CHAPTER 5

ICT and Caribbean Tourism

It is an open secret that we live in a technology-mediated world. Over the past decade, information and communication technology (ICT) has become an invaluable tool in most if not all facets of life. In addition to the overwhelming use for entertainment and leisure, these tools democratize access to goods and services, afford faster and more efficient communication and decision-making, and connect persons across the globe in an instant, all while cutting costs and waste in many organizations. Investment in ICT can spur gains in productivity in a number of ways: it contributes to overall capital deepening, helping to increase labour productivity; technological progress may contribute to faster multifactor productivity growth in the ICT-producing industry. In addition, greater use of ICT outside the ICT industry helps firms and public and private institutions to increase efficiency and develop new products and services.

These and other advantages of ICT are all critical for travel and tourism globally and Caribbean Small Island Developing States (SIDS) are increasingly recognizing the importance of incorporating these tools into their tourism product development and policies. ICT tools used for or during travel have become much faster, smaller, more intelligent, and more embedded in the user's environment. According to Vong (2012), the average traveller visits about 22 travel-related sites prior to booking a vacation. Social media is also taking the industry to new and ever-growing heights. According to Google Think Insights quoted in Scarborough

A. Spencer, *Travel and Tourism in the Caribbean*,
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(2013), in 2010, 11% of leisure travellers used their mobile devices to access travel information. This figure grew to 38% in just two years. Similarly, for business travellers, 40% used mobile devices to book their travel in 2010 and this increased to 57% in 2012. The fast adoption of new mobile technologies generates a tremendous impact on travel and will very likely transform the behavioural patterns of tourism consumption and the tourism experience itself. It is becoming harder to ignore the fact that travellers, particularly from areas with high internet penetration in North America, Europe, and Asia, are equipped with today's cutting-edge mobile technology and often have the expectation that technology will be part of every stage of their travel process. A new world is emerging as a smart world (smart cities, smart destinations), where individuals interact, communicate, collaborate, and share information in new ways. Increasingly, sustainable tourism models are moving beyond traditional considerations to include the level of ICT penetration as a marker of a robust and viable product. This chapter explores the importance of ICT to tourism product development and argues that to remain competitive, Caribbean destinations need new ICT-related development principles, policies, processes, and objectives that will result in attractive tourism products. The progress that destinations have made in integrating ICT into process flows will also be assessed.

ICT and Tourism: The New Frontier

In the case of the Caribbean, the development and diffusion of ICT are crucial to competing effectively in the global world. The services industry is the main pillar of economic growth, and ICT plays a crucial role in a services-oriented economy. For example, destinations and attractions can be efficiently marketed in the tourism industry by using ICT. Caribbean tourist authorities have up-to-date and interactive websites which offer information on the destination, as well as travel advisories, and other important information for visitor safety and satisfaction. Increasingly as well, these countries have invested in social media handles on Twitter, Facebook, and Instagram in order to connect in real time with potential visitors and residents alike. These platforms make it easier to access market and management data, share information, and build trading partnerships. In the area of logistics, ICT can improve efficiency by reducing delivery times and coordinating stock levels through improved monitoring of supply and demand, which in turn enhances customer service and guest satisfaction.

As expressed by Spencer (2014), for developing countries interested in maintaining their tourism product, there is a critical need to explore their readiness, willingness, and ability to adopt new technology into their marketing, sales, and general interaction with an ever-evolving tourism market. Not only have ICTs made it easier for developing countries to market and distribute their products and increase their customer base, but they have also made it easier for investors to access market and management data, to share information, and to build trading partnerships. Moving into the e-business arena has provided opportunities for tourism stakeholders to offer fully developed web portals as comprehensive Destination Management Systems (DMS) that include booking and transaction facilities—thus promoting the opportunity to increase sales and to generate more revenue for the local economy. The Caribbean is competing with developed nations, which have largely integrated ICT in every aspect of the service industry. According to Chevers (2015), American and European hotels have adopted ICT and successfully integrated systems like computer reservation system (CRS), customer relation management (CRM), enterprise resource planning (ERP), supply chain management (SCM), project management system (PMS), knowledge management system (KMS), and office automation system (OAS) and are able to realize the intended benefits.

ICTs have become one of the most effective tools for addressing the imbalance between competing destinations in the global market. For many tourism market sectors and tourism products, marketing and selling via the internet is becoming the accepted and preferred method. Technology used in tourism organizations can be classified into two main sections, namely, vertical (industry-specific) and horizontal (general business) applications, aiming to cover both hardware and software specifications which are of relevance to tourism-related organizations, together with the connectivity requirements among departments, branches, and external partners.

