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## The evolution of innovative models: innovative network in tourism

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**Abstract.** *Modern information and communication technologies based on innovation are renovating, complicating, and their area of use is extending every year. Goals of innovations in tourism are to develop consistently international tourism, to control the tough connection between a consumer and a producer, to provide the information exchange and interconnection among touristic organizations. Over the last 10 years innovative process has developed slightly. Economics is moving from early atomic models to systematic approaches based on interactive processes, which are strongly linked by territories. Innovative networks develop as the most appropriate structure to reach the high effectiveness of innovation.*

*Topicality of research questions on innovation in tourism is connected with a sharp increase of competitiveness in world market in XXI century and consideration of innovation in a scientific community as a main source of the competitiveness growth in tourism market. Global tourism market is one of the highly technological spheres of economic activities.*

*This article describes J. Schumpeter's and R. Roswell's innovative models from 1950s to today along with analysis of Berkhout's and Chesbrough's fifth generation models. In addition, strategic suggestions for innovations in touristic organizations directed to the competitiveness improvement have been proposed.*

**Keywords:** *innovation, models, competitiveness, networks, tourism market, tourism industry.*

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**Introduction.** As an economic basis, tourism area is an important trigger influencing the social-economic and spiritual development of a state from a region to a country itself. Therefore, information-communication technology platform for gradual development of the young sphere is being used.

Innovators network has substantially been extended in all types of economic functions recently. Sole traders and regional ones positively influence the general increase of region itself and regional innovation networks. Taking into account the variety of participants according to their ages, social-economic statuses, behaviors, tastes, last models in innovative development have covered centralized networks. According to advantages

leading to innovation, these networks create and propose necessary opportunities to open an access for unique values, skills, experiences and resources, to gain external knowledge on time, to provide services in a fair way, to adapt quickly to market changes, to introduce innovations [1]. It might be considered as a strong lever for tourism small-sized and medium-sized businesses by assisting to overcome the risks connected to the lack of internal research and practical constructive works along with innovative processes and high investments [2, 3, 4, 5]. Additionally, it facilitates the efforts to analyze the demand, to define market opportunities, to increase the competence of human resources for innovation, to be ahead of competitors and to gain information resources.

Considering the complex and systematic nature of travel destinations [6], it is necessary to organize the united travel innovations, which increase the competitiveness in the market.

**Research methods.** It should be mentioned that the scientific state of theoretical-methodological researchers in innovation tourism area is not enough. Foreign researchers' such as J.A. Schumpeter, B. Santo, P. Drucker, M. Porter, A. Toffler, H. Toffler, A. King investigations are important as a conceptual basis of innovation research methodology. They consider the issue of innovation as a social-economic phenomenon. Additionally, D. Buhalis's, M. Forest's, A.M. Hjalager's, M. Ottenbacher's researches are devoted to analyzing modern innovational procedures in world tourism industry and to develop innovation in tourism. In order to establish tourism projects based on social media, online resources, and mobile applications, scientific concept of e-business has been introduced by D. Buhalis's explanation. Moreover, D. Buhalis set up innovational strategy of tourism industries by information technologies use. J. Sundbo and A.

Maksimczuk entered the concept of innovation marketing based on results of mutual relationship between economic and innovational activities. In CIS countries, especially in Russia, investigators are analyzing the new direction and putting into operations smart city programs. In our country smart cities and innovational directions are supported on the state level and the European model is proposed to be employed.

**History.** Austrian economist Joseph Schumpeter used the term "innovation" for the first time in his works. His book "Economic development theory" was published in 1911. Innovation theory was discussed in the book. According to Schumpeter, it is a new combination of "creative destruction" and industrial factors: introducing a new good or service, putting untested production methods into practice, setting up new business organizations, opening up new markets for selling goods and services, and opening up new sources of supply, including new markets [7].

