

Article

An Empirical Investigation of Architectural Heritage Management Implications for Tourism: The Case of Portugal

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Abstract: The aims of this study are manifold. First, to investigate the potentials of architectural heritage in the context of tourism destination development, as well as examine public sector policies and make plans toward the preservation of these resources. Secondly, to appraise the outcome of preservation and its implications for tourism. The study is an effort to explore and understand the interrelationships between tourism and architectural heritage sites through tourist image and perception. For the purposes of this research, numerous heritage sites were sampled in Portugal. A mixed research method was utilized to gauge tourists' image/perception of heritage resources, and impact (quantitative approach). A qualitative approach was utilized to assess the priority of tourists in their visits and public-sector policies toward heritage resource management and planning. The fuzzy logic method was used to assess the architectural value and the tourist and preservation potential of historical buildings in Porto/Aveiro. The contribution and implications of the study are also explained. The results revealed that architectural heritage resources have the most appeal to tourists. The study to date demonstrates the architectural value and tourist and preservation potential of the buildings observed via evaluation by fuzzy logic methods.

Keywords: heritage preservation; reuse; architectural heritage; heritage planning; heritage management; heritage tourism; Portugal

1. Introduction

Cultural heritage has drawn the consideration of tourism planners, urban planners, and historians. The intention is to restructure the human habitat in terms of material and non-material heritage, covering architecture, monuments, historical relics, artefacts, artistic icons, celebrations, and folklore.

Nowadays, historical buildings as a part of cultural heritage have become a significant tourism product and thus many destinations have funded and supported their renovation and reuse. These changes in attitude towards heritage restoration have produced a heightened awareness at the state and European Community levels of the socioeconomic potentials of heritage for tourism purposes.

Despite various perspectives and debates regarding tradition and modernity in the cultural setting, many scholars have established reciprocal relationships between heritage and tourism [1–3]. In order to gain a high level of understanding through heritage preservation, the significant role of heritage should be transferred to visitors. Involving local communities with tourism is likely to promote the economy [4]. Over time, historical buildings as cultural heritage assets are threatened with demolition. Today, building sustainability development has reduced the impact of human activities identified with ecological issues [5]. Sustainability prevents negative environmental effects through

conservation or preservation and protects culture and traditions with the aim of promoting the local economy [6]. Long-term conservation is expected to enhance cultural and natural resources.

To carry out the social, economic and environmental targets in heritage conservation, certain pre-conditions are essential. First, to manage human responses to the environment. Second, to have the ability to analyse sustainability and its effect on life cycle of a building. Third, to consider the connection between human and environment that is characterised by human-integrated design. Conservation could come through adaptive reuse, which promotes sustainability in tourism. There is an emphasis on cultural heritage and local community traditions to conserve sustainable tourism [6] (Powter).

This study focused on the concept of building heritage, which should be considered within the sustainable planning range. As stated by [7], cultural heritage is the portrayal of historical and architectural assets that belong to the past. Thus, efforts to safeguard them are indispensable for generations to come. That is the motivation behind why historical assets should be examined through the concept of sustainability.

This study focuses on the extent to which sustainability and tourism are influencing aesthetics in heritage building zones, highlighting the role of policies and plans. Specifically, this research concentrates on preservation as a result of different cultural activities and reactions at a particular time. The cultural aspects can be depicted by the architecture of historical buildings, which influences the experience of international tourists. Moreover, we will focus on the rising awareness of preservation and how it is expected to promote the economy.

1.1. The Significance of the Study

Portugal is endowed with architectural heritage in various forms and shapes. It attracts tourists from across the world for means of education and indulging the curiosity of visitors in historical monuments and architecture. This research aimed to investigate and reveal the potentials of architectural heritage in tourism destination development and an examination of public sector policies and plans toward the conservation and preservation of these resources. Knowing that heritage resources have become a significant tourism product, the conservation and preservation of architectural heritage requires a case-specific planning system with the end goal of tourism and national pride. The results of the thesis are expected to clarify the limitations and challenges of preservation in historical buildings. Despite some unresolved debates about the different dimensions of sustainability, preservation will be useful for conserving buildings' life and protecting them from demolition; it is likewise beneficial in economic and social cases and in saving energy [8].

This paper has the general objective of determining the role of tourism in promoting the conservation of buildings as cultural heritage assets through tourist perceptions. Second, the aim is to identify the effect of conserving historical buildings on tourism, specifically in terms of enhancing economic profit and ways to protect them from demolition. The specific objective is to define the principles by which concepts of sustainability are integrated into the conservation of historical buildings, which is used to enhance cultural heritage in the tourism industry. Protecting built heritage and conserving local traditions and cultural values of communities for future generations present a real challenge for developers, architects and professional education programs. In the meantime, the tourism sector has established a sub-sector of heritage tourism that requires the use of plans for their sustainability. Neglecting these valuable cultural resources will be a loss not only for the nation but for its international values as manifested in the designation of World Heritage Sites.

1.2. Theoretical Framework

The framework of this study is based on Smith and Bugni's [9] theory of symbolic interaction. They clearly show that symbolic interaction theory is one of the theoretical sociology perspectives that support the connection between architecture, visitors' impressions, and their emotions towards the building. Visitors' perceptions of architecture are not just related to human behaviour, unlike many designs that shape visitors' thoughts. Moreover, the effect of architecture on the emotions, thoughts

and performance of visitors represents the human aspiration [10]. Designing the physical environment is a way to transfer messages to human beings. Arday declared that where design and physical shape affect human emotions, architecture can come into the visitor's soul [9]. To begin with, based on the work of Tait and While [11], the actor-network theory 'has been influential in recent work that seeks to offer a new perspective on how buildings are defined, categorized, and shaped in complex networks over time' [11]. Furthermore, the actor-network theory allows for an understanding of the relationship between tourists' gaze [12] and multiple parts of a conserved object. In this regard, the theory has been used by a number of studies to understand how buildings are defined physically and culturally. The dimension of conservation of the historic built environment, besides its materiality, reflects social, cultural and political values, with an emphasis on the role of media [13,14]. Tourists' interaction and interpretation of heritage, which are also embedded in the actor-network theory, are placed in the context of 'conservation', which is manifested in the World Heritage Site (WHS) designation, which has become the Holy Grail of 'heritage tourism' [15]. In a way, theories of architectural conservation pose the question 'how did we get from what we had to what we have?'; this arouses the curiosity of tourists through the formation of heritage tourism. The conservation philosophy has also been established by the International Council on Monuments and Sites (ICOMOS), which recognises the cultural significance of a building as well as its current or future uses. Cultural significance encompasses aesthetic, historic, scientific, social or spiritual value for past, present and future generations [16]. This has had tremendous implications for heritage tourism.

1.3. Background

Prior research into cultural heritage in many countries revealed that, among the various attributes of cultural heritage that were researched, historical buildings, castles and museums were known as fascinating places that attract more tourists. What is more, increasing the demand for visits to historical places for pleasure can open up great opportunities for the tourism industry [17]. According to research by Glasson on the characteristics of tourists who visited Oxford, 80% of them were satisfied with the architecture and traditional colleges. This research also showed 80% willingness to revisit and found that architecture was a main satisfaction factor for revisiting [18]. As stated by Embaby [16]: "The obligation to conserve the architectural heritage of our local communities is as important as our duty to conserve the significant built heritage and its values or traditions of the previous era". It is essential to understand, define, interpret and manage living heritage well for future generations [19]. The issues associated with the literature explain the relationship between the architecture of heritage buildings and tourist perceptions and experiences.

Apostolakis [17], Jolliffe and Smitt [18] stated that in order to find uniqueness in a heritage commodity chain, it is important to comprehend what experiences of cultural heritage attributes can fulfil the needs of cultural consumption [20]. In this vein, this study contributes to scholarship by identifying tourists' image (mental destination representation), and also the conserving effect of historical buildings on tourism performance. As indicated by the literature, despite the value of cultural heritage and human interest in heritage, few researchers have studied this topic specifically. The majority of studies concentrate on the architectural practice and heritage conservation independently, not integrated as a whole. Little is known with respect to the effect of architecture on tourism [21]. Tourists' perception of a destination can be shaped by architectural heritage sites. Remoaldo [22] revealed that historic centres, monuments and architectural buildings have motivated tourists to revisit a destination in the case of Portugal. There is also evidence of measures such as tax relief to restore architectural buildings for the purpose of tourism, including in Ireland and France among other countries [23].

Therefore, this study starts to fill the gap by providing several contributions to the body of literature and heritage principles. What is more, it attempts to answer the call of Kirillova and Lehto [24], who recommended examining aesthetic judgment in tourism and discovering the role of

perceived aesthetics in the destination. Due to the negative effect of mass tourism on built heritage and culture, this study further contributes to partnership in heritage conservation [25].

1.3.1. Tourists' Image, Perception and Experience of Place

Based on the theoretical framework, the focus of this study is on the relationship between architecture, image and the perceptions of tourists. Valorisation of heritage is precious for many societies [26]. According to Park [25], heritage has a significant socio-psychological dimension which is interconnected to the national identity through different attributes of heritage experience. Referring to Lew [27], three perspectives must prevail in studies about drawing tourist attention to certain places. This study has been inspired by typologies of tourist attraction measures such as the three below perspectives and non-typical tourist attraction measures such as historical and valuation measures. However, they can be utilized as a part of any of the three below approaches.

- The Idiographic Perspective

Attraction typologies with an emphasis on an idiographic perspective spotlight the uniqueness of sites rather than the common characteristics. The aim of this typology is to explain why particular places have the potential to appeal to tourists and also justifies the differences between those with nature orientation and human orientation. Human-oriented attractions outweigh nature-oriented in seven categories [28]. The idiographic approach is visible in tourism research.

- The Organizational Perspective

This focuses on the spatial (scale, size) and the functional (capacity-integration-temporal). Consideration on this scale can offer a vision into tourist organisation to draw more attention to attractions, relationship with other attractions and the attachment of images of attractions to attractions themselves. In such cases, scale is to be considered in the planning and marketing of tourism. It considers the factors involved with tourism capacity including the accessibility of services, the vulnerability of the attraction, technological progress, level of education, and political and community support for tourism [29].

