

Towards an ICT framework for sustainable tourism

Aligning Tourism Enterprise Processes, Destination Management Services and Technology.

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1 Preface

While studying Information Science, I have developed an interest in the relation between ICTs and socioeconomic development. Since tourism has become to play a key role in many socioeconomic development strategies, ICTs act as strong drivers of the global tourism industry, and because I had a part-time job in a sustainable tourism company, choosing this thesis' subject was easy, even more when the opportunity of conducting a case study in Wayanad presented itself. To me, presenting this thesis even feels like I have finally found a way of combining most of my (perhaps too broad) interests into a single work.

I would like to thank... Prof. dr. ir. Theo van der Weide for supervising my research and for stimulating both researching and living abroad, in a different culture – which has been a real eye-opening experience to me (and probably many other students) time and again; dr. Luca Consoli for providing feedback on the first research plan; dr. Stijn Hoppenbrouwers for fine-tuning my understanding of the ArchiMate modelling language; Frans de Man (ReTour Foundation) and Ruud Crul (InfoBridge Foundation) for presenting Wayanad as the case study's destination; all members of RASTA Kambalakkad for hosting and aiding the research – special thanks go to Danesh and Omana for their support and kind hospitality; and all research respondents. On a personal level, I would like to thank my partner Lisette van Engelen, my friends and my family, for providing me with mental support, insights, and decent coffee.

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3 Abbreviations

AT	Appropriate Technology
DMS	Destination Management System
DTPC	District Tourism Promotion Council
eTourism	The digitization of all elements in the tourism supply chain
ICT	Information and Communication Technology
ICT4D	Information and Communication Technology for Development
LDC	Lesser Developed Country
NGO	Non-Governmental Organization
PPT	Pro-poor tourism
PRSP	Poverty Reduction Strategy Paper
RASTA	Rural Agency for Social and Technological Advancement
SMART	Specific, Measurable, Actionable, Relevant, Time-bound
SME / SMTE	Small to Medium Enterprise / Small to Medium Tourism Enterprise
SMS	Short Message Service (a mobile text message)
SOA	Service Oriented Architecture
SWOT	Strength, Weaknesses, Opportunities, Threats
UNWTO	United Nations World Tourism Organization
WETO	Wayanad Eco-Tourism Organization
WTO	Wayanad Tourism Organization
WTTC	World Travel & Tourism Council

5 Introduction

However much attention has been paid to the possible use of ICTs in development strategies and of ICT in tourism, to sustainable tourism strategies and the concept of destination management, concrete methods to leverage ICTs in order to provide enterprises equal opportunity for achieving their sustainability goals within a destination context has received only little attention. This thesis aims to describe an ICT framework supporting these enterprises.

In this chapter, the concept of tourism is introduced with special attention for tourism in the third world and sustainable tourism, second the application of ICT in socioeconomic development strategies (ICT4D), third the concept of eTourism, and fourth the relation between ICT4D and sustainable tourism.

5.1 Tourism

The UNWTO has defined tourism as "The activities of persons travelling to and staying in places outside their usual environment for more than twenty-four (24) hours and not more than one consecutive year for leisure, business and other purposes not related to the exercise of an activity remunerated from within the place visited" (UNWTO, 1995 p. 1).

Tourism has become a major industry (Brown, et al., 2008), which has still been expanding rapidly during the last decade. Despite the current economic downturn, the WTTC (World Travel and Tourism Council) (2008) has prospected a steady growth of 4.4% a year between 2008 and 2018, rising to generating approximately US\$10,855 billion a year in 2018, supporting 297 million jobs and 10.5% of global GDP.

Many stakeholders and processes are involved in this complex, large scale industry; "From an industry structural perspective, tourism is a complex network of selling chains, transport patterns, attractions, accommodation and technologies" (Ryan, 2002 p. 17).

In the next two sections, tourism in developing countries is discussed, followed by the concept of tourism sustainability.

5.1.1 Tourism in the third world

Many challenges are to be faced in the third world. The United Nations' Millennium Development Goals (MDGs) provides a comprehensive list of priorities for development in LDCs (see table below).

Goal 1	Eradicate extreme poverty and hunger
Goal 2	Achieve universal primary education
Goal 3	Promote gender equality and empower women
Goal 4	Reduce child mortality
Goal 5	Improve maternal health
Goal 6	Combat HIV/AIDS, malaria and other diseases
Goal 7	Ensure environmental sustainability
Goal 8	Develop a global partnership for development

Table 1 The UN's Millennium Development Goals

Alleviating poverty and hunger requires serious economic effort; the economic significance of tourism in developing countries has long been recognized, and has for the last year increasingly gained interest as a powerful tool for poverty alleviation (Zhao, et al., 2007). The developmental approach in which tourism is used to support the poor is called pro-poor tourism. Pro-poor tourism strategies "... aim to unlock opportunities for the poor – whether for economic gain, other livelihood benefits, or participation in decision-making" (Ashley, et al., 2001 p. viii).

5.1.2 Sustainable tourism

Pro-poor tourism strategies however do not take issues of environmental or ecological sustainability into account, like the approach of sustainable tourism does, which places tourism as tool for development in a broader context (Ashley, et al., 2001; Mowforth, et al., 2009).

Based on observed practice, Mowforth and Munt (2009) describe tourism sustainability as a condition meeting four criteria:

1. Ecological sustainability;
2. Social sustainability;
3. Cultural sustainability;
4. Economic sustainability.

An educational element, local participation and a conservation element often play a crucial role in the methods, tools and policies designed to achieve these criteria (Mowforth, et al., 2009). Due to the rapid development of the tourism industry, sociocultural issues such as equity, power sharing and

sustainability are also involved and should receive specific attention, especially in developing countries (Ryan, 2002; Mowforth, et al., 2009).

5.1.3 Tourism and local enterprises

The destination's tourism enterprises are argued to play a major role in achieving economic sustainability, while awareness should be raised for environmental and sociocultural consequences. These enterprises include accommodating enterprises and intermediaries such as tour operators, but also other enterprises involved in the tourism supply chain, such as transport, food and leisure activities.

Economic benefits for the destination caused by local tourism enterprises are primarily increased employment, increased job security and increased wages, and procurement of local products and services. Meantime, enterprises need to be aware of their impact on the destination's environment, culture and society. For optimizing the economic benefits and managing the other impacts on the destination, strategies such as capacity building, empowerment, training and knowledge dissemination can be used.

5.2 ICT4D

ICT for Development (ICT4D) is "about how information and communication technologies can be used to help poor and marginalized people and communities make a difference to their lives" (Unwin, 2009 p. 1). Empowerment, development and poverty reduction frequently appear in agendas aimed for achieving these goals. Similar to tourism sustainability issues, ICT4D nowadays addresses development as a multidimensional concept, which goes beyond the scope of economics alone (Unwin, 2009).

From a more technological perspective, ICT4D addresses ICTs as solutions which need to be completely appropriate within the local context of LDCs, and not simply based on what is common practice in more developed countries, because this approach usually results in failure (Reijswoud, et al., 2008). Therefore ICT4D solutions may use common technologies which need to undergo fundamentally revising, or whole new designs.

The concept of the "digital divide" plays a major role in the expertise of ICT4D, which attempts to close this gap. The actual meaning of the digital divide has been topic of dispute for some years now, but in its broadest sense, it refers to a divide in access to or availability of telecommunications, internet, information or knowledge and the implications of this divide for unequal socioeconomic development opportunities (Dijk, 2001; Warschauer, 2003; Yates, et al., 2010; Kargbo, 2002; Unwin, 2009). From a

macroeconomic perspective, the concept of the digital divide signifies the value of information in markets. Improved information flows "... have an important part to play in extending and improving the operation of markets, and they can also improve governance, the delivery of services and education" (Unwin, 2009 p. 179).

5.2.1 ICT4D and local enterprises

On a microeconomic level, telecommunications, particularly the mobile telephone and the internet, have a major impact on enterprise productivity, efficiency, and performance. Market prices and availability of a product or service can be nearly immediately checked, without the need to travel, and products and services can be offered from remote locations to previously unreachable markets (Unwin, 2009).

5.3 ICT and tourism: eTourism

ICT acts as a major driver within the tourism industry. The concept of eTourism can be used to relate ICT to the tourism industry, and can be described as "... the digitization of all elements in the tourism supply chain" (Page, 2009 p. 12).

The many stakeholders and processes comprised by the tourism industry (see "5.1 Tourism") can be supported by eTourism solutions in order to manage their enterprise, provide and get timely information, handle transactions, share information and knowledge, etc. (Buhalis, 2003).

5.4 ICT4D and tourism

As illustrated above, much literature is available on pro-poor tourism, sustainable tourism, ICT4D and eTourism. Some notion has been made regarding possibilities for ICT4D supporting tourism SMEs and sustainable tourism (Nadkarni, 2008; Kotelnikov, 2007; Andam, 2003; Harris, 2009). A structured framework for developing and implementing an ICT solution on a destination level is however still lacking.

5.5 Problem statement

The problem statement used in this thesis is:

How can ICTs be leveraged to support sustainable tourism enterprises?

5.5.1 Sub questions

Four sub questions have been formulated to answer the main problem statement:

1. How can ICTs support tourism destination management?
2. How can these solutions support tourism sustainability?
3. How can the success rates in terms of sustainability be increased by monitoring and evaluation?
4. Can a framework for ICTs supporting sustainable tourism be derived, and if so, what are its features?

6 Method

The research underlying this thesis can be regarded as a combination of two: the research for deriving the framework, and validating the framework during a case study.

6.1 Framework

For deriving the framework and answering the main research question (“How can ICTs be leveraged to support sustainable tourism enterprises?”), a literature study has been conducted. Literature has been analysed from the domains of tourism management, sustainable tourism, eTourism, ICT and ICT4D. Based on the findings during the literature study, a framework has been designed, and validated in the case study (see next section).

6.2 Case study: Wayanad

In order to validate the framework, a case study has been conducted in Wayanad, Kerala (India). Stakeholders were identified beforehand in cooperation with InfoBridge foundation, ReTour foundation and RASTA, and interviewed using a SWOT-based semi-structured method for official interviews. Other sources of information have been included as well for a more thorough understanding of Wayanad’s situation. An overview is provided in the section below.

6.2.1 Sources of information

1. RASTA (Rural Agency for Social Technology Advancement):
 - a. Mrs. Omana, director;
 - b. Mr. Danesh Kumar, chief social technology advancement;
 - c. Mr. Vishnu, ICT department;
 - d. Mr. Chandren Seker, social worker;
 - e. Mrs. Bhagha Lakshmi, social worker;
 - f. Mr. Baburaj, general support;
 - g. Mr. Suresh, finance.
2. Mr. Pavitre, coordinator of Responsible Tourism Department Wayanad;
3. Sobi Devadasan:
 - a. owner of two Hotel Management Schools in Wayanad District;
 - b. owner of Vythiri Village resort;

- c. active member of WTO.
4. Muddy Boots outdoor adventure activities:
 - a. Mr. Roby , owner (and former ICT consultant);
 - b. Mr. M. (“Ram“) Ramachandran, coordinator.
5. Wayanad Wildlife Forest Department (ranger officer);
6. Mrs. Narayani, Kattunaikkan tribal village leader;
7. Mr Hari (Formerly Responsible Tourism Department, Formerly Wayanad DTPC, Currently Homestay owner);
8. Dinesh (Manager at Wayanad DTPC);
9. Manager of Marmalade Springs resort;
10. Sunny Mathews, board member of WETO (Wayanad Eco-Tourism Organization), and resort owner;
11. Mr. Vanchy, secretary of WTO, owner of Wynberg resort;
12. Floor manager of Kambalakkad Palace Hotel (SME);
13. Mr. Abdul, travel agency entrepreneur and planning a resort in Kambalakkad;
14. Miss Lisette van Engelen BA.;
15. Mr. Ruud Crul, InfoBridge Foundation;
16. Mr. Frans de Man, ReTour Foundation;
17. Own observation.

7 Tourism destination management systems

Tourism destination management systems are considered to play an increasingly important role in achieving and maintaining tourism sustainability (Page, 2009; Buhalis, 2003). The definition suggested by Buhalis (2000) is used in this thesis for a destination: "... a unique entity, with a political and legislative framework for tourism marketing and planning" (Buhalis, 2000 p. 98). In this section, first the concept of tourism destination management is explained, followed by the possible roles of ICTs in tourism destination management.

7.1 Tourism destination management

Tourism destination management can be regarded as a collection of multi-agent processes involving a wide range of stakeholders. It can apply many techniques, strategies and processes to shape the development and daily operation of tourism related activities.

Tourism destination management has no single clear definition or perspective. In tourism literature, destination management is often regarded as a collection of marketing and branding processes and strategies. Within the sustainable tourism field, destination management is perceived as a collection of applied methods to ensure the sustainability of a tourism destination. In both perspectives, a destination management organization can support cooperation between the various stakeholders.

This thesis' scope is restricted to a business-supporting perspective: how can local enterprises be supported by a DMS in achieving and maintaining tourism sustainability?

In the next sections, the destination management's stakeholders, context and key processes (marketing, booking, rating, and learning) will be discussed.

7.1.1 Stakeholders

The stakeholders within a tourism destination typically are considered to be (adapted from Buhalis (2000)):

- Host population;
- Tourism enterprises;
- Tour operators;
- Public sector and government;

- Destination management organizations;
- Tourists.

