

MEASUREMENT OF SPATIAL INEQUALITIES BETWEEN DESTINATION IN METAFORDISM PERIOD. THE ROLE OF INNOVATION VIA GRID COMPUTING

S. AVDIMIOTIS

Department of Tourism Management, Alexander Technological Education Institute of Thessaloniki, Thessaloniki, Greece
E-mail: soga@tour.teithe.gr

Abstract. It is inevitable that the development of tourism induces changes on the overall character of a destination, meaning that there are significant changes and impacts in the social, economic local activity and in the environment as well. On the occasion of the recent stock exchange crisis and the deliberation on the end of capitalism, it would be wise to approach historically the basic models of economic, and therefore, tourist development of the 20th century and their impact on the creation of contemporary tourist products, which is now based on the differentiation and flexibility of services and businesses, having at the same time a strongly sentimental nature. The object of our project is to stress the importance of new infrastructures and innovation for the contemporary tourism economy. The author of this paper believes that the basic problem underneath these scientific approaches is that the conceptual contexts of qualitative and quantitative basic elements have to be acknowledged and measured as well. As far as concerns the qualitative analysis there is no denying that qualitative aspects are mostly not included in the existing models of destination management. In this paper, under the hypotheses of the transformation of infrastructures, the use of Knowledge Management Techniques and the Schumpeters pattern of innovation and evolution, we conclude that differentiations and inequalities are emerging, among destinations. In order to measure these differentiations, it would be appropriate to use the indicators, developed in the laboratory of Environmental Planning of the University of Aegean, by Harris Coccusis.

Keywords: sustainable development, destination, infrastructure, information technologies.

AIMS AND BACKGROUND

On the occasion of the recent stock exchange crisis and the deliberation on the end of capitalism, it would be wise to approach historically the basic models of economic and, therefore, tourist development of the 20th century and their impact on the creation of contemporary tourist products, which is now based on the differentiation and flexibility of services and businesses, having at the same time a strongly sentimental nature.

The object of our project is to stress the importance of new infrastructures and innovation for the contemporary tourism economy.

THE FORDISM CONCEPT

Up until the mid-70's, in Western Europe and North America, the dominant model of economic and social organisation was one of more or less distinct features: that which some analysts call 'fordist capitalism'¹. The spatial expression of the term is associated with the concentrative tendencies of the great industrial units in the urban centres of the capitalistically developed countries*. The labour framework in question relies on a narrow spectrum of specialisation, the standardisation of the object of labour, making way for the production of products in large quantities and lines, which will nevertheless be characterised by small variety and great standardisation. Hence, during the period of the fordist model of development, a new social prototype was created and its main components were mass consumption of standardised products, supply of standardised goods and services, reduction of unemployment, as well as the labour model of full-time/ typical employment.

Not being an exception, tourism in the second half of the 20th century developed within the context of Fordism, producing standardised products – mainly holiday packages – placing no emphasis on quality, essentially establishing the model of 'mass production' that operated at the rate of the 'conveyor belts', meaning the production process was strictly specified at both levels of travel package creation and service supply.

The aforementioned 'organisation' elements of 'fordist development'³ started fading or even reversing in the last quarter of the 20th century, under pressure from the following important factors.

INDIGENOUS FACTORS

- The inflexibility and inability of the general, and consequently of the tourism, system – a natural inclination towards the uniform and standardised market – to meet the requirements of unstable demand, signified a break with the standardised mass production.

- The transformation of the technological base that has as a direct consequence the decline of the model whose major parameter for the viability and the dynamism of a business is 'size'.

EXTRANEIOUS FACTORS

- The internationalisation of the economic system which intensified competition while at the same time reduced the potential national governments have to influence their economies with the usual economic instruments.

* It is the so-called urbanisation phase, which lasts from the time of the industrial revolution until the first two post-war decades. The driving force of population concentration and activity in the big cities are the external economies of scale that the industry appreciates as a dominant form of economic activity².

