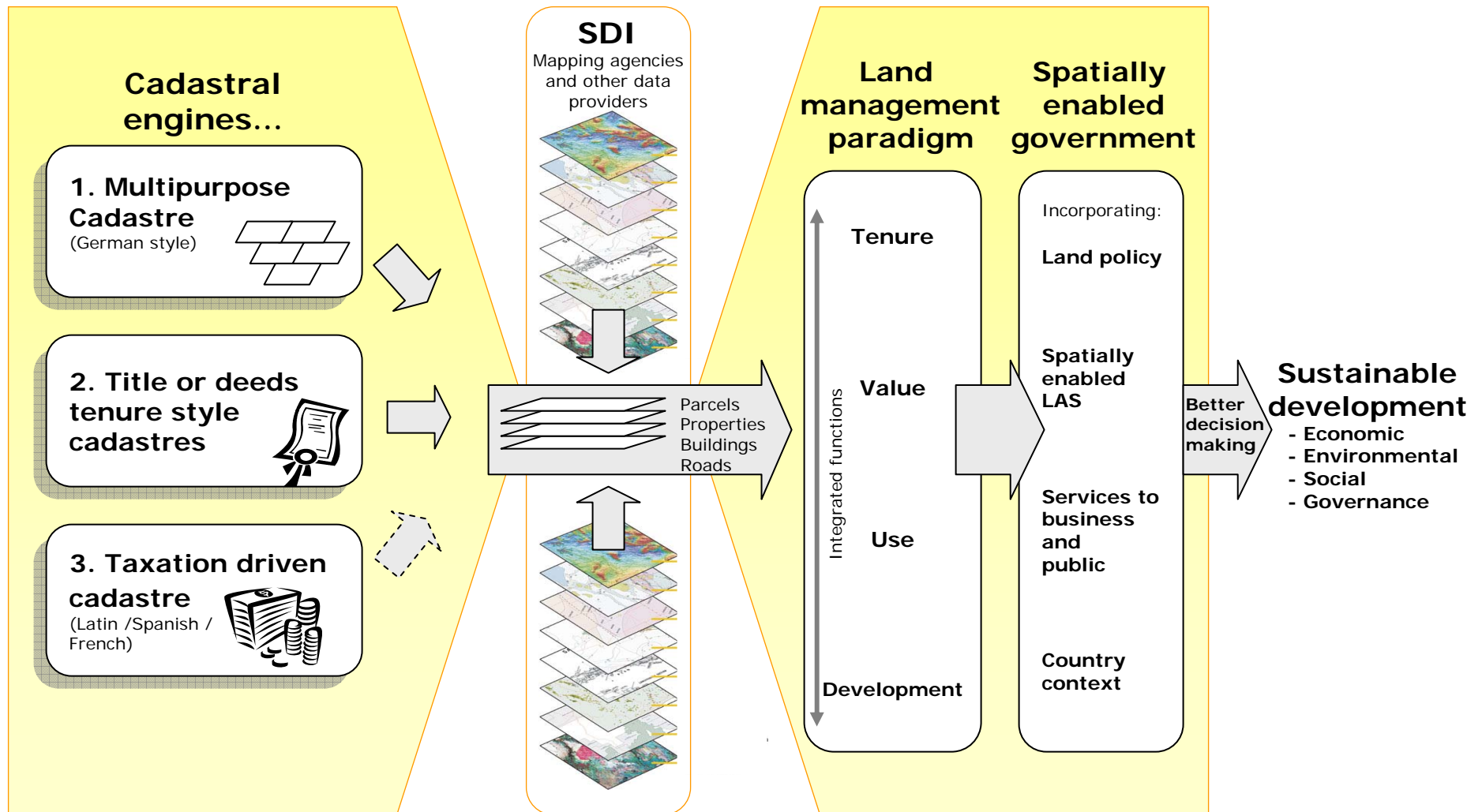- Consumption and choice

Drainage
Geocoded
Owners'
Mortgages
property
contact
addresses
address
Hydrology
Utilities
Business licenses
Heritage
Water license
Soil
Transport
Parcel
Use, condition
and zoning
Geology
Restricted sites
Owners'
addresses
Topographic
Landform
Burglary
risks
Admin
Resou
register
Business
entities
Habit
Boundaries
Estates and interests
te Images
Photogrammetric
control archive
Owners' names
Topographic map archive
Aerial photos
Residents and or occupiers
Access
Image data
Geographic Names

Spatial & Non-Spatial Data

Enabling Technology

Web Enabled Access

Location Based Platforms

Spatial Data Infrastructures *SDIs*

Supported Functions
for Key Government and Business Activities

Policy making

Land development & planning

Transactions management

Activity management

Emergency management

Land valuation & taxation

Provision of utilities & services

Transport and access

Farming & resource management

Disclosure of restrictions

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Significance of the cadastre

Cadastral engines...

