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Digital economy and tourism impacts, influences and challenges

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Abstract

Digital economy is based on electronic goods and services produced by an electronic business and traded through electronic commerce, a business with electronic production and management processes and that interacts with its partners and customers and conducts transactions through Internet and Web technologies. With growing population and resource mobilization, digital economy is not limited to business trading and services effecting on every aspect of life from health to education and from business to banking. Many observers have noted the rapid growth of the broadly defined digital economy. Much attention is being paid to the ongoing and dramatic growth in electronic or e-commerce. In spite of its rapid growth in recent years, we view the emergence of e-commerce as an important trend that is only part of the more general changing structure of the economy brought on by the dramatic changes in information technology (IT).The main purpose of this paper is to show the digital economy effects on tourism industry through Internet and Web technologies.

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1. Introduction

The definitions of tourism innovation (such as product, service and technological innovations) remains unclear, with the exception maybe of the Internet. New technologies can produce an essential contribution to tourism development.

For tourism businesses, the Internet offers the potential to make information and booking facilities available to large numbers of tourists at relatively low costs. It also provides a tool for communication between tourism suppliers, intermediaries, as well as end-consumers.

According to WTO, the Internet is revolutionizing the distribution of tourism information and sales. An increasing proportion of Internet users are buying on–line and tourism will gain a larger and larger share of the online commerce market.

E-commerce is defined as the process of buying and selling or exchanging products, services and information via computer networks including the Internet (Turban, Lee King & Chung, 2000). However, adoption of Information and Communication Technologies (ICT) is only part of the story. In particular, network access costs, dissemination of information on electronic commerce, training, skill development and human resources provide big challenges for smaller companies.

Most research suggested that governments play an important role in facilitating the use of electronic commerce for the tourism industry and in increasing their ability to reap the benefits. The two main factors for conducting successful e-commerce are 'security of the e-commerce system' and 'user-friendly Web interface', thus recognizing that building customer trust and convenience for customers are essential to succeed. In spite of its rapid growth in recent years, we view the emergence of e-commerce as an important trend that is only part of the more general changing structure of the economy brought on by the dramatic changes in information technology.

The terms "digital economy," "information technology," and "electronic commerce" do not have standard definitions. When referring to information technology, we will be referring to information processing and related

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equipment, software, semiconductors, and telecommunications equipment. References to electronic commerce will mean the use of the Internet to sell goods and services. We interpret digital economy as including both information technology and electronic commerce.

The digital economy is not a standard classification for economic data, so there may be some disagreement on what it entails.

A digital economy is an economy that is based on electronic goods and services produced by an electronic business and traded through electronic commerce. That is, a business with electronic production and management processes and that interacts with its partners and customers and conducts transactions through Internet and Web technologies. The concept of a digital economy emerged in the last decade of the 20th century. Nicholas Negroponte (1995) used a metaphor of shifting from processing atoms to processing bits.

E-Government is already playing its part in this digital economy by providing e-services through various ministry/department to its e-Citizen.

Electronic commerce has contributed to changes in transportation and distribution services, by relying on the increased availability of air and courier services and local trucking to get its product to consumers. The growth of the digital economy1 is unprecedented and has been a major contributor to recent economic growth, the booming stock market, and the revival of productivity.

1.1. Internet technology

When the Internet first commercialized it was relatively mature in some applications, such as commercial infrastructure and software applications for business use. This was due to the fact that complementary Internet technology markets developed among technically sophisticated users before migrating to a broad commercial user base.

The invention of the web in the early 1990s further stretched the possibilities for potential applications, exacerbating the gap between the technical frontier and the potential needs of the commercial user.

The technical frontier changes frequently, both in terms of maximum achievable engineering goals and in terms of viable commercial activities that generate revenue in excess of resources.

When the technology migrated away from these users and into wider use, some capabilities were obviously valuable, such as e-mail.

