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Evaluating Thematic Museums' Websites: The Case of Olive Museums

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Abstract

Museums have traditionally been among the most popular tourists' attractions. Lately, cultural stakeholders are using the websites as a powerful tool for attracting tourist audiences. The usability and functionality of a museum website can only be confirmed through an evaluation experiment. The scope of this paper is on presenting an evaluation model for evaluating and comparing the websites of thematic museums.
The particular evaluation model has been used for evaluating the websites of thematic museums on olives and olive oil using an inspection method. Inspection methods are mainly conducted by experts that comment on specific evaluation criteria. The criteria used in the described evaluation experiment have been selected after a review of the criteria of the inspection models used for evaluating museum website. Furthermore, the proposed method use an elegant way of combining these criteria using a multi-criteria decision making theory called Analytic Hierarchy Process (AHP). AHP uses pair-wise comparisons between criteria and alternative museum websites. This process results in calculating a final value for each museum website and form a final classification of the websites of the olives and olive oil museums in Greece. The comparative study of the websites of the thematic museums of olives and olive oil in Greece can provide useful conclusions for software engineers and cultural stakeholders, in general.

Keywords: *Websites of thematic museums, multi-criteria decision making, software evaluation, inspection method, museums of olives and olive oil, cultural tourism.*

JEL Classification: L86- Information and Internet Services • Computer Software

1. Introduction.

Museums have traditionally been among the most popular tourists' attractions. Lately, cultural stakeholders have started to assess their power in attracting tourist audiences by using Internet as a powerful tool. As a result, museums have paid a lot of energy in developing websites that attract more visitors. Although the advantages that stem from the adoption of ICTs (Information and Communication Technologies) and the web in museums and cultural organisations have been highlighted by many researchers (e.g. Karoulis et al. 2006, Fotakis & Economides 2008, Maravelakis et al 2013), sometimes the usage of the technology is not successful. As a result, the interaction is made difficult and the museums lose attention instead of gaining.

Many researchers have discussed the importance of creating accessible and usable information resources for online museum projects (e.g Dyson & Moran). Therefore, the usability and functionality of a museum website can only be confirmed through an evaluation experiment. Several categorisations of the proposed evaluation methods exist. For example, Lewis & Rieman (1994) as well as Davoli et al. (2005) distinguish methods to empirical methods and inspection methods, taking into account the participants of the experiment.

Empirical methods are implemented with the participation of different categories of potential users of a museum's website. In inspection methods, on the other hand, the experts have the central role and evaluate the website trying to spot errors and check several aspects of the website having a careful attention to the potential museum user's point of view (Kabassi 2017).

Inspection methods have the advantage of being cost effective as a small number of expert users may detect a large number of the usability problems of a website in a relatively short time of interaction with the system. However, a possible problem with expert-based evaluation experiments is that one could wonder about the reliability of the results as the experts' judgment is subjective. This problem may be overcome by the use of a double system of experts that uses both usability and domain experts. Indeed, as Karoulis et al. (2006) point out, the use of a double expert (usability and domain experts) system may increase the reliability of the results. Lin & Gregor (2006) examines museum websites that offer educational material using expert interviews as the primary method. Indeed, as Awad and Ghaziri (2004) proposed there are several advantages for interviewing experts, including the flexibility of the process and better assess of the validity of information. In order to evaluate and combine the websites of thematic museums on olives and olive oil we have used an inspection method. For the evaluation of these websites, we have used the criteria located after a systematic review of the criteria of the inspection models used for evaluating museum website (Kabassi 2017). Furthermore, these criteria have been combined using a multi-criteria decision making theory called Analytic Hierarchy Process (AHP) (Saaty 1980). AHP has not been used before in museum websites' evaluation experiments despite the fact that many experiments have been implemented for evaluating or comparing museum Websites. So taking into account the suitability of AHP for evaluating websites and the lack of such experiments for museums' websites, we have used AHP for the implementation of the evaluation experiment.

2. Method of Evaluation.

Analytic Hierarchy Process (Saaty 1980) is one of the most popular MCDM theories. The choice of AHP amongst other MCDM theories is easily made as it presents a formal way of quantifying the qualitative criteria of the alternatives and in this way removes the subjectivity of the result (Tiwari 2006). Furthermore, the method's ability in making decisions by making pair wise comparison of uncertain, qualitative and quantitative factors and also its ability to model expert opinion (Mulubrhan et al. 2014) are other important reasons of its selection against other alternatives. This method uses the nine point scale developed by Saaty (Table 1) for the evaluation of the goal with the criterion as well as the criterion with the alternative (Zhao et al. 1986, Mulubrhan et al. 2014).

