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CONCEPT OF DATA MODELLING FOR MICRO-NETWORKS IN WINE TOURISM

KONCEPCJA MODELU DANYCH MIKROSIECI W TURYSTYCE WINIARSKIEJ

Abstract: The aim of this paper was to develop the concept of a data model for micro-wine tourism networks. "Micro" is used to underline the importance of a perspective of wine tourism experience which was a key determinant for the two presented methods of its design. Thus, in this approach micro-wine tourism networking is defined as a network capability of making dynamic connections corresponding to the creation and delivery of wine activities. The first method is based on obtaning the in-depth knowledge in the studied area, while the second one

is related with analytical structuring of the network actors (then called objects) completed by defining their attributes. These attributes were selected due to the significance of creating wine tourism experience. Thus the authores prepared the first conceptual framework of this large-scale design, which provided the structure of the distinguished classes of objects with their attributes.

Keywords: tourist experience network, wine tourism, data modelling, network dynamics.

Streszczenie: Celem artykułu jest opracowanie koncepcji modelu danych mikrosieci w turystyce winiarskiej. Przedrostek „mikro" podkreśla, że w obu zaprezentowanych metodach projektowania doświadczenia turysty, tj. technicznej i eksperckiej, najważniejszym elementem jest kompozycja elementów doświadczenia enoturystycznego. Zatem sieć jest w tym podejściu definiowana jako możliwość modelowania atrybutów obiektów na obszarze winiarskim w taki sposób, aby były one w stanie kreować i dostarczać wartościowe doświadczenie enoturystyczne dla odwiedzającego turysty. Ekspercka metoda dochodzi do takiego rezultatu odgórnie, tzn. poprzez wiedzę jakościową pozyskiwaną w terenie i uwzględniającą możliwości doświadczania enoturystyki w danym regionie winiarskim. W podejściu techniczno-analitycznym, inaczej oddolnym, proces ten rozpoczyna się wraz z podziałem obiektów tworzących to doświadczenie i wyróżnieniem atrybutów określających jego specyfikę. Oryginalnym wynikiem badań jest opracowanie koncepcji modelu danych dla sieci enoturystycznej, w którym klasy i obiekty zostały podzielone na kluczowe i wspierające, co należy zaliczyć do wstępnej (konceptualnej) fazy tego przedsięwzięcia badawczego.

Słowa kluczowe: doświadczenia enoturysty, turystyka winiarska, modelowanie danych, dynamika relacji sieciowych.

1. Introduction

From the viewpoint of wine tourism management, networks are the result of both wine and tourism actors (Kirkman, Strydom, and Zyl, 2013). This networking is a complex research operation because it involves the need to combine two main perspectives, of wine-tourism related actors (both, public and private) and of wine tourists' experiences (Quadri-Felitti and Fiore, 2012).

The classical wine tourism network concerns the analysis of relations, roles, connectivity and collaboration between either business actors (Kirkman et al., 2013), and public and business actors (Festa, Shams, Metallo, and Cuomo, 2020). In both cases the central position is taken by wineries and their relations with other wine-related suppliers (wine shops, restaurants, hotels, etc.), called 'professionals' by the latter. This connection allows to reflect upon the relation within the network of wine tourism actors in the researched wine region (B2B). This view is missing, however, from the aspect of the co-creation of tourist's experience, which is linked with network adaptation to emerging customer problems (B2C).

However, the general methodology of identifying tourism networks should also include the tourism destination point of view (Pavlovich, 2003), where wine tourism actors are among other tourism suppliers and so co-create a specific product

offer in the tourism area. For instance: visiting a winery and wine tasting can be offered together or separately, participation in local events sometimes requires previous reservation, in some places of appellation wine tourism is more related with gastronomy, and in another a little less.

This means that the basic tourism network design shows how wine tourism actors are networked with other wine-related services (Festa, Vrontis, Thrassou, and Ciasullo, 2020), and examines how wine tourism product offers are constructed in the analysed area.

The identification and mapping of wine tourism network relations are also an important aspect in creating links between the territory and service providers (especially wineries), because strategically they are a key component of shaping the wine tourism product offer in a wine region (Festa et al., 2015).

Yet, these relationships do not always reflect the best and most authentic product offers which are possible to experience in a particular area (Barbini, Presutti, and Zambelli, 2014). Therefore, to design the micro-wine tourism network it is needed to add the perspective of individual wine experiences, i.e. interesting and hedonistic services (Bruwer and Alant, 2009), and appropriate solutions in planning wine tourism activities (Brás, Costa, and Buhalis, 2010).