Worldwide, approximately 304 million people had Internet access by 2000, a nearly 80-percent increase from the previous year. In contrast, only 3 million people around the globe had similar access in 1994. Most of the growth occurred outside of the United States and Canada, which for the first time totaled less than half of those with online access. However, the number of American Web users still rose by 40 percent. In most other areas of the world, Internet access at least doubled. Access in Africa showed a 136-percent increase; Asia and the Pacific, 155 percent; Europe, 108 percent; the Middle East, 111 percent; and South America, 102 percent.

The Net is now the iconic technology of our age. Everyone is able to buy and sell in cyberspace. States will no longer be able to control electronic commerce which can cross national borders. Dramatic decreases in the price of IT-related technology fueled phenomenal growth in Internet expansion and use. From 1995 to 1999, computer prices declined at a rate of 26 percent annually, rapidly making computer technology available to a widening percentage of the population.

1.2. Development of Electronic Commerce

In these ways, electronic commerce has the potential of greatly changing the ideal situation of economy. However, efforts are beginning to be made to prepare for the age of electronic commerce, including recent positive signs in investment in information technology among companies, as well as the precursory introduction of electronic commerce in some sectors.

Information technology, which is the foundation of the "digital economy," will continue to develop at a rapid pace, and for this reason there will be considerable changes in the ideal situation of economic activities. There will be widespread dissemination of electronic commerce, and digital information will pervade into all aspects of the lives of the people.

The rules which applied to the economy of the past (the legal system, commercial practices, etc.) would no longer apply in the age of the digital economy as they are. For this reason, it is necessary to consider the establishment of new rules to deal with this situation.

1.3. Resolution of Problems through Technology and the Marketplace

If new problems should arise from the introduction of information technology for the digital economy, rather than immediately adopting regulations to deal with these problems, these matters should basically be solved by technological means, as well as competition in the marketplace or through the creation of new independent business practices in the private sector. Even if considering regulations should become unavoidable, they should be kept at a minimum taking

into consideration the interest to be protected by the law and harmonization with traditional solutions to similar issues.

1.4. Security and Trust

If electronic data which are exchanged through electronic commerce are exposed to theft, falsification or unauthorized access, there will be remarkable damage in the degree of trust for the foundation of the digital economy. Also, neglecting social problems accompanying the development of the digital economy, including the problems of the circulation of obscene information and the obstruction of privacy, and consumer-related problems, will make it impossible to assure security in economic activities. In order to realize the sound development of the digital economy, these problems should be adequately dealt with, basically through technology and the marketplace.

1.5. Universal Access

In the age of the digital economy, business opportunities for small and medium size enterprises as well as local industries will increase dramatically through the effective application of information technology, and in this way it will enable the economic frontier to expand. For this reason, an environment should be created in which all businesses and individuals will be able to have equal access to the digital economy.

1.6. International Coordination

With an understanding of the global characteristics of a network-based digital economy, the governments should promote the rigorous exchange of information and policy coordination among different nations.

1.7. Digital Economy and Tourism

The tourism sector is challenged by a growing demand for customer orientation, increasing international competition, volatile markets in an insecure environment, changing customer demands towards individualization and significant potential in various market segments.

Furthermore, it is vitally important for the sector to be able to attract the labor force trained specifically for work in tourism. The problem was noted that some employers deliberately look for unqualified labor for the sake of paying less. The question, however, remains whether such a policy would lead to higher profits and longer-term competitiveness. Another important question remains: how can the skill gaps in the tourism sector be overcome under the condition of insecure and often seasonal employment and relatively low pay?

Over the past six decades, tourism has experienced continued growth and diversification to become one of the largest and fastest growing economic sectors in the world. Over time, more and more destinations have opened up and invested in tourism development, turning modern tourism into a key driver for socioeconomic progress.

Today export incomes generated by international tourism ranks fourth after fuels, chemicals and automotive products. For many developing countries, it is one of the main income sources and the number one export category, creating much needed employment and opportunities for development.

