

ICT Postgraduate Research  
and Training Partnerships

Cyber Vulnerabilities and the Tourism Industry:  
Developing a Conceptual Framework

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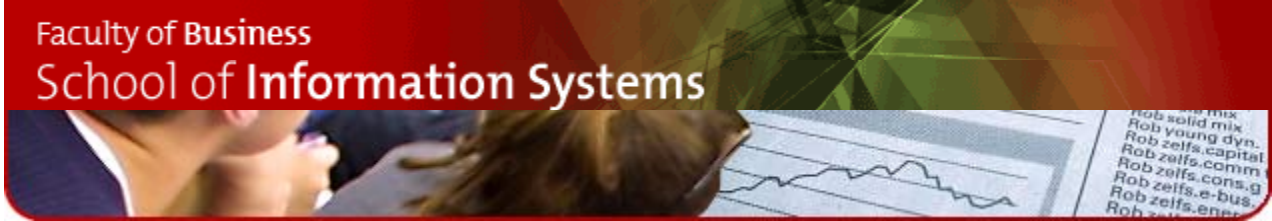
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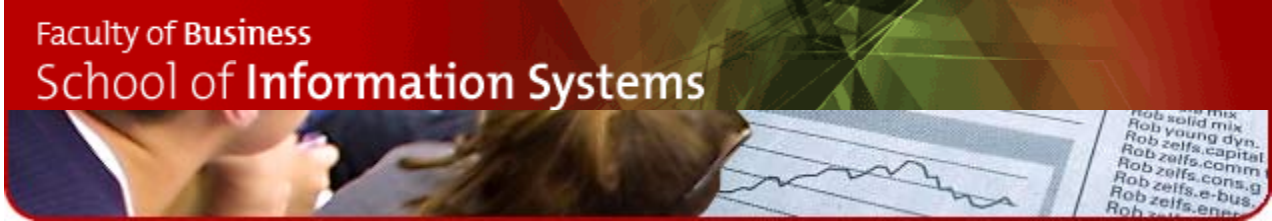


## What Is Covered

- Importance of Tourism industry and the threats faced.
- Growth in the use of ICT within Tourism.
- The increasingly malicious cyber environment.
- The need to investigate cyber vulnerabilities from a Tourism industry perspective.
- The proposed conceptual model.

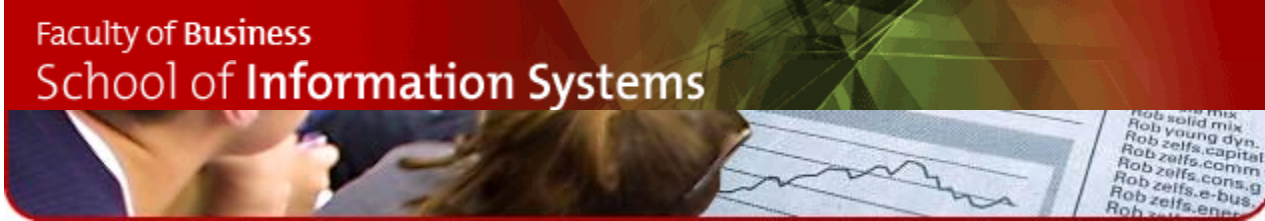
# Background

- Tourism is a \$48.7 billion industry in Australia.  
(Tourism Victoria, 2006)
- Tourism industry is extremely diverse and is made up of a large number of distinct sectors, all with varying levels of involvement in tourism. (Goeldner and Richie, 2003)
- An important industry globally and to Australia.
  - Expected to grow with recent developments.



# Threats to Tourism

- Since 9/11 the security of travellers has been at the front of concerns by many governments and organisations.
- Major focus on the physical security.  
(Beirman, 2003; Hall & Dallen, 2003; Wilks, 2005; Pizam & Mansfeld, 2006)
- Little research has been undertaken focusing on cyber threats to tourism industry.
- Cyber threats from other industries are taken very seriously.



# ICT Use in Tourism

- ICT is becoming increasingly important to the tourism industry offering "...efficiency, productivity & competitiveness."