- The introduction of new technologies and the parallel support of innovation in small/ medium businesses.
- The shift in the pattern of consumerist behaviour. The search for distinctiveness and uniqueness conflicted with the standardisation and the production of identical goods and services.
- Burdening of the social, environmental and economic resources mostly because of the intensity of production^{4,5}.

POST-FORDISM

Under the burden of the formation of the above-mentioned indigenous and extraneous organisational factors of fordist development, the trend of developing a new model was created, a model whose theoretical basis is the questioning of the mass production dynamic and the effort to set innovative business principles for the establishment of a new wave of economic welfare. This model was named post-fordism and was heavily promoted during the 1980's by political economy scientists in their effort to explain the dynamics of the reformation of production and consumption.

In the vein of cooperation and flexibility of the specialisation of the already globalised small/medium businesses, which tend to be of no great size, but multi-divided and flexible, Schumpeter (1934) highlights through his theory of 'creative destruction' the importance of technology in the facilitation of the transition to the 'new age', thus shaping the new infrastructures, for which information technology and telecommunications are of great significance, since they are sectors that created a chain of consequences⁶, making the tourist product more flexible through customisation and complete specialisation. In the same way, the transition to the post-fordist era of tourist development goes together with the transition from mass tourism to the development of non-mass forms of tourist activity⁷ on the one hand, and to the creation of a new type of independent consumer, on the other.

This tendency of tourists to view themselves as excursionists-travellers, led to the emergence of specialised tourist agencies that promote a type of mild tourism which encourages a greater accountability and sensitivity towards the needs of local reception communities on the tourists part⁸. Modern tourism is no longer a heavy industry, but rather a small industry of experiences and impressions, since it now follows the logic according to which the phenomenon transcends the status of simple commodity (which includes goods and services) and becomes a complex product (always commercial) whose main peak component is personalised experience.

The above-mentioned shows that the determinative factors in tourism, whether we are talking about the product or the producers, the consumer or even the location, undergo significant transformations. Meethan⁹ notes that in the age of 'meta-tour-

ism', the traditional tourist destinations should either be restructured or confront the decline by determining their position in the chart of the product circle of life.

Naturally, tourism, as a multidimensional phenomenon, affects and is affected in its turn by the environment^{10,11}, since, in the context of the product massiveness, additional population numbers live for specific periods of time in places where the natural wealth and the technical faculties with respect to infrastructure are not ready to support the extra weight, thus violating the principles of viability as defined by a number of researchers, such as Coccosis, Farsari, Spilanis and others. The question, posed by the researchers themselves, is how the development of tourism may be planned so that viability is achieved, meaning in a way that the socio-cultural and natural environment is affected as little as possible and has the ability to regenerate itself. These reasons make the design a far more important and complex issue than it was until now. The design of tourism is based on broader infrastructures and it should be a constant, flexible and partial, step-by-step process. The partial development of tourism 'stresses the gradual application of recommendations (instructions) for the design, the constant observation of tourist development and the flexibility in the adjustment of the design'¹².

THEORETICAL APPROACH

THEORETICAL APPROACH TO NEW INFRASTRUCTURES IN TOURISM

So, within the context of the post-fordist era, 'meta-tourism' is characterised by flexibility, independence of services and viability of destinations. The basis of development and transformation are the infrastructures that can be divided into two general types: the 'new' ones which are mainly based on the combination of telecommunications and information technology, that is telematics, and the 'old' ones which are based on the traditional sectors of constructions.

Targeting on the new infrastructures, the most typical example of this approach, is the analysis of Janssen¹³ and Hoogstraten¹⁴, which belongs to the approaches that directly associate this concept with production. Their main argument is that 'a policy of infrastructure supply for regional development should be estimated in the light of constructional needs for constant changes in the transportation and communication systems that are created by structural changes in economy'¹⁴. Approaching a little closer the new infrastructures, we realise that they are based on the ongoing revolutionary changes in the technology of information and telecommunications, targeting the functional, numerical and financial flexibility¹³. This flexibility can be understood on these two levels: (a) on the level of inter-business flexibility, and (b) on the level of cross-business flexibility that aims to facilitate the exchange of information among the participants of the economic network.