1. Multipurpose Cadastre (German style)

2. Title or deeds tenure style cadastres

3. Taxation driven cadastre (Latin /Spanish / French)

SDI
Mapping agencies and other data providers

Parcels
Properties
Buildings
Roads

Land management paradigm

Integrated functions

Tenure

Value

Use

Development

Spatially enabled government

Incorporating:

Land policy

Spatially enabled LAS

Services to business and public

Country context

Better decision making

Sustainable development
- Economic
- Environmental
- Social
- Governance

Williamson, Enemark, Wallace, Rajabifard (2009)

Achievement

Time

Vision

?

Evolving

Past

Present

Remotely-sensed data

Effective databases

Integrated data management

GIS

Internet

ICT advancements

Multi-disciplinary applications

Web-based applications

Digital data

Distributed services

Computer networks

No standardization

others

Paper Maps

Lack of Collaboration

Isolated Computing stations

Centralized archives

GSDI
Global Spatial Data Infrastructure

Road Map?

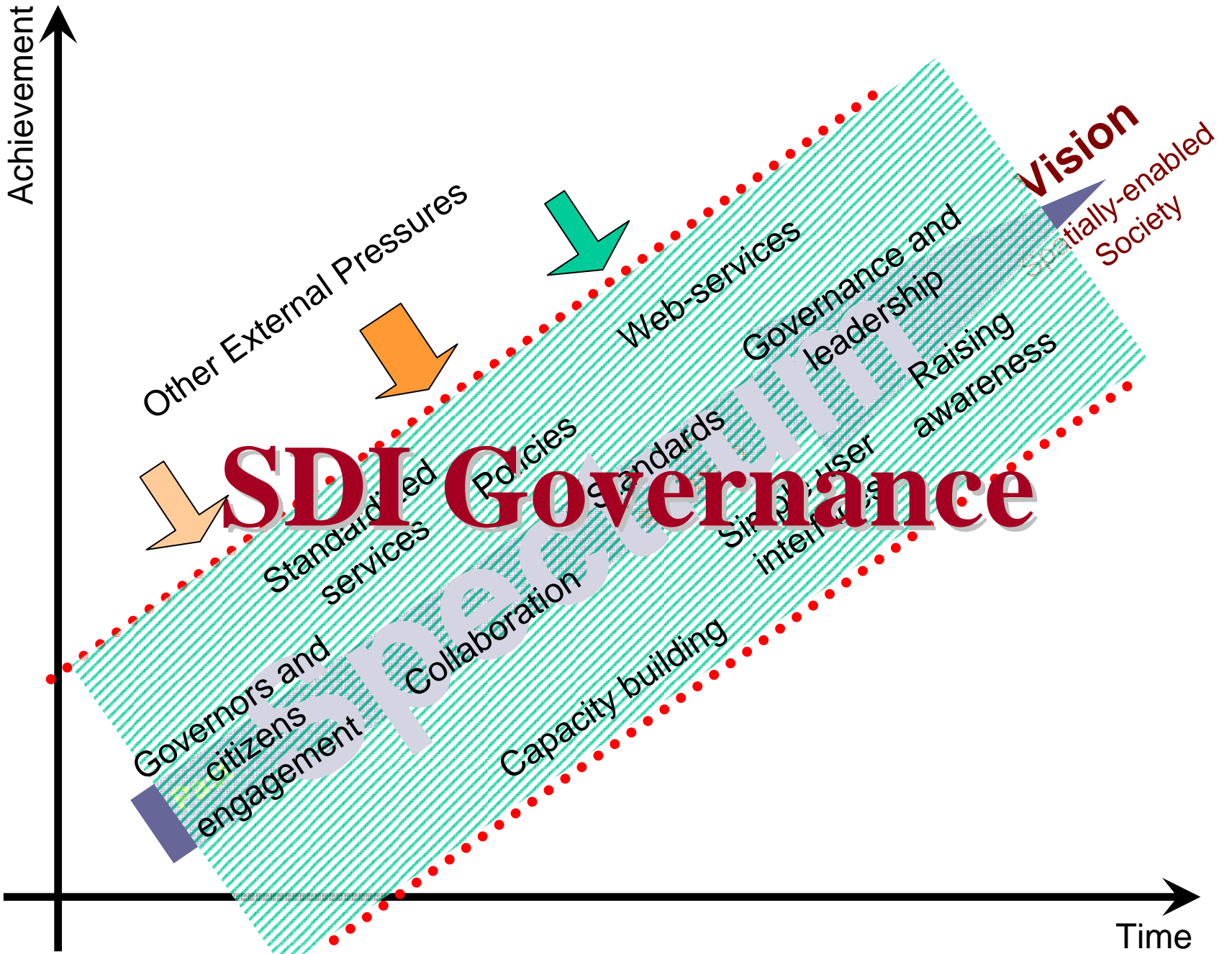# Spatially-enablement stages

Achievement

Every country has
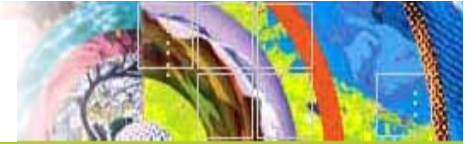its own journey
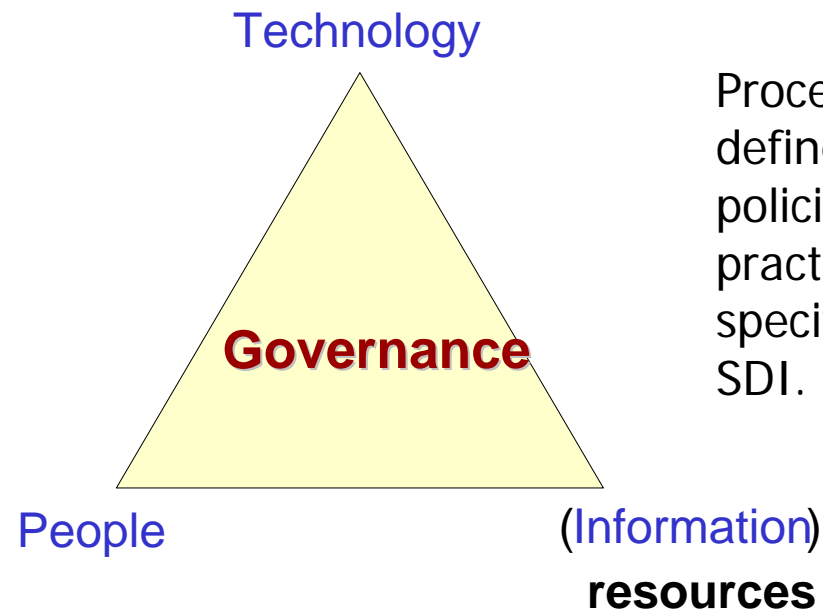
Spectrum
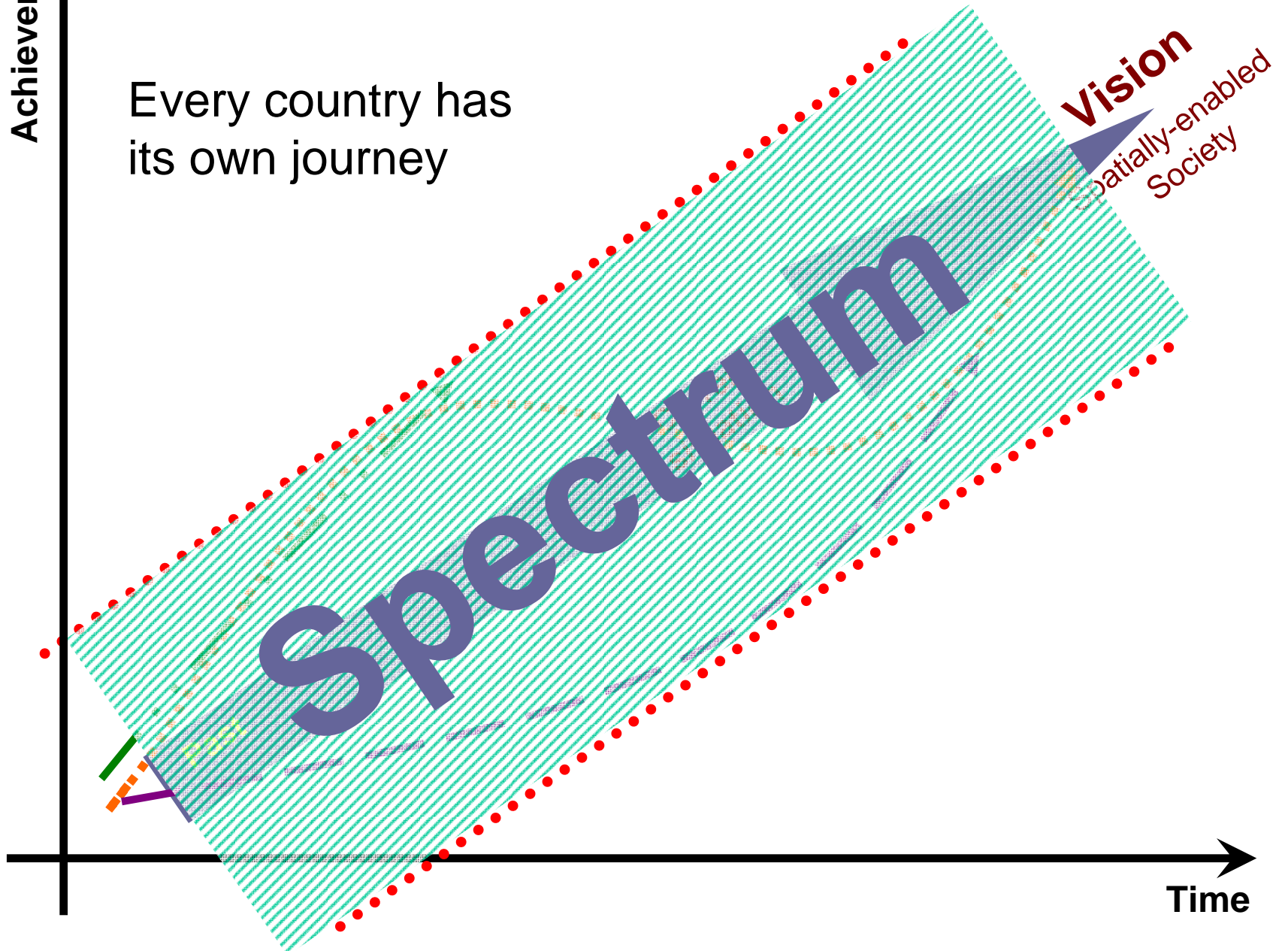
**Vision**

