Vol. 15 2020

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CREATING A NEW CULTURAL TOURISM PRODUCT RELATED TO LOCAL POST-INDUSTRIAL HERITAGE AS A MULTIPLE CRITERIA DECISION AIDING PROBLEM

DOI: 10.22367/mcdm/2020.15.06

Received: 30.12.2020 | Revised: 19.09.2021 | Accepted: 28.10.2021.

Abstract

Creating local cultural tourism products (CTPs) requires the involvement of many entities, e.g., local government units, culture and tourism institutions, non-government organisations, etc., as well as organisational, technical, financial, and human resources. When deciding on a future product venture, it is important to establish visions, goals, or the product's desired functions common to all these actors. Then, the alternative instances of such CTP need to be designed and examined from the viewpoint of these goals, which may be mutually exclusive due to the various preferences of the actors. Furthermore, despite their importance, these criteria may conflict with, e.g., the tourism policy of local authorities. The issues mentioned above make the decisions regarding creating CTPs very complex and have behavioural, group multiple criteria character. This paper aims to identify the structural elements of creating the best possible CTP promoting local post-industrial heritage in the Czeladź Commune. The specific assumptions, conditions, and criteria are defined to formulate the problem for further consideration using multiple criteria group decision-making (GDM) approaches.

Keywords: multiple criteria decision making, group decision-making, multiple criteria problems in cultural tourism, decisions on new cultural tourism products.

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1 Introduction

The development of cultural tourism, especially at the local and regional levels, has contributed to the growing importance of territorial marketing (Bagautdinova et al., 2012), promotion of a given local government unit (LGU), (Felsenstein and Fleischer, 2003; Panasiuk, 2020), and expanding the cultural and tourist offer (Bec et al., 2021). New CTPs have become an original and distinctive offer, attracting tourists from outside the LGU and the inhabitants themselves (Smith et al., 2021). However, before the new CTP is implemented, the decision to plan and design it goes through a long and procedural way of acceptance. There are many factors that affect the complexity of the problem related to creating a new CTP, e.g., the definition of the decision problem (Hammond, Keeney and Raiffa, 2002), identification of different CTP variants (Cemali, 2010), adequate selection of the set of evaluation criteria (Ginevičius and Podvezko, 2005), and analyses of entities and stakeholders, e.g., formal and informal decision-makers, experts (Crane and Ruebottom, 2011).

Economists and cultural, geographical and sociological scholars have been involved in a debate for at least two decades aiming to clarify the relation between destinations development and the use management production of the assets on which such development is based initially. In the case of cultural tourism, the issue is to "exploit wisely" the heritage for tourist use. In the variety of issues, methods, recommendations, and caveats generated by such discussion, two themes emerge as particularly productive for practical policy developments: the compatibility between the development of tourism industry and the preservation of the heritage "out of the market":

- a) the compatibility between the development of tourism industry and the preservation of the heritage "out of the market";
- b) the existing and potential synergies and tensions between the "global" tourism system and the "local" socio-economic development (Russo and van der Borg, 2002).

Yet another issue that may affect the complexity of the issues is the contemporary interdisciplinary character of such areas as: recreation, tourism, culture, etc. The importance of culture and heritage is becoming more and more obvious, both in local and regional development. Cultural factors are important because they directly affect economic performance and development, and therefore the competitiveness of the region. Moreover, a significant increase of the complex relations between culture, heritage, geography, tourism, economy and experience economy can be observed. Furthermore, cultural tourism offers a clear definition of each specific term, and defines the newest forms and trends in cultural tourism and experience economy (Bujdosó et al., 2015).

Given the very high complexity of the problem related to the creation of CTPs, the issue of implementing an appropriate multiple criteria behavioural group decision aiding tool arises. Theoretical and practical support for management decisions on CTPs is becoming a significant challenge for such areas as operational research, Multiple Criteria Decision-Making (MCDM) or optimisation.

The main objective of this paper is to identify the problem of creating a new CTP related to local post-industrial heritage as a MCDM problem. This requires structurisation and identification of its key elements, which allows producing grounds for further decision-making analyses from the viewpoint of any selected stakeholder of this process. The paper's contribution is twofold. First, we structure in detail the real-world problem of creating a new CTP for post-industrial heritage of the Czeladź Commune. Second, due to such a structurisation, we show what may be the elements of the decision making problem when any new CTP of post-industrial heritage is analysed; in particular, what types of criteria can be considered by the analysts and decision makers.

This problem is multidimensional, and specific relationships (exclusions, correlations, synergies) can be distinguished between individual dimensions. Therefore, several major levels of multidimensionality can be distinguished, such as:

- 1) multiplicity of entities and stakeholders involved (e.g., decision-makers (DM), experts, consumers) (Robson and Robson, 1996);
- 2) diversity of means and resources: technical, organisational, financial, etc. (Lee-Ross and Pryce, 2010; Nogueira and Pinho, 2015);
- 3) divergent perspectives on the mission, vision, objectives and CTP functions (Smith, 1994; Russo and van der Borg, 2002; Vucetic, 2009);
- 4) different CTP characteristics: e.g., attributes, features which can be considered as evaluation and finally as decision criteria (Keane, 1997; Lohmann, 2004; Mason, 2016);
- 5) identification of scales to measure criteria depending on their quantitative and qualitative characteristics (Davies, 2003; Weber and Taufer, 2016);
- 6) problems of selecting the key criteria from among the set of all identified criteria that will allow the most comprehensive evaluation of CTP alternatives (different types of criteria are presented in Section 4) (Ban, 2012; Blázquez, Molina and Esteban, 2012; Logunova et al., 2020; Nair et al., 2012; Stefano et al., 2015; Szromek and Herman, 2019);
- 7) diversity of base and potential of post-industrial heritage;
- 8) a multiplicity of categories, types and forms of a tourist product:
 - a) e.g., product-thing, product-service, product-route which can take the real, virtual or mixed form of the trail,

- b) product types depending on their complexity: mono-products, systemic products (multi-products) etc.
- c) different forms (instances): real product, virtual product, hybrid product etc. (Burkart and Medlik, 1981; Mason, 2016; Medlik and Middleton, 1973; Stokes, 2008; Yu and Xu, 2019).

In this paper, we focus on identifying the possibility for developing a CTP in the Czeladź Commune using the potential provided by the post-industrial cultural heritage of the town. We can understand this possibility as a set of all strengths, weaknesses, benefits, opportunities, threats (some intangible costs) and risks, which are located in the aspects listed above. The multifaceted analysis of the problem concerning the creation of a new CTP related to the promotion of post-industrial cultural heritage, presented below, was performed from the point of view of people working at the "Saturn" Museum in Czeladź.

The remainder of this paper is organised in the following way. Section 2 presents the essence of tourism products. In Section 3 diversity of stakeholders is presented. The issue related to resources as well as goals, and functions related to creation of a new CTP is presented in Section 4. The aspect of CTP criteria evaluation is described in Section 5. Diversity of the base and potential of post-industrial heritage is described in Section 6. In Section 7 we describe the multiplicity of categories, types, kinds, forms and forms of a tourist product. Finally, in Section 8, the summary and discussion are presented.

2 The essence of tourism products

There are many definitions of tourism products in the literature. Burkart and Medlik (1974, p. 45) emphasize the process of purchasing all things, their consumption and use, as well as the tourist's activity and activities related to the implementation of trips, travel or stay. Medlik and Middleton (1973, p. 32) define a tourist product in terms of area, because from the moment when tourists travel for a specific purpose, their destination has become the most important product they buy and they claim that the tourism products consists of a variety of elements which is a package that is not integral to each other and meet the needs of tourists from leaving his residence to the place of destination and back again to the place of origin. Thus, it can be concluded that there are three elements that form a tourism product, namely (Muainuddin and Hasan, 2018):

- a) the attractiveness of the destination,
- b) facilities of destination,
- c) the ease of destinations.

Furthermore, the following six tourism product elements make up an integrated tourism package (Tresna and Nirmalasari, 2018; Yu and Xu, 2019):

- a) objects and attractions,
- b) services of travel agents and tour operators,
- c) transportation services,
- d) accommodation, restaurants, recreation and entertainment possibilities,
- e) souvenir services,
- f) business support.

Tourism product is a series of interrelated services produced by various companies (economic aspect), community services (social aspect) and service branches. The formulation of the components of tourism products was proposed by P. Mason (2016). They are namely:

- 1) attractions, which are a tourist attraction of natural, cultural and man-made origin such as festivals and performing arts;
- 2) accessibility, the ease of obtaining or achieving organisational goals such as tourism, travel agents;
- 3) amenities of the facility to obtain pleasure; in this case the tourism product can take the form of accommodation, cleanliness and hospitality, networking, the network of cooperation relating to the products offered by local, national or international organization.

Tourism product is something that can be offered to tourists to visit a tourist destination. Tourism products can be natural, cultural or community handicrafts. It is a service that can be enjoyed by tourists in a tourist destination, which is supported by tourist attractions, facilities and services, product price, or accessibility support that can facilitate travel activities. In turn, the definition presented by the World Trade Organization (WTO) in 1985 describes cultural tourism as movements of persons for essentially cultural motivations such as study tours, performing arts and cultural tours, travel to festivals and other cultural events, visits to sites and monuments, travel to study nature, folklore or art, and pilgrimages (von Rohrscheidt, 2008).

Regarding the general information about tourism products, it can be concluded that the local post-industrial CTP is a multi-component set of all goods and services enabling the consumer-tourist to sightsee post-industrial heritage, stay, rest and recreate in a geographically determined area of post-industrial heritage.

As mentioned above, the process of establishing CTPs is very complex. If we consider a specific context of such a product related to the local heritage of post-industrial areas in the Czeladź Commune, the level of complexity increases further. This is caused by the diversity of entities, decision-makers, stakeholders, the diversity of types of cultural heritage, and the lack of integrity of the

previously promoted post-industrial heritage. Below we analyse the elements that comprise this multidimensionality and identify key important elements for the future decision-making problem of 'which CTPs to choose to promote post-industrial heritage in Czeladź in the best possible way'.

3 Diversity of stakeholders

Stakeholders' identification was based on an analysis of organisational structures, formal information provided by various entities and based on competencies and responsibilities of various human resources in institutions located in the Czeladź Commune. In general, four types of stakeholders can be distinguished from different entities located in Czeladź:

- 1. Stakeholders at the level of the LGU of the Czeladź Commune.
- 2. Stakeholders in units, entities and institutions subordinate to the Czeladź Commune.
- 3. Stakeholders in (non-governmental organisations) NGOs whose statutory activity is related to promoting culture, tourism, cultural tourism.
- 4. Stakeholders in municipal educational institutions (related to the subject of cultural tourism).

A more detailed description of the above classification is presented in Table 1.

Table 1: Planned entities and stakeholders in the process of creating a cultural tourism product related to the post-industrial cultural heritage of the Czeladź Commune

Name of the stakeholder group	Institution/entity	Person/persons representing a unit, institution or entity
1	2	3
Stakeholders at the	Czeladź Commune Hall	- Mayor of the Czeladź Commune and/or
level of the LGU		Deputy Mayor for Social Affairs
		- Head and/or Deputy Head of the City
		Promotion, Culture and International
		Cooperation Department
		– an employee of the City Promotion, Culture
		and International Cooperation Department
		- Head and/or Deputy Head of the City
		Development and External Funds Department
		- employee of the City Development and
		External Funds Department
Stakeholders in	"Culture Mine" - municipal	- Manager of the "Culture Mine"
organisational units	culture institution	- Director of the Municipal Sports and
and institutions and	Municipal Sports and Recreation	Recreation Centre
entities subordinate	Centre	- Head of the Sport, Organisation and
to the LGU	"Saturn" Museum	Coordination of Events Department

Table 1 cont.

1	2	3
	"Saturn" Museum – Department:	- Director of the "Saturn" Museum
	Contemporary Art Gallery	- Head of the History of the City and
	"Elektrownia"	Dąbrowski Basin Mining Department
	Municipal Public Library	- Employee of the History of the City and
	House of Culture "Odeon"	Dąbrowski Basin Mining Department
		- Manager of the Contemporary Art Gallery
		"Elektrownia"
		- Deputy Manager of the Contemporary Art
		Gallery "Elektrownia"
		- Employee of the Contemporary Art Gallery
		"Elektrownia"
		- Director of the Municipal Public Library
		- Manager of the House of Culture "Odeon"
Stakeholders in NGOs	Associations, foundations, public	Decision-makers in NGOs from the Czeladź
whose statutory activity	benefit rganisations, etc.	Commune
is related to promoting	- Educational and Cultural	
the Czeladź Commune	Association	
	- "Razem"	
	- "Czeladź Is Cool" Association	
	– Public Society "Czeladź"	
	- "The Mine of Magnificent	
	Climates" Association	
Stakeholders in	Primary and secondary schools:	- Headmasters (and/or their deputies) of
municipal educational	- Primary School No. 1	primary and secondary schools
institutions	- Primary School No. 2	and/or
	- Primary School No. 3	- Teachers of primary and secondary schools
	- Primary School No. 4	
	- Primary School No. 5	
	- Primary School No. 7	
	- General Education and	
	Technical Education Schools	
	(secondary school)	

Diversity of resources, visions, and goals 4

Various actors that are involved in the CTP development process have different means and resources. Their specificity may affect the definition of one's own vision and goals of CTP implementation related to the promotion of postindustrial heritage.

In order to implement a new CTP (regardless of its form: real, virtual, or combined), appropriate means and resources are necessary, such as:

- a) organisational requires an appropriate organisational structure of entities, appropriate delegation of powers to individual stakeholders and an appropriate management style;
- b) technical concerns a variety of materials, devices, equipment and infrastructure. It is difficult to imagine, for example, a thematic well-prepared post-industrial route without easy communication accessibility (e.g., public transport stops, bicycle routes, tourist routes, etc.);
- c) financial that must be secured in the budget of the Czeladź Commune (which is the main substantive provider of the new product) and the budget of the leading institution; here, a question arises regarding an "optimal" level of financial resources; decision-makers will have to deal with such a problem – what is the best ratio of the funds involved to the benefits and positive effects of a new product?
- d) personnel (human resources) that requires proper selection of people involved in the decision-making process and the executive process; here, the following issues are also important: experience in creating new ventures, competences and knowledge, managerial skills, interpersonal relations and behavioural aspects of decision-making or advisory activities.

Different goals and functions

Each stakeholder may have a different view on the vision and goals of creating a new CTP related to post-industrial heritage and the functions it needs to fulfil. Differences in views on these issues may result, among other things, from (Smith, 1994; Russo and van der Borg, 2002; Vucetic, 2009):

- a) the nature of the main activity of the entity,
- b) personal beliefs and concepts,
- c) conflict of matters between different entities,
- d) prejudices, stereotypes and lack of motivation to overcome stereotypes and habits in making decisions, as well as risk aversion of creating abovestandard solutions,
- e) not being aware of the existence of other alternative visions, goals or functions,
- f) lack of stakeholders' awareness of alternative variants of the potential CTP.

For example, the authorities of the Czeladź Commune may strive to ensure that the new product is:

- a tool for the promotion of the Commune (primarily it plays promotional and PR functions).
- a new item in the tourist and cultural offer of the Commune. On the other hand, the managers of the "Saturn" Museum in Czeladź may see the new product as:
- fulfilling educational functions, disseminating the history of the industry, etc.,
- a new offer in the activities of the Museum,
- a presentation of new ideas and creativity of their employees.

Criteria of CTP evaluation 5

The CTPs have many different characteristics that can be described by various attributes. Depending on, for example, the visions, goals and functions of the planned product, the properties mentioned above can be considered as criteria for assessing a given alternative of the future CTP. There may be many different objectives, evaluation criteria and related preferences of the identified stakeholders (Keane, 1997; Lohmann, 2004; Mason, 2016). The second aspect is related to the fact that the criteria may be either measurable or not, namely:

- a) non-measurable evaluation criteria, such as: mission, objectives, action plan, strategy, functions, program, location;
- b) measurable evaluation criteria, e.g., number of attractions, number of tourists in a given destination, estimated future volume of tourist traffic, potential tourist capacity of the region.

The research approach to eliciting preferences over such criteria should therefore take into account their dual character. Since many stakeholders may define a large number of potential criteria, the next issue is selecting the subset of key criteria that will best match the specificity and features of CTPs related to the promotion of post-industrial heritage. After analysing the problem from the viewpoint of our DMs - the management of the "Saturn" Museum - the following set of criteria was defined, as shown in Table 2.

Table 2: The list of potential CTP decision criteria

Criteria and possible sub-criteria	Meaning of the criteria/sub-criteria
1	2
C1: Development prospects:	What activities are planned for product development?
a) an action plan	What development strategy is planned for the product?
b) a development strategy	what development strategy is planned for the product:
C2: Attractiveness of the product	In what ways are the product attractive?
from the point of view of tourists:	a) main attractions related to the product
a) main attractions	b) USP – unique features that motivate tourists to take advantage of
b) USP – unique selling proposition	the product offer
c) objects of heritage, objects of	c) heritage features, land-use facilities that attract tourists to a given
spatial development	area and area
C3: Commercialisation of the	What actions are taken to commercialise the tourist product –
cultural tourism product:	activities related to introducing the cultural tourism product to the
a) bundling of services and offers	market?
b) using various distribution channels	market.
c) joint marketing strategy	
d) the number and names of travel	
agencies, sales portals offering this	
product, etc.	
C4: Innovation in product	What innovative solutions will be applied as regards:
development:	- the offer (e.g., offering services/products previously unknown
- solutions within the scope of the	on the market, completely new)
offer itself	- management (e.g., functioning under an innovative formula
- management solutions	of partnership with other entities)
- marketing solutions	- marketing (the use of innovative promotion methods, research,
marketing solutions	communication with the market, etc.)?
C5: New technologies in product	What new technologies will be implemented in product development
development and its promotion	and its promotion? e.g., beacons, QR codes, mobile applications,
development and its promotion	the use of web 2.0/3.0 technology, travel planners, geotagging,
	multimedia platforms, multimedia and/or interactive exhibitions,
	ICT systems, online booking/purchase, e-books, 3D exhibitions,
	holograms, virtual tours, etc.
C6: Economic, social and economic	What economic and social aspects of a cultural tourism product will
importance of the product for the	be important for the development of the region?
development of the region:	or important for the development of the region:
a) the economic potential of the	
product, including the ability to	
generate jobs	
b) product image – perception	
of the offer on the tourist market	
c) economic effect	
d) integrating the local community	
e) estimated future volume of tourist	
traffic	
f) product receptivity	
1) product receptivity	

Table 2 cont.

1	2	
C7: Timeless cultural significance	Does the product show important solutions for value created by	
	people, timeless importance for culture in the development of	
	architecture, technology, fine arts, town planning or landscape design?	
C8: Contribution to cultural	Does the product make a unique or at least exceptional contribution	
tradition or civilisation	to a cultural tradition or civilisation – living or vanishing?	
C9: A product identifies events or	Does the product identify events or traditions that are directionally	
traditions with a universal meaning		
	distinguished by a universal meaning?	
C10: Old age criterion	How important is the time of creation related to the specific	
	historical context of a given artefact, place, object, area, etc.?	
C11: Authenticity criterion	Does the product meet preservation conditions?	
	- the state of a given artefact, place, facility, area, etc.	
	- the legitimacy of maintaining the existing spatial layout of a place,	
	facility, area	
	- susceptibility to adaptation to new functions/supplementing the	
	infrastructure of the place, facility, area with elements necessary	
	for making available	
	Is the product authentic, naturally tied to the region (its natural	
	conditions, history, culture); does it transmit a specific message	
	about the region, tells about it?	
C12: Uniqueness criterion	Does the originality of the product take into account elements such as:	
	a) author/authors or creator/creators – significant for the	
	development of architecture, the figure of the author/design team	
	of a single site, facility/complex of buildings/spatial layout, area, etc.	
	b) form – significant architectural value resulting from the formal	
	analysis of the place, object, area:	
	- exceptional stylistic features or their uniqueness in a given territory	
	- type of design solution	
	- a unique type of construction technology used	
	- the unique nature of the building material	
	- a solution based on a "typical project", the occurrence of which	
	in a given place, facility, the area is incidental or has analogies	
	in ethnically or culturally different areas	
	c) function – a function of a place, object, area	
C13: Criterion of complementarity	Does the product have complementarity and integrity in contexts such as:	
and integrity of the object	a) spatial:	
	- further surroundings: the importance of the place, object, area as	
	an integral element embedded in the landscape	
	- closer surroundings: in the context of a group of places, objects	
	- immediate surroundings: connection of a place, object with other	
	objects, organisation of the area, role in the functional team of	
	places, objects	

Table 2 cont.

1	2	
	b) historical/cultural/social:	
	- local and regional importance: significance for the history of the	
	place, facility, area, e.g., the historical basis for the creation of	
	the region	
	- link to significant historical events or customs	
	- an example of mutual cultural/national/ethnic relations	
	Does the product have complementarity and integrity in relationships	
	such as:	
	a) integrity:	
	- the importance of a place, object in a group of places, objects	
	- the importance of the place, object in the context of the	
	landscape or urban layout	
	b) complementarity:	
	- a wide typological cross-section of a given type of place, facility,	
	area	
	- fully preserved nature of the place, facility, area,	
	- continuity and complementary character of the facility in the	
	spatial structure of a place, area	
C14: General infrastructure	Does the product affect the development of such infrastructure	
	elements as:	
	– tourist facilities	
	- accommodation base	
	- food and entertainment facilities	
	- public communication accessibility	
	- transport at the destination	
	- tourist equipment rentals	
C15: Tourist events	How does the product stimulate the tourist events in the region?	
	In cycling, Nordic walking, hiking etc.?	
C16: Cultural events	How does the product stimulate the cultural events in the region?	
	In festivities, picnics, festivals, exhibitions, etc.?	
C17: Piloting and guiding tourist	Does the product provide professional service by a tour leader, guide,	
trips	curator or other substantively prepared persons?	
C18: Image of the place	What is the image of a place? ('image' understood as the sum of	
	beliefs, ideas and images a person has in relation to a given place)	
C19: New experiences, emotions	Does the product provide knowledge of the place, attraction, value,	
and impressions, new social	heritage, excitement, fascination with the visited place, establishing	
contacts	a relationship with people who experience and feel alike?	
C20: Usability criterion	How does the CTP meet the specific needs of buyers (tourists)?	
for tourists		
C21: Criterion of consistency	Are all elements of the CTP compatible with each other?	
of elements and complexity	Is the product comprehensive – does it constitute a wide, integrated	
	offer; it is not a random combination of attractions, all elements of	
	the product are consistent and well thought out?	

1	2	
C22: The criterion of originality,	How original, recognisable, and distinguishable the product is?	
recognisability, distinguishability	For instance:	
3,7,8,8,8,8,8,8,8,8,8,8,8,8,8,8,8,8,8,8,	- the cultural tourism product should stand out from other products	
	on the market	
	- the product differs from the competitors' offer because it is	
	unrivalled	
	- the product should be recognisable in the tourism, culture and	
	related industries and it is recognisable thanks to the name, graphic	
	characters, slogans used to distinguish and promote it	
C23: Brand strength criterion for	What is the strength of the brand related to advertising products	
a cultural tourism product	marked with a logo, e.g., books, calendars, guides, decorative	
	and utility ceramics, etc.	
C24: Criterion of complementarity	Is a given CTP itself the purpose of the visit and how it complements	
of the tourist offer	the local tourist offer or a place of excursion for tourists staying	
	in the near and distant surroundings?	
C25: Criterion of high quality	Is a given CTP characterised by the high quality that meets the needs	
	of specific market segments - tourists associate the brand with	
	quality?	
C26: Criterion of promotion,	Does the product promote the area of the LGU, increasing the value	
creation of the region's image,	of the LGU's tourist offer and building its image?	
region's recognition by the	Does it strengthen the competitiveness of the LGU on the regional	
product, region's competitiveness	market of tourist services? Does the CTP give the feedback effect as an impulse for further	
C27: Product bidder investment	Does the CTP give the feedback effect as an impulse for further	
stimulation criterion	action?	
C28: Criterion of tourist travel	Is the product a motivation to come not only for cultural tourism	
motivation	enthusiasts but also for visitors with less specialised interests?	
C29: The criterion of inspiration	Does the product become a model and inspiration, influencing the	
and modelling C30: The criterion of a better	attractiveness of other products and the environment?	
quality of life for the inhabitants	To what extent does the product increase the standard of living of the inhabitants in the region?	
of the region, new fashion, a new	To what extent does the product contribute to creating a new	
trend in culture, tourism,	lifestyle, becoming over time a permanent point of visit for residents	
recreation	together with guests from outside the region? (e.g., for a family visit)	
C31: Criterion of cooperation	How does the product contribute to cooperation with business entities	
with other entities	from other industries, reporting a constant demand for their services	
	(electrical, telecommunications, transport, outsourcing and others)?	
C32: Educational criterion	Does the product affect the quality of the educational offer (e.g.	
	giving the possibility of conducting thematic lessons or creating	
	educational trials)?	
C33: The criterion of shaping	How much does the product influence the feeling of ties with the	
local/regional identity	region and the feeling of pride in living there?	

Source: Own elaboration based on: Abdurahman et al. (2016); Fuadillah and Murwatiningsih (2018); Logunova et al. (2020); Nair et al. (2012); Ramírez-Guerrero et al. (2020); (www 1).

The above-mentioned unified criteria form a set which characterises CTP in its general form, without indicating what cultural potentials this product relates to. The product related to the promotion of post-industrial heritage will be assessed against specific criteria, best suited to the specificity of the post-industrial heritage. The task of the stakeholders involved in the process of creating a new CTP is to select the most important, non-redundant criteria.

Depending on the stakeholder, various subset of criteria may play significant role in evaluating future instances of CTP. To select such a subset of criteria, techniques from GDM may be used that would build the ranking of the most important ones out of the list prepared individually by each stakeholder or decision maker (Morais and Almeida 2012; Morais, Costa and Almeida, 2014; Nurmi, 1981; Raiffa, Richardson and Metcalfe, 2002; Roszkowska and Wachowicz, 2015).

However, the issue of how to select and assign weights (priorities) to key criteria that fit in the post-industrial heritage CTP context is a separate issue which falls outside the scope of this paper and will be the subject of our further research.

6 Diversity of the base and potential of post-industrial heritage

The identification of post-industrial heritage was made on the basis of an analysis of Polish bibliographic resources such as: Binek-Zajda, Lazar and Szaleniec, 2016; Chmielewska et al., 2016; Domaszewski, 2000; Kurek, 2012; Lazar and Binek-Zajda, 2015. The diversity of elements comprising this heritage (which is presented in Table 3) is also an additional factor that determines the complexity of the problem of creating CTP promoting post-industrial heritage. In view of the above, stakeholders in the process of establishing CTP may face such issues as:

- a) What elements of this heritage are to be taken into account?
- b) How to classify (by what criteria) these elements?
- c) Should not individual elements of this heritage have a specific weight or priority?
- d) What is the core of this heritage?

An example of a detailed classification of the heritage base of the "Saturn" mine is presented in Table 3.

Table 3: Classification of the post-industrial heritage base of the former "Saturn" mine

Distinguishing the type of	The name of the heritage items	
heritage base		
1	2	
Type I: Facilities included	1) Assembly hall:	
in the "Saturn" mine	a) guild hall	
	b) bathhouse	
	c) cloakroom	
	d) administration	
	e) meeting room	
	2) Electric workshop	
	3) Transformers and converters room	
	4) Building with compressors	
	5) Mechanical workshop	
	6) Power plant (power plant building, compressors room and switching	
	station)	
	7) Boiler house building – with two chimneys	
	8) Garages	
	9) Shaft No. 1:	
	a) overhang building with the hoisting tower of shaft No. 1	
	b) the engine room of shaft No. 1	
	10) Shaft No. 2:	
	a) the superstructure of shaft No. 2	
	b) the building of the engine room of shaft No. 2	
	11) Sorting building	
	12) Railway siding	
	13) Building of the fire brigade	
	14) Weight	
	15) Non-existent, demolished buildings from the 1930s.	
	16) Powder Magazine (facility outside the mining plant complex)	
	17) Coal dump	
Type II: Housing estate –	1) "Stara Kolonia" housing estate	
workers' and clerks' housing	2) "Nowa Kolonia" housing estate	
Type III: Housing estate –	1) Clerks' club	
public utility buildings	2) School	
	3) Teachers' house	
	4) Workers' hotel	
	5) Gazebo in the Jordanowski Park	
Type IV: Housing estate –	1) Mine management building	
management buildings	2) Director's Villa	
Type V: Machine and	1) Machines and devices in the former power plant:	
equipment infrastructure	a) Power system. "Wanda" power generator – reversible compressor	
	b) Compressor by Belliss & Morcom	
	c) Power system. Generator set I	
	d) Power system. Generator set II	
	e) Power system. Backup power generator – Brown Boveri converter	

Table 3 cont.

1	2	
	f) Control and measurement desk	
	g) Gantry	
	h) Compressor control cabinet by Belliss & Morcom	
	i) Signalling board	
	j) Switchgear units, exciter units	
	k) Control and measurement cabinets	
	l) Movable links for switchgear	
	m) Piping parts	
	n) Other ancillary infrastructure	
	2) Machines and devices in former mechanical workshops	
	3) Machines and devices in buildings above the shafts	
	4) Machines and devices in engine rooms	
Type VI: Parks, gardens	1) The Jordanowski Park	
and estate greenery	2) The mulberry garden	
Type VII: Sports fields	1) Playing field in the mulberry garden (in the northern part)	
and other sports facilities	2) Playing field in the mulberry garden (in the southern part)	
	3) Playing field in the "Stara Kolonia" housing estate (in the northern part)	
	4) Playing field in the "Stara Kolonia" housing estate (in the southern part)	
	5) Playing field in the Jordanowski Park	

Source: Own elaboration based on: Binek-Zajda, Lazar and Szaleniec (2016, pp. 49-95).

As regards the former "Czeladź" mine, it is also possible to classify the types of distinguished heritage. It can be divided into several types according to the criteria given in Table 4.

Table 4: Classification of the post-industrial heritage base of the former mine "Ernest Michał" ("Czeladź", "Czeladź-Milowice")

Distinguishing the type of heritage base	Object name	
1	2	
Type I: Housing estate –	1) Housing for officials – clerks' houses at Sikorski St.	
workers' and clerks' housing	2) Workers' housing	
	3) Complex of 4 residential buildings at the "Juliusz Lair" mining shaft	
	4) Buildings in Francuska St.	
	5) Complex of houses in Betonowa St.	
	6) A complex of 3 buildings servicing the "Jan Keller" mining shaft	
	7) Complex of 6 houses in Płocka St.	
	8) Construction investment in Trzeci Szyb St.	
Type II: Housing estate –	1) 4 schools	
public buildings	2) Orphanage for children	
	3) Teachers' house at Kosciuszko St.	
	4) 2 night shelters	

Table 4 cont.

1	2	
	5) Hospital	
	6) Pharmacy	
	7) Canteen – a dining room for mine employees	
	8) Clerks' Club in Sikorski St. with a garden and a tennis court	
	9) Shops	
Type III: Housing estate –	1) Building of the Delegate of the Administrative Council (House of the	
management buildings	Delegate) known as "Viannay's Palace"	
	2) Building of the Deputy Delegate of the Administrative Council	
	3) Building of the main mine mechanic (house for engineers)	
	4) Support staff buildings	
	5) Building of the Head Office	
	6) The building at 19, 3 Kwietnia St. – house of a senior official	
Type IV: Church and	Church in Piaski (originally the temple functioned as Saint Angela's church,	
parishes	in the erection decree it was called the Church of the Seven Sorrows of the	
	Blessed Virgin Mary, in 1939 it was changed to the Church of Our Lady of	
	Sorrows)	
Type V: Housing estate	1) The original layout of buildings with green spaces between the houses in	
greenery	3 Kwietnia St. and later Sikorski St.	
	2) Park in Piaski in the vicinity of the Head Office	
	3) Gardens surrounding the management's houses:	
	a) villa of the Delegate of the "Saturn" Mining and Industry Society Board	
	b) houses of clerical staff	
	4) Private gardens surrounding 4 houses for mining supervision in	
	Francuska St.	
	5) Row plantings of trees along local streets	
	6) The Jordanowski Park in Mickiewicz St.	
Type VI: Playing fields	1) The playing field of the Reserve NCO in the vicinity of the Jordanowski	
	Park in Mickiewicz St.	
	2) The playing field of the Police Station of the State Police at the	
	intersection of Kościuszko St. and 3 Kwietnia St.	
	3) The pitch of the "Sokół" Gymnastic Society at the intersection of	
	Francuska St. and Nowopogońska St.	
	4) The playing field of the "Gwiazda" Sports Club on the green square	
	in Betonowa St.	
Type VII: Objects included	1) Mine railway station	
in the "Ernest-Michał"	2) Railway siding (connecting with the Warsaw-Vienna Iron Road)	
mine ("Czeladź", "Czeladź-	3) Sorting building	
-Milowice")	4) Central power plant	
	5) Boiler room building	
	6) Shaft structures and equipment:	
	a) extraction shafts	
	b) ventilation shafts	

Table 4 cont.

1	2
	7) Auxiliary objects:
	a) mechanical workshops
	b) machine halls
	c) forges
	d) electrical switching stations
	e) stables
	f) carpentry shops
	g) gatehouses

Source: Own elaboration based on: Lazar and Binek-Zajda (2015, pp. 20-28, 71-95).

The post-industrial heritage database presented in Tables 3 and 4 shows a huge variety of objects, elements, places and other traces. The above-mentioned differentiation of this base (according to the criteria proposed by us) may contribute to the creation of tourist sub-products. Therefore, it is possible to combine certain common elements that occur in the post-industrial heritage of two mines or create separate sub-products related only to a given coal mine. The wide and diverse base of post-industrial elements prove the great potential of this heritage in the Czeladź Commune. They give opportunities to design CTPs in the form of mono-products, system products, network products, integrated area products, and others. This gives an opportunity to create a CTPs that will comprehensively and interdisciplinarily exhibit the original values of local tourism industrial and technical facilities.

7 Multiplicity of categories, types, kinds, forms and forms of a tourist product

The CTP is not only one homogeneous product or, in other words, a monoproduct. There are many classifications into categories, types or forms introduced by various researchers. In general, it can be seen that a CTP may appear in such categories as (Burkart and Medlik, 1981; Mason, 2016; Medlik and Middleton, 1973; Stokes, 2008; Yu and Xu, 2019):

- 1. Thing, material good or real-product (souvenirs, promotional gadgets, tourist guidebook, map, etc.).
- 2. Service (thematic tourist guide, accommodation and catering services, etc.).
- 3. Event (festivals, festivities, picnics, etc.).
- 4. Sets of services (themed tourist rallies, cultural trips, etc.).
- 5. Object or facility (monuments, buildings, architectural real-estates).
- 6. Route or trail (traditional, virtual, mixed, etc.).
- 7. Area (e.g. comprehensive cultural heritage area).

We can also identify CTPs from the perspective of the complexity of their structure and divide them into three main groups as shown in Figure 1 (Panasiuk, 2017).

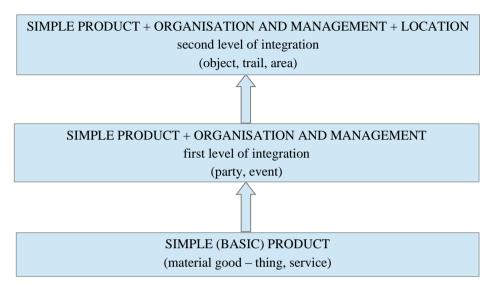


Figure 1: Tourism product/CTP pyramid

Source: Own elaboration based on: Panasiuk (2017).

Another criterion for distinguishing CTPs is their form related to their way of existence, namely:

- 1) Real (traditional, tangible).
- 2) Virtual (concerning the Internet space, computer programs and applications for mobile devices).
- 3) Multimedia (consists of, e.g., digital photos, figures, graphic elements, sounds, music, interactive elements, films, animations).
- 4) Mixed hybrid (e.g., real-virtual or real-multimedia real-multimedia-virtual).

The CTP typology shows that the product of tourism of industrial and technical facilities can be designed as a particular portfolio of elements selected in terms of specific preferences of stakeholders. Stakeholders' preferences must address issues such as:

- a) How to choose individual components (simple products)?
 - according to specific criteria?
 - according to certain subjective "rankings" by stakeholders in the process of creating a new CTP?
- b) How many components should be selected?
- c) Which product categories, types, and instances should be linked together to

make them clear and logical (e.g., a virtual product-area, a multimedia product-tourist service?)

The DM from whose point of view we analyse this example identified the following products (Table 5):

Table 5: The CTP portfolios related to the promotion of post-industrial cultural heritage in the Czeladź Commune

Suggested name of an alternative variant of CTP	Combination in relation to the multidimensionality of the product	Description of the alternative variant of CTP
Portfolio product A	Material good (thing) in multimedia form + virtual service + virtual route + virtual objects	Interactive and multimedia map of post-industrial attractions, on website Virtual guide service of the most important attractions
		Thematic virtual route through the most important post-industrial attractions
		Virtual sightseeing of objects (virtual walks in through the facilities)
Portfolio product B	Material good (thing) + event + services set + virtual route	Guidebook with map in printed form Thematic cultural event with attractions: games, plays, competitions
		Thematic, sports, tourist rally with elements of learning about post-industrial culture
		Thematic virtual route through the most important post-industrial attractions
Portfolio product C	Product-thing in multimedia form + route + questing	Interactive and multimedia map of post-industrial attractions, on website
		Traditional thematic route through the most important post-industrial attractions
Portfolio product D	Material good (thing) + virtual service + virtual route + event + product-area	Questing of post-industrial heritage Information boards at heritage sites and brochures related to post-industrial attractions Thematic virtual guide service regarding each of the distinguished elements of heritage – on the website
		Thematic virtual route through the most important post-industrial attractions
		Thematic tourist and cultural event with attractions: games, plays, competitions
		Thematic, geographically determined area of the former two coal mines, their patronage housing estates and other infrastructure sites

In the process of setting up the CTPs, the stakeholders need to face the issue of solving complex system problems concerning the creation of various types of such products, e.g., CTPs which consist of only one category listed above, one type only or any combinations of them.

8 **Discussion and summary**

In this paper we identified the key elements of the structure of the problem of designing new CTP based on the post-industrial heritage in the Czeladź Commune. This way we reached the goal of this paper, which was to identify the problem of creating a new CTP related to local post-industrial heritage as a MCDM problem. The proposed perspective of the identification related to the decision-making problem has several advantages, in particular:

- 1) Multifaceted nature takes into account the diversity of determinants of the decision-making problem.
- 2) Multidimensional approach adapts to the changing decision problem.
- 3) Multidimensional perspective of problems related to creating a new CTP should not discriminate against any decision conditions or factors.
- 4) The idea of the presented approach to decision-making has an open formula; since in the course of further research on other behavioural models it will turn out that one of them can be used.

Our intention is to use the structure of the problem identified in this paper in a future decision-making problem of selecting the most promising CTP at the level of the LGU – the Czeladź Commune. The direction of further research includes designing research surveys, conducting an interactive decision experiment and producing recommendations regarding alternative CTPs to be implemented.

The multidimensionality of the process of creating CTPs and the high complexity of the problem will require in future analyses the use of an appropriate integrated and hybrid methodological approach, which includes:

- a) classic MCDM/Multiple Criteria Decision Aiding (MCDA) methods,
- b) issues of behaviourism and psychology,
- c) GDM perspective,
- d) methods for aggregating individual assessments,
- e) author's innovative approach to the modification of the above-mentioned methods.

The presented multifaceted approach to the decision problem related to the plan to create a new CTP was developed from the point of view of knowledge, competence, but also subjective opinions of the employees of the "Saturn" Museum in Czeladź. If research is conducted among a group of identified stakeholders, there is a probability that the multifaceted nature of the problem will be extended by further aspects, which may increase the problem complexity even more.

Identification and characterisation of the multidimensionality of the problem is the basis for group, multiple criteria decision analysis in a behavioural context to be conducted in the future. The general scheme of proceeding in the decision analysis may take the form shown in Figure 2.

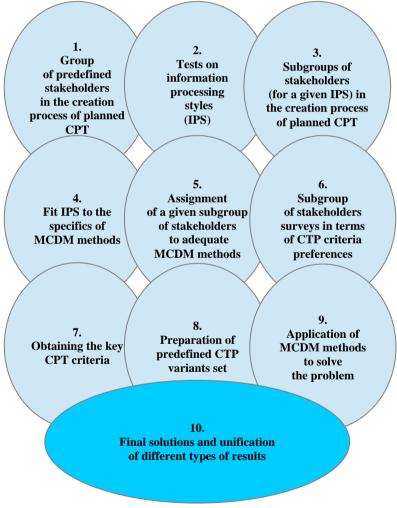


Figure 2: The general scheme of proceeding in the decision analysis

Source: Author's own elaboration.

In the first step of the future research (to be conducted among the respondents) properly prepared tasks and psychological tests will be used. In the next step, after the respondents have solved the tasks and tests, the obtained results are analysed in terms of the dominant style of information processing. Individual respondents (characterised by a specific information processing style) will be assigned to the groups of particular decision-making styles and abilities. Then, the characteristic features of a given information processing style will be confronted with the specificity of algorithms of selected MCDA or MCDM methods, and the best possible recommendations of the method to the distinguished styles will be given. The use of this selected method by individual respondents from a given group will be one of the steps in the further stages (in the second phase) of the study.

Finally, a GDM approach will be implemented to identify the final recommendation of the CTP best matching the goals and priorities of all stakeholders and decision makers involved from the Czeladź Commune.

The structuring of the above-mentioned decision problem is based on the three initial stages of the universal PrOACT (Problem, Objectives, Alternatives, Consequences, Tradeoffs) algorithm. The theoretical assumptions of multidimensionality and multiple criteria structure create a certain conceptual framework which a group decision-maker (a group of stakeholders) can use in a practical aspect. The concepts of creating new CTPs related to a diverse cultural heritage become very complicated due to the multifaceted nature, variety of factors (entities, means, goals, functions, attributes, etc.). An additional element that affects the complexity of the CTPs creation problem are various types of relationships (cause-effect relationships, positive or negative relationships). Therefore, the decision analysis and the MCDM theory are able to support the stakeholders of such a complex decision problem by means of problem structuring tools and adequate methods of selecting the best solutions.

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