It can be argued that more stakeholders are (indirectly) involved, such as the support industries (infrastructure, telecommunications, hospitals, legislation, regulations, security, and police) and the supply industries (agriculture, food, clothing, manufacturing, souvenirs, services, energy, computers, real estate, and retailing). Besides tour operators, other intermediaries such as outbound travel agencies exist (Buhalis, 2003). Within the tourism sustainability movement, NGOs play a very important role as well (Mowforth, et al., 2009).

The tourism enterprises and destination management organizations (DMOs) are discussed in more detail in sections 7.1.1.1 and 7.1.1.2 below.

7.1.1.1 Tourism enterprises

In this thesis, a tourism enterprise is regarded as an enterprise producing a tourism product, i.e. accommodation, an activity (safari tour, guiding), etc..

The tourism industry is still dominated by the small business sector. These SMTEs are in many countries regarded as playing or expected to play a key role in economic development. Entrepreneurship in this sector seems however only weakly developed, because of its perceived low entry barriers. They suffer from a short-term planning horizon, limited knowledge, skills and resources, and as such often lack adequate ongoing business planning and marketing processes (Page, 2009)¹.

Especially these SMTEs are likely to benefit from support on destination level, in order to reach their market and make a sustainable profit. It can be argued however, that not only these SMTEs, but all stakeholders (including tourism enterprises of all sizes) should be included in the destination's management scope in order to achieve and maintain sustainability (Buhalis, 2000), and to prevent unequal distribution of power and benefits (Mowforth, et al., 2009). Furthermore, studies have illustrated the ambiguity of unequal resource distribution for collective action regarding natural resources, showing that more resourceful stakeholders are more willing to provide the methods necessary to keep the natural resources sustainable (Ruttan, 2008); this is another reason for including tourism enterprises of all sizes.

¹ In this thesis the term SMTE is used in the cases where the difference with large tourism enterprises is relevant due to the SMTE's special features as described in this section.

7.1.1.2 Destination management organizations

Due to the complex nature of tourism destination management, many destinations have created a destination management organization (DMO) to bear the destination's management leadership. The DMO has several areas of activity and in summary its roles, "in the broadest sense of terms, are: to work towards enhancing the well-being of destination residents; to do everything necessary to help ensure that visitors are offered visitation experiences that are at a minimum, highly satisfactory, and where possible, highly memorable; and while doing so, to ensure the provision of effective destination management and stewardship" (Bornhorst, et al., 2010 p. 573).

Within their destination management function, the DMO has the role (among others) to support and collaborate with the local enterprises. This role can be assumed implicitly or explicitly by the DMO; a number of services can be provided in this role – which are topic of section 7.2.

While the DMO often plays a key role within the destination's management, its inner workings on a concrete level go beyond the scope of this thesis. Only the DMO activities and features relevant to this thesis are discussed.

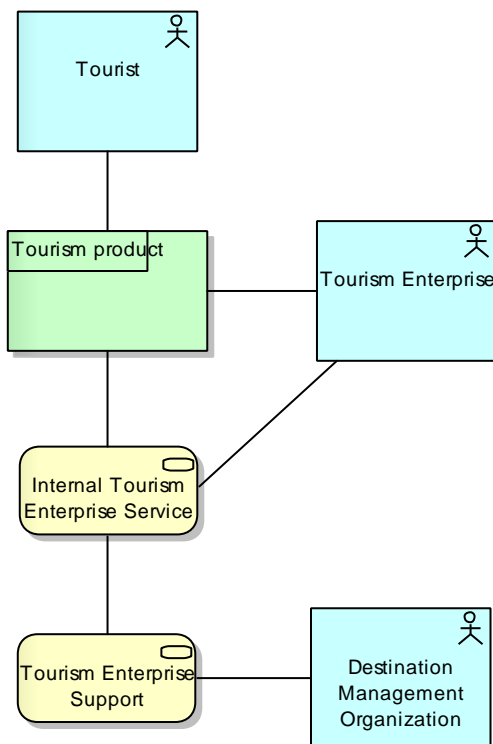


Figure 2 The Destination Management Organization supporting the Tourism Enterprise

7.1.2 Context, policies and strategies

The contexts of the tourism industry and sustainable tourism are very broad, comprising economic, social, technological, human, cultural, environmental, legal, political, governmental factors as well as international relationship trends, security, infrastructure and knowledge availability (Buhalis, 2000; Buhalis, 2003; Mowforth, et al., 2009). While all factors should be taken into account, aligning the tourism destination management processes with the tourism development strategies and policies should be a good start – assumed these are adequately designed.

7.2 Internal tourism enterprise key processes

Several internal key processes can be distinguished within the tourism enterprise which can be supported by a destination management organization, including marketing, booking, rating and learning (see Figure 3 below). Each of the internal tourism enterprise key processes may be present (implicitly) in the enterprise, or not (yet), depending on the maturity, scale, and management style and decisions.

The processes and their possible support at DMO level are discussed in the next subsections, each also including an exemplary model of the tourism enterprise's processes' inner behaviour.

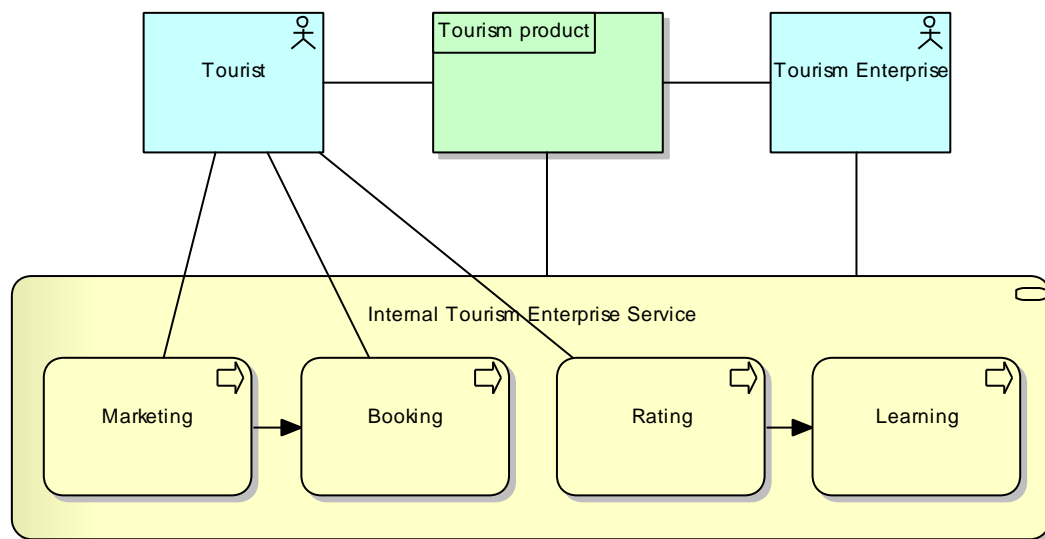


Figure 3 Internal tourism enterprise key processes

7.2.1 Marketing

However all tourism enterprises engage in marketing efforts of some sort, many SMTEs lack the knowledge or resources to market their services and/or products appropriately. Destination management can provide the enterprises with collective methods for marketing, on top of their own marketing, further boosting their profits by reaching a larger market and applying more professional marketing methods.

Marketing is also argued to be an important tool for tourism sustainability, although it does appear very infrequently in literature (Buhalis, 2000). Like planning, marketing and coordination, marketing the destination is traditionally undertaken by the public sector or by partnerships of local tourism industry stakeholders (Buhalis, 2003), and can be used to facilitate the achievement of the destination's tourism policy. As such it plays a key role in keeping the destination sustainable and competitive on the long term, and may even sometimes apply discouraging marketing strategies to achieve these goals (Buhalis, 2000).

The tourist destination can be described using the Six As framework of Attractions, Accessibility, Amenities, Available packages, Activities, and Ancillary services (see Table 2 below), which also provides a list of all the destination's assets to be included in the marketing. All assets need to be included in this marketing in order to provide a complete image of the destination to the targeted customer. Improved marketing is likely to lead to increased bookings, which are discussed in the next subsection.

Attractions	Natural, man-made, artificial, purpose built, heritage, special events
Accessibility	Entire transportation system comprising of routes, terminals and vehicles
Amenities	Accommodation and catering facilities, retailing, other tourist services
Available packages	Pre-arranged packages by intermediaries and principals
Activities	All activities available at the destination and what consumers will do during their visit
Ancillary services	Services used by tourists such as banks, telecommunications, post, newsagents, hospitals, etc.

Table 2 Six As framework for the analysis of tourism destinations (adapted from Buhalis, 2000)

The marketing processes need the tourist satisfaction levels to be closely monitored, and use these as the criteria for success (Buhalis, 2000), among the other sustainability criteria. As such, marketing is a continuous process of learning and adaptation.

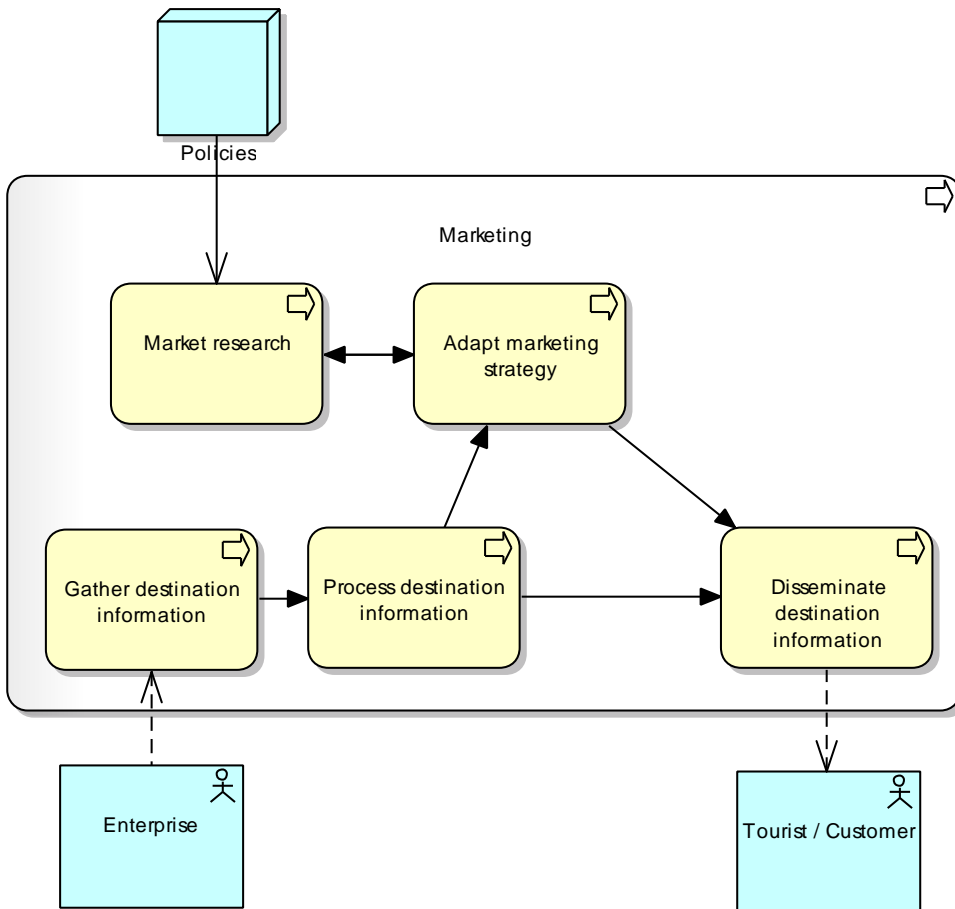


Figure 4 The destination marketing process (exemplary model)

7.2.2 Booking

A smooth booking process lowers the tourist's barriers in order to actually become the tourism enterprise's customer and is therefore essential to increasing performance at both the tourism enterprise level and destination level.

The possible complexity and workload of the booking process can be simplified and eased by collective action through providing booking services at a destination level. This enables enterprises to be easily booked by international customers and reduce the risks of both the enterprise and the customer by providing trusted payment methods.

The booking process can be divided into two: reservation and payment. A successful booking results in a specific resource (an accommodation or tour guide for example) being exclusively reserved to a client on the agreed period of time and place. An upfront payment can be required prior to confirming the

reservation, as insurance for the enterprise the consumer will show up, or to at least cover the costs made by the enterprise for blocking the resource. Transferring the upfront payment may be difficult for customers, even more if they come from abroad, or have limited access to banking.