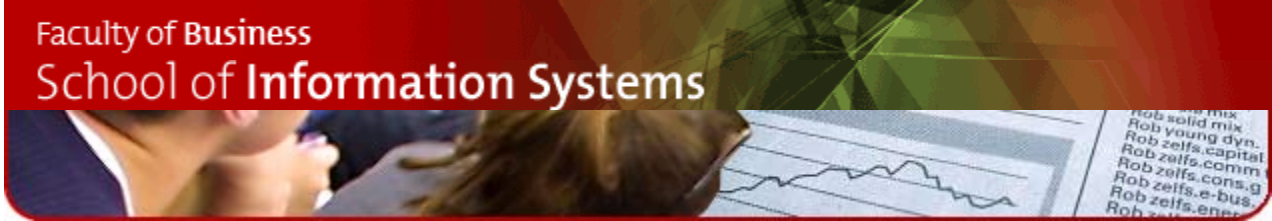
(Buhalis, 2003:805)

- Tourism is an 'information intensive' industry.

(Buhalis & Deimezi, 2003)

- "The proliferation of the Internet, as a main stream communication media and as an info-structure for business transactions has generated a wide range of strategic implications for businesses in general".

(Buhalis, 2003:805)

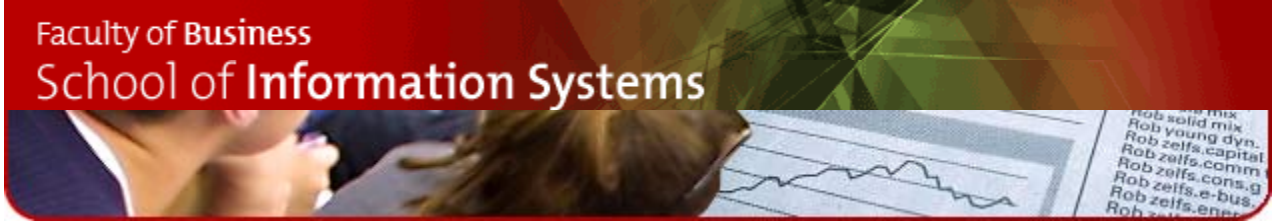


# Cyber Vulnerabilities

- ICT offers opportunities for undertaking criminal, illegal and inappropriate cyber behaviours. (Broucek & Turner, 2005)
- ICT is also an enabler for illicit activity. (Savona & Mignone, 2004)

Overcome geographic boundaries	ICT systems global availability
Allow a high level of anonymity	ICT access and purchase at a low cost
ICT systems can be easy to use	Networks are highly unregulated
Allow fast access	High level of security and encryption

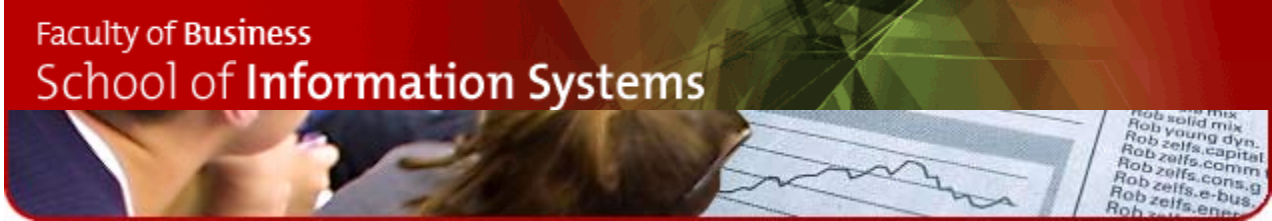
(Savona & Mignone, 2004)



# Malicious Cyber Environment

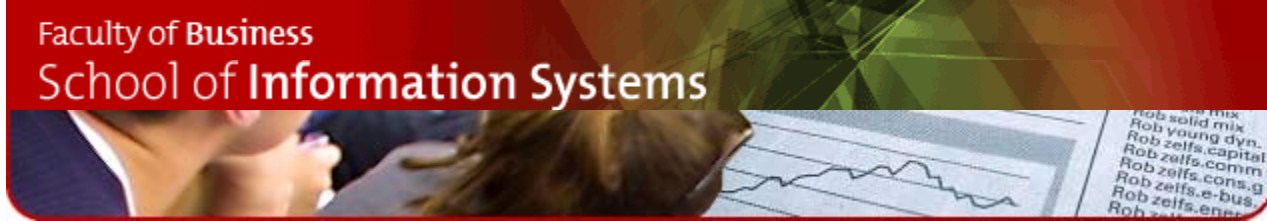
- Cyber attacks are now more malicious and targeted.
- Identity theft (and the resulting financial fraud) is the biggest growing cyber threat at present. (CSI, 2007)
- There is a market for ‘Zero-day’ exploits, tools and information. (McAfee, 2007)
- “The unfortunately reality is that no one is immune from the malicious industry’s reach.”

