



Metaverse and tourism development: issues and opportunities in stakeholders' perception

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Abstract

In recent years, understanding how the managers of tourism attractors (such as archaeological parks, museums, seaside resorts, nature reserves, etc...) adopt, refuse, integrate, and benefit from the digital transformation has received growing interest. In addition, consistent case-study literature highlights how adopting technologically advanced tools can generate positive externalities for the territories in which such attractors are located. However, it is still unclear how different tourism stakeholders value including Metaverse tools in their strategies. In this paper, we explore stakeholders' preferences for embedding metaverse tools in their strategy, and we check for the existence of cluster of preferences. The study applies a recent development of Q-methodology which allows substituting classical q-statements formulation with multi-attribute and multi-level formulations. Data are collected by involving stakeholders from Sicilian territories. The results of this exploratory study demonstrate that the use of the Metaverse tool is influenced by the perception of the stakeholders and confirm the existence of heterogeneous preferences among groups of stakeholders, as expected in a diffusion model of innovation. The dominant point of view considers a full awareness of the metaverse tools and perceives them as slightly worse than the social ones. Some stakeholders do not have adequate knowledge of the Metaverse. We can argue that we are still in a moment of transition in the diffusion of the Metaverse between the phase of persuasion and that of evaluation and decision on the basis of the impact effects of the Metaverse on competitiveness within the tourism sector. The critical mass may not have been reached yet in the adoption rate of Metaverse innovation.

Keywords Metaverse · Tourism · Q-Methodology · Stakeholders

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1 Introduction

Within the framework of the stakeholder approach (McCabe et al. 2012), stakeholders frequently are bearers of different, and often divergent, interests in what is essential to tourism development and on implementation of innovative technologies. Researchers have studied different stakeholder groups and their strategies individually (Andereck and Vogt 2000; Adongo et al. 2018; Pizam et al. 2000). Other studies highlighted the importance of coordination between the various stakeholders (Movono and Hughes 2022; Hall 2019), and their findings show that the value generated collectively is greater than the sum of the value created by each actor (Gyrd-Jones and Kornum 2013). A more general view of territorial marketing describes it as a holistic approach that, through the coordination of multiple stakeholders, aims to enhance the development of places also as tourist destinations. Some authors furthermore show that stakeholder coordination can favour the introduction of technological innovations (Shams 2013; Ferraris et al. 2020), for example, by integrating the knowledge and the skills of the stakeholders present in the area (Mahr et al. 2014; Hall 2019). The role of technology has been pivotal in significant developments in the tourism industry in recent years. Tourists have a strong dependence on the information. The acquisition of tourism information, exhibiting of tourism resources, promotion of tourism destinations and development of tourism activities can be achieved using different communication channels. Tourists also obtain cross-validation of tourism-related information through multiple channels. In past years communication channels have been divided into two main groups, traditional media and online media advertising. The recent developments in online applications and social networking platforms have increased the informative role of the Internet. Digital technology has become an important channel for exchanging information, ideas, sentiments, experiences, and aspirations. The extensive use of the Internet has changed how online marketing activities are carried out to promote tourism and various tourist destinations. Travel and Tourism Blogs and social media are the modern online promotional strategies more used by tourism promotion bodies and tourism marketers. In recently years, Virtual Reality (VR), Augmented Reality (AR), and so-called metaverse technologies are being widely used. VR/AR and holographic projection are also very suitable technical instruments to display tourism resources. Using VR technology to turn typical tourism resources into virtual reality scenes and conduct 360-degree immersive experiences through the network can allow tourists to visit without leaving their houses. The introduction of scenic spots in the travel manual using AR technology can be combined with traditional media and digital media so that tourists can get a richer understanding when they search for travel information. The emergence of the Metaverse started the discussion about its use within the tourism sector and its role in future tourism destination strategies (Williams and Hobson 1995). Currently, Metaverse is perceived as a disruptive technology within this sector (Gursoy et al. 2022) as it revolutionizes how customers and hospitality organizations of a tourist destination interact in the co-creation of tourism experiences, products, and services (George et al.

2021; McFee et al. 2019; Buhalis and Karatay 2022). We can refer to the **transilience model** proposed by Abernathy and Clark (1985) about innovation. As they noticed, innovations can be grouped in four archetypal categories (niche creation, architectural, regular and revolutionary), according on how much the specific innovation disrupts or entrenches competences and markets/customers linkages. To which category the Metaverse belongs when used for tourist scopes appears to be a still open question. For instance, Buhalis and Karatay (2022) highlighted that the Z generation considers mixed reality fundamental in the fruition of cultural heritage, as the latter improves the consumer experience. Hence, because mixed reality deeply modifies the market/customers linkage, we could detect an architectural innovation. On the other hand, recent studies (e.g. Um et al. 2022) shows how the technological level of innovation can be limited, as in the city of Incheon (South Korea) where the city authorities relies on the Minecraft platform to deliver their contents. The critical mass may not have been reached yet in the adoption rate of Metaverse innovation studies have shown that virtual reality will never replace conventional tourism (Guttentag 2020) but offers potential tourists a “try before you buy” experience (Tussyadiah et al. 2018), which allows them in advance to experience virtually a destination (Cheong 1995; McFee et al. 2019) and to evaluate whether to invest in expensive air and hotel packages to reach that destination (Yemenici 2022). Many scholars show that applying virtual reality in the travel choice process positively affected tourist destinations (Tussyadiah et al. 2018) and hotels (Bogicevic et al. 2019). On the contrary, in some cases, Metaverse could hinder the physical travel industry and its complementary activities because the Metaverse connects tourists as if they were really in a destination, a hotel, or a plane (Buhalis and Karatay 2022; Baia Reis and Ashmore 2022). This may have created different perceptions by stakeholders, which have generated different approaches and levels of integration within the tourist offer of the different territories (McCabe et al. 2012). Nevertheless, to our knowledge, no studies on stakeholder perceptions have been reported in the literature. We have tried to bridge this gap, analysing the points of view of the stakeholders of a tourist-oriented area through the use of the Q-methodology, which, although very suitable for the type of study, to our knowledge, has never been applied to these purposes. The remainder of this paper is presented as follows:

- in Sect. 2, we present a brief review concerning territorial marketing strategies in the tourism field, and provide the stylised model of strategies adopted in the paper;
- in Sect. 3, we introduce the Q-methodology and show the results of the analysis carried out;
- in Sect. 4 we discuss the results;
- Section 5 provides our concluding remarks.

