Functional Complexity and Web Site Design: Evaluating the Online Presence of UNESCO World Heritage Sites

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Abstract
Functional complexity is a widespread and underresearched phenomenon in Web sites. This article explores a specific case of functional complexity by analyzing the content of UNESCO World Heritage Web sites, which have to meet demands from both World Heritage and tourism perspectives. Based on a functional analysis, a content checklist was developed and used to evaluate a sample of 30 World Heritage Web sites. The results show that World Heritage Web sites generally fall short in all content categories. A cluster analysis reveals three types of World Heritage Web sites based on their emphasis on World Heritage content versus tourism content: (a) less well-developed Web sites (no emphasis), (b) Web sites of World Heritage Sites with touristic possibilities (emphasis on World Heritage), and (c) Web sites of touristic attractions with outstanding cultural or natural value (emphasis on tourism). In all, the findings show that functional complexity

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poses serious threats to the exhaustiveness of a Web site’s information and that evaluation approaches based on functional analysis can be useful in detecting blindspots in the content provided.

**Keywords**

content strategy, functional analysis, functional complexity, tourism, UNESCO, Web site design, Web site evaluation, World Heritage

When people need specific information, they increasingly use the World Wide Web as their first resource because it has vast amounts of up-to-date information readily available. It is important, then, for businesses or organizations to create a suitable online presence in order to be portrayed optimally and meet the information needs of relevant stakeholder groups.

Research in human–computer interaction and technical and professional communication has focused on various aspects of Web site quality, and usability and accessibility have been prominent topics (Carter & Markel, 2001; Spool, Scanlon, Schroeder, Snyde, & DeAngelo, 1999; Van den Haak, De Jong, & Schellens, 2007; Youngblood, 2012). In addition, attention has been paid to the rhetorical aspects of Web site design (Everett, 2013; Tirdatov, 2014), visual design issues (Tractinsky, Cokhavi, Kirschenbaum, & Sharfi, 2006; Van der Geest & Loorbach, 2005), and Web site design for special interest groups (Jochmann-Mannak, Lentz, Huibers, & Sanders, 2012; Meloncon, Haynes, Varelmann, & Groh, 2010). So far, little research attention has been paid to content selection although a Web site’s content is crucial for its usefulness.

A major challenge for Web site designers involves the functional complexity of the Web site’s content. We speak of functional complexity when communication is intended to serve more than one goal or address more than one stakeholder group simultaneously. Earlier research showed that functional complexity is a widespread phenomenon in oral and written communication (De Jong & Schellens, 2000a; Kühn, 1995; Lentz & Pander Maat, 2004; Schellens, De Jong, & Witteveen, 1997). This applies even more to Web site communication: Almost by default, an organization’s Web site has to serve multiple user groups with various goals. A study by Schellens, De Jong, and Witteveen (1997) suggests that such functional complexity might easily lead to information that is inadequate for
addressing the needs of certain audience segments or for accomplishing some of the communicative purposes.

A promising way to evaluate the content of functionally complex documents is to conduct a *functional analysis* (Lentz & Pander Maat, 2004; Schellens et al., 1997)—that is, a thorough reflection on the functions a document must fulfill in order to be effective. Based on this inventory of functions, requirements can be formulated for the content or structure of the information. A functional analysis can be used in the stages of design (for formulating specifications) and evaluation (for evaluating the quality of a document). Lentz and Pander Maat presented a functional analysis of patient information leaflets, showing how the overall goal of promoting health can be translated into a series of more specific text functions and how these functions can foster the development of content and structure requirements. Schellens et al. (1997) used a functional analysis to evaluate various brochures about legal procedures and regulations, demonstrating how this approach facilitates the detection of serious shortcomings in the content and structure of such brochures.

In this article, we further investigate the problem of functional complexity by using a functional analysis to evaluate the content of Web sites—specifically, United Nations Educational, Scientific, and Cultural Organization (UNESCO) World Heritage Web sites. These Web sites have an inherent functional complexity, which might be attributed to the dual nature of World Heritage Sites: They are both potential tourist destinations and designated locations with a lasting outstanding value.