The relations in the micro-wine tourism network are therefore determined on the basis of the selection of an appropriate composition of wine-related services experienced in real time. This is an extremely important issue in networking wine product offers, because in spontaneous tourism planning (without making a previous reservation), one can encounter a large dissonance between the expected services (e.g. restaurant table is not available, wine event is fully booked etc.).

When tourists' expectations cannot be fully realized during an unplanned visit, it may be assumed that there is no link between attributes, and so the holistic perception of experience can be regarded as unsatisfactory.

The specificity of wine tourism experience requires defining and combining the attributes of wine tourism with tourism activities which thus combines the classes of objects (Benitez-Amado, Henseler, and Castillo, 2017). Therefore, the aim of the paper was to develop a concept of a data model for micro-wine tourism networks.

2. Methodology of the micro-wine networks research

Taking it into the research consideration, the authors designed the basic shape of the wine tourism services network, and linked it with the visitor experience approach. For this new design of a wine tourism micro-network, the offered wine tourism proposals were understood as equal to the potential of the co-creation visitor experience in the tourism destination (Figure 1).
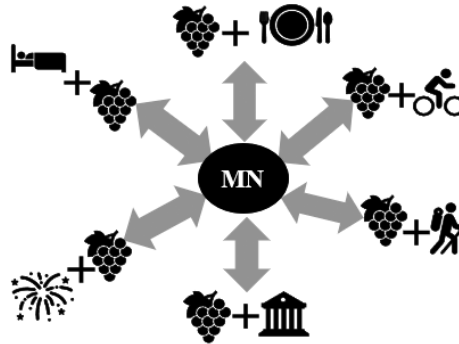
Fig. 1. Wine tourism network identification – the experience approach

Source: authors' own elaboration.

The proposed design of wine tourism micro-networks can be carried out on the basis of two methods according to the expert and technical knowledge presented in Figure 2.
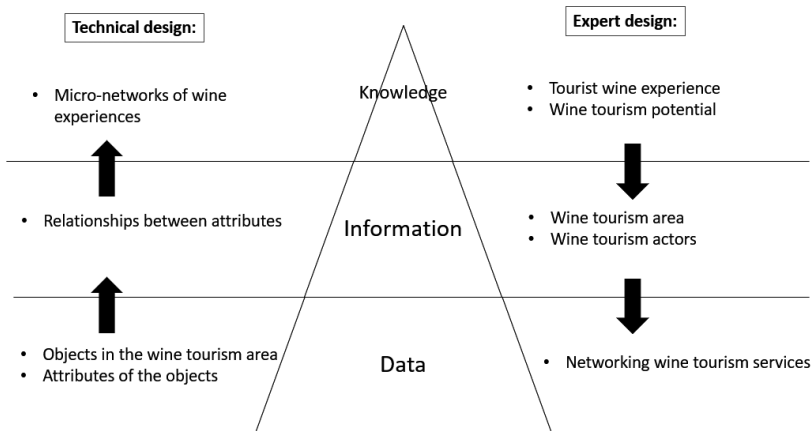
Fig. 2. The two methods of designing micro-networks of wine tourism

Source: authors' own elaboration.

The logical process goes from 'top down', hence the analysis begins with the identification of the potential of the wine service experience for tourists (later called the user's environment). These experiences should have been already selected from the offers proposed in a specific wine tourism area, which means that they concern the services not only on offer but are mostly able to create the remarkable, unusual and unique wine (e.g. wine tasting) and wine-related experience (e.g. wine & dine).

In such a context, the service orientation is shifted from the wine actors' perspective to the customer experience. This automatically leads to the question: which wine services are able to create remarkable experiences for visitors? Next, in order to answer, there is a need to analyse the user's experience of wine tourism activities proposed by different actors in the researched area. For example, just in the northern part of the Rhone Valley in France there is a huge variety of proposed tourism areas (designated by the area's Tourism Office)to co-create and perform the wine activities together with their actors. In some areas, this is a dynamic and very active performance (for example in *Ardèche-Hermitage*, *Condrieu-Côte-Rôtie*), while in others, wine tourism activities are performed rather spontaneously by single actors (for example in *Cornas* and *St. Peray*).