Table 1. The nine scale for pair-wise comparison

Importance	Definition	Explanation
1	Equal importance	The importance of two criteria or alternatives is equal
2	Weak	
3	Moderate importance	A slight favor of one criterion or alternative over another
4	Moderate plus	
5	Strong importance	A strong favor of one criterion or alternative over another
6	Strong plus	
7	Very strong importance	A very strong favor of one criterion or alternative over another
8	Very, very strong	
9	Extreme importance	One criterion or alternative is surely favored over another

We propose the basic steps of the experiments based on the advantages of the inspection methods and the steps of the AHP theory as these are given by (Zhu & Buchman 2000): 1) Developing a goal hierarchy, 2)

Setting up a pair-wise comparison matrix of criteria, 3) Ranking the relative importance between alternatives and 4) Calculating AHP values. Taking into account these steps, the proposed method work as follows:

1. **Developing a goal hierarchy**

    a. **Forming the overall goal:** The overall goal is to evaluate museum websites
    b. **Forming the set of criteria:** The criteria for evaluating museum websites are collected by a review on inspection evaluation experiments of museum websites. The criteria are presented in section 4.2.
    c. **Finding the websites to be evaluated:** In this step the websites of the museums that are going to be evaluated are selected. However, since complexity rises with the increase of websites, the number of alternatives that can be compared is limited (we propose up to 15 websites).
    d. **Forming the hierarchical structure:** In this step the hierarchical structure is formed so that criteria and the alternatives could be combined to pairs.
2. **Setting up a pair-wise comparison matrix of criteria:** In this step a comparison is implemented among the criteria of the same level. As, in this experiment, an inspection method is used, 4 human experts were used to make the pair-wise comparisons of criteria. The group of human expert was formed by 2 experts of software engineering and 2 archaeologists, so that different aspects of view could be taken into account.
3. **Calculating weights of criteria:** After making pair-wise comparisons, estimations are made that result in the final set of weights of the criteria.
4. **Ranking the relative importance between websites:** In this step, the relative importance between each pair of websites in terms of a criterion will be assessed in order to calculate a value for each one of the websites evaluated.
5. **Calculating AHP values:** Finally, an AHP value is calculated for each website and these values are used for ranking the websites. The website that has the higher value is considered to be the best.

3. Developing the Goal Hierarchy.

Forming the Overall Goal

On top of this hierarchy is the overall goal of the decision making problem which in our case is to evaluate museum websites. Then, in the next level, the criteria are situated.

Forming the Set of Criteria

It is quite common evaluation experiments to use guidelines or checklists as criteria to discover problems and limitations of systems and websites. However, deciding which criteria are going to be used is a rather complicated procedure. In some evaluation experiments, it is proposed a first phase where experts independently to extract the criteria that are going to be used in the next phases of the experiment (Sylaiou et al. 2014). In order to decide the goals and the criteria used for website evaluation, we make a review of the criteria used in inspection methods found in the literature for evaluating museum websites.

However, the complexity of evaluation experiment of a website is further increased by the usage of several criteria (Nilashi & Janahmadi 2012). As a result, we only selected the criteria that are proposed by at least two different experiments of inspection evaluation of museum websites. This process resulted in having two layers of criteria which are the following:

UC Usability
Uc1 Currency/ Clarity/Text comprehension
Uc2 Consistency
Uc3 Accessibility
Uc4 Quality Content
Uc5 User interface and metaphors
Uc6 Overall presentation-Design
Uc7 Structure/Navigation/ Orientation

Uc8 Interactivity & Feedback
Uc9 Multimedia Usability
Uc10 Learnability
Uc11 Efficiency
FC Functionality
Fc1 Multilingualism
Fc2 Multimedia features
Fc3 Services-Mechanisms
Fc4 Web communities
Fc5 Maintainability - Compliance - Reliability
Fc6 Adaptively/ adaptability
Fc7 Technical issues

Finding the Websites to be evaluated

In this step, the websites of the museums that are going to be evaluated are selected. For this purpose, the websites of museums for olives and olive oil in Greece have been selected. More specifically, 5 websites of museums for olives and olive oil were found and evaluated. These websites were assigned to opt-1…opt-5, which are the alternatives in our decision making problem (Table 2).

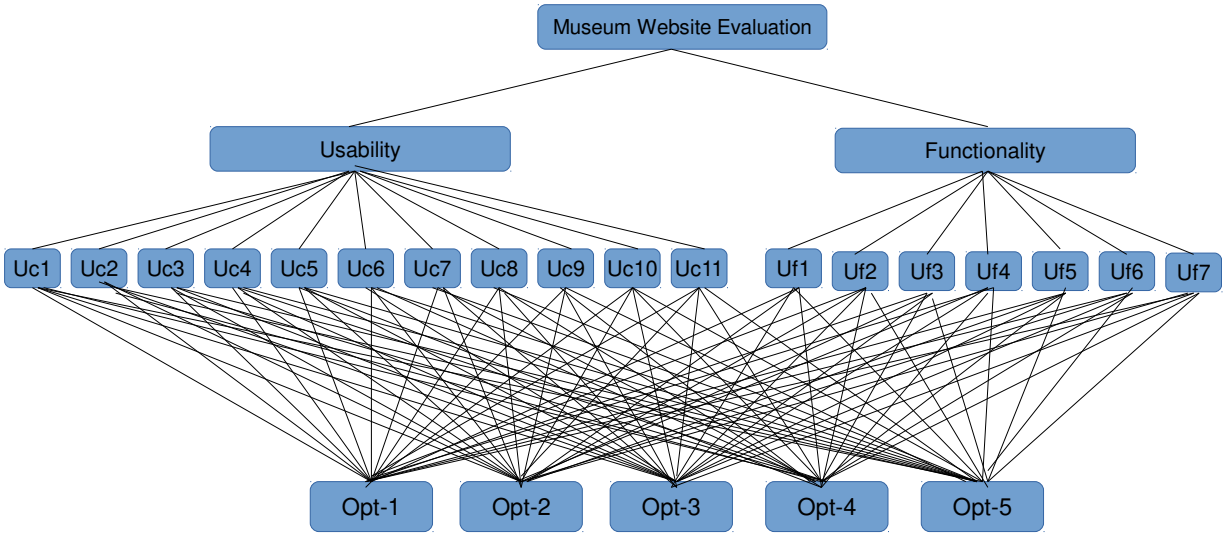
Table 2. The museum websites that are evaluated