Alzua suggests that destinations and their respective travel and tourism industries need to progress over three different stages of evolution on their way towards achieving economic development. The first stage in this theorization is tourism activity based on factors while the second is based on investment. The third and most ideal stage is one based on innovation. As the sector and the destination evolve, they leave behind the first phase where endowments are the main asset and evolve into a tourism activity starting to produce quality standard services. At this stage, private and

public investment starts to occur for the modernization of tourism activity, and technology stops being a stranger or unattainable. Caribbean SIDS tend to straddle stages two and three, as there is still a heavy dependence on foreign investment and endowments to develop the local tourism economy. However, this is often being combined with more and more reliance on technological innovations.

ICT adoption is facilitating changes in tourism value chains and in the way tourism products are consumed. Trends facing the travel and tourism industries are focused primarily in the following factors: increasing competition, emerging countries and destinations, adoption of technology, and branding and identity building. Research indicates that specific to hotel operations, ICT should be viewed as an amplifier to a hotel's operational structure and management. Thus, if implemented in a poorly managed hospitality establishment its ability to increase the hotel's performance is significantly lessened. On the other hand, the implementation and use of ICTs in properly managed hotels will result in the increase of its performance (Sigala et al. 2004). Guest satisfaction, while not being the only outcome, is the ultimate indicator of whether key objectives are being met. Tourists today are informed and connected, and participate actively in social networks. The proliferation of these media and new forms of communication have led to a better understanding of the products offered as well as of the experiences of other visitors. Technologies undoubtedly play an important role facilitating memorable experiences. Each traveller has his or her individual preferences, demands, and expectations. One of the great dangers is falling into traditional thinking to understand the fragmented tourism demand. Tourists are increasingly having a preference for destinations that provide a complete and personalized choice of all elements that allow them to create their own vacations prior to travel or while on location, through the use of ICT tools.

Marketing of Caribbean SIDS is already undergoing important transformations. Fragmented and personalized marketing is being undertaken based on interests and the focus has shifted from television ads and is far more focused on personal devices: computer, tablet, or smartphone. Customer relationships are also being performed in new ways: destinations are using virtual tourist offices across social networks, and hotels are using tablets and smart TV to interact with customers. Thus, multiscreen marketing is needed with travellers moving across devices to complete bookings. At the same time, the increasing proliferation and adoption of information systems together with other developing technologies (cloud

computing, internet of things, new interaction devices, mobile devices) is generating an unprecedented amount of data. These data are acquired from heterogeneous sources and are often unstructured. One of the major challenges remaining is how to use technology in order to make sense of the data, so that new tourism-related services and knowledge can be generated. This also requires new analytic capacities. This phenomenon is known as Big Data. The effective use of Big Data has the potential to transform the tourism sector, delivering a new wave of productivity growth and consumer surplus. Using Big Data will become a key basis of competition for existing companies, and will create new competitors who are able to attract employees that have the critical skills for a Big Data world.

In addition to the importance of e-business solutions, the importance of ICT in times of major natural disasters and acts of terrorism and crime has now become vital. In the context of disaster risk management (DRM), ICT-based KMSs can help to decide what developments to monitor, what decisions to focus on, and what processes to set in motion automatically, or in advance of an impending hazard. KMSs facilitate the collection, retrieval, dissemination, and storage of information, to ensure that it is available to those who need it, at the time and place it is needed. Access to adequate infrastructure is therefore a prerequisite for organizations and individuals to adopt and use ICTs. Modern technology has become an essential tool as a means of anticipatory warning and post-impact crisis management and in controlling their harmful effects on tourism. While natural disasters in the Caribbean are simply a fact of life as the region is among the world's most vulnerable to hurricanes and other "acts of God", these effects can also be mitigated through improvements in ICT infrastructure and the need to put in place measures to reduce the vulnerability and impact of these hazards on tourism is most critical in this subregion.

Effective DRM relies heavily on information collection, storage, and dissemination in order to accurately determine patterns, which may indicate the onset of an impending disaster, giving early warning information to vulnerable populations (inclusive of tourists). As Williams and Phillips indicate (2014), ICTs are important tools for lessening disaster risks through detection and analysis of dangers, propagation of early warning messages to populations in harm's way, coordinating and tracking relief activities and resources recording, and dissemination of knowledge and experiences, raising awareness. Travellers may be more confident to visit certain destinations over others based on the destinations' innate ICT capability. In the unfortunate circumstance that their stay coincides with a

disaster event, they are much more likely to survive and be in continuous communication with both family abroad and local officials in destinations where ICT infrastructure is present and resilient.

Caribbean disaster management offices have, for instance, used Twitter to propagate warning messages to a wide audience in a timely manner. In cases of earthquake, landslide, floods, and hurricanes, Twitter's ability to spread messages quickly and widely can make it a powerful tool that saves lives. Specifically for tourists, it allows friends and family abroad to track the state of loved ones through their own postings rather than depending on traditional media which, though critical, does not facilitate such personalized information. Twitter can also be used in a post-disaster situation, to publicize the availability of relief services and to act as a gateway to receive requests for emergency assistance. Members of mainstream media are also frequently plugged in to Twitter, and this can be leveraged to amplify early warning messages by passing them along through a broad range of channels.

