

25 Years of SDI and Federated GIS Implementation Lessons Learned in the Middle East and Beyond

FIG/GSDI-8
Cairo, Egypt
April 2005

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... Moving to the Internet, GIS Networks

GIS Projects	GIS Systems	GIS Networks
Stand Alone 1980's	Coordinated 1990's	Cooperative 2000's

Geospatial clearinghouse and portal architectures present new opportunities to bring GIS to ever wider communities

Metadata Portal

Data Communication Networks

Web Services

Data Servers

FTP

Search Capable

Document in catalog

Published data and services

Communicated User

Communicated User

Spatially enabled E-Service portal architecture on the horizon

Presentation	Services	Infrastructure
<ul style="list-style-type: none"> Content layout, grouping, navigation Colors, outlines, shadows, branding Natural language translation Personalization, document support 	<ul style="list-style-type: none"> Web content management Document management Integrated content creation workflows Full support for 3rd party WCM Search & Categorization Personalization Portal container for integration User-defined process integration Configurable applications Integration (Portal Builders) Full Web Services support Awareness Instant messaging Team work areas Content Expertise location 	<ul style="list-style-type: none"> Security Single Sign-On Administration Scalability Performance Clustering Caching Fall-over

Spatial enabling of web portal architecture opens many new opportunities for E-Service development

Geospatial

Geospatial

Info resource metadata
Service metadata
Map services
Geographic interface
Location based services

A geographic information revolution is occurring...

SRTM SHUTTLE RADAR TOPOGRAPHY MISSION

TERRA

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Getting people, organizations and governments to change how they think about what they do and the way they have done it for years is a huge undertaking!!

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How Do We Get There From Here??

What?
How Far?
How Fast?
What Steps?
Who Leads?

Basic targets often similar, but the path to get there may vary greatly

Vision

Current Reality

International NSDI experience very valuable, and many "targets" are the same.....

Standards	Metadata FGDS Technology
Technology	Portal Services Network
Policies	Legal Financial Technical
Organization	Executive Technical FGDS Custodian Agency Enterprise

.....but approach has to be tailored to the special needs of every country.

Effective technology adoption seems to follow a similar cycle

Vision

Current Reality

Who initiates?

Awareness
Establishing Commitment

Top-Down Executive Visionary

Bottom-Up Early Adopters

Movement towards federated GIS requires change

Revolutionary

How Far? How Fast?

Evolutionary

Vision

Current Reality

Revolutionary Implementation

Formalized SDI

No functioning federation

Current Reality

Vision

Revolutionary Implementation

Usually “top-down” driven
 One entity assigned to “make it happen”
 Formalized structure and process
 High short-term investment, long term unsecured
 High demand for early visible results
 Political foundation

Formalized SDI →

Current Reality




Vision

Revolutionary Implementation

May be more rooted in appearance than real need
 “Head” will eventually go away
 If foundation policies and “culture of cooperation” not yet in place and internalized, the initiative will likely collapse
 High investment and low visible near-term results can make the initiative vulnerable

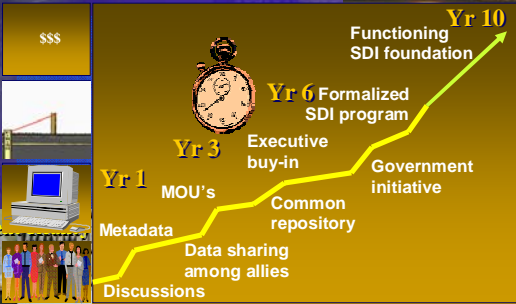
Formalized SDI →

Current Reality





Vision

Evolutionary Implementation



sss

Current Reality



Vision

Evolutionary Implementation

Usually stakeholder driven
 Groups of individuals decide to “make it happen”
 Informal structure and process
 Low short-term investment, long term unsecured
 Expectations based on near term opportunities and long term results
 Foundation of cooperation

Current Reality



Vision

Evolutionary Implementation

Stakeholders may not have sustained leadership, will or resources
 If foundation policy framework not eventually in place, the initiative may erode or collapse
 Informal initiative may not gain enough momentum to sustain

Current Reality




Vision

Evolutionary Implementation

The appropriate approach is usually a hybrid that has been tailored to a specific context.

Current Reality



Province-wide E-Service Portal

Vision

Presentation

- Content layout, grouping, navigation
- Natural language translation

Services

- Content:** Web content management, Document management, Integrated content creation workflows, Full support for 3rd party WCM, Search & Categorization, Personalization
- Integration:** Portal container for integration, User-defined process integration, Configurable application integration (Portal builders), Full Web Services support
- Collaboration:** A working, Instant messaging, Team work areas, Content, Expertise location

Infrastructure

- Security, Administration, Performance, Caching
- Single Sign-On, Scalability, Clustering, Self-care

Geospatial

>50 organizations, only a handful of whom have more than basic computing capacity
Regional ITC spotty
Public access to Internet spotty
Few federations already in place
Little framework data available

Current Reality

Many organizations not yet familiar with GIS, much less SDI and Portal principles
 Current capacity to build and maintain own components low
 Resources probably not a constraint

Current Reality

Committee Review

Phase 1 Prototype System

Phase 2 Foundation System

Phase 3 Expanded System

Phase 4 Full Web Portal Framework

Planning, Analysis, Design, Development, Testing, Deployment, Executive Presentation

Current Reality



Foundation built to address key issues.....

Poverty	Economic Development	Environmental Quality
Health	Safety and Security	Social Equity
Government Transparency	Government Efficiency	Basic Services

Foundation built through key stakeholders.....