Since the necessity of new infrastructures has been established, we also have to determine their operational and implementation framework at a specific destination. For this reason, it would be wise to specify: (a) the role and the expectations of the tourism producers, and (b) the essence and status of the destination administration and promotion organisation. According to Savage et al.¹⁵, stakeholders are defined as groups or individuals that have specific interests in an organisation actions and the ability to affect it. The International Tourism Organisation (1993) defines as stakeholders the private citizens, the local community and the government. According to Spilanis (2000), the modern international structure of the tourist phenomenon has created three main groups of stakeholders who are going in different directions, but do not necessarily have contradicting interests. The first and primary group is the government. The organised central administration participates in the formation of the phenomenon even locally, lending stability, financing infrastructure works, supporting investing, etc. having as a final goal the inflow of incomings through taxation and the attainment of stability, affluence and social peace. The second group is the one that expresses itself mainly through the local self-government whose main concern is the improvement-preservation of the environmental appeal of the destination, aiming not only to the improvement of the citizens daily lives, but also to the attraction of investors, and the increase of the number of job positions within the narrow limits of the destination, securing social peace, affluence, incomings and lastly, the destination viability. The third group of stakeholders is the private enterprise that aims to increase the profits and for which the social and environmental viability is second priority.

The activity categories that form the relations of the tourism commissions can be placed in the following five categories:

- economic network and its viability,
- qualitative characteristics of the local population,
- natural and man-made environment,
- infrastructure system, which includes the infrastructures that affect a district appeal and function both economically (for the attraction of production units, such as transportation, communication and energy infrastructures) and socially (for example, health, educational, cultural and recreational infrastructures),
 - ‘developmental climate’ or the ‘ambient conditions’, which include all the elements that affect the district developmental dynamic, such as developmental institutions, the cultural level, enterprise, the level of technology and innovations and the inclination to integrate into the production process, the beliefs, the expectations and the intensions of the local manpower concerning the content of the developmental conditions and the quality of life, etc.

From the above it is obvious that in all the stages of design and materialisation of the developmental plan, within the framework of a destination, there is a

great need for quantitative and qualitative information. This information concerns the *past*, so that the current condition of the destination can be properly analysed, as well as the *present*, in order to be aware of the existent state in the immediate competitive environment and by extension to be able to place the destination in this environment, and finally the *future*, so that there is, on the one hand, a correct evaluation of the results of the strategies and the necessary correctional interventions and, on the other, the possibility of predicting oncoming changes. The latter helps the destination to be able to foresee oncoming changes and react sooner than the competitors, securing a strategic advantage.

This means that the gathering and processing of information in dynamic form (web 2.0, semantic web, etc.) are necessary, concerning both the *extraneous* and *indigenous* factors that affect the district course. It has to be stressed that, in contrast to the indigenous factors, a destination can neither ignore nor avoid the extraneous ones.

APPROACH OF THE TERM 'KNOWLEDGE MANAGEMENT' (KM)

The gathering and processing of information, the production of knowledge, in short the need to manage it, stemmed from the need of the organisations to manage more effectively their corporate resources in the extra competitive environment of global economy. Nonaka¹⁶ in his book 'The Knowledge Creating Company' characteristically mentions: '...in an economy where the only certain thing is uncertainty, the only safe resource for the maintenance of the competitive advantage is knowledge... successful are the businesses that continually create new knowledge, distribute it to all the levels of the business and integrate it into the new technologies and their products'. Skyrme¹⁷ describes the roots of KM as the colligation of the following elements:

- total quality management and business process redesign;
- the need for innovation;
- the exponential growth of information (did you know 2.0);
- the popularisation of knowledge-based systems;
- the intellectual capital which prevailed as the most fundamental productive factor;
- the popularisation of the so-called Learning Organisations.

However, how could 'knowledge management' be defined and what is its application in the contemporary tourism progress?

According to the latest report from KPMG (Ref. 18) it is an organisation systematic and organised effort to produce functional knowledge and have a better performance, while its application in the context of a Destination Management and Promotional Organisation may be an important medium of improvement of:

- the overall performance of the Organisation^{19,20};
- the productivity and competitiveness²¹;

- the effective acquisition, exchange and use of information²¹;
- the process of decision-making²²;
- the way of conceiving the best practices²³;
- the reduction of research costs and delays²¹, and of
- the support and management of innovation²⁴.