Opt-1	Cyclades Olive Museum- Chelmis Olive Mill	Andros	http://www.musioelias.gr/el/node/26
Opt-2	Olive Tree Museum of Vouves	Crete	http://www.olivemuseumvouves.com/
Opt-3	Olive Oil Museum of Thassos	Thassos	http://www.oliveoilmuseum.gr/
Opt-4	Olive & Oil Museum of Pelion	Pelion	http://mouseioelias.gr/
Opt-5	Eggares Olive Press	Naxos	http://www.olivemuseum.com/greek.html

Forming the hierarchical structure

In this step the hierarchical structure is formed so that criteria and the alternatives could be combined to pairs. Furthermore, it is shown that all alternatives are combined in pairs which respect of each sub-criterion of usability and functionality (Figure 1).

Figure 1. Hierarchical structure of criteria and alternatives.



4. Employing AHP.

Setting up a Pair-Wise Comparison Matrix of Criteria

In this step a comparison matrix is formed so that the criteria of the same level are pair-wise compared. More specifically, three matrixes are formed. The first compares usability and functionality, which are in the same level and then another one is formed for the sub-criteria of usability and one for the sub-criteria of functionality. For example the matrix of combining usability to functionality is presented in table IV. In the comparison process, a V from the scale that is presented in Table IV is assigned to the comparison result of two elements P (P in table IV is usability) and Q (Q in table IV is functionality) at first, then the value of comparison of Q and P is a reciprocal value of V, i.e. 1/V. The value of the comparison of P and P is 1.

Table 3. Matrix for the pair-wise combination of usability and functionality.

	usability	functionality
usability	1	V
functionality	1/V	1

The comparison process is performed by human experts as the proposed method is an inspection method. In order to overcome the problem of inspection methods that we have used a double system of experts that uses both usability and domain experts. More specifically, each one of the four human experts that participated the experiment completes the three matrixes of the pair-wise comparison of the criteria. Then each group of the four similar matrixes are used to calculate the values of the final matrix of pair-wise comparisons. More specifically, each cell of the final matrix is calculated as a geometric mean of the other four matrixes collected by the human experts.
As a result the final matrixes are built. More specifically, from the pair-wise comparison matrix of criteria usability and functionality (Table 4) one can easily derive the fact that usability is considered more important than functionality. The information collected for the creation of the pair-wise comparison matrix of the sub-

criteria of usability (Table 5 – fig. 2) revealed that archaeologists thought that the criteria 'Content Quality' and 'Currency/ Clarity/Text comprehension' were very important whereas experts in usability thought that 'Overall presentation/Design' and 'Structure/Navigation/ Orientation' were more crucial. Finally, in functionality, the opinions of human experts and archaeologists were in agreement and the pair-wise comparison matrix of the sub-criteria of functionality is presented in Table 6 and fig. 3.

Table 4. Pair-wise comparison matrix of criteria usability and functionality

	usability	**functionality**
usability	1,00	4,47
functionality	0,25	1,00

Table 5. Pair-wise comparison matrix of the sub-criteria of usability

	uc1	**uc2**	**uc3**	**uc4**	**uc5**	**uc6**	**uc7**	**uc8**	**uc9**	**uc10**	**uc11**
uc1	1,00	0,50	2,38	0,27	1,11	0,71	0,84	3,00	2,71	3,00	3,00
uc2	2,00	1,00	3,00	0,50	3,00	0,23	0,50	3,72	3,46	3,72	3,72
uc3	0,42	0,33	1,00	0,21	0,33	0,14	0,27	2,00	2,00	2,00	2,00
uc4	3,72	2,00	4,73	1,00	4,23	0,93	3,00	4,73	4,40	4,73	4,73
uc5	0,90	0,33	3,00	0,24	1,00	0,34	0,37	3,00	2,71	3,00	3,00
uc6	1,41	4,28	6,96	1,07	2,91	1,00	4,95	1,86	6,65	5,66	7,74
uc7	1,19	2,00	3,72	0,33	2,71	0,20	1,00	5,00	6,00	6,74	6,74
uc8	0,33	0,27	0,50	0,21	0,33	0,54	0,20	1,00	2,21	2,00	0,45
uc9	0,37	0,29	0,50	0,23	0,37	0,15	0,17	0,45	1,00	2,00	0,45
uc10	0,33	0,27	0,50	0,21	0,33	0,18	0,15	0,50	0,50	1,00	0,45
uc11	0,33	0,27	0,50	0,21	0,33	0,13	0,15	2,21	2,21	2,21	1,00