Spatially-enabled
Society

Time

Governance

The setting, application and enforcement of rules that determine how a group works together to achieve common goals.

The role is to **glue** together the technology, organizations and information that comprise an SDI

Technology

Governance

People

(Information)

resources

Processes and institutions to define and manage agreed policies, technologies, standards, practices, protocols & specifications and to monitor the SDI.

Societal governance

Corporate governance

IT governance

SOA governance

SDI governance
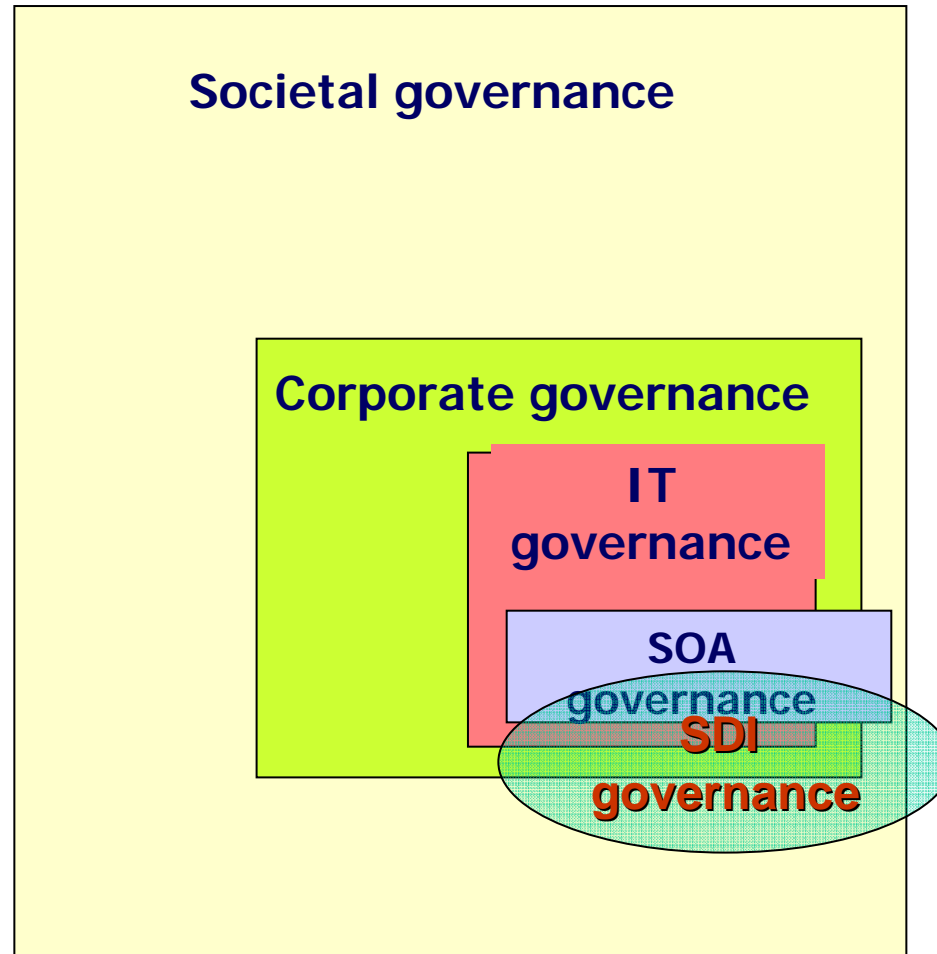
Spatial Enablement –
Experiences & Activities

