企業架構在地球觀測群GEO之應用

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Overview

- GEO簡介
- GEOSS採用之架構框架及其架構
- 開放標準如何支援GEOSS
- 範例-以開放標準為基礎的災害管理系統
- 結論

GEO

- **Group on Earth Observations**
- 2002年在八國峰會中倡議成立
- 目的為整合全球力量進行地球之長期觀測以對應氣候變遷議題
- 會員須志願性貢獻，目前有58個國家會員
- 以GEOSS(Global Earth Observation System of Systems)為國際合作平台
- 支援九大Social Beneficial Areas(SBA)，以促進人類福祉

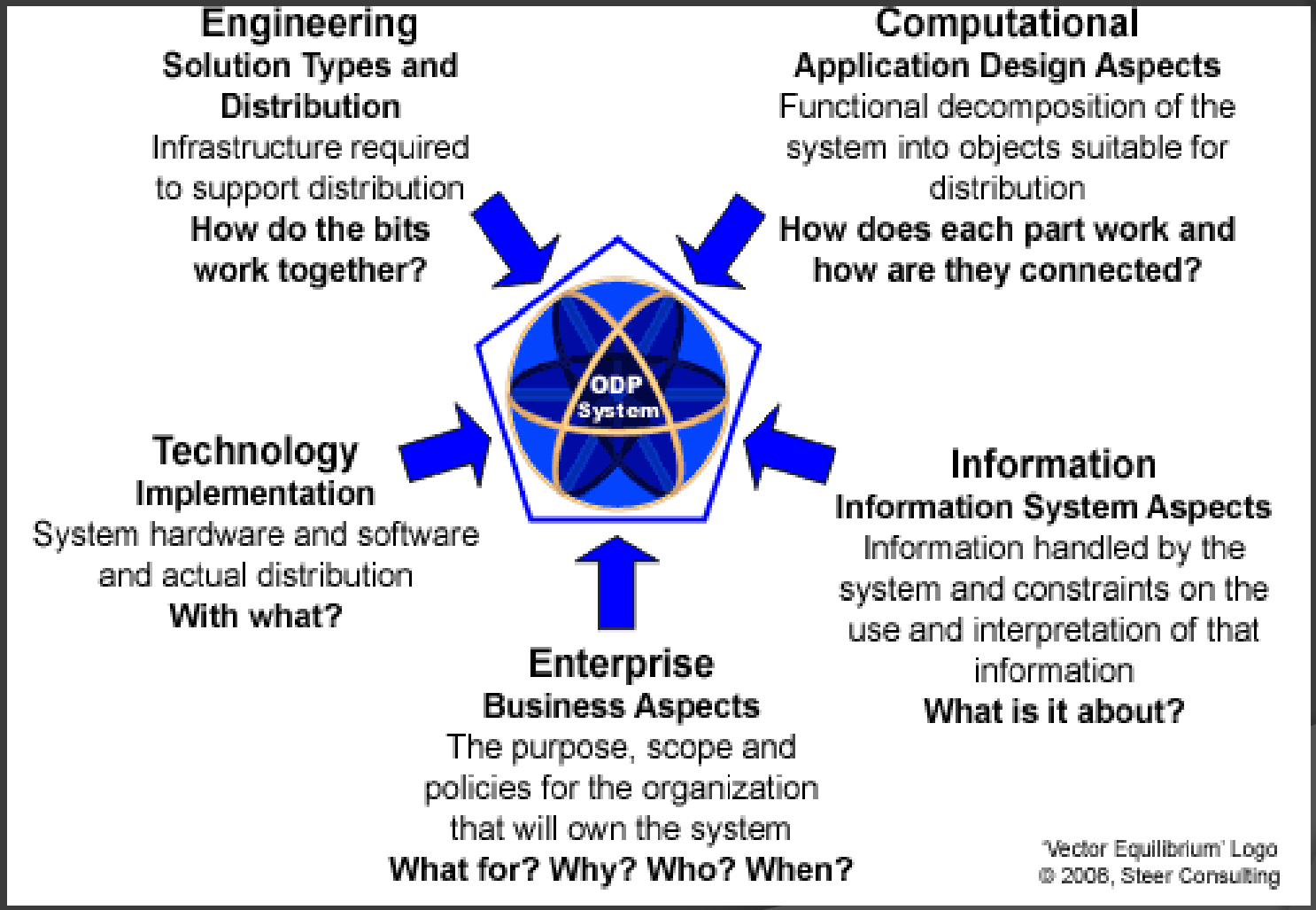
九大Social Beneficial Areas(SBA)

- 災害管理
- 健康
- 能源
- 天氣
- 水源
- 氣候
- 生態系統
- 農業
- 生物多樣性

GEOSS是甚麼?

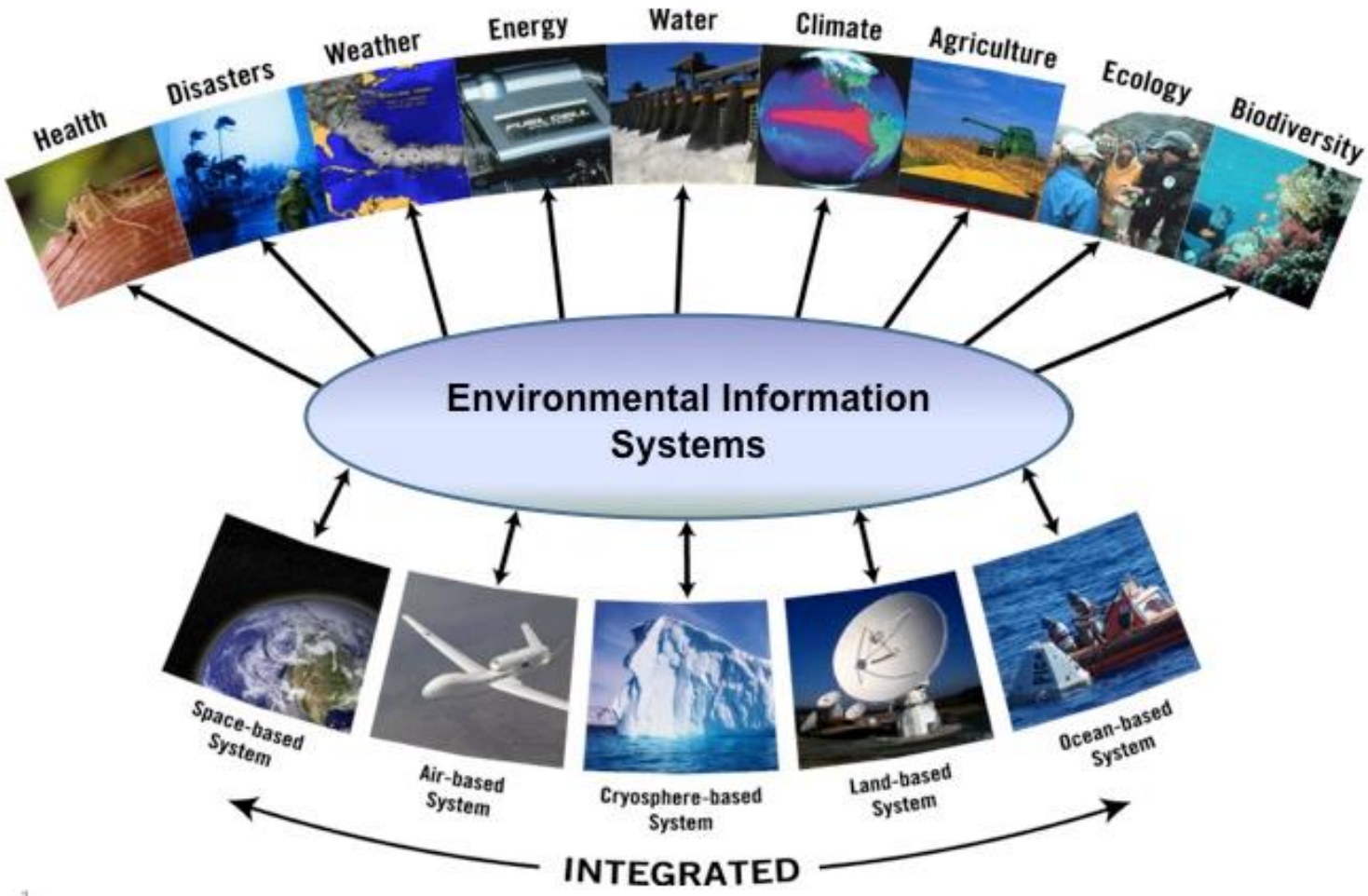
- Global Earth Observation System of Systems
- 以ISO RM-ODP為其架構框架
- 依循OASIS RM-SOA所設計出來之服務導向架構 Broker
- 提供世界各國以一致的標準註冊服務
- 提供世界各國以一致的標準查詢服務
- 提供世界各國以一致的標準引用服務
- 提供標準介面之服務以供世界各國共享地球觀測成果

RM-ODP
Reference Model for Open Distributed Processing



ISO/IEC10746, Information technology — Open Distributed Processing — Reference model.