- The Cognitive Perspective

A tourist destination and its attributes plays an important role in the evaluation of that destination, and this reinforces feelings in tourists as integral affect that contains meaning. It is valuable for tourists to achieve authenticity of place. The contrast between tourist activities and tourist experiences in the cognitive perspective is the nature of research. Those research studies that originate from activity have a tendency to be fundamentally behavioural, whereas those originating from experience have behavioural or phenomenological perspectives. A cross perspective is the other measure used in attraction research. A cross perspective can be used in any of the three approaches mentioned [28].

1.3.2. Tourists' Image of a Place

For over four decades, destination image has been the main part of tourism research [30]. There are various definitions of image by different scholars.

Table 1 shows that scholars unanimously used the attribute of destination images to measure tourists' image of a place. They identified factors measuring the destination image of tourist such as: architecture or buildings, historic or local sites [31,32], architectural styles, cultural heritage [33], culture, history, and art historical buildings [34], historic attractions, history, heritage and buildings [35].

Table 1. Conceptualization of Image.

[26]	Image is defined as “an internalized, conceptualized and personalized understanding of what one knows”
[26]	“Perceptions or impressions of a destination held by tourists with respect to the expected benefit, consumption values”
[27]	“Totality of impressions, beliefs, ideas, expectations, and feelings accumulated towards a place over time by an Individual or group of people”
[36]	“Destination image is an interactive system of thoughts, opinions, feelings, visualizations, and intentions toward a destination”
[37]	One of the factors influencing destination image is personal factors that consist of socio-demographic characteristics (age, gender, education, occupation, income, etc.) and physical characteristics (preference, motivation, satisfaction with past experience).
[38]	“Perceptions or impressions of a destination held by tourists with respect to the expected benefit, consumption values”
[39]	“Destination image is an interactive system of thoughts, opinions, feelings, visualizations, and intentions toward a destination”

Source: own construction.

A delineation by scholars of measurement of the perception of tourists is important, so this study sketched measurements to answer the question of how we tend to perceive buildings. In order to identify the preference and motivation of the tourists that form perception, the following model was designed (Figure 1).

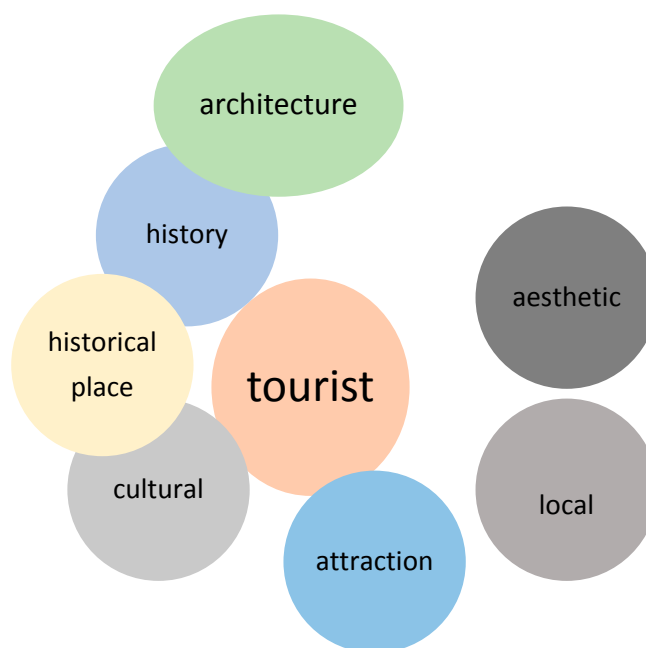


Figure 1. Measuring process of tourist perception of place. Source: own construction. Inspired by [40].

Figure 1, also contextualized in Table 2. There are common denominators between attributes of image or perception which is shown in Table 2.

Table 2 shows that the point of architecture is not, obviously, that the places bring feelings to visitors physically. What is going on is that visitors come to understand and explore them with experience and memory, with their mind and reasoning [42]. In other words, visiting a place is a mental activity or process of gaining knowledge and understanding through thought, experience

and the senses [43]. This encompasses procedures such as knowledge, attention, memory and working memory, judgment and evaluation, reasoning and ‘computation’, and problem solving that prompts creation of new knowledge. According to [44], individuals’ perception of a place is essential, as it will be derived from a sense of identity and belonging [45]. Tourists’ perception of what they have visited is different. What is important is not just the physical fabric, buildings and architecture, but also the perception and experience through observation of that place [43].

Table 2. Common Denominators between Attributes of Image/Perception.

Attribute of Image/Perception	Common Denominator
Architecture & history	Empathy [41]
History & historical place	Style of the cities, story
Historical place & culture	Common understanding & sharing
Culture & tourist	Ethnicity & identity of sites [30]
Tourist & attraction	Destination image, belief, memory [31]

Source: own construction.

As shown in Table 3, what people experience in the present will be a part of tomorrow’s history [40]. What could also be important are: personal memories, shared imaginaries, historical narratives, and emotional and spiritual attachment [46]. In other words, individuals’ responses to external and environmental stimulation are different [47].

Table 3. Attributes of Image and Perception.

Attribute of Image Perception	Perception
Architecture	Sense
History	Factual understanding, rational, memorial
Historical place	Uniqueness, story
Culture	Distinctiveness
Attraction	Experience, memory (value, beliefs and characteristic of place)
Aesthetics	Visual perception of art & spiritual feeling
Local	Pride and authenticity

Source: own construction.

2. Study Sites

2.1. The Case of Portugal

Portugal (the Portuguese Republic) is a country in southwestern Europe. The land within the borders of today’s Portuguese Republic has been constantly settled since prehistoric Iberia (www.Newworldencyclopedia.org/prehistoric). Tourism is one of the most important sectors of the Portuguese economy. The authorities have launched a program for various attractions and the government is restoring historical and cultural assets such as castles and monasteries, with the EU meeting one third of the costs (www.nationencyclopedia.com/economies/Europe/Portugal).

2.2. Porto

Porto embraces historic places registered as World Heritage Sites by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1996. This historic centre is part of the medieval fabric of the second-largest metropolitan region of Portugal. The historic centre of Porto includes the landscape of the waterside houses reaching Ribeira, by the River Douro; the waterfront area in Vila Nova de Gaia, which has linked the history of the city to maritime activities since Roman times. This is an exceptional city landscape with the cathedral and the Clérigos Tower as a symbol of Porto, the abundance of buildings, Baroque churches and the Neoclassic Stock Exchange representing a rich history of thousands of years. The CRUARB (Comisariado para a Renovacao da Area de

Ribeira-Barredo) is a technical-professional team of architects and engineers, historians, archaeologists and social assistants along with other professionals, and has been working on sites, first with national money from the Portuguese government, and also with funding from Europe and the municipality of Porto, since 1947.

2.3. Aveiro

Aveiro is the capital of a region where prominent contrast is visible between mountains and a lagoon. Moreover, the harmony between tradition and modernity is significant in Aveiro with its 1000 years of history. Aveiro is rich with multiple heritage sites including cultural heritage, industrial heritage and natural heritage. The cultural heritage includes museums, monuments and public buildings of architectural importance. The twentieth century was the golden age of the Art Nouveau style in Portugal and, early in the century, Aveiro was influenced by Art Nouveau for a short time. The strong footprint of Art Nouveau remains in Aveiro in spite of its short influence in Portugal. ([www.//portualities.com/en/art-nouveau-in-aveiro-the-venice-of-portugal/](http://portualities.com/en/art-nouveau-in-aveiro-the-venice-of-portugal/)).

This study analysed 52 Art Nouveau buildings in Aveiro as a case study. Three buildings out of 52 in Aveiro are shown as a sample.

3. Methodology

The methodology in this study is based on mixed method research, which is known as triangulation. It refers to an approach that uses multiple observers, theoretical perspectives, sources of data, and methodologies, [48] but the emphasis has tended to be on methods of investigation and sources of data. Triangulation can operate within and across research strategies. 'It was originally conceptualized as an approach to the development of measures of concepts, whereby more than one method would be employed in the development of measures, resulting in greater confidence in findings' [49]. On this basis, the study adhered to mixed research method/multiple methods (i.e., qualitative, quantitative and fuzzy logic—qualitative comparative analysis (QCA)). This approach has become attractive in the social sciences and especially in tourism literature to strengthen knowledge creation.

3.1. Quantitative Approach

This study used empirical and exploratory data. Empirical research is based on quantitative methods through a survey. The interview was done through a questionnaire administered to domestic or international tourists who visited Aveiro and Porto. The purpose of the interview was to identify tourists' perception/image of the places. Construct validity is used to identify the research validity regarding the distribution of the questionnaire. The sample of this study consisted of the tourists who visited the heritage sites. Data were collected from 310 participants. Convenient sampling in this research is adopted because of the background knowledge of the researcher about case studies. The questionnaires were distributed randomly among international and domestic tourists in downtown tourist areas: Moliceiros, Saint Joana Museum, Melia Ria Hotel, Aveiro train station and tourist site in downtown Porto and Porto Sao Bento train station over two months (June–July 2017).

The purpose of the survey was explained to tourists upon their consent to participate. The questionnaire consisted of three parts. These parts examined the effect of aesthetics on tourists' image of architecture via a Likert-type scale. The questionnaire has been validated and is derived from [50–55].

This study sheds light on how and why various competing cultural heritage destinations are visited in terms of architecture, given that planning and management for preservation can create effective economic outcomes while influencing tourists' experiences and behaviours.

The empirical evidence of this study adds to the literature on destination architecture and supports the theory of Smith and Bugni [9]; the theory of symbolic interaction backs up the connection between architecture and visitors' emotions towards a building. The perceptions of visitors demonstrate the effect of architecture on the emotion, thought and performance of visitors [10].