Dave DeWalt – President and CEO of McAfee Inc.(2007)



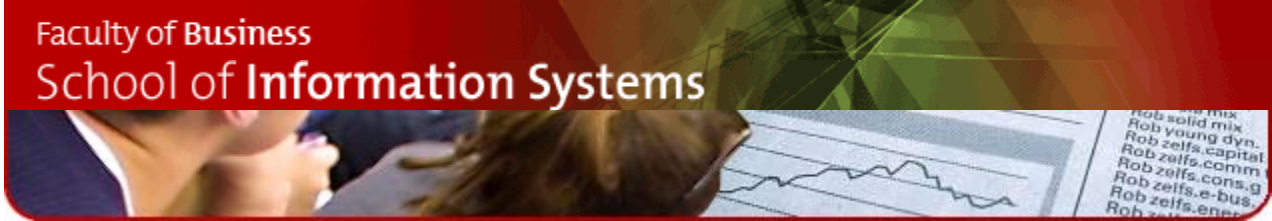
# Unique Aspects in Tourism

- Challenges faced by tourism industry
  - Information intensive.
  - Sensitive information is required.
  - Systems can be linked together.
  - ICT systems can be accessed via public networks.
  - Tourists want convenience.
  - Travellers can be 'out of touch' for periods of time.
- 'Organisational centric' approach to cyber security causes challenges for tourism industry.



# Research Overview

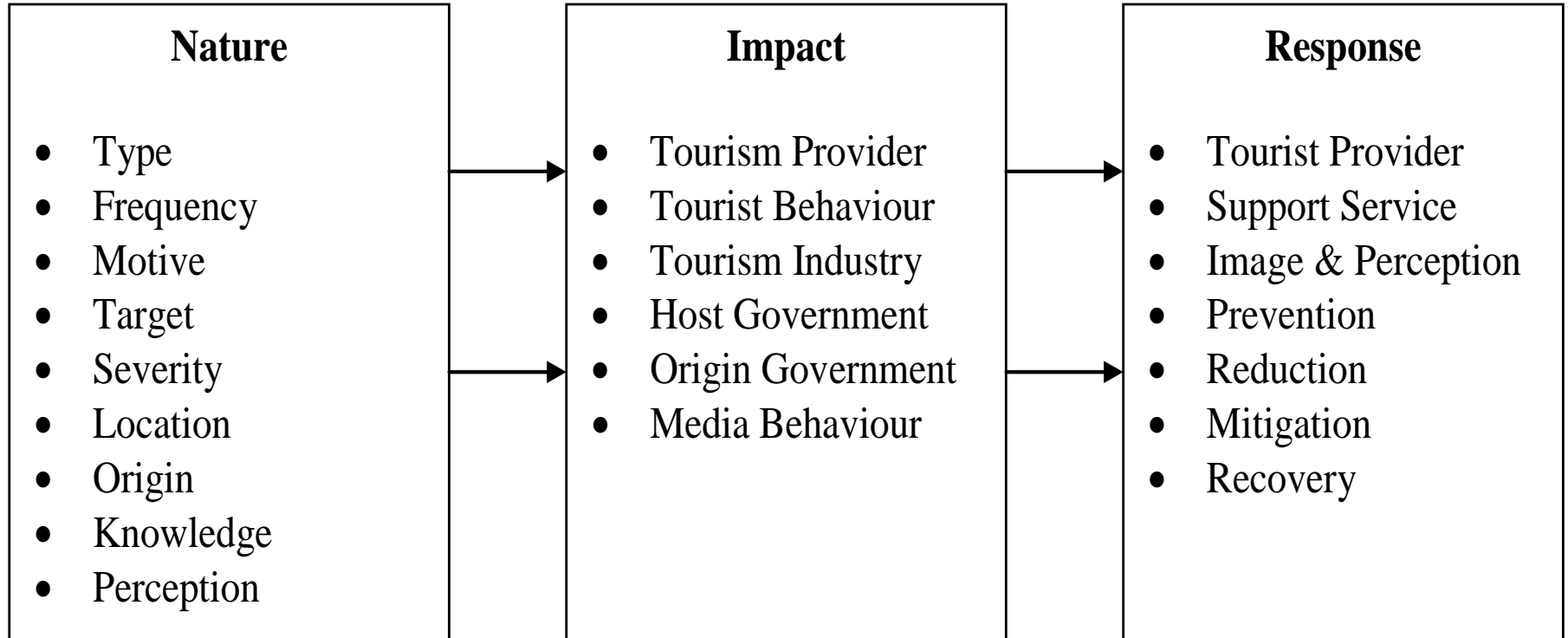
- There is a need to investigate cyber threats and vulnerabilities from the Tourism Industry perspective.
- Need a framework from which to explore:
  - the potential vulnerabilities faced by the use of ICT in tourism.
  - the possible impacts of the vulnerabilities.
  - suitable responses to cyber based threats and incidents.