Table 6. Pair-wise comparison matrix of the sub-criteria of functionality

	fc1	**fc2**	**fc3**	**fc4**	**fc5**	**fc6**	**fc7**
fc1	1,00	3,22	3,22	2,00	4,00	3,00	3,00
fc2	0,31	1,00	0,22	2,00	2,00	2,00	2,00
fc3	0,31	4,47	1,00	3,94	3,46	3,22	3,22
fc4	0,50	0,50	0,25	1,00	0,50	0,50	0,59
fc5	0,25	0,50	0,29	2,00	1,00	0,45	2,21
fc6	0,33	0,50	0,31	2,00	2,21	1,00	2,00
fc7	0,33	0,50	0,31	1,68	0,45	0,50	1,00

Figure2. Graph View for the pair-wise comparisons of the sub-criteria of usability.

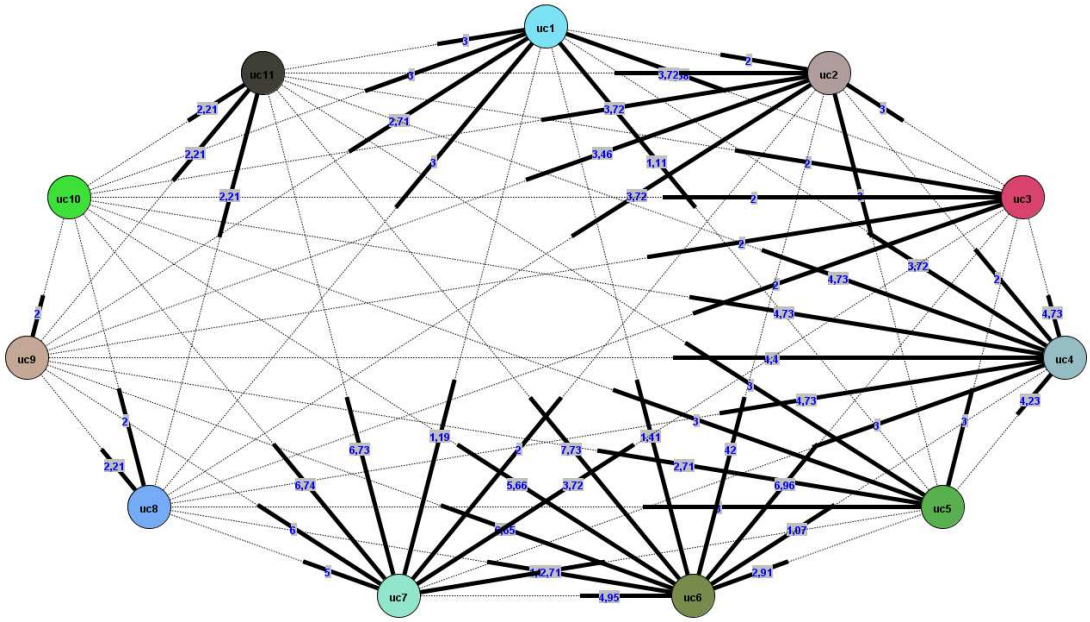
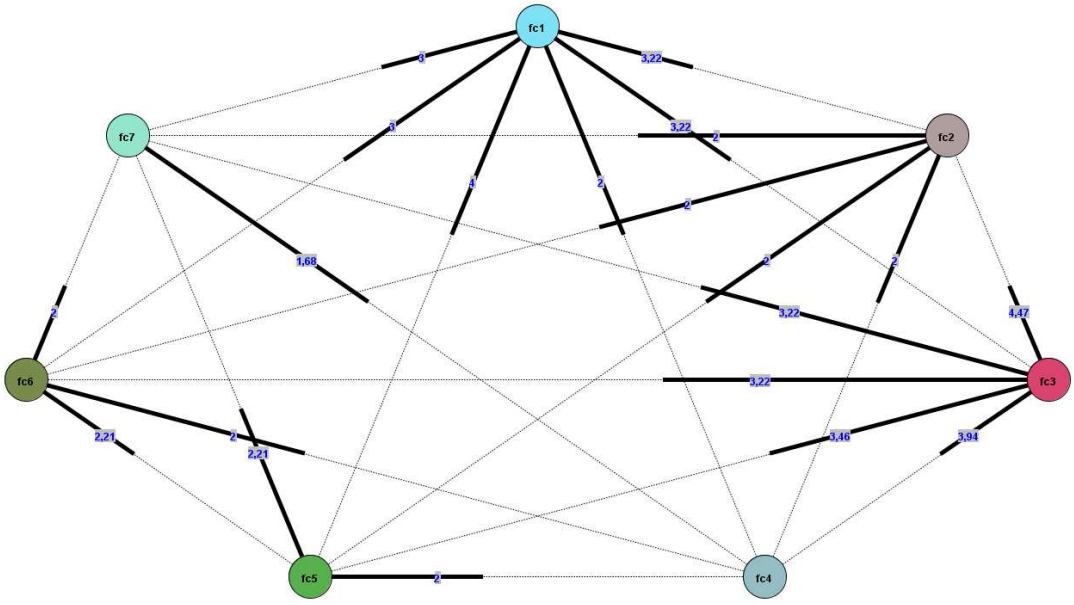