1.8. Global network

In order to meet a number of challenges that the sector faces, global network was identified as one of the technologies that could help the tourism sector to meet a number of challenges, including direct booking, marketing as an important tourist destination, etc.

1.9. Multimedia

This is seen as a crucial technology that could help promote tourism both locally and internationally. Several key technologies that would underpin multimedia were identified, including large, wall-hung, high-definition screens, digital sound and voice recording, and artificial worlds to mention a few.

1.10. Alternative transport systems

If tourism is to survive, several modes of transport to meet the diverse needs of tourists will have to be considered. These modes of transportation could be divided into two types, the faster mode from one location to the other and the second mode, which is mainly for scenic viewing. For the faster mode, magnetic levitation, fast trains and lighter, faster airplanes have been identified while for the second mode, airships and hot-air balloons have been identified.

1.11. Infrastructure

This is identified as the key to expanding tourism to underdeveloped sites. The infrastructure is also divided into two parts, physical and IT infrastructure. Physical infrastructure includes water purification, renewable energy and light rail, while IT infrastructure includes smart-card readers, satellite links, etc.

In addressing areas of strategic involvement and actions needed for socio-economic development and competitiveness purposes, the following benefits of the collaborative process are apparent:

- Pockets of innovative capacity within the country
- New ideas, opportunities and future markets
- Emerging transport, information and infrastructure investment opportunities
- Contribute to influence policy and better decision making

Technological change is driving economic development. In recent times, a number of countries have embarked on technology foresight to guide research and development and to help with policy design.

Tourism has become a fiercely competitive business. For tourism destinations the world over, as indeed, competitive advantage is no longer natural, but increasingly man-made and driven by science, technology, information and innovation.

The tourism system is very information sensitive. A model for discussing technology in tourism is indicated in the diagram below. The tourism destination incorporates a mix of attractions and traveler services and consists of a mix of interdependent elements, such as attractions, facilities, infrastructure, transportation and hospitality. In short, attractions draw visitors to the area. Facilities serve the needs of the visitors while they are away from home.

1.12. International and Local Trends and Driving Forces

Global forces of competitiveness, information technology and socio-cultural dynamics are impacting and shaping tourism destinations significantly.

Places, culture and identities seem to converge in the world of international travel. The global economy is being transformed by forces of regional trading blocs, global alliances, deregulation, new technologies, the Internet and electronic commerce. It will be necessary to understand the powerful driving forces that will create the future if we are to realign and reframe the agenda for research and technology, and that will be the focus of attention in this chapter.

At the same time, travelers are becoming more knowledgeable, more informed and demanding. Competition has shifted from improving productivity to value-added quality, flexibility and agility in the marketplace, and meeting customer demands anywhere, anytime with customized solutions. Decisions are becoming more rapid and reaction times shorter, so that success will depend on one's ability to position products and services and to respond rapidly to customer needs.

While knowledge and innovation are crucial to success, the global economy is also characterized by marked socio-economic disparities between developed countries and developing economies.

A key feature of globalization is the mobility of information, capital and people driven by the restructuring of economic relations and competition. In responding to the strategic challenge calls for local initiative that is both innovative and flexible.

Local communities are increasingly shaped by the interplay between what occurs at the local and global levels.

As the world's largest industry, tourism development is incumbent on the outcome of global and local forces as they impinge on the economy, where tourism caters to the needs and interests of global audiences, but is also geared towards the cultural needs and leisure aspirations of local communities. The challenge is to integrate the local with the global in a relational context.

There is growing evidence of a new paradigm in tourism policy to influence the competitive position of a destination under conditions of global competition. Tourism has become a fiercely competitive business. For tourism destinations the world over, competitive advantage is driven by technology, information and innovation.