Innovation theory by Schumpeter employs in tourism area regarding specific issues. Mentioned

Table 1

Development chronology of innovation process models

| №                                                                | Period of time              | Model / research                                                          | Author               |
|------------------------------------------------------------------|-----------------------------|---------------------------------------------------------------------------|----------------------|
| 1                                                                | The beginning of XX century | Concepts such as "innovation" and "creative destruction" were introduced  | Schumpeter           |
| 2                                                                | 1920-50s                    | "Technology push" linear model, 1G                                        | R. Rothwell          |
| 3                                                                | 1960-70s                    | "Market pull" linear model, 2G                                            | R. Rothwell          |
| 4                                                                | 1978                        | A dynamic model of process and product innovation                         | Abernathy, Utterback |
| 5                                                                | 1970-80s                    | Coupling of R&D and marketing, 3G                                         | R. Rothwell          |
| 6                                                                | 1986                        | Linear model                                                              | Kline, Rosenberg     |
| 7                                                                | 1980                        | Model of integrated business processes, 4G                                | R. Rothwell          |
| 8                                                                | 1986                        | "Stage-gate" model                                                        | Cooper               |
| 9                                                                | 1990                        | Model of system integration and networking, 5G                            | R. Rothwell          |
| 10                                                               | 1990                        | Interdependence of time and expenses was identified in innovation process | Gupta, Wilemon       |
| 11                                                               | 1992                        | "Funnel" model                                                            | Wheelwright, Clark   |
| 12                                                               | 1993                        | R. Rothwell's models classification                                       | R. Rothwell          |
| 13                                                               | 2002                        | Cyclic model                                                              | Berkhout             |
| 14                                                               | 2003                        | The open innovation model                                                 | Chesbrough           |
| Note: table [6, 9, 10] literature resources are formed by author |                             |                                                                           |                      |

objectives influence positively to make a profit and develop entrepreneurship. On the basis of his theory, Danish researcher A.M. Hjalager categorized tourism innovations in a following way:

- to propose new or improved product taking into account changes of consumers' demand, taste, and behavior;
- to form a new system based on widely used new technologies in tourism area;
- to control innovation directed to improving brand acceptance and to develop new segments of the market;
- an effective management that is able to coordinate qualified staff in an industry;
- reorganize an industry [8].

**Main part.** Innovation models have changed considerably in recent years. Organizational structures, innovation resources, driving force, social-economic situations, competitiveness, market changes, and dynamics among science, education and economics influence them directly. Table 1 describes the chronology of innovation process models.

Various methods of innovation model categorizations were scientifically asserted. One of them is generation of innovation process model proposed by Roy Rothwell. He demonstrated the categorization of industrial innovation process

models, which helped to identify innovation management strategies from 1650 to 1990 [9].

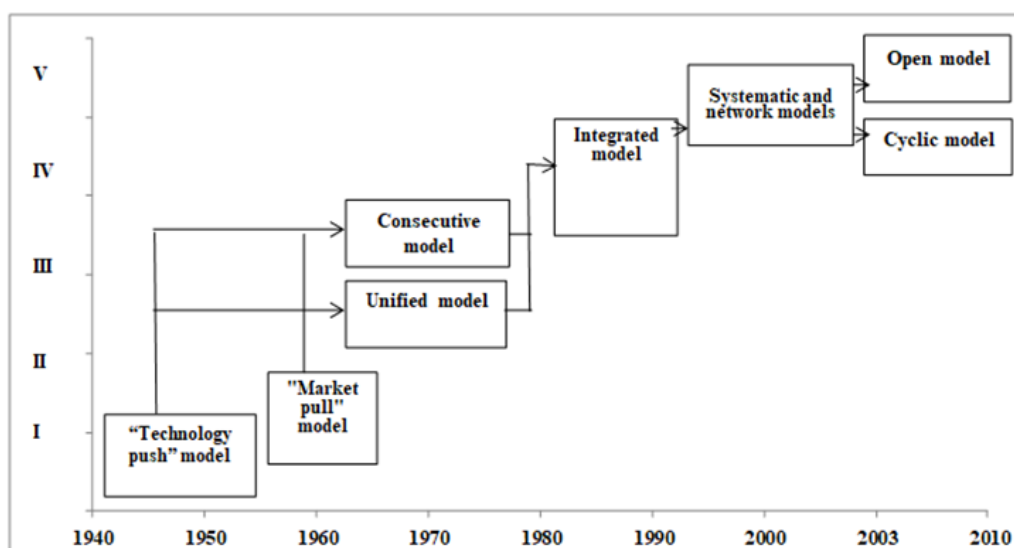
Initial innovation models have become linear during simple process assembled in an enterprise. After that science, scientific researches, marketing and sales started to develop. Dramatic development of the market demands from innovation to be active. That is why science, research and practical constructive works are innovation that opens a new way to form profitable product and services.