World Heritage Sites are cultural and natural resources that are considered to be “priceless and irreplaceable assets, not only of each nation, but of humanity as a whole” (UNESCO, 2013, p. 2). Famous examples of World Heritage Sites are the Great Wall in China, the Taj Mahal in India, and Yellowstone National Park in the United States. Each World Heritage Site is unique and has its own outstanding universal value. Cultural sites include monuments and groups of buildings, and natural sites include physical, biological, geological, and physiographical formations and areas that constitute the habitat of threatened animal or plant species (UNESCO, 2013). The UNESCO World Heritage List currently includes 1,007 sites in 161 countries, consisting of 779 cultural, 197 natural, and 31 mixed sites (UNESCO, 2014). In 2015, 39 new sites were nominated. Before a site can be inscribed on the World Heritage List, it undergoes a rigorous process that starts with a nomination by the state party, then an evaluation by two (for natural sites) or three (for cultural sites) independent advisory bodies, and ends with a decision by the intergovernmental World Heritage Committee.
Once a site is inscribed in the World Heritage List, the state party involved has the responsibility for conserving and maintaining the site (UNESCO, 2013). Our analysis concentrates on the official Web sites of such World Heritage Sites.

We have two purposes for this analysis. First, we want to demonstrate the use and usefulness of a functional analysis in evaluating the content of functionally complex Web sites. Our first research question, then, is To what extent do World Heritage Web sites provide the content elements that are relevant for their visitors? Second, we want to explore the multifunctional nature of World Heritage Web sites by examining whether their content selection can be attributed to differences in emphasis between touristic and World Heritage content. Thus, our second research question is How does the content selection on World Heritage Web sites relate to the strategic choice between information about World Heritage and information about tourism?

Before describing the design and results of our study, we first provide background information about World Heritage Sites, giving special attention to the combination of World Heritage and tourism as a potential source of functional complexity.

**World Heritage Versus Tourism**

The relationship between World Heritage listings and tourism is not straightforward. For one, there is an ongoing debate over whether a World Heritage listing attracts more visitors to a region. From empirically validated models of tourist motivations, we might conclude that visiting historical and culturally important places and experiencing nature are among the popular motives for selecting touristic destinations (e.g., Kozak, 2002). Specific research into the effects of World Heritage listings, however, led to mixed results. Buckley (2004), Palau-Saumell, Forgas-Coll, Sánchez-García, and Prats-Planagumà (2013), Patuelli, Mussoni, and Candela (2013), Su and Lin (2014), and Yang, Lin, and Han (2010) reported positive effects of World Heritage listings on tourism whereas Hardiman and Burgin (2013); C.-H. Huang, Tsaur, and Yang (2012); and Poria, Reichel, and Cohen (2013) did not find such effects. King and Halpenny (2014) found that many visitors of two particular World Heritage Sites were not even aware of the sites’ World Heritage status and did not recognize the UNESCO World Heritage logo. Such contradictory findings imply that although a World Heritage listing might result in increased tourism, this effect will probably depend on specific site and regional characteristics. Not all World
Heritage Sites automatically have the right features to become a major touristic attraction. In this vein, McKercher, Ho, and Du Cros (2005) discussed the occurrence of “unrealistic expectations” regarding the touristic function of World Heritage sites (p. 544).

There is also an ongoing debate about the desirability of mass tourism to World Heritage Sites. For instance, conserving World Heritage Sites for future generations and allowing people to experience the heritage now can be a trade-off because visits by large numbers of tourists could result in damage to the cultural or natural heritage (Garrod & Fyall, 2000; Li, Wu, & Cai, 2008). In Garrod and Fyall’s (2000) Delphi study, representatives of heritage sites, consultants, and academics ranked conservation and accessibility as the first and second most important mission elements, respectively, indicating that both were regarded as important but that ultimately conservation was prioritized over accessibility. Again, much depends on the characteristics of the specific site. Du Cros (2001) argued that World Heritage Sites could be placed on a continuum between “conservation” and “commodification.” Some sites might not be able to handle tourism; for other sites, receiving mass tourism might be an essential part of their identity, and many World Heritage Sites might fall somewhere in between. That is, conservation and tourism are important aspects that need to be balanced. Du Cros (2001) proposed a matrix between market appeal and robustness to position World Heritage Sites on such a continuum, and McKercher et al. (2005) distinguished seven possible relationships between tourism and cultural heritage management.

Enriching this debate, Carter, Thok, O’Rourke, and Pearce (2015) described other possible side effects of World Heritage tourism such as producing adverse societal consequences (e.g., unregulated development of the area, displacement of local people), drawing attention away from other potential touristic attractions in the region and losing the intrinsic, cultural meaning of the World Heritage Site. Zhang, Fyall, and Zheng (2014) analyzed conflicts between tourism and World Heritage in China, mentioning problems with management structure, inappropriate tourist operations, and legislation as main causes of such conflicts.