1.13. Economic impact of tourism

Tourism is the leading economic driver for the millennium. The World Tourism Organization is calling on governments around the world to unleash tourism's job creation potential by improving information networks and capitalizing on its human resource capital by incorporating innovation and investment know-how.

Travel and tourism are now the largest generators of jobs, accounting for about 11% of the global workforce. The economic impact of tourism is aptly demonstrated by its relative contribution to GDP, foreign exchange earnings and employment opportunities. Where tourism is well integrated into the tourism economy, the job creation prospects are good. Good transport infrastructure is critical for the development of tourism .Globally, the airline transport market has continued to expand and this trend is expected to continue. Air traffic control and safety at many regional airports are poor by international standards and require upgrading in terms of both equipment and staff. The problem areas require improved telecommunications infrastructure and satellite-based navigation. The rapid application of technological

developments will improve the current navigation and safety position.

1.13.1. Technology impact

The global convergence of technology is penetrating and supporting the tourism industry through an array of major technologies. The global increase in consumer demand for tourist products has provided one of the main driving forces in the development of a wide range of technologies. Information is the backbone supporting tourism.Therefore, timely and accurate information relevant to consumers' needs is often the key to satisfying tourist demand. Within the fiercely competitive global tourism environment, prospective travelers are continuously faced with more information and options. The combination of these forces and the need for professionalism in handling the information supplied to the consumer necessitates the use of technology to gather, manage, distribute and communicate information.

Over recent years, information technology has experienced an unprecedented degree of change. The Internet and e-commerce are increasing at a rapid pace and are fulfilling a vital support role in such activities as global connectivity and foreign business activity.

The application of information technology (IT) and telecommunications, as well as technologies specifically designed and developed for the tourism industry, includes the management of the various modes of transportation, travel distribution systems, the hospitality industry, and the recreation and entertainment components of tourism. The use of IT technology in the management of ecosystems, wildlife populations and natural areas is becoming increasingly important.

1.14. The Economics of Tourism

The tourism industry generates substantial economic benefits to both host countries and tourists' home countries. It is an especially important industry to developing countries. The main benefits of tourism to a country are foreign exchange earnings, tax revenues, business opportunities for budding entrepreneurs, and employment for workers in the industry. According to the WTO, "Tourism is one of the top five export categories for as many as 83% of countries and is the main source of foreign exchange earnings for at least 38% of countries." Foreign exchange earnings from exports are used to purchase imports and augment reserves. They generate income in the host country and can stimulate consumer spending and investment in other sectors of the economy. Tax receipts from tourism are both direct and indirect. Direct tax receipts are generated from the incomes earned by businesses and workers. Indirect taxes are duties levied on goods and services purchased by tourists

Tourism is a monopolistically competitive industry. It has many relatively small enterprises producing slightly differentiated products and services. Tourism is an information-intensive industry with a quite long value chain. Seeking information about booking, transport, accommodation and destination is a process where traditionally suppliers, intermediaries and consumers had their own role using their own specific information systems (Henriksson 2005). However, the entire tourism industry structure is changing (Werthner and Ricci 2004), and this may be easily understood if we focus on the distribution factor: e-commerce is incredibly appropriate to the tourism industry because the consumers are not usually close to the places where production essentially occurs. This also stands for all the intermediaries between suppliers and end users (Scavarda et al. 2001).

Insufficient adoption of information and communication technologies (ICTs), is considered as a barrier to equal opportunities to commercial activities: people and businesses without access to the Internet and related technologies are incapable of benefiting from e-services provided and could be gradually driven out of competition from global markets (Pimenidis et al. 2006). In fact, ICTs have contributed to the massive growth of tourism and the increased volume of supply and demand. ICTs have been changing the way in which tourism companies conduct their business.