2 Territorial marketing strategies and tourism destinations

Tourism destination marketing strategies are attracting increasing attention among scholars (Pike and Page 2014; Mior Shariffuddin et al. 2023) because today, they represent an essential prerequisite for the tourist development of a place. The elaboration of an appropriate marketing strategy for a tourist destination is the primary tool for marketing planning and for adopting the combination of actions that, if done effectively, can lead to entire areas capable of attracting the correct type of clientele according to the characteristics of the territory itself. Some theoretical frameworks developed by territorial marketing researchers mainly focus on specific issues, such as the design of an attractive place image (Kotler and Gertner 2002; Zhang et al. 2018; Zhu et al. 2018). Destination images can influence tourists to set expectations and shape the experiences of visiting those places concerning the type of tourism they are interested in Kim and Richardson (2003). Since each tourist destination has its specificity, the marketing mix must contain elements adapted to the objectives set. It starts from the analysis of the competitive qualities of the territory—from a cultural, naturalistic, or ludic point of view—and tourist target—national or international. In this case, the definition of the objective and the target will strongly impact all the operations of subsequent campaigns, from the assets to be highlighted to the communication channels themselves. The choice of media and channel depends significantly on the audience we want to reach. However, that is not all: tools and channels must be evaluated by considering the many possible financial resource combinations available for tourism provided by public bodies and entities and planned over the short, medium, and long term. Consequently, these four parameters (target, content, tools, and resources) interact each other and define the general framework that shapes the strategy. In actual strategies, any of the parameter can assume different modalities, or levels, belonging to a virtually infinite set. In the stylised representation adopted in this paper, we reduce the levels of interest as follows:

- Main target:
 - Domestic: relates to the citizens of a nation who visit the localities of their country;
 - International: those residents of a nation who cross borders to visit other countries;
- Main content:
 - Recreational: promotes the destination as the appropriate context where to enjoy recreational activities;
 - Cultural: promotes the destination as the appropriate provider of knowledge and experience;
- Principal tool (or media channel):
 - traditional channels such as media (TV or radio) or print advertising;
 - Internet and social media advertising;
 - advanced advertising using VR, AR, or other Metaverse technologies.

- Preferred financial scheme (resources):
 - public funding;
 - private funding;
 - Mixed partnerships.

3 Q-factor analysis

3.1 Q-Methodology

People pay attention to multiple information when making decisions. For instance, a comprehensive review of standard models adopted in various fields (finance, supply chain management, and so on) is presented by Taherdoost and Madanchian (2023). Recently, an interesting Multi-Criteria Decision-Making methods (MCDM) devoted to choosing an experiment that benefits from the advantages of Q-methodology (Q-meth) has been proposed by Gao and Soranzo (2020). Developed by William Stephenson in the 1930s (Stephenson 1935), Q-methodology was initially designed to investigate subjectivity (e.g., attitudes, viewpoints, perspectives, etc.) because it can provide a robust and efficient method to reveal consensus or disagreement among respondent. A Q-study can expose consensus (similarities in viewpoints) and conflict (differences in views). Q-Methodology reveals the different perspectives around a topic and clusters of views. Since Stephenson's works, Q-methodology has been applied in many fields, such as sociology, biodiversity management (Hamadou et al. 2016), and political sciences (Danielson et al. 2009). Still, in recent years, it has gained much attention from psychologists, economists, and researchers interested in decision-making processes (Lee 2017). It comprises quantitative and interpretive approaches for systematically identifying "social viewpoints and knowledge structures relative to a chosen subject matter" (Watts and Stenner 2012). Q-methodology (Q-sort) systematically studies participant viewpoints by having participants rank and sort statements. The sample of statements for a Q-sort is drawn from and claimed by the researcher to represent a "concourse" (the sum of everything people say or think about the issue being investigated). Participants were asked to arrange statements in a fixed quasi-normal bell-shaped grid (in the sense that it resembles a normal Gaussian distribution with more stimuli in the middle than in the tails). This Q-sorting procedure facilitates the decision process of participants and enables them to differentiate the subtle differences in their preferences accurately. Participant responses are analysed using factor analysis. Unlike standard uses of factor analysis, the variables are individuals in Q-methodology. Q-factor analysis differs from a conventional factor analysis because participants cluster instead of items. It can identify clusters of participants who produce similar outcomes by analysis of Q-sorting data. In Q-Methodology, Q-factor is claimed to represent shared ways of thinking (Stephenson 1935); it is particularly useful when researchers wish to understand and describe the variety of subjective viewpoints on an issue. Recently, Gao and Soranzo (2020) developed a novel analysis procedure allowing Q-methodology to study preferences from a combination of characteristics from multiple variables.

They refer to “preference” to indicate the case in which people differ in their preference for one aspect over another within the same variable and to “dominance” to indicate the importance of a variable across all variables. In their paper, they propose a protocol and a script developed in R to run five analyses about the preference in the MCDM case:

- Analysis of overall preference: Which are the overall preferred characteristics of each variable?
- Analysis of overall dominance: Which factors influence people’s decisions?
- Analysis of individual differences: Do people differ in their decisions?
- Analysis of the interaction between individual differences and dominance: Are different clusters of people driven by different variables?
- Analysis of the interaction between individual differences and preferences: Do different clusters of people prefer different characteristics of a variable?

3.2 Statement

As presented previously, we have decided to focus our analysis on the following four main characteristics that we recognize to concur with the definition of best tourism marketing strategy:

- Main target;
- Main content;
- Principal tool (or media channel);
- Preferred financial scheme (resources).