Bridging the Digital Divide

The notion of the digital divide addresses the degree to which information technology access provides an advantage and disadvantage to some individuals and directly influences tourism distribution. While the digital divide may have been reduced, more recently, Minghetti and Buhalis (2010) still identified that there are multiple technological divides which exist between tourists and destinations within developed countries and between developed and developing countries. This, they claim, will lead to varying levels of digital exclusion. In particular it points to important marketing and communication challenges between tourism generating countries and tourism destinations. Minghetti and Buhalis (2010: 278) articulate that "the study of the digital divide is critical for less technologically developed regions that need to expand their ICT usage to be able to promote their offerings, interact with consumers, and reduce their dependency on intermediaries". The future of tourism for tourism-dependent regions will be determined by competitive approaches and the ability to engage in cutting-edge practices. Technology adoption for sales and marketing, to include interactive social media, is no longer a luxury but a necessity to capture and sustain the travelling market. The new generations of visitors are demanding the use of technology in their daily activities. For example, accessibility to wireless internet is very important, which can

assist with various business processing and simplify the playing of games or sending messages. Effective adoption of ICT in the tourism industry can lead to improved service quality, reduced costs, and improved operational efficiencies (Law et al. 2014). The developing countries and the Caribbean in particular now need to critically assess the position in this virtual tourism space, which is likely to become even more ubiquitous as technology dependence grows.

Since 2000 it has been argued that there are varying levels of internet readiness on the international landscape. Canadians and North Americans in general were keen users. According to Law and Leung (2000) North America and Europe were ahead of most countries in internet penetration. More recently, mega players in technology from Asia, such as South Korea and Japan, have dictated the pace. As Flamm (2013) indicates, the United States ranked outside the top ten countries with the use of smart phones, tablets, and internet protocol television in 2012. Although there is now a smaller disparity between countries, the developing world and in particular the Caribbean typically lags behind both as Table 5.1 indicates. Many Caribbean SIDS operate in a technological context that does not always facilitate full immersion into the ICT pool. The availability of state-of-the-art ICT infrastructure and adequate bandwidth with access to the international information superhighway is crucial. As Table 5.2 indicates, there is no Caribbean country with 100% internet access, with most countries averaging 50–60%. In addition, Jamaica is also reasonably ranked at 83 out of 139 countries in the 2016 Global Network Readiness Index (Baller et al. 2016: 16). This index seeks to evaluate the degree of a society's preparedness and readiness to take advantage of their ICT infrastructure. This increases the ability of Jamaica to take advantage of ICT for the betterment of the tourism product (Chevers and Spencer 2017).

Many of these medium- and low-digital-access destinations still depend on analogue transactions and physical intermediaries to develop their planning processes for stimulating vacations in these destinations. This is very applicable to the Caribbean context which is a relatively low-digital-access destination catering to high-digital-access markets such as the United States and the United Kingdom. Tourism and technology discourse relies, in large part, on the views and attitudes of societies regarding general technology use. As evidenced in the literature more technologically savvy societies will intuitively be more welcoming to technology infusion in the tourism space. Despite the diminishing disparity between nations, there is much to be desired if developing country destinations are

Table 5.1 Caribbean internet users and population statistics: 2016

Caribbean region	*Population (2016 estimate)*	*% population of world*	*Internet users, June 30, 2016*	*Penetration (% population)*	*Users % world*	*Facebook June 30, 2016*
Caribbean	42,401,541	0.6%	18,526,199	43.7%	0.5%	10,972,840
Rest of the World	7,297,757,951	99.4%	3,657,298,614	50.1%	99.5%	1,668,460,690
World Total	**7,340,159,492**	**100.0%**	**3,675,824,813**	**50.1%**	**100.0%**	**1,679,433,530**

Source: https://www.internetworldstats.com/stats11.htm

Notes: (1) Internet Statistics for the Caribbean were updated on June 30, 2016. (2) Population is based mainly on data published by the US Census Bureau. (3) The most recent usage data comes mainly from figures published by Nielsen Online, ITU, Facebook, and other trustworthy local sources. (4) Facebook subscriber data is for June 30, 2016. (5) Data on this site may be cited, giving due credit and establishing an active link back to Internet World Stats. (6) For definitions and help, see the site surfing guide.