Office of the Executive	Cabinet of Ministers	Regional Governments
Local Governments	Ministry of Environment	NMO
Central Statistical Org	Ministry of ICT	Ministry of Justice
Ministry of Municipalities	Ministry of Public Works	Ministry of Transport

Leveraging “fundamental” geospatial data sets.....

Elevation	Transportation	Hydrology
Administrative Boundaries	Soils and Geology	Addresses
Cadastral	Utilities	Etc.

...and leveraged through involvement of other key stakeholders

Private Industry
NGO's

More likely to be driven by:

Slogans (“policies”)
Opportunities
Disasters

Vision

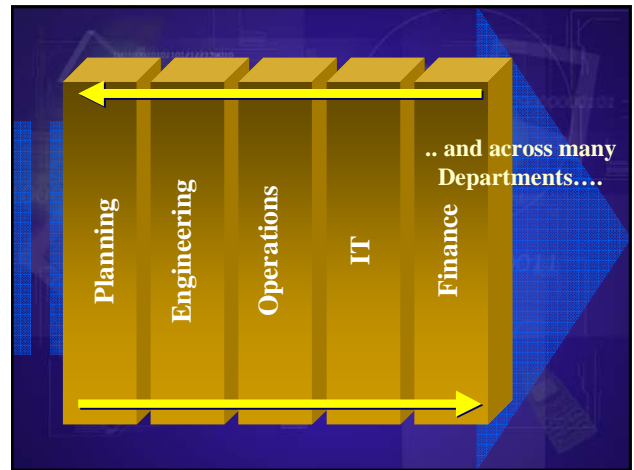


Sustainable SDI initiatives recognize that organizations must first respond to their primary mission, and can improve that through participation

Current Reality

Vision

GIS Implementation Tends to Force Communications Across Traditional Boundaries Where it May Not Have Previously Existed



.. and among many Organizations....

Office of the Executive	Cabinet of Ministers	Regional Governments
Local Governments	Ministry of Environment	NMO
Central Statistical Org	Ministry of ICT	Ministry of Justice
Ministry of Municipalities	Ministry of Public Works	Ministry of Transport



Building GIS federations and SDI is an excruciating process, not an event...

Office of the Executive	Cabinet of Ministers	Regional Governments
Local Governments	Ministry of Environment	NMO
Central Statistical Org	Ministry of ICT	Ministry of Justice
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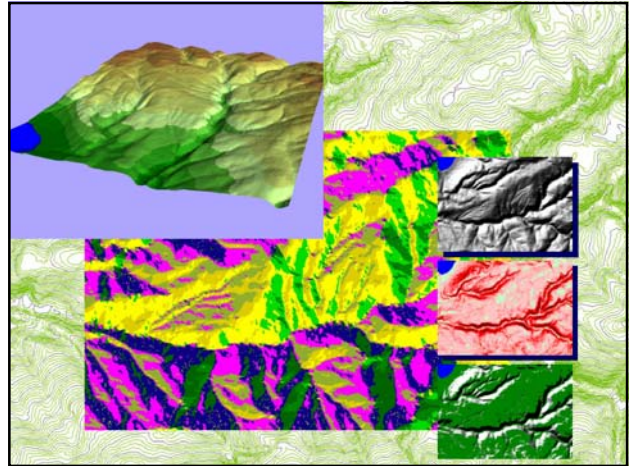
Planning
Engineering
Operations
IT
Finance

Executive
Management
Operations

Communication is critical at all levels.....

... and there are many obstacles to overcome.

- Traditional administrative boundaries and "fiefdoms"
- Entrenched interests
- Outdated mandates and attitudes
- Drive for revenue
- Legal definitions of "security" and "privacy"



... and there are many obstacles to overcome.

- Lack of creative and innovative problem solving
- Fear of change
- Complacency and lack of will
- Lack of budget??

What Role Can Each of Us Play?

- In many countries, the SDI playing field is still wide open
- Many organizations adopting GIS technology
- Much investment in useful data
- Efforts like the GSDI helping to establish dialog at the highest levels of government



What Role Can Each of Us Play?

- Many standards emerging that can help to support data sharing and interoperability
- ICT infrastructure growing quickly in most parts of the world
- Internet open new opportunities for creating federations and leveraging SDI



What Role Can WE Play?

Level 1

- Stay focused exclusively on what we have always done, in the way we have always done it.
- Become involved with SDI only as it affects our current mandates
- React to change only when absolutely necessary
- Allow constraints and setbacks to overcome our will to progress



What Role Can WE Play?

Level 2

- Re-assess our role in community context
- Help to initiate and participate in country, regional and global SDI development
- Push for the adoption of policies for widespread, low or no cost dissemination of basic framework data
- Take a leadership role in breaking down legal and administrative barriers to data sharing

Current Reality

Vision

What Role Can WE Play?

Level 3

- Re-invent ourselves to take a leadership role in promoting and supporting SDI development
- Get directly involved in facilitating, promoting and supporting framework communities
- Lead our organizations and our communities in a process of adaptation to new principles, practices, and technologies into the future

Current Reality

Requires inspired vision, leadership, courage, persistence, empathy, knowledge, expertise, political savvy, and boundless patience and energy....

Vision

What Role Can WE Play?

Level 3

- Re-shape mission to take a leadership role in promoting and supporting SDI development
- Facilitate and coordinate framework communities
- Lead the community in a process of adaptation to new principles, practices, and technologies into the future

Current Reality

Are we up to the challenge?? If not us, whom??

Vision

Check One

- Lead
- Follow
- Get out of the way