3.2. Qualitative Approach

In this study, the researcher employed semi-structured interviews with two groups. The first set of interviews was done with tourism planners and government authorities who are responsible for the development of the tourism industry in Portugal. It aimed to identify how tourism potential is managed in historical sites and what legislation is in place for the preservation and sustainability of heritage sites. The nature of the questions and their broadness is in line with the unstructured or semi-structured interview questions in qualitative research. Bryman [45] stated that ‘In qualitative interviewing, there is much greater interest in the interviewee’s point of view; in quantitative research, the interview reflects the researcher’s concerns. Furthermore, in qualitative interviewing, “rambling” or going off tangents is often encouraged—it gives insight into what the interviewee sees as relevant and important’.

The second set of interviews was done with 110 tourists who visited cultural heritage in Aveiro and Porto, aiming to find their visit preferences. The interviews were conducted in the English language. The interviews were done in downtown tourist areas: Moliceiros, Saint Joana Museum, Melia Ria Hotel, Aveiro train station, and tourist areas in downtown Porto and Porto São Bento train station over two months (June–July 2017). The interviews with officials were semi-structured, which gave the opportunity for the interviewee to make comments and have a discussion with the interviewer. Slightly different questions were framed based on the differing positions and responsibilities of the interviewees. Interview questions focused on economic, social and cultural, environmental and physical and political issues. The interviews were conducted and each interview lasted two hours. Tape recordings were used for the interviews and later transcripts were produced for further analysis. The questions were also sent by e-mail before the interview. A copy of the interview format is included in the Appendix. The second set of interviews was conducted with random tourists in downtown tourist areas: Moliceiros, Saint Joana Museum, Melia Ria hotel, Aveiro train station, and tourist areas in downtown Porto and Porto São Bento train station over one month (June 2017). These interviews were also composed of open-ended questions and were semi-structured. Seven questions were included. Questions were designed based on the relevant literature [13,56,57].

3.3. Fuzzy Logic/Observation Method

The fuzzy logic method was used to assess the architectural value from tourists’ perspective because fuzzy logic/QCA is a new analytical technique that uses Boolean algebra to implement principles of comparison used by scholars engaged in the qualitative study of macro social phenomena. A conventional (or ‘crisp’) set is dichotomous; a case is either ‘in’ or ‘out’ of a set. Thus, a conventional set is comparable to a binary variable with two values. The fuzzy set theory has broadly been used as a backing tool to process decision-making and execution assessment in engineering, and in particular to support decisions to restore and maintain historical buildings. As noted by Siozinyte [58] in most real situations, human judgments are ambiguous and cannot be converted into numerical terms because human logic, argumentation and decision-making are constantly connected with a specific level of subjectivity.

Fuzzy sets are able to cope with unspecified or intelligible data because they are generally accessible and aimed at modelling phenomena in the real world. Along these lines the end goal is to manage the ambiguity related to the assessment of the practical state of buildings. This study carried out the fuzzy logic principles established by Zadeh. A fuzzy set, by contrast, permits membership in the interval between two values (0–1) [59]. Therefore, the fuzzy approach permits perceptions in the interval between 0 and 1 while retaining the two qualitative states. The fuzzy logic approach was added to the methodology of this study in order to get other points that might not have shown up in interviews and also to deal with the uncertainty and vagueness associated with the evaluation. It is crucial to reach the validity of collected data through other methods implied in the current research. As a result, three evaluation sheets were designed to obtain results using the fuzzy logic method. The evaluation of the architectural value of buildings was designed in evaluation sheet

number 1. The evaluation of the tourism potential of buildings was designed in evaluation sheet number 2 and evaluation of the preservation potential of buildings was designed in evaluation sheet number 3. The criteria are extracted from “Criteria of Environment Canada Park Service” and cases in the literature.

According to Pizam [60], collecting secondary data, observation and direct communication with subjects is the best way. This study is based on in-depth analysis, special recognition for projects and longitudinal studies of the place over time. The observation research method is administered through photographic documentation. The first author of the article spent over one year as a resident of Aveiro, and had the opportunity to observe and take photographs (verification can be provided upon request). The observation of buildings helped to detect the problems associated with conservation and preservation. Most of the buildings were observed frequently in both locations—Aveiro and Porto. Observation focused on the function, shape and environmental surroundings of the buildings. The research process, especially observation, contributed to an understanding of the measures and policy approaches involved in the preservation of historical buildings.

3.4. Research Question

- Once heritage values are assessed, they become a crucial instrument for the purpose of conservation planning. Discussion of ‘values’ leads to questions of ‘valuing’ [61]. What is the effect of the value of architectural heritage resources on preservation and restoration?
- Tourists and stakeholders present preservation professionals with two particular challenges, tourism planning and management. Does preserving heritage buildings have an effect on tourism planning and management?
- Tourism’s potential for conveying heritage values refers to cultural significance as an important factor in enhancing and shaping tourists’ image of a destination. It embodies the sense of a site; therefore, it demands expert evaluation and assessment. Once image is assessed, this is the question: how do the different images get prioritized, and which factors are significant for the tourism potential in terms of providing and carrying out plans?
- The site is important in many ways. First, as a factor to attract tourists. Secondly, it represents stakeholders’ identity and pride in the destination. Third, it is considered an asset/resource for future generations. Fourth, it is part of the international heritage, especially when designated as a WHS. “Why is this site important and to whom?” is an essential two-part question. It can be answered with respect to the economic value of assets [62]. To find the main factors that appeal to tourists is relevant to economic value and a reflection of the cultural value of the sites: Which factors in heritage buildings would be the main factors appealing to tourists?
- Will conservation be the cause of a loss of authenticity? Some scholar believes ‘central to the subject of loss and compensation is the notion of authenticity’ [63]. The topic of authenticity has become one of the highly discussed concepts in tourism as well. However, authenticity from a tourism epistemology point of view poses a different set of questions. Xin [64], categorized authenticity in tourism as: ‘intrapersonal authenticity and interpersonal authenticity. Intrapersonal authenticity is subdivided into bodily feelings and self-making. The former involves several dimensions including relaxation, rehabilitation, and sensual pleasures. In the latter, tourists seek to achieve a sort of self-actualization previously unobtainable in everyday mundane life’. Therefore, there is an issue of commodification in the context of tourism. Nevertheless, ‘contemporary conservation must find a middle ground and balance knowledge and experience by acknowledging both product and process, as in craft tradition, whereby knowledge and experience are tied together’ [63].

3.5. Model Research

This study attempts to posit a model to show the effect of architectural heritage resources and the role of conservation and heritage planning in tourism development and sustainability. See also Figure 2.

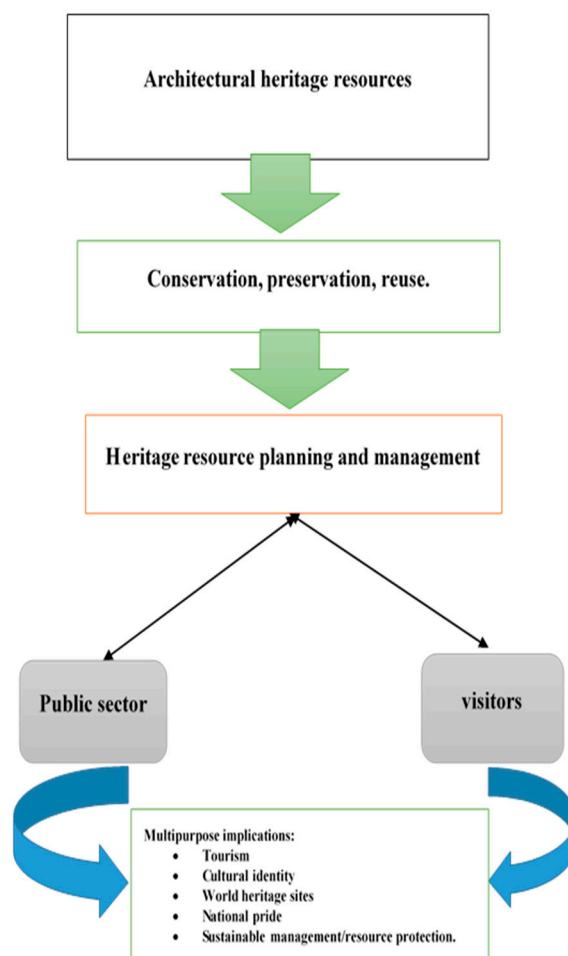


Figure 2. Study model.

The model indicates that architectural heritage resources are part of the foundations for overall heritage tourism with implications for conservation, preservation and reuse. In the model, the public sector's role is highlighted as heritage planning embedded in the public-sector institutions. This is logical as heritage resources are part of the national identity and potentially as World Heritage Site (WHS) that valued by the international community.

3.6. Hypotheses

Embaby [16] stated that 'the obligation to conserve the architectural heritage of our local communities is as important as our duty to conserve the significant built heritage and its values or traditions of the previous era'. This subject is covered by other scholars as well; however, the novelty of our study is that this study is a holistic approach researching the integration of three constructs: (i) architectural practice, (ii) heritage conservation, and (iii) tourists' perceptions. Thus, this study is the first attempt to explore the architectural heritage conservation/preservation in the tourism context. Therefore, this study is an attempt to fill the gap by providing several contributions to the body of literature and heritage principals. Furthermore, the study attempted to respond to the suggestion by Kirillova and Lehto [21], who recommended examining aesthetic judgment in tourism and discovering the role of the perceived aesthetics of the destination. Last but not least, and due to the negative effect of mass tourism on built heritage and culture, this study contributes to partnerships in heritage conservation [65].