Table 5.2 Internet usage and population statistics for the Caribbean

Caribbean	*Population (2016 estimate)*	*% population Caribbean*	*Internet usage, June 30, 2016*	*% population (penetration)*	*Users % region*	*Facebook June 30, 2016*
Anguilla	16,752	0.0	11,557	69.0	0.1	9000
Antigua and Barbuda	93,581	0.2	81,545	87.1	0.4	50,000
Aruba	113,648	0.3	91,532	80.5	0.5	78,000
Bahamas	392,712	0.9	333,143	84.8	1.8	210,000
Barbados	291,495	0.7	228,717	78.5	1.2	160,000
Bonaire, St. Eustatius, Saba	22,303	0.1	20,956	94.0	0.1	20
British Virgin Islands	34,232	0.1	14,620	42.7	0.1	4600
Cayman Islands	57,268	0.1	47,003	82.1	0.3	45,000
Cuba	11,014,425	26.0	3,696,765	33.6	20.0	n/a
Curacao	149,035	0.4	138,774	93.1	0.7	80
Dominica	73,757	0.2	48,249	65.4	0.3	39,000
Dominican Republic	10,606,865	25.0	6,054,013	57.1	32.7	4,500,000
Grenada	111,219	0.3	56,000	50.4	0.3	56,000
Guadeloupe	470,716	1.1	220,000	46.7	1.2	220,000
Haiti	10,228,410	24.1	1,308,290	12.8	7.1	1,300,000
Jamaica	2,970,340	7.0	1,581,100	53.2	8.5	1100,000
Martinique	396,813	0.9	303,302	76.4	1.6	170,000
Montserrat	5267	0.0	2900	21.4	0.0	2900
Puerto Rico	3,578,056	8.4	3,047,311	85.2	16.4	2,100,000
St. Barthélemy (FR)	7209	0.0	1540	21.4	0.0	20
St. Kitts and Nevis	52,329	0.1	37,210	71.1	0.2	35,000
St. Lucia	164,464	0.4	109,370	66.5	0.6	88,000
St. Martin (FR)	31,949	0.1	1100	3.4	0.0	200
St. Vincent and Grenadines	102,350	0.2	65,984	64.5	0.4	59,000
St. Maarten (NL)	40,486	0.1	20	0.0	0.0	20
Trinidad and Tobago	1,220,479	2.9	942,713	77.2	5.1	700,000
Turks and Caicos	51,430	0.1	25,000	48.6	0.1	25,000
US Virgin Islands	102,951	0.2	57,485	55.8	0.3	21,000
Total Caribbean	42,402,541	100.0	18,526,199	43.7	100.0	10,972,840

Notes: (1) The Caribbean Statistics were updated for June 30, 2016. (2) Bermuda is included together with the North American countries according to the United Nations Statistical Division listings. (3) The most recent usage information comes mainly from the data published by Nielsen Online, ITU, Facebook, and other reliable sources. (4) Facebook subscriber data is for June 30, 2016

to keep pace with developed tourist generating markets. Many Caribbean economies, many of which are developing states, have challenges considering the costs to invest in and maintain up-to-date technology. These include the costs of ICT equipment, telecommunication, or installing an e-commerce system. The availability and affordability of ICT services in the Caribbean can therefore be improved with increased competition in the telecommunication industry. Therefore, governments should ensure that a regulatory framework exists which facilitates equal access to the ICT infrastructure. Waller (2006) also warns against the dangers of ICT policies and intervention that are solely implemented by outside forces, which often deepen inequalities, social injustices, and local underdevelopment. Ideally, local players within the sector should be able to develop and offer services through the domestic and international backbone infrastructure. In cases where competition is limited or not possible, the regulator must ensure that conditions exist for users to obtain the bandwidth capacity they need under transparent conditions and at cost-based prices.

Advances in ICT are having major implications for the operations of organizations throughout the tourism value chain. The information storage and data analysis functions are vital for the analysis of tourism statistics, as well as for reservation systems. Moreover, the opportunities provided by the internet for the online sale and distribution of products enable traditional handicraft manufacturers to access new markets. Nevertheless, reliance on ICT raises issues with regard to data protection and safety from external exploitation. This raises another challenge in Caribbean SIDS' ability to capitalize on the benefits of the ICT environment—that of the legal and regulatory framework. ICT opens the door to cyber crimes and external control of sensitive data. The legal enforcement of electronic documents, electronic transactions, and digital signature is essential because it reduces the risks of doing online business. Embarking on major ICT overhauls without the necessary mechanisms to protect users and entities alike can lead to epic breaches. Measures to fight internet crime should be included in the legal and regulatory framework as these increase a country's reputation as a safe environment for tourists in the online space. Currently, the legal and regulatory framework in the region can be characterized as fragmented, lacking sufficient anti-cybercrime legislations. Several reports by international institutions, including the World Bank and the Caribbean Community (CARICOM), have

emphasized the importance of a regional approach for the development of a legal and regulatory framework for Caribbean countries. Importantly, a regional approach is necessary to ensure harmonization of e-legislation and e-regulation among the countries in the region if the region is to be taken seriously as a cutting-edge technological space for tourism and travel to thrive. The Caribbean framework should be in line with international best practices. Moreover, the framework should be flexible to adapt to new ICT developments.