Enterprise Viewpoint(企業觀點)



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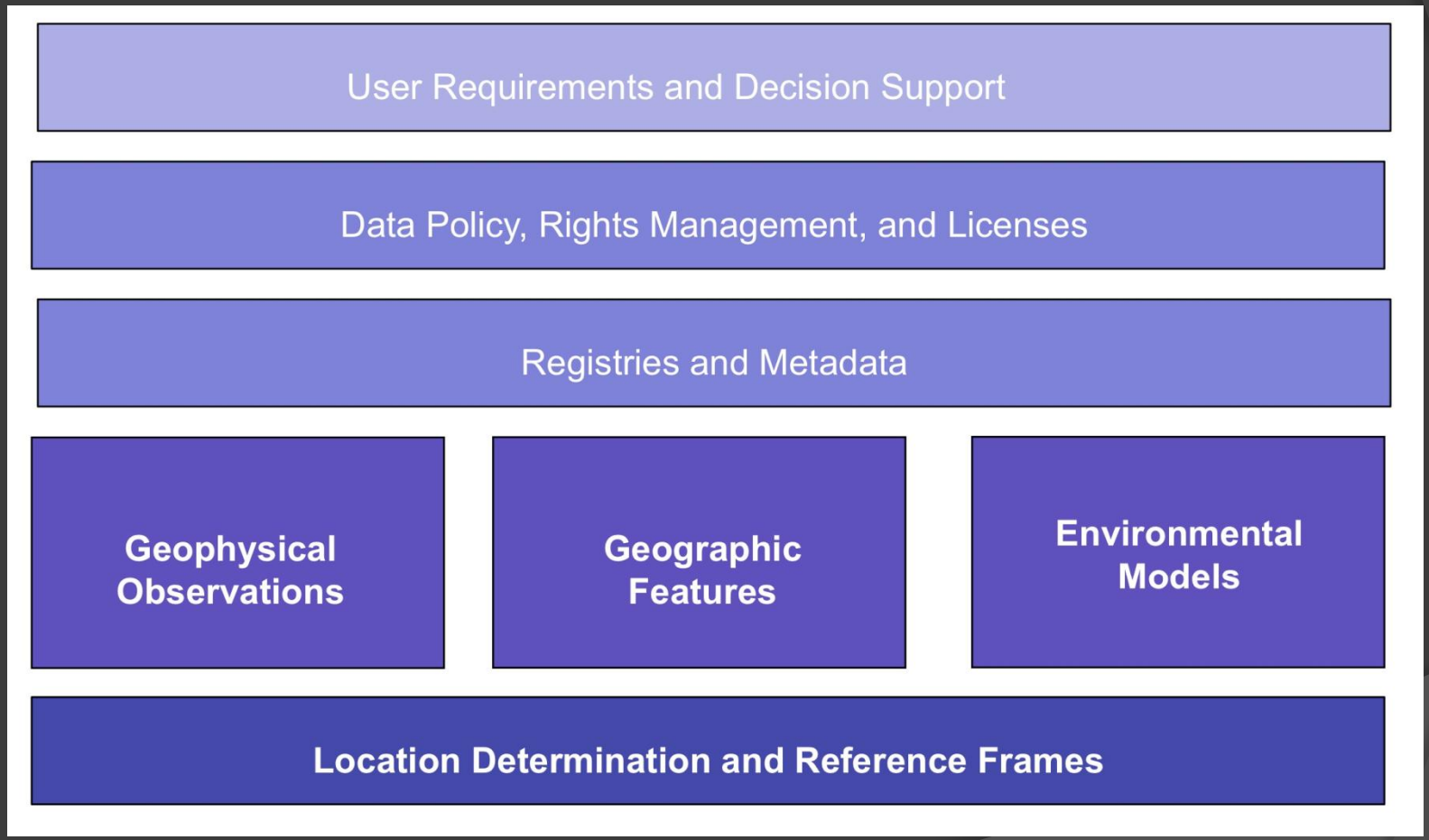
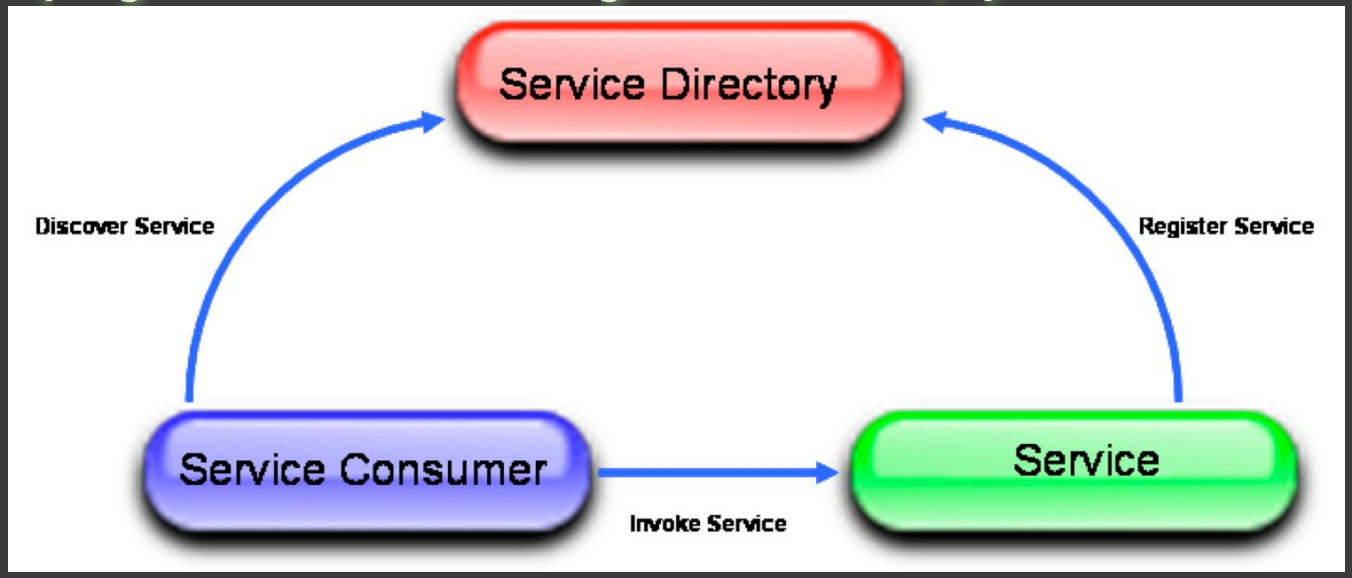
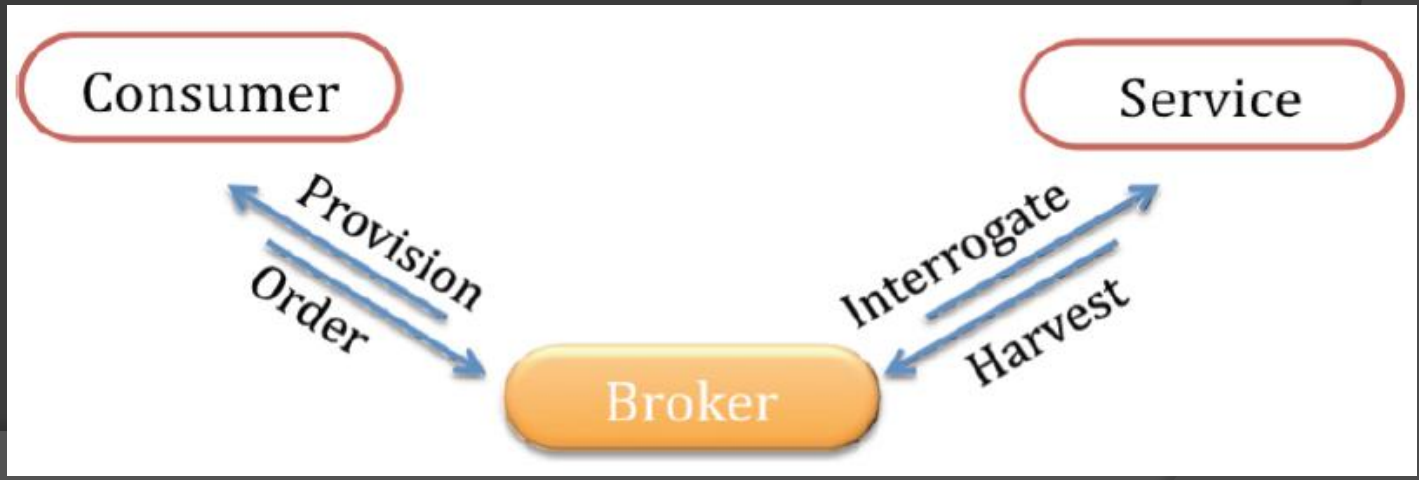
Information Viewpoint(資訊觀點)



Computational Viewpoint(計算觀點) (System of Systems,)





https://geossregistries.info/geosspub/service_details.jsp?serviceId=urn:uuid:d15e236b-6730-4907-a542-97d9361c

GROUP ON EARTH OBSERVATIONS

Welcome pinkyhuang [logout]

Feedback for this page

Back | Main Page

GEOSS Service Instance Details

Service Basic Information	
Component Id:	urn:uuid:86e0ff33-3805-4ffd-af16-f0e590faaeea (Click to see Component details)
Service Id:	urn:uuid:d15e236b-6730-4907-a542-97d9361d3254
Name:	GIS.FCU-Historical typhoon path web services
Abbreviation:	Historical typhoon path web services
Description:	Historical typhoon path web services
Information URL:	http://140.134.48.12/aip/typhoon.asmx
Interface URL:	http://140.134.48.12/aip/typhoon.asmx?WSDL

服務名稱:歷史颱風路徑查詢服務

Service Contact Information	
Contact Name:	Pinky Huang
Contact Email:	pinky@gis.tw

註冊者

Service Time Period of Information Content	
Begin Date:	2001-01-01
End Date:	2009-09-30

該服務之時窗

Referenced GEOSS Classification Standard or Speical Arrangement	
Classification Information:	Data Access
Standard (click to view details):	Simple Object Access Protocol (SOAP) 1.2

該服務採用之協定

Referenced GEOSS Supportive Standards or Speical Arrangements		
1.	Supportive Information:	Data Format
	Standard (click to view details):	Web Services Description Language (WSDL)

Date and Time of Last Update

2010-07-20T01:07:40Z

Approval Status

udig-1.2.0.win32.wi....zip | 08-062r4_OGC_Ref....pdf | 哈佛商業評論講座_....pdf | 哈佛商業評論講座_....pdf | 顯示所有下載...

SOA Way

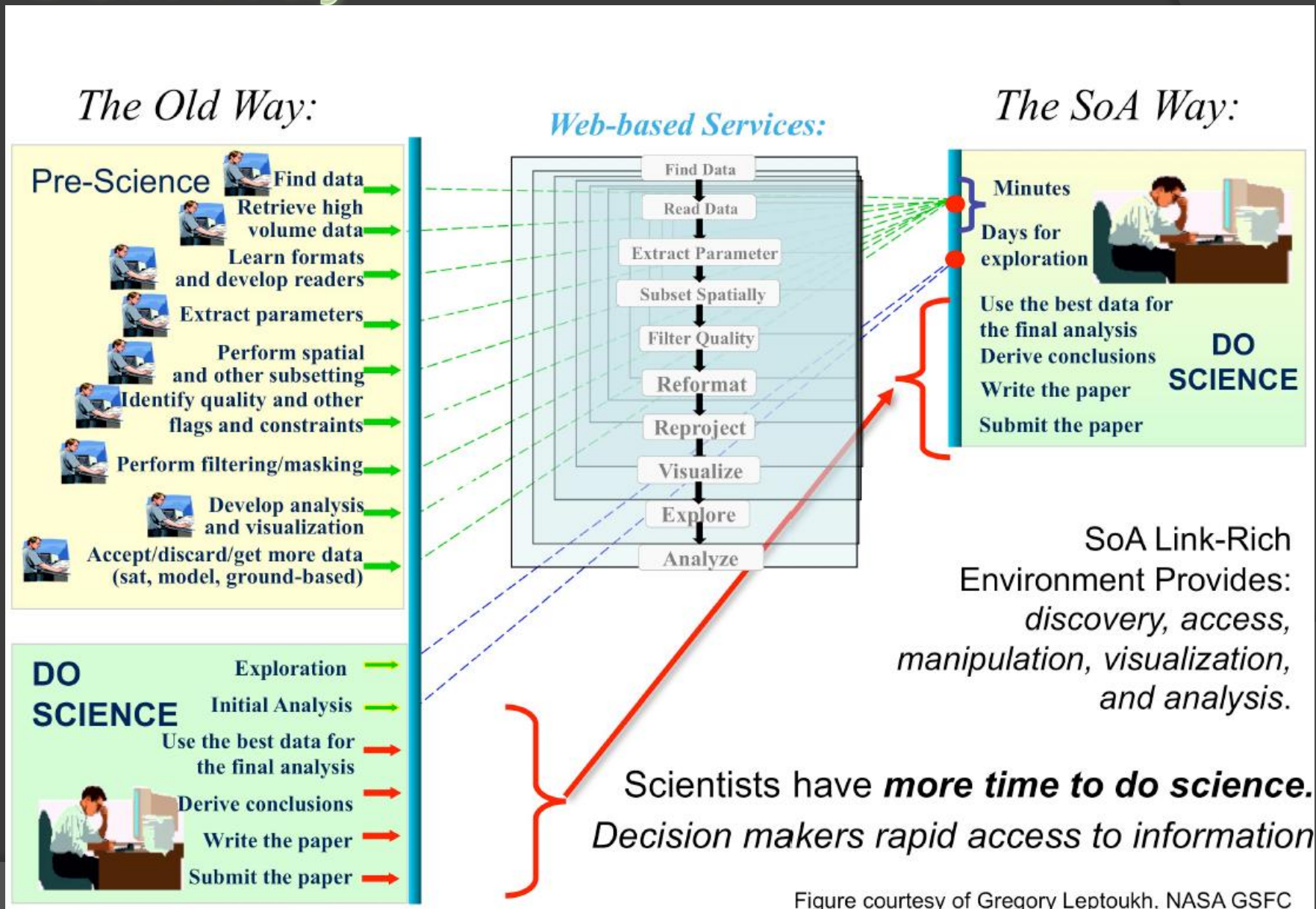
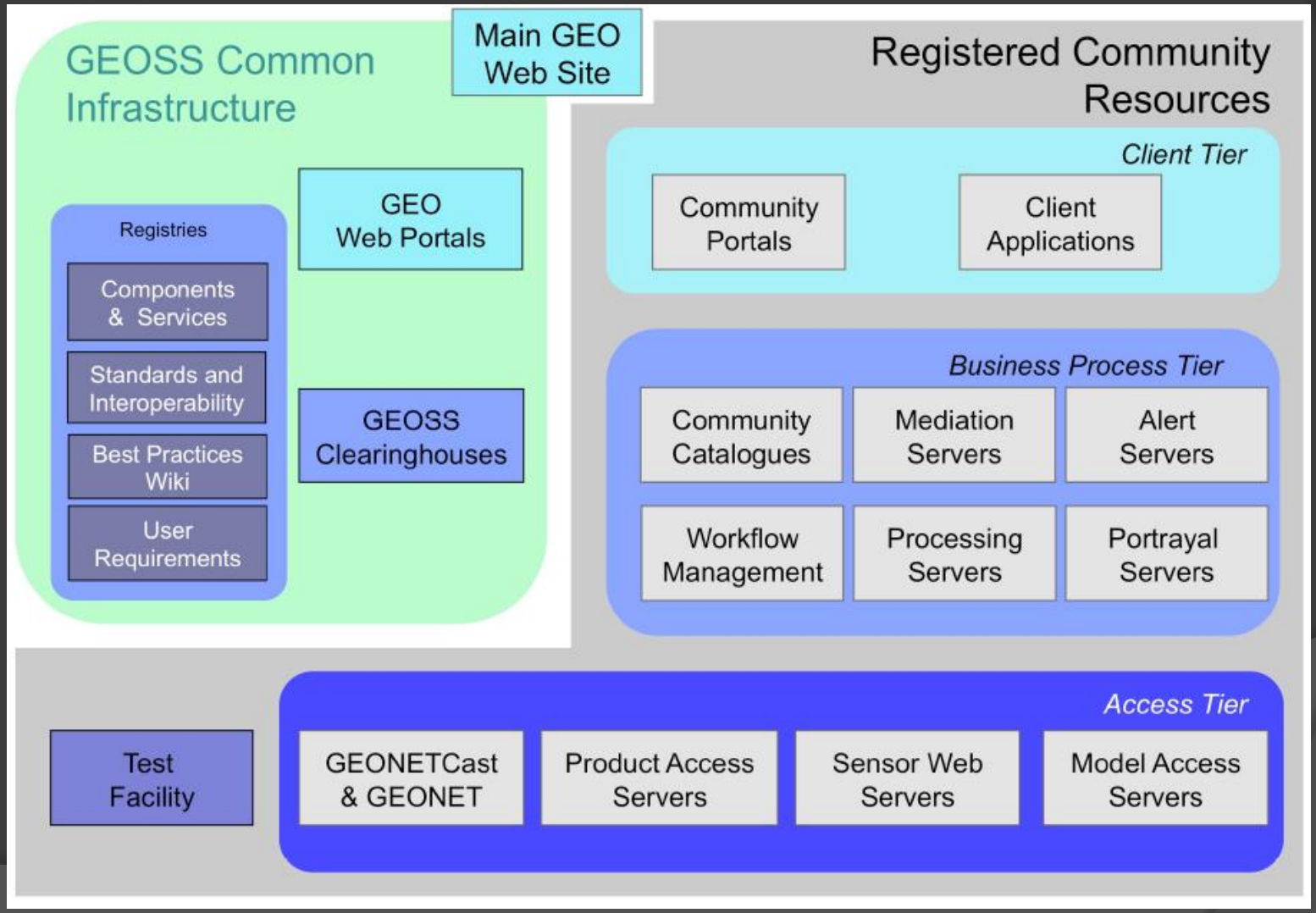
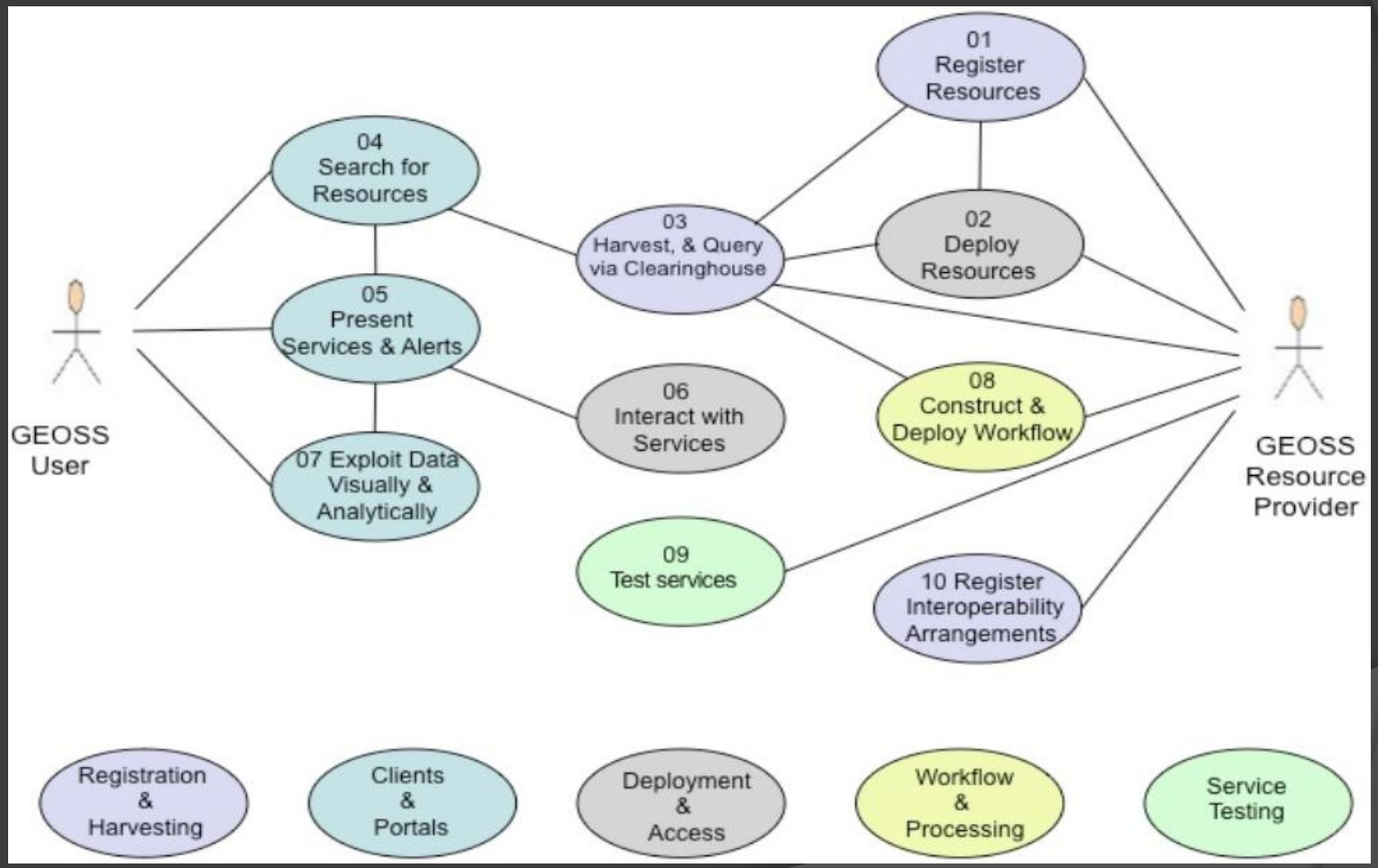


Figure courtesy of Gregory Leptoukh, NASA GSFC

Engineering Viewpoint-(工程觀點) Components Types



Engineering Viewpoint- Engineering use cases



Engineering Use cases的目的為九大SBA在開發時會使用到共通的使用案例

開放標準如何支援GEOSS

Open Standards

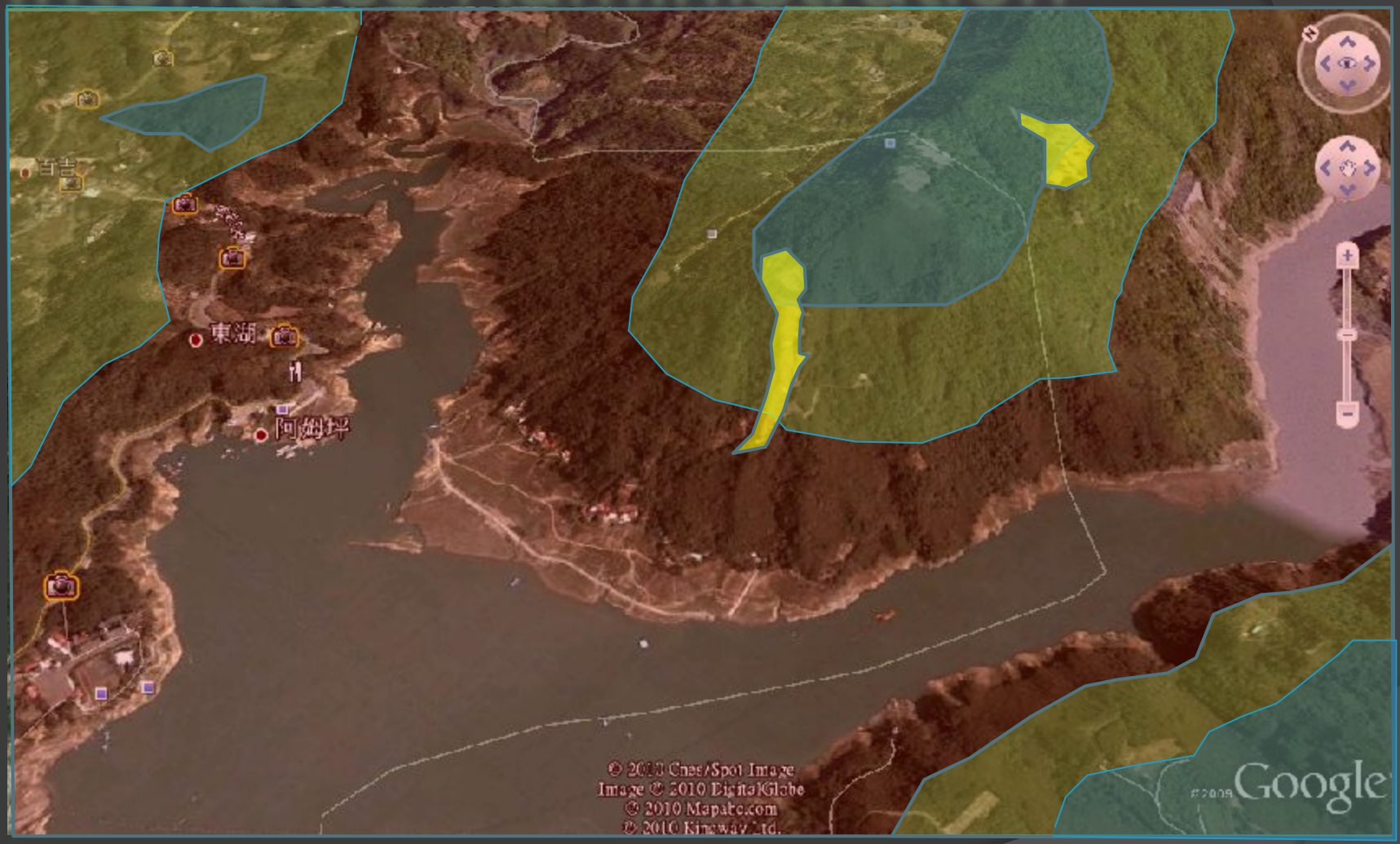
- Standardization is the reason for the success of the Internet, the World Wide Web, e-Commerce, and the emerging wireless revolution. The reason is simple:
  - our world is going through a communications revolution on top of a computing revolution. Communication means “transmitting or exchanging through a common system of symbols, signs or behavior.” Standardization means “agreeing on a common system.”

Interoperability

- The IEEE Glossary defines interoperability as:
  - the ability of **two or more systems or components** to **exchange information** and to **use the information** that has been exchanged.
- ISO/IEC 2382-01, *Information Technology Vocabulary, Fundamental Terms*, interoperability
  - *"The capability to **communicate, execute programs, or transfer data among various functional units** in a manner that requires the user **to have little or no knowledge of the unique characteristics** of those units"*

為什麼需要
交互操作性?

Interfaces-Administration



Forest Bureau	Soil&Water Conservation Bureau	Water Resource Agency	Central Geological Survey

Interfaces-Sensors

CCD camera

	Forest Bureau	Soil & Water Conservation bureau	Water Resource Agency
Setup year	2001	2008	1998
Resolution	100M	300M	200M
Type	Analog	Digital	Analog
Brand	HTC	AXIS 2200M	AXIS 1570
Interface	Files	OGC SOS	MySQL
Height	12m	15m	17.3m

Disaster doesn't care that much...

Forest Bureau

Central Geological Survey

Soil &Water Conservation Bureau

Water Resource Agency

Administrative interfaces

1. Forest Bureau
2. SWCB
3. WRA

Publishing Interface

1. CSV(various schema)
2. Database
3. OGC SOS
4. Data logger
5. ….

Maps Interfaces

1. Shape file
2. Geodatabase
3. DWG/DGN
4. WMS/WFS

Why don't you speak in the same LANGUAGE???

Sensors Interface

1. Rain Gauge
2. Camera
3. Water this, water that
4. Geophone…

Give me nothing But Standards

GEOSS為各種國際標準交互操作之試驗場

GEOSS的服務入口網

範例-

以開放標準為基礎的災害管理系統

Shared Data

Fleet Numerical Meteorology and Oceanography Center

Japan Meteorological Agency

National Meteorological center of CMA

Central Weather Bureau, Taiwan

To coordinate historical typhoon paths and rainfall prediction

Overview of Pre-Warning Decision Support System

Water Level Meter (WRA)

Landslide debris Dan (CGS)

Precipitation(CWB)

Debris flow warning info.(SWCB)

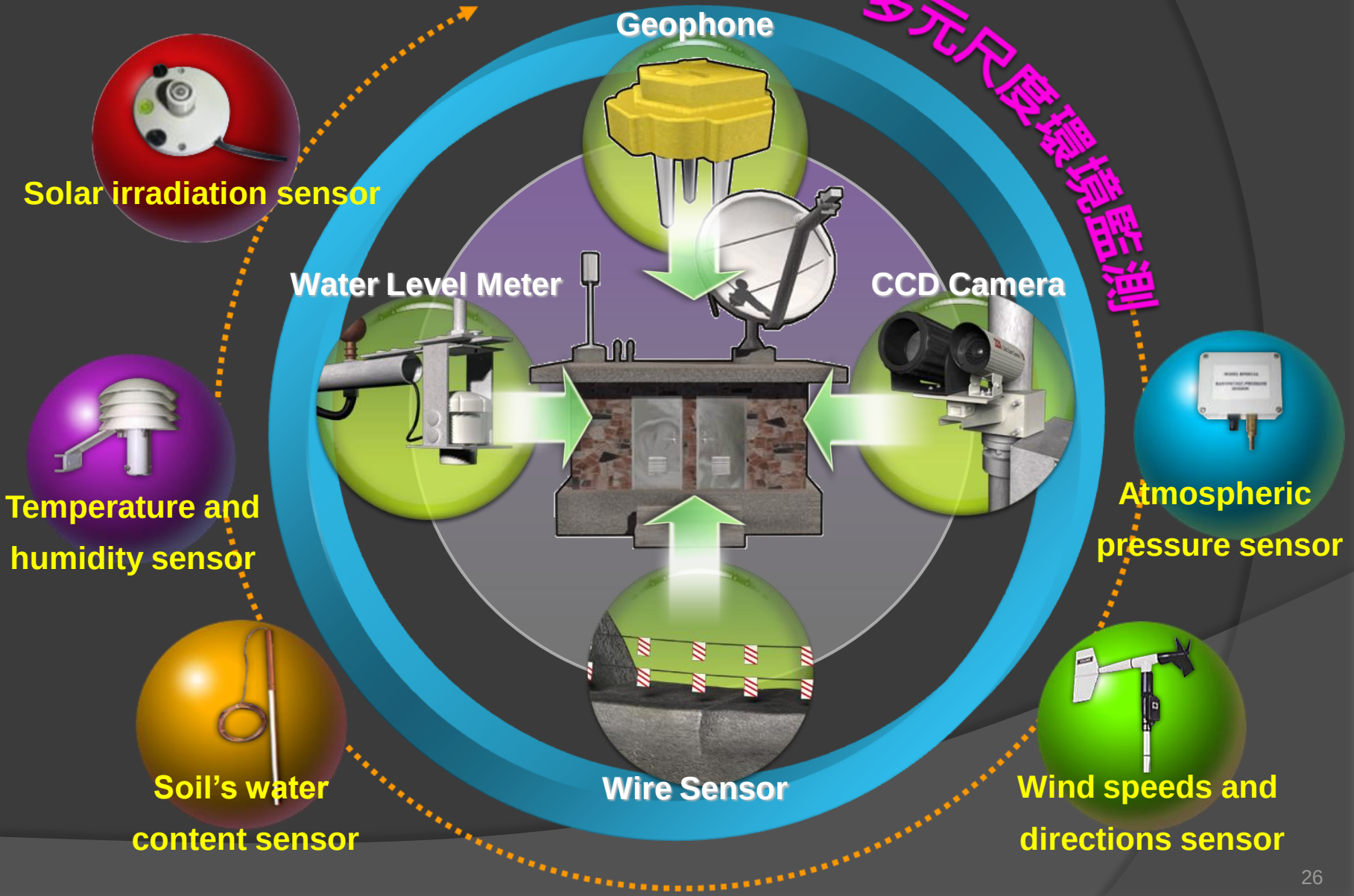
Transportation info.(MOTC)

Danger villages Prediction

Via DSS(WPS) to predict danger villages in middle and down streams

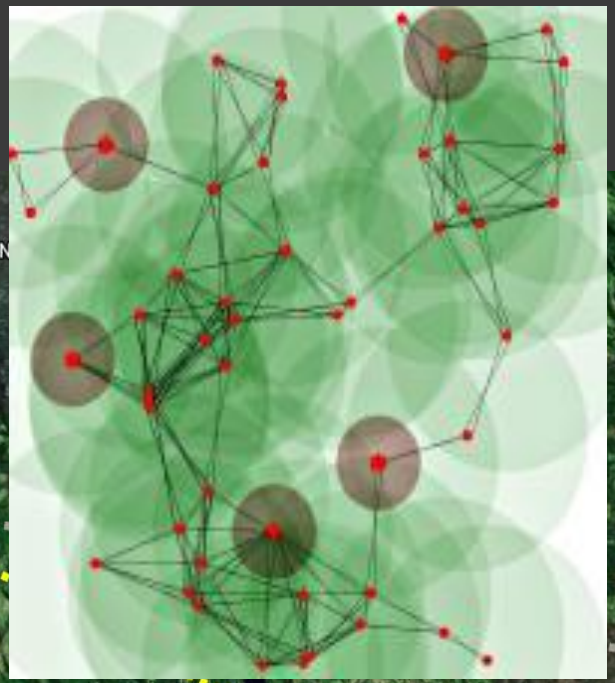
Ranking of danger villages in 2D/3D map

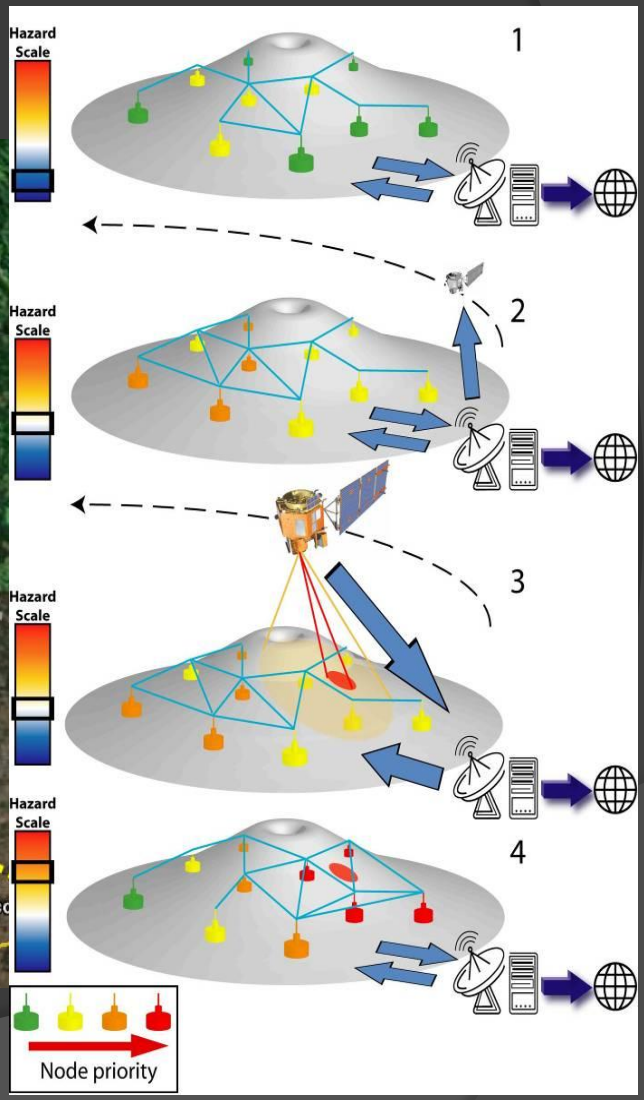
Monitoring Sensors Used in Debris Flow Monitoring Station



WSN in Debris Flow Monitoring

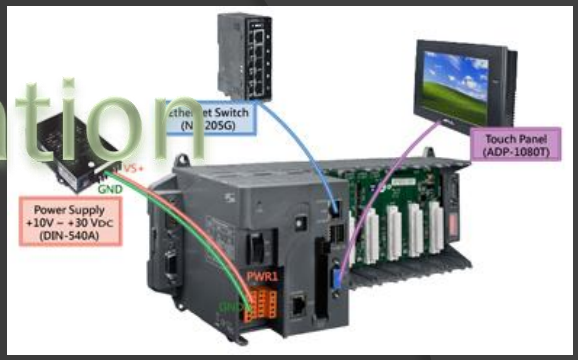
Extend Monitoring Scope

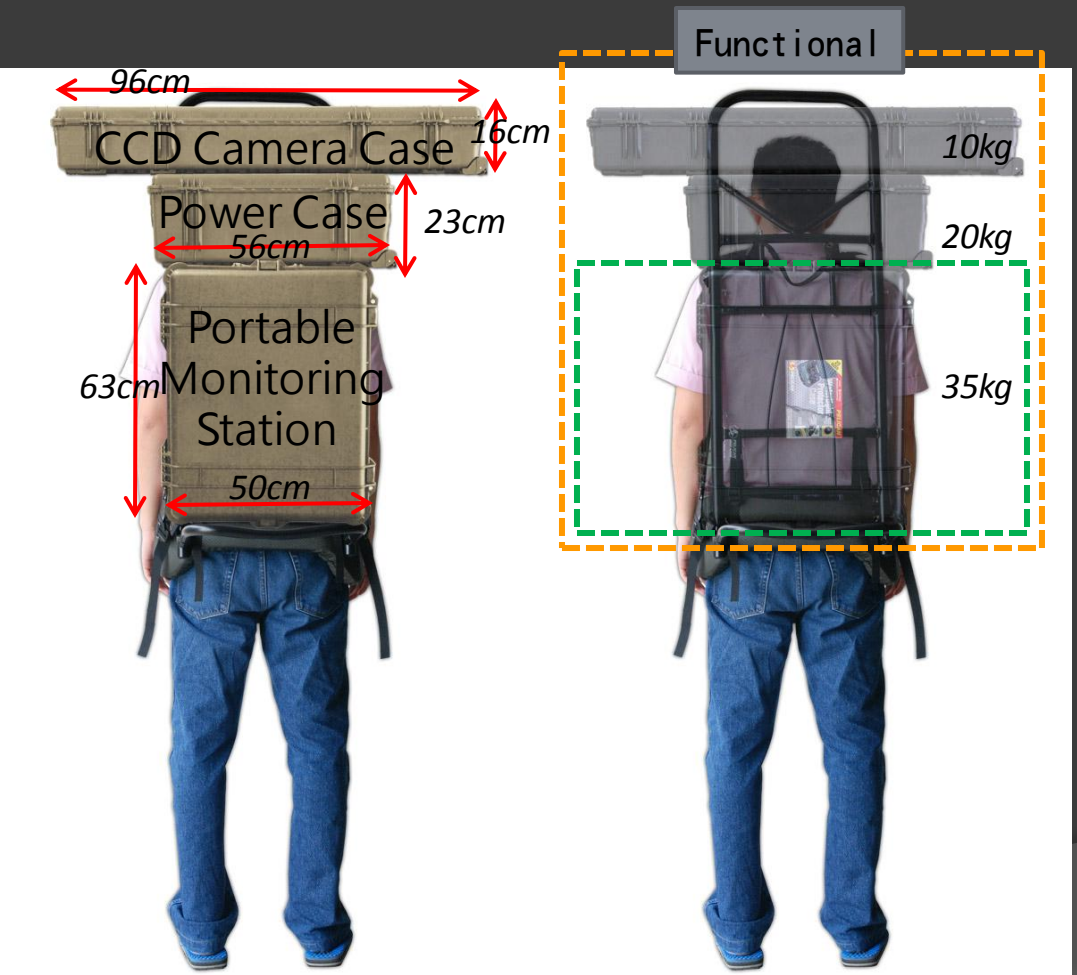


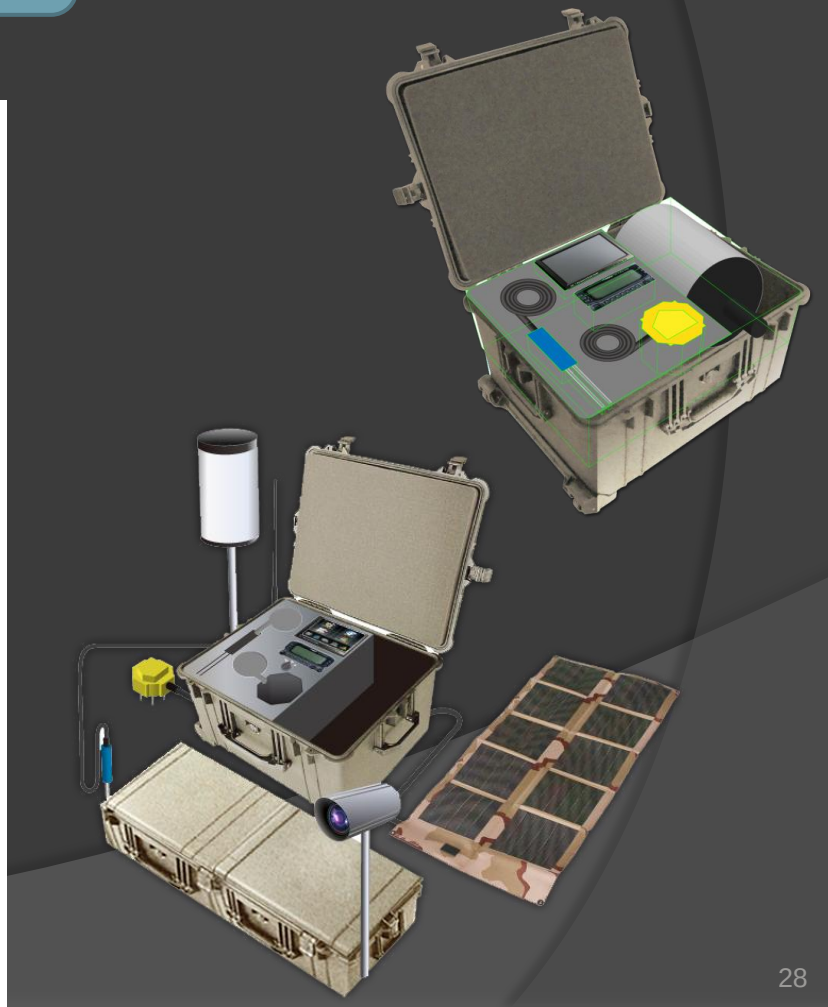


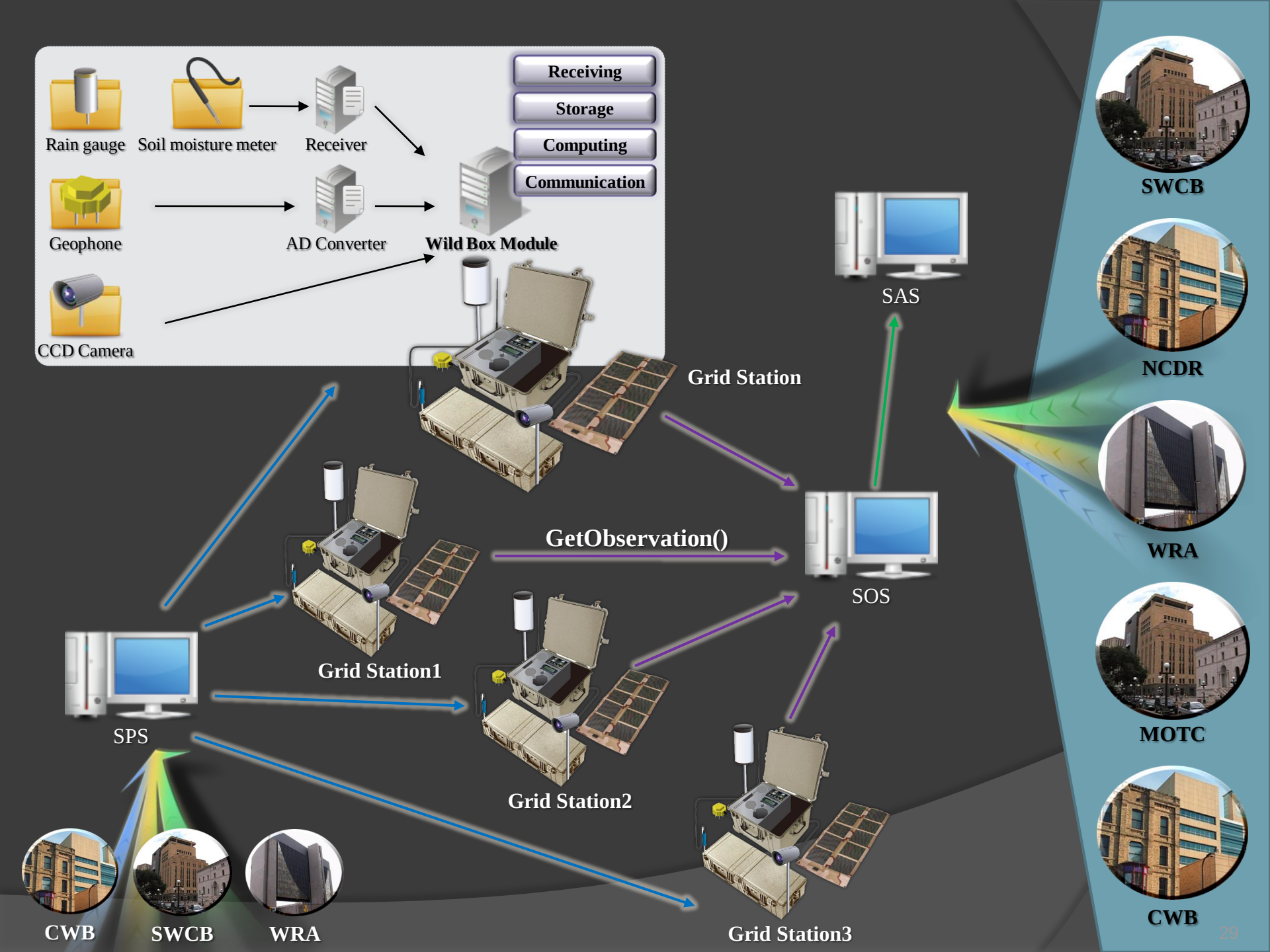
Portable Monitoring Station

SWE+PAC



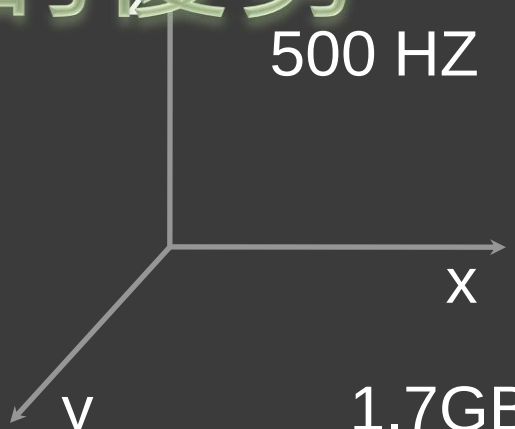




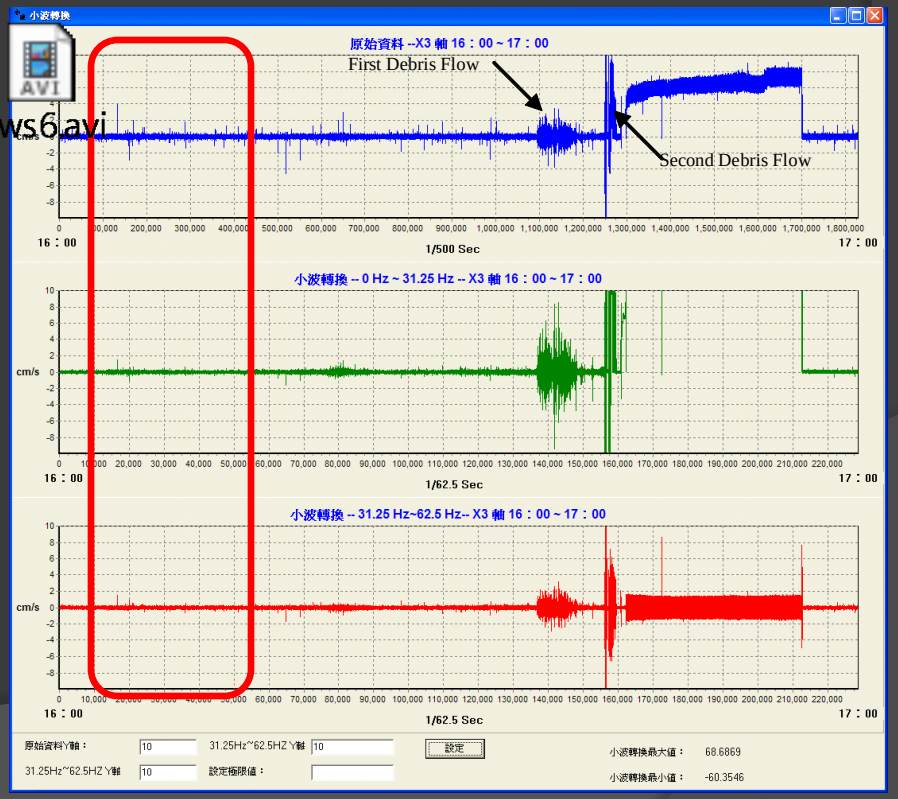

Receiving
Storage
Computing
Communication
Rain gauge
Soil moisture meter
Receiver
Geophone
AD Converter
Wild Box Module
CCD Camera
Grid Station
SAS
SWCB
NCDR
WRA
GetObservation()
SOS
Grid Station1
SPS
Grid Station2
MOTC
CWB
SWCB
WRA
Grid Station3
CWB

開放式架構的優勢

Geo phone sensor



1.7GB/Sensor/Station/Day



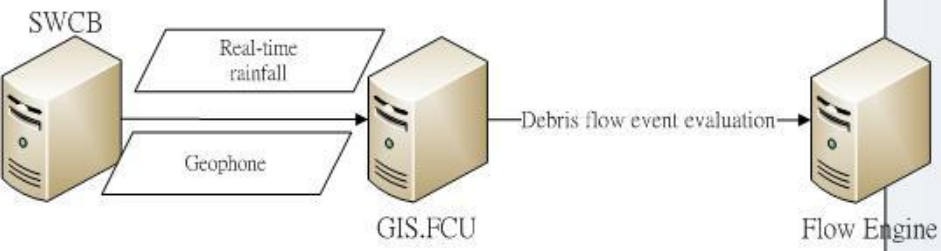
x

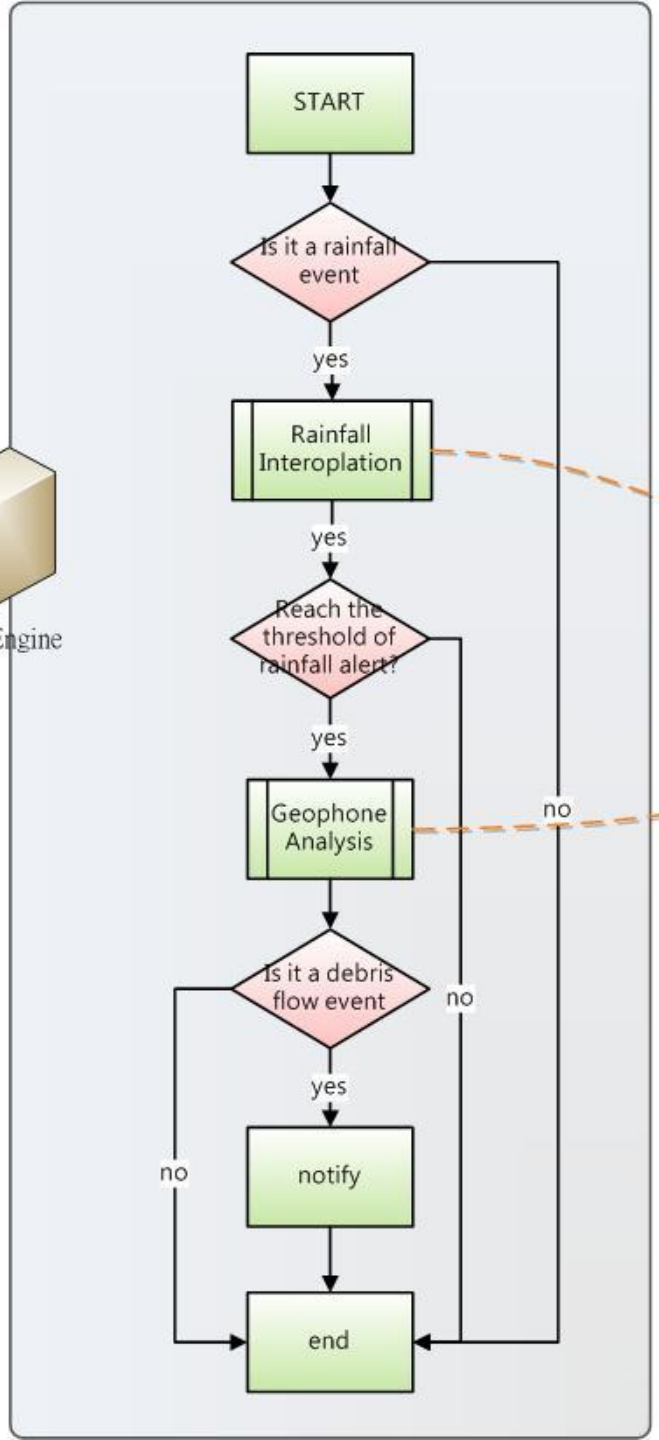
y

z

發展OGC WPS Grid processing profile
橋接OGF OGSA以進行平行運算

Feng Chia University+ University of Muenster





By IDW or Kriging algorithm

By wavelet algorithm

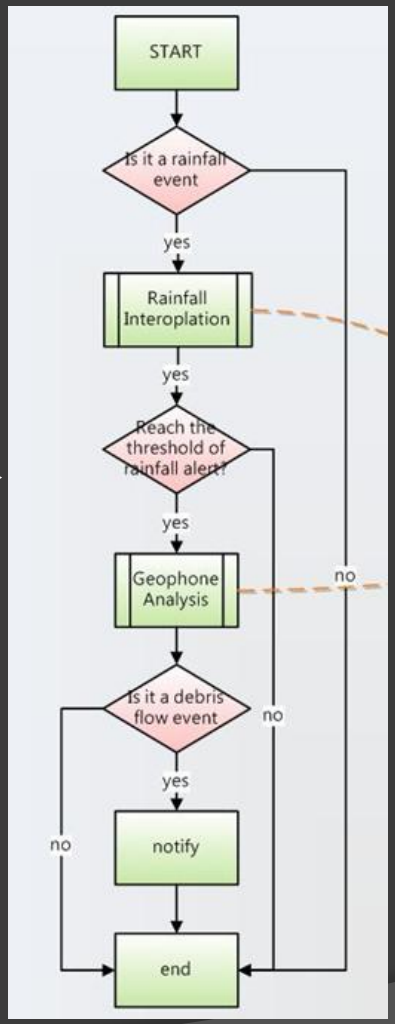
- 52° North WPS (WPS Specification 1.0.0)
- full support for UNICORE 6 grid middleware
- processing is done in GRID at **Jülich Supercomputing Center** (JSC), Germany
- input data is dynamicaly transferred into GRID

Co-op with ifGI, University of Muenster

Demon http://www.opengeospatial.org/pub/www/ows6/index.html

我國災害管理如何支援GEOSS?

多樣的感測器服務

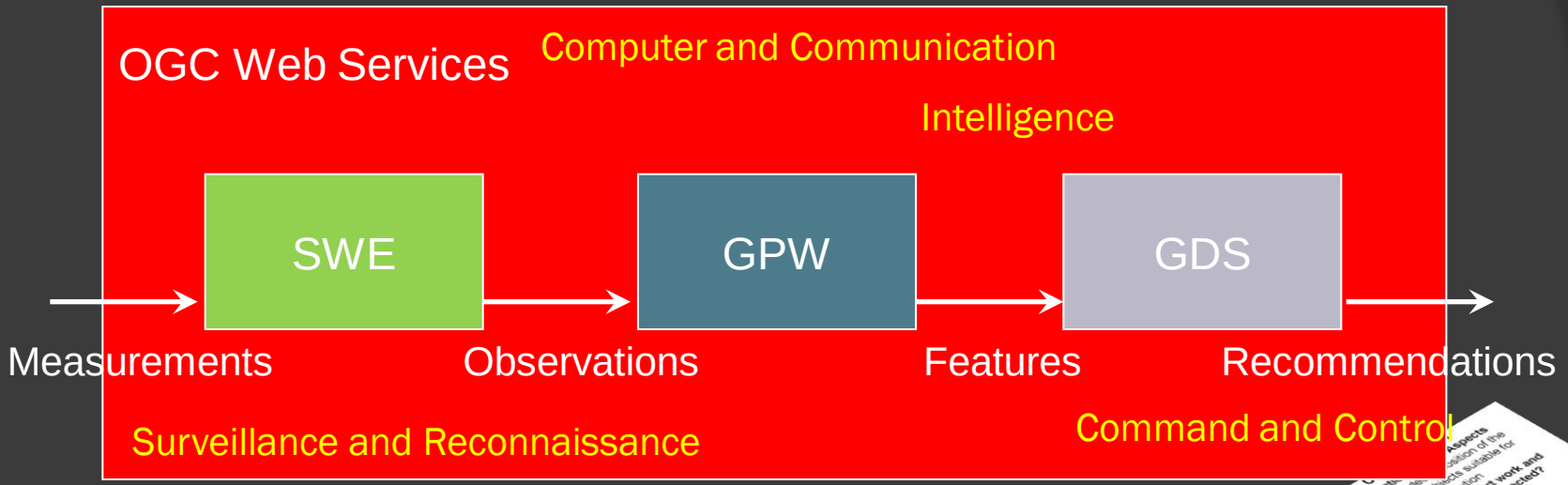


處理流程

註冊至GEOSS以支援世界各國之地球觀測研究

結論

GEOSS的戰術：從感測到決策支援



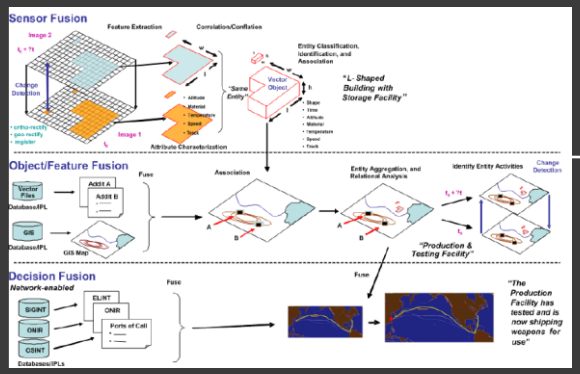
SWE = Sensor Web Enablement
GPW = Geo-Processing Workflow
GDS = Geospatial Decision-support Service

C4ISR

Fusion? SOA? Taiji?

TAIJI=Any philosophy that asserts two elements such as the yin-yang of Chinese philosophy will also look for a term to reconcile the two, to ensure that both belong to the same sphere of discourse

-> **Sharing Platform for SDSS**



The Great Commonwealth by Confucius BC 1200

簡報結束 敬請指教