As it is quite obvious, the introduction of new infrastructures and innovation requires a high and effective level of management of the emerging – registered and empirical knowledge, creating conditions of the destination differentiation and support of its comparative advantages that lead to securing and supporting the competitiveness and rapidly enlarging the local economy.

GRID NETWORKS AND COMPUTING, TOWARDS INNOVATION AND EFFICIENT KNOWLEDGE MANAGEMENT

The last few years, there is a common need for computer processing power and efficient data share. The grid computing is a recently developed technique in which the idle systems in the Network and their ‘wasted’ CPU cycles can be efficiently used by uniting pools of servers, storage systems and networks into a single large virtual system for resource sharing dynamically at runtime. These systems can be distributed across the globe; they are heterogeneous (some PCs, some servers, maybe mainframes and supercomputers); somewhat autonomous (a grid can potentially access resources in different organisations). Although grid computing is firmly ensconced in the realm of academic and research activities, more and more companies are starting to turn to it for solving hard-nosed, real-world problems. The definition of the grid computing could be ‘Resource sharing and coordinated problem solving in dynamic, multi-institutional virtual organisations’²⁵, while its importance could be concentrated as a viable technology that businesses can use to wring more profits and productivity out of IT resources grid computing is flexible, secure, coordinated resource sharing among dynamic collections of individuals, institutions, and resources. Grid computing enables the virtualisation of distributed computing resources such as processing, network bandwidth, and storage capacity to create a single-system image, granting users and applications seamless access to vast IT capabilities. Just as an Internet user views an unified instance of content via the World Wide Web, a grid user essentially sees a single, large, virtual computer.

Grid computing will give worldwide access to a network of distributed resources – CPU cycles, storage capacity, devices for input and output, services, whole applications, and more abstract elements like licenses and certificates. For example, to solve a compute-intensive problem, the problem is split into multiple tasks that are distributed over local and remote systems, and the individual results are consolidated at the end. Viewed from another perspective, these systems are connected to one big computing grid. The individual nodes can have different ar-

chitectures, operating systems, and software versions. Some of the target systems can be clusters of nodes themselves or high performance servers. To prove the word of concept, a comparison of Networks, where grid is based, versus Computer Performance, from 1986 to 2000 is as follows: the computers performance is increased 500 times, where as Network performance is increased 340 000 times (Ref. 25).

Tourism and more specifically destinations have much to benefit from the use of GRID networks. The ontology formulation, as an extremely, time and resource, consuming process, which will be highly facilitated by the increase of computing power, while the same thing will happen with the tagging process which is necessary in XML and RDF languages. Thus, the semantic annotation task will be more accurate and efficient, supporting the web 2.0 and semantics, developed applications, given the fact that the semantic annotated information will be saved in databases, used as tools in the KM process. The efficient establishment of the ontology and annotation process will, also, facilitate the development of intelligent agents, able to support the virtual aspect of information and resources, leaving adequate ground, to develop innovative applications such as telemedicine, GIS, HDTV, Life long e-learning, KM, etc.

DISCUSSION

The theories to which we move on in order to explore the association between New Technologies, New Infrastructures, Innovation and Knowledge Management are based on the initial question: ‘Since the transformation of the classical infrastructures into new ones and the correct knowledge management set the basis for the new determination of the tourist product, is it possible that differentiations and inequalities among the destinations will arise? What is the effect of the differentiations and the possible inequalities on the various features that shape the appeal of the destination?’

The inequalities and differentiations can be found by using indicators of tourist development and appeal. Farsari and Prastacos²⁶ recommend a series of indicators that apply mostly in the Mediterranean, whose tracing will certify the theory.

The sub-questions that have to be answered are the following:

- How are infrastructures defined in the modern society?
- How is a destinations innovativeness defined?
- How are innovativeness, viable development and mild types of tourism connected?
- How are tourism corporations defined, and what is their role in the modern structure of a Management and Promotional Organisation?