A symbiotic relationship between tourism and conservation is possible, especially when the income from tourism is used for long-term conservation purposes. Esparon, Stoeckl, Farr, and Larson (2015) found that tourism and conservation must be compatible to some extent because touristic success at least partly depends on adequate conservation of the World Heritage Site. But asking for higher admission prices seems to conflict with the mission of a World Heritage listing, which “explicitly includes providing public access
to the property or site concerned” (Garrod & Fyall, 2000, p. 703; Li et al., 2008). Moreover, the costs of reducing or repairing damage caused by visitors can be high (Garrod & Fyall, 2000). King and Halpenny (2014), however, argued that increasing tourists’ awareness of a site’s World Heritage status might contribute to more responsible tourist behaviors.

Because the relationship between World Heritage and tourism is not straightforward, we must carefully consider the tourism function of each World Heritage Site and place it in a broader perspective of informing and educating the general public about the site’s outstanding universal value. The state party receiving World Heritage recognition for its site must take the responsibility not only for the conservation but also for providing contemporary citizens with the chance to optimally experience it. A World Heritage Web site, then, has to enable people to visit the site, offer people who cannot visit an online experience, and further inform people, both visitors and nonvisitors, about the site’s outstanding universal value. The latter is important in its own right, but it is also instrumental in deepening and strengthening people’s online or offline experiences with World Heritage Sites; Massara and Severino (2013) referred to it as reducing the “psychological distance.”

All World Heritage Web sites must find a way to balance and optimize touristic and World Heritage–related information. Content elements required for World Heritage aspects are not necessarily required for touristic aspects and vice versa. Marcotte and Bourdeau (2012), for instance, found a lack of attention to World Heritage conservation in touristic promotion activities. Although there may be some common ground between the two aspects, the breadth and depth of the required information will vary. Audience segments will differ as well: Unlike the touristic audience, the World Heritage audience is not necessarily limited to visitors and potential visitors.

Method

We used a functional analysis approach (Lentz & Pander Maat, 2004; Schellens et al., 1997) to develop a coding scheme for World Heritage Web sites. A functional analysis starts with an inventory of functions that are required for an optimally effective Web site. Following Schellens et al. (1997), we described each function using four elements: (a) a speech act, (b) the type of content, (c) the (specific) target audience, and (d) the purpose. Taking the literature about World Heritage Sites and an exploratory analysis of a sample of 10 World Heritage Web sites as the starting
point for our analysis, we identified seven main function areas. Within some of these function areas, we needed to formulate more than one function. Table 1 outlines the functions we identified, which formed the input for our coding scheme.

Two of the functions—visitor information and destination marketing—primarily represent the tourism perspective. Four other functions—UNESCO status, virtual experience, education, and community participation—primarily represent the World Heritage perspective. The virtual experience function area is reflected in the many initiatives that are reported to use advanced technology in the context of World Heritage Sites and museums (Ott & Pozzi, 2011). Such initiatives include 3-D (D’Andrea, Niccolucci, Bassett, & Fernie, 2012; Y.-C. Huang, Backman, Backman, & Moore, 2013), augmented reality (Bostanci, Kanwal, & Clark, 2015; Tom Dieck & Jung, 2017), virtual reality (Gutentag, 2010; Shaw & Krug, 2013; Smith et al., 2012), multimedia (Neto & Neto, 2012), and telepresence (Hyun & O’Keefe, 2012). One function—advertising—can be connected to both the tourism and the World Heritage perspective.

Of course, the decision to pay attention to a certain function on a specific Web site might be based on strategic considerations. For instance, not all World Heritage Web sites are used for advertising purposes, and destination marketing and prominent visitor information are only relevant if the World Heritage Site is prepared to attract and accommodate visitors.

**Content Requirements**

Based on the functional analysis, we developed a list of content requirements by focusing on the presence or absence of potentially relevant content elements. The step from functions identified to the checklist was made using the literature on World Heritage and tourism Web sites and our exploratory analysis of Web sites. For each function area, we identified a number of content elements (see Table 2). The resulting checklist was used to answer our first research question: To what extent do World Heritage Web sites provide the content elements that are relevant for their visitors?