Thus, Hypothesis 1 is posited as:

Hypothesis 1 (H1). *Architectural heritage is valuable and deserves to be preserved.*

Lack of proper planning in tourism is deemed as a threat to heritage sites and conservation; this will prompt a loss in authenticity [66]. For preserving heritage sites, a plan is a procedure to achieve the target of preservation. A management plan including planning, transport, government political and tourism policies provides a conservation plan [67]. The lack of appropriate planning in the context of visitor management due to the complacency of destination managers and planners has been emphasised in tourism literature [68–70]. Visitor management and preservation of architectural heritage involves diverse issues, including the social and political dimensions of visitor management, the implementation of monitoring, vandalism and augmented reality [31]. Knowing that tourism has had a tremendous negative impact on some vulnerable historical buildings, it is an imperative to have a clear policy regarding this aspect, which has been neglected in the consideration of numerous destinations [71]. Empirical evidence from this study adds to the literature on destination architecture and supports the theory of Smith and Bugni [9] regarding the symbolic interaction between architecture and visitors' emotion towards the building. The perceptions of visitors demonstrate the effect of architecture on the emotions, thoughts and performance of visitors.

Thus, Hypothesis 2 is posited as:

Hypothesis 2 (H2). *The tourism potential of heritage building requires a management plan and preservation.*

Scholars unanimously identified the factors measuring the destination image of tourists as: architecture or buildings, historic sites, local [72], architectural styles, cultural heritage [73], culture, history, and art historical buildings [51,74].

Thus, Hypothesis 3 is posited as:

Hypothesis 3 (H3). *Tourists' impressions determine the architectural and cultural value of buildings.*

Glasson [70 Rue] showed in his research that 80% of tourists who visited Oxford were satisfied with the architecture of the traditional colleges, arising as they from a physically attractive environment.

Thus, Hypothesis 4 is posited as:

Hypothesis 4 (H4). *Architecture is a principal factor in appealing to tourists.*

According to Jokilehto [73], ancient works exhibit historical periods as long as their authentic material is undamaged; any attempt to restore and conserve would result in the loss of authenticity and the creation of a fake [53]. Restoration can build an interesting monument but without soul, ancestors and not sacred [2]. We have posited (H5) that conservation will entail a loss of authenticity. This hypothesis was rejected based on our findings. However, the controversy with respect to this issue remains. As Kalčić [75], elaborated:

A breaking point was reached during the post-war period, which due to the significant damage caused during the war is known for extensive reconstruction that exceeded professionals' expertise and became an "authentic" reflection of that time. Opposition to the Vienna heritage preservation doctrine can also be observed in Milan, who interprets the originality of the monument as a "complex of individual components, the relations between which lend the monument its essential personal image", and advocates the preservation of only those elements that help present the monument in its greater originality. Hence, for monuments with various styles he only allows the option of removing certain parts and adding new ones that provide a more complete aesthetic image and help increase the monument's original character.

Thus, Hypothesis 5 is posited as:

Hypothesis 5 (H5). *Conservation will cause a loss in authenticity.*

4. Preservation and Management of Heritage Assets in Portugal

Recently, heritage marketing, based on customer demand, has led to the commercialization of heritage beyond preservation values. Today, the main objective of management and planning of suburban areas is the solidarity of places and cultural heritage [76]. In this regard, this study evaluated the preservation of buildings chosen as the case study. Before assessing the preservation of historical buildings in Portugal, we took a brief glance at preservation in some other countries. Of the six countries, the USA, Germany, Italy, England, Canada and Portugal, only Portugal is specified below in light of the fact that there is no possibility of including all these countries in this article.

The Convention Concerning the Protection of World Cultural and Natural Heritage was adopted in 1972 at the General Conference of the United Nations Educational, Scientific and Cultural Organization (UNESCO). Portugal was incorporated into this Convention in 1979 in Order 79/79 (<http://whc.unesco.org>). According to the DGPC (Direção-Geral do Património Cultural), the architectural heritage and landscape arising from interactions between people and places over time is a vital resource for collective identity. Moreover, it is a factor of distinction and assessment of a range that must be preserved and transmitted to future generations. Its protection, valorization and dissemination have a local, regional and national potential and, in particular, a global layout, due to the demand from different people for pleasure.

Due to the diversity of value according to different demand, the values given are: historical, urban, architectural, ethnographic, social, industrial, technical, scientific and artistic [DGPC. <http://www.patrimoniocultural.gov.pt>]. Portugal has several values for preservation: Aesthetics, age, cultural identity and political value.

Three samples of 52 buildings in Aveiro and two samples of five buildings in Porto are brought as a case study to show the effect of preservation on buildings.

The authors considered the objects based on the report published by Museum da Cidade and a publication by the Ministry of Tourism from 2008. These documents are part of the tourism strategy and designated buildings are historical attractions of the country. In the case of Aveiro, the common elements are the uniqueness of the features, which represent typical Art Nouveau architecture. In the case of Porto, the common elements of the objects are their designation as a World Heritage Site (WHS).

- Pompeu de Figueiredo, c. 1910

This building was designed for residence. Recently the first floor has been rented to a family and the second floor was rented out to Portuguese students. The design of the balcony is the significant feature that makes a difference between this building and other Art Nouveau buildings. While most balconies are designed with forged iron, the balcony of this building is composed of tiles and stone.

As is visible in Figure 3, tiles are missing under the arched windows. According to the tenant, somebody stole the tiles. The last picture represents the lack of balance between preservation and necessity of modernity and human needs. The inside: original tiles on the wall and floor.



Figure 3. Facade of building Pompeu de Figueiredo c. 1910. Source: taken by author Shahrbanoo.

Figure 4 shows the inside of the building and the extent of the preservation. They have disregarded the maintenance of the original tiles on the passageway wall and floor. As is clear in the pictures, they were careless about keeping the tiles safe when they were painting the wall in the yard. Harmony exists between the chiseled work on the stone. An aesthetic effect can be seen on the façade with the elegant ribbon frames on the windows, door and tiles, and congruity can be seen with the etched work on the stone. A tasteful impact is demonstrated on the veneer with the exquisite edges of windows, the entranceway and strips of tiles.

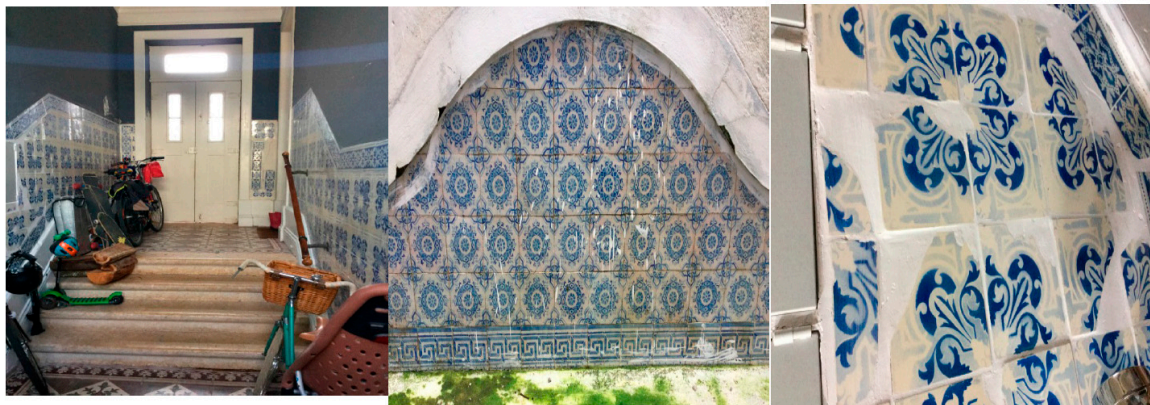


Figure 4. Inside of building Pompeu de Figueiredo c. 1910. Source: taken by author Shahrbanoo.

- Ilhavo—R. Vasco da Gama

This building is located in Ilhavo, district of Aveiro.

Figure 5 indicates that this building requires a major overhaul as, for the most part, there is no sign of protection; this building has been totally ignored. We found those problems that have just been specified with previous buildings, such as the placing of gutters, the presence of a power line at the front of the building, dirty façades, broken windows, rusting railings, missing colour in some parts of the building and also the grass in the courtyard. It is a pity that such a building could become a ruin because of negligence.

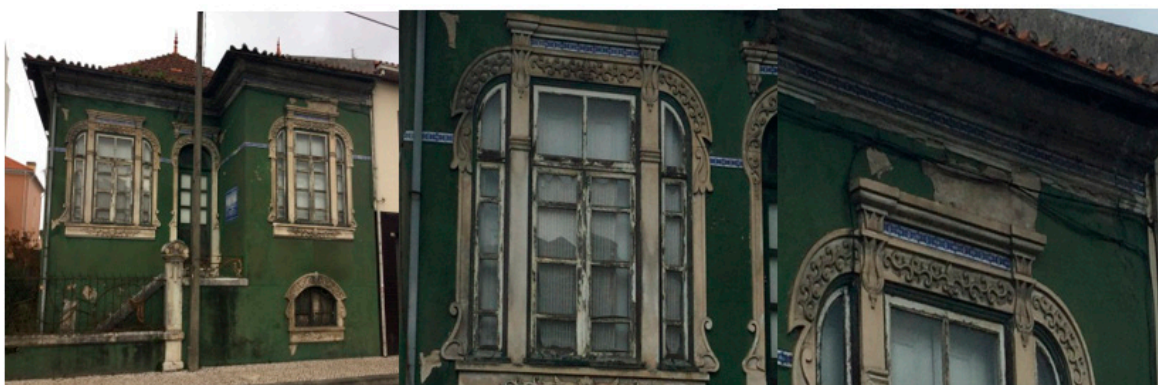


Figure 5. Façade of building in the R. Vasco da Gama. Source: taken by author Shahrbanoo.

- Vivenda Paradelas

The divergence between the style of the attic and the rooftop displays a contrast in perspective. The design of flower clusters at the edges of the two sides and also the forged ironwork over the attic window is the typical design for this building. Elsewhere, a lion figure can be seen on both sides of the windows, with tiling and forged ironwork repeated in the design of the other buildings.