In the next layer of expert design the wine experiences, in the context of their networking, were analysed according to the aspect of a formal and informal recommendation system. How can a tourist move from one supplier to another to network these quality-oriented experiences? In this case, the filed study took place in the Northern Rhone Valley areas. These destinations offer wine experiences based on very famous wine appellations: *Côte-Rôtie*, *Condrieu*, *Hermitage*, *Crozes--Hermitage*, *Saint-Joseph*, *Cornas* & *St. Peray* where wine is not produced in large volume but it is oriented onto high quality. Despite a more or less similar wine profile, the idea of wine tourism is performed differently in each appellation, due to the fact that wine activities are delivered by wine-related actors (e.g. wineries, wine bars, restaurants etc.) and not just by the wine producers. Therefore, from the territorial point of view, wine tourism is organized, promoted and performed by a network of actors (Festa et al., 2015).

Nevertheless, tourism offices in northern Rhone Valley destinations collaborate with the actors' network related to wine tourism, and organize the information system in a different manner. This can be a constraint for the design process of the tourist experience if she/he comes to visit not only one area but travels through them (mostly in the case of international tourists).

For that reason, the planning process of the tourist experience has rely on a micro-network design, which first of all still requires designing single integrated information database. Tourism offices possess rich information of how wine tourism actors are networked in the area, but are not linked with each other (e.g. the information system of the tourism office of *Ardèche-Hermitage* is not connected with one in *Condrieu--Côte-Rôtie*). Thus, the tourist services networking can be derived from the websites of tourism offices on condition that they are operating with the same information data system where all the wineries, restaurants, touristic sites, wine bars and other wine-related suppliers from these destinations are included.

The final phase in the top-down design concerns gathering the qualitative data during a field study. The field-expert methods include:
- participation research (to obtain first-hand experience at the place),
- active observation (learning by doing, especially the wine cultural context),

- using a mystery customer (to gain an insight into real experience co-creation while visiting different wine-related suppliers: wineries, restaurants, wine bars etc.),
- conducting expert interviews with managers of wineries as well as with tourism office managers (to obtain tacit knowledge about informal and formal relations).

To design a bottom-up approach from the technical point of view, one starts by identifying the objects which make up the wine tourism network and describing their attributes (the user environment). By definition, this is a slice of reality represented by the database and it consists in objects and dependencies between objects (David et al., 2013). Thus, the next step requires analysing all the attributes which can favourably influence positive wine tourism experiences. In the final step, a class diagram is developed. In order to do so, the UML notation (Weilkiens, 2011) can be used.

3. Results of the research – a concept of the data model

When analysing the environment of a user a wine tourist, one has to take into account three aspects of activity and the use of tourist services, including:
- wine tourism space (the wine appellation area),
- the tourist experience (wine activities developed in this area),
- information space (the area databases with the wine services network).

For the user of the information network, the latter (a complex website that enables to plan wine visits, wine events, restaurant etc.) determines the success of tourism experience planning, in other words, crucial for the point of an individual network design. This model assumes that it is the wine tourist himself/herself, who, as the planner of his/her movement in various wine appellation locations, creates dynamic relational ties between actors from different tourism areas (in Figure 3 these are called objects).
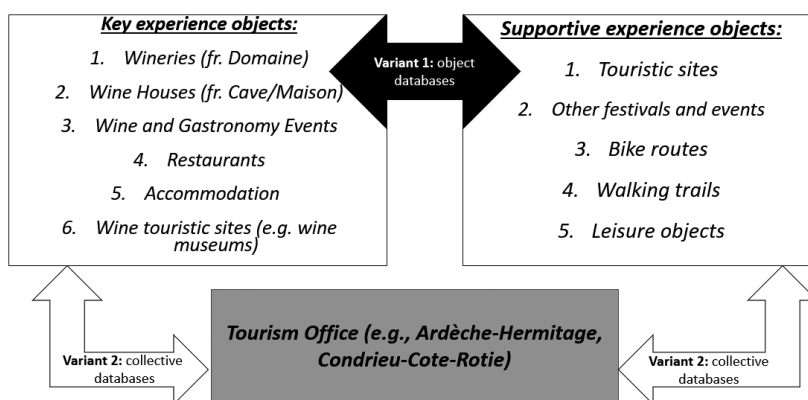

Fig. 3. Division of objects that form the tourist's network environment

Source: authors' own elaboration.