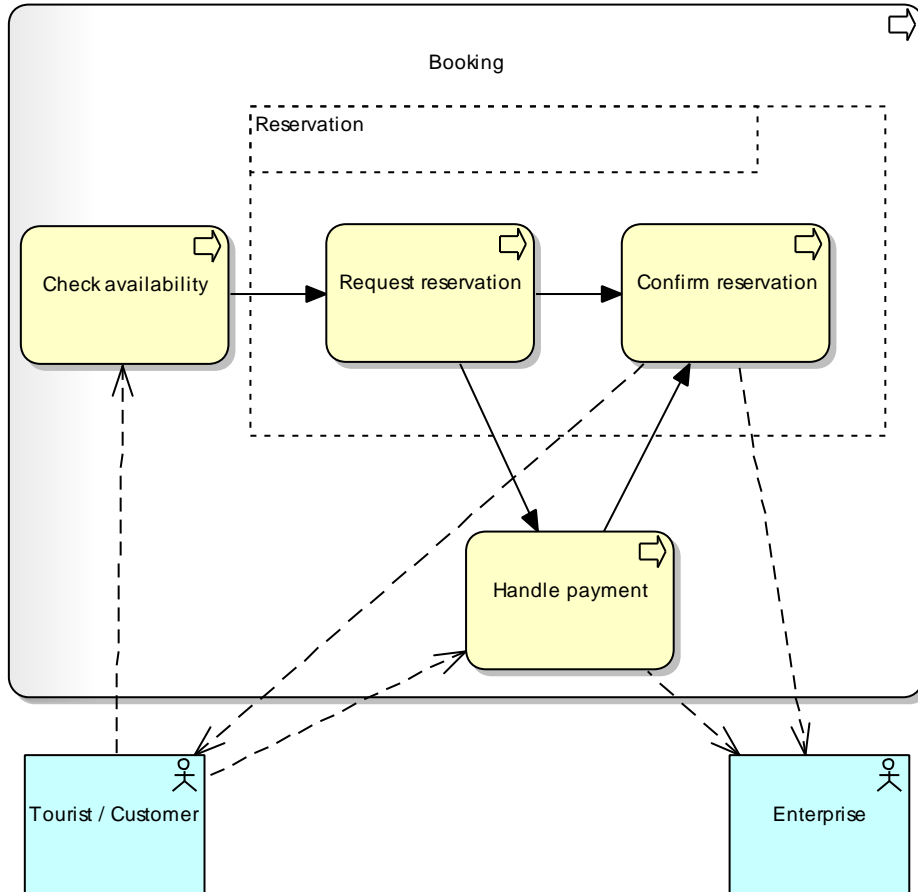


Figure 5 The booking process (exemplary model)

Several factors may affect the booking process, including:

- **Trust** in the booking methods and the party dealing with (from both sides);
- **Distance**: international bookings may suffer some time differences and communication issues; booking at location (face to face) is probably the least complex method;
- **Payment method** (usability, trust, availability of the method to both parties);
- **Information availability**:
 - o Enterprise: the ease of keeping the information on resource availability up to date and accurate;
 - o Customer: the ease of obtaining the correct information.

- **Communication:**
 - o Language;
 - o Channel.
- **Usability** of the methods;
- **Intermediaries** may simplify or harden the booking processes.

Improved booking leads to higher revenues and lower financial risks for both tourist and accommodation, both resulting in improved economic sustainability on both enterprise and destination level.

7.2.3 Rating (tourist feedback)

Providing the enterprises with tourist feedback mechanisms, enable the enterprises to improve their service levels and sustainability, which in turn results in improved destination sustainability.

Feedback mechanisms can be applied to monitor customer satisfaction, as well as for monitoring sets of sustainability indicators. These can be used to improve service level and sustainability, which in turn are likely to lead to increased economic, environmental and sociocultural sustainability on the destination level. When a measurement base has been established, monitoring and evaluation on destination level becomes possible, even comparing performance across destinations.

This requires a standardized set of indicators, and thus a standardized survey. For measuring tourism sustainability, several sets of indicators are known (Schianetz, et al., 2008; Reddy, 2008; Ko, 2005; Choi, et al., 2006), however none seems to be standardized for use with tourists, services and enterprises.

Other difficulties in this process are the customer's willingness to provide feedback and its accuracy, and the way it is processed (corruption, errors, anonymity of the feedback provider, and the enterprise's reputation).

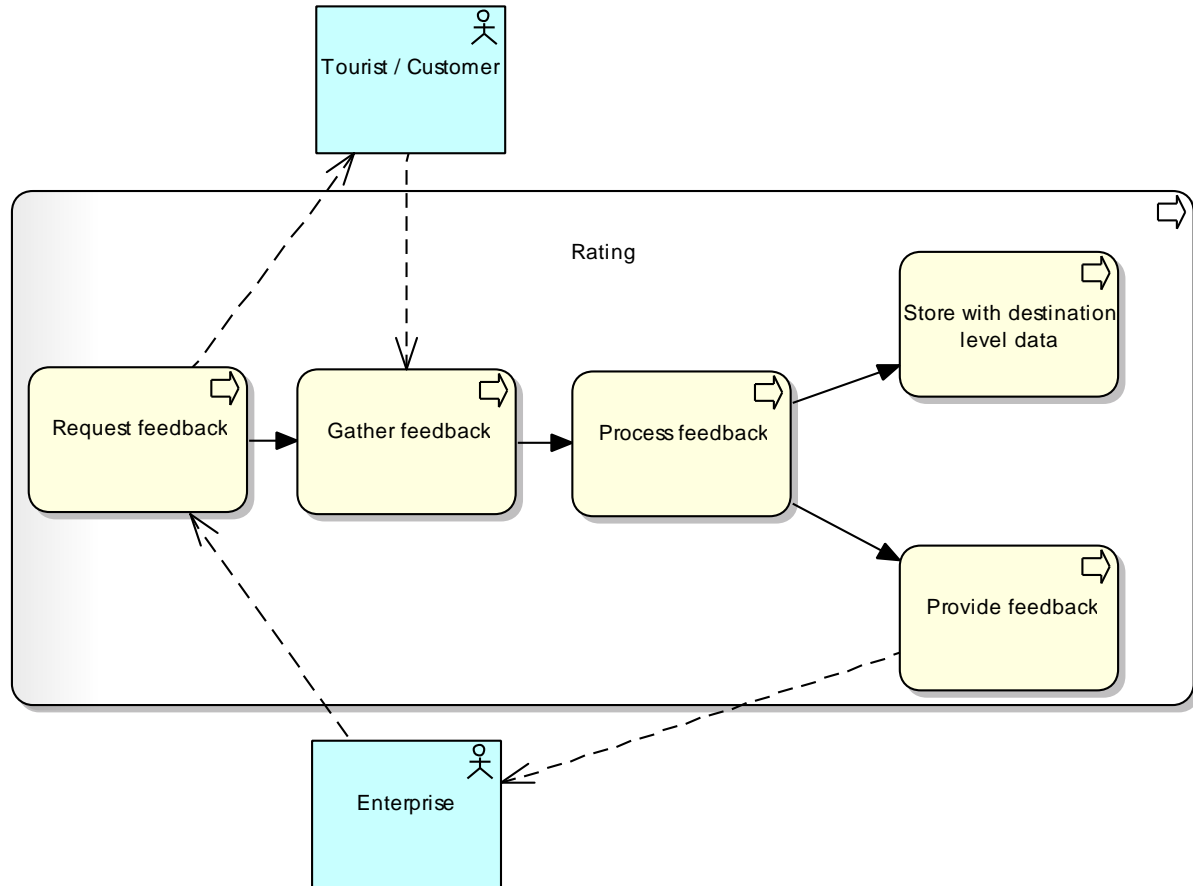


Figure 6 The rating process (exemplary model)

7.2.4 Learning

Learning is key to surviving and growing in competitive environments, for both tourism enterprises and destination management organizations. To improve collaboration and to foster the sharing of knowledge are therefore two of the top priorities of destination management, as many lessons can be learnt by all stakeholders within the destination. Sharing these lessons and other relevant information is essential to improving the destination's sustainability. In order to achieve sustainability on a destination level, all enterprises for example need to be educated on the environmental impacts of their performance, the importance of sustainability for their future, and practical methods for achieving this sustainability. Other important knowledge for the enterprises includes government regulations and support by NGO's, the public sector, and tourism organisations.

The results from the rating process (see section 7.2.3 above) can also be used for learning, as well as the results from the monitoring and evaluation processes (see section 9 "Monitoring and evaluation" below).

Specific attention should be given to creating the feedback loops leading to two-way communication, as many networks run the risk to become a tool for one-way communication for actors assuming a “teacher’s” role. This results in under-used knowledge utilisation opportunities, as the actors do not really cooperate, and the receptivity of the teacher actor is low (Halme, 2001).

This learning process, or “educational element” as referred to by Mowforth & Munt (2009 p. 106), can lead to widening the inequalities of tourism development, if it leads to enhancing control or benefits for only a part of the stakeholders (Mowforth, et al., 2009). The information in the learning process should thus be equally accessible to all stakeholders, as well as the possibility to provide the input.

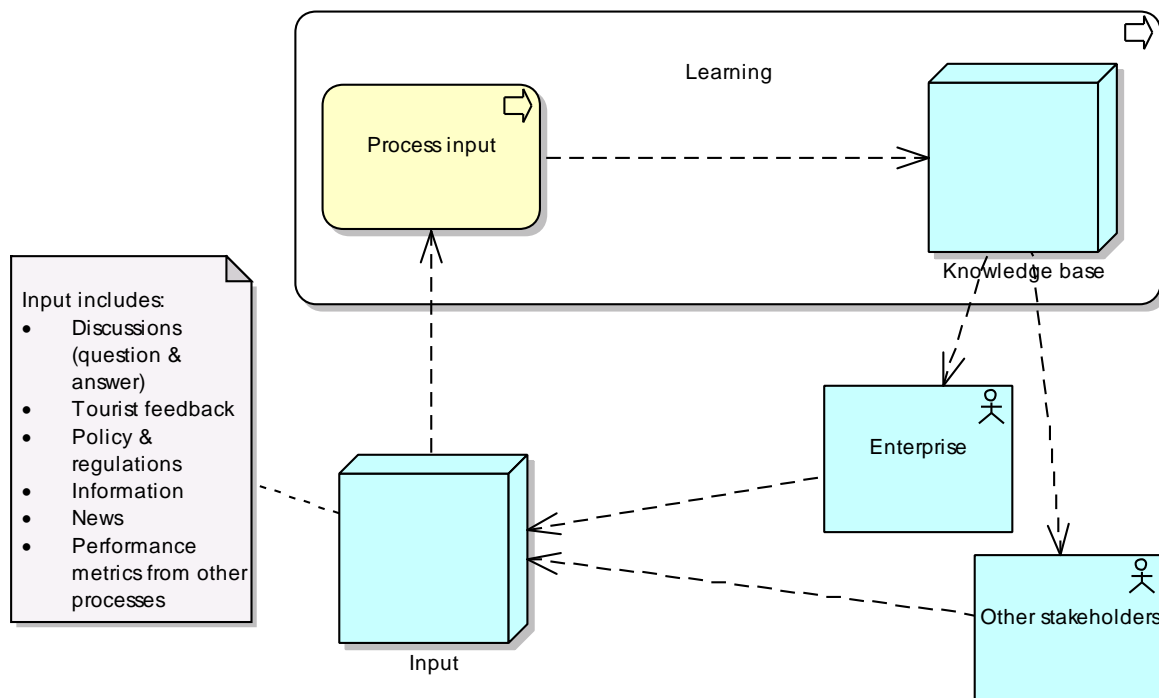


Figure 7 The learning process (exemplary model)

7.3 Destination management’s supporting processes

As described, the internal tourism enterprise processes can be supported by services² provided by the destination management organization; the processes can even be fully outsourced to the DMO (i.e. the DMO takes care completely of the tourism enterprise’s marketing and booking processes). A representation is provided in Figure 8 below.

² The inner behaviour of the support services can take many shapes and have therefore been left abstract on purpose.

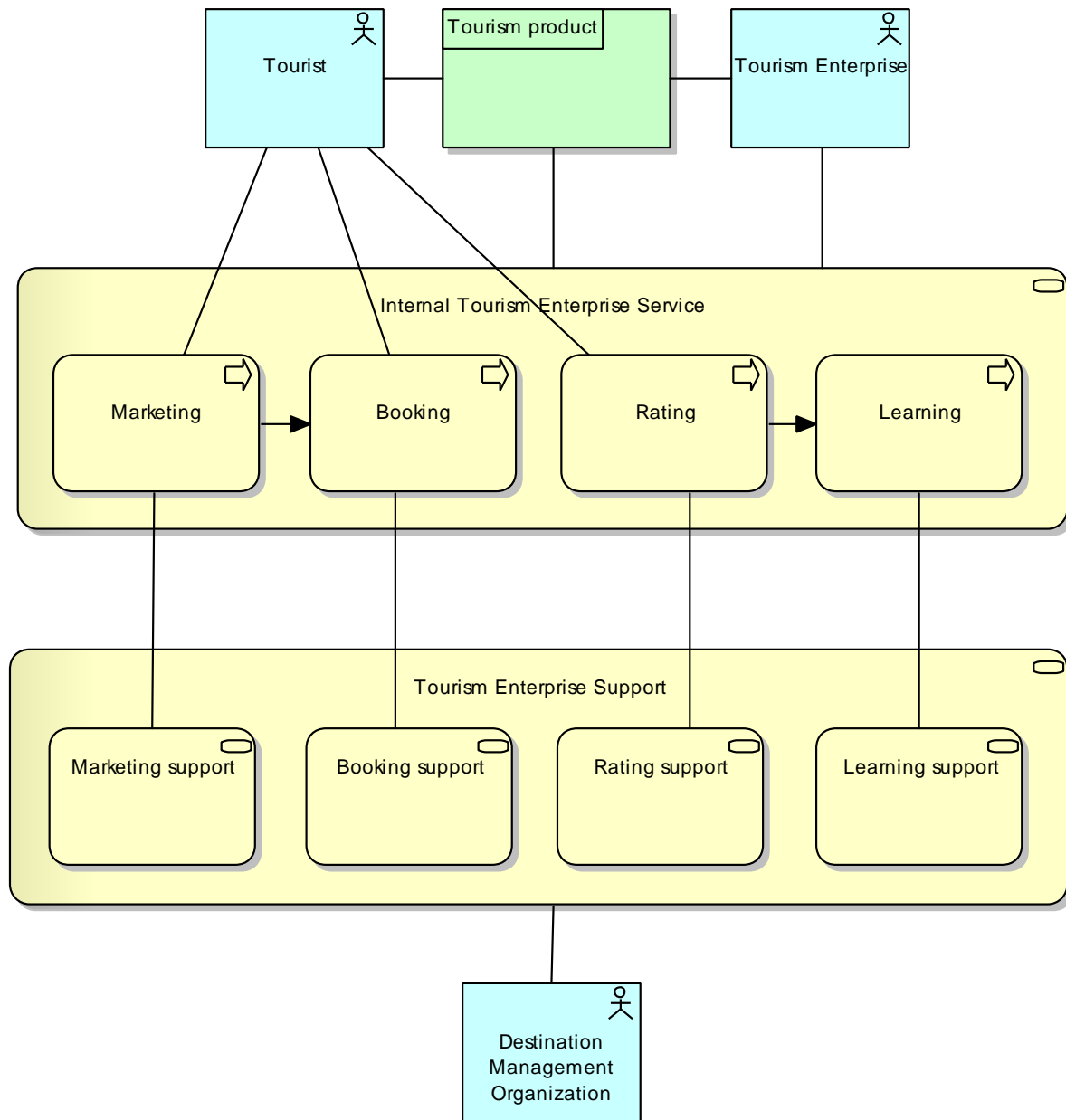


Figure 8 Tourism enterprise support by the DMO

8 ICT and tourism destination management

The application of information and communication technologies (ICTs) in the tourism industry can aid in improving its social and economic impacts, both in developing and developed countries (Minghetti, et al., 2009). ICTs can be used to support tourism destination management processes such as the marketing, booking, rating and learning support services described above. An ICT system designed for this task is called a destination management system (DMS).

