Information and Communication Technology Key to Achieve Sustainable Tourism

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Abstract—*ICTs are driving the innovation process by reducing distance and time constraints in inter-personal and inter-institutional contacts and by reducing the complexity of exchanging and However, while it is important to acknowledge their important role, these technologies only play a part in enabling the many processes and relationships that characterize the patterns of socioeconomic development. An efficient use of ICT-based services demands the existence of dense immaterial networks, related to social interactions that occur within and between places and socioeconomic activities, allowing in turn the constant production of innovation.*

Innovative solutions are the key to the promotion of tourist regional development. Rapid developments in mobile telephony, cable, and wireless applications as well as in the field of computer hardware and software products appear to offer excellent opportunities to tourism development for the use of Information and communication technology in tourism , we must recognize that this knowledge in what direction we should be guided and regulated, to achieve this purpose, must pay to clarify the factors that make up the foundation of sustainable tourism we are investigating the matter we base our work on the conceptual model Sadler (Ecological development or the environment , economic development and social development) and then the necessity of using ICT as an innovative and effective method to achieve sustainable tourism will be discussed.

Keywords*: eTourism , Sustainable Tourism, Ecological development , economic development , social development, IT managemen*

1. INTRODUCTION

Technological progress and tourism have been going hand in hand for years (Poon, 1993; Sheldon, 1997). Since the 1980s, Information Communication Technologies (ICTs) have been transforming tourism globally. Developments in ICTs have undoubtedly changed both business practices and strategies as well as industry structures (Porter, 2001). The establishment of the Computer Reservation Systems (CRSs) in the 1970s and Global Distribution Systems (GDSs) in the late 1980s, followed by the development of the Internet in the late 1990s, has transformed the best operational and strategic practices in the industry dramatically (Buhalis, 2003) Tourism as an international industry and as the biggest provider of jobs on the planet boasts a greater array of heterogeneous stakeholders than many other industries. The energetic growth and

development of the industry are perhaps only mirrored by the growth of ICTs. The accelerating and synergistic interaction between technology and tourism in recent times has brought fundamental changes in the industry and on our perceptions of its nature. The significance of crossing the new information threshold of universal, ubiquitous communications access has brought the entire tourism industry to the new levels of interactivity, propelling management by wire. Increasingly, ICTs play a critical role for the competitiveness of tourism organizations and destinations as well as for the entire industry as a whole (UNWTO, 2001).developments in search engines, carrying capacity and speed of networks have influenced the number of travellers around the world that use technologies for planning and experiencing their travels. ICTs have also changed radically the efficiency and effectiveness of tourism organisations, the way that businesses are conducted in the marketplace, as well as how consumers interact with organisations (Buhalis, 2003).

2. MATERIALS

2.1 Sustainable Ecotourism

Sadler was among the first people who proposed sustainable ecotourism model in 1990. He has three social, economic and environmental goals in his model. Social goals include the provision of social benefits, participation in planning, training and employment of local residents. Economic goals include economic benefits for local communities as well as sustainability in the economy of these regions. Environmental goals include the protection of natural resources, prevention of degradation and management of those resources. Sadler's model and social, economic and environmental goals shows that the confluence of these goals indicates sustainable ecotourism (Sadler, 1990).
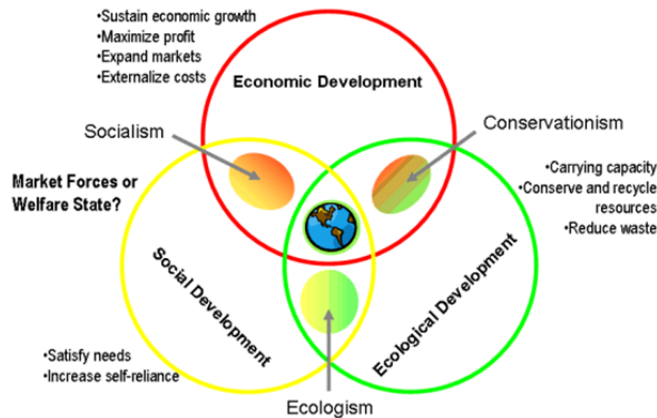
Epler (2002) also considers four criteria for the concept of sustainability in ecosystem or sustainable ecosystem:

• Having the least negative impacts on the natural and cultural environment.

• Maximum responsibility of the host culture.

• Enhancing the economic interests in local communities.

• Increasing eco-tourists satisfaction (Epler, 2002).

• Actors.

Ecotourism as a sustainable tourism:

Basically ecotourism is a strategy for controlling protected areas. This type of tourism deals with the a multi-dimensional goal, i.e. the protection of the environment, respecting local communities and promoting the cultural components of host communities and these goals are consistent with sustainable development and their main motto is "responsible travel to natural areas in order to protect the environment and improve the economic conditions of local communities". In light of the foregoing, what is important in this type of tourism (ecotourism) is the issue of sustainability (Honey, 2008). Sustainable development emphasizes meeting needs at a minimum level of benefits in the community (intergenerational justice) and fair sacrament of future generations (intergenerational equity) (Jiang, 2008). Without careful planning and attention to ecological, local, cultural and social capabilities, tourism industry will be followed by problems for each region; on the other hand, planned and flawless tourism will go toward the proper use of the environment and of environmental, cultural, historical resources and etc. in the region (Edgell et al., 2008).