Victorian State Australia

Victorian Spatial Council

Victorian Spatial Strategy 2008-2010

Asia-Pacific PCGIAP-WG3

SEG Working Group

UN Resolution, 2006 for SEG and VSDI

SEG International Workshop, Korea 2007 (jointly with GSDI)

GSDI Association

GSDI 12 Conference, 2010, Singapore

Realizing Spatially Enabled Societies theme

Asia and the Pacific

17th United Nations RCC-AP, Bangkok, 18-22 September 2006

United Nations Statistics Division
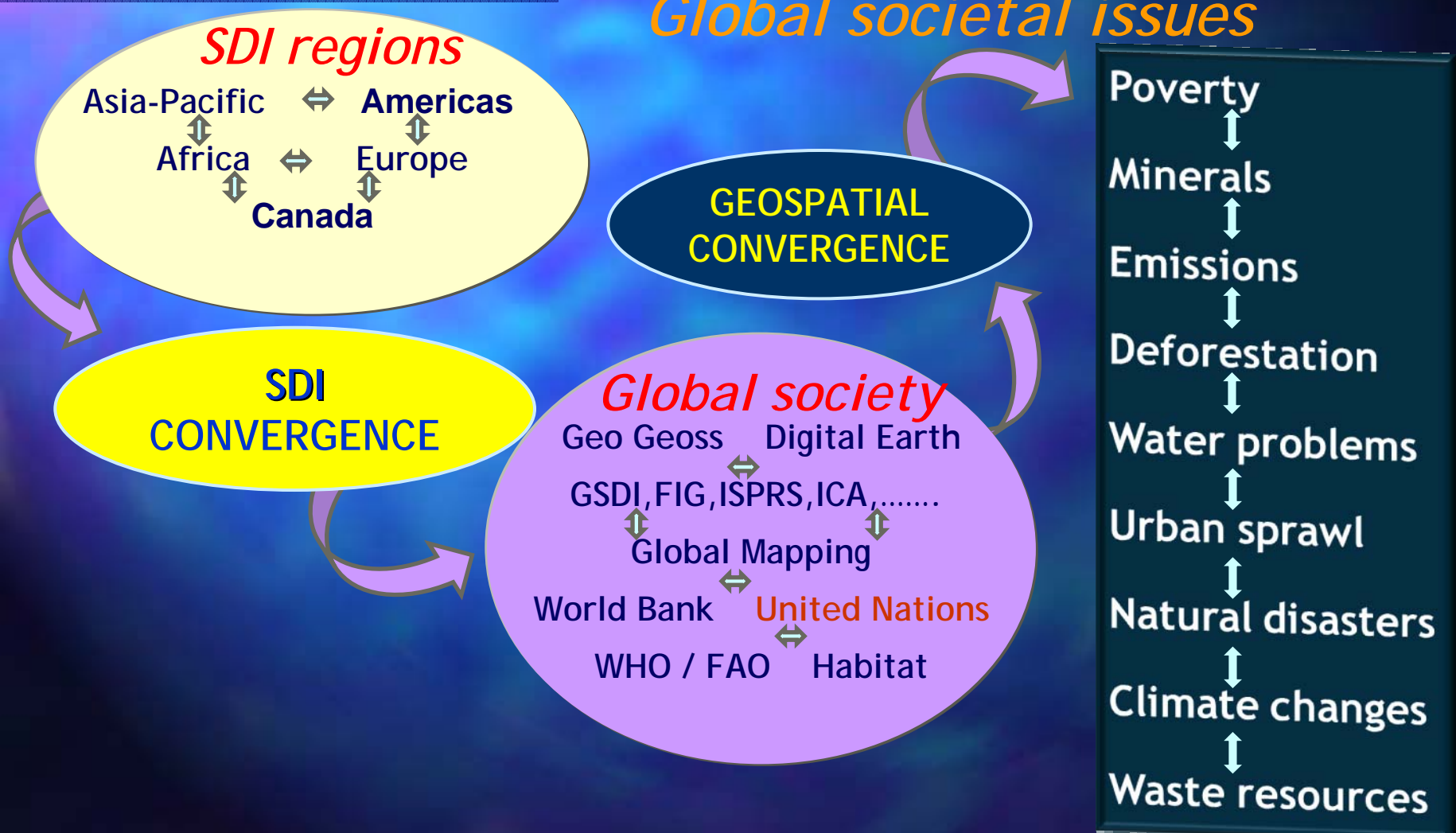
Resolution:
SDI to support spatially enabled government