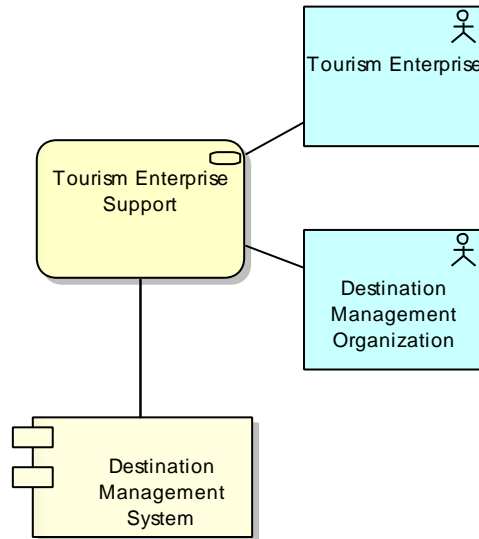


Figure 9 The DMS supporting Destination Management

This chapter discusses the possible features of a destination management system for tourism sustainability from an enterprise perspective. Literature exists on the different dimensions of tourism sustainability (Mowforth, et al., 2009), the roles of a DMS in the tourism industry and in tourism sustainability (Buhalis, 2003; Egger, et al., 2008; Page, 2009). However, no framework description for a DMS supporting enterprises and sustainable tourism has been encountered. This thesis aims to provide the first steps towards such a framework, and presumes the DMS is managed by the DMO.

8.1 Context

The DMS' context is similar to the tourism industry it supports. However, for implementations in LDCs, special attention should be paid to the field of ICT4D and Appropriate Technology, providing some guidance on implementing ICT in LDCs.

According to the concept of Appropriate Technology (AT), technology should be adapted to local contexts in order to be successful. AT is technology that is suitable for the environmental, cultural and economic conditions in which it is intended to be used. AT is embraced by fields like architecture, building technology and agriculture but has not yet rooted in the area of ICT, however Reijswoud et al. (2008) have proposed an adapted set of principles for ICT4D solutions (see Table 3 below).

Benefits:

- The technology must result into economic and/or social progress.
- The technology must contribute to the increase of productivity.
- Technologies may be relatively labor-intensive, but must have a higher output than the traditional technologies.
- The technology should not have a negative impact on the environment.

Flexibility:

- The technological solutions must be flexible and easily to be adapted to changing circumstances.

Knowledge and awareness:

- The technology must be understandable for people without specific or academic training.
- Small rural communities should be able to produce and maintain the technology.³
- The technology must be fully understandable for the local population, the end-users, resulting into possibilities for them to become involved in the possible innovation and extension of the use of the technology.

Resources and implementation:

- It should be possible to implement/ realize technological solutions with limited financial resources.
- The use of available resources must be emphasized to reduce the costs and to guarantee the supply of resources e.g., for maintenance.

Table 3 Appropriate Technology principles for ICT4D (adapted from Reijswoud et al. (2008))

8.2 Key components of a destination management system

The internal tourism enterprise key processes within tourism destination management (as discussed in section 7.2 above) can be supported by a DMS, using the four eComponents:

1. **eMarketing:** using the DMS for expanding the online exposure of the destination and targeting specific markets;
2. **eBooking:** using the DMS for online reservation and payment of an accommodation or service;

³ This AT principle may be considered irrelevant in this case, if the core of the solution can be developed and provided by an outside agency, and collective resources are sufficient to maintain the solution.

3. **eRating:** using the DMS for online user feedback, in order to improve tourism sustainability and service level;
4. **eLearning:** using the DMS as a collaborative medium to share knowledge among stakeholders.

These four eComponents are each discussed in more detail in the next section.

8.3 The four eComponents

This chapter discusses the four eComponents (eMarketing, eBooking, eRating and eLearning) as introduced in the previous chapter.

ICTs have been applied in the tourism industry for some decades, and the enterprises' competitiveness has been proven to strongly correlate to its ICT usage. While the large tourism enterprises often have ICTs implemented in their business processes, SMTEs still appear to be reluctant to adopt ICT and to be unaware of its possibilities (Buhalis, 2003; Egger, et al., 2008).

Especially in LDCs, SMTEs often do not have access to ICTs (Minghetti, et al., 2009), and many ICT solutions are not tailored to the local needs (Reijswoud, et al., 2008). While infrastructure is developing and access to the internet is increasing, many people are still excluded from its possibilities (Unwin, 2009). When implementing the eComponents described below, the principles of AT (see Table 3 above) should therefore be adhered to at all time. In many cases, an appropriate solution may involve additional mobile solutions, for mobile telephony has become an ICT4D option in many LDCs, and the use of telecenters, which provide last-mile connectivity to the digitally excluded, combined with training and assistance (Unwin, 2009; Heeks, 2008).

8.3.1 eMarketing

The major opportunity for ICT supporting marketing processes lies with providing easy online exposure on the internet. SMTEs, especially in LDCs, typically lack the resources and skills to develop and maintain their own website; however their online presence is rapidly increasing (Karanasios, et al., 2006). Independent of the enterprises' size, they can all benefit from an online presence organized on a destination level.

By providing a centralized online place to market the destination and its enterprises, a large number of potential customers can be reached and through centrally aggregating and presenting the destination

information (using the Six As framework, see Table 2 above), more coherent destination branding and improved search engine rankings become within reach for each participating enterprise.

An online destination portal can be used to gather, organize and disseminate the destination information (Egger, et al., 2008). Depending on the targeted market, this portal's user interface design needs to be adapted to cultural and lingual differences for optimal visitor experience (Singh, et al., 2006).

8.3.1.1 ICT for gathering, processing and disseminating destination information

Storing the destination information in an online information system enables easy gathering, processing and disseminating the information.

The gathering process can be eased by empowering the SMTEs with access to the information system for managing their own information (such as contact details and pricing). This information then can be used for marketing the destination. This also eases the information processing, resulting in lower overhead cost: tasks such as validation and keeping the information up-to-date become the SMTE's responsibility.

If correctly implemented, the information system can support processing the large datasets containing the destination's information, by for example structuring and indexing the data. This can in turn be used for disseminating the information to potential markets.

The most obvious option for this information dissemination nowadays is to use a large destination website, providing low-cost options for online exposure, worldwide, 24/7 (Buhalis, 2003). In addition, the emerge of social media and the so-called Web 2.0 features enable even more low-cost options for marketing the destination and its SMTEs.

8.3.1.2 Market research and marketing strategies

Marketing through a website also enables the automated collection of online visitor statistics, and low-cost survey tools can be applied, which both can contribute to researching the market and formulating marketing strategies (Buhalis, 2003).

If the website's and its information system are flexible enough, adapting them to changing marketing strategies should cost only little effort.

8.3.2 eBooking

SMTEs, especially in LDCs, are often unable to offer booking in advance (Ashley, et al., 2001). ICTs can provide methods for communication between the tourist and enterprise (email has proved to be an

effective enabler (Harris, 2009)), and methods for managing the enterprise's resources and reservations (Buhalis, 2003). Furthermore, possibilities such as eBanking (online banking) and mBanking (mobile banking) can be leveraged to enable banking for SMTEs (Donner, et al., 2008), providing their customers with the option to book in advance, while decreasing the SMTEs' risks (see also section 7.2.2 Booking above).

8.3.3 eRating

Providing the destination's SMTEs with automated feedback mechanisms can support improving service levels, and achieving and maintaining sustainability. To request feedback from the customer, an email (and a reminder) can be sent automatically some time after his/her departure, inviting the customer to participate in an online survey. Capturing this feedback digitally enables automated processing of the results, making it available at destination level and to the enterprise, which can access these results online or receive them by email or even by SMS.

8.3.4 eLearning

Training in the hospitality sector is imperative for the tourism industry's development, and learning through ICTs can be used to improve "inventory management, strengthen marketing and communication strategies and develop their internal business processes" (Collins, et al., 2003 p. 483). As discussed in section 7.2.4 above, learning can also contribute to the destination's sustainability.

Providing eLearning possibilities to SMTEs enable them to benefit from training at reduced cost (Collins, et al., 2003). At a destination level these costs can be even further reduced if training resources are centrally collected and provided, which are often made (almost) freely available from the public sector and NGOs. Additional input can be gathered from the eMarketing, eBooking and eRating components automatically and used in the eLearning component as well. In order to monitor and evaluate the performance of all four eComponents and the tourism enterprise support processes, this can also be applied to the eLearning component (see chapter 9 below).

The knowledge base can be managed by special privileged users (i.e. "administrators"), or a community based approach can be taken, empowering all users to modify and manage content as they see fit (this approach can for example be resembled in the use of Wikipedia.com (Jahnke, 2010)). The latter approach decreases overhead costs and the likelihood of inequalities, while increasing user involvement.

Accessing and using the online knowledge base may be impaired due to inappropriate infrastructure and technology, lack of skills, awareness problems and sociocultural issues. All these barriers should be overcome in order to stimulate people to participate in eLearning (Collins, et al., 2003). Many of these obstacles may be overcome with help of the telecenters, which provide the combination of internet access with training and assistance.

8.3.5 The four eComponents combined

The four eComponents can be used by the destination management organization to support the tourism enterprises in enhancing their sustainability (see Figure 10 below). The eComponents can be interconnected or implemented separately as seen fit, and even can be provided as separate services in a SOA (Service Oriented Architecture). This enables integration of the eComponents in existing eTourism systems and websites as well – exploring the possibilities of this approach to its full extent goes beyond the scope of this thesis.

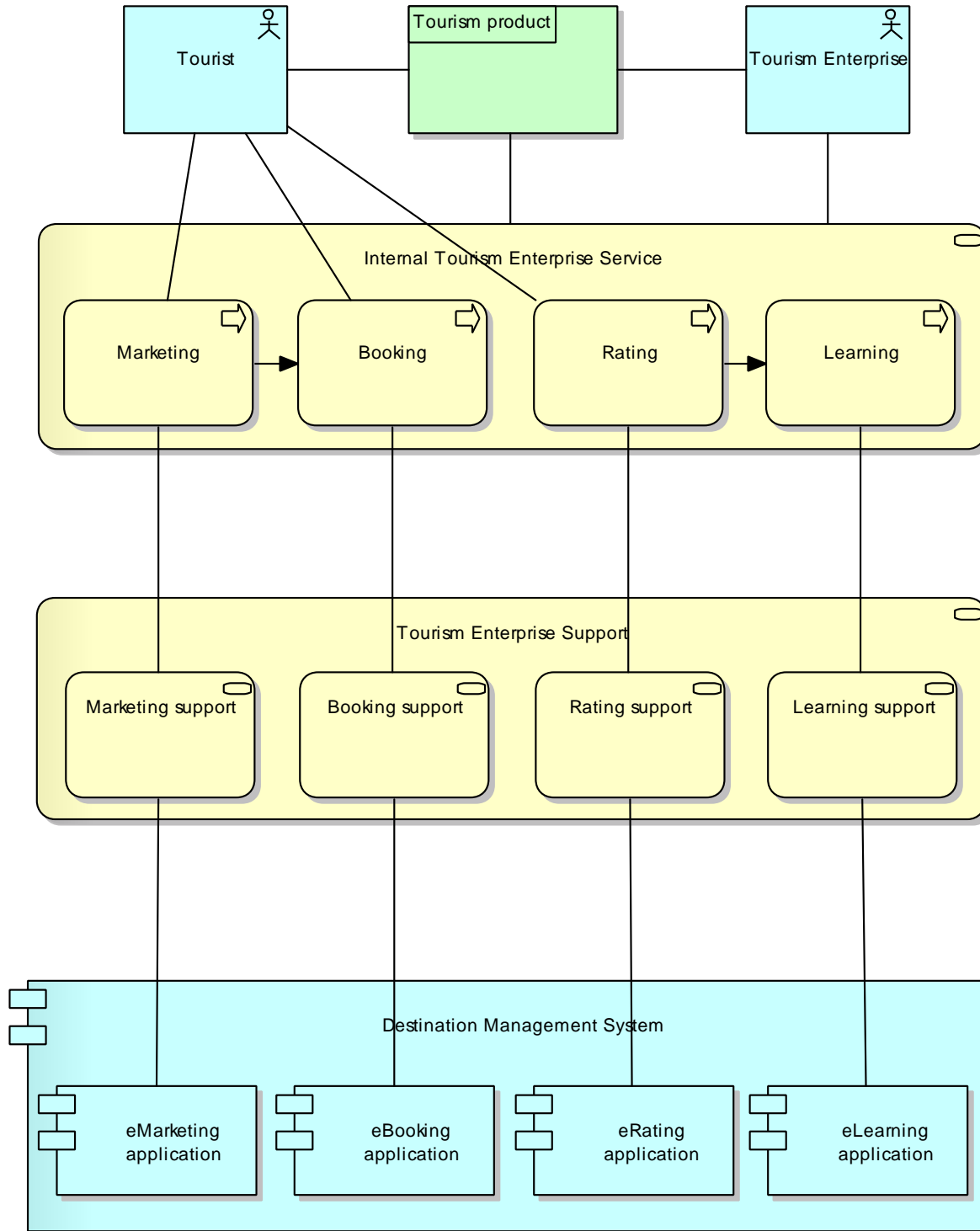


Figure 10 The tourism enterprise supported by the DMO and its DMS' components.