Kline and Rosenberg (1986) notice the following truth about linear model: "...market needs must be satisfied in a successful innovation" [10], in other words the fact that main source of innovation is a consumer should not be forgotten.

The second generation of innovation models called supply and demand looks like the linear model, but a customer was set as a supplier of leading principles in innovation process. This experience forces the enterprises to introduce gradually innovations and to lose adaptability to radical market changes [9].

As an answer to limitations of linear models regarding market changes, Kline and Rosenberg Chain-Linked Model [10] and Rothwell's Coupling Model [9] were introduced as a result of interactive process. Looking through foreign studies, Picture 1 describes the innovation process

### Generations of innovation process models



Picture 1 - The evolution of innovation process models [9]

from the 1950s to today according to Rothwell's generations model.

The scope and significance of models between the first and fifth generations of innovation processes should be depicted.

First-generation models (1G, between 1950 and 1960) are linear models. It is based on a simple linear model, described by market unsaturation; consequently attention is paid not on product usage, but on production.

The second generation (2G, mid-1960s – 1970s) is a linear and consecutive model that draws considerable attention to market need directed to science, research and practical constructive works. Consumer needs is a reason to form innovation. In addition, this preparation decreases the significance of innovation during the commercialization process.

The third generation (3G, early 1970s – the mid-1980s) is an interactive model. Considering the link between technology abilities and market needs of opportunities, innovation process is described as non-linear. As a result, market and scientific-technological factors are important. It is in tough connection by marketing and scientific innovation structural processes [9].

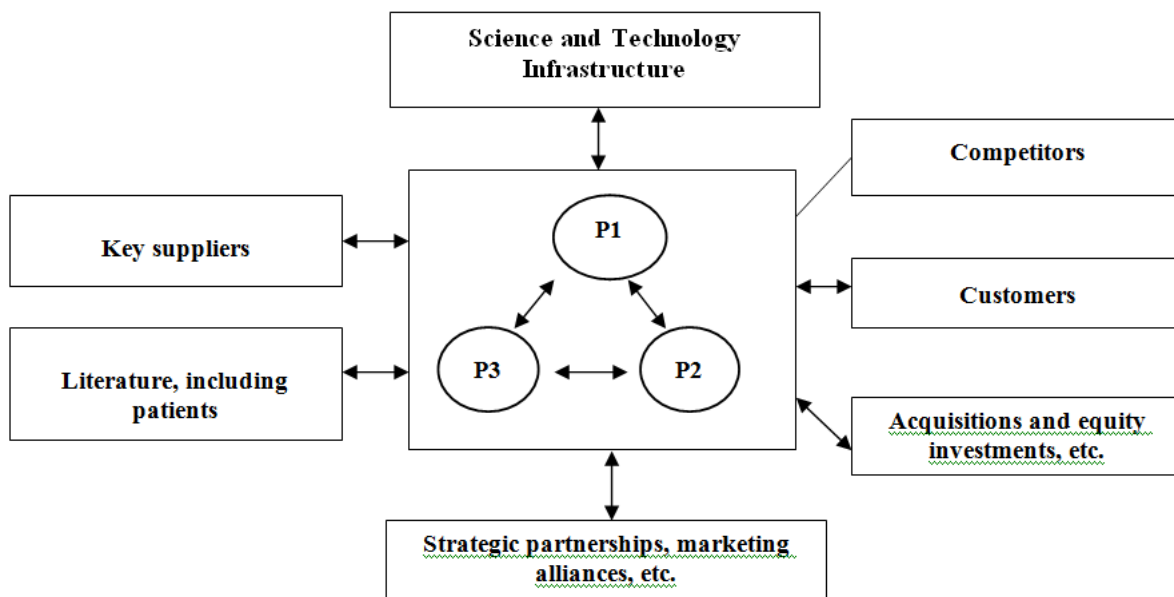
The fourth generation (4G, 1980s – today) is established on advanced experience and Japanese model of integrated business processes.

Consequently, an enormous attention is paid on integration between science, research and practical constructive works and enterprises along with attention on cooperation between suppliers and sellers. Marketing analysis on product idea should be carried out along with the regulation of all preparation periods by a special inter-service group.

The fifth group (5G) is founded on strategic network model that covers today and future, on strategic integration, and on formation of links [9]. That is why the role of information and communication technology which provides the strengthening internal and external link of enterprises.

5G elements help to define either development speed or effective ways of development of innovation process in enterprises. Rothwell's fifth generation innovation process is described on Picture 2 [9].

The following descriptions can be done for Rothwell's 5 G model: strategy aimed at considering time; management support and assistance; goal implementation and resources mobilization; effectiveness in additional services during development; horizontal management on the basis of taking right decisions; prepared new products and authors of projects; major peculiarities and high quality of prepared



Picture 2 - Fifth generation innovation process model (5G)

products; obligatory and constant quality control; additional strategy organization of development; consumer delivery strategy adoption; connection between product design and modern history; adaptation during preparation; innovation and economics in technology; to be in touch with product suppliers; availability of information resources; attraction of qualified professionals; know-how use; ICT intercommunication and information exchange use; reflection of fast and effective exchange means and approaches.

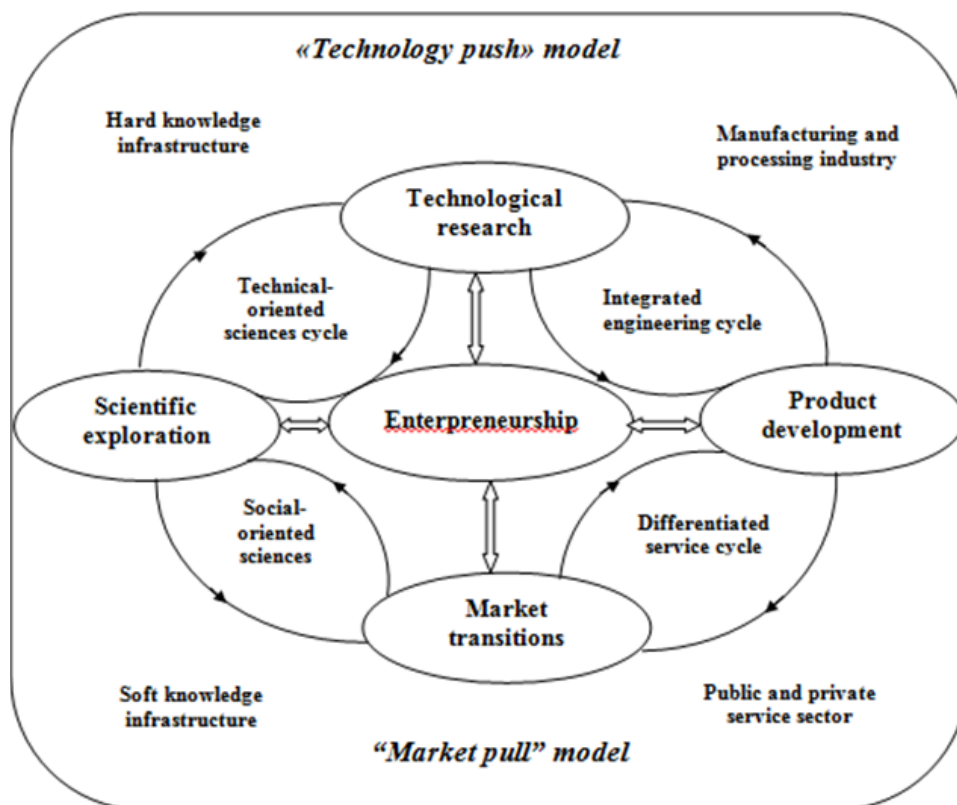
Recent researches are based on developing fifth generation model. Guus Berkhout proposed "Innovation cyclic model" (2000) [11], Henry Chesbrough suggested "Open innovation model" ("Open Innovation: The New Imperative for Creating and Profiting from Technology") in 2003 [12]. He defines the investigations as open system. To form innovation, a company/enterprise/firm has an opportunity to use new different information types and it also employs both its own researches in innovation preparations and other organizations' studies. If defined innovation does not comply with

company/enterprise/firm's business-model, it cannot conceal this fact and finds a way to make a profit from use by other organizations sales, license spread etc.

Innovation cyclic model illustrates that profitable manufacture of new products and services is not a linear process that covers mutual actions among process participants. It connects "Technology push" model and "Market pull" model. Painting 4 describes innovation cyclic model scheme.

Model is an endless circle that covers unified changes by four mutually dependent cycles [13]. Mutually connecting, this requires preparing methods and approaches to form new design and industry ways in various technology areas. Technological and engineering cycles unify the necessity to implement researches in technology sphere.

Marketing cycle is development of new market. This requires satisfaction of public needs from products. Nowadays products go along with additional services, but technological complex products require additional services.



Picture 3 - Berkhout's cyclic model [11]

Therefore, innovation often means “product-service” combination. Product formation combines marketing and engineering cycles.

Innovation process is proposed by an endless cycle, that is why the fact that science or market is set at the end of the process is incorrect. Innovation process is able to start anytime and anywhere. Changes made in one tie lead to all changes in a cycle.

Last two generations approaches are based on networks. Its purpose is to establish the link between enterprises that are placed in the directed market in case an enterprise is aimed at innovation development. Tough connection among higher education institutions, research centers, enterprises and product consumers is effective and they should exchange information with each other. It is really significant, but it leads to acknowledge the innovation as silent education importance. Eventually, recent innovation models are based on education and connection and considered as an integrated phenomenon [14].

Tourism is under similar situation. Zach (2016) [15] asserts that cooperation in innovation is a driving force in hotel and tourism field. Sundbo, Orfila-Sintes Sørensen state that innovations in tourism should investigate the demand of network and cooperative system along with central territory functioning from the view of “tourist destination”. Regional innovation networks are main mechanism of increase for private enterprises and regions themselves. This idea initially was developed by GREMI Milieu’s innovation model.

**Results.** Innovation in tourism is a new field in scientific researches. Due to dramatic development of global tourism market, this area appeared as an innovation issues research sphere in the 1980s. Global tourism industry is placed on the third place after oil chemistry and machine industry, that is why it becomes the center of scientific community in the 2000s.

Preparation and introduction of innovation in global tourism as an object of tourism field and tour product innovation activities are related with the following:

- non-materialistic (a customer cannot investigate the tour product’s physical description before the purchase);

- no opportunity to possess as a tour product;
- no use of tour product as a main mean object or asset;
- production and consumption of the tour product at the same time;
- human factor (high number of participants during tourist services: staff, consumers, residents, other tourists);
- inconstancy in quality of tourism field and its complex management;
- season (changes of demand volume and price for tourist products).

Tourism innovation is tour product production and its creative activity in tourism market or new quality method of acquisition, aiming at attracting tourists, its needs satisfaction and making profits to tourism organizations today. In tourism, especially in innovation development, making profits to organization is vitally important. Information exchange, particularly experience exchange, increases the effectiveness and innovation opportunities in tourism industry, in other words networks are essential to launch innovations and regional innovations in tourism.

**Conclusion.** The following peculiarities of innovation development researches in global tourism industry:

- harmony between technological and marketing investigations;
- applied characteristics of implemented researches;
- researches directed to components of tourism industry (transport, staying place, food and drink venues etc.)
- Consumer-orientation.