Jamaica's Ministry of Tourism, through its Linkages Network, is leading the way in encouraging the tourism sector to make greater use of technology to enhance guest experience. In June 2018 the Tourism Linkages Network partnered with Digicel Business to host "Smart Destination Jamaica: A Preview of the Latest Technology in Tourism", a think tank and forum that discussed and demonstrated some of the latest technological trends globally being employed in the hospitality industry. Minister of Tourism Hon Edmund Bartlett supported the importance of technology as a driving force in knowledge and innovation, and noted that the initiative was intended "to look at how the technologies have been impacting tourism and what it is going to mean for the architecture that will emerge in the tourism space".

For Jamaica, initiatives such as these exist within a policy framework; the Sector Plan for ICT is one of the strategic priority areas of the Vision 2030 Jamaica—National Development Plan. It is one of 31 sector plans that form the foundation for Vision 2030 Jamaica—a 21-year plan based on a fundamental vision to make "Jamaica the place of choice to live, work, raise families, and do business" and on guiding principles which put the Jamaican people at the centre of the nation's transformation. The ICT Sector Plan considers ICT under two main aspects, as a sector in its own right and as an enabler of all other sectors, including economic, social, environmental, tourism, education, and governance sectors. This enabling role of ICT encompasses the concept of technology for development, reflecting the contribution that cutting-edge tools can make to national development in all sectors. The ICT Sector Plan in particular includes linkages with a number of other sectors including education, governance, science, technology and innovation, the cultural/creative industries, and, importantly, tourism and travel. According to the Vision 2030 mandate, the aims for ICT include the following:

1. The attainment of the Millennium Development Goals
2. The integration of ICT at all levels and processes in the education system. This will include early childhood, primary, secondary, tertiary, and lifelong learning institutions as well as teacher training colleges. The average Jamaican will be ICT literate.
3. Attainment of affordable universal broadband access for all citizens, private sector, government, and civil society, thereby eliminating the digital divide. Universal access will extend beyond voice to include internet, computing devices, information literacy, and access to telecommunications services.
4. The establishment of internationally renowned technology parks and research centres to foster innovation in society.
5. Attraction of international companies to establish software development companies or manufacturing plants in Jamaica.
6. Continued enhancement of the legal and regulatory framework to promote industry development, transparency, true competition, consumer protection, and quality standards, based on the dynamic nature of the sector. The enhanced support for competition will attract local and international investors.
7. The establishment of a networked society and economy in which all citizens use ICT in all aspects of their lives, including school, work, home, and church.

In terms of the Eastern Caribbean, Bertin (n.d.) found that there are fairly wide levels of internet adoption and diffusion throughout the tourism industry among those countries. The main area of deficiency, however, is with respect to the smaller accommodation providers, where there is a much lower level of internet presence in guest houses and apartments. While internet adoption is relatively high, most websites and web-based systems still have a limited focus on basic information provision and communication, as opposed to distribution- and transaction-oriented activities. There is therefore much room to graduate from primary tools to secondary and tertiary level ICT engagement. The social and economic advancement in developing countries can undoubtedly be enhanced by the use of new ICTs in public sector organizations in the tourism sector. The first step, however, invariably requires the successful adoption, implementation, and diffusion of these technologies within the relevant organizations. In order to achieve this, due attention must be given to bridging

key dimensions of the "conception-reality" gap or overcoming organizational context variables and inhibiting factors, in the information systems implementation process, of which technology is but one aspect. A broad and comprehensive approach is necessary to enable fundamental changes, at the individual, organizational, and national levels, which would undoubtedly lead to greater levels of social, economic, and cultural progress, as well as, in the process, narrow the digital divide.

Meaningful strides have been made to infuse technology solutions into the "Caribbean Brand" of tourism, however. A good example is the Small Tourism Enterprise Project (STEP), or STEP Caribbean Project, launched in 2008, which is aimed at business development training, promoting the adoption of technology, creating mechanisms for joint promotion of destinations, and helping in the communication and exchange of best practices among small tourism companies and small Caribbean hotels. Driven by the Organization of American States (OAS), it aims at reducing the digital divide of hotels in the use of different technologies, including the use of internet as an instrument for marketing their accommodation and bookings, but also by improving their internal management and accounting processes.