- Do the GRID computing capabilities affect the physiognomy of the modern consumer, according to the post-fordist approach? Is there a correlation between the new technologies and the supply of personalised experiences?
- How is knowledge management defined, and how can a destination possibly benefit by its application?
- Up to what extent do the GRID technology can affect knowledge management?

We have to acknowledge the following:

- The validity of the post-fordist approach in the modern economies.
- The validity of the Kontradiev wave approach.
- The Schupertian approach that associates innovation with the new infrastructures and the enlargement of the economic activity circle.
- The theory of Perez and Skayannis about how: (a) new infrastructures are the most important basis of all economic activities, and (b) technological advancements are the capstone of infrastructures and the progress of modern economies depend on them.
- The legitimacy of the viable development and destination appeal indicators, as they are mentioned in the project of Farsari and Prastacos²⁶.
- The fact that new technologies (and especially GRID computing) are a major reference point for the restructure of a Destination Management Organisation functions.

The graphic display of the theory is presented in Fig. 1.

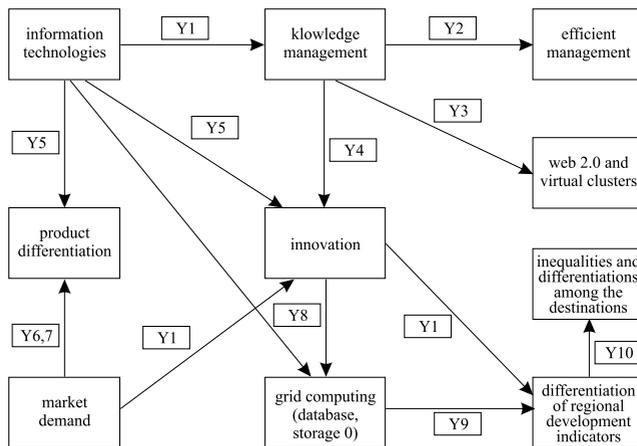


Fig. 1. Representation of the model of influence on the viability and appeal indicators

As it was mentioned, the approach of ‘post-fordism’ involves the production flexibility, its personalisation, having application in the supply of tourist benefits. The new infrastructures come either to meet the needs that arise from the development of various activities or to set in spatial units in order to attract new economic

activities and investments (they work as an element of the spatial units supply or equipment).

Whether we install the new infrastructures or not, certain viability and appeal indicators are affected, practical spatial units that are differentiated as far as their access to modern networks is concerned are created, resulting in the creation of a new type of geographic inequalities that do not concern just the equipment of the spatial units with the hard infrastructure of networks, but also the potential of their creative use²⁷.

So, for example, a destination that makes use of a broadband system, providing a multitude of applications (for example, navigation via GIS, telemedicine, integrated forwarding practices, etc.) and information that come from a source of information, an organised database or an ontology formed on the web 2.0 and semantic network principles, bears no resemblance to a destination where the producers just gather, evaluate and organise information and its distribution. The main organisation and management of knowledge (both empirical and registered) by a specialised Management Organisation provides not just certified and correct information, which addresses both producers and consumers, but will also provide in time the perspective of rating correctly the information and the informational systems, which is the most important thing. An important role in the support of the position of the destinations differentiation on the basis of technology is the role played by the general conditions relating to education and especially to the information technology education, as well as the overall development of the potential of investment in economic sectors that utilise either directly or potentially various forms of telematics. In other words, we have to secure the trust of the producers and especially of the media in telematics and the structure and precision of the ontology, which are a subject of the broader education mainly of the producers and then of the consumers.

REFERENCES

1. T. PELAGIDIS: Divergent Real Economies in Europe. *Economy and Society*, **26** (4), 546 (1998a).
2. G. PETRAKOS: The Spatial Impact of Economic Change in Europe (Book review). *J. of Comparative Economics*, **26**, 565 (1998)
3. J. A. SCHUMPETER: *The Theory of Economic Development*. Harvard University Press, Cambridge, MA, 1934.
4. J. SPILANIS: Tourism and Regional Development: The Case of the Aegean Islands. In: *Tourist Development: Multi-scientific Approaches* (Ed. P. Tsartas). Exandas, Athens, 2000.
5. H. COCCOSIS: Tourism and Sustainability: Perspectives and Implications. In: *Sustainable Tourism European Experiences* (Eds G. K. Priestley, J. A. Edwards, H. Coccusis). CAB International, Oxon, 1996.
6. J. URRY: *The Tourist Gaze: Leisure and Travel in Contemporary Societies*. Sage, London, 1990.

7. C. GREEN, L. CHALIP: Sport Tourism as the Celebration of Subculture. *Annals of Tourism Research*, **25** (2), (1998).
8. I. KELLY: Study Tours: a Model of Benign Tourism? *The J. of Tourism Studies*, **8** (1), 42 (1997).
9. K. MEETHAN: New Tourism for Old? Policy Developments in Cornwall and Devon. *Tourism Management*, **19** (6), 583 (1998).
10. H. COCCOSIS: Defining, Measuring and Evaluating Carrying Capacity in European Tourism Destinations. Environmental Planning Laboratory, University of the Aegean, 2001.
11. P. TSARTAS: Tourist Development: Multi-scientific Approaches. Exandas, Athens, 2000.
12. D. TIMOTHY: Incremental Tourism Planning in Yogyakarta, Indonesia. *Tourism Recreation Research*, **23** (2), 72 (1998).
13. B. JANSSEN: New 'Schemes of Production' and the Role of Material Infrastructure: The Case of the Netherlands. Working Paper. Eindhoven University of Technology, 1986.
14. B. JANSSEN, KAI P. HOOGSTRATEN: New Infrastructure Requirements for Regional Development. In: Intern. Conference Regional Policy at the Crossroads, 22–24 April, Leuven, Belgium, 1987.
15. G. T. SAVAGE, T. W. NIX, C. J. WHITEHEAD, J. D. BLAIR: Strategies for Assessing and Managing Organizational Stakeholders. *Academy of Management Executive*, **5**, 61 (1991).
16. I. NONAKA, K. UMEMOTO, D. SENOO: From Information Processing to Knowledge Creation: a Paradigm Shift in Business Management. *Technology in Society*, **18** (2), (1996).
17. D. J. SKYRME: Knowledge Networking, Creating the Collaborative Enterprise. Butterworth-Heinemann, Boston, MA, 2003.
18. KPMG, I www.kpmg.com. Available at http://www.kpmg.com/GR/en/IssuesAndInsights/Articles/Publications/Sustainability/Documents/ss_Corporate-Sustainability.pdf (Access on Jan, 2011)
19. N. OSTRO: The Corporate Brain. *Chief Executive*, **123**, 58 (1997).
20. L. J. BASSI: Harnessing the Power of Intellectual Capital. *Training & Development*, **51** (12), 25 (1997).
21. J. MAGLITTA: Smarten up! *Computerworld*, **29** (23), 84 (1995).
22. B. COLE-GOMOLSKI: Chase Uses New Apps to ID Best Customers. *Computerworld*, **31** (35), 49 (1997a).
23. B. COLE-GOMOLSKI: Users Loath to Share Their Know-how. *Computerworld*, **31** (46), 6 (1997b).
24. J. HIBBARD: Knowing What We Know. *Information Week*, **653**, 46 (1997).
25. R. NAGAR, L. B. MYLAVARAM: GRID Computing. A Paper Presentation of Lakireddy Balireddy College of Engineering, New Delhi, India, 2007.
26. Y. FARSARI, P. PRASTACOS: Sustainable Tourism Indicators for Mediterranean Established Destinations. Regional Analysis Division, Institute of Applied and Computational Mathematics (IACM), Foundation for Research and Technology, 2002.
27. P. SKAYANNIS: The Planning of Tourism, Transport Infrastructures and the Environmental Protection in the Onshore Areas of Magnisia: Local Interests and Expectations. *ΤΟΠΙΟΣ*, **18–19**, 109 (2002) (in Greek).

Received 9 March 2009
Revised 20 April 2009