Recommendation *Member Nations develop a better understanding and pursue the principles of designing SDIs to support spatially enabled government.*

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GSDI Perspective
GI Society: A Partner in Setting the Global Agenda

Global societal issues

SDI regions

Asia-Pacific ⬌ Americas

Africa ⬌ Europe

Canada

GEOSPATIAL CONVERGENCE

SDI CONVERGENCE

Global society

Geo Geoss   Digital Earth

GSDI,FIG,ISPRS,ICA,…….

Global Mapping

World Bank   United Nations

WHO / FAO   Habitat

Poverty

Minerals

Emissions

Deforestation

Water problems

Urban sprawl

Natural disasters

Climate changes

Waste resources

Global Spatial Data Infrastructure

Actions For Our Spatial Communities
Bridge building between sectors (Convergence)

- ## Convergence
  - Launched at **GSDI 11 Conference** (June 2009)
  - Central theme in GSDI Strategic Plan

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Global Spatial Data Infrastructure

Next Conference

with UN-PCGIAP

GSDI 12
World conference

SINGAPORE 2010
19-22 October

Realising Spatially Enabled Societies

Be part of our history. This is the first time that the GSDI World Conference is held in Singapore.

In the heart of Asia, the Garden City of Singapore welcomes you in October 2010 for the GSDI 12 World Conference, to be held in conjunction with the 16th PCGIAP Annual Meeting. Engage yourself in intellectual exchange with leaders and experts in the geospatial industry. Network with your counterparts to expand your business. Immerse yourself in the harmonious blend of culture, cuisine, arts and architecture that is Uniquely Singapore. A memorable experience awaits you.

Visit www.gsdi.org or www.sla.gov.sg for more information.

"GSDI 12 World Conference will be the premium geospatial conference in 2010. Singapore is proud to be co-organising this event with GSDI Association."
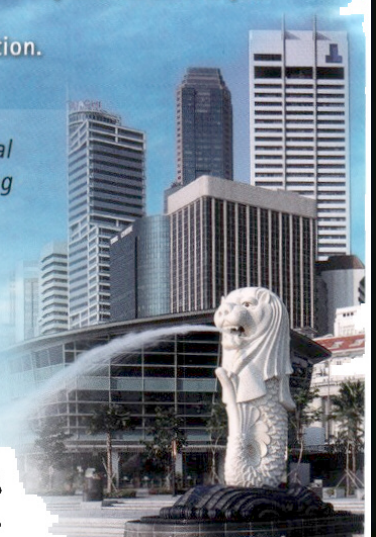
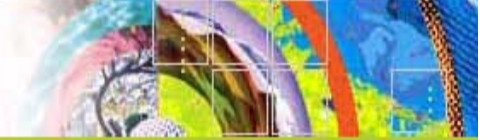**Vincent** Hoong, Chief Executive,
Singapore Land Authority

Jointly organised by:

Global Spatial Data Infrastructure GSDI

SLA SINGAPORE LAND AUTHORITY

Supported by:

Held in:

UNIQUELY Singapore
www.visitsingapore.com

PERMANENT COMMITTEE ON GIS INFRASTRUCTURE FOR ASIA & THE PACIFIC

A major project focus of the organization over the past twelve months as well as the months ahead is further development of

Geographic Information Knowledge Network

(GIK Network)

http://giknetwork.org

GSDI
Global Spatial Data Infrastructure

GIK Network

The goal of this facility is to enhance communications and sharing among geospatial specialists and organizations from all nations and to serve the global geographic information community at large.

It will allow geospatialist specialists, agencies and organizations at all levels to self-report detailed profiles about their expertise and organizations in a systematic manner.

| GI Community Registry | Deposit Spatial Documents | Find Spatial Documents | Mapping Agency Central | SDI Survey Responses | Quarterly Global Survey | Best Geo Web Resources | Geospatial Discussion Forums | About this Network |

... a professional and academic network for the geographic information global community

Organizational Supporters

Geographic Information Community Registry

Put yourself and your organization on the global map! To browse profiles supplied by others, use the map index above or go to the Community Registry to search by category or key words.

Deposit Spatial Documents

Contribute your works that address spatial data infrastructure and geographic information development concepts to an open access depository.