STEP aims to provide business development training, promote the adoption of technology, create mechanisms for joint promotion of destinations, and facilitate communication and the exchange of best practices among small tourism companies and small hotels with 75 rooms or less, in the Caribbean. Their main achievements have been providing, through web portals, tools to strengthen the management and operations of the hotels, and a plan to promote the 13 STEP Caribbean destinations, as well as the hotels affiliated with the programme. It also provides internationally recognized certification tools and programmes; more than 2000 employees of 228 small hotels were certified by the American Hotel and Lodging Association Education Institute (AHLA-EI). It also provides training on environmental issues; staff from more than 140 companies have been trained, and immediate assistance centres have been set up. This supported the creation of the Central Federation of Small Hotels (FCAPH) with over 800 members. Its activities have focused on the use of digital technologies to strengthen regional integration. Their websites contain tools for training and capacity building and the project has been added to social networks such as Facebook and Twitter. The initiative has spread to other Small-Medium Enterprises (SMEs) through a joint effort with the Central American Secretariat of Tourism Integration (SITCA).

The South America STEP Project uses the same model. More than 300 small and medium hotels participate in the project with websites and are on social networks, like the aforementioned one.

Similarly, the Small Tourism Enterprises Network (STEN) was designed as a unified network that integrates public, private, and community sector strategies to provide strategic support to micro, small, and medium enterprises in the tourism industry in the Caribbean. Chief among the tools to achieve this goal is the integration of ICT to bolster marketability and viability of small tourism enterprises in the Caribbean through tools that increased market access, provided more effective communication between the tourism Medium Small and Micro enterprises (MSMEs) and the target market, and facilitated the packaging of "tourism experiences". In particular, ICT has been flagged to support and promote community tourism activities as part of the tourism visitors' experience in a destination. Mechanisms that give community members tools to interact with travellers all over the world are critical to fostering sustainable involvement of local persons in the tourism product. STEN also aims to enhance the competitiveness of the small tourism enterprises in the Caribbean to meet new international standards and expectations of travellers in the digital age. STEN is an inclusive programme, which includes Antigua and Barbuda, the Bahamas, Belize, Barbados, Dominica, the Dominican Republic, Grenada, Guyana, Haiti, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago. Programmes like these have already contributed to enhanced marketability and viability of tourism MSMEs in the Caribbean, and an improvement in the use of ICT tools for marketing of MSMEs and to enhance promotion/communication. Importantly, sites, attractions, and community tourism activities are gaining added visibility and patronage on social media platforms.

Plans are also under way for a Single ICT Space for CARICOM to enhance the environment for investment and production by building the digital economy over the period 2014 to 2019. This process led to the articulation of a vision for the Space as "an ICT-enabled borderless space that fosters economic, social and cultural integration for the betterment of Caribbean citizens". This is a valuable step in breaking unnecessary barriers existing amongst CARICOM states in order to allow for the free movement of goods, people, services, and capital, as envisioned by the Caribbean Single Market and Economy (CSME).

This is a step in the right direction, as research has indicated that ICT components have a positive impact on the satisfaction experienced by hotel

guests in both Jamaica and the Bahamas. According to Chevers and Spencer (2017), in Jamaica wireless internet service, telephone service, dining table reservation, in-room television, and skyping facilities are critical due to a larger number of all-inclusive hotels being existent. The implication is that where guests spend a majority of the vacation on property, they expect that ICT systems will create greater ease. According to the same authors, in the case of the Bahamas, where there is a larger number of European Plan (EP) hotels—guests pay for room-only, there were two significant ICT components. These are an automated wake-up system and in-room television. The implication is that guests expect less from a hotel since they spend less time on properties, while searching for food and entertainment options externally.

In the not so distant future, Caribbean SIDS will have to consider how to move to towards smart tourist destinations. These would embody an innovative consolidated space with cutting-edge technology infrastructure that combines the concepts of sustainability, leisure, and technological innovation. The added value provided by the smart tourist destination is the consideration of the visitor/tourist at its centre. Placing the visitor at the centre of developments will facilitate the generation of integrated intelligent systems, improving the integration and interaction with the destination (before, during, and after the travel), creating elements that facilitate the interpretation of the environment, streamline decision-making, and increase the quality of visitor experience and getting real time feedback on goods and services. Travel agents capable of differentiating their services in today's globalized and digital market will be leaders in creating socialized brands in new technological environments.

Therefore, travel agencies have to be ready and willing to move towards the digital age despite what may be perceived as risks. Indeed, an important factor in determining technology adoption is the extent of risk and uncertainty related to the implementation of ICT. For example, firms will be more inclined to do business online if the infrastructure for online payments, delivery, and guarantees is secure. Assets and resources are also prerequisites that influence the decision to adopt ICT. In essence, the availability of financial and human resources can enable an organization to invest and implement the desired technology, embark on system integration, conduct employee training, and develop long-term ICT capabilities for sustainability. It is believed that if administrators perceive ICT to be a strategic tool, then the associated resources will be allocated for its implementation. On the contrary, if administrators lack the vision and foresight regarding the benefits of ICT, then the technology might not