9 Monitoring and evaluation

In order to safeguard their performance and impact, monitoring and evaluation of the four eComponents and the tourism enterprise support services provided by the DMO is necessary. Additionally, researchers from the fields of sustainable tourism (Schianetz, et al., 2008; Reddy, 2008; Ko, 2005; Choi, et al., 2006) and ICT4D (McNamara, 2003; Batchelor, et al., 2005; Heeks, 2002; Wagner, et al., 2005) have expressed the need for collecting more data for analysis. As InfoDev's manual for project monitoring (Batchelor, et al., 2005) illustrates, both targets can be simultaneously achieved: gathering data for research, while monitoring and safeguarding the project's progress.

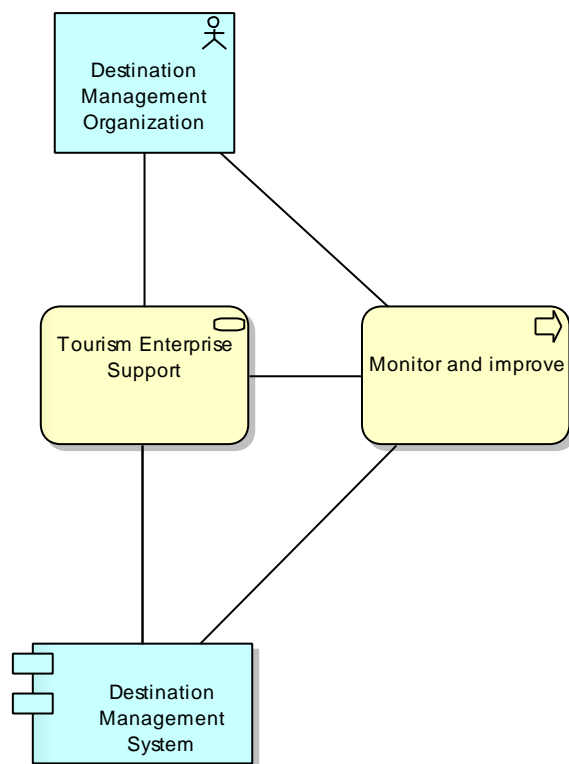


Figure 11 The monitor and improve process

However it contributes to the likelihood of the project's success, designing and implementing monitoring and evaluation processes often is very complex, confrontational and resource expensive from an organizational perspective, and is therefore often skipped or simply neglected (Heeks, 2008). Making the destination's performance and the stakeholders' impacts transparently visible may add to improving the destination's sustainability. It therefore can be argued that monitoring and evaluation methods should be integrated from the project's start.

Methods for monitoring and evaluation are known in the fields of eTourism (Buhalis, 2003; Egger, et al., 2008), sustainable tourism (Schianetz, et al., 2008; Reddy, 2008; Ko, 2005; Choi, et al., 2006; Mowforth, et al., 2009) and ICT4D (McNamara, 2003; Batchelor, et al., 2005; Wagner, et al., 2005; Hudson, 2001), aimed for impact assessment and/or facilitating decision-making. However, methods for monitoring and evaluation of projects combining the fields of eTourism, sustainable tourism and ICT4D have not been encountered. The development of a detailed framework covering these aspects goes beyond the scope of this thesis. Nevertheless, some suggestions for monitoring possibilities for each of the four eComponents are provided in the sections 9.1 (eMarketing), 9.2 (eBooking), 9.3 (eRating) and 9.4 (eLearning) below.

Some general remarks can be made as well. It is considered best practices in project management to formulate an aligned mission, vision and strategy, and choose SMART indicators (Specific, Measurable, Actionable, Relevant, Time-bound) to steer and track the progress regarding the project's goals (Earl, et al., 2001). These measurements enable the visualization of the project's impact and progress. If implemented correctly, collecting and processing the measurement data can often be automated or supported by ICTs (The Stationary Office, 2007). This would likely result in an additional dedicated eComponent for monitoring the DMS (the "eMonitor"), as illustrated in Figure 12 below⁴. The monitored results can be used to improve the tourism enterprise support processes and the DMS, including the eMonitor.

⁴ In fact, this eMonitor would then arguably be part of the DMS. For clarity reasons it has been separated from the DMS in this illustration.

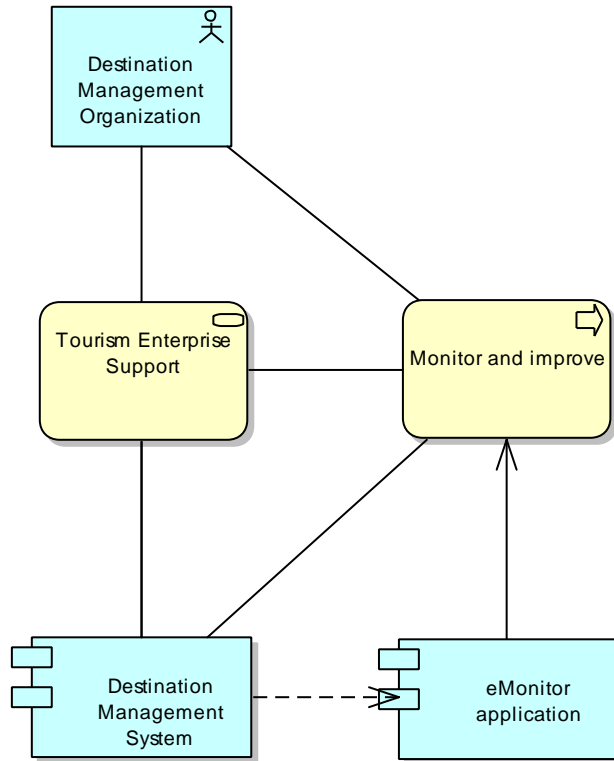


Figure 12 A dedicated eMonitor component

9.1 Monitoring eMarketing

The eMarketing component can be monitored by gathering online visitor statistics, or by using online polls and surveys. If a website is used in the eMarketing process, online visitor statistics can be automatically gathered, and surveys and polls can be managed, using pre-packaged tools. These tools are available at little or no cost.

If a service oriented architecture (SOA) is used, the manner in which the eMarketing component is applied in other systems and to what intermediaries these systems belong, can also be determined.

9.1.1 Online visitor statistics

The following statistics can be gathered and used for monitoring eMarketing performance:

- **Click through rate:** to determine the success of an online advertising campaign by measuring the number of clicks on an ad compared to the number of times the ad has been displayed;
- **Conversion rate:** to measure the number of eMarketing process visitors continuing to the eBooking process;

- **Visitor and system information:** to determine the visitors' nationalities and languages, internet usage (connection type / bandwidth), used browser types and operating systems. These statistics can be used for determining market targeting performance and steer market research, and optimizing the technology used for the eMarketing process for working with the visitors' systems.

9.1.2 Online polls and surveys

Online polls typically are used for quickly determining the opinion of visitors on a specific statement. Online surveys can be used for more thorough analysis of the eMarketing visitors' demographics, opinions and thoughts.

9.2 Monitoring eBooking

The booking process consists of a reservation process and payment process. From both digitized processes statistics can be gathered. The eBooking process handles private data as well as sensitive enterprise data, and as such must be anonymized accordingly.

9.2.1 Reservation statistics

The reservation statistics may include the number of reservations made, the reservation method, the reservation's duration and period, the number of visitors (total and per reservation), and demographic information of the visitor, such as nationality; the travel path (country entry point), the duration of stay and the purpose of stay can be determined as well.

Keeping track of customers showing up after reservation also adds to monitoring the reservation process' performance, but it should be noted that this requires an additional feedback loop for the enterprise, which has to notify the monitoring system.

It may also be of interest to monitor the sources of the reservations made (i.e. are the reservations made directly by the customer, by an intermediary, or if a SOA-like architecture is used, via another system?).

9.2.2 Payment statistics

The payment statistics may include the number of payments made, the payment method and sum, the success rate of payments, the timeliness of payments made, and the receiving enterprise type.

9.3 Monitoring eRating

The eRating process itself is intended to enable specific monitoring of the destination's and its enterprises' sustainability and service level. Additional statistics can be gathered regarding the response rate, and the rating's source, in order to improve the eRating process itself. The eRating process handles private data as well as sensitive enterprise data, and as such must be anonymized accordingly.

If a SOA is used, it may be of interest to monitor in what other systems the eRating service is used, and to what intermediaries these systems belong.

9.4 Monitoring eLearning

The eLearning process incorporates the monitoring statistics of the other eComponents into its knowledge base. The eLearning process can be monitored by measuring user activity (i.e. number of user logins, the number of knowledge base visits and the number of inputs provided by users).

9.5 Monitoring and improving the four eComponents

The input gathered for monitoring can be used to improve the eComponents, and the actual tourism enterprise support services. Improving these services is likely to result in improved tourism enterprise sustainability. The input gathered for monitoring of one eComponent, is not restricted to be used for improving that eComponent only, but can be used across multiple eComponents and the tourism enterprise support services (see Figure 13 below). For example, based on statistics from the eBooking component, it may become apparent that the communication between the eMarketing and the eBooking components should be improved.

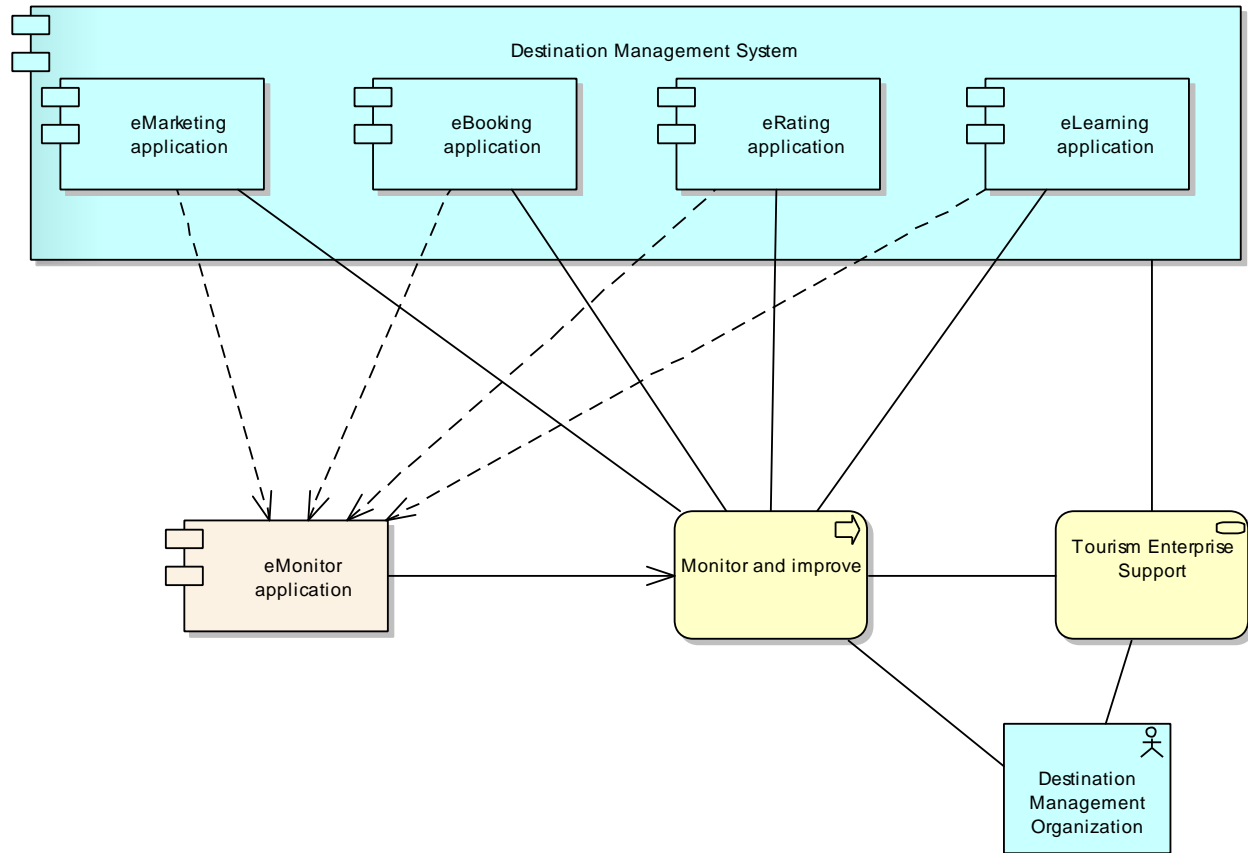


Figure 13 Monitoring and improving the four eComponents

10 Framework

Based on the findings discussed in the chapters above, a framework can be proposed for the support of tourism enterprises by using ICTs, while achieving and strengthening their sustainable practices, which in turn result in enhanced destination sustainability. Figure 14 below displays a visualized representation of the framework. The framework's elements are discussed below, followed by a section presenting some guidelines on how to apply the framework.