Referring to the first item, we have decided to differentiate it into two options: domestic and international tourists. Regarding the second one, we consider two possibilities: content purely for recreational entertainment vs. content aimed at cultural growth. We assume, as a media channel to develop attractiveness, three options: traditional advertising tools as standard media (TV or print advertising), consolidated digital tools (Internet/social-media advertising), or advanced digital tools such as Metaverse (AR, VR). Lastly, we referred to economic resources to identify the main actors implementing the strategy. We provided three options: public resources, private resources, or a mixed public/private resource. So, participants were provided with different levels of the four variables: Target, Content, Tool, and Resource:

| Target | Content | Tool | Resource |
|-------------------|------------------|----------------------|--------------|
| Domestic (D) | Recreational (R) | Traditional (T) | Public (Pu) |
| International (I) | Cultural (C) | Standard digital (S) | Private (Pr) |
| | | Advanced digital (A) | Mixed (PP) |

A typical statement will have the following form:

*For me, the best strategy to increase the tourist attraction of the place where I live is the one that aims at an **international tourist target**, based on a proposal of purely **recreational content** that uses **traditional tools** (such as **TV or print advertising**) and funded by **public economic resources**.*

Combining the different levels of the four variables, we obtain thirty-six statements (the above statement will be identified in our analyses by the code: **I.R.T.Pu** and so on for the other statements).

3.3 Data collecting

The “Q sort” data collection procedure uses a paper template and a sample of statements or other stimuli printed on individual cards. However, there are also computer software applications for conducting online Q sorts. In our case, by using the open-access EQ Web Sort developed by Banasick (2019), we create an online tool hosted on official authors’ university web pages. Participants could complete the sorting in web browsers on their devices (computers, mobile phones, and tablets). We encouraged participants to complete the study on a device with a larger display for ease of sorting. After consenting to the study, participants were asked to pre-sort statements by differentiating them into three groups: “I relatively agree with it”, “I relatively disagree with it”, and “I am indifferent with it”. The statements are presented in random sequence. Successively, they need to arrange statements in a grid, as shown in Fig. 1. As we had 36 statements in our Q-set, we opted for an eleven-interval scale on the x-axis, ranging from -5 (strongly disagree) to $+5$ (strongly agree), with a neutral column at 0. As the grid was fixed and normally distributed, this meant that participants could only place 1 statement on each of the extreme ends. After participants completed the sorting activity, follow-up questions were asked to understand better why they placed certain statements in extreme positions. Participants must also respond to questions about their role, education level, and familiarity with

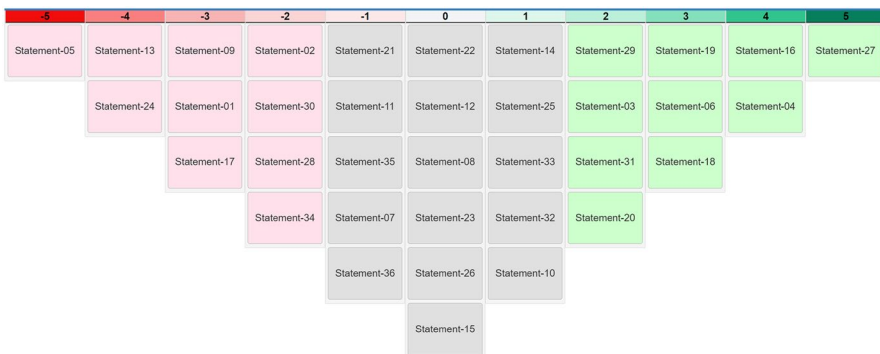


Fig. 1 Q-sorting grid used in our experiment

social tools. Each participant took 25 min on average to complete the entire sorting process.

3.4 Participants

About what was established in the literature (Pforr 2006) on the need to involve public and private actors to identify strategy, this study focuses its attention on the stakeholders within different tourist destinations present in the Sicily region of Italy. Sicily is rich in many attractors of primary importance, which is helpful for our scope. As the methodology suggests, involved stakeholders come from heterogeneous territories characterized by different urban dimensions, different attractors' categories, and different attractors' relevance. In addition, stakeholders belong to groups of actors that play different roles in promoting destinations. Although there is no standard definition of stakeholder theory (tom Dieck and Jung 2017), we refer to Freeman's definition of stakeholder as "*any group or individual who can affect or is affected by the achievement of the organization's objectives*" (Freeman 1984). Several contributions tried to provide criteria to identify stakeholders and their salience (Daniels et al. 1997; Grimble and Chan 1995; Vos 2003) because not considering a typology stakeholder could mean the failure of a strategy (Clarkson 1995). The first group of stakeholders is the **public actors (Pa)** (Gilmore and Rentschler 2002; Carmin et al. 2003; McLean 2012; Steelman 2001) responsible for territory management and the enhancement of its resources. A second stakeholder group is the **private actors (En)** (Johnson et al. 2008; Stoney and Winstanley 2001) who manage firms inside the territory. A further and important group of tourist destination stakeholders is represented by the **attractor managers (Am)**. These actors have been entrusted with the management of cultural assets present in a territory and pay more attention to the opportunities provided by technological innovation (Karagouni 2018; del Vecchio et al. 2018). Finally, the last stakeholder group is **skills providers (Sk)**. The territorial innovation process requires integrating the knowledge of organizations and firms inside the territory and the participation of external subjects with technological and economic knowledge (Carroll and Buchholtz 2003). First, we made a screening of the various Sicilian tourist locations where there are different types of cultural (museums or archaeological parks) and recreational (seaside or mountain resorts) tourist attractions. Based on the economic dimension linked to the tourism sector and their attractiveness in terms of number of visitors, we decide to focus our attention to five location, so we identified the key figures relating to those territories that corresponded to the different types of stakeholders described above. We have also included two further public stakeholders who have a responsibility for the whole Sicilian territory. The initial sample was therefore made up of twenty-two stakeholders, which was reduced to twenty as two of them did not complete the sorting and decided not to participate in the study. These actors were preliminary asked to give a Metaverse definition to understand the instrument's knowledge. We assigned a score to each actor by comparing their definition with that of Gursoy et al. (2022): "*Metaverse is a digital space that empowers users to interact socially,*