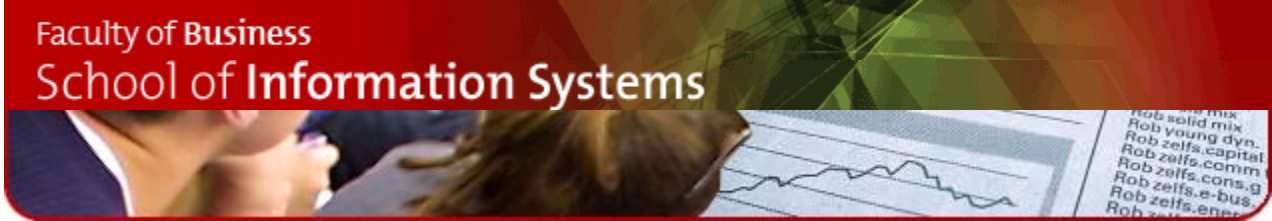
# Proposed Conceptual Framework

- Need a framework from which to explore cyber vulnerabilities from an industry wide perspective.
- Proposed model based on physical security exploratory model proposed by Pizam and Mansfeld (2006).
- Framework consists of 3 aspects:
  - The ‘Nature’ of the threats.
  - The ‘Impact’ of the threats.
  - The ‘Response’ to the threats.

# Framework

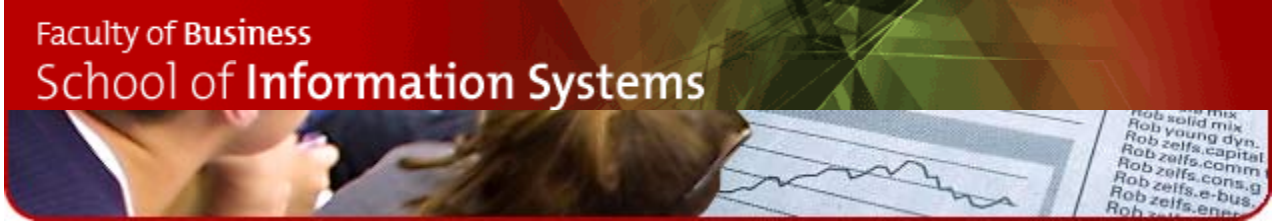


Based on Model by Pizam and Mansfeld, 2006.