For visitor information, we identified those types of information that visitors need in planning their visits. Such content starts with information that provides an overall first impression of the World Heritage site so that visitors can decide whether and how long they want to visit. It includes practical information regarding opening hours, fees and ticket reservations, geographical location (description and map), transportation, visitor rules, facilities for visitors (or the lack thereof), and possible routes and guided
Table 1. Functional Analysis of World Heritage Web Sites.

Function Area 1: Visitor information
- to inform potential visitors about the site so that they can decide whether they actually want to visit the site
- to inform visitors about the site and its regulations and facilities so that they can optimally plan their visit of the site

Function area 2: UNESCO status
- to inform a variety of internal and external stakeholders about the UNESCO status of the site so that they are aware of the site’s lasting natural or cultural value

Function area 3: Virtual experience
- to present prospective visitors with an online experience of the site so that they can anticipate their visit of the site
- to present nonvisitors with an online experience of the site so that they can have a visit-replacing impression of the site’s natural or cultural value
- to present former visitors with an online experience of the site so that they can cherish the memories of their visit and share them with others
- to present prospective visitors and nonvisitors with an online experience of the site so that they can experience it in different circumstances (e.g., season, festivities, and time)

Function area 4: Education
- to inform visitors and other interested parties about the backgrounds and special features of the site so that they can understand its natural or cultural value
- to inform visitors and other interested parties about the background and special features of the site so that they can further develop broader natural or cultural knowledge or views

Function area 5: Destination marketing
- to persuade potential visitors of the significance of the site so that they are willing to plan a visit to the site

Function area 6: Community participation
- to enable a variety of internal and external stakeholders to interact with each other so that they can express their views or experiences and share them with others
- to enable a variety of internal and external stakeholders to interact with the site so that they can express their views or experiences and contribute to the site

Function area 7: Advertisements
- to enable noncommercial or commercial organizations to advertise as a service to visitors, a reward for sponsors, or a way to raise extra money for the site

Note. UNESCO = United Nations Educational, Scientific, and Cultural Organization.
tours. Finally, it might include a question-and-answer section highlighting relevant questions of earlier Web site visitors.

For UNESCO status, we included content that explicitly connects the site to UNESCO and the World Heritage List using the two logos and a link to the specific UNESCO Web site. This function area also includes background information regarding the World Heritage status: the year of inscription, the relevant UNESCO criteria, an explanation of the site’s outstanding universal value, and information about conservation and management of the site.

For virtual experience, we identified traditional elements, such as a picture gallery, videos, and a panoramic view, or more advanced elements, such as a virtual and interactive tour. We also included artistic impressions of the site, such as paintings, sculptures, or music.

For educational content, we identified background information about the site that puts it in a broader historical, cultural, geographical, or biological perspective or that describes specific anecdotes or stories about the site. In addition, such content elements could include links to relevant documents and publications about the site or information about current academic

Table 2. Coding Scheme.

| Visitor information | First impression, opening times, fees and ticket reservation, geographical location, transportation, visitor rules, facilities for visitors, routes and guided tours, and question and answer |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| UNESCO status       | UNESCO and World Heritage logos, link to the specific UNESCO Web site, year of inscription, relevant criteria, outstanding universal value, conservation information, and management information |
| Virtual experience  | Picture gallery, videos clips, panoramic view, virtual and interactive tour, and artistic impressions |
| Education           | Background information, access to documents, access to publications, academic activities on site, and information for children |
| Destination marketing | Logo, slogan, prolific quotations, media attention, and celebrities |
| Community participation | Social network linkage, interactive space, volunteer recruitment, and donation information |
| Advertisements      | Local business advertisements and partner or sponsor advertisements |

Note. UNESCO = United Nations Educational, Scientific, and Cultural Organization.
activities there, or they might include educational information specifically targeted at children.

For destination marketing, we included all content elements aimed at attracting visitors that were not covered by the previous categories. Research has pointed at the potential relevance of a logo, slogans, and apt quotations (Lee, Cai, & O’Leary, 2006; Lee, Rodriguez, & Sar, 2012). Quotations might be drawn from news media, tourist information sources, important or famous persons, or ordinary visitors. In addition, highlights of or links to media attention for the site might provide further evidence of its significance. Finally, such content might highlight celebrity involvement including celebrities’ visits to and affiliations with the site.