Wineries
- Identity
- Appeals
- Parcel size
- Manufacturing quantity
- Grape varieties
- Growing
- Harvest
- Location in relation to tasting venue
- Suggested activities on the vineyard
- Winery tour

Wine houses
- Identity
- Localization
- Parking
- Opening hours
- Infrastructure of venue
- Network infrastructure in the area
- Degustation
- Events
- Offer for business

Wine and gastronomy events
- Names of events
- Dates of events
- Events venues
- Description(Program)
- Infrastructure
- Languages
- Price for participation (ticket)
- Reservation
- Nearest accommodation

Wine touristic sites
- Identity
- Localization
- Organization
- Opening hours
- Types of visits
- Ticket prices
- Activities
- Services
- Events

Tourism offices
- Identity
- Localization
- Organization
- Opening hours
- Key services
- Additional services
- Cooperation with wine associations
- Cooperation with tasting venues
- Cooperation with wine stores
- Collaboration with wineries
- Co-organization of events catering and wine events

Restaurants
- Identity
- Localization
- Vinery observation deck
- Opening hours
- Cuisine
- Wine card
- Wine for the lamps
- Price per menu
- Reservation
- Groups offer

Accommodation
- Identity
- Localization
- Check-in hours
- Check-out hours
- The nearest restaurants
- The nearest wineries
- Price per room per night
- Additional services
- Local wine in room

Touristic sites
- Identity
- Localization
- Opening hours
- Ticket prices
- Languages
- Average visit time
- Types of visits
- Reservation
- Activities
- Services
- Events

Walking trails
- Identity
- Tourist area
- Difficulty level
- Activities
- Services

Leisure objects
- Identity
- Tourist area
- Organization
- Activity
- Services
- Wine consumption

Other festivals and events
- Name
- Type
- Date
- Venues
- Description
- Languages
- Prices
- Reservation

Bike routes
- Identity
- Tourist area
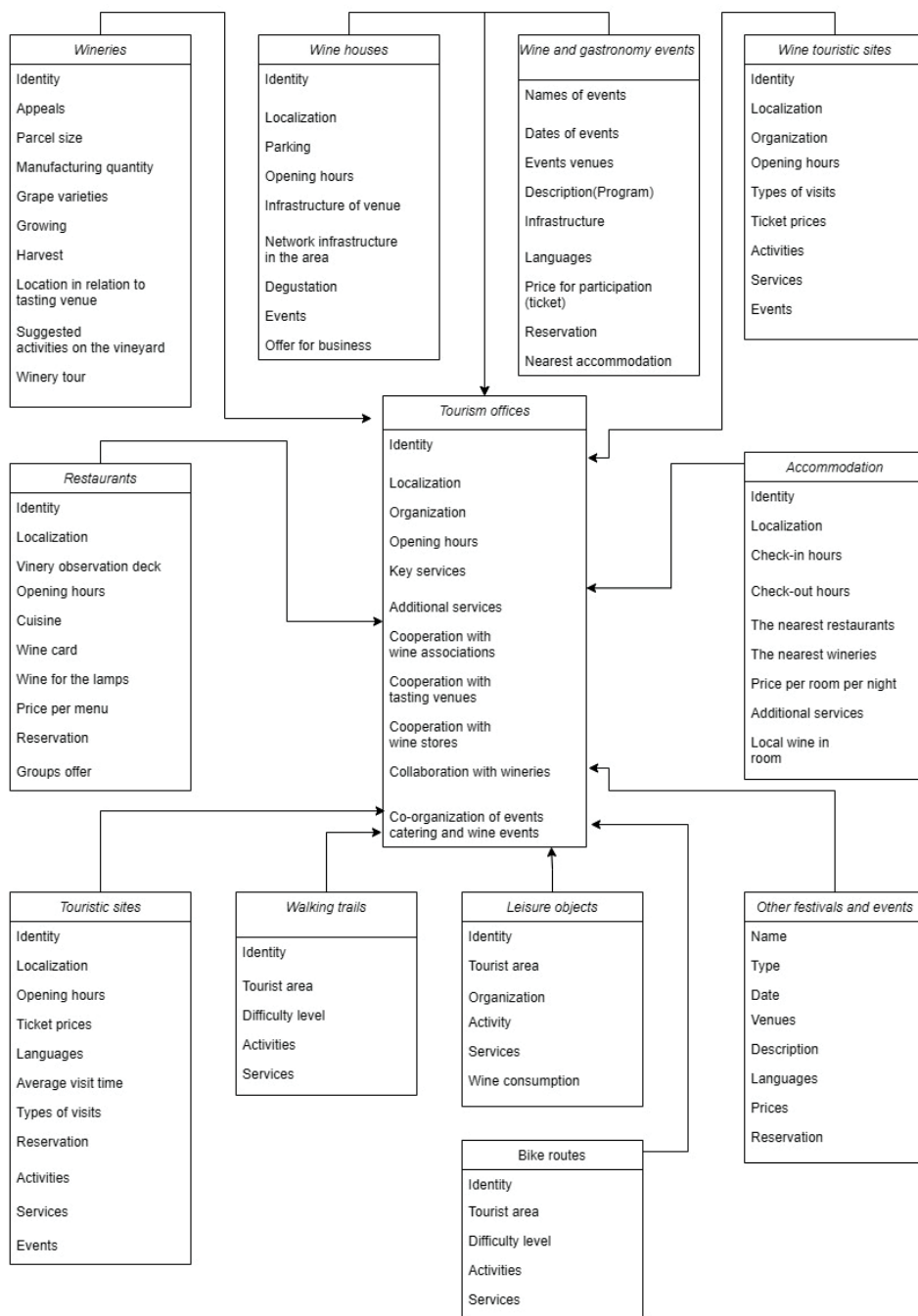- Difficulty level
- Activities
- Services

Fig. 4. The wine tourism network in tourist experience

Source: authors' own elaboration.

In the first variant of planning tourist's experience is based on selection and combination objects into an individual network. It can be done by selecting objects one by one from various databases, for example, for hospitality objects by using bookin.com, and for restaurants Michelin, etc.

In the second variant, the tourist does the same but uses just one-area databases. Thus, the construction of the network is different than in the first case; it assumes that the recommendations are given from a single information source, which is the area database, e.g. a tourism office website.

To design the collective database which could integrate the databases of different tourism offices, the second variant was adopted. To do this, the variations of how one can network the wine services from different areas from the already existing tourism office network were analysed. Therefore, in the proposed model the actors were divided into objects directly or indirectly related with the tourist experience. As a result, the network should gain the operational ability of planning tourist experiences by setting and compiling the attributes of the objects–wine activities' providers (Figure 4).

The key objects represent the main objective of a tourist's stay in the analysed destination, i.e. wine tastings and combination of wine and gastronomy, wine events, and taking wine-related activities such as grape-picking, etc. This group includes: vineyards, tasting places, food and wine events, restaurants, accommodations and wine tourism attractions. The supporting objects are: other tourist attractions, other events, bicycle paths, walking paths, water recreation facilities. These play a complementary role because they do not have the services and competences directly connected with wine tourism (such as bike paths, walking paths, bicycle tracks), but may contain this element as they are located among the vineyards in famous wine appellation locations (for example riding a bike, or an e-bike on Hermitage Hill).

4. Conclusions and recommendations

The concept of the data model for micro-service networking in wine tourism was developed in two ways (expert and technical approach) of designing a network. Expert knowledge was crucial in defining the wine tourist experience and the latter was necessary to classify the wine tourism objects in a network structure. Thanks to their combination, it was possible to identify wine tourism objects through their contribution to the tourist experience (or precisely, on tourist experience network as the tourism experience route composed of wine visits, wine tasting, 'wine & dine' in restaurants, wine in hotel rooms and in different tourist attractions, etc.).

This can also serve to transform the qualitative data into a technical order wherein the expert interprets what a technician does. For the technical approach based on data clustering, the major point is to design a relations map of the wine tourism network, which, from the expert's perspective, can be a highly important key to define the

customer experience. This logic also works the other way round: where the expert sees experience, the technician makes a network of attributes.

Therefore, the usage of both top-down and bottom-up methods open up a new area of network design. It is then a synthetic process which takes into account the most important problems detected by an experienced expert and the logic of network attributes put into order by technical analysis. Together they are able to determine the right selection and logic of objects networking in the context of a specific service sector.

The concept of this data model design can be used in further work on the development of an information system supporting the management of micro-networks in wine tourism.

The main limitation of the presented design is its conceptual character. Therefore, further research work may concern the detailed modelling of the wine tourism network system, and the development of methods for the detection of dynamic micro-networks using machine learning.

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