E-tourism therefore emerged as a term describing the entire range of applications of ICTs on tourism industry. Tour operators, travel agencies, hotel enterprises, car rental companies, cruise companies, etc. can benefit from the advantages of ICTs since these technologies could support many functional activities, such as:

1.14.1. Marketing

Tourist products and destinations are better advertised via the Internet rather than traditional means, like brochures, advertising catalogs, etc.Furthermore, ICTs allow direct and interactive relationships between tourism organizations and customers. But the most interesting perspective of ICTs applications on marketing is that, companies can build a customer’s profile and make personalized offerings.

1.14.2. Sales

Sales can be successfully accomplished without the need of any intermediaries. For example, a customer is able to perform online booking without the intervention of a travel agent. There is also the possibility to use intelligent agents in some stages of the selling process, thus leading to increased overall productivity of the tourism organization by releasing human resources.

1.14.3. Operations

Management information systems, enterprise resource planning, customer relationship management (CRM), and other systems based on ICTs can accelerate and facilitate information flow, including acquisition, storage, processing and transfer of information concerning internal processes and tourism business environment.

1.14.4. Human Resource Management

It is a fact that increased personnel mobility in tourism organizations of seasonal demand (e.g. hotels, travel agencies) generates higher costs of HRM. ICTs enable online recruitment, training and evaluation, reducing efforts, time and costs required (Garce´s et al. 2004).

1.15. Purchasing

Best supplier opportunities all over the world can be detected via the Internet and buyer-seller transactions are easily accomplished in a completely electronic environment.

An interesting issue to deal with is what actually the Internet and the other ICTs mean for tourism organizations. Is the use of the Internet a competitive advantage for the tourism industry? Are the applications of ICTs going to replace all conventional ways of doing business? And of course, the crucial question is whether to create separate Internet strategies or integrate the Internet into an overall strategy.

First of all, we need to examine the impact of the Internet on tourism industry structure. According to Porter (2001) the underlying forces of competition which determine the structure of an industry are the same irrespective of whether this industry belongs to the traditional or new economy. These forces are: (1) the intensity of rivalry among competitors, (2) the barriers to entry for new competitors, (3) the threat of substitute products or services, (4) the bargaining power of suppliers, and (5) the bargaining power of buyers. Let's try to explain very briefly how the Internet influences the structure of tourism industry.

Rivalry in the market: the competition of tourism organizations over the Internet is much more intense. It is mainly a price competition instead of offering a product of better quality or differentiating the service package. Another argument that competition will continue to increase is that numerous non tourism organizations are entering the sector and start to provide online tourist services. Hence, the effect of the Internet on rivalry is strongly negative.

Barriers to entry: the barriers for a new entry to e-tourism have been minimized, since the technological obstacles as well as the necessary resources to start up an online business (capital, personnel, etc.) are very limited, compared to traditional tourism business. As more traditional companies turn to the online channel and more online companies enter the market, tourism organizations will be exposed to increasing threats. The effect of the Internet on barriers to entry is moderately negative.

Threat of substitutes: it is nowadays easy, costless and not time consuming to find substitutes for any tourism business via the Internet (rooms to let instead of hotels, transportation by rail or ship instead of airlines, etc.). Even if we looked for substitutes for tourist products and services outside the tourism sector, we would be amazed by the many alternatives the Internet provides (entertainment, cultural and sporting activities, etc.). It is concluded that, the effect of the Internet on threat of substitutes is moderately negative.

Bargaining power of suppliers: tourism organizations are capable of offering their products and services via the Internet to more customers without depending upon any traditional intermediaries. This implies a better bargaining position of suppliers. However, suppliers will continue to work with online intermediaries, thus leading to another kind of dependencies. Consequently, the Internet seems to have a slightly positive in parallel with a slightly negative effect on bargaining power of suppliers.

Bargaining power of buyers: the direct relationships between customers and e-tourism organizations have increased the bargaining power of buyers.

Moreover, as customers become more familiar with the Internet technology, their loyalty to specific service providers will decline; in combination with the low costs of switching a supplier over the Internet, the bargaining power of buyers will also strengthen. Hence, the effect of the Internet on bargaining power of buyers is strongly positive.