Table 1 Stakeholders classification based on a comparison between their definition of “metaverse” and the definition of Gursoy et al. (2022)

| Id | Digital space | Interact socially | Digital avatars | To generate value | Co-create experiences | Score |
|-----|---------------|-------------------|-----------------|-------------------|-----------------------|-------|
| Pa1 | * | * | * | * | * | 5 |
| Pa2 | | * | | * | | 2 |
| Pa3 | * | * | * | | | 3 |
| Pa4 | | * | * | | | 2 |
| Pa5 | * | * | * | * | * | 5 |
| Pa6 | | * | * | * | | 3 |
| Pa7 | * | * | * | * | | 4 |
| En1 | | * | | | | 1 |
| En2 | * | * | * | | | 3 |
| En3 | * | * | * | | | 3 |
| En4 | * | | | | | 1 |
| Am1 | * | * | * | * | | 4 |
| Am2 | * | | | | | 1 |
| Am3 | | * | | | | 1 |
| Am4 | | * | * | | | 2 |
| Am5 | | * | | | | 1 |
| Sk1 | * | * | | * | | 3 |
| Sk2 | * | | | | | 1 |
| Sk3 | | * | * | | | 3 |
| Sk4 | | | * | | | 1 |

Stars are attributed to each element present in the participant metaverse definition

using digital avatars, to generate value and co-create experiences”. The following table gives a summary of the scores:

The semi-qualitative exploratory analysis summarized in Table 1 shows that only in some cases the definition of Metaverse provided is rich and correct. This is a clear signal that there has not been an effective transfer of information on the characteristics of this product/tool towards those who represent the leading players in spreading its use.

3.5 Results

As a result of the Q-sort survey carried out, for each of the 36 combinations/statements about the best destination marketing strategy, we obtained 20 evaluations (one from each of the participants) ranging from – 5 (in case they consider it the one with which they most disagree) to 5 (in the case consider it the one with which they are most in agreement). In Fig. 2, we have reported the box-plot of the values obtained for each statement we have recorded.

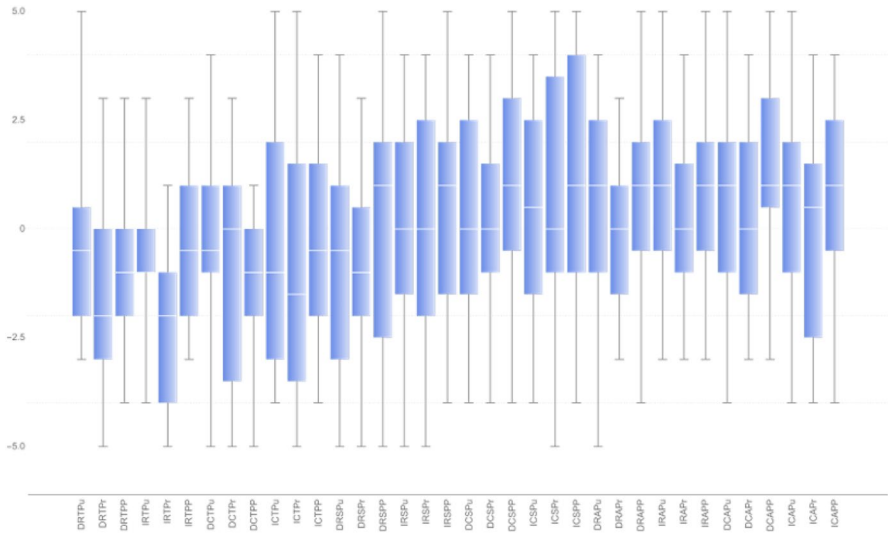


Fig. 2 Box-plot of the distributions of the values obtained for each statement

3.5.1 Analysis of individual differences

From the box-plots in Fig. 2, it is already possible to see that stakeholder preferences show a fairly marked heterogeneity. However, it is possible to note how a group of statements is, on average, less appreciated than others.

The graphs in Fig. 3 show the overall participants’ preferences for all the variables; the graphs show that the participants do not show a clear differentiation regarding the content and target variable, while expressing a moderate differentiation regarding the economic resource variable, and the tool variable. However, these are not as clear-cut as one might expect.

3.5.2 Analysis of overall dominance

The result obtained from the analysis of the overall preferences can be better analysed to measure the overall dominance of different variables. Relying on what was proposed by Gao and Soranzo (2020), we calculated the dominance of each variable for any participant as a measure of the spread of the variables across the Q-sorting grid based on its levels; Gao and Soranzo defined the dominance of variable (D_v) as the maximum difference between the sums of scores (s) of each of couple of options j and k about the variable v :

$$D_v = \text{Max} \left(\sum_{i=1}^{n_j} s_{ji} - \sum_{i=1}^{n_k} s_{ki} \right) \quad \forall j, k \in N_v \tag{1}$$

where v are the variables in our analysis (*Target, Content, Tool, Resource*), j and k span on specific variable options (i.e., for “Target” case, the option are International

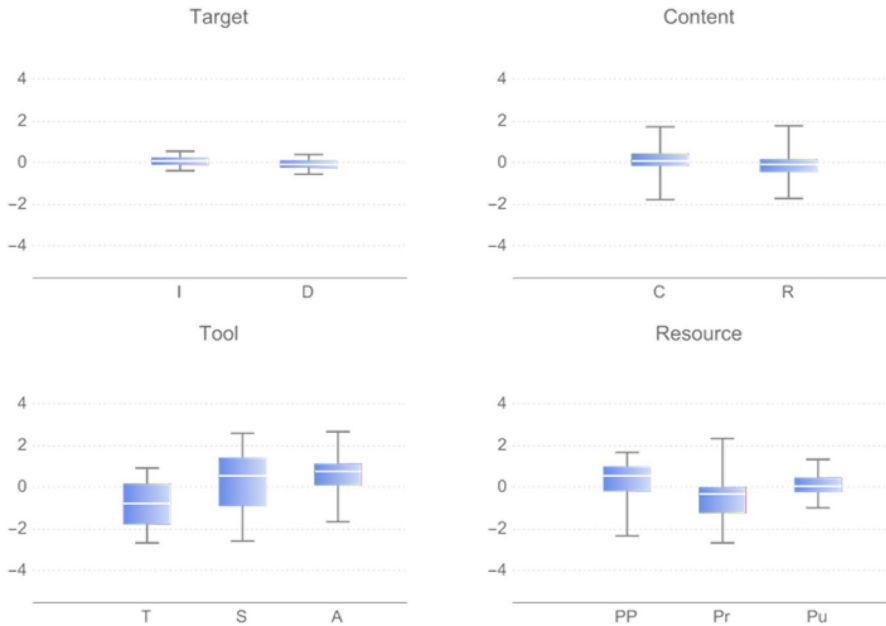


Fig. 3 Box-and-whisker summary of the distribution of overall participants' preferences with median confidence interval specifications (25% quantile ? 75% quantile)

or Domestic: $N_v = \{I, D\}$) and n_j (n_k) is the number of statements in which the option j (k) are present. As Gao e Soranzo suggests (Gao and Soranzo 2020), to compare different variables in case they have different options, D_v has to be weighted for the maximum difference that each variable can get (which depends on the number of its options). So, to measure the overall dominance for all participants, we collect the proportion of dominance for each variable (the weighted average of the dominance). The results are shown in Fig. 4.