Figure3. Graph View for the pair-wise comparisons of the sub-criteria of functionality.



Calculating weights of criteria

After making pair-wise comparisons, estimations are made that result in the final set of weights of the criteria. In this step, the principal eigenvalue and the corresponding normalized right eigenvector of the comparison matrix give the relative importance of the various criteria being compared. The elements of the normalized eigenvector are the weights of criteria or sub-criteria. In terms of simplicity, we have use the 'Priority Estimation Tool' (PriEst) (Sirah et al. 2015), an open-source decision-making software that implements the Analytic Hierarchy Process (AHP) method, for making the calculations of AHP.
The weights of the criteria are presented in Table 7. The results would be slightly different if the geometric mean instead of eigenvector is used as a method in AHP for the calculation of the final set of criteria.

Table 7. Weights of criteria using the eigenvector method in AHP

WeightOfUsability	**0.818**
Wuc1	0.072
Wuc2	0.076
Wuc3	0.032
Wuc4	0.160
Wuc5	0.057
Wuc6	0.395
Wuc7	0.103
Wuc8	0.036
Wuc9	0.021
Wuc10	0.019
Wuc11	0.028
WeightOfFunctionality	**0.182**
Wfc1	0.321
Wfc2	0.117
Wfc3	0.253
Wfc4	0.062
Wfc5	0.079
Wfc6	0.102
Wfc7	0.066

Ranking the relative importance between thematic museum websites

After calculating the weights of the criteria the alternative actions are evaluated. Generally, Opt-1 had low accessibility due to its interface; it had photos of the museum as well as photos from events of the museum. But the main drawback of the website is that it has big texts that are difficult to read in a black background. A main advantage, though, is that it supports web communities through a forum. Opt-2 has a good interface and, additionally, a VR tour of the museum as well as of the Olive Tree in the surrounding area of the museum and photos of the exhibits. Opt-3, on the other hand, had only some photos and not enough information about the museum or the olive oil history. However, its main drawback was that the information was only in Greek. For the Olive & Oil Museum of Pelion, two different websites were found but only one had information. It had not enough information about the museum but it gave the opportunity to users to comment on its web pages as it was a blog. Opt-5 had a nice simple user interface, which had comprehensible and easy to read texts, better accessibility, photos of the museum and helpful information.

Opt-1	Cyclades Olive Museum- Chelmis Olive Mill	Andros	http://www.musioelias.gr/el/node/26
Opt-2	Olive Tree Museum of Vouves	Crete	http://www.olivemuseumvouves.com/
Opt-3	Olive Oil Museum of Thassos	Thassos	http://www.oliveoilmuseum.gr/
Opt-4	Olive & Oil Museum of Pelion	Pelion	http://mouseioelias.gr/
Opt-5	Eggares Olive Press	Naxos	http://www.olivemuseum.com/greek.html

Figure4. The website of Cyclades Olive Museum-Chelmis Olive Mill (Opt-1)

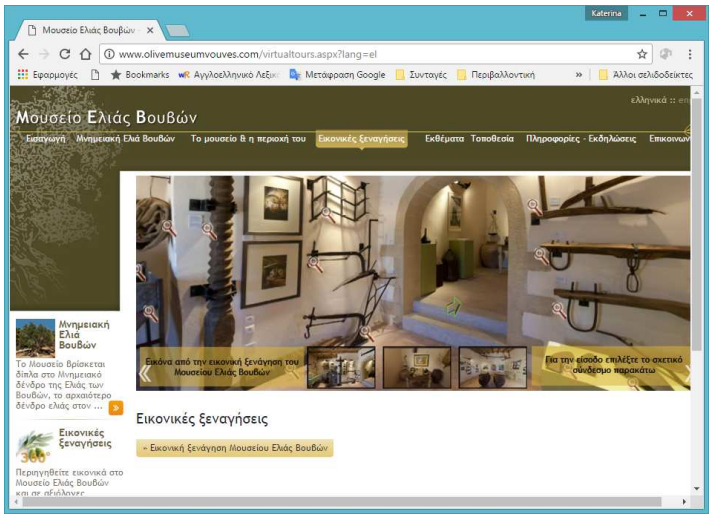


Figure5. The website of Olive Tree Museum of Vouves (Opt-2)

After visiting all alternative websites, the evaluators were asked to compare the websites in pairs in terms of the criteria of the previous step. More specifically, they were asked to assess the relative importance between each pair of websites in terms of a criterion in order to calculate a value for each one of the alternative museum websites. More specifically, for each one of the 11 sub-criteria of usability and the 7 sub-criteria of functionality one table is constructed, where the alternative museum websites are pair-wise compared taking into account the specific criterion. Therefore, as a result 18 such tables are constructed for each evaluator and at the end; the values of each one of these 18 tables are calculated as a geometric mean of the values of the corresponding cells of the 4 tables of the 4 evaluators for a specific criterion.

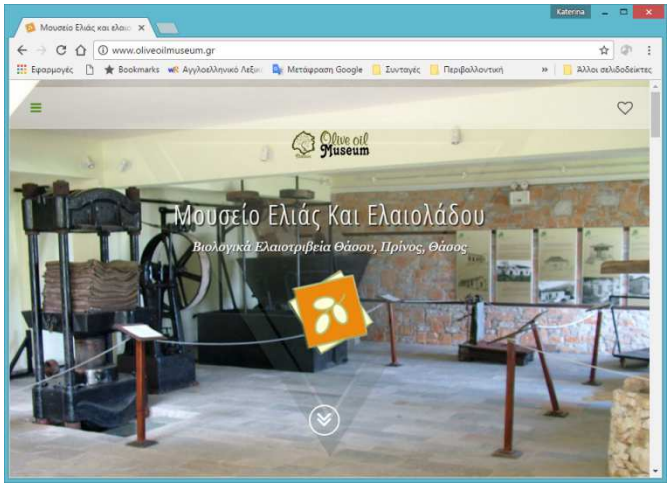


Figure6. The website of Olive Oil Museum of Thassos (Opt-3)

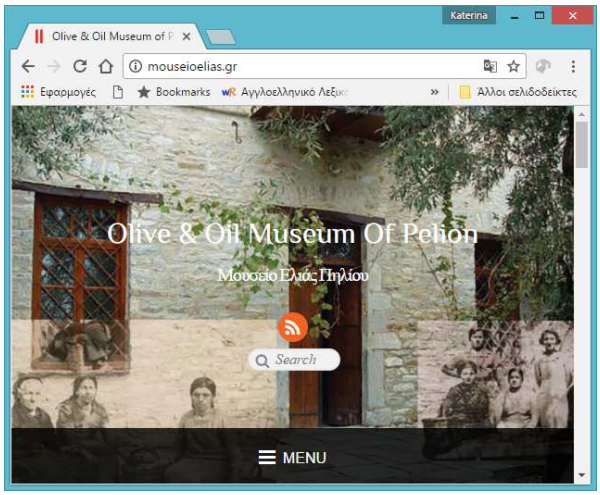


Figure7. The website of Olive & Oil Museum of Pelion (Opt-4)

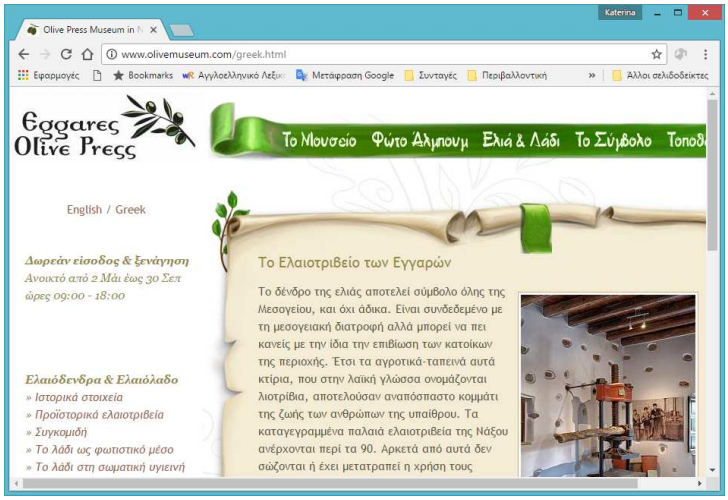


Figure8. The website of Eggares Olive Press (Opt-5)

Some representative tables for the criteria uc1, uc4, uc7, uc9, fc1, fc2, fc4, fc6 are presented below (table 8...table 15). According to tables 8-15, opt-5 seems better than all the other alternatives in terms of criteria uc1, uc2, uc7 whereas opt-2 seems the best in terms of criteria uc9, fc2. In terms of criterion fc1, three alternatives opt-1, opt-2 and opt-5 are considered of equal importance because all of them support two languages and are considered to be much better than opt-3 and opt-4, which support only Greek. In terms of criterion fc6, all alternatives are equal because none of these websites can adapt its interaction to each individual user.

Table 8. Matrix for pair-wise comparison of alternatives in terms of criterion uc1 (Currency/ Clarity/Text comprehension)

uc1	opt-1	opt-2	opt-3	opt-4	opt-5
opt-1	1.00	0.41	2.45	2.45	0.25
opt-2	2.45	1.00	4.47	4.23	0.50
opt-3	0.41	0.22	1.00	2.00	0.17

opt-4	0.41	0.24	0.50	1.00	0.17
opt-5	4.00	2.00	6.00	6.00	1.00

Table 9. Matrix for pair-wise comparison of alternatives in terms of criterion uc4 (Quality Content)

uc4	opt-1	opt-2	opt-3	opt-4	opt-5
opt-1	1.00	0.50	2.00	5.00	0.25
opt-2	2.00	1.00	4.23	5.44	0.50
opt-3	0.50	0.24	1.00	1.22	0.14
opt-4	0.20	0.18	0.82	1.00	0.13
opt-5	4.00	2.00	6.93	7.94	1.00

Table 10. Matrix for pair-wise comparison of alternatives in terms of criterion uc7 (Structure/Navigation/ Orientation)

uc7	opt-1	opt-2	opt-3	opt-4	opt-5
opt-1	1.00	0.50	3.00	2.00	0.25
opt-2	2.00	1.00	3.00	2.00	1.00
opt-3	0.33	0.33	1.00	0.50	0.17
opt-4	0.50	0.50	2.00	1.00	0.29
opt-5	4.00	1.00	6.00	3.41	1.00

Table 11. Matrix for pair-wise comparison of alternatives in terms of criterion uc9 (Multimedia usability).

uc9	opt-1	opt-2	opt-3	opt-4	opt-5
opt-1	1.00	0.18	2.00	4.00	2.00
opt-2	5.66	1.00	6.32	8.49	5.92
opt-3	0.50	0.16	1.00	2.00	2.00
opt-4	0.25	0.12	0.50	1.00	0.17
opt-5	0.50	0.17	0.50	6.00	1.00

Table 12. Matrix for pair-wise comparison of alternatives in terms of criterion fc1 (Multilingualism)

fc1	opt-1	opt-2	opt-3	opt-4	opt-5

opt-1	1.00	1.00	9.00	9.00	1.00
opt-2	1.00	1.00	9.00	9.00	1.00
opt-3	0.11	0.11	1.00	1.00	0.11
opt-4	0.11	0.11	1.00	1.00	0.11
opt-5	1.00	1.00	9.00	9.00	1.00

Table 13. Matrix for pair-wise comparison of alternatives in terms of criterion fc2 (Multimedia features).

fc2	opt-1	opt-2	opt-3	opt-4	opt-5
opt-1	1.00	0.20	2.00	4.00	2.00
opt-2	5.09	1.00	5.69	8.49	5.69
opt-3	0.50	0.18	1.00	2.00	2.00
opt-4	0.25	0.12	0.50	1.00	0.17
opt-5	0.50	0.18	0.50	6.00	1.00

Table 14. Matrix for pair-wise comparison of alternatives in terms of criterion fc4 (Web communities).

fc4	opt-1	opt-2	opt-3	opt-4	opt-5
opt-1	1.00	5.00	5.00	6.00	4.00
opt-2	0.20	1.00	1.41	0.59	1.41
opt-3	0.20	0.71	1.00	0.59	1.41
opt-4	0.17	1.68	1.68	1.00	2.00
opt-5	0.25	0.71	0.71	0.50	1.00

Table 15. Matrix for pair-wise comparison of alternatives in terms of criterion fc6 (Adaptively/ adaptability)

fc6	opt-1	opt-2	opt-3	opt-4	opt-5
opt-1	1	1	1	1	1
opt-2	1	1	1	1	1
opt-3	1	1	1	1	1
opt-4	1	1	1	1	1
opt-5	1	1	1	1	1

Calculating AHP values

As soon as the tables of pair-wise comparisons of the alternatives in terms of the criteria were inserted in PriEst, the final AHP values could be calculated (Figure 4). It is beyond the scope of this paper to present the exact mathematical formulae for the calculation of AHP as there are several mathematical methods that have been proposed in the international literature for this purpose (Saaty & Hu 1998). Except for eigenvector method that we selected to use, one can use the geometric mean or Logarithmic Least Squares Method (LLSM), the Least Squares Method (LSM), and others.
The calculation of the AHP values revealed that the best alternative was opt-2, which was rather expected as it is a complete webpage and, additionally, has VR tour of the museum. However, the distance from the second is not big. Indeed, the AHP value of opt-5 is also very high, which shows the good quality of the website. A medium website was considered opt-1 and the other two had very low AHP values which show that their quality should be improved either by enriching their content and/or improving their design.

Table 16. Ranking of the museum websites that are evaluated.