Find Spatial Documents

Search the spatial docs depot or explore links to best papers, best practices, and other geospatial document collections.

Mapping Agency Central

Explore the national mapping agency contact list, the status of national mapping agency spatial data infrastructure programs, the mapping agency discussion forum, and the equipment exchange.

Spatial Data Infrastructure Survey Responses

See survey responses from across the globe on the status of national, sub-regional and local spatial data infrastructure developments.

Quarterly Global Survey

Express your opinion in this quarterly one question survey. Accumulated responses are posted at the end of each quarter.

| GI Community Registry | Deposit Spatial Documents | Find Spatial Documents | Mapping Agency Central | SDI Survey Responses | Quarterly Global Survey | Best Geo Web Resources | Geospatial Discussion Forums | **About this Network** |

About this Network

Organizational Supporters

The goal of the geographic information knowledge network is to enhance communication and freely share knowledge among professionals in the geographic information global community. This is a participatory *user created and maintained* commons. The intended users are professionals, government agencies at all levels, non-government organizations (NGO's), private companies, practitioners, scholars and students across the globe who have sincere interests in creating a geographic information "knowledge network" and advancing the practice and science of the discipline.

As such, this is a *two-degrees of separation knowledge network*. *First link* members are trusted registrants typically invited from the membership rosters of sponsoring organizations or are well-known leaders in the profession in their respective nations. After registering, *first link* members have the ability to invite others to join the knowledge network. Those invited by *first link* members are *second link* members. *Second link* members join the geographic information community knowledge network by registering and may contribute materials but are unable to invite others to join. *Second link* members may apply for *first link* status if desired. The geographic information community knowledge network administration at its sole discretion reserves the right to change the status of any registrant at any time or ban participation by any party causing or facilitating disruption of the knowledge network.

In short, none of us knows as much as all of us. This is intended as a facility for *collective intelligence* where each community member acts responsibly and makes their own decisions on what and how much to contribute.

For more information, email GIKnetwork@gsdi.org

Terms and Conditions | Copyright | Privacy Policy | Disclaimer

Geographic Information Knowledge Network

Search

| GI Community Registry | Deposit Spatial Documents | Find Spatial Documents | Mapping Agency Central | SDI Survey Responses | Quarterly Global Survey | Best Geo Web Resources | Geospatial Discussion Forums | About this Network |

View All

Oceania

For countries shown in red, some data has been received.

American Samoa *overseas territory of the United States*

Australia

Baker Island *overseas territory of the United States*

Cook Islands *territory in free association with New Zealand*

Fiji

French Polynesia *overseas territory of France*

Fiji

I. Geographic Information and Mapping Community

▼ National Government Agency Profiles
Fiji Department of Resource Protection
Fiji Department of Lands
Fiji Department of Tourism and Economic Development

▼ Private Company Profiles
GIScience Limited
Island Mapping
Charts are Us

▼ Non-Profit and NGO Profiles
Nature Conservancy of the South Pacific

▼ Profiles of Individuals
Alexander Bolt, Professor, University of Oceania
Samantha Jones, GIS Manager, Municipality of Suva
Bob Reichman, Student
John Roberts, GIS Consultant, JR Nautical Charts Ltd.
Susan Sperry, Surveyor, SS Surveys

II. SDI Program Status Reports

▼ Status of National Spatial Data Infrastructure Developments
Department of Lands SDI as reported by Kemeuli Masakuri (23 March 2007) Fiji NSDI as reported by George Able (13 June 2008)

▼ Status of Sub-National Spatial Data Infrastructure Developments
Suva Municipal GIS as reported by John Ravi (14 Jan 2005)

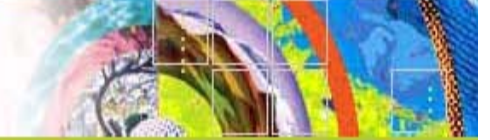# Mapping Common Paths to achieve the <u>Vision</u>
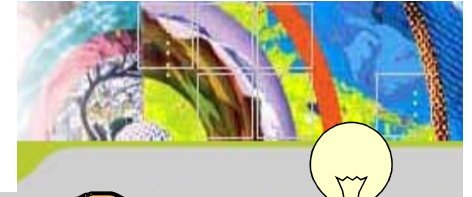
To assist in collaborative mapping of possible **re-usable common paths** to a shared vision:

- Requires collective action
- Different groups working on different parts of the problem
- Together pieces provide potential paths to realising vision
- Knowledge managements is required
- Treated as integral part of SDI