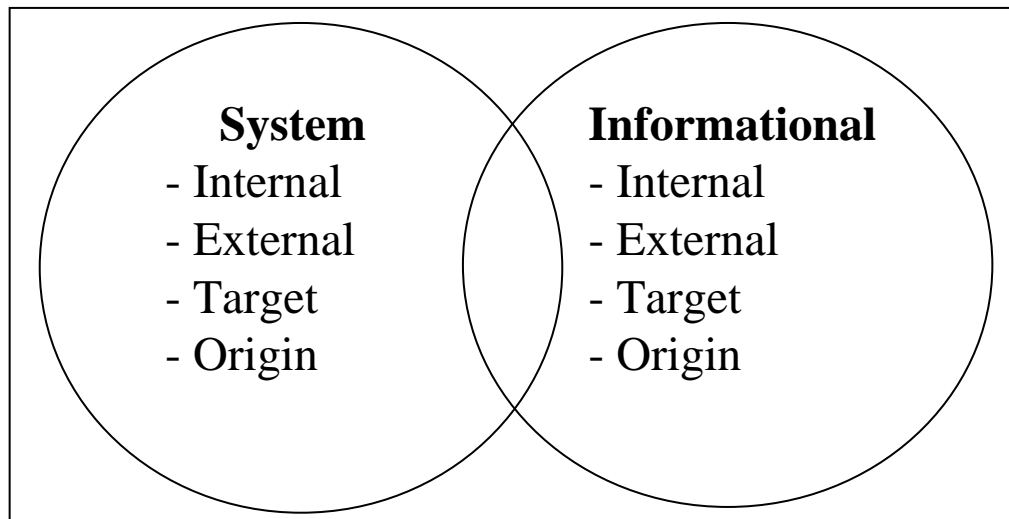
## Nature of the Threat

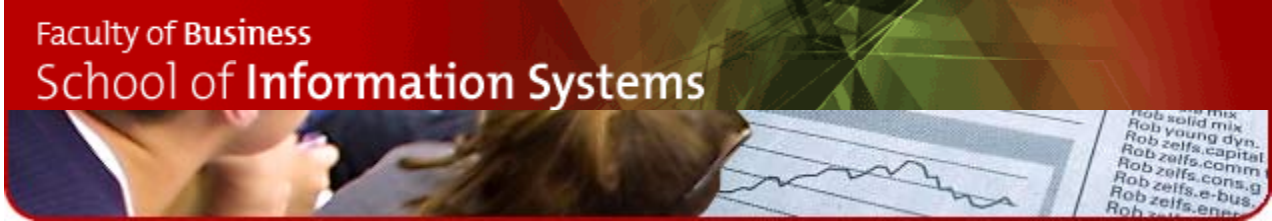
- First stage is to identify the threats faced by the tourism industry.
- Examine the threats based on their *Legal Nature* (Criminal, Illegal or Inappropriate); and
- The *Intent* behind the attack (Accidental vs. Deliberate).



# Impact of the Threat

- Second stage is to assess the impact of the threat on the tourism industry.
- This stage will examine the *Impact* from a *Systems* and/or *Informational* perspective.





# Response to the Threat

- Final stage is to assess responses to the perceived threats.
- Examine based on *Incident Type* (Targeted, Untargeted & Potential).
- The possible *Protective* activity (Proactive, Reactive & Mitigation).

# Summary

- Tourism is important to Australia and the rest of the world.
- Increasing use and reliance on ICT to conduct business.
- Important to examine cyber based threats from a tourism industry perspective.
- Research in early stages.
- Proposed framework will form the basis of the investigation.



- Beirman, D. (2003) Restoring Tourism Destinations in Crisis, Cabi Publishing
- Buhalis, D. (2003). "eAirlines: Strategic and Tactical use of ICTs in the Airline Industry." Information and Management 41: 805-825.
- Buhalis, D. and O. Deimezi (2003). "E-Tourism Developments in Greece: Information Communication Technologies Adoption for the Strategic Management of the Greek Tourism Industry." Tourism and Hospitality Research 5(2).
- Computer Security Institute (2007), CSI Survey 2007, viewed 26<sup>th</sup> November 2007, <i.cmpnet.com/v2.gocsi.com/pdf/CSISurvey2007.pdf>
- Goeldner, C. R. and J. R. B. Ritchie (2003). Tourism: Principles, Practices & Philosophies, 9th Edition. New Jersey, Wiley & Sons.
- Hall, M., Dallen, T.J., (eds) (2003). Safety and Security in Tourism: Relationships, Management, and Marketing, Haworth Hospitality Press.
- McAfee Inc. (2007). McAfee Virtual Criminology Report – Cybercrime: The Next Wave, viewed 1<sup>st</sup> December 2007, <[www.mcafee.com/us/research/criminology\\_report/default.html](http://www.mcafee.com/us/research/criminology_report/default.html)>
- Pizam, A. and Y. Mansfeld (2006). Toward a Theory of Tourism Security. Tourism, Security & Safety: From Theory to Practise. A. Pizam and Y. Mansfeld. Sydney, Australia, Elsevier / Butterworth-Heinmann.
- Savona, E. and M. Mignone (2004). "The Fox and The Hunters: How ICT Technologies Change the Crime Race." European Journal of Criminal Policy and Research 10(1).
- Tourism Victoria (2006), Strategic Plan 2002-2006 - Significance of Tourism, viewed 17th April 2007 <[http://www.tourismvictoria.com.au/strategicplan/plan2002\\_2006/2\\_significance\\_tourism/section2\\_index.htm](http://www.tourismvictoria.com.au/strategicplan/plan2002_2006/2_significance_tourism/section2_index.htm)>.
- Wilks, J. (2005) Tourism in Turbulent Times: Towards Safe Experiences for Visitors (Advances in Tourism Research), Elsevier Science.