Considerable amount of research outcomes in global tourism industry in recent 10 years. The following main directions of investigation of tourism innovation issues can be demonstrated: general theory of tourism innovation activities, innovation provided the constancy of tourism development, tourism marketing innovations, the link between innovation and compatibility, innovations in specialized fields (hotel business, SPA industry, transport, information technologies etc.).

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### **Инновациялық модельдер эволюциясы: туризмдегі желілер**

**Аннотация.** Инновацияға негізделген заманауи ақпараттық-коммуникативтік технологиялар жыл сайын жаңартылып, күрделеніп, қолданылу аясы кеңеюде. Туризм индустриясындағы инновациялардың несізі мақсаты – дүниежүзілік туризмді тұрақты дамыту, тұтынушы мен өндіруші арасындағы тығыз байланысты қадағалау, туристік ұйымдардың бір-бірімен өзара байланыста болып ақпарат алмасуын қамтамасыз ету. Кейінгі онжылдықта инновациялық процесс біршама эволюцияға ұшырады. Экономика ертедегі атомдық модельдерден территорияларға қатты байланған интерактивтік процестерге негізделген жүйелі тәсілдерге қарай жылжуда. Инновациялық желілер инновацияның жоғары тиімділігіне қол жеткізудегі бағыттар үшін ең қолайлы құрылым ретінде өседі.

Туризм индустриясындағы инновацияны зерттеу сұрақтарының өзектілігі ХХІ ғасырдың басындағы әлемдік туристік нарықтағы бәсекеге қабілеттіліктің жылдам өсуімен және инновацияны туристік нарықтағы бәсекеге қабілеттілікті өсірудің негізгі көзі ретінде ғылыми қоғамдастықтың қарастыруымен байланысты. Әлемдік туризм индустриясы экономикалық әрекеттердің жоғары технологиялық салаларының бірі болып табылады.

Мақалада ХХ ғасырдың 50 жылдарынан бастап бүгінгі күнге дейінгі Й. Шумпетер, Р. Росвеллдің инновациялық модельдеріне сипаттама, Беркхоут пен Чесброның бесінші буын модельдеріне талдау жасалған. Сондай-ақ, бәсекеге қабілеттілігін арттыруға бағытталған туристік ұйымдарға арналған инновациялар үшін стратегиялық ұсыныстар ұсынылады.

**Түйін сөздер:** инновация, модельдер, бәсекеге қабілеттілік, желілер, туристік нарық, туризм индустриясы.

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### **Эволюция инновационных моделей: сети в туризме**

**Аннотация.** Современные информационно-коммуникативные технологии, основанные на инновации, ежегодно обновляются, усложняются и сфера их использования расширяется. Основными целями инновации в индустрии туризма являются постоянное развитие международного туризма, мониторинг тесной связи между потребителем и производителем и обеспечение информационного обмена туристскими организациями, которые связаны между собой. За последние 10 лет инновационный процесс подвергся эволюции. Экономика движется от ранней атомной модели к систематическим подходам, которые основаны на интерактивных процессах, связанных территориями. Инновационные связи развиваются в виде самой удобной структуры для достижения высокой эффективности инновации.

Актуальность вопросов исследования инноваций в индустрии туризма связана с быстрым ростом конкурентоспособности на рынке международного туризма в XXI веке и с рассмотрением инноваций в научном сообществе в качестве основного источника роста конкурентоспособности на международном рынке. Международная индустрия туризма является одной из высокотехнологичных сфер экономической деятельности.

В статье описываются инновационные модели Й. Шумпетера и Р. Росвелла с 50-х годов XX века до сегодняшнего дня и анализируются пятое поколение моделей Беркхоута и Чесбро. К тому же были рекомендованы стратегические предложения для инноваций туристских организаций, направленных на увеличение конкурентоспособности.

**Ключевые слова:** инновация, модели, конкурентоспособность, сети, рынок туризма, индустрия туризма.

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