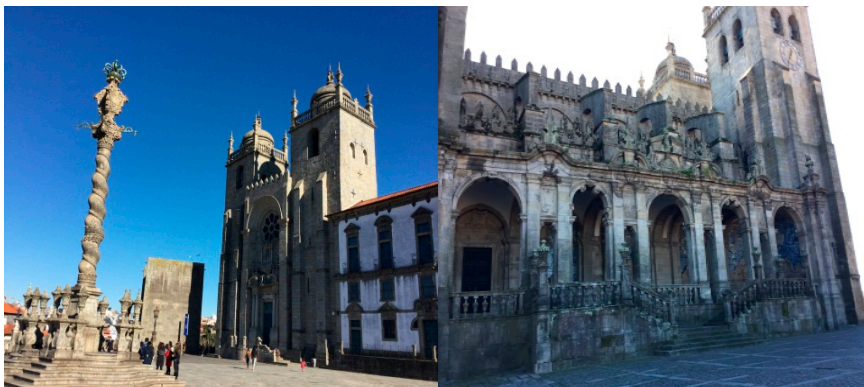
The dirty façade, the broken windows, rusting railings and the missing colour in Figure 6 show a lack of preservation.



Figure 6. Facade of building Vivenda Paradelas. Source: taken by author Shahrbanoo.

- Cathedral—Porto

The cathedral has undergone different architectural styles (Gothic, Baroque) over the centuries. Nicolau Nasoriand and Vital Rifarto are the designers of this architectural masterpiece.



As is clear in Figure 7, the façades require cleaning. Also, the tiles are damaged and they need to be repaired.



Figure 7. Facade of cathedral in Porto. Source: taken by author Shahrbanoo.

- Igreja dos Congregados—Porto

It was built in 1703 in place of the chapel dedicated to St. Antonio in 1662. Its façade is of a 17th-century Baroque style. It was rebuilt in the 19th century. Jorge Colaço ornamented it with tiles in the 20th century.

One can observe in Figure 8, the tiles are broken and damaged, and a power line that obstructs the view can be observed.



Figure 8. Facade of Igreja dos Congregados—Porto. Source: taken by author Shahrbanoo.

4.1. Heritage Issues and Policies

Heritage policies were conducted by IGESPAR (the Institute for the Management of Architectural and Archaeological Heritage) and IMC (the Museums and Conservation Institute) with the new organic structure of the Ministry of Culture in 2006.

IGESPAR acquired new competences regarding nationally classified monuments and accreditation and administration of buildings, held some time ago by the Public Work Ministry.

Heritage was measured by the following institutions between 2008 and 2009:

1. A heritage risk chart
2. Cultural heritage safeguard fund, 2009
3. Classified heritage restoration

The National Strategic Plan for Tourism 2013–2015 (Plano Estratégico Nacional do Turismo Horizonte 2013-2015, in Portuguese), published by Turismo de Portugal [35] underlines the need to develop tourist activity based on:

1. Authenticity of national assets;
2. Offering unique experiences [77].

4.2. Criteria for Evaluating Buildings in Portugal

There are four different processes in Portugal, as follows:

1. Historical perspective
2. Cultural policies
3. Main cultural policy issues and priorities
4. Heritage issues and policies

The level of government in Portugal is: State (federal), Regional (province), Local (municipal, council), Central (ministry).

Different scholars have identified tourism and the preservation potential of buildings through different criteria. The evaluation will be done according to the criteria of Cultural & physical value: *history, environmental value, usability, integrity, commercial value, experiential value, product design needs, historical scientific, aesthetics, economic value* [50]. Moreover, the International Cultural Tourism committee evaluated the place by *nature of the place, significance of the place, conservation of the context and tourism in the context*.

5. Results

A mixed approach was proposed for the study research methods and data analysis: quantitative and qualitative, with fuzzy logic provided through observation methods. This kind of method became popular as it allows the researcher to achieve a comprehensive investigation of the cases and issues. See Figure 1 for the study model. A total of 310 interviews were performed in 2017 with domestic and international tourists in Portugal. Two hundred interviews were conducted via questionnaires and 110 were conducted via semi-structured interviews in downtown places: the Moliceiros Saint Joana Museum, Melia Ria Hotel, Aveiro train station, tourist places in downtown Porto and Porto São Bento train station over two months (June–July 2017). In a nutshell, respondents were composed of domestic and international tourists for these two methods. Survey questionnaires were administered to 200 respondents and interviews were conducted with 110 interviewees. Overall, 310 respondents made up the sample size. The sample size should have been larger. However, as the study was conducted in 2017, statistics for the number of tourists were used from previous years. Based on the numbers for previous years, the sample size would be an estimate. Secondly, the constraints of time and cost posed a limitation to enlarging the sample size. Another difficulty we experienced was the lack of cooperation of respondents to participate in an interview or commitment to fill out the survey questionnaires. At the end, the value of Cronbach alpha indicates that there is no threat to the research result due to that size of the sample. Cronbach's alpha provides a useful lower bound on reliability (<http://www.real-statistics.com/reliability/cronbachs-alpha/>). Cronbach's alpha for six variables are calculated using Cochran's (1977) formulas [48]. See also Table 5 in the manuscript. Except for one variable, the Cronbach's alpha registered between (+0.6) and (+0.7), which is an accepted value for internal consistency (<http://data.library.virginia.edu/using-and-interpreting-cronbachs-alpha/>). In this regard, Anderson and Vingrys [47] argued that studies using small sample sizes are not meant to quantify general performance within a population but merely to document the existence of an effect, and so the number of subjects is less important.

An interview script was used for the interviews, with audio recorded by permission. The interviews had an average duration of 30 min. Moreover, the second set of interviews was performed with the authorities to determine the policies for the preservation of historical buildings and with the head of the tourism department at the University of Aveiro to determine the collaboration between tourism administration and the university. The fuzzy logic research method was applied by observation. Three evaluation sheets with different criteria were filled in by observing 55 historical buildings over eight months (July–October 2017).

5.1. Analysis and Results from the Quantitative Method

The first set of data was collected from 200 tourists who visited Porto and Aveiro by distribution of a questionnaire. It was analysed with the software Stata, R and Excel and based on different fixed questions with Likert scales, as well as, a composite score index for each part. In line with the procedure, each response is examined in detail to identify tourists' thoughts about architecture, with different questions in order to fit the main question of this part: "Can the impact of tourist's image of aesthetics prevent the negative effect on heritage buildings through conservation and management planning?"

Upon organizing all the relevant data with the software, the frequency of results was examined and delineated in tables.

We used factor analysis with the following procedures: (1) convert, or recode, nominal or ordinal (Likert) responses to numeric responses; (2) apply a factor analysis model that reflects the known structure, or calculated correlation structure, of the variables; (3) save the factor scores and factor loadings; (4) rescale the factor scores using the factor loadings, the weighted mean, and the weighted standard deviation of the original data so that the composite scores reflect (as near as possible) the original semantic (i.e., word) meaning of the original data. In this process, the factor loadings serve as weights for the weighted mean and weighted standard deviation calculations. The last step of rescaling the composite scores is necessary because it allows us to retain the meaning of the responses that went into creating the composites. Before conducting the composite scores index, a check of the reliability and internal consistency of a set of items (questions) is suggested. These are examined using Cronbach's alpha test. Note that the methodology is applied to all parts of questionnaires and regression is also carried out.

5.1.1. Descriptive Statistic

- Demographic characteristics using 200 respondents

200 domestic and international tourists were interviewed by questionnaire in the tourist places mentioned in Porto and Aveiro. The demographic characteristics are shown in the Table 4:

Table 4. Demographic breakdown of the sample ($n = 200$ tourists interviewed by questionnaire).

Characteristic	Frequency	Percent
<i>Gender</i>		
Female	96	48.00
Male	104	52.00
Total	200	100.00
<i>Age</i>		
18–35	109	52.50
36–55	59	29.50
56–65	25	12.50
65 and above	7	3.50
Total	200	100.00
<i>Education</i>		
Junior High school	6	3.00
College	31	15.50
Master	64	32
Doctoral	32	16.00
Bachelor	59	29.50
Secondary	8	4.00
Total	200	100.00

As shown in the Table 4, 48% of the subjects are female while the rest (52%) are male. In addition, the majority in the sample are young people whose age range is between 18 and 35. Moreover, 32% of the subjects have higher education (e.g., Master's degree), while those who have a bachelor's degree were second with 29.5%.

Note: since the variety of nationalities was too great, the tabulation of nationality is not reported. However, it is available upon request. It can be seen in the graph that men have the most different countries of origin. Germany has the most male visitors with more than 15% of international tourists, followed by Brazilian women visitors with more than 10%.

The assessment of the questions that were answered by the tourists via filling in the questionnaire is shown in the Table 5.

Table 5. Assessment items.

Variable with Items	Cronbach's Alpha	Split-Half (Odd-Even) Correlation	Split-Half with Spearman Brown Adjustment	Mean for Test	Standard Deviation
Quality of physical environment 5 questions, Section 2	0.79113073	0.65198901	0.78933819	31.995	3.77822379
Tourist image 7 Questions, Section 3	0.72920551	0.54135332	0.70243897	27.45	3.29962119
Cultural value 5 questions, Section 3.1	0.76043447	0.63577456	0.77733763	20.11	2.64952826
Physical value 5 questions, Section 3.2	0.64756293	0.5860603	0.72798213	17.335	2.22911978
Product value 4 questions, Section 3.3	0.59904829	0.4259596	0.64481151	13.41	2.23649279
Experiential value 4 questions, Section 3.4	0.66734995	0.5002817	0.66691702	15.7	1.9

In the Table 5, as the Cronbach's alpha is more than 0.5, more items have shared covariance and probably measure the same underlying concept, while the correlation is also acceptable as it is more than 0.5. Hence, we can conclude that merging items to construct a new index makes sense. Each item is measured on five points.

We know that a higher alpha coefficient means that more items have shared covariance and probably measure the same underlying concept. Although the standards for what makes a "good" α coefficient are entirely arbitrary and depend on your theoretical knowledge of the scale in question, many methodologists recommend a minimum α coefficient between 0.65 and 0.8 (or higher in many cases); α coefficients that are less than 0.5 are usually unacceptable, especially for scales purporting to be unidimensional.

After checking the reliability of items and index for each part, a table is constructed where the results are reported below. Note that on the Y axis, 1 stands for Strongly disagree; 2 Disagree; 3 Neutral; 4 Agree; and 5 means Strongly agree.

