MyGEO-RS: THE GEODIVERSITY REPOSITORY SYSTEM BASED ON DIGITAL OBJECT MODELING

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INTRODUCTION

- All geological and landscape resources have two opposing values : extractive and conservative.
- A geopark is defined as an area with a geological heritage of significance, with coherent and strong management structure and where a sustainable economic development strategy is in place.
- Geopark not only concern about the rocks but also concern with people.

INTRODUCTION

- Geoconservation idea arose mainly from the need to protect heritage resources.
- Langkawi
  - is a well known geopark with valuable geology sites and rich with natural heritage.
  - accorded as a geopark status by UNESCO.
- Several works have been done to create geodiversity inventory.
- But there are scattered, not integrated and mostly done at the geologists side.

WHAT IS GEODIVERSITY

- Geodiversity is the range of rocks, fossils, minerals, soils, landforms and natural processes that go to make up the Earth's landscape and structure (dorset 2005).
- Geodiversity can be protected for its
  - Intrinsic value
  - Ecological value
  - Scientific value
  - Heritage value
  - Educational value

OBJECTIVES

- To introduce a digital object (DO) definition
- To establish a data model for geodiversity repository
- To design and implement Geodiversity Repository System(MyGeo-RS)
- To capture the Langkawi geodiversity data into a single repository
- To provide geodiversity data for tourism industries.

WHY WE NEED DATABASE

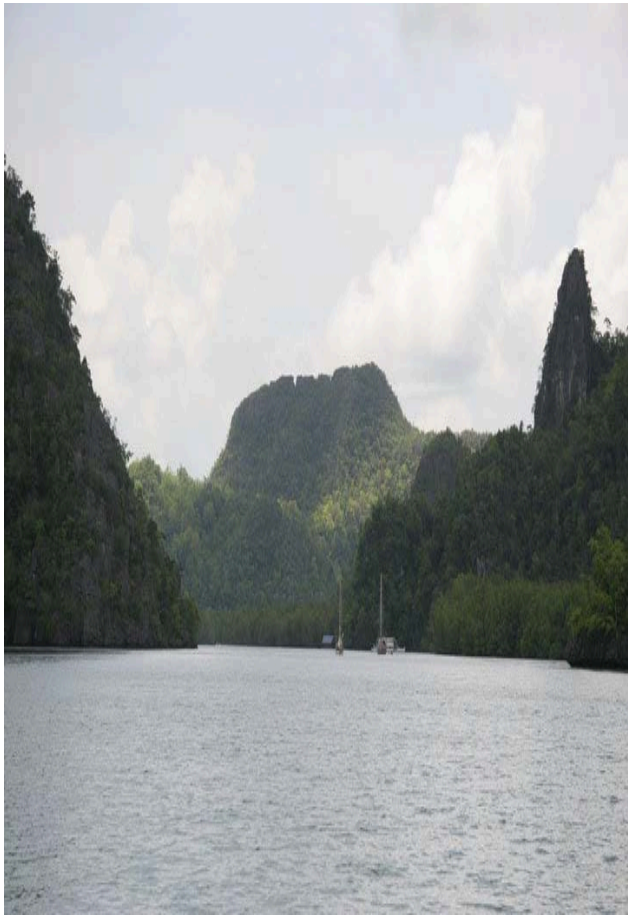
- Amount of data are still held by scientists or institutes that have not released their findings.
- Many data are generated to be anaylsed once, published, and often not visited again.
- Not knowing where to find useful information – bottleneck in sharing information.
- Therefore, we need a systematic directories that guide users, have classifications and indexes.

System Analysis

- Data or data sets without descriptions of data will lose enduring meaning, and are difficult to be understood or shared.
- **Metadata** – "information regarding the location, source, content or other specifics in relation to actual data"