Using the Internet can really create multiple benefits for a tourism organization, but on the other hand, as we can see in Table 1, it is related to some important negative implications on tourism industry. To deal with these implications, we need to realize that ICTs (including the Internet technology) are nothing else but complementary tools, which have to be integrated into an overall strategy. Indeed, ICTs do not guarantee profitability unless their adoption is related to the company's strategy (Powell and Dent-Micallef 1997). Concerning the adoption of ICTs in small and medium-sized tourism enterprises, being the vast majority of tourism enterprises around the world, three of the most commonly cited obstacles are:

the inadequate and unreliable telecommunications infrastructure (nowadays only in developing countries), (2) the cost involved with adopting and using ICTs, and (3) the lack of the relevant knowledge and skills (Karanasios and Burgess 2008).

According to Buhalis (1998), two strategic directions could be followed: tourism organizations could either offer differentiation value, by designing high quality personalized arrangements, which customers would be willing to pay a

premium for, or they could offer cost value by delivering less expensive products than competitors, through standardization, high volume and consolidations. Buhalis also suggested a strategic framework, demonstrating how ICTs contribute to the tourism business strategy development, as well as all the possible interactions between tourism organizations and customers.

1.16. Implications for tourism policy

The role of government is very important. The key principle is that the private sector leads the market. The government should avoid creating undue obstacles to e-commerce and its aims should be to support and enforce a predictable, minimal, consistent and simple legal environment if governmental involvement is needed. Active government support to foster an entrepreneurial culture is important. Key policy agendas include; 1) improving the legal and regulatory framework, 2) moving government procurement on line, and 3) facilitating e-transformation in industry sectors.Finally, government could help the growth of e-commerce in various ways through, planning, creating the legal and regulatory framework, building capacity in information technology infrastructure, skill formation and manpower planning, and also undertaking promotional and incentive measures.

ICT is transforming the global economy and creating new business linkages and opportunities that cross business sectors, cultures and distances.

Access to these technologies remains difficult in many parts of the world especially in the Least Developed Countries (LCD's) – this inequality is referred to as the "digital divide"

Often the "Digital Divide" is a reflection of social and economic inequity between and within developing countries.

Developing countries have a necessity to proactively integrate themselves into the ICT Society in order to avoid remaining on the periphery of the global economy – this is particularly true of the tourism sector.

Tourism is an information intensive sector and ICT a key driver for developing countries in organizing and marketing their tourism products.

No sector has been more affected by the "technology revolution" than

Tourism – ICT have totally changed the historical trading structures of the industry – and of these technologies possibly the commercialization of the Internet has resulted in the most dramatic changes.

Not only have ICT's 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 stakeholders to access market and management data, to share information and build trading partnerships.

Encouraging the development of e-business practices in a developing economy makes it easier for countries to share information and to encourage co-operation among stakeholders.

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 into a local economy.

ICT's have become one of the most effective tools for addressing the imbalance between competing destinations in the global market. Indeed for many tourism market sectors and tourism products, marketing and selling via Internet is fast becoming the accepted and preferred method. Because of the costs, plus lack of local ICT providers and facilities, the practice in many developing countries has been for much of the offline and on-line marketing and distribution services to be provided by service providers based in developed countries.

As with the provision of investment capital, air services, and certain skills and expertise the provision of ICT's has become another vital dependency that some developing countries do not have totally within their own control and may affect their ability to achieve sustainable tourism development .Understanding the opportunities brought about by ICT's in the tourist sector and implementing effective e-business solutions has, in many developing countries, become a priority for tourism providers and public authorities at national regional and community levels.

Policy makers and tourism enterprises today need to understand the implications of ICT developments and the importance of their role in developing and maintaining a strong sustainable tourism industry.Making ICT and e-development strategies an integral part of policy planning is now essential in order to support the necessary human and physical infrastructure and to introduce and adopt measures to ensure equitable access and widespread capability to make maximum use of ICT's.