Ecology

The ecological sustainability of human settlements is part of the relationship between humans and their natural, social and built environments(*Scerri, Andy; James, Paul 2010)* Also termed human ecology, this broadens the focus of sustainable development to include the domain of human health. Fundamental human needs such as the availability and quality

of air, water, food and shelter are also the ecological foundations for sustainable development (White, F; Stallones, L; Last, JM. 2013) addressing public health risk through investments in ecosystem can be a powerful and transformative force for sustainable development which, in this sense, extends to all species (Bringing human health and wellbeing back into sustainable development, 2011-12)

Environment

Environmental sustainability concerns the natural environment and how it endures and remains diverse and productive. Since resources are derived from the environment, the state of air, water, and the climate are of particular concern. The IPCC Fifth Assessment Report outlines current knowledge about scientific, technical and socio-economic information concerning climate change, and lists options for adaptation and mitigation*(IPCC Fifth Assessment Report 2014)* Environmental sustainability requires society to design activities to meet human needs while preserving the life support systems of the planet. This, for example, entails using water sustainably, utilizing renewable energy, and sustainable material supplies (e.g. harvesting wood from forests at a rate that maintains the biomass and biodiversity) an unsustainable situation occurs when natural capital (the sum total of nature's resources) is used up faster than it can be replenished. Sustainability requires that human activity only uses nature's resources at a rate at which they can be replenished naturally. Inherently the concept of sustainable development is intertwined with the concept of carrying capacity. Theoretically, the long-term result of environmental degradation is the inability to sustain human life. Such degradation on a global scale should imply an increase in human death rate until population falls to what the degraded environment can support if the degradation continues beyond a certain tipping point or critical threshold it would lead to eventual extinction for humanity

Consumption of renewable resources	State of environment	Sustainability
More than nature's ability to replenish	Environmental degradation	Not sustainable
Equal to nature's ability to replenish	Environmental equilibrium	Steady state economy
Less than nature's ability to replenish	Environmental renewal	Environmentally sustainable

Integral elements for a sustainable development are research and innovation activities. A telling example is the European environmental research and innovation policy, which aims at defining and implementing a transformative agenda to greening the economy and the society as a whole so to achieve

a truly sustainable development. Research and innovation in Europe is financially supported by the program Horizon 2020, which is also open to participation worldwide. An promising direction towards sustainable development is to design systems that are flexible and reversible.

Economics

It has been suggested that because of rural poverty and overexploitation, environmental resources should be treated as important economic assets, called natural capital (Barbier, Edward B. 2006). sustainable development may involve improvements in the quality of life for many but may necessitate a decrease in resource consumption (Brown, L. R. 2011).according to ecological economist Malte Faber, ecological economics is defined by its focus on nature, justice, and time. Issues of intergenerational equity, irreversibility of environmental change, uncertaintyof long-term outcomes, and sustainable development guide ecological economic analysis and valuation (Malte Faber. 2008). as early as the 1970s, the concept of sustainability was used to describe aneconomy "in equilibrium with basic ecological support systems (Stivers, R. 1976). scientists in many fields have highlighted *The Limits to Growth* (Meadows, D.H., 1972), and economists have presented alternatives, for example a 'steady state economy', (Daly, H. E. 1973) to address concerns over the impacts of expanding human development on the planet. In 1987 the economist Edward Barbier published the study *The Concept of Sustainable Economic Development*, where he recognized that goals of environmental conservation and economic development are not conflicting and can be reinforcing each other (Barbier, E. 1987).

Culture

Working with a different emphasis, some researchers and institutions have pointed out that a fourth dimension should be added to the dimensions of sustainable development, since the triple-bottom-line dimensions of economic, environmental and social do not seem to be enough to reflect the complexity of contemporary society .

Technological innovation

Constant innovation in applications of hardware, software, and network developments means that only dynamic organizations, which can assess the requirements of their stakeholders and respond efficiently and effectively, will be able to outperform their competitors and maintain their long-term prosperity. Rapid technological development paradoxically means that the more powerful and complex the ICTs become, the more affordable, user-friendly they become, enabling more people and organizations to take aadvantage. Technological innovations in hardware, software, and Netware have been propelling a wide range of changes in Information Systems (IS). ICTs convergence effectively integrates the entire range of hardware, software, groupware, Netware, and

human ware and blurs the boundaries between equipment and software (Werthner & Klein, 1999)

Implications

Despite the aforementioned benefits, hitherto the eTourism vitality is still primitive. This jeopardizes the opportunities for tourism corporations to develop credible interfaces with other members of the value-chain, and thus, it prevents them from developing their vitality further. A number of organizations fail to appreciate the benefits of co-petition and co-destiny, when organizations collaborate with players that they would normally regard as competitors. A wide range of issues must be therefore resolved before the tourism industry can take full advantage of the ICTs and maximize its verticality.

3.   CONCLUSIONS

Developments in search engines, carrying capacity and speed of networks have influenced the number of travelers around the world that use technologies for planning and experiencing their travels. ICTs have also changed radically the efficiency and effectiveness of tourism organizations, the way that businesses are conducted in the marketplace, as well as how consumers interact with organizations There have been many new entrants among the players on the tourism stage, shifts in market share and balance of power, changes in political perceptions of tourism, and a growing recognition of the importance of tourism to an ever-increasing number of national and regional economies.

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