For community participation, we identified both online and off-line content. This content might include social network linkage. Platforms such as Facebook and Twitter enable people to build interaction and create an online community with others who are interested in the site. The Web site itself might also provide interactive spaces, such as discussion forums or opportunities to ask questions or give feedback. In addition, the Web site might provide information aimed at recruiting volunteers and receiving financial donations.

Finally, for advertisements, we identified content that advertised local businesses or partners and sponsors.

Selection and Coding of World Heritage Web Sites

Our selection process resulted in a final sample of 30 official Web sites of World Heritage Sites inscribed by UNESCO. The first step in this process involved language. To avoid translation issues, we included only the Web sites of countries in which English was the official or dominant language, which reduced the selection to 188 World Heritage Sites. The second requirement was that the Web site had to be the official online presence of the World Heritage Site. Including Web sites hosted or created by travel agencies, commercial organizations, or local or regional authorities would have threatened the comparability of the Web sites. This requirement led to a reduction to 77 sites in 20 countries, including 29 natural, 44 cultural, and 4 mixed sites. Given their small number, we included all mixed sites in the corpus and randomly selected 13 cultural World Heritage Sites and 13 natural World Heritage Sites. For each site type, we used a maximum of one site per country. Our corpus of Web sites is listed in Table 3.

We carefully searched each Web site for the various content elements. We discovered that relevant information could be found in surprising
places, so we analyzed all the Web pages in each site and used the search engine to double-check whether the various content elements were present.

We tested our coding scheme for agreement by using a second coder in a sample of five Web sites. The Cohen’s $\kappa$ coefficient per Web site ranged from 0.80 to 1.00, which indicates a very good agreement. We discussed the coding differences and used the implications of these differences for the remaining Web sites.

**Table 3. Corpus of Web Sites.**

| Cultural Site (Country) | Natural Site (Country) | Mixed Site (Country) |
|------------------------|------------------------|----------------------|
| Aapravasi Ghat (Mauritius) | Aldabra Atoll (Seychelles) | Kakadu National Park (Australia) |
| Brimstone Hill Fortress National Park (St. Kitts and Nevis) | Bwindi Impenetrable National Park (Uganda) | Ngorongoro Conservation Area (Tanzania) |
| Cahokia Mounds State Historic Site (United States) | Dorset and East Devon Coast (United Kingdom) | Papahānaumokuākea (United States) |
| Chief Roi Mata’s Domain (Vanuatu) | iSimangaliso Wetland Park (South Africa) | St. Kilda (United Kingdom) |
| City of Bath (United Kingdom) | Joggins Fossil Cliffs (Canada) | |
| City of Valletta (Malta) | Manas Wildlife Sanctuary (India) | |
| Gebel Barkal (Sudan) | Namib Sand Sea (Namibia) | |
| Old Town of Lunenburg (Canada) | New Zealand Sub-Antarctic Islands (New Zealand) | |
| Robben Island (South Africa) | Phoenix Islands Protected Area (Kiribati) | |
| Sukur Cultural Landscape (Nigeria) | Serengeti National Park (Tanzania) | |
| Sydney Opera House (Australia) | Tubbataha Reefs Natural Park (Philippines) | |
| Taj Mahal (India) | Wet Tropics of Queensland (Australia) | |
| Tombs of Buganda Kings at Kasubi (Uganda) | Yellowstone National Park (United States) | |
Cluster Analysis

We conducted a cluster analysis to answer our second research question: How does the content selection on World Heritage Web sites relate to the strategic choice between information about World Heritage and information about tourism? A cluster analysis is an exploratory technique to discern groups with similar profiles within a sample (for a similar approach, see Jochmann-Mannak et al., 2012). The input of the analysis comprised the overall scores of the Web sites on the seven main content categories. To further make sense of the resulting clusters, we compared their mean scores on the seven functions nonparametrically (due to the relatively small sample size of 30 Web sites).

Results

In discussing the results of our study, we first address the descriptive results per function. These results serve three complementary purposes: They demonstrate how our functional analysis plus content requirements can be used to evaluate or redesign World Heritage Web sites; by indicating the state of the art in World Heritage Web sites, they can be used to benchmark specific Web sites; and they show design variations and best practices in World Heritage Web sites. After addressing the descriptive results, we present the results of the cluster analysis aimed at identifying different types of World Heritage Web sites.