Alternative	AHP value	Rank
opt-1	0.154	3
opt-2	0.354	1
opt-3	0.074	4
opt-4	0.069	5
opt-5	0.349	2

5. Conclusion.

A main problem in cultural tourism is that although ICTs are used extensively for attracting more visitors, sometimes the technology is not used correctly and has the opposite result. Therefore, the only way to ensure the correct usage of the technology and its advantages is implementing evaluation experiments. As a result several evaluation experiments have been proposed for evaluating museum websites (Kabassi 2017). However, there is no framework that takes into account other researchers' work on the field and unifies all different approaches. Trying to implement a unification framework, we have used the criteria used for museum websites evaluation that have been concluded by a review of relevant work (Kabassi 2017) and used them in an inspection method for evaluating thematic museums.
Inspection methods have the advantage of being cost effective due to fact that a small number of expert users may detent a large number of the usability problems of a website in a relatively short time of interaction with the system. The evaluations are usually complicated procedures that focus on the examination of several different criteria. However, a main disadvantage of the evaluation experiments of museum websites is that they do not weight the criteria used for the evaluation or they do not use a formal way of calculating these criteria. In view of the above, we have shown how AHP can be used in an inspection method for the evaluation of the websites of thematic museums.
Indeed, AHP provides a formal way of quantifying the qualitative criteria of the museum websites and, therefore, is considered ideal for being combined with an inspection method of evaluation. Furthermore, the method's ability in making decisions by making a pair-wise comparison of qualitative and quantitative criteria and also its ability to model expert opinion are other reasons of its selection against other alternatives for evaluating museum websites. Indeed, AHP not only gets the most important museum website but also ranks the websites that are evaluated by conducting pair-wise comparisons for all estimated alternatives (Wu & Chen 2013). As a result, AHP seems very effective for the evaluation of several websites of thematic museums and not just one.

References.

Awad, E. M., & Ghaziri, H. M. (2004). Knowledge Management. Upper Saddle River, NJ: Pearson Education.

Davoli P., Mazzoni F., Corradini E. (2005) Quality Assessment of Cultural Web Sites with Fuzzy Operators. Journal of Computer Information Systems, 44-57

Dyson, M., & Moran, K. (2000). Informing the design of Web interfaces to museum collections. Museum Management and Curatorship, 18, 391–406.

Fotakis, Th. & Economides, A. A. (2008). Art, science/ technology and history museums on the web. International Journal on Digital Culture and Electronic Tourism. Vol. 1, No. 1, pp. 37-63, Inderscience. ISSN (Online): 1753-5220, ISSN (Print): 1753-5212

Kabassi K. (2017). Evaluating Websites of Museums: State of the Art. Journal of Cultural Heritage (Elsevier), 24, 184-196.

Karoulis A, Sylaiou S., White M. (2006). Usability Evaluation of a Virtual Museum Interface. INFORMATICA, 2006, Vol. 17, No. 3, 363–380

Lewis, C, & Rieman, J. (1994). Task-centered User Interface Design: A Practical Introduction. Boulder: University of Colorado.

Lin, A.C., & Gregor S. (2006). Designing Websites for Learning and Enjoyment: A study of museum experiences. International Review of Research in Open and Distance Learning, 7(3).

Maravelakis, E. , Konstantaras, A., Kritsotaki, A., Angelakis, D., Xinogalos, M. (2013). Analysing User Needs for a Unified 3D Metadata Recording and Exploitation of Cultural Heritage Monuments System. In Advances in Visual Computing, Lecture Notes in Computer Science, 8034, 138-147.

Mulubrhan, F., Mokhtar, A.A., Muhammad, M. (2014). Comparative Analysis between Fuzzy and Traditional Analytical Hierarchy Process. MATEC Web of Conferences 13.

Nilashi M. & Janahmadi N. (2012). Assessing and Prioritizing Affecting Factors in E-Learning Websites Using AHP Method and Fuzzy Approach. Information and Knowledge Management 2(1), 46-61

Saaty, T. L. (1980). The analytic hierarchy process. New York, NY: McGraw-Hill.

Saaty T.L. & Hu G. (1998). Ranking by Eigenvector versus Other Methods in the Analytic Hierarchy Process. Appl. Math. Lett. 11(4), 121-125.

Sirah S.,, Mikhailov L., Keane J. (2015). PriEsT: an interactive decision support tool to estimate priorities from pair-wise comparison judgments. International Transactions in Operational Research, 22(2), 203–382.

Sylaiou, S., Killintzis, V., Paliokas, I., Mania, K., Patias P. (2014). Usability Evaluation of Virtual Museums' Inter, faces Visualization Technologies. In R. Shumaker and S. Lackey (Eds.): VAMR 2014, Part II, LNCS 8526, 124–133, 2014. © Springer International Publishing Switzerland.

Tiwari, N. (2006). Using the Analytic Hierarchy Process (AHP) to identify Performance Scenarios for Enterprise Application, Computer Measurement Group, Measure It, 4(3)

Zhao, H. Xu, S., He, j. (1986). AHP, A new simple method for the decision-making, Science Press, 61-87

Zhu, Y. Buchman, A. (2000) . Evaluating and Selecting Web Sources as External Information Resources of a Data Warehouse, The Third International Conference on Web Information Systems Engineering (WISE'00), 149-160.

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