Vision

To get from where we are now to where we want to be

Current position
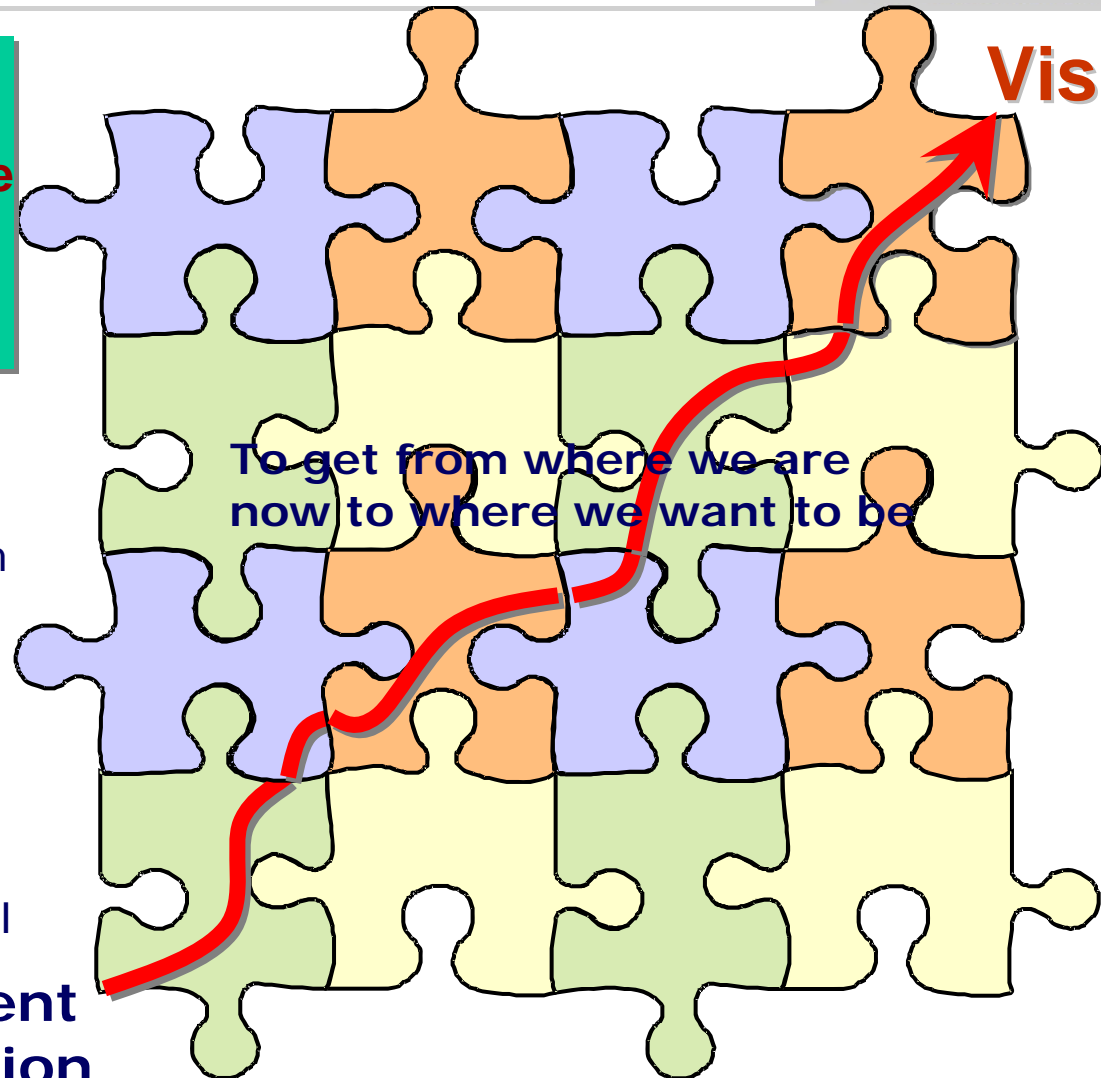
Enables the **past** to be leveraged to achieve a **future vision.**

Thank you

http://giknet.org

If you would like an invitation to join, send an

email request to

onsrud@gsdi.org

GSDI Mission

The **GSDI Association** promotes international cooperation and collaboration in support of local, national and international spatial data infrastructure developments that will allow nations to better address social, economic, and environmental issues of pressing importance.

It is an inclusive non-governmental, non-profit international organisation of organisations,agencies, firms, and individuals from around the world formed exclusively for educational, scientific, and research purposes.

GSDI Vision

Foster SDI development locally to globally

- Promote access to data at a variety of scales and from multiple sources
- Common standards and interoperable systems and techniques
- Heavy reliance on partners world-wide

GSDI
Global Spatial Data Infrastructure