These ICT and E-Development strategies need to take into account the following issues:

- Access and Use
- Enabling Environment
- Human Capacity
- Global and National Governance Issues
- New Tourism Markets and Practices and Strategies for growth

Policy Implications include

- E-tourism strategies should be integrated within the broader framework of national ICT Policies
- The role and contribution of Public Authorities in providing infrastructure and human capacity and encouraging the use of ICT's relevant to tourism.

- Identify and include tourism niche products in national tourism development plans that can be easily and cost effectively marketed and managed using ICT's, in order to increase the attractiveness, competitiveness and uniqueness of the destination
- Support ICT's use by SME's, and consumers, including remote areas, by providing easy and low cost access to ICT solutions.
- Organize regular consultative meetings and share knowledge with other destinations in order to define appropriate ICT strategies and implementation plans and timetables.

Developing countries need to adopt ICT's and associated business processes and management skills in order to remain competitive in the constantly changing and increasingly competitive global tourism market.

The positive effect of ICT's on the tourism industry in a developing country depends on a national enabling ICT environment that relies on multiple factors including:

- Access
- Infrastructure
- Education
- Capacity Building
- Legal Framework

Without governments understanding these opportunities and challenges, and failing to address these issues in the form of tourism policies, and by not adopting pro-active implementation the tourism sector will fail to take advantage of the opportunities to improve product and market share in tourism markets, and is unlikely to develop a tourism industry that will be sustainable in the longer term The Sustainable Tourism Workshop will discuss some of these issues, matters and policy implications.

2. Discussion and Conclusions

The ubiquity of computers and the Internet at home, school and work is creating a sense that the economy is changing in fundamental ways: in the way that goods and services are produced, distributed and sold, and in the training and skill requirements of the work force. While the ubiquity of IT is self-evident, our ability to quantify its impact on the economy is limited by the nature and types of data currently being collected by federal statistical agencies and other sources. There are a number of unresolved conceptual questions that exacerbate the measurement difficulties. For instance, the IT revolution is closely connected to growth of sectors of the economy (e.g., services) which we have traditionally struggled to measure.

The emerging digital economy is forcing the statistical agencies to rethink how they measure the basic building blocks of our national accounts: outputs, inputs and prices. Some progress has been and is being made on refining the measurement of individual components (e.g., the national investment in computers taking into account changes in computer quality and the fraction of retail sales accounted for by e-commerce). Clearly, policy and research needs should direct further efforts by statistical agencies to improve data collection and measurement of the emerging digital economy. In this paper, we have outlined many of the issues involved in improving our measurement of the digital economy. However, while policymakers and researchers have an insatiable appetite for data, concerns about respondent burden and the resource costs of collecting data cannot be ignored. It is not likely that all the suggestions that we, or other observers, offer can be implemented. Therefore, realistic priorities must be set by the data using community.Moving into the new millennium, the competitive environment creates major opportunities, but also represents major risks for those who don't change or adapt to the change. In exploring the options and potential areas of investment, it is prudent to benchmark the technologies. The travel and tourism industry has to work hard at integrating multiple channels that allow customers to switch effortlessly between them. The new technique visualizes innovation through mapping to help spot patterns and craft strategies. In the digital economy there is an emerging infrastructure of networks, which blurs the boundaries between sectors. The convergence of technologies is apparent as demonstrated by an example from the airline industry. This effectively implies that Boeing becomes a design, networking, project management and marketing company, working with suppliers and customers in e-business communities to design aircraft in cyberspace. According to analysis, much attention should be paid to the negative implications of the Internet on the tourism industry. The consideration of the Internet technology, being the major ICT, provides a clear view of the dramatic changes occurring in the tourism industry. In airlines, hotels and motels, car rentals, tour and travel operators, restaurants, special tour operators, and travel agents

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