be implemented and if implemented, its implementation might not be effective enough to realize the potential benefits. Work on the leadership factors that determined whether Jamaican travel agents adopted ICT in their operations by Spencer (2013) facilitated a reconceptualization of the leadership element in the technology adoption discourse through an identification of leadership characteristics at each level of technology adoption. The key adoption being investigated was online selling practices and social media adoption was also included as an aspirational level of adoption. Spencer found that technology adoption behaviour in these organizations related to how decisions were made about what technologies to adopt and how to implement and sustain their use. The framework essentially posits that ownership as well as leadership, influenced by previous experiences, affects firm structure such as size, control, and division. Also, they influence creativity and risk taking as elements of entrepreneurship and leadership issues such as motivation, stimulation, charisma, and strategic change. The trickle-down effect is that strategy formulation, implementation, and resource allocation are affected by these elements. Ultimately firm behaviour and activities in terms of input, processes, and output, are influenced and this affects innovation adoption.

Spencer's work revealed that the perceptions of these owner-managers did not generally favour a greater use of internet technology in sales and marketing efforts. They typically felt that such technological investments were high-risk and yielded low returns on investments. Of particular interest was the fact that they were able to identify some potential benefits of using the internet such as speed, convenience, and efficiency but this did not outweigh the perceived psychological risk of becoming too dependent on the internet. This, they felt, would mean that they would lose the strength of their personal interaction with clients. A few exceptional respondents had differing perceptions which led to a greater openness and intention to increase adoption. Their views suggested that the use of multiple platforms was the best approach. In this way personal contact would be maintained for those clients who required this, while new platforms could be created for more technologically savvy customers. From a resource perspective owner-managers indicated that they face human and financial resource constraints. Many owner-managers implied, however, that they did not feel that there were other technologies which they needed but could not have because of limited resources. In simpler terms even if they had the resources they may not be inclined to adopt more technologies. The implication is that the decision of how to allocate

already limited resources is the sole purview of owner-managers. The tendency to prioritize spending in areas other than technology adoption was a reflection of the individual leader's preferences and comfort zone. Most respondents to the study saw that there were potential benefits of greater technology adoption for their firms; however, their own technology understanding and capability influenced adoption decisions.

In the final analysis firm strategy and resources did not sufficiently explain differences in adoption behaviour in the firms. These factors were especially insignificant in explaining why some firms were at different levels of the technology adoption hierarchy as strategies and resource constraints were not heterogeneous enough to answer the question of why some firms were more technologically advanced than others. These internal factors emerged as a product of differences in the leadership of these small, owner-managed travel firms rather than as significant input factors into the decision to adopt newer technologies. Contextual issues such as culture and the digital divide may explain overall industry behaviour but they are inadequate in explaining differences in behaviour among firms within the same society. The constructs assessed were values, norms, traditions, and social interactions. The firms investigated are faced with similar external environments in which to operate and yet they make different choices operationally and strategically. The examination of culture as a factor revealed that firms were operating in a relationship-oriented society where friendships and familiarity influenced business relationships. In addition to a relationship orientation, the national culture had an impact in that it promoted traditionalism with strict adherence to norms within the society.

Conclusion

In order to take advantage of today's global economy and maintain the economic importance of tourism in the region, the Caribbean needs to remain and gain competitiveness. So far, most of the Caribbean countries have based the development of tourism on what their location can naturally provide: nice sceneries, beaches, and, more recently, natural, cultural, and medical resources. However, the region needs to work further on its unique characteristics to become a destination that is articulated intelligently, in a way that fosters productivity and efficiency based on innovation, while preserving its authenticity. Generally speaking, the adoption of ICT changes radically the traditional functioning

and competitive landscape for most industries and sectors. Increased competition and globalization have provided the impetus for hotels to identify methods that will provide a competitive edge. The adoption of ICT has been the preferred method by most hotels to manage the transformation of the hotel industry landscape. ICT facilitates instantaneous access to hotels' products and services by the consumer irrespective of their geographical location. Furthermore, the capabilities which ICT applications possess have allowed hotel management to successfully target consumers worldwide; the rapid growth of mobile computers and web technologies has made this significantly easier. The use of ICT to tailor the tourism product produces an increasing level of guest satisfaction. Therefore, improving customer satisfaction is viewed as imperative for prolonged success and survival.

ICT has changed and continues to change the nature of contemporary tourism. Its major adoption in all parts of the industry is transforming tourism into an information- and knowledge-intensive sector, valid in a globalized economy. Caribbean tourism authorities should recognize the capacity of ICTs to empower their local SMEs and their competitive capacities considering them when designing new policy policies. The benefits of ICT policies to empower destinations include enhanced communication, access to information, increase productivity, acquisition of new skills and knowledge, which are critical for many of those businesses improving their marketing strategies, especially through e-commerce and direct interaction with tourists. Additional resources will be needed to support SMEs modernization and digitalization; launching ICT training programmes; training hospitality students in the area, and improving their online visibility and interaction with the digital traveller. Incorporating innovation and new technologies in the tourism sector must be facilitated by training and skills policies for human resources in the sector—investing in the creation and consolidation of own skills through training. Most Caribbean countries have a large skills gap in this area, to the extent that this know-how is not usually part of the training curriculum of most universities and vocational training in the region, and is much less specifically applied to the tourism sector. It is therefore essential to develop specific policies and programmes in the region to strengthen these skills. Without sufficient allocation of resources and IT training, Caribbean countries run the risk of being on the wrong side of the digital divide. National governments and their regional partners are invited to consider policy guidelines to ensure that ICTs contribute to the sustainability of the tourism sector.