10.1 Policies, strategies, contextual requirements, and stakeholders

The context influences the destination's performance, including sustainability, and affects the destination's management and DMS solution possibilities (see section 7.1.2). Therefore, meeting the (additional) requirements presented by the context is imperative to a successful DMS implementation. Especially in LDCs, attention should be paid to the appropriateness during the ICTs' design, development and implementation phase. The AT principles presented in Table 2 provide guidelines for these phases (see section 8.1).

A DMS should be aligned with the policies and strategies regarding sustainable development and sustainable tourism as well, as they provide more concrete guidelines on how to achieve tourism sustainability at a destination level (see section 7.1.2). Not adhering to these guidelines may result in inhibiting other development processes.⁵

All stakeholders should be included in the destination management processes to foster sustainability through collaboration and to maximize impact (see section 7.1.1). This framework is focused on tourism enterprise support; therefore a) all tourism enterprises and the destination management organization should be included, and b) the framework's scope is limited to the tourism enterprises and the DMO.

10.2 Framework model

The destination's performance and sustainability heavily depend on destination management, in which the four support processes (marketing, booking, rating and learning) presented in this thesis are assumed to play a key role on tourism enterprise level. As the destination management system is

⁵ However the policies, strategies and contextual requirements do not continuously influence the framework's elements (in other words: they are not required by the framework's elements), they play an important part and should not be neglected. They are therefore included in the framework using an ArchiMate representation element.

intended to support primarily these key processes, they need to be identified and studied (i.e. performance, impact on sustainability, and their relation with the context, policies, strategies and stakeholders) first, before determining the possibilities of enterprise support by ICTs, and to what extent. A more detailed description of each key process can be found in section 7.2.

A destination management system's main task is to support the destination management processes (see section 8). The four destination management key processes are therefore reflected in the DMS as the "four eComponents", being eMarketing, eBooking, eRating and eLearning (see chapter 8.3). Continuously monitoring and improving the DMO support services and DMS's eComponents is essential to its viability, while contributing to the destination management's performance (see chapter 9) and therefore the eMonitor application component has been added to the DMS's eComponents in the framework model.

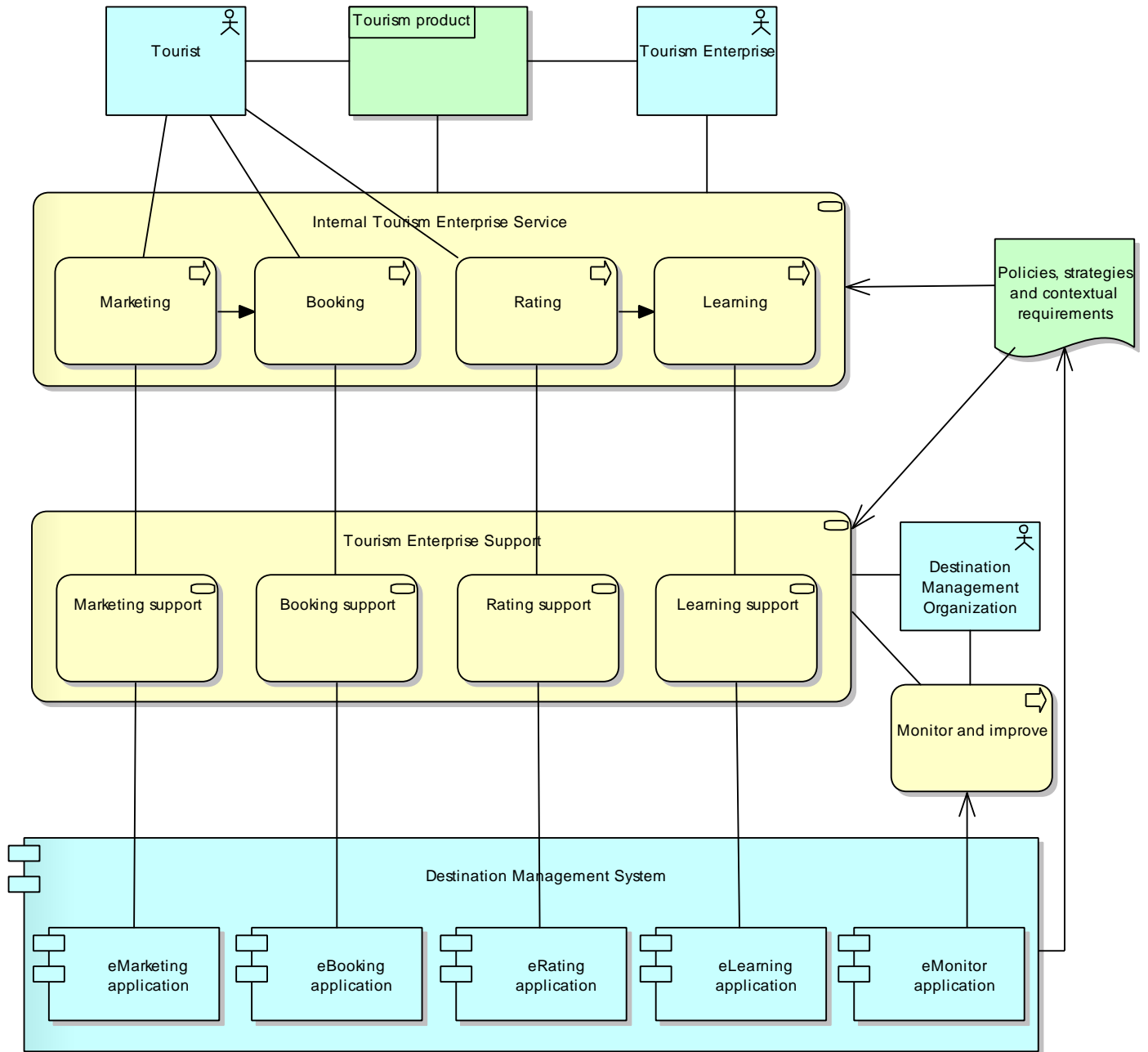


Figure 14 The framework

10.3 Applying the framework

The framework described above can be used to get an understanding of the destination’s current situation regarding tourism enterprise performance and possibilities for support by a DMO and a DMS.

A two-step approach can be taken when applying the framework. First, identify the contextual requirements, stakeholders, policies and strategies. Second, apply the matrix described below.

10.3.1 Framework SWOT matrix

A matrix can be derived from the framework which can be used for SWOT analyses of the destination's tourism enterprise, DMO and DMS alignment and possibilities (see Table 4 below). Each cell can contain a SWOT analysis, however for practical reasons it may be more convenient to combine SWOTs horizontally or vertically during different research phases:

- When conducting interviews, it saves time and reduces complexity if SWOTs are combined horizontally. For example, if all tourism enterprises are interviewed first, this will result in a single SWOT covering all cells starting with an "A".
- When researching (support) alignment issues (regarding marketing, booking, rating and/or learning) across the tourism enterprise, the DMO and the DMS, it is advisable to convert the "horizontal" SWOTs generated during the interview phase into "vertical" SWOTs. This enables focusing on a single alignment issue. For example, all information on marketing (all cells containing a "1") can be combined in a single SWOT by combining the marketing information from the interviews conducted with the tourism enterprises, the DMO and the DMS experts (if any).

	Marketing	Booking	Rating	Learning
Tourism enterprise	A1	A2	A3	A4
Support by DMO	B1	B2	B3	B4
Support by DMS	C1	C2	C3	C4
DMO, DMS: Monitor and improve	D1	D2	D3	D4

Table 4 Framework SWOT matrix

When applicable, the contextual requirements, policy and strategy implications and involved stakeholders should be included as well in each SWOT analysis.

11 Case Study: Wayanad

During April 2010, the framework described in the previous chapter has been applied in research conducted in Wayanad (Kerala, India) in order to validate the framework and assess the possibilities of DMS support. This case study has been initiated by the Dutch foundations InfoBridge and ReTour⁶, and has been conducted by the author, in cooperation with and hosted by RASTA (Rural Agency for Social and Technological Advancement)⁷.

This chapter describes the outcomes of this research, preceded by a brief introduction about Wayanad as a tourism destination.

11.1 Introduction

Wayanad is a district of Kerala and said to be one of its most beautiful regions; the Kerala state covers a part of the west coast of South India (see Figure 15). Wayanad's plateau offers tourists a soft climate, green and peaceful surroundings and terrific views and visitor attractions such as the Wildlife Sanctuaries of Muthanga and Tholpetty, local festivities or cultural heritage (primarily temples). The district

has only been habituated for some decades, after the English ruled to open up the plateau for cultivation of tea and cash crops, which has paved the way for the organized large-scale agriculture as it is today.

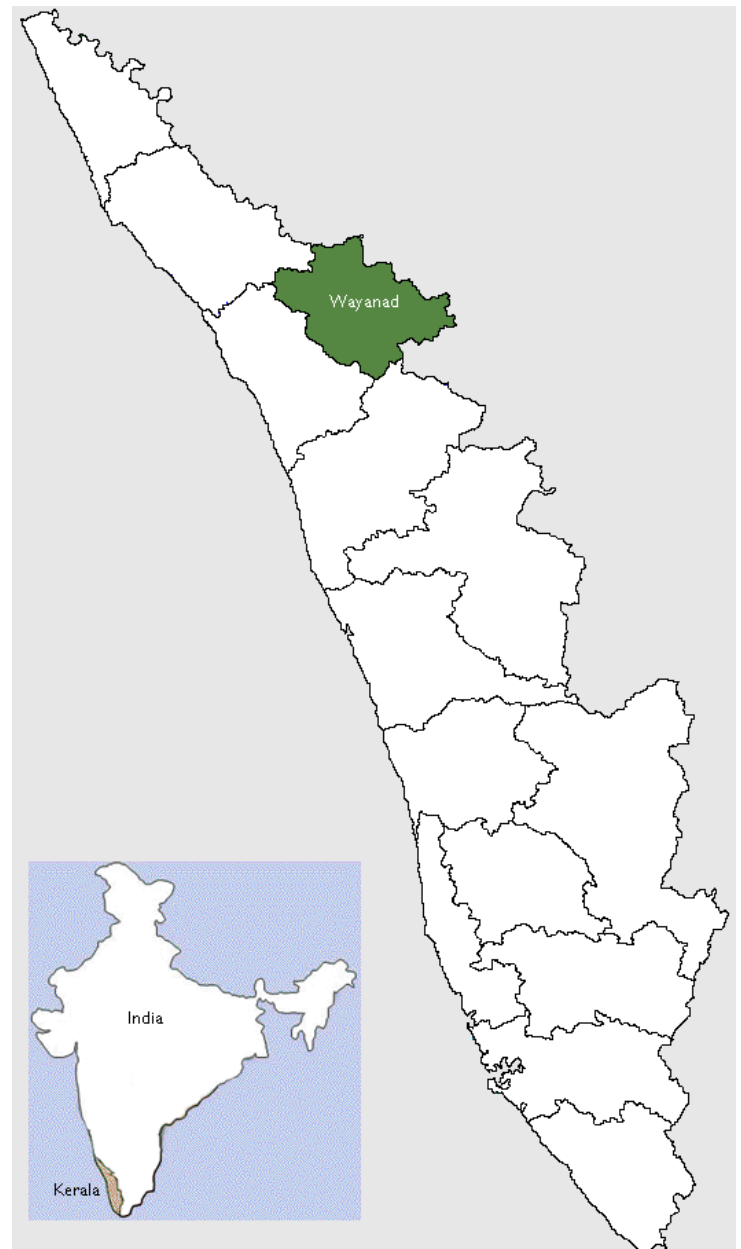


Figure 15 Wayanad and Kerala

⁶ See <http://www.infobridge.org> and <http://www.retour.net> for more information on InfoBridge and ReTour foundation.

⁷ See <http://www.rastaindia.org/> for more information on RASTA.

11.2 Applying the framework

The two-step approach described in section 10.3 above is adhered to during this research. Section 11.2.1 discusses the first step; the second is discussed in section 11.2.2.

11.2.1 Step 1: Contextual requirements, stakeholders, policies and strategies

In this first step a description is provided regarding the contextual requirements (section 11.2.1.1), the stakeholders (section 11.2.1.2), and the policies and strategies (section 11.2.1.3).

11.2.1.1 Contextual requirements

The contextual requirements in this case study are restricted to those which are relevant to the DMS and its components.

Most of the requirements presented in Table 3 above (p. 26) apply here:

1. The technology must result into economic and/or social progress;
2. The technology must contribute to the increase of productivity;
3. Technologies may be relatively labor-intensive, but must have a higher output than the traditional technologies;
4. The technology should not have a negative impact on the environment;
5. The technological solutions must be flexible and easily to be adapted to changing circumstances;
6. The technology must be understandable for people without specific or academic training;
7. The technology must be fully understandable for the local population, the end-users, resulting into possibilities for them to become involved in the possible innovation and extension of the use of the technology;
8. It should be possible to implement/ realize technological solutions with limited financial resources;
9. The use of available resources must be emphasized to reduce the costs and to guarantee the supply of resources e.g., for maintenance.

Additionally:

1. Like the DMO's activities, the DMS needs to be compliant with the requirements posed by the policies and strategies, which can be found in section 11.2.1.3 below.
2. The DMS needs to be available in at least the languages used in the tourism enterprises, DMOs, and the targeted markets.

