



CIRCULAR ECONOMY 3.00: TOURISM SERVICE CASE

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Abstract

“Circular economy“ initiative reflects mainly physical approach to cut use of materials and energy in production and consumption chain, mainly related to repair, reuse, remanufacturing, refurbishing, and recycling. The try to apply existing approach to tourism service providing by SME met significant methodological and practical troubles to use it. If repair and reuse is easy everyday practice of tourism service, remanufacturing, refurbishing and recycling frequently are out of tourism service cycle, they require specific knowledge, investments, founding, additional expenses and specific work not directly connected to tourism service. They sometime look like try to return to a Subsistence farming, when a family implement all scope of home works. When nowadays business moved towards to specialisation very far. It's very difficult to motivate tourism SME to reduce their profitability seeking of abstract social benefit of CE. Applied holistic approach to circular economy in tourism SME business enabled to synthesize holistic concept CE 3.00, which uses overall qualitative leap from linear to circular economy through steps of physical, economical, green, sustainable and smart innovations and enables to reduce office, manual work, materials and energy consumption. Created life cycle, indicators, principles and solutions of CE 3.00 in tourism service enabled foreground significant benefits for business and society. Created and validated virtual Self-assessment tool iSAT „Innovation circles“ enables to use CE 3.00 concept for tourism service innovations.

KEY WORDS: circular economy 3.00, tourism service life cycle, SME, Self-assessment, virtualics, sustainable innovation.

Introduction

Increasing of tourism demands and business service especially in coastal areas is one of challenges of EU Innovation Union and blue and green growth strategic initiatives. Coming after Production and Service quality stages European Innovation culture resulted creation of many methodological approaches and practical schemas to achieve overall goals of EU 2020 strategy towards competitiveness and sustainable development of the community. “Circular economy” (CE) as one of such approaches primary serves to reduce consumption of materials and energy by return and reuse such resources back from the end of production and consumption cycles. EU is awaiting of great numbers of economy such resources and increasing profitability and sustainability of business, especially in SME's, which are samples of increasing work productivity as indicator of societal progress.

During initiation of South Baltic programme project “CIRTOINNO - Circular economy tools to support innovation in green and blue tourism SMEs” the number of special tools were planned to create: Market handbook, Self-Assessment virtual tool, learning programme and advisory means to support tourism SME's towards CE.

The main problem. However, analysis of existing CE approach enabled to discover, that existing concept of CE is enough new and not formed finally. The main purpose of CE was mainly physical approach to cut use of materials and energy in production and consumption chain, mainly related to repair, reuse, remanufacturing, refurbishing, and recycling. Considering that scope of business resources is much wider and near materials and

energy includes large scale of intellectual, job, manual and high-tech work, finances, etc., the subject must be named as “Circular economy of materials and energy” and no more. Moreover, that some authors include into Circular economy concept other resources also.

The try to apply such approach to tourism service providing by SME met significant methodological and practical troubles to use it. If repair and reuse is easy everyday practice of tourism service, remanufacturing, refurbishing, and recycling frequently are out of tourism service cycle, they require specific knowledge, investments, founding, additional expenses and specific work not directly connected to tourism service. They sometime look like try to return to a Subsistence farming, when a family business implements all scope of home works. When nowadays business moved towards to specialisation very far. It's very difficult to motivate tourism SME to reduce their profitability seeking of abstract social benefit of CE.

Detailed analysis of CE approaches and practical projection to different fields was made by project CIRTOINNO team in 2017 year [Jesper Manniche and other]. CE 1.00 and CE 2.00 were defined as steps toward circular economy. In next stage holistic approach enabled to state, that existing CE concept isn't enough positioned in overall scope of EU methodological culture and EU2020 strategy and its initiatives of smart, inclusive and sustainable growth. Holistic methodology requires to consider saving of not only materials and energy, but of all scope of business resources: material, energy, information, time, intellectual, manual work, high-tech,

etc. Physical approach to business innovation is too low, considering increasing number of feed-back loops related to economical, green, sustainable and smart circularity. Enlarge of CE concept towards all kinds of resources and to higher levels of innovation culture aren't not only natural such concept development tendencies. CE 3.00 as holistic approach was synthesised and implemented in practice of project CIRTOINNO. It includes motivation and means for tourism service business to go towards CE in natural way of business development.

Main subject of the article is the synthesis of holistic concept of CE at the basis of its application in tourism SME business.

Main aim of the article is to position of CE concept in EU innovation culture in scope of main resources to be saved during business practice.

Main tasks of the article are:

1. To position of CE 3.00 concept in EU Innovation culture.
2. To present tourism service holistic concept scope, innovation trends and principles.
3. To present tourism service CE 3.00 solutions and benefits to business and society.
4. To design, create and validate tourism service SME's virtual Self-Assessment tool.

1. Towards EU Circular Economy

Faced to stagnation and destruction challenges European Union second decade composes strategic methodologies, programmes and tools, which targeted to increase growth and competitiveness of EU in global market. The Lisbon strategy for last decade and current strategy EU2020¹ European Union is targeted to become smart, sustainable and inclusive growing community, which uses innovations as sustainable development engine. They aren't buzzwords, because they have deep sense and should be used as methodological tools for growth. However, here is lack of understanding of holistic system and structure of EU growth methodology in qualitative and time scales.

„A circular economy² is a regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling. This is contrast to a linear economy which is a 'take, make, dispose' model of production.”

However, the state of development of Circular economy concept is enough draft and partial, because it accents only two circles – loops of material and energy resource flow. These loops can't be excluded from loops of other business resources, like time (human, communication, etc.), finance, legislation, knowledge and other. Practical implementation of CE solutions requires

to consider also other business cycles. As an analogy: not a disease, but a person needs to be treated.

2. Circularity as general principle of economy

Circularity is global feature of a Universe, life and business. The world is circular and developing system. Everything has the beginning and the end. In time scale a circle is a qualitative leap. Life is going as qualitative spiral. Circular model of any reality is a virtual Leap. Virtualics is methodology of virtual modelling of reality. Linear acceptance of circular world is simplification and reduces opportunities to use it in practice. So, circularity is measure of efficiency of modelling of reality and practical action. So, as more of circularity, as closer to reality, as better.

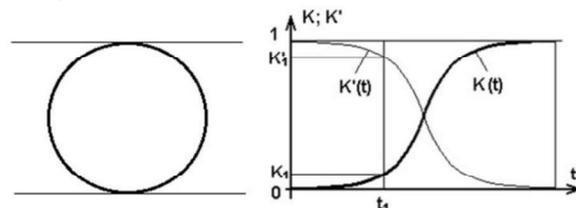


Fig. 1. The circle and its projection in to time scale on basis of dichotomic virtual model. (S. Paulauskas) Where: $K'(t)$ – Linear economy quality; $K(t)$ – Circular economy quality, $K(t)=1-K'(t)$

Circular economy as business activity firstly is smart, because it is grounded on feed-back loop activity cycle. Businessmen is involved in such cycle as innovator, interested to increase profitability of business.

Dyping into sence of Circular economy gives opportunity to see its internal qualitative steps as hystoric paradigms of human economical activity (Fig.1). The hystorical path from Linear economy to Circular economy goes trough Physical, Economical, Environmental (Green), Sustainable and Smart steps. From ancient time physical deals with material things during production of other things hasn't unified methodological frames. Only individual human smartness was a handbook for economical activity in natural economy.

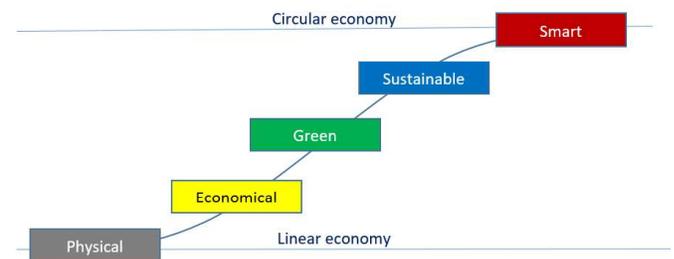


Fig. 2 Qualitative leap of circular economy paradigms (S. Paulauskas, 2017)

Some hundreds year ago occurred economical theories enabled to change physical language of natural economy to economical language of value and large system of quantitative and qualitative micro and macroeconomic indicators. Environment or ecological and Green economy paradigm occurred in end of last century as antithesis to poluting economy. Sustainable

¹ EUROPE 2020 A European strategy for smart, sustainable and inclusive growth, http://ec.europa.eu/europe2020/index_lt.htm

² http://ec.europa.eu/environment/green-growth/index_en.htm

development paradigm synthesised economical, environmental and social priorities with responsibility against future generations. Smart growth paradigm was declared in EU2020 strategy as official strategic methodology of European community in current decade.

One of the most significant feature of growth loops is spreading of business resources (Table 1.) For physical

level materials and energy are main resources of business. Economical paradigm adds to them office and manual work. Green growth is impossible without clean technologies. Sustainable growth requires of health technologies. Artificial intelligence is necessary for smart quality of circular economy.

Table 1. Used business resources by paradigms

Paradigm	Physical	Economical	Green	Sustainable	Smart
Resources	Materials and energy	Office and manual work	Clean technologies	Health technologies	Artificial intelligence

Different economy paradigm forms different understanding of economy growth. Here is the reason of some misunderstanding in contacts between people and overall countries used different economy paradigms, including scientists and developers. European community take care for common understanding of current paradigm through strategic documents, which are obligatory for all actors of EU. Achieving of highest Smart growth methodology is the main benefit of Circular economy.

3. Tourism service scope, innovation trends and principles

According to tourism circle a tourism service consumption business arranges own activity, which consist mainly from the most important activities: marketing, communication, accommodation, catering, wellness and local transportation.

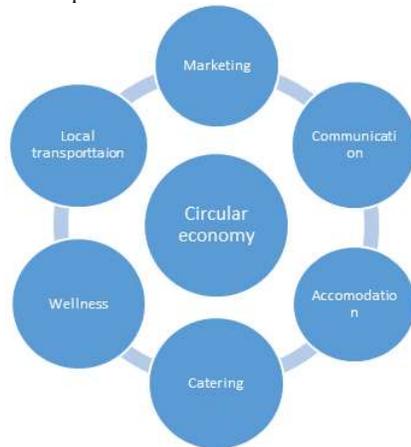


Fig. 3 Tourism service cycle (S. Paulauskas, 2017)

3.1. Tourism service efficiency indicators

A life is an innovation – permanent flow of changes, which are going circularly and by development spiral. As in any business in tourism sector is quantitative and qualitative growth. Sustainable innovation of tourist service requires of scope of business, technical and social changes, taking into account sustainability criterias. Taking into account circular qualitative growth character of any social activity, tourism service business is modeling as repeating smart cyclic feed-back process,

operating in dependence from such cycle of tourism service consumption.

Quantitative growth means increasing of number of visitors, income and market geography. Qualitative growth shows positive changes in rates and relative indicators, such as work productivity, profitability, etc. Work productivity is the most important indicator of progress. It shows which amount of profit was generated by one employee. In tourism business is a lot of manual work, which could be transferred to equipment/robots, smart solutions and virtual informational systems. Employees could change manual work to more qualified jobs. Reduction of low qualified manual work is global Humanity occupation change. In the short period employees should be involved in service innovation process through requalification for high-tech work with smart systems. Further robotisation and virtualisation of tourist services should be operated providing payment to all citizens Universal Basic Income or Dividend³.

Work profitability shows overall SME efficiency of tourism business. At first extent transition to green, blue or smart growth requires investments, which let increase service efficiency through rise of attractiveness of service thanks to better environment and health quality of service.

3.2. Tourism service innovation trends

Tourism is traveling with purpose of information, wellness and entertainment. The demand for travel is grounded on geographical deconcentration of tourism sources in different continents, regions and countries. Informational character of tourism forms two main tourism directions: physical and virtual. Covering of tourist demands is very expensive for tourists and for planet. Tourist spends a lot of money. Planet meets problems related to air and water pollution by travelling and accommodation. Last year become evident risk of travel to some exotic countries due to local climate disasters and terrorism.

Internet technologies are developing in direction of transfer virtually information related to all 5 human senses: eyesight, hearing, touch, smell and taste. First two of them are implementing easy through TV, radio, movies, etc. Scientists still working on transferring of rest senses. And they have success on that.

³ The European New Deal. <https://diem25.org/end/>

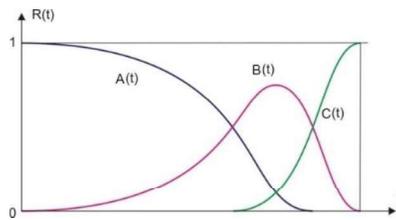


Fig. 4 Tourism transition trichotomy (S. Paulauskas, 2016)

Transition from physical to virtual tourism is going through trichotomy (Fig.4): A) Physical tourism is wellbeing (thesis); B) Physical tourism is too polluting and risky for travellers; C) Virtual tourism lets to achieve all tourist demands avoiding travel and pollution of environment.

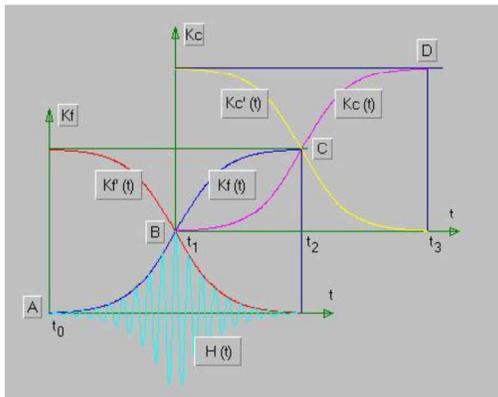


Fig. 5 Virtual model of tourism innovation (S. Paulauskas, 2016)

Nowadays tourism is mostly economic $K_f'(t)$ phenomenon, wide field of tourism business, related to travel, accommodation, catering and SPA (Fig. 5). Large marketing tools are used for attracting travellers and visitors in all countries. Due to transition from biogenic to demand of safety and health (A. Maslow) humans start take care for save environment and stop climate change. Economical paradigm is replacing by Sustainable development paradigm $K_f(t)$.

The contradiction $H(t)$ between economic and sustainable approaches will increase accordingly resonance sinusoid. In not far future the physical $K_c'(t)$ tourism will start to be replaced by virtual tourism $K_c(t)$. Each informational demand could be covered trough internet avoiding expensive and danger travel. But this will be a bit in Future.

3.3. Tourism service circular economy innovation principles

Circular economy innovation of tourism SME’s business requires to understand and follow to number of the best theoretical principles, raised from great EU strategical growth initiatives and documents: dialectic, sustainability, complexity, holistic, smartness and applicability.

Dialectic. Tourism service provider and consumer are two opposites, but always united parts of communication. Frequently consumer looks like passive side seeking for impressions and convenience. Service provider is active

side and he leads on organising and assuring the best communication and satisfaction of the consumer. No secret, that businessmen seeks to earn profit from his service. The principle of dialectic means the balance between service provider and consumer. Disruption of such balance from one or other side reduces efficiency and quality of the service.

Sustainability. Tourism SME’s innovations should be in accordance to sustainable development criteria. Economic – should result higher work productivity and reduce manual work of tourism service users and providers. Ecologic –not polluting of environment. Social – should result longer full-range life span and happiness of tourism service providers and users. Responsibility – no leave problems for people around and next generations.

Complexity. Tourism service should provide and assure covering all complex of consumer needs, which are obligatory during tourism service cycle. Communication – exchange of information between service provider and consumer during overall service cycle. Accommodation – to assure hotel service. Catering – to assure meal and drinks. Wellness – to assure opportunities for SPA. Local transportation – to assure opportunities for choice of convenient transportation in service location.

Holistic. Considering A. Maslow’s human demand growth pyramid holistic approach requires to consider and create opportunities to satisfy all level needs of tourism service consumers. Biogenic – needs on meal and water. Safety and health – avoidance of risk for body and mind. Communication – assure wished contacts with other people. Self-esteem - to protect disturbing of achieved self-assessment level. Self-expression – opportunities for expression of a creativeness.

Smartness. Considering different quality levels of business growth, SME should give priority to higher of them starting from lower to higher. Physical growth – increasing of technical facilities to give service for bigger number of visitors and higher complexity of service. Economic growth – increasing of work productivity and profitability through automatization and virtualisation of business service. Green growth – introduction clean technologies seeking to reduce pollution of environment and expenses related to waste treatment and recycling. Sustainable growth – introduction healthy and secure for employees and consumers work conditions. Smart growth – assuring permanent growth through introduction of cyclically operating technical and social Self-Management system included software, artificial intelligence and innovation service.

Applicability. CE solutions must be applicable, based on scope of rationales. Technically implement ability – must exist technical solutions of an innovation considering hardware and software equipment. Practical use – must be applied in business practice of some places of the World. Interest of consumers – consumers must be interested in an innovation considering tourism service scope and elements, price and delivery conditions. Interest of SME’s – tourism service providers SME’ must be interested on an innovation, considering profitability of business and covering other demands of businessmen. Interest and legislation of a society – European

community or/and a State must be interested, and EU/local legislation must be friendly for an innovation.

4. Tourism service circular economy innovation solutions and benefits

Innovation is the bridge between the past and the future. In this investigation the past is linear economy, and the future is circular economy. Absolutely necessary to forecast and provide how will look tourism SME in quality of circular economy. Nobody knows and can't to provide the future exactly. However, use of existing development trends and advanced practical applications gives opportunity to talk about circular economy solutions and benefits of its applications in tourism sector.

4.1. Tourism service circular economy innovation solutions

Global marketing. Globalisation of tourism enlarges geography of visitors and unification of services. Tourism globalisation is connected to transition of physical booking to large internet marketing and booking networks, as booking.com. Holders of such networks keeps close direct links to consumers and realises promotion and feed-back loops on tourism service through polls of visitors on matter of satisfaction of received services. Participation in global tourism marketing and booking networks lets to increase work productivity, reduce local marketing operation, expenses and manual work.

Virtual communication. Transition of competition to global market raises needs of tourism service provides to be in line with nowadays innovations and service culture. Face-to-face contact less booking of tourism services, making of payment and receiving of invoices is available in many developed countries. The process of booking virtualisation is going on very rapidly. Seems not far the time, when will be not necessary to have any contacts with service administrators.

Smart accommodation. Accommodation is one of main parts of tourism service. Accommodation service needs significant manual work related to cleaning of apartment and bad room, replace of materials and bed-clothes. Assurance of lighting, heating, cooling, ventilation and other conditions is enough big challenge to employees of a hotel. Here are few parts, which needs sustainable innovations from vision of nowadays: Contact less of administration access and leave a room. A++ and higher energy class of buildings. is subject of construction new one's buildings according to EU legislation and renovation old ones with help of EU energy efficiency funds. Assuring automatic lighting, heating, cooling, ventilation of a room. Replace of bed-clothes. Assuring cleaning of apartment. Replacing sanitary materials in bad room and apartments. Waste water and heat recycling. Sanitary and visitor's safety monitoring and support.

Smart catering. Supply of catering service in hotel and its restaurant is obligatory component of whole tourist service. Special attention should be done to

planning of a meal according to individual needs. Convenient buffet has weak side related to up to 40% of waste food. Virtual booking systems enables to book nourishment according to personal need and request of visitors. Considering local specialities of food, hotels could do good work if they could take care for to avoid health problems for visitors from some known countries. Easy communication by internet could give opportunity to reduce waste food amounts. Use of automatic drink preparing equipment and 3D print food solutions in living rooms could avoid necessity to have expensive restaurants and breakfast rooms.

Smart wellness. Health monitoring and support devices in rooms and special SPA, sport and wellness procedures become obligatory part of whole tourist service. This assure increasing income of service provider due to additional services. Also, this asks to take care on automatization of lighting, heat, cool, air, water supply and use. Traditional use of paper, towels, cosmetic materials should be replaced by electronical solutions. Waste water and heat should be taken off from water, cleaned and reused. SPA visitor emergency and trauma prevention equipment should be used in SPA.

Smart local transportation. Some attractiveness and additional income tourism service provider could earn by propose to visitor's local transportation means: bicycles, rollers, wheel chair, bus shuttles, etc. All polluted fuel used transport means should be replaced by natural or electric vehicles. Driver-less transportation is the most appropriate from point of view of circular economy, especially for people with special needs.

4.2. Benefits of circular economy innovation for tourism SME's business and society

Circular economy, same as other European innovation initiatives and strategies isn't buzzword. They targeted to decide global and local development problems. At same time circular economy gives direct additional profit for tourism SME's trough increasing of service complexity, saving of materials, energy and indirect – trough increasing of benefit for society. Any way tourism SME's earns many times through circular loops of innovations.

Work productivity. Work productivity is one of main economic indicators of progress and development of a society. It shows efficiency of human work -which economic value is created by one employee or worker. Stagnation of work productivity growth results destruction and crisis in a society. So, only increasingly growing productivity is indicator of welfare of a society. Talking about increasing of work productivity it's necessary to state, that higher work productivity results not absolute exclude of people from job places. Human are operating two kinds of job: manual and intellectual. First of them is hard, mostly physical and it's not wished by human, operating him mainly for salary. At other hand, the price for manual work permanently is increasing. Naturally, that this unwished manual work is replacing by machines, robots and virtual systems.

High-tech jobs. Intellectual work has wished character and it is connected to highest human demand – self-esteem and self-expressions, which are increasing. So, raise of work productivity freeing people from hard

manual work and creates opportunities for high-tech intellectual jobs. Human are obligatory to seek increase intellectual abilities for high-tech jobs through permanent self-improvement. No other ways exist. Tourism business nowadays is related to large manual works on assuring clean rooms, beds, SPA and healthy nourishment. Automatization and robotisation of tourism services result reduction of manual work demand, work places. However, the need for high-tech jobs related to innovations of tourist service will create new high intelligence work places.

Business profitability. It's any secret, that business historically is dedicated for profit. No body can't take back from SME's this purpose. However, European Community declares being society of social market. It means that not only economic, but social capital also are values of interaction of service providers and consumers. Social market orientation gives for businessmen to use social market orientation as marketing opportunities to attract more visitors and earn additional income. Seeking to increase service complexity SME can add to its e.g. only breakfast service the nourishment during all day or local transportation opportunities.

Social responsibility. Social responsible business brings new feature into social market activities. Because socially responsible businessmen earns not direct additional income, but increasing of self-esteem for doing good deals, which anyway return to them earlier or later.

Clean environment. Cleaner environment and reduced climate change become undisclosed good deals for planet. Large tourist flows, and huge amounts of energy, food and other materials are related to enormous amounts of waste and pollution of environment. Circular economy ecological benefit is evident and not doubtful. Tourism SME's has opportunity to take part in great ecologic initiatives and help to do our planet more acceptable for life.

Longer life span of people. Cleaner environment, safer food, more healthy tourism services results the most important indicator of human wellbeing – full-range life span and wellness. According to World Health Organisation, combustion related pollution of environment reduces human life span on 17-20%. So, humans could live longer on 20 years if combusting and polluting of environment will be stopped.

5. Design, creation and validation of tourism SME's virtual Self-Assessment tool

CE 3.00 methodology was approved through virtualisation and validation of principles, solutions and applications on virtual Self-Assessment tool, which is accessible at – <http://www.virtualika.lt/iSAT>. 17 tourism

service providers SME's participated in trial test of the tool in December of 2017 mainly in Lithuanian regions.

Total evaluation of the CE 3.00 methodology and tool was positive. Average rate is 2,5 (from max 5.0) – „I understood and become interested“. Self-assessment showed average *economical* level of tourism SME's CE in Lithuania regions. The economic innovation culture and growth are aimed at increasing business profitability by expanding the scope of services and reducing costs. Expert practical look to self-assessment results shows adequacy between testing results and real state of circular economy innovation in Lithuania.

Conclusions

Holistic approach enabled to state, that existing CE concept isn't enough positioned in overall scope of EU methodological culture and EU2020 strategy and its initiatives of smart, inclusive and sustainable growth.

Holistic methodology requires to consider saving of not only materials and energy, but of all scope of business resources: material, energy, information, time, intellectual, manual work, high-tech, etc.

Technical innovation approach to business activity is too easy, considering increasing number of feed-back loops related to economical, green, sustainable and smart circularity. Enlarge of CE concept towards all kinds of resources and to higher levels of innovation culture is not only natural such concept development tendencies.

CE 3.00 as holistic approach was synthesised and implemented in practice of project CIRTOINNO.

On the basis of CE 3.00 were synthesised tourism service business scope, innovation trends, principles, implementation of which in Self-assessment virtual tool iSAT „Innovation circles“ enabled SME's to innovate their business and significant benefits to society.

Main tourism innovation trend is transition from physical to virtual tourism what results total reduction of all kind of resources.

Main CE 3.00 principles defined as: dialectic, sustainability, complexity, holistic, smartness and applicability.

Main CE 3.00 solutions in tourism recognised as: global marketing, virtual communication, smart accommodation, catering, wellness and local transportation.

Main benefits stated as: work productivity, high-tech jobs, business profitability, social responsibility, clean environment and longer full-range life span of people.

Created CE 3.00 methodology was approved through validation of tourism service SME's Self-assessment tool iSAT. Economical level of tourism service SME's CE innovation in Lithuanian regions was recognised.

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