E-tourism strategies should be integrated into the broader framework of national ICT policies and national tourism policies should address the need for a national enabling environment for the uptake of ICT in tourism. Basic ICT skills within the tourism workforce should be encouraged through the teaching of ICT in pre-schools, primary and secondary schools, and adult education, and the uptake and use of ICT by tourism SMEs, including those in remote areas, should be facilitated by providing easy and low-cost access to ICT solutions.

References

Baller, S., Dutta, S., & Lanvin, B. (2016). *The Global Information Technology Report 2016: Innovating in the Digital Economy*. Geneva: World Economic Forum. Retrieved from http://www3.weforum.org/docs/GITR2016/WEF_GITR_Full_Report.pdf.

Bertin, C. K. (n.d.). *Information and Communication Technologies and Tourism: Information Systems Implementation and IT-Enabled Organisational Change in the Tourism Sector*. Retrieved from http://unpan1.un.org/intradoc/groups/public/documents/tasf/unpan023745.pdf.

Chevers, D. A. (2015). Evaluating the Impact of ICT Usage on the Performance of Jamaican Hotels: A Conceptual Perspective. *Journal of Tourism and Hospitality Management, 3*(1–2), 22–31. https://doi.org/10.17265/2328-2169/2015.02.003.

Chevers, D. A., & Spencer, A. (2017). Customer Satisfaction in Jamaican Hotels through the Use of Information and Communication Technology. *Worldwide Hospitality and Tourism Themes, 9*(1), 70–85. https://doi.org/10.1108/WHATT-11-2016-0068.

Flamm, M. (2013, February 11). US Lags Europe in Tech Adoption. *Crain's New York Business*. Retrieved from http://www.crainsnewyork.com/article/20130211/TECHNOLOGY/130219991/u-s-lags-europe-in-tech-adoption.

Law, R., & Leung, R. (2000). A Study of Airlines' Online Reservation Services on the Internet. *Journal of Travel Research, 39*(2), 202–211. https://doi.org/10.1177/004728750003900210.

Law, R., Buhalis, D., & Cobanoglu, C. (2014). Progression Information and Communication Technologies in Hospitality and Tourism. *International Journal of Contemporary Hospitality Management, 26*(5), 727–750. https://doi.org/10.1108/IJCHM-08-2013-0367.

Minghetti, V., & Buhalis, D. (2010). Digital Divide in Tourism. *Journal of Travel Research, 49*(3), 267–281. https://doi.org/10.1177/0047287509346843.

Scarborough, S. (2013, June 10). *Trends in Travel, Tourism and Technology*. Paper presented at ICTT 2013: International Conference on Travel Technology India, Kovalam, Kerala.

Sigala, M., Airey, D., Jones, P., & Lockwood, A. (2004). ICT Paradox Lost? A Stepwise DEA Methodology to Evaluate Technology Investments in Tourism Settings. *Journal of Travel Research, 43*(2), 180–192.

Spencer, A. (2013). *The Leadership Imperative: Technology Adoption and Strategic Management in Travel Firms in Jamaica*. Newcastle Upon Tyne: Cambridge Scholars Publishing.

Spencer, A. (2014). Tourism and Technology in the Global Economy: Challenges for Small-Island States. *Worldwide Hospitality and Tourism Themes, 6*(2), 152–165. https://doi.org/10.1108/WHATT-12-2013-0047.

Vong, K. (2012). *How Technology in Tourism Is Taking Travel to the Next Level*. Posted July 11. Retrieved from https://www.trendreports.com/article/technology-in-tourism.

Waller, L. G. (2006). *ICTs for Whose Development? A Critical Analysis of the Discourses Surrounding an ICT for Development Initiative for a Group of Microenterprise Entrepreneurs Operating in the Jamaican Tourism Industry: Towards the Development of Methodologies and Analytical Tools for Understanding and Explaining the ICT for Development Phenomenon*. PhD Thesis, University of Waikato.

Williams, R. C., & Phillips, A. (2014). *Information and Communication Technologies for Disaster Risk Management in the Caribbean*. Chile: ECLAC. Retrieved from https://repositorio.cepal.org/bitstream/handle/11362/36735/1/S20131130_en.pdf.