Frequency and percentage of indexes (quality physical environment, cultural, experiential, image, physical) are shown in Table 6.

Table 6. Frequency and percentage of indexes.

Index	Frequency	Percentage
Quality Physical Environment Index & Cultural Index		
1 = strongly disagree	1	0.50
2 = disagree	1	0.50
3 = neutral	25	12.50
4 = agree	137	68.50
5 = strongly agree	36	18.00
Total	200	100.00
Experiential Index		
1 = strongly disagree	0	0.00
2 = disagree	2	1.00
3 = neutral	25	12.50
4 = agree	158	72.50
5 = strongly agree	15	7.50
Total	200	100.00

Table 6. Cont.

Index	Frequency	Percentage
Image Index		
1 = strongly disagree	0	0.00
2 = disagree	2	1.00
3 = neutral	28	14.00
4 = agree	160	75.00
5 = strongly agree	19	9.00
Total	200	100.00
Physical Index		
1 = strongly disagree	8	4.00
2 = disagree	9	4.50
3 = neutral	34	17.00
4 = agree	134	67.00
5 = strongly agree	15	7.50
Total	200	100.00

- The Table 6 shows that 68% of respondents agreed about the quality of the physical environment (including architecture attractions and physical infrastructure). Note that the quality index and cultural index both have the same distribution and frequencies, which shows that the quality of physical environment is in line with cultural values. As shown, 72% of respondents agreed about the experiential index. No respondents disagreed strongly. It can be seen that 75% of respondents agreed about image, including motivation and experience, and that the highest frequency in the sample size arose from item 3 with 75%. It is shown that the highest frequency in the sample size arose from item 4 with 67. In other words, 67% of respondents agreed about the physical aspect. Second is the fact that the relationship between attribute performance and overall performance (and satisfaction [63] may be nonlinear [78]. In such a situation, a linear regression coefficient can produce just “local” measures of importance [57,79].

5.1.2. Regression of Interviews by Questionnaire

Table 7 is designed to show the regression of interview by questionnaire.

Table 7. Regression of interviews by questionnaire.

Dependent Variable: Q1			
Method: ML—Binary Logit (Newton-Raphson/Marquardt Steps)			
Variable	Coefficient	Std. Error	Prob.
Quality Index	1.02	0.561	0.045 **
Cultural Index	1.02	0.562	0.045 **
Experiential Index	1.26	0.033	0.001 ***
Image Index	1.16	0.099	0.000 ***
Physical Index	0.93	0.136	0.482
Product Index	0.91	0.214	0.251
McFadden's pseudo R-squared: 0.685			

Note: ** $p < 0.05$, *** $p < 0.01$.

As is shown in the Table 7, the weight of the image and experiential indexes is greater than the others. The quality and cultural indexes are significant at the 5% level of significance, while the quality and cultural indexes are significant at 1%. The significant variables image and experiential can support Hypothesis 3, showing the potential of architecture to promote tourism to the historical buildings of Porto/Aveiro. The significant variable of quality supported Hypothesis 1, as it shows the necessity of preserving buildings because of their architectural value. The cultural index with significance at the

5% level can support Hypothesis 2 as it shows that a plan is required to make a procedure achieve the target of conservation. On the other hand, the physical index was not significant so Hypothesis 5 was not supported, as it shows that conservation is not a reason for losing the authenticity of buildings. In addition, around 68% of independent variables explained the dependent variable, as proved by McFadden's pseudo *R*-squared.

5.2. Analysis and Results of the Qualitative Approach

- Interviews using 110 observations

The second set of data concerning the interviews with 110 tourists was analysed using Matlab software to identify the preferences of tourists. The purpose of this part is to contribute to the tourism literature by: first, developing a hybrid neural network that will be able to predict tourists' overall satisfaction with their travel experience; and second, prioritizing travel attributes based on the proportional impact on tourists' overall satisfaction with their experience. The data are used to develop a hybrid neural network in which the Genetic Algorithm (GA), as a metaheuristic algorithm, is applied in order to adopt feature selection based on variable rank ordering. Using the hybrid method helps us to find the rank of all attributes in the tourist satisfaction analyses. Each response is examined in detail to identify the priority and experience of tourists visiting, with different questions that would fit with the main question from tourist interviews: "can experience of cultural heritage satisfies the priority needs of cultural consumption by tourists?"

5.2.1. Descriptive Statistics

As shown in Table 8, the same percentage is shared by men and women over the entire sample and different ages have different percentages over the entire sample.

Table 8. Demographic break down of the sample ($n = 110$ tourists interviewed orally).

Characteristic	Frequency	Percent
<i>Gender</i>		
Female	55	48.00
Male	55	52.00
Total	110	100.00
<i>Age</i>		
18–35	22	52.50
36–55	46	29.50
56–65	29	12.50
65 and above	13	3.50
Total	110	100.00

Table 8 indicates that 48% of the subjects are male while the rest (52%) are female. In addition, the majority in the sample are young people whose age range is between 18 and 35.

Moreover, Figure 9 shows the scatter plot graph of different age ranges, sorted by country. For example, Iranian respondents have an age range of just 35–45. Since there is a nonlinear relationship between overall satisfaction and attributes performance [57], traditional statistical methods have limitations when dealing with such a relationship. These methods assume that:

- The data are relatively normal;
- The relationship between independent and dependent variables is linear; and

Multicollinearity between independent variables is relatively low [80]. In tourist image surveys, these assumptions cannot be assured in most cases [61]. So, there is a need for alternative methods that

do not have the limitations of statistical methods. On the other hand, although measurement of tourists' image is a prevailing theme in the hospitality and tourism literature [70], the importance of travel attributes needs to be investigated further. The information obtained through importance analysis can later be used in importance-performance analysis, as the primary tool for identifying the critical performance attributes. To address the above subjects, a new data mining tool is developed, such that the GA is combined with the multilayer perceptron (MLP) in order to find the most significant variables. However, it is believed that direct importance assessment is often misleading because ratings are uniformly high [71]. Respondents' lack of involvement [78] and possible lack of expertise regarding the product or service assessed are among the causes of this phenomenon. However, the primary reason is the use of measures of absolute rather than relative (competitive) importance [57]. Other disadvantages of direct importance measurement are: misinterpretation of questions by respondents and researchers [78] and the lack of discriminating power between tourist images attributes [78]. To overcome these disadvantages, indirect measures are often employed, including: multiple regression analysis [60], partial correlation analysis [61] and structural equation models [62]. Although indirect measurement of attribute importance is more realistic than direct measurement, this approach has at least two major disadvantages: The first is the possibility of collinearity [58]. Collinearity among attribute performances, when used as a predictor of overall performance, can lead to the precision of the regression coefficients being so poor that they fail to discriminate reliably among the attributes [61]. Second, the fact is that the relationship between attributes performance and the overall performance and satisfaction may be nonlinear [57]. In such a situation, linear regression coefficient can just produce "local" measures of importance.



Figure 9. Frequency by country.

5.2.2. Network Design

The purpose of this part is to contribute to the tourism management literature by: first, developing a hybrid neural network that will be able to predict tourists' overall satisfaction of their travel

experience; and second, prioritizing the travel attributes based on their proportional impact on tourists' overall satisfaction of their travel experience [78]. The data is used to develop a hybrid neural network in which the Genetic Algorithm (GA) as a metaheuristic algorithm applied in order to adopt a features selection based variable rank ordering. Using the hybrid method helps us to find the rank all attributes in the tourist satisfaction analyses. Using the above methods reveals the results in Table 9.

Table 9. GA and ANN parameters.

GA Parameters	
Maximum Number of Iterations	100
Population Size	50
Mutation Rate	0.1
ANN Parameters	
Number of Neuros	10
Hidden Layer	1
Training Rate	75%

The Figure 10 shows how the cost of feature selection method (adding a new variable or dropping another one) decreases to reach the optimal value. Selected variables are sorted based on their rank, which is in accordance with their cost.

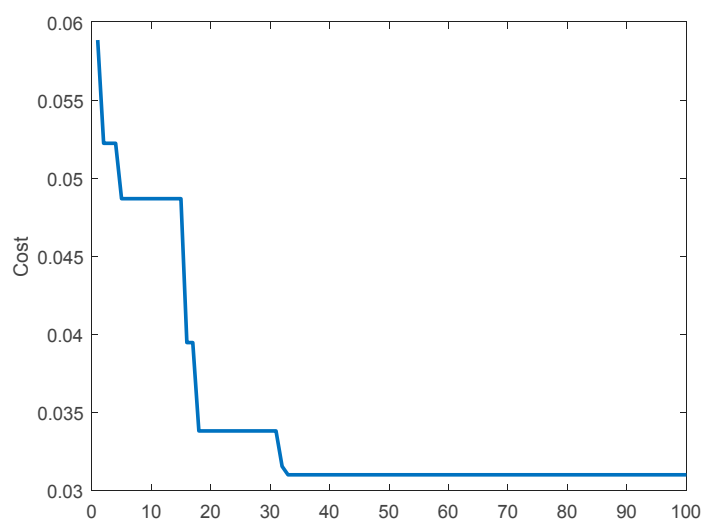


Figure 10. Cost of feature selection. Source: own construction.

In Figure 10, the total cost of the procedure (RMSE = 0.023) indicates that the fitting process could perform proper analyses in order to measure the satisfaction of respondents.

Cost of process is shown in Table 10. Table 10 shows that 11 variables out of 17 are selected.

Table 10. Cost of process.

Cost of process	0.023
Number of Features (variables) selected	11 out of 17

5.3. Selected Variables Based on Degree of Importance

As we have already mentioned, the sensitivity analysis of the hybrid model is also employed in this study to indirectly analyse the relative importance of travel attributes. It is expected that the

use of a combination of metaheuristic algorithms and neural networks will remove or reduce the noisy data and prevent the drawbacks of ANN-based analysis [63]. The procedure is as follows: Each input variable was modified by 10 percent up and down from its actual value, while keeping the other inputs unchanged. The impact of this change on the output was then monitored. This way, each of the 17 inputs was changed by 10 percent up and down. Following this, the total change in output variable due to the change in input was calculated for each travel attribute in each factor as follows: The total change in output variables due to the change in input = (Output change for 10% increase in input, output change for 10% decrease in input)/2.