3. The DMS hardware needs to be able to endure the climate extremes of Wayanad: high temperatures combined with high humidity, monsoons, and dust.
4. The DMS needs to be accessible conveniently by the DMOs, tourists, tourist enterprises, and other relevant stakeholders. It should be noted that all respondents stated that they have the possibility of accessing the internet, whether directly using a computer at home or a mobile phone, or indirectly through a community member or friend.

11.2.1.2 Stakeholders

In order to provide a complete description of Wayanad's tourism industry, no distinction has been made in this section between all major stakeholders involved in Wayanad's tourism industry, and the stakeholders directly relevant to this case study. All stakeholders are briefly discussed in this section, starting with the tourists, followed by the tourism enterprises, the tour operators, the public sector and government, the destination management organizations, and the host population.

11.2.1.2.1 Tourists

The number of tourists visiting Wayanad has been growing steadily for years. Several tourist categories can be distinguished, as described in this section.

The majority of the tourists visiting Wayanad are domestic tourists, enjoying Wayanad's soft climate and green surroundings. Tourism has seen an increase by the rise of a new class of domestic tourists, which has emerged due to the development of the IT industry in three cities in southern India (Hyderabad, Bangalore and Chennai). They usually stay a weekend or midweek, travel using their own car, and speak Hindi and/or English. In many cases the trips are awarded as a bonus by the employer.

International tourism is still scarce; international tourists also come to enjoy the nature, culture and soft climate Wayanad has to offer. They are often unable to find Wayanad's tourism service levels fully meeting their (Western) standards, and are limited to the services and information offered in their language, in most cases English.

Special efforts by the district government and the Wayanad Tourism Organization (WTO) to promote Wayanad's Monsoon (the rain season during June and July) have resulted in another category of tourism: Monsoon tourism. On top of hiking, some of Wayanad's traditional activities are offered as attractions for tourists during this period, such as planting rice, fishing, and racing bulls in paddy fields. The tourism markets aimed for reside in the dry regions of India, where rain in this quantity is an attraction in itself.

11.2.1.2.2 Tourism enterprises

The tourism enterprises can be divided into enterprises offering accommodation and offering activities. Both are discussed in this section.

11.2.1.2.2.1 Tourism accommodation enterprises

Wayanad's tourism accommodations all try to optimize their occupancy rate and income. They are increasingly aware of their impacts on the destination's sustainability. Many rural accommodations apply sustainable solutions (i.e. power generation) because it is the only available solution in the remote area, and not for destination sustainability as key reason. The tourism accommodation enterprises can be categorized into homestays, dormitories, resorts and hotels, which are discussed each in turn below.

A homestay is usually owned by a family, and due to the fact that the authorities maintain very strict and high entry levels for starting homestays, these small enterprises typically belong to the more wealthy families. The homestays are rated by the government using the terms "silver", "gold" or "diamond", all providing upper to top class facilities and service levels. They employ the family members and some additional staff (one to three employees) for housekeeping, maintenance and cooking.

A large number of resorts have been developed as additional sources of income for the farming families. These families usually own a large piece of land for cultivating coffee beans or spices. Some of their employees are retrained to be resort personnel, ranging from three to eight employees. The resorts offer exclusive places to stay amidst the farms' plantation. All resort owners responded that they did not planned on expanding the resort in order to keep it exclusive, and because the current resort size already yields enough income.

Most of Wayanad's hotels serve two primary functions: accommodation and catering. As such they do exclusively rely on neither; most of the respondents stated that the more steady income from the catering (bar and restaurant) minimized the risks from the fluctuating accommodation's occupation rate. Depending on the hotel size (the number of rooms, occupation rate, and the catering turnover) they have about five to fifty employees.

The dormitories are actually not intended for tourists, but for long-term guests – typically students. As such the dormitories are not regarded as real stakeholders within this thesis.

11.2.1.2.2.2 Tourism activities enterprises

The main tourism activities in Wayanad include Ayurveda, outdoor activities, and tours covering safaris and sightseeing.

Ayurveda is a traditional Hindu medical treatise, ranging from relaxing massages to full hospitalized medical treatment. It remains an influential system of medicine in South Asia and as such attracts many tourists. Ayurvedic services are offered in the more expensive accommodations and in special clinics. Many Ayurveda practitioners working in accommodations have made arrangements with the accommodation's management for marketing and booking their Ayurvedic services.

The outdoor activities are relatively new to Wayanad's tourism industry; a few tourism enterprises have just started to offer outdoor biking, hiking and camping trips, and additional teambuilding activities for companies if demanded.

Attractions such as wildlife sanctuaries and cultural heritage are controlled by the government, which uses the entrance fees to cover the costs for preservation, maintenance and staffing. Guided sightseeing tours or safaris also are offered by small tourism enterprises, mostly self-employed. While the attractions are marketed by the government, these guides rely on offering their services on the spot, or by using their personal connections with other tourism enterprises (usually accommodation).

11.2.1.2.3 Tour operators

A tour operator typically sells tour and travel packages, which are acquired by the customer prior to travelling to the (package's) destination. This thesis' case study has been restricted to the stakeholders acting within the destination itself; therefore the destination's tour operators are excluded.

11.2.1.2.4 Public sector and government

This section covers the Department of Responsible Tourism, the District Tourism Promotion Council

Wayanad's Department of Responsible Tourism is supporting the coordination of initiatives to promote, implement, maintain and improve sustainable tourism practices, in cooperation with local stakeholders including the Wayanad Tourism Organization, tourism enterprises and NGOs.

The District Tourism Promotion Council (DTPC) acts as a central point where tourists can obtain destination information and at additional costs book activities, guides, cars and accommodation. The DTPC also promotes Wayanad as a travel destination to markets outside the district. They keep a

shortlist of tourism enterprises to refer to; it is however unclear how tourism enterprises can get on this list, resulting in a heavily skewed distribution of referrals.

The Forest Department controls and safeguards Wayanad's nature, the wildlife sanctuaries, while finding a balance between these functions, the local population's daily life, and the tourism industry. Therefore, their staff (rangers and guides) includes local tribal residents.

Wayanad's public transport offers a dense network of travel possibilities at low cost. Most towns are accessible by bus, and locally motorized rickshaws are available for travelling locally. Transport by taxi can be booked. There are no planes or trains travelling directly to Wayanad.

11.2.1.2.5 Destination management organizations

However none offers the enterprises the complete package of marketing, booking, rating and feedback support, three tourism organizations within Wayanad can be regarded as a destination management organization, being the WTO, the WETO and the DTPC. They are each in turn briefly discussed in this section.

The Wayanad Tourism Organization (WTO) is a tourism accommodation association; all of its members are accommodation enterprises. Their primary aims are to support development of the tourism industry, and to provide a single body where knowledge is shared, collaboration (primarily marketing) is fostered and Wayanad's tourism enterprises' interests are voiced towards the public and the government. They also promote sustainable tourism practices among their members. By maintaining high entry levels, the less wealthy accommodation owners remain excluded from their support. The WTO has grown into a powerful organization, continuously in debate with the government.

The Wayanad Eco-Tourism Organization (WETO) has been founded only recently by a small number of accommodation enterprises. Their aims are similar to the WTO's, except for the emphasis on Eco-Tourism.

The DTPC (introduced in section 11.2.1.2.4 above) can also be regarded as a destination management organization, for it promotes the destination and coordinates some of its tourism activity.

11.2.1.2.6 Host population

Wayanad hosts about 780,000 citizens. Agriculture is the major source of income; however an increasing part of the population is employed in the tourism sector. Some hotel management schools have been started in order to be able to meet the new demands.

Wayanad's native language is Malayalam; for the majority of the citizens this is the single language they speak. Neither the national Hindi language, nor English is understood by many, making communication with tourists hard, whether they come from abroad or are domestic (coming from another state). Many English and/or Hindi speaking citizens move to the large cities in neighbouring states for work.

The growth of Wayanad's tourism industry also has led to pollution of some tourism hot spots such as temples' surroundings and the wildlife sanctuaries. The Department of Responsible Tourism and the Forest Department have coordinated some efforts to reduce the pollution; for example the souvenir shops now provide bio-degradable bags instead of plastic bags; the bags are collected centrally and disposed of using bio-gas equipment.

Like in most other regions of India, Wayanad's social life and culture are changing rapidly due to influences from abroad, brought by the media using television and the internet - and according to the respondents, not by tourism.

11.2.1.3 Policies and strategies

Policies and strategies regarding India's tourism can be found at national, state and district level. The next subsections discuss each level in turn.

11.2.1.3.1 National level (India)

At national level, no Poverty Reduction Strategy Paper (PRSP) has been issued (yet) by the government of India (The World Bank and the International Monetary Fund, 2004). A national tourism policy has been issued in 2002, addressing tourism as a tool for poverty reduction; its key objectives are (Department of Tourism, India, 2002 p. 12):

- Positioning and maintaining tourism development as a national priority activity;
- Enhancing and maintaining the competitiveness of India as a tourism destination;
- Improving India's existing tourism products and expanding these to meet new market requirements;
- Creation of world class infrastructure;
- Developing sustained and effective marketing plans and programmes.

11.2.1.3.2 State level (Kerala)

In 2005 a tourism act has been issued for preservation and conservation of Kerala's tourism areas (Kerala Department of Tourism, 2005). A new act has been planned for release in 2010.

11.2.1.3.3 District level (Wayanad)

However Wayanad hosts a number of government bodies indirectly and directly regulating and supporting the district tourism industry, no district level policies have been encountered of relevance to this thesis.

11.2.2 Step 2: Framework SWOT matrix

In this step the current situation is assessed by addressing its strengths and weaknesses, followed by possible opportunities for improvement and possible threats to these opportunities. The framework matrix as proposed in section 10.3.1 above is traversed vertically in order to focus turn by turn on the destination's marketing, booking, rating and learning processes.

11.2.2.1 Marketing

	Enterprise level	DMO support	DMS	Monitor and improve
Strengths	<ul style="list-style-type: none"> - All respondents stated that their current marketing efforts yielded enough customers and high occupation rates. - All respondents stated that their current customer base included many returning customers, and most customers have found the enterprise through word of mouth. - The majority of the tourism enterprises (resorts, homestays, the larger hotels and tourism activity enterprises) have their own website, and are able to keep its (very static) information up to date. 	<ul style="list-style-type: none"> - The destination has developed a strong brand within South India. - Both DTPC and WTO are performing marketing on a destination level, and include a part of Wayanad's tourism enterprises in the marketing processes, i.e. by presenting them on their website and in their promotional flyers. - The WTO and especially the WETO are promoting sustainable practices among their members, and towards outside parties including tourists. 	<ul style="list-style-type: none"> - The WTO uses its website to promote Wayanad as a destination, and list all of its members' accommodations and contact information online. - The DTPC has a website offering some information on Wayanad as a destination. 	<ul style="list-style-type: none"> - At enterprise level, monitoring marketing yield has resulted in the conclusion that it does not need improving. - The WTO and DTPC are improving Wayanad's marketing rapidly.

	Enterprise level	DMO support	DMS	Monitor and improve
Weaknesses	<ul style="list-style-type: none"> - The smaller tourism enterprises are lacking marketing expertise, leaving them vulnerable to changing demand. - The majority of the tourism enterprises does not relate their marketing performance to the enterprise's and destination's sustainability. - Current marketing efforts primarily target the domestic market only, resulting in extreme tourism seasonality peaks and the risk of depending on a single market. - The tourism enterprises depend on third parties for developing and maintaining their website, resulting in unexpected costs and maintenance problems. 	<ul style="list-style-type: none"> - Not all enterprises are supported by Wayanad's DMOs, resulting in structural exclusion of some of the enterprises and unequal marketing support opportunity. - The above is also likely to result in an incomplete picture of the destination towards the targeted market. - It is unclear how tourism enterprises can be included in the DMOs' listings. 	<ul style="list-style-type: none"> - Despite the efforts of WTO and DTPC having implemented a website, there is no real DMS available. 	<ul style="list-style-type: none"> - Both at enterprise level and DMO level, there are no signs of explicitly monitoring marketing performance. - Both tourism enterprises and DMOs do not actively track their website visitor statistics.

	Enterprise level	DMO support	DMS	Monitor and improve
Opportunities	<ul style="list-style-type: none"> - Provide the tourism enterprises with basic marketing knowledge, including its relation bearing on sustainability, in order to enhance sustainability. - Provide the tourism enterprises with basic online marketing tools to support their marketing efforts, and the knowledge to utilize them. - Kerala's ICT4D telecenters project "Akshaya" may support achieving the opportunities stated above. - Identify and reach new markets. 	<ul style="list-style-type: none"> - Include all of Wayanad's tourism enterprises in the destination marketing. - Have clear processes to achieve the above. - Present potential tourists with a complete picture of Wayanad's tourism enterprises' offerings. 	<ul style="list-style-type: none"> - Develop and implement a DMS (eMarketing component) to market Wayanad as a destination using the Six As framework. - In this DMS, provide the tourism enterprises with the possibility to manage their own information. - Make the DMS available to all of Wayanad's tourism enterprises. 	<ul style="list-style-type: none"> - Implement processes of monitoring, evaluation and improving at enterprise, DMO and DMS level in order to enhance their sustainability. - At DMO and SMS level, make the monitored marketing performance available to the destination's stakeholders. - Market research surveys can be implemented in the current websites.