Descriptive Results: Content Elements per Function Area

Table 4 presents our descriptive results, that is, the content elements that we found in each of the seven function areas. As Table 4 shows, the World Heritage Sites did not use their Web site to its full potential. Of course, in specific cases, there might be good reasons not to include certain content elements; however, on average, the Web sites only included 45% of the potentially useful content elements (95% confidence interval [38, 51]). And several of the lower scoring content elements were remarkable.

Visitor Information. Only four of the 30 Web sites had all of the nine content elements that we identified as requirements for the visitor information function whereas one Web site did not contain any of these content elements. Remarkably, basic information for visitors—opening times, facilities, visitor rules, and fees—was often missing on the Web sites even
Table 4. Content Element per Function Area.

| Content Element                                      | Number of Web Sites (N = 30) |
|------------------------------------------------------|-----------------------------|
| Visitor information                                  |                             |
| First impression                                     | 29                          |
| Geographical location                                | 24                          |
| Transportation                                       | 18                          |
| Routes and guided tours                              | 17                          |
| Visitor rules                                        | 16                          |
| Facilities for visitors                              | 14                          |
| Fees and ticket reservation                          | 13                          |
| Opening times                                        | 10                          |
| Question and answer                                  | 9                           |
| **UNESCO status**                                   |                             |
| Year of inscription                                  | 25                          |
| Management information                               | 17                          |
| UNESCO and World Heritage logos                     | 16                          |
| Conservation information                             | 13                          |
| Outstanding universal value                          | 12                          |
| Relevant criteria                                    | 7                           |
| Link to the specific UNESCO Web Site                 | 7                           |
| **Virtual experience**                               |                             |
| Picture gallery                                      | 18                          |
| Video clips                                          | 17                          |
| Virtual and interactive tour                         | 9                           |
| Artistic impression                                  | 4                           |
| Panoramic view                                       | 3                           |
| **Education**                                        |                             |
| Background information                               | 30                          |
| Access to documents                                  | 18                          |
| Access to publications                               | 17                          |
| Academic activities on site                          | 14                          |
| Information for children                             | 7                           |
| **Destination marketing**                            |                             |
| Logo                                                 | 20                          |
| Prolific quotations                                  | 15                          |
| Slogan                                               | 14                          |
| Media attention                                      | 5                           |
| Celebrities                                          | 3                           |
| **Community participation**                          |                             |
| Social network linkage                               | 13                          |
| Interactive space                                    | 13                          |

(continued)
though visitor information is equally important for World Heritage sites with limited access to visitors as it is for sites that accommodate mass tourism. Potential visitors need to be informed about restrictions such as limited opening times or a lack of facilities. The Web sites’ presentation format of visitor information also varied. Some Web sites offered a separate menu with visitor information (Taj Mahal) or included a printable PDF with visitor information (Yellowstone National Park), whereas other Web sites had visitor information scattered across the entire Web site (Kakadu National Park), making the information harder for users to access. Of the latter, all three of the Web sites earned a full score on visitor information, despite the user-unfriendly presentation.

**UNESCO Status.** Only one Web site had all of the seven content elements that we identified as requirements for the UNESCO status function, and two Web sites did not contain any of them. The relatively low scores on almost all content elements are puzzling, considering the significance of World Heritage status to all kinds of stakeholders. The City of Bath Web site contained none of the seven content elements, but it did use a slogan that referred to its UNESCO status (Welcome to Bath England World Heritage City). In contrast, the Wet Tropics of Queensland Web site, which had many of the UNESCO-status content elements, complemented the specific elements with general background information about UNESCO and World Heritage, assuming that visitors might not always have a clear conception of its meaning and significance.

**Virtual Experience.** Despite the attention in the literature to virtual experiences of World Heritage and museums, our findings suggest that such content is still underdeveloped on World Heritage Web sites. Not one of the 30 Web sites had all of the five content elements that we identified as

| Content Element               | Number of Web Sites (N = 30) |
|-------------------------------|------------------------------|
| Volunteer recruitment         | 9                            |
| Donation information          | 7                            |
| Advertisements                |                              |
| Local business advertisements | 5                            |
| Partner or sponsor advertisements | 5                         |

*Note. UNESCO = United Nations Educational, Scientific, and Cultural Organization.*
requirements for the virtual experience function whereas six Web sites did not contain any of them. Of the content elements, the traditional picture gallery and video clips were by far the most popular. The most common format of a virtual and interactive tour was an interactive map. On these maps, online visitors can click on certain areas to find corresponding descriptions and photos, audio, or video. Only two Web sites used 3-D techniques in the virtual tour (Sydney Opera House and Aaprvasi Ghat). On the Sukur Cultural Landscape Web site, traditional musical instruments and the unique musical style of Sukur are introduced using audio files.