The results confirm what was suggested in the previous analysis of overall preferences. As it is easy to see from the graph, the **Target** variable is the one that least seems to dominate the preferences of the participants; also, the **Content** variable does not seem to have a significant dominance, although there are individual cases in which it assumes significant values (we will return to this point later). On the other hand, the **Resource** variable is the one that shows a very high dominance spread, as well as the **Tool** variable, which among our variables is the one that shows the most remarkable dominance.

3.5.3 Analysis of individual differences

To analyse differences between individuals, we used Q-Factor analysis that, as described above, groups participants together instead of items. Gao e Soranzo protocol employs the 'qmethod' R-package (Zabala 2014) to conduct principal component analysis (PCA) with Varimax rotation to analyse the Q-sorting data. The number of

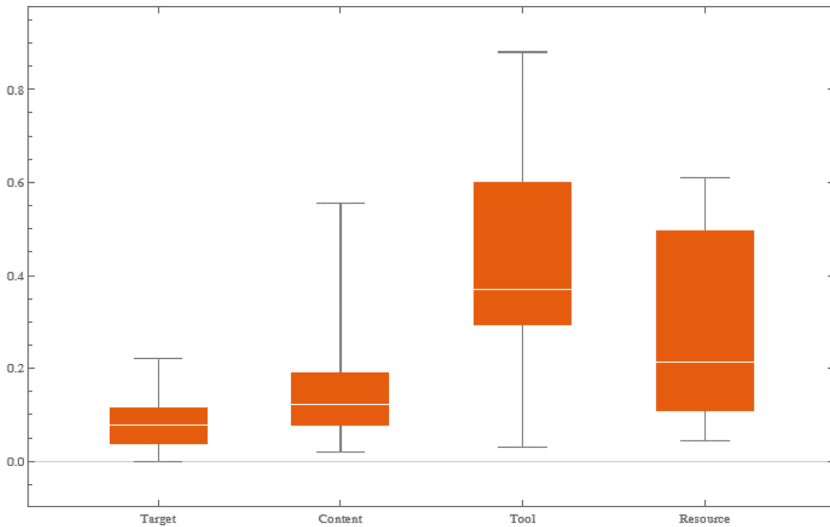


Fig. 4 Box-and-whisker summary of the distribution of participants' relative dominance of variables as defined in (1)

Q-factors depends on the data; the usual criteria by which the number of components is selected include the total amount of variability explained or eigenvalues higher than a certain threshold.

Figure 5 shows the scree plot (Cattell and Vogelmann 1977) of the eigenvalues of the principal components. Using a scree plot, the chosen procedure of finding statistically significant factors led to considering only the principal components for which the eigenvalue was more significant than 1. This led to the identification of 5 principal components on which a varimax rotation procedure was performed; these collect almost 80% of the total variance. Following the criterion proposed by Zabala (2014), we can “flag” each of the participants with respect to the 5 factors based on the following two criteria:

$$|l_i| > \frac{1.96}{\sqrt{N}} \quad \text{and} \quad l_i^2 > \sum_{j=1}^{n_f} l_j^2 - l_i^2 \quad (2)$$

where l_i is the loading values of each participant on factor i , N is the number of statements (in our case $N = 36$), and n_f is the number of factors considered (in our case $n_f = 5$). In Table 2, we report the loading values of each participant; in yellow are the values that pass both criteria in (2). Only for one of the participants (Pa2), both of the criteria in (2) were not satisfied, and therefore (s)he is not assigned to any factor; all the other participants were assigned to a factor.

Q-factor 1, which explains approximately 25% of the variance of the sample, collects the most significant number of flagged people and, in particular, the majority of stakeholders belonging to the Policy Makers typology and 2/4 of those of the Private Initiatives Actors typology. Q-factor 2, which explains a

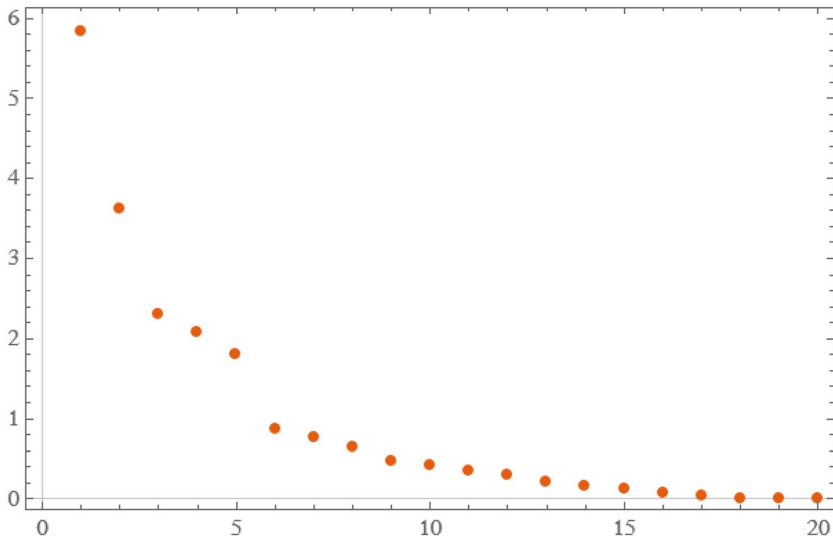


Fig. 5 Scree plot of the eigenvalues of the principal components

further 14% of the variance, accounts for 2/4 of the Skills Providers and one of the Attractor Managers (analysing the detail of the training of this stakeholder and his/her) professional position, we have noticed that (s)he can also be considered as a Skills Provider who, at this time, plays the role of Attractor Manager). Q-factors 3 to 5 (each explains a further 13% of the variance) gather the rest of the stakeholders without distinguishing between the different typologies. The Zabala's R-package provides a simulation of the answers from the various points of view of the Q-factors by assigning a factored score to each of the statements following the distribution of the values (from -5 to $+5$) of the grid used (see Fig. 1); these are listed in Table 3.

The analysis of the various values makes it possible to verify whether the multiple points of view (Q-factor) have points of convergence (consensus) or diverge and differ by assigning a score to a particular statement that distinguishes a specific Q-factor. As it is possible to see, there is a single statement that collects all consensus, particularly negative agreement. There is, therefore, a shared vision that a strategy that focuses only on a local tourist target, proposing purely playful/recreational content through a traditional promotional tool implemented by private individuals, is the least suitable.

It is also interesting to note that only one statement collects all positive scores among the various Q-factors although the values are not similar enough to define that there is a consensus on its evaluation. This last statement is the one that foresees a strategy aimed at an international audience, which proposes purely cultural contents through advanced tools and implemented through the use of private and public resources.

Table 2 Loading values of each participant; highlighted the values that pass both criteria in (2)

| Loadings | Q-Factor1 | Q-Factor2 | Q-Factor3 | Q-Factor4 | Q-Factor5 |
|----------|-------------|---------------|-------------|---------------|---------------|
| Pa1 | 0.84 | 0.17 | 0.07 | - 0.12 | 0.27 |
| Pa2 | 0.67 | - 0.18 | 0.01 | 0.15 | 0.64 |
| Pa3 | 0.07 | 0.53 | 0.31 | 0.7 | - 0.08 |
| Pa4 | 0.79 | - 0.39 | - 0.2 | 0.06 | - 0.14 |
| Pa5 | 0.67 | - 0.16 | 0.13 | 0.08 | 0.25 |
| Pa6 | 0.88 | 0 | 0.06 | - 0.13 | - 0.05 |
| Pa7 | 0.85 | 0.04 | 0.04 | - 0.04 | - 0.12 |
| En1 | 0.68 | - 0.15 | 0.1 | 0 | 0.65 |
| En2 | - 0.29 | 0.13 | - 0.28 | 0.29 | -0.66 |
| En3 | 0.02 | 0.1 | 0.95 | 0.05 | 0.15 |
| En4 | 0.61 | - 0.48 | - 0.29 | - 0.06 | - 0.13 |
| Am1 | 0.02 | 0.1 | 0.95 | 0.05 | 0.15 |
| Am2 | 0.22 | - 0.1 | 0.12 | 0.73 | 0.26 |
| Am3 | - 0.09 | 0.38 | 0.19 | 0.86 | - 0.14 |
| Am4 | - 0.03 | 0.13 | -0.6 | - 0.18 | 0.46 |
| Am5 | - 0.05 | 0.81 | 0.18 | 0.05 | - 0.08 |
| Sk1 | 0.36 | 0.08 | 0.19 | - 0.76 | 0.04 |
| Sk2 | - 0.09 | - 0.69 | 0.12 | - 0.18 | 0.06 |
| Sk3 | 0.24 | 0.01 | 0 | - 0.18 | - 0.87 |
| Sk4 | - 0.31 | 0.81 | - 0.01 | - 0.05 | - 0.03 |

Bold refers to the statement that collects all consensus and the one that collects only positive scores among the various Q-factors

3.5.4 Analysis of the interaction between individual differences and dominance

To understand the difference in Q-factor ways of thinking, we measured the overall dominance for q-factored groups of participants. To do it, we refer to Zabala factor scores of statements obtained by rounding the weighted average of scores given by the factor-flagged participants to statements towards the array of discrete values in the grid of Fig. 1. In Fig. 6, we report the relative dominance for all Q-Factors applying formula (1) to each factor score.

As can be seen from the graph in Fig. 6, it is possible to note that for Q-Factors 1 and 2 the “Tool” variable is the one that has the most significant relative dominance. Also, for Q-Factor 3, the “Tool” variable has a significant dominance although it is subordinated to the “Resource” variable in importance. For Q-Factor 4, instead the variable that has the greater dominance is the “Content” one; finally, for Q-Factor 5, it is only the “Resource” variable that has the greater dominance. For none of the Q-factors, the “Target” variable appears relevant. This makes it possible to understand how the applied methodology allows recognizing, from the point of view of the perceptions of the stakeholders, the different points of view referring to the importance of the variables considered for each of them.

Table 3 Q-factor score for each statement obtained by Zabala's R-package (Zabala 2014)

| Statement | fsc f1 | fsc f2 | fsc f3 | fsc f4 | fsc f5 | Consensus or distinguishing |
|-----------|--------|--------|--------|--------|--------|-----------------------------|
| D.R.T.Pu | -3 | -1 | -2 | 2 | 1 | |
| D.R.T.Pr | -2 | -2 | -2 | -2 | -3 | Consensus |
| D.R.T.PP | -3 | 1 | -2 | 1 | 0 | |
| I.R.T.Pu | -1 | 0 | -1 | 3 | 1 | Distinguishes f4 |
| I.R.T.Pr | -4 | -2 | 0 | -2 | -1 | |
| I.R.T.PP | -2 | 2 | 0 | 0 | -1 | |
| D.C.T.Pu | -1 | 0 | 4 | -1 | 0 | Distinguishes f3 |
| D.C.T.Pr | -5 | -3 | 3 | 0 | -2 | Distinguishes f1; f2; f3 |
| D.C.T.PP | -2 | 3 | -1 | -1 | -1 | Distinguishes f2 only |
| I.C.T.Pu | -3 | 0 | 5 | 3 | 0 | Distinguishes f1 |
| I.C.T.Pr | -4 | -4 | 3 | -3 | 0 | Distinguishes f3; f5 |
| I.C.T.PP | -2 | 1 | 2 | 2 | -2 | |
| D.R.S.Pu | 0 | 2 | -5 | -3 | 2 | Distinguishes f1; f3; f4 |
| D.R.S.Pr | -1 | -3 | -3 | 0 | 1 | |
| D.R.S.PP | 2 | 4 | -4 | 1 | 3 | Distinguishes f3;f4 |
| I.R.S.Pu | -1 | 1 | -3 | -5 | 4 | Distinguishes all |
| I.R.S.Pr | 2 | -2 | -3 | 1 | 3 | Distinguishes f4 |
| I.R.S.PP | 2 | 3 | -4 | 0 | 2 | Distinguishes f3 |
| D.C.S.Pu | 3 | 2 | 0 | -4 | -1 | Distinguishes f4 |
| D.C.S.Pr | 3 | -1 | 1 | 0 | 2 | Distinguishes f1; f2 |
| D.C.S.PP | 3 | 5 | 0 | 0 | 2 | Distinguishes f2 |
| I.C.S.Pu | 1 | 1 | 1 | -2 | 3 | Distinguishes f4 only |
| I.C.S.Pr | 4 | -1 | 0 | 2 | 5 | Distinguishes f5 |
| I.C.S.PP | 1 | 3 | 0 | -1 | 4 | |
| D.R.A.Pu | 0 | -1 | 1 | 4 | -3 | Distinguishes f4; f5 |
| D.R.A.Pr | 0 | -2 | -2 | -1 | 0 | |
| D.R.A.PP | 5 | 4 | -1 | 1 | 1 | Distinguishes f1; f2 |
| I.R.A.Pu | -1 | -1 | 2 | 5 | -2 | Distinguishes f3; f4 |
| I.R.A.Pr | 0 | -4 | -1 | -3 | -3 | |
| I.R.A.PP | 2 | 2 | -1 | 1 | -5 | Distinguishes f3; f5 |
| D.C.A.Pu | 4 | 0 | 2 | 2 | -4 | Distinguishes f2; f5 |
| D.C.A.Pr | 0 | -5 | 2 | -2 | -2 | Distinguishes f1; f3 |
| D.C.A.PP | 1 | 0 | 1 | 3 | 0 | |
| I.C.A.Pu | 0 | 0 | 4 | -1 | -1 | Distinguishes f3 |
| I.C.A.Pr | 1 | -3 | 1 | -4 | -4 | |
| I.C.A.PP | 1 | 1 | 3 | 4 | 1 | |

3.5.5 Analysis of the interaction between individual differences and preferences

Using the factor-scores, as defined by Zabala (2014), it is also possible to reconstruct the preferences of the various Q-factors concerning the various options of the

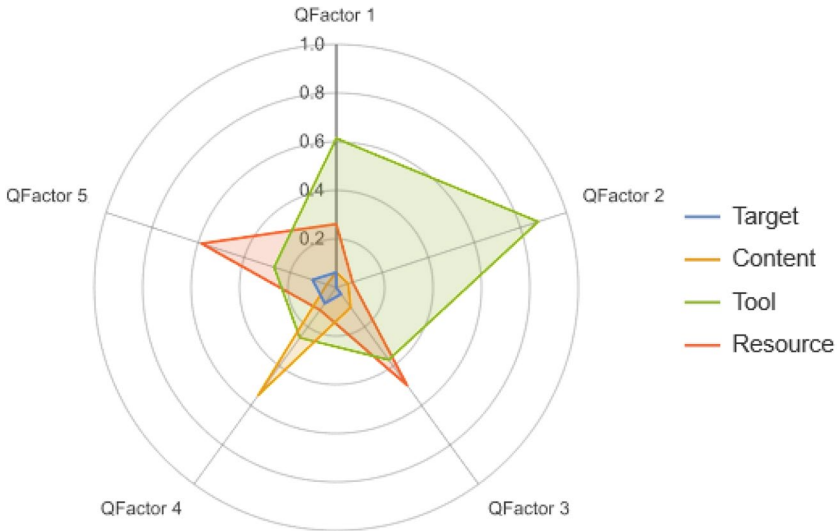


Fig. 6 Relative dominance for Q-Factors

variables: this procedure allows us to understand what the dominant preferences are and also to have an idea of the possible reading that can be done on the various Q-factors. Figure 7 shows the box-plots of the values attributed by each of the Q-factors to the various options of the various variables.

Again, it is confirmed that the “Target” variable is not a clear discriminator for any of the Q-factors; neither of the two options for this variable (International or Domestic) seems to assume significantly distinct values. As seen previously, the “Content” variable appears to discriminate only for Q-Factor 4 which shows a favourable preference towards cultural content. About the “Resource” variable, as already seen above, the various options seem to be discriminating for Q-factor 5 which tends to consider recourse to private resources negatively. The same variable also appears to discriminate slightly for Q-factor 3 which tends to prefer the public-private partnership option to the purely private one. Finally, the “Tool” variable discriminates with different configurations of the various options. It is discriminated for Q-factor 1 and 2, but while for Q-factor 1, the “Traditional’ option is the least attractive, for Q-factor 2, the least preferred option is “Social”. For Q-Factor 2 only, it is evident that the “Advanced” option, i.e., the tools of the Metaverse, is the most preferred. For Q-Factor 1, however not at a high level of significance, it is the “Social” to be preferred over the “Advanced” one.

4 Discussion

The set of analyses carried out through the Q-methodology has allowed us to deepen in detail the role and the importance given to the Metaverse by the stakeholders of a territory about its integration and centrality in constructing a strategy for the

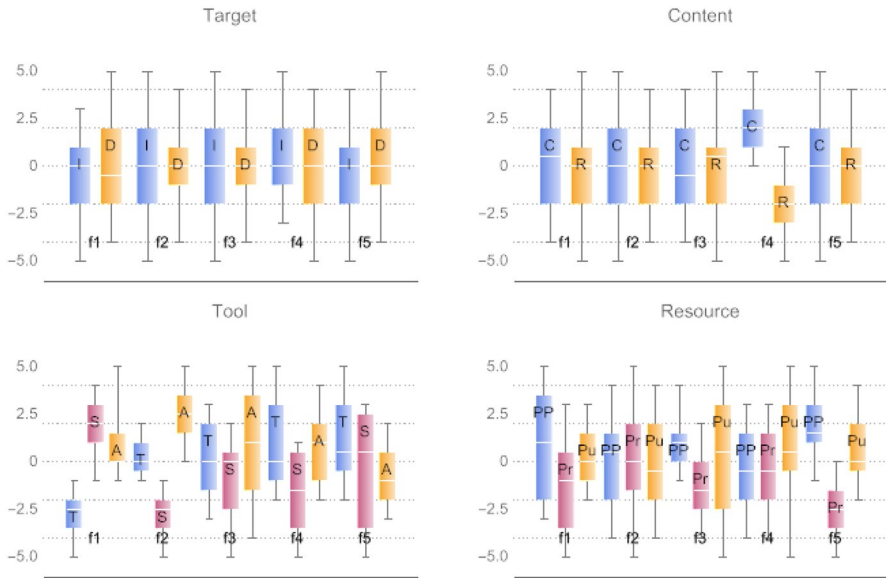


Fig. 7 Box-plots of the values attributed by each of the Q-factors to the various options of the various variables

promotion of a tourist destination. Abernathy and Clark's (1985) transilience model identified four types of innovation: opening new market niche opportunities via existing technologies, incremental by small-scale regular changes, revolutionary by involving significant new technologies or architectural which can change the entire industry. Our results show that, in the stakeholders' perception, the Metaverse is seen in different ways. For example, it can be read as a niche innovation that concerns only some types of tourist attractions or revolutionary because it involves new technologies and, at the same time, as architectural because it could change the structure of the tourist destination market. Collecting the results of the proposed analyses, the first thing that must be highlighted is that only one component (Q-factor 2) favours this type of tool over all the others and considers it central in defining a tourism promotion strategy. However, recalling the classification shown in Table 1 and cross-referencing the data on the loading of the various participants shown in Table 2, we realize that those who have been flagged in Q-factor 2, on average, show little knowledge of the Metaverse. According to Rogers's innovation diffusion theory and his adopter classification (Rogers 2003), we can identify the Q-factor 2 as the point of view of the first two categories of Rogers's classification (*Innovators and Early Adopters*). As far as Q-factor 1 is concerned, we can define it as the main point of view since it represents the factor that explains the most variance in the sample and in which the largest number of participants are flagged. Also, considering the type of participants flagged on Q-factor 1, this factor represents the dominant point of view among those who play a key role in defining a promotion strategy for a tourist destination. There is no clear preference for this component between the "Social" and "Advanced" tools because they are not yet perceived as distinctly different. On

average, Metaverse is perceived as slightly worse than the social option. Considering that the average knowledge of the Metaverse for participants flagged on Q-factor 1 to be the highest, we can therefore state that they do not recognize a Metaverse positive marginal utility compared to “Social” tools, which are therefore still preferred. Referring again to Rogers’s classification, we can infer that Q-factor 1 represents the point of view of the category of adopters defined as the *Early Majority*. The point of view of Q-factor 5, which perceives the Metaverse as least important among the various categories, can instead be traced back to that class of adopters that Rogers defines as *Laggards*, i.e. the last to adopt an innovation. They perceive the cost/risk to be still very high and therefore prefer it to be borne by the community rather than by the individual. Q-factor 3 and 4, on the other hand, can represent the point of view of adopters classifiable as *Late Majority*; they are typically skeptical about innovation and adopt an innovation after the average participant. We recall that Q-factor 4 represents the point of view of the adopters who subordinate the preference of the tool to that of the contents and who therefore evaluate the effectiveness of the Metaverse according to its ability to propose cultural contents. These results help us to understand the actual state of penetration of the Metaverse within the tourism sector and the perception that the actors have regarding the advantages in terms of competitiveness in the attractiveness of a destination. The complex system built around the Metaverse still suffers from an imperfect knowledge among the main players in the tourism sector. It is only a component of the main actors that promote the Metaverse. They have a point of view that, however, is not justified by adequate knowledge of the Metaverse and, idealistically, see an innovative potential in it because they are fascinated by the novelty. It can therefore be imagined that the costs of transition to the Metaverse for stakeholders in the tourism sector are still high, especially regarding the psychological component linked to the risk that the change does not satisfy them. There is, therefore, a problem of “limited rationality” of the stakeholders which implies the impossibility of quantifying precisely an optimal solution regarding the innovative activity.

5 Conclusion

The present study, although limited to a specific territory, examined the role and importance given to the Metaverse by different typologies of stakeholders: Public actors, Private actors, Attractor Managers, and Skills Providers. Q-methodology allowed us to explore the preferences of these stakeholders, who certainly play a crucial role in defining a tourist destination’s promotion strategy. The results of this exploratory study confirm the existence of heterogeneous preferences among groups of stakeholders. Our results show that the Metaverse is seen differently in the stakeholders’ perception. Furthermore, it was possible to identify the stakeholder group with a different dominant point of view. In particular, the knowledge lack of the metaverse tool could lead a group of stakeholders to promote it only because they are fascinated by the novelty. Instead, as our results reveal, the dominant point of view considers a full awareness of the metaverse tools and perceives them as slightly worse than the social ones. This is coherent with unstable preferences for digital

instruments, and it suggests that technology producers are probably ahead of what the market is ready to understand and adopt. The tourism system has not yet reached a total capacity to manage the transition towards Metaverse. So, it is possible that, in this case, the transience of the tourism sector, i.e., the system's ability to respond to innovative change (Matin et al. 2018), is not uniform and homogeneous among the various stakeholders. This can lead to a form of barrier to the use of the metaverse and a brake on its diffusion and implementation on a large scale. We can therefore state that we are still in the initial phase of the Metaverse diffusion process within the tourism system and the critical mass may not have been reached yet in the adoption rate of Metaverse innovation. However, it is clearly accelerating thanks to widespread experimentation, which is facilitating the adopters' *persuasion process*. It is possible to imagine that soon the number of adopters will grow, that the number of trials will increase, and that we will enter a critical phase in which we will have adopters take the concept of the change, weigh the advantages/disadvantages of using the Metaverse and decide whether to adopt or reject it. We know that each territory has its peculiarities and the structure of the preference change. However, understanding the stakeholder's decision-making processes is a prerequisite for sustainable destination planning, good governance, and destination management. So, we hope similar analyses will be conducted in different territories to understand the structure of preferences in this phase of structural changes in the tourism sector.

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Data availability The data supporting this study's findings are available on request from the corresponding author. The data are not publicly available due to their containing information that could compromise the privacy of research participants.

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