	Enterprise level	DMO support	DMS	Monitor and improve
Threats	<ul style="list-style-type: none"> - External support (funding) may be necessary for realisation of the opportunities, which may be hard due to the current economic downturn. - Improved marketing may lead to more customers, which may lead to increased enterprise sustainability, but simultaneously to instable destination sustainability. 	<ul style="list-style-type: none"> - Parties having strong vested interests in Wayanad’s tourism industry, such as the larger hotels or a DMO protecting its members, may block the inclusion of all tourism enterprises in destination marketing efforts. 	<ul style="list-style-type: none"> - The DMS needs a committed and open DMO to succeed. - External support (funding) may be necessary for realisation of the opportunities, which may be hard due to the current economic downturn. - Development, maintenance and usage of the DMS require specific sets of skills and knowledge, which may not be available at DMO or enterprise level. 	<ul style="list-style-type: none"> - Participants may not see or underestimate the added value of monitor and improve processes. - Participants may be reluctant to share their performance details.

11.2.2.2 Booking

	Enterprise level	DMO support	DMS	Monitor and improve
Strengths	<ul style="list-style-type: none"> - Making a reservation is possible by telephone and in most cases by email as well. - Pricing details are clearly provided online in most cases. - Upfront payment is possible for domestic tourists using bank transfers. 	<ul style="list-style-type: none"> - Currently, DTPC supports enterprises and tourists by acting as a broker and translator during the booking process – booking through DTPC is however not obligatory. 		<ul style="list-style-type: none"> - At enterprise level, a history is kept on room occupancy and payments. - DTPC keeps a record of successful referrals.
Weaknesses	<ul style="list-style-type: none"> - Upfront payment is not available to international tourists. This leads to the enterprise bearing the risk of a customer not showing up, or the tourist not being able to book the enterprise's services. - Service or room availability is not online accessible for tourists. - Communication during the booking process may be affected by the language gap problems. 	<ul style="list-style-type: none"> - Not all enterprises are supported by DTPC, resulting in structural exclusion of booking support for some of the enterprises. - DTPC needs to contact each tourism enterprise by phone during the booking process in order to find the most suitable deal, if any. 	<ul style="list-style-type: none"> - There is no central point managing service or room availability, pricing and booking, which tourists can turn to for information, or intermediaries can cooperate with. 	<ul style="list-style-type: none"> - Most enterprises do not measure the number of no-shows. - DTPC does not keep a (publicly available) record on how many customers they have referred to what enterprise. - Any implemented monitoring process is not explicitly used as input for improvement, but for bookkeeping. - There is no method for automated and/or centralized monitoring of booking performance and booking support performance.

	Enterprise level	DMO support	DMS	Monitor and improve
Opportunities	<ul style="list-style-type: none"> - Adopt new (online, mobile) payment methods. - Keep a record on room availability online. 	<ul style="list-style-type: none"> - Include all enterprises in DMO's booking support. 	<ul style="list-style-type: none"> - Develop and implement a DMS for centrally managing service/room availability, pricing and booking, in order to enable easy booking support and cooperation with intermediaries (an eBooking DMS component). 	<ul style="list-style-type: none"> - Provide the enterprises with tools to measure the number of no-shows and other relevant booking information. - This data can be made accessible to all stakeholders in order to increase awareness, ownership and project performance. - Integrate monitoring functionality in an eBooking component for automated data collection.

	Enterprise level	DMO support	DMS	Monitor and improve
Threats	<ul style="list-style-type: none"> - Unwillingness or impossibility to adopt new payment methods. - Unwillingness or impossibility to keep a room availability record online. - For security reasons, the government demands all tourists to be tracked and therefore requires the tourism accommodation enterprise to hand over a number of forms on each arrival and departure. Further severing these security protocols are likely to affect the booking processes. 	<ul style="list-style-type: none"> - Parties having strong vested interests in Wayanad’s tourism industry, such as the larger hotels or a DMO protecting its members, may block the inclusion of all tourism enterprises in booking support. 	<ul style="list-style-type: none"> - The DMS needs a committed and open DMO to succeed. - External support (funding) may be necessary for realisation of the opportunities, which may be hard due to the current economic downturn. - Development, maintenance and usage of the DMS require specific sets of skills and knowledge, which may not be available at DMO or enterprise level. 	<ul style="list-style-type: none"> - Participants may not see or underestimate the added value of monitor and improve processes. - Participants may be reluctant to share their performance details.

11.2.2.3 Rating

	Enterprise level	DMO support	DMS	Monitor and improve
Strengths	<ul style="list-style-type: none"> - The smaller tourism enterprises are very responsive to customer feedback, if provided. 	<ul style="list-style-type: none"> - Wayanad’s DMOs implicitly keep track of the customer feedback on the enterprises. 		
Weaknesses	<ul style="list-style-type: none"> - Very little tourism enterprises utilize the opportunity to proactively ask their customers for feedback/a rating. - The larger tourism enterprises have a traditional hierarchical organization structure; feedback given at bottom level is unlikely to make it to the top level management unless an explicit rating process is implemented. 	<ul style="list-style-type: none"> - Implicit feedback/rating results in strong subjectivity. - Official accommodation ratings (i.e. stars) awarded by the government are regarded as superior to the tourist’s experience. - There is no public (list of) tourist rating information available. - The DMOs do not support the enterprises’ rating processes. 	<ul style="list-style-type: none"> - No DMS support is available for ratings provided by tourists. 	<ul style="list-style-type: none"> - No processes for monitoring and improving rating processes have been encountered.

	Enterprise level	DMO support	DMS	Monitor and improve
Opportunities	<ul style="list-style-type: none"> - Provide tourism enterprises with knowledge and tools to implement feedback / rating processes. 	<ul style="list-style-type: none"> - Implement and provide tools for (supporting) explicit enterprise rating by tourists. - Provide a central point to collect, process and access tourist feedback/rating. 	<ul style="list-style-type: none"> - Develop and implement a central DMS component (eRating) for automated collection and processing tourist feedback/rating, and to view the results on destination and enterprise level. - Provide the tourism enterprises with rating tools which can be included in their existing websites (and connected to the DMS' eRating component if available) for collecting ratings and displaying rating results. 	<ul style="list-style-type: none"> - If rating processes have been implemented supported by an eRating component, the response rate can be monitored, and customers can be triggered by email some time after the tourism enterprises service has occurred. - The collected data can be made accessible to all stakeholders in order to increase awareness, ownership and project performance.

	Enterprise level	DMO support	DMS	Monitor and improve
Threats	<ul style="list-style-type: none"> - Participants may not see or underestimate the added value of rating processes. - Participants may be reluctant to review/share their performance details with their colleagues and/or superiors. 	<ul style="list-style-type: none"> - Participants may not see or underestimate the added value of rating processes. - Participants may be reluctant to review/share their performance details with their collaborators. 	<ul style="list-style-type: none"> - The DMS needs a committed and open DMO to succeed. - External support (funding) may be necessary for realisation of the opportunities, which may be hard due to the current economic downturn. - Development, maintenance and usage of the DMS require specific sets of skills and knowledge, which may not be available at DMO or enterprise level. 	<ul style="list-style-type: none"> - Participants may not see or underestimate the added value of monitor and improve processes. - Participants may be reluctant to share their performance details publicly or with collaborators.

11.2.2.4 Learning

	Enterprise level	DMO support	DMS	Monitor and improve
Strengths	<ul style="list-style-type: none"> - Many tourism enterprises participate in learning programmes organized by the government or meetings organized by the WTO or WETO. 	<ul style="list-style-type: none"> - Wayanad’s DMOs support enterprises’ learning processes by organizing meetings and learning programmes. 		
Weaknesses	<ul style="list-style-type: none"> - There is little explicit attention for learning processes in most tourism enterprises. - However an enormous amount of information is made available by the government, NGOs, DMOs, etc., tourism enterprises are lacking the incentive or methods to obtain this information. - Changes in regulations and time-bound opportunities are hard to keep track of. - For the majority of the enterprises leave most processes unmonitored, it is hard for them to learn from their performance. 	<ul style="list-style-type: none"> - Learning programmes or information coming from the government is strictly one-way communication, leaving little room for public-private collaboration regarding learning. - Information relevant to enterprises’ learning processes is not available from a central location. 	<ul style="list-style-type: none"> - No DMS support is available for supporting tourism enterprises’ learning processes. 	<ul style="list-style-type: none"> - No processes for monitoring and improving rating processes have been encountered.

	Enterprise level	DMO support	DMS	Monitor and improve
Opportunities	<ul style="list-style-type: none"> - Raise awareness amongst the enterprises regarding additional opportunities of learning and the role of (collaborative) learning processes in their enterprise. - Provide the skills and tools for obtaining (free) information and implement learning processes. - Arrange or rearrange information for optimal accessibility. 	<ul style="list-style-type: none"> - Provide collaborative learning processes. - Provide a central point for gathering and disseminating information and knowledge relevant to Wayanad's tourism enterprises, including data from monitoring other processes' performance. 	<ul style="list-style-type: none"> - Develop and implement a central DMS component (eLearning) for automated gathering and disseminating information and knowledge relevant to Wayanad's tourism enterprises, including data from monitoring other processes' performance, and a place to collaborate. 	<ul style="list-style-type: none"> - If learning processes have been implemented supported by an eLearning component, the component's activity can be monitored and visualized. - This data can be made accessible to all stakeholders in order to increase awareness, ownership and project performance.
Threats	<ul style="list-style-type: none"> - Tourism enterprises lack the incentive to implement learning processes. - External support (funding) may be necessary for realisation of the opportunities, which may be hard due to the current economic downturn. 	<ul style="list-style-type: none"> - Participants may not see or underestimate the added value of learning processes. - Participants may be reluctant to review/share their knowledge. 	<ul style="list-style-type: none"> - The DMS needs a committed and open DMO to succeed. - External support (funding) may be necessary for realisation of the opportunities, which may be hard due to the current economic downturn. - Development, maintenance and usage of the DMS require specific sets of skills and knowledge, which may not be available at DMO or enterprise level. 	<ul style="list-style-type: none"> - Participants may not see or underestimate the added value of monitor and improve processes. - Participants may be reluctant to share their performance details publicly or with collaborators.

11.3 Case study conclusion

Wayanad's tourism enterprises can be supported by a DMS; however there is currently no single DMO body providing the complete support service package including marketing, booking, rating and learning. The support provided by the DMOs currently is heavily focused on marketing; a select number of enterprises benefit from booking and learning support provided by the DMOs as well.

Given the tourism enterprises' satisfaction regarding their current occupation rates, it seems unnecessary to further develop the methods to support their marketing and booking activities. However, the tourism sector is a highly dynamic industry, and in order for Wayanad to remain competitive in the future, its tourism enterprises and DMOs may need to make some preparation efforts now.

Providing support on gathering feedback and improving the tourism enterprises' services levels and (impact on destination) sustainability seems an appropriate possibility; however it is unlikely these options will be adopted in the current situation – because business is going well. Monitoring and improving of support services can be recognized within some DMOs in implicit and very limited forms, leaving many lessons unlearned.

Wayanad's tourism industry does have an impact on the destination's sustainability. The case study showed however that – according to the interviewed stakeholders - Wayanad's tourism enterprises have no significant impact on the ecological, social and cultural dimensions of sustainability, only on its economic dimension – primarily by generating income and creating jobs. The tourists themselves seem to contribute to the pollution of Wayanad's natural resources; it is the DMOs' responsibility to coordinate the efforts to solve this problem, but this goes beyond the extent of this thesis focused on tourism enterprise support.

12 Conclusion

ICTs can be used at destination management organization (DMO) level to help tourism enterprises improve their service level and enhance their sustainability. This in turn also leads to enhanced sustainability at destination level.

Four key internal tourism enterprise processes have been identified being eligible for support by a DMO, being marketing, booking, rating and learning. The DMO can utilize a destination management system (DMS) when providing the tourism enterprises with their support services (being marketing support, booking support, rating support and learning support). These support services are directly mapped to the DMS' eComponents, being eMarketing, eBooking, eRating and eLearning. The derived framework matrix can be used to research the alignment of these internal tourism enterprise processes, DMO support services and DMS eComponents. The likelihood of success – in terms of destination sustainability – can be increased by directly monitoring the DMS eComponents, which can be a tool for indirectly monitoring and improving the DMO support services. The collected data may also be a great addition to the currently scarce research data on performance of the tourism destination's sustainability.

Additionally, the models included in this thesis – especially the framework model – are intended to contribute to a more profound understanding of the roles and functioning of the tourism enterprises, the DMO and the DMS and the relations in between, within the domain of the destination tourism industry.

The proposed framework model and matrix were validated during a case study conducted in Wayanad's tourism industry. This case study did not result (yet) in implementation of any of the proposed DMS' eComponents; following the guidelines provided with the framework, it became apparent that Wayanad's tourism enterprises and the destination itself are not really in need of DMS-infused support despite the prior assessment made by the case study's initiators.

12.1 Recommendations

Based on the research underlying this thesis, some recommendations can be made. First, more research is necessary in order to further clarify the relations between ICTs and tourism sustainability, and to assess the possibilities of tourism enterprise support using ICTs without having a DMO.

Second, intermediaries have been excluded from this thesis' scope however they are playing an increasingly large role within the increasingly networked tourism industry. Their possible bearing on the tourism enterprises, the DMO and the DMS' functionality needs to be researched as well. Additionally, assessing the possibility of telecenters functioning as intermediaries in LDCs may be an addition as well.

And third, repeated application of the framework matrix may offer sufficient results to develop a more specific scorecard, which can be used for assessing the destination's tourism industry's situation in a more efficient way, instead of generating a large number of (sometimes overlapping) SWOT analyses.

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