SYSTEM ANALYSIS

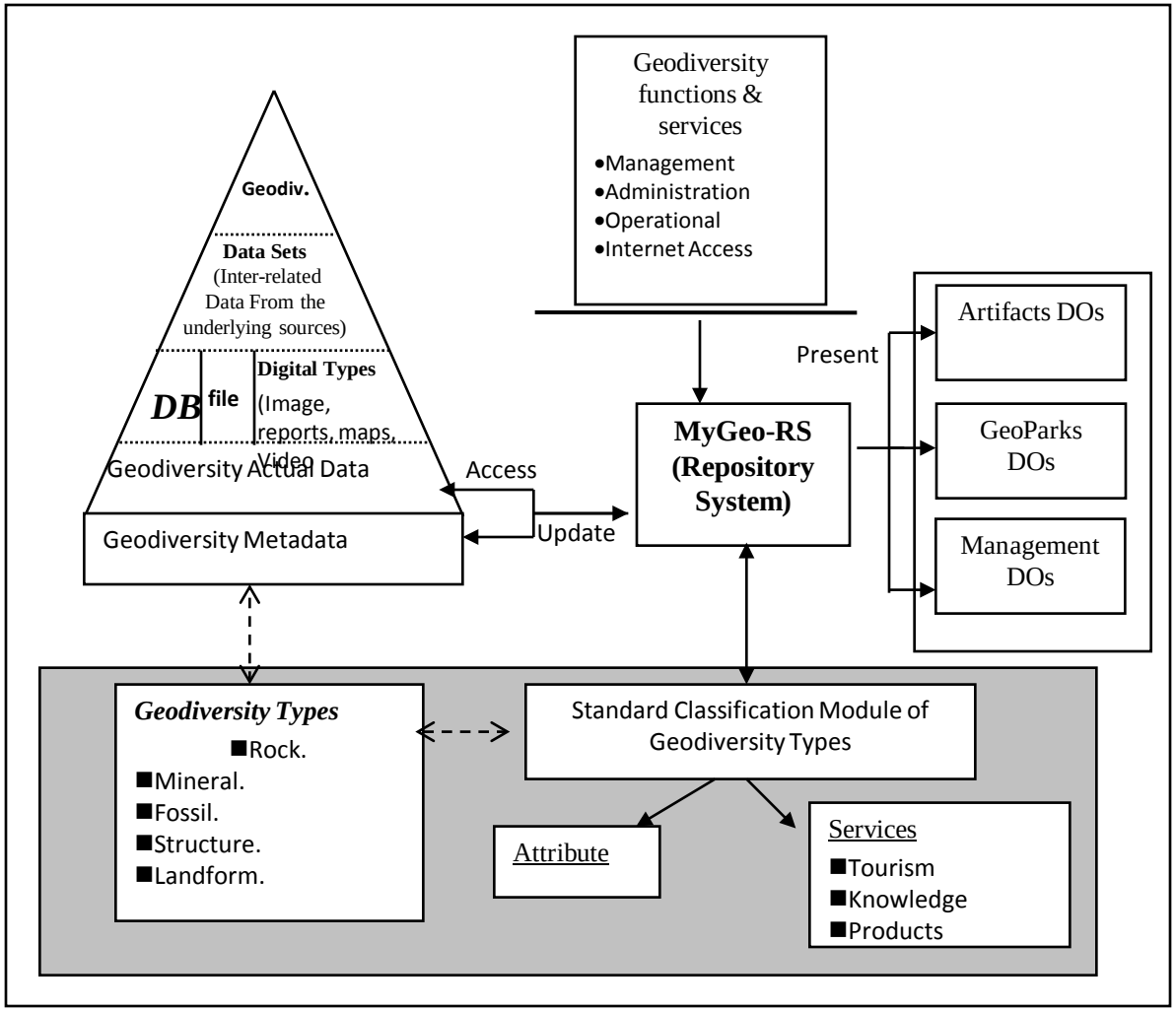
- The target user group for MyGeo-RS includes tourism sector and general public (with little contribution to scientific users).
- Initial discussion to establish user needs. Two main domain involve are geologist and information technology experts.
  - Understanding the concept of geodiversity from both domain groups.
  - Visited several geoparks in Langkawi to observe and better understanding of the domain.



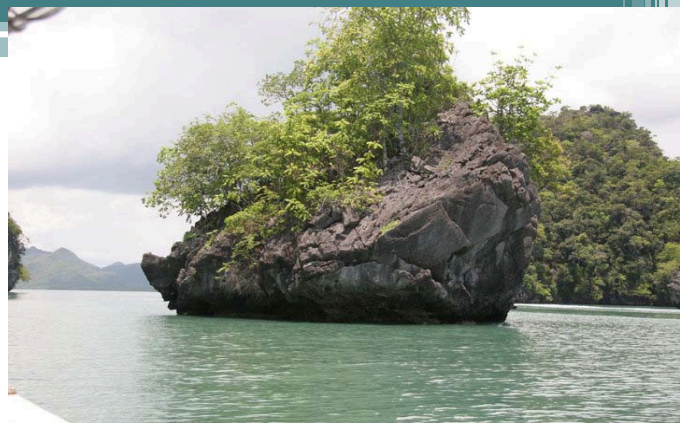
System Analysis

- A metadatabase is a database that has been designed and implemented to hold requisite metadata.
- Operate in exactly same way as normal database.
- **MyGEO** – the database designed to store geodiversity metadata and to serve as information query to assist users in searching the location and characteristics of geodiversity data.

MyGeo-RS – The Architecture



Systems Design

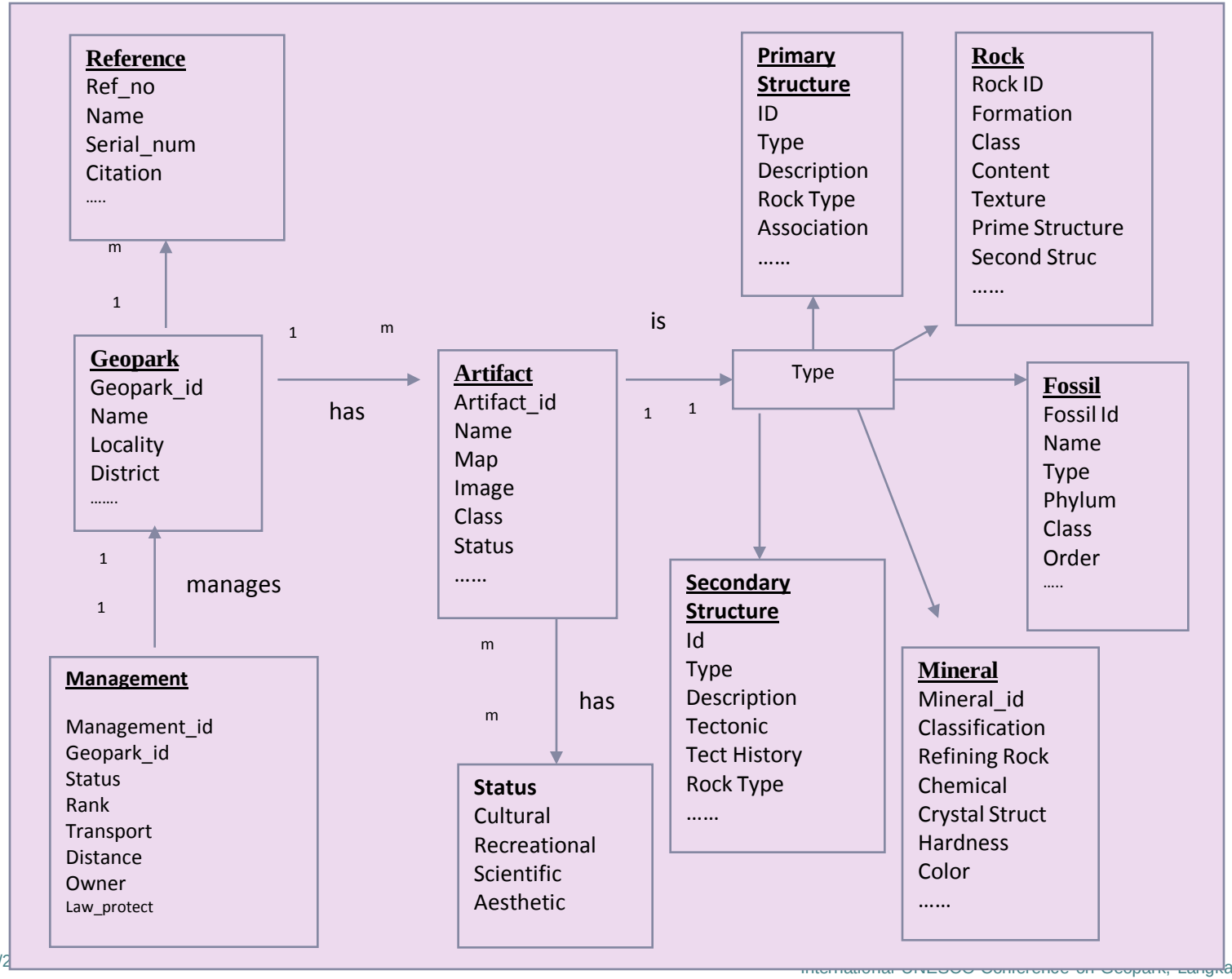


- Four steps in the phase of system design:-
  - Data Requirements and specification
  - Data structure of databases
  - Logical structure of the system
  - Overall control design
- Issue to be solved is how to realize the structure of the data.
- Difficult to get a mutual understanding and agreement between computer experts and geology experts.

System Design

- The process of identification and classification are very complex and time consuming.

The Semantic Data Model

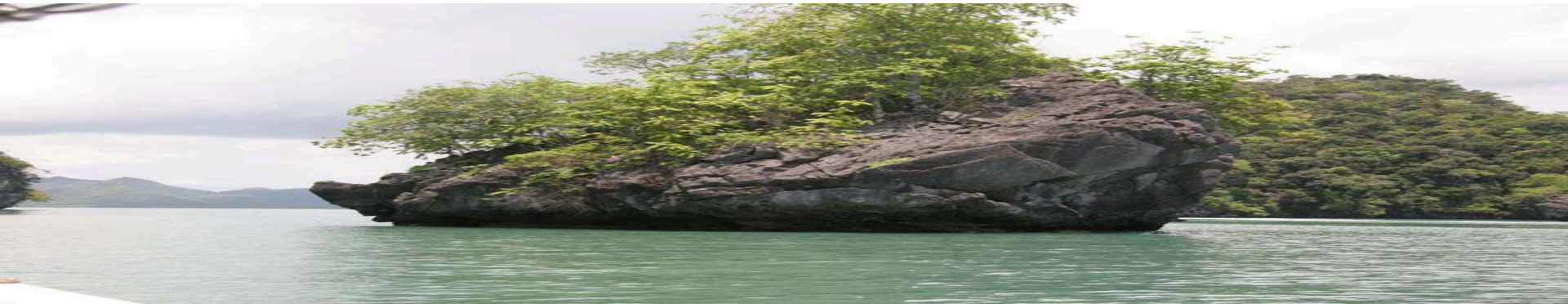


MyGeo-RS : Functional Modules

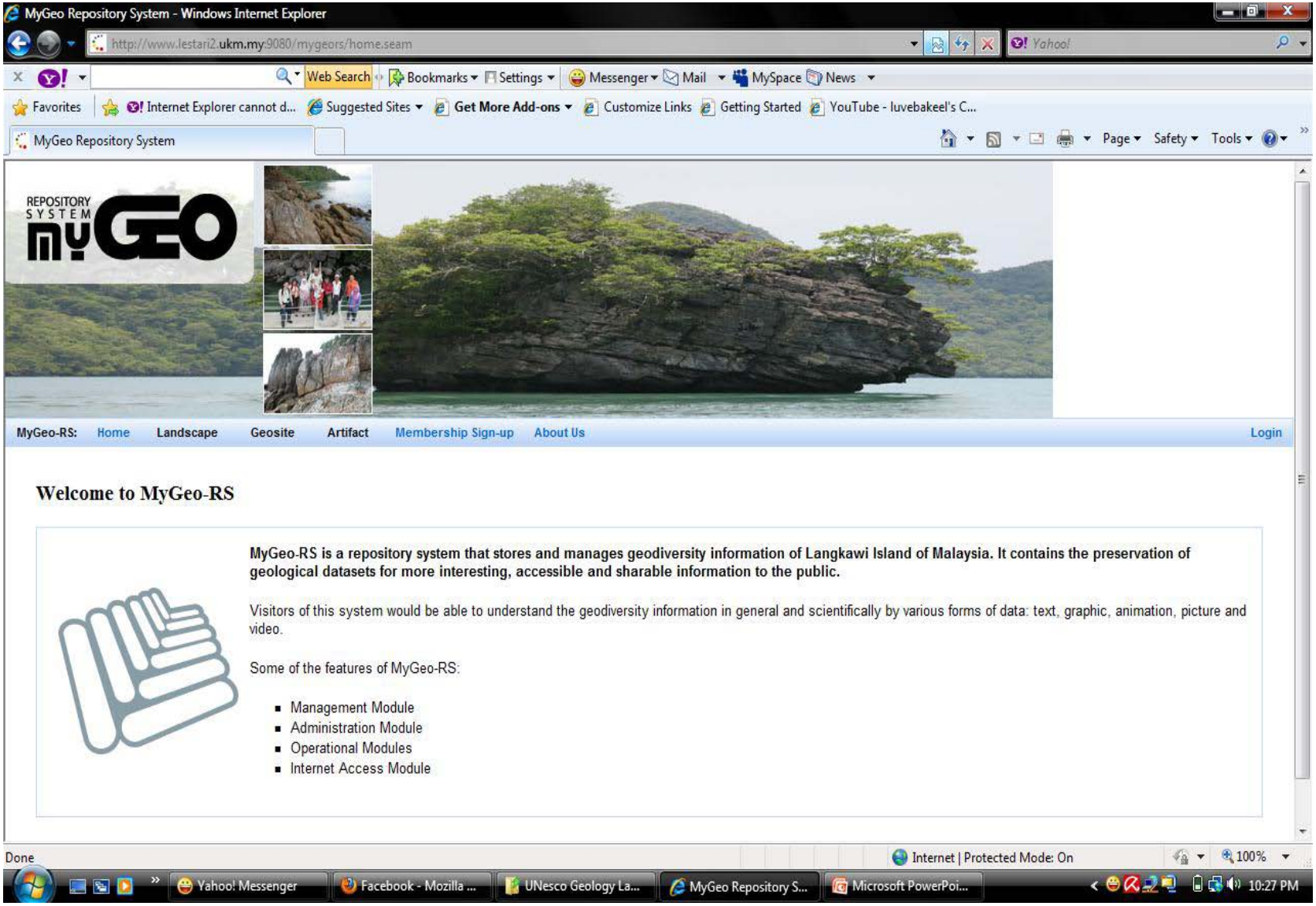
- Operational Module -(manipulation of multimedia data i.e. text, images, photo & video)
  - Input
  - Update
  - Delete
  - Import and export facilities based on prescribed format.
  - Search for specific content based on “keyword” (full and practical)
  - Reporting (operational activities).

MyGeo-RS Functional Modules

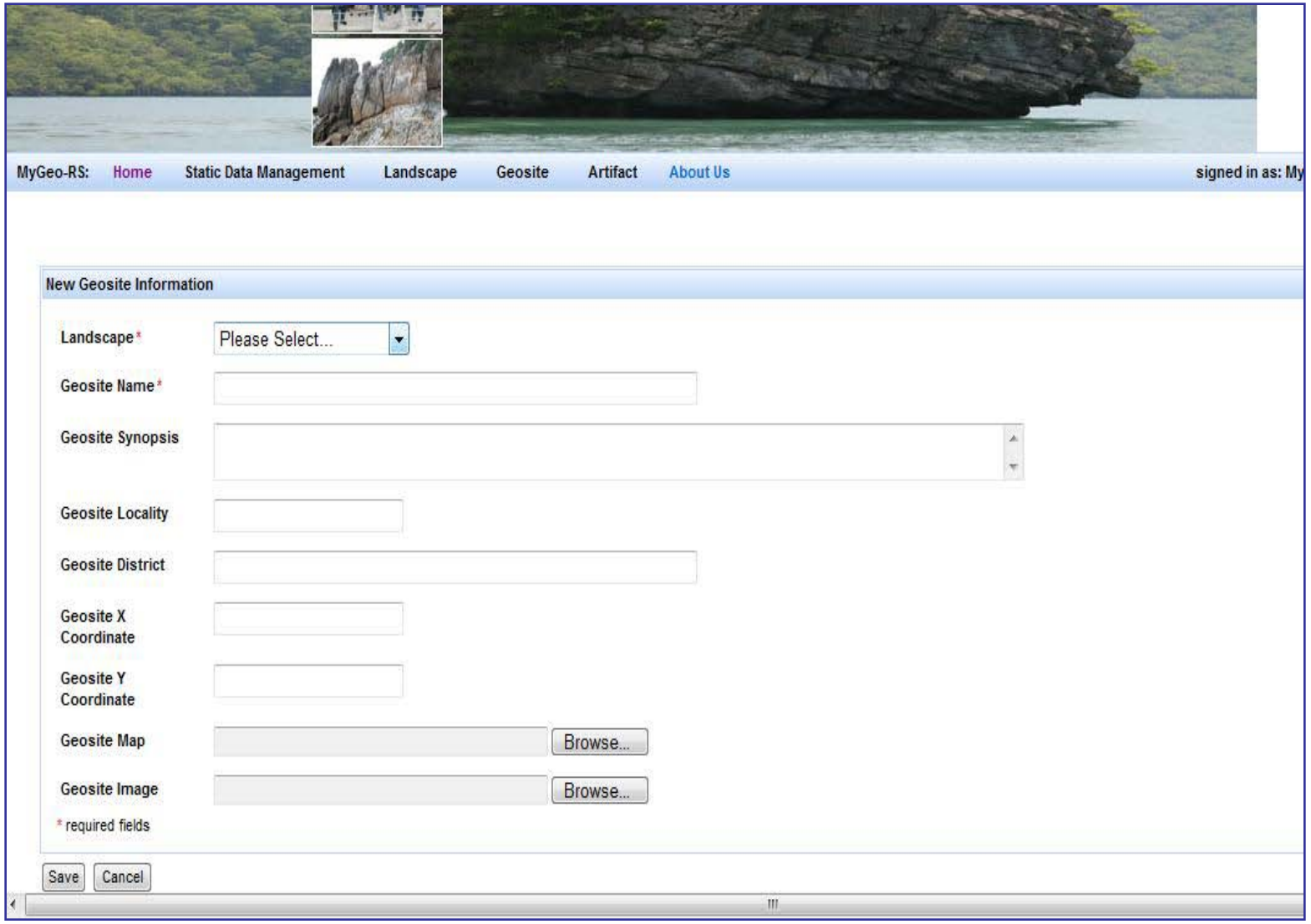
- Internet Access Modules
  - To provide public access based on a simple membership system
  - Viewing capabilities based on prescribed format (printer friendly format)
  - Search for specific content based on “keyword” (full and practical)
  - Membership/Hits counter
  - Feedback/comment communication



MyGeo-RS : The Screen Shot



MyGeo-RS : Input Screen



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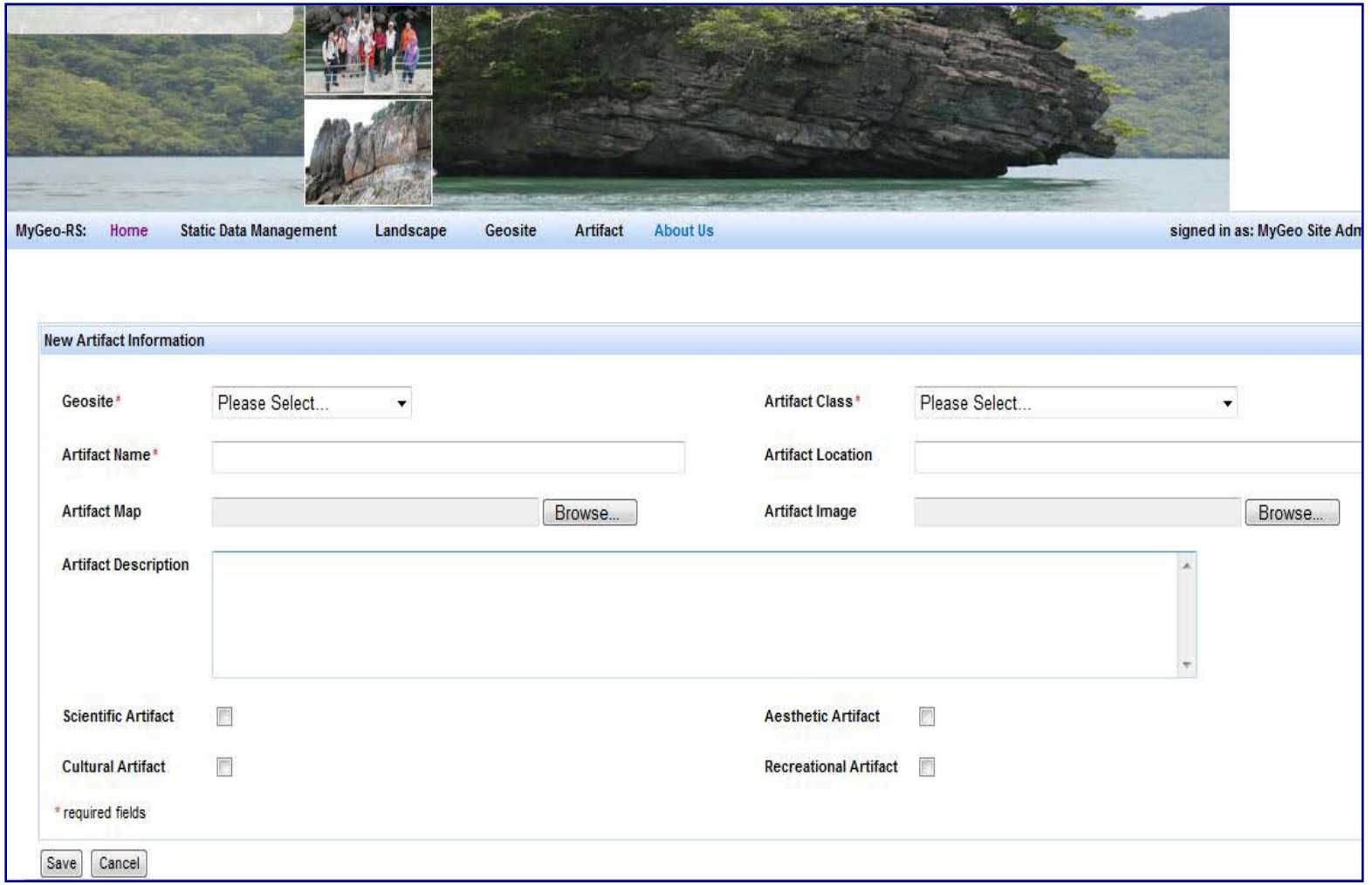
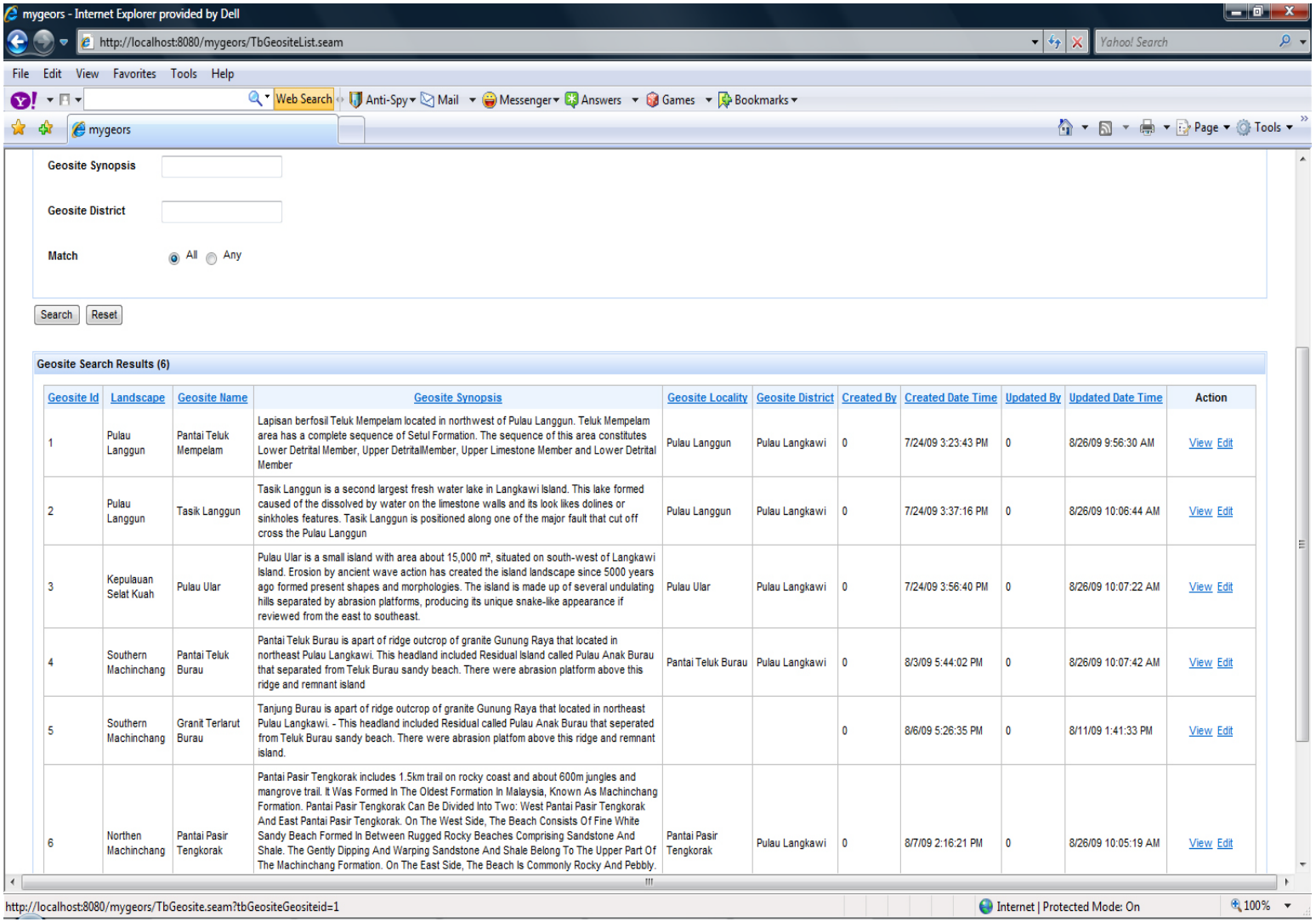


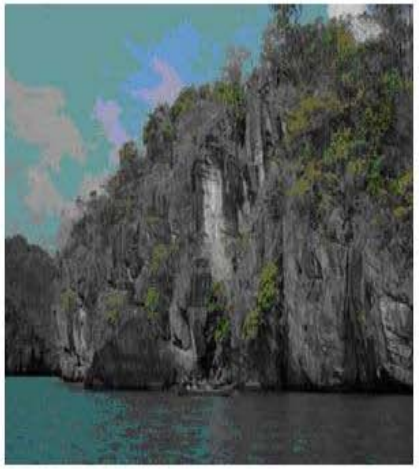
MyGeo-RS : Geosite Search



Geosite Id	Landscape	Geosite Name	Geosite Synopsis	Geosite Locality	Geosite District	Created By	Created Date Time	Updated By	Updated Date Time	Action
1	Pulau Langgun	Pantai Teluk Mempelam	Lapisan berfosil Teluk Mempelam located in northwest of Pulau Langgun. Teluk Mempelam area has a complete sequence of Setul Formation. The sequence of this area constitutes Lower Detrital Member, Upper DetritalMember, Upper Limestone Member and Lower Detrital Member	Pulau Langgun	Pulau Langkawi	0	7/24/09 3:23:43 PM	0	8/26/09 9:56:30 AM	View Edit
2	Pulau Langgun	Tasik Langgun	Tasik Langgun is a second largest fresh water lake in Langkawi Island. This lake formed caused of the dissolved by water on the limestone walls and its look likes dolines or sinkholes features. Tasik Langgun is positioned along one of the major fault that cut off cross the Pulau Langgun	Pulau Langgun	Pulau Langkawi	0	7/24/09 3:37:16 PM	0	8/26/09 10:06:44 AM	View Edit
3	Kepulauan Selat Kuah	Pulau Ular	Pulau Ular is a small island with area about 15,000 m², situated on south-west of Langkawi Island. Erosion by ancient wave action has created the island landscape since 5000 years ago formed present shapes and morphologies. The island is made up of several undulating hills separated by abrasion platforms, producing its unique snake-like appearance if reviewed from the east to southeast.	Pulau Ular	Pulau Langkawi	0	7/24/09 3:56:40 PM	0	8/26/09 10:07:22 AM	View Edit
4	Southern Machinchang	Pantai Teluk Burau	Pantai Teluk Burau is apart of ridge outcrop of granite Gunung Raya that located in northeast Pulau Langkawi. This headland included Residual Island called Pulau Anak Burau that separated from Teluk Burau sandy beach. There were abrasion platform above this ridge and remnant island	Pantai Teluk Burau	Pulau Langkawi	0	8/3/09 5:44:02 PM	0	8/26/09 10:07:42 AM	View Edit
5	Southern Machinchang	Granit Terlarut Burau	Tanjung Burau is apart of ridge outcrop of granite Gunung Raya that located in northeast Pulau Langkawi. - This headland included Residual called Pulau Anak Burau that seperated from Teluk Burau sandy beach. There were abrasion platfom above this ridge and remnant island.			0	8/6/09 5:26:35 PM	0	8/11/09 1:41:33 PM	View Edit
6	Northen Machinchang	Pantai Pasir Tengkorak	Pantai Pasir Tengkorak includes 1.5km trail on rocky coast and about 600m jungles and mangrove trail. It Was Formed In The Oldest Formation In Malaysia, Known As Machinchang Formation. Pantai Pasir Tengkorak Can Be Divided Into Two: West Pantai Pasir Tengkorak And East Pantai Pasir Tengkorak. On The West Side, The Beach Consists Of Fine White Sandy Beach Formed In Between Rugged Rocky Beaches Comprising Sandstone And Shale. The Gently Dipping And Warping Sandstone And Shale Belong To The Upper Part Of The Machinchang Formation. On The East Side, The Beach Is Commonly Rocky And Pebbly.	Pantai Pasir Tengkorak	Pulau Langkawi	0	8/7/09 2:16:21 PM	0	8/26/09 10:05:19 AM	View Edit

MyGeo-RS : Artifact Details

Artifact Details

Artifact Id	26		
Artifact Name	Vertical limestone Cliff	Artifact Location	Pulau Langgun
Artifact Class	Beach Outcrop	Geosite	Tasik Langgun
Artifact Map		Artifact Image	
Artifact Description			
Scientific Artifact	true	Aesthetic Artifact	true
Cultural Artifact	false	Recreational Artifact	false
Created By	0	Created Date Time	07/08/2009 12:22:05 PM
Updated By	0	Updated Date Time	04/12/2009 10:06:26 AM

Done

CONCLUSION

- The development of MyGeo-RS is a timely effort and a suitable solution that can ensure the management and preservation of geological dataset to be more interesting and accessible.
- With the advancement of ICT, this research attempt to establish on how geodiversity components and their relationships can be modeled into various forms of digital object.
- Target groups are public users and tourism industry.

THANK YOU

myGEO-RS

Geodiversity Research Group 2010®