**Education.** Our findings regarding education content are slightly more positive. Six Web sites had all five content elements that we identified as requirements for the education function, and not one Web site completely neglected its educational function. History and local culture were the central focus on Web sites of cultural sites; geology and biology were central on Web sites of natural sites. In general, we distinguished three approaches: (a) giving basic knowledge to the general public, (b) providing professional knowledge for academics and researchers, and (c) educating children with simplified or playful information. Attention to the needs of the general public was most common, followed by attention to academic researchers and to educational content for children, respectively. Within the latter category, various approaches could be seen from the use of simplified language to that of on-site activities, games, and videos.

**Destination Marketing.** Not one of the Web sites had all five content elements that we identified as requirements for the destination marketing function, and four Web sites did not contain any of them. We discerned two basic approaches: creating a strong, marketable identity by using a logo and a slogan and persuading people of the site’s outstanding universal value by using external sources such as prolific quotations, media attention, and celebrities. In the first approach, the World Heritage status played an important role, especially in slogans (South Africa’s First World Heritage Site, Welcome to Bath England World Heritage City). For the second approach, Web sites often chose quotations, for instance, from books, locals, or scholars. Only five Web sites provided links to media coverage about the site. The use of celebrities was even scarcer. Examples of such use included evidence of a celebrity visit (pictures of Queen Elizabeth at the Sydney Opera House in the photo gallery) and a celebrity endorsement (teen idol Jedward playing the tour guide for children on the Web site of Dorset and East Devon Coast).
Community Participation. The content elements regarding community participation were rather limited. Two Web sites had all four content elements that we identified as requirements for this function area, but 10 Web sites did not contain any of them. Elements regarding online involvement included links to social network sites, such as Facebook, which enable people to share content within their network of family, friends, and acquaintances. On the Sydney Opera House Web site, visitors can use Facebook to leave comments on the tour. There are also interactive spaces on the Web sites themselves. The most common interactive space invites feedback from users. Some Web sites (e.g., Taj Mahal) have a guest book for visitors to write comments. On the City of Bath Web site, visitors are asked to contribute to the Web site, and on the St. Kilda Web site, online visitors can take a quiz after browsing the Web site content, receiving a printable certificate if they score more than 50%. Elements regarding off-line involvement (donations information and volunteer recruitment) were even less prevalent than those regarding online involvement.

Advertisements. Only 10 Web sites contained advertisements, whether commercial or noncommercial. None of the sites contained both types of advertisements. The City of Bath Web site published its advertisement policy online. It had four types of advertisements: listings, free links, paid links, and banner ads. Advertising on the Web site is free for all Bath businesses and noncommercial organizations. The Kasubi Tombs Web site recommends many other Ugandan sites for tourists. The Sydney Opera House used its Web site to broadcast its partnership with Samsung Electronics Australia. And the Aldabra Atoll Web site included Funding as one of its eight main menu titles, providing information about expeditions sponsored by the Aldabra Marine Program.

Cluster Analysis: A Typology of World Heritage Web Sites

We used a cluster analysis to uncover a typology of World Heritage Web sites based on their content. The result, what we call the dendrogram, can be seen in Figure 1. In this dendrogram, individual Web sites are connected by vertical lines, forming small clusters. The clusters, in turn, are also connected to each other so that eventually all the (groups of) Web sites are connected by the vertical line in the right part of Figure 1. There was one singleton among the Web sites: The Namib Sand Sea Web site did not belong to any group. Among the remaining 29 Web sites, three main groups were uncovered. We used nonparametric tests (a Kruskal–Wallis test to
distinguish between the three groups and Mann–Whitney U tests for pairwise comparisons) to establish the differences between the three clusters of World Heritage Web sites. The results are shown in Table 5.

The first cluster of Web sites \( (n = 17) \) is characterized by relatively low scores for all content elements. Although for some content elements, the average scores in the first cluster were higher than those in the second

Figure 1. The cluster analysis dendrogram of the Web sites. One Web site (Namib Sand Sea) was not included. Cluster 1 refers to less developed Web sites, Cluster 2 refers to predominantly touristic Web sites, and Cluster 3 refers to predominantly United Nations Educational, Scientific, and Cultural Organization Web sites. The broken vertical line helps identify the three main clusