



**UNIVERSITI PUTRA MALAYSIA**

**EXPERT SYSTEM FOR RATING OF ECOTOURISM  
SITES BASED ON SAFETY, HEALTH AND ENVIRONMENTAL  
QUALITY ASSURANCE**

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**EXPERT SYSTEM FOR RATING OF ECOTOURISM SITES BASED ON  
SAFETY, HEALTH AND ENVIRONMENTAL QUALITY ASSURANCE**

**BY**

**VIKNESWARAN NAIR SEHKARAN**

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,  
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Doctor of Philosophy**

**June 2003**



*Specially dedicated to...*

*Mum and dad.*

*My beloved wife Banunthy Devi.*

*Sister Shoba and brother Ramesh*

*Brother-in-law Steven*

Abstract of thesis submitted to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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**June 2003**

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The environment is the backbone of tourism products. Profitability in tourism depends on maintaining the attractiveness of tourist destinations with pleasant environment. Malaysia is a tropical country that is rich in a variety of ecological resources that of high tourism potential. Hence, the condition of the environment plays a critical role if the industry is to be sustained for future generations. The concept of ecotourism emphasises the sites that has potential for ecological interest. Although the ecotourism industry in Malaysia has vast potential for further development, it has not received adequate attention. All ecotourism sites must be planned, guided and developed in a monitored and controlled manner for effective and efficient management. A systematic expert rating system is developed to maintain a certain level of standards based on different levels of categorisation to ensure the sustainability of ecotourism sites in Peninsular Malaysia. The expert system developed uses a Web-based information-sharing platform consistent with the existing legislation on safety, health and environment. The system is designed and developed on a back-end on-line

database, which will keep record of all successful transactions. This research presents an efficient model using the Active Server Pages scripting method to manage and deliver the ecotourism rating expert system.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia untuk memenuhi keperluan Ijazah Doktor Falsafah

**SISTEM KEPAKARAN PENILAIAN EKO-PELANCONGAN  
BERDASARKAN KEPADA JAMINAN KUALITI KESELAMATAN,  
KESIHATAN DAN ALAM SEKITAR**

Oleh

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Alam semulajadi merupakan tunjang sektor pelancongan negara. Hasil keuntungan yang diperolehi daripada industri pelancongan ini bergantung kepada daya tarikan sesuatu destinasi pelancongan yang kaya dengan keindahan alam semulajadi. Malaysia merupakan sebuah negara yang dikurniakan dengan keajaiban tropical, kaya dengan pelbagai tarikan ekologi. Hal ini telah menjadikan Malaysia berpotensi sebagai destinasi eko-pelancongan. Oleh itu, keadaan alam semulajadi memainkan peranan yang kritikal untuk mengekalkan industri ini untuk generasi yang akan datang. Konsep eko-pelancongan mengutamakan destinasi-destinasi pelancongan yang mempunyai kepentingan ekologi. Walaupun industri eko-pelancongan di Malaysia mempunyai potensi yang luas untuk pembangunan, namun konsep pelancongan ini masih belum mendapat perhatian yang sewajarnya. Destinasi-destinasi eko-pelancongan harus dirancang, diterokai dan dibangunkan dengan pengawasan dan pengawalan untuk memastikan pengurusan yang cekap dan berkesan. Oleh itu, satu system penilaian yang pakar telah dihasilkan untuk menilai dan mengenalpasti serta

mengkategorikannya kepada tahap-tahap tertentu. Tahap-tahap ini akan digunakan untuk mengenalpasti tahap pengekalan destinasi-destinasi eko-pelancongan di Semenanjung Malaysia. Sistem kepakaran ini direka bentuk dan dibangunkan berasaskan kepada “Platform perkongsian maklumat melalui halaman Web” yang berpandukan kepada undang-undang keselamatan, kesihatan dan alam sekitar yang sedia ada dimana segala urusan yang berjaya akan direkodkan. Sistem ini menggunakan pangkalan data “*back-end on-line*”. Kajian ini dirangka menggunakan kaedah menskriptasikan “Active Server Pages” yang menurus dan meyampai membentangkan sebuah model yang menggunakan cara skriptasi “*Active Server Pages*” yang mengurus dan menyampaikan sistem kepakaran penilaian eko-pelancongan.

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The study has been a great experience and has given me valuable insight into the field of information technology in environment. I submit in humility and gratitude to the Supreme Power for all his blessings and generous help from sources that were beyond our expectation.





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## LIST OF ABBREVIATIONS

AOTO	Association of Official Tourist Offices
ASP	Active Server Pages
CGI	Common Gateway Interface
CNTA	Chinese National Tourism Association
CPR	Cardio Pulmonary Resuscitation
CST	Certification in Sustainable Tourism
DOE	Department of Environment
FRIM	Forest Research Institute of Malaysia
GUI	Graphical User Interface
HTML	Hyper Text Mark-up Language
KMO	Kaiser-Meyer-Olkin Measure
NEAP	Nature and Ecotourism Accreditation Programme
NGO	Non Government Organisation
NSTA	National Science Teachers Association
SIRG	Services Industries Research Group
SQL	Standard Query Language
TCHT	Taylor's College School of Hospitality and Tourism
TIES	The International Ecotourism Society
UPM	Universiti Putra Malaysia
WTO	World Tourism Organisation
WWF	World Wide Fund For Nature

# CHAPTER I

## INTRODUCTION

### 1.1 Prologue

The earth's human societies are experiencing some of the most dramatic changes in history. Borders are dissolving and countries, societies, people and firms are connecting more and in different ways than they ever have in the past. International trade agreements, global business activities, telecommunication networks and personal and educational travels are linking the planet together like never before. These linkages are being forged and supported by two of the largest and fastest growing industries in the world today - tourism and information technology (Sheldon, 1997).

According to Waters (1995), tourism is well documented as the world's largest industry, contributing significantly to many national and regional economies. He further added that tourism was responsible for over 200 million jobs world wide in 1995. According to the World Travel and Tourism Council (2003), the travel and tourism economy account for 11.7% of world GDP in 1999, and this figure is expected to grow in years to come.

Tourism's position as the world's largest industry has led to the widespread acknowledgement of the decisive role it plays in shaping the global economy (Davidson, 1993). More recently, attention has also been focused on the



environmental and cultural impact of tourism, in particular on the physical and human environment of tourism destinations. With ever-unpredictable economic conditions, modified consumer behaviour and emergence of new technologies have created further expansion of the industry, and the impact has become increasingly pervasive. Tourism contributes significantly to the economies of developing countries. Growth has been more rapid there than in developed countries and has been continuous for several decades. The travel, tourism and hospitality industries have collectively achieved international and national recognition as one of the major social and economic forces of our times (Ritchie and Goeldner, 1994). Over the last decade, world competition in tourism has grown as more and more countries and regions realise both the desirability and the necessity of including tourism as a major component of their social and economic structure.

In Malaysia, tourism has become a major economic activity. The 2001/2002 Malaysian Economic Report showed that Malaysia's tourism receipt of 10% to GDP in 2001 was the highest in the region compared with Singapore (6%), Thailand (5.2%), Indonesia (3.8%), Philippines (2.4%) and South Korea (1.5%). In 2001, Malaysia's tourism sector, the second largest source of foreign exchange earnings after manufacturing sector, generated RM39.1 billion (\$10.3 billion) in earnings (10% of GDP) and earned no less than RM24 billion (\$6.3 billion) in foreign exchange. Nonetheless, development of domestic tourism market remains largely untapped. Domestic and regular leisure travel was not a common feature in Malaysian society despite rising domestic incomes and extensive promotional marketing efforts. Nevertheless, the extensive promotion by the Ministry of Culture, Arts and Tourism, Malaysia both internationally and locally for the last three years, have suddenly given

the tourism sector the limelight it deserved. Thus, it is envisaged that domestic tourism potential will be increasingly harnessed and developed.

Despite the economic slowdown after 1997, Malaysia has experienced tremendous increase in the development of the tourism industry. This has been made possible through incentive tourism related investments. This was complemented by the hosting of prominent international conferences and events namely the 1998 Commonwealth Games in Kuala Lumpur, the International Ecotourism Colloquium 2002, the 7<sup>th</sup> World Leisure Congress 2002 and the launching of Visit Malaysia Year campaigns and activities, both within and outside the country. At present, greater confidence prevails in the tourism sector with Malaysia enjoying a relatively high profile in the international market.

National tourism policies and strategies, focus on the efficient development of the tourism sector, while concurrently enhancing the quality of life of Malaysians and minimising possible detrimental socio-cultural and environmental effects. The potential of tourism sites is dependent on supporting facilities such as parks and protected areas, transportation, roads, solid waste collection and disposal, sewerage and drainage, water distribution systems and health care facilities (Department of Environment, 1991). As part of the environmental factors contributing to the tourism industry, the infrastructure needs to be improved. Without coordination and planning, service demands may exceed capacity, with adverse results for residents as well as tourists. Indirect linkages between tourism and local cultures, businesses, resident populations and workforces are potential problems. Failure to recognise them can

diminish project benefits as well as inflict adverse socio-economic impacts on the local population.

Malaysia is a tropical country that is substantially rich in a variety of ecological based sites. Abundantly green and home to over 11,000 known species of flora and fauna (Khairuddin, 1992). Malaysia is an ecological area of much tourist potential. This potential can be harnessed by developing successful destination for tourists.

Ecotourism is defined by the Ecotourism Society as, “Purposeful travel to natural areas to understand the culture and natural history of the environment, taking care not to alter the integrity of the ecosystem, while producing economic opportunities that make the conservation of the natural resources beneficial to local people” (Font and Buckley, 2001). The ecotourism concept emphasises the use of areas of ecological interest, managed forests and the vast areas of natural habitat. While having vast potential for further development, ecotourism has not received adequate attention in Malaysia as compared to developed countries like the United Kingdom, Holland, Germany, Italy, the United States of America, Australia and New Zealand. The development of ecotourism must be planned, guided and managed in a monitored and controlled manner. Effective and efficient management is necessary so that the project is feasible on a sustainable basis. Carried out in this way, it is hoped that the industry will provide for increased opportunities for economic development and expansion.

It is estimated that of the 10.2 million tourists arrival in Malaysia in 2000, 10 percent were nature lovers or eco-tourists (The Star, 2001). It was also reported in The Star that Taman Negara National Park is one of the more popular eco-tourist favourite, which may create a problem of overcrowding soon. With 60,000 tourists in 1997, the park is approaching its carrying capacity of 70,000 to 90,000. With Mulu Caves in Sarawak and Mount Kinabalu in Sabah receiving World Heritage Listing (UNEP World Conservation Monitoring Centre, 2002), and Endau Rompin in Johore acknowledged as one of the oldest rain forest in the world (IMSP, 2000; Johore National Park Corporation, 2001), the ecotourism industry in Malaysia is moving into a new era. Without proper enforcement and management, the tourism demand may not be sustainable.

## **1.2 Problem Statement**

Modernization theorists argue that mass tourism development improves local economies and inhabitants' standard of living. Dependency theorists, however, contend that it strips precapitalist societies of their economic surplus, causes "economic leakage," leaves underdeveloped nations even more dependent on foreign imports, and ultimately destroys the socio-cultural framework of host countries (Khan, 1997). In contrast, ecotourism promotes preservation of natural ecosystems and local cultures while providing more egalitarian and locally controlled opportunities for economic growth.