The changes in the output due to the change in each particular input were then averaged across the 100 iterations and scaled to fall in a 0 to 1 interval ending in one “mean output change” for each input. Rank of variables is shown in Table 11.

Table 11. The rank of variables.

Variables	Rank	Mean Output Change
Lack of awareness	10	0.391
Architecture	1	0.695
Nature	11	0.315
Academic	8	0.513
Cheap	6	0.561
Food	5	0.601
Historical buildings	4	0.612
Language	9	0.412
Typical design of the buildings and city	2	0.686
Touristic	3	0.660
Religious place	7	0.552

As shown in the Table 11, the most influential and highest-ranked variable is architecture, followed by typical design of the buildings and city, touristic, historical buildings, food, cheap, religious place, academic, lack of awareness and nature. Table 12 is designed to show the regression of tourists’ interview.

Table 12. Regression of interviews.

Dependent Variable: Q1			
Method: ML—Binary Logit (Newton–Raphson/Marquardt Steps)			
Variable	Coefficient	Std. Error	Prob.
Academic	0.097	0.561	0.075 **
Architecture	1.983	0.471	0.000 ***
Cheap	0.190	0.033	0.051 *
Cultural place	0.209	0.899	0.160
Food	0.620	0.465	0.182
Historical buildings	0.431	0.784	0.064 *
Language	0.021	0.547	0.075 *
Typical design of the buildings and city	0.842	0.214	0.047 *
Touristic	0.254	0.541	0.093 *
Religious place	0.354	0.214	0.325
Lack of awareness	0.092	0.954	0.213
McFadden’s pseudo R-squared: 0.792			

Note: ** $p < 0.05$, *** $p < 0.01$, * $p < 0.1$.

As shown in the Table 12, the weight of architecture is more than that of the other independent variables. The variable academic is significant at the 5% level while the architecture is significant at a 1% level of significance. According to the Table 12, tourists’ preferences in order were architectural and

then academic. The varieties of historical buildings, typical design of the buildings and city, touristic, language and cheap have the same significance of 1. In addition, around 79% of independent variables explained the dependent variable as proved by McFadden's pseudo *R*-squared. So, Hypothesis 4 is supported. It revealed that architecture is the factor most likely to appeal to tourists.

5.4. Analysis and Results of Interviews with Authorities

The third set of data was analysed based on interviews with the authorities. The data were analysed on the basis of the question "How is the capacity of tourism potential and conservation managed in historical sites, in these two cities?". The interviews were conducted with authorities in the municipality and museums and with architects, namely, Gabriela Mota Marques (dctc | cultura, museus e património cultural da cidade de Aveiro) and Artur Jorge Almeida (Centre of Portugal Regional Tourism Board) and Prof. Carlos Manuel Martins da Costa (Director of DEGEIT, Aveiro university). All transcripts were examined in detail to find all the paragraphs, sentences and words that fit with the themes.

In line with the prominence of historical buildings, transcripts found that several buildings are classified under the protection, safeguarding and enhancement of the Portuguese heritage law [Lei 107/2001, 8 September]. National Monuments are under national protection, although the Municipality can also classify buildings as Monuments of Municipal Interest; the law that standardizes their management and protection is the same (Lei 107/2001, 8 September). Speaking of which, this research found no evaluation of preservation for historical buildings in these two cities; they answered vaguely and claimed that each building has a long process including assessments from different authorities, both local and national. Any citizen can request the classification of a building or site, and, after being classified, no action can be carried out without having the authorities' assessment, too.

Respondents answered the question about evaluating the potential cultural heritage value of buildings in almost the same way. They referred to the maps of the master plan and other urban development plans to define areas and list buildings and monuments. We noticed that these statements did not specify any evaluation criteria already applied to these particular buildings up to now. In the case of how they balance the preservation of the historical fabric and manage heritage sites for tourism purposes, some of the above respondents proposed planning for tourism and some emphasised the importance of tourism. None of them specified any management applied in this issue.

The view of Professor Costa was that nowadays local authorities do not have to rebuild or maintain buildings. They have to make plans and play the role of a referee. Due to a lack of funding, they are not able to preserve buildings. Research has shown that the majority of these buildings were private sector undertaking, and were put up for sale. In this regard, he explained that it is not related to planning, but is the result of law and the legislative framework.

Behind the impact of tourism on economic growth, government policies tend to have a special concern for long-term planning, using the PENT (National Strategical Tourism Plan) as a guideline (personal conversation with Artur Jorge Almeida, Centre of Portugal Regional Tourism Board, April, 2017). Regarding the disconnection between place management and tourism planning, he emphasised that less bureaucracy and a reduction in the number of authorities would be a way to solve this problem. He further emphasised that the physical position of the buildings which is marked for preservation in these two cities is related to their importance. In this vein, they underlined the significant role of architecture, especially the Art Nouveau buildings and the contemporary architecture of the Aveiro university campus, which encourages the interest of tourists.

In light of the collaboration between tourist administration, tourism planning authorities and the university, Professor Costa, as the director of DEGEIT (the Department of Economic, Management, Industrial Engineering and Tourism), declared that local authorities invited the university to participate in meetings about regional planning much more than tourism because tourism is new and there is no scale of development. The interaction between the tourism department and the authorities is not as great as it should be; very often authorities do not pay attention.

Results of Interviews with Authorities

The predominant reason for the lack of preservation at some historical sites was a lack of funding. Nowadays, local authorities have the role of planners and the private sector is responsible for implementing those plans. Negligence of owners is due to the legislative framework.

Despite the general consensus for preservation, and the position of buildings and architecture, no effective action has been implemented for all buildings. Planning has taken place but it has only been legislated in the framework of the laws. Although the law emphasizes the necessity of protection, it is not successful in providing a strategy for safeguarding heritage. According to the findings, so far, no criterion has been proposed to define the extent of tourist potential and protection value of a building. The analysis also revealed a major lack of balance between preserving the historical fabric, urban development and developing tourism. In this case, they did stress that the law was not influential. Moreover, it is deduced that a lack of management and planning is particularly evident in striking a balance between protection of historical fabric and the necessity for urban development. Regarding the disconnection between place management and tourism planning, we concluded that serious measures have not been taken in this respect. This study found that the collaboration between municipality, tourism planning authorities and the university was much more about regional planning and not tourism planning.

5.5. Fuzzy Logic/Direct Observation Approach

This study is based on in-depth analysis, special recognition for projects and longitudinal studies of the place over time. In order to answer the research question and fulfil the objective of the current study, this study applied all three approaches to collect the data. Observation is done through photographic documentation. The observation of buildings, as a part of this research, helped to find the problems that go with conservation and preservation. Most of the buildings in the cities were visited more than once (in Aveiro) and three times (in Porto). All the changes made in the case study were analysed. Observation was carried out by observing the function, shape and environment of buildings. Through observation, it was expected to produce a study that can help in preserving historic buildings. The fuzzy logic approach was added to the methodology of this study in order to raise other points that might not have been shown by interviews and also to deal with the uncertainty and vagueness associated with the evaluation. It is crucial to ensure the validity of collected data through other methods implied in the current research.

Three evaluation sheets were designed for this study. Building evaluation was done with evaluation sheet number 1. The tourism potential of buildings was evaluated by evaluation sheet number 2 and the preservation potential of buildings was assessed by evaluation sheet number 3. The analysis of evaluation sheets is done through observation and with experts. The criteria are extracted from "Criteria of Environment Canada Park Service", also from countries mentioned in the literature and scholars' criteria.

Analysis and Results by Observation and Fuzzy Logic Method

The following step was done to assess 57 observed buildings in order to identify the value of buildings, the tourism potential of buildings and preservation potential of buildings. Five buildings out of 57 are presented in this study. Measurements were performed using three evaluation sheets that were adapted for several criteria. To evaluate the buildings, each sample was also analysed in terms of three evaluation sheets. During analysis, the style, construction, architect, design façade and interior were characterised for the architecture of the buildings. Each criterion was measured from 0 to 5: E = excellent (5), VG = very good (4), A = average (3), G = good (2), F = fair (1), P = poor (0). Furthermore, of the total numbers, the numbers 60 to 100 were considered for the minimum and maximum of having criteria for each building. The buildings are then sorted according to the total score obtained as the following ranking: A = E (95–100), B = VG (90–95), C = A (80–90) D = G (70–80),

E = F (60–70), F = P (0–60). Ultimately, all 57 buildings reached 60 by different levels in adaptation with the criterion. Below is the result of five case study buildings mentioned above according to criterion no. 3, as below. Figure 11 shows that the potential of preservation and rank of the building no. 26 is measured by criterion no. 3.

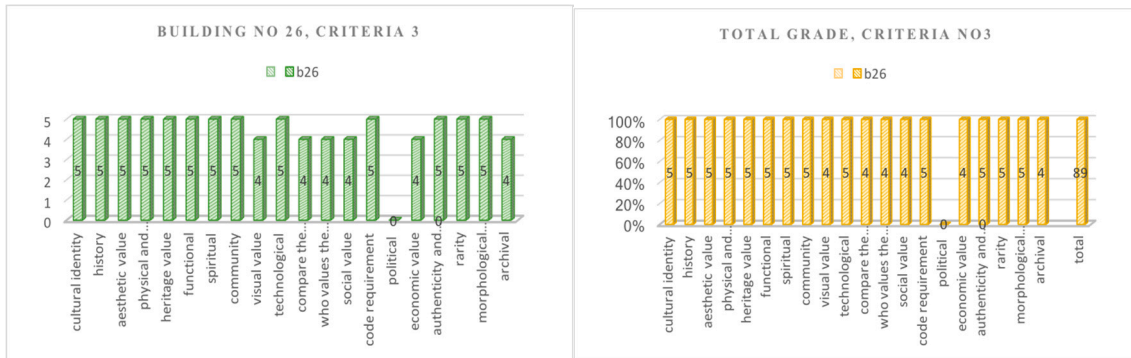


Figure 11. The measure of preservation and rank of building no. 26 by criterion no. 3.

Figure 11 shows the building no. 26 has the potential of preservation reaching rank of C. Figure 12 shows that the potential of preservation and rank of the building no. 36 is measured by criterion no. 3.

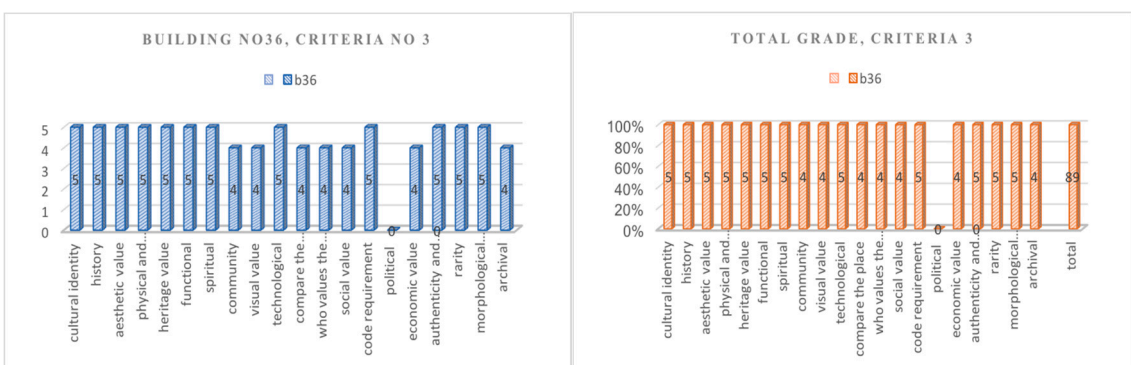


Figure 12. The measure of preservation and rank of building no. 36 by criterion no. 3.

Figure 12 shows the building no. 36 has the potential of preservation reaching rank of C. Figure 13 shows that the potential of preservation and rank of the building no. 33 is measured by criterion no. 3.

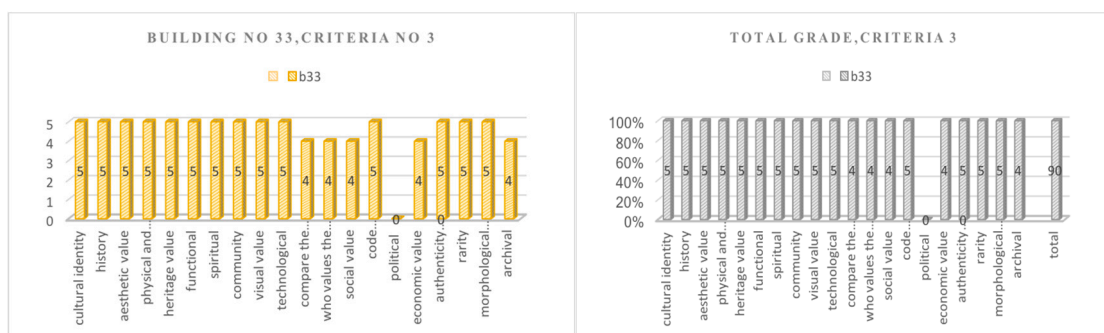


Figure 13. The measure of preservation and rank of building no. 33 by criterion no. 3.

Figure 13 shows the building no. 33 has the potential of preservation with reaching rank of C. Figure 13 shows that the potential of preservation and rank of the building no. 26 is measured by criterion no. 3.

Figure 14 shows the building no. 56 has the potential of preservation with reaching rank of C. The Figures 11–14 show that all these buildings reached a score of 60 and they have preservation potential resulting from criterion no. 3. Also, by reaching a score of 60 from criteria nos. 1 and 2, their architectural value and tourism potential are approved.

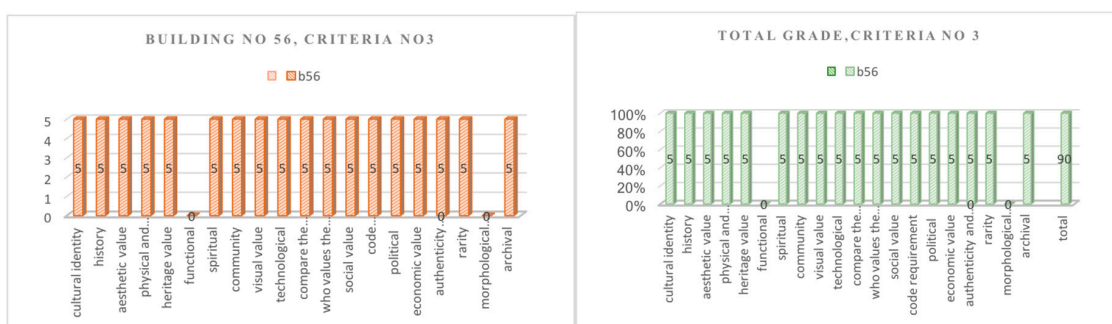


Figure 14. The measure of preservation and rank of building no. 56 by criterion no. 3.

The result of criterion no. 1 revealed that all samples are valuable and have architectural value, reaching the rank of D = G for buildings 26 and 36 and rank B = VG for buildings 52–56. Thus, Hypothesis 1 is supported. The result of criterion 2 also showed that all these samples have potential tourism value, with the same rank as criterion no. 1. Furthermore, they need to be managed and hence Hypothesis 2 was supported. It is revealed by criterion no. 3 that all these buildings are worthy of preserving, reaching the rank of C = A for building nos. 26–36 and the rank B = VG for the building nos. 33–56 and rank A = E for building no. 56. However, the research showed that there is an obvious absence of preservation for some of these valuable buildings that may play a noteworthy part in tourism development and economic progress. Some of these buildings are left defenceless because inefficient structures responsible for protection have ignored the economic, social and cultural value of the historic buildings such that, when they are deemed useless, demolition takes place. Lack of preservation was the strongest point we obtained from observation, as is shown in the pictures of buildings above.

6. Conclusions

This study is constrained by the fact that research on two cities is not enough to generalize the results. Future studies should be carried out to refine the definition of architectural heritage, to test it in different cities and countries and to investigate its connection with the other constructs. Likewise, other examples of cultural heritage such as monuments, museums, festivals and so on should be examined. It is advisable to find similarities and dissimilarities of cultural assets in tourist image by comparing destinations that are not geographically close to each other. It is highly recommended to put the value of the region to the forefront, which can be obtained through the branding of any architectural destination by marketing. Also recommended is exploring potential regional branding in order to change the marketplace. A cultural route for Art Nouveau or Moliceiros and events organised in Aveiro are suggested. Architectural arrangements should be carried out by establishing facilities around architectural sites and physical and social arrangements for interpretation at the destination. The secret behind creating an image would be communicating between local and international markets. Aveiro has the potential to be considered a cultural city. It can be publicized as a city of cultural tourism in an effort to maximise cultural visits domestically and internationally. Finally, it is recommended to investigate which buildings should be reused by utilizing the fuzzy logic method. In this case, it may

be found which buildings are to be assessed and to what extent adaptive reuse might bring benefits in terms of tourism.

During the study, the major limitation was the tourists themselves. The majority of them refused to be interviewed downtown on account of time constraints. Most hotel managers did not give permission for their clients to be interviewed. The other alternative was interviewing in the museum, which was done after obtaining permission. Meanwhile, another limitation was the lack of access to authorities to be interviewed. Authorities prefer to have questions by e-mail in advance but, after we sent the e-mail, they were not interested in giving an appointment to be interviewed face to face, and just three of them accepted. It took two months to arrange meetings with them.

This study shed lights on how and why various competing cultural heritage destinations are being visited, especially for architecturally related knowledge. In regard to planning and management towards preservation also, this study will have economic implications in the context of tourists' perceptions and experiences. Thus, this study provides further evidence of management approaches that will contribute to the preservation of architectural assets. Furthermore, empirical evidence of this study adds to the literature on the architecture of destinations that supports Smith and Bugni's theory of symbolic interaction [9 smith].

As the study revealed, lack of funding is the dominant factor that curtails the preservation of most historical sites. The study has also revealed that a lack of monitoring and failure to enforce the relevant preservation laws means that private parties are given the right to reuse historical buildings.

Based on the observations of the authors and evaluation of the criteria for buildings, there is a need for preservation, not only for tourism, but also for the intrinsic value of these historical monuments [63]. It is suggested that the local government might share a fund with the private sector in order to manage the preservation of historical buildings. One policy that can achieve this aim is providing a tax break to the private sector to motivate them to follow the regulations. Additionally, local authorities should execute conservation approaches and emulate the policies of other countries in dealing with the private sector (e.g., when preserving buildings, England approaches the owners in charge of them). Also, a review of the laws on cultural heritage is required because loopholes open the way for future damage to heritage.

To sum up, several managerial and policymaking implications are presented. It can be deduced that the authorities who are in charge of preservation and the tourism industry must give more consideration to heritage and historical sites as tourism destinations. In light of the findings, it is highly recommended that government seriously maintain the procedure for the preservation of the buildings on the purpose of sustainability and tourism enhancement. According to the findings, it is highly recommended that the government seriously maintain the procedures for building these buildings to maintain sustainability and increase tourism, establishing a link between architecture and nature would respond to present-day necessities. A strong connection between humans and nature would result in an overlap between destination potential and marketing in tourism.

Designing strong plans is suggested in order to improve the efficiency and effectiveness of the legislative framework. Moreover, allocating funds to the private sector will enhance efficiency in preserving buildings. Legislation must include cultural and natural heritage in the planning phase in order to prevent damage to heritage buildings.

To conclude, in due time, local authorities should be actively involved with tourism experts from the universities because the future of tourism depends on co-creative activities. The private sector, locals and university authorities should get together and start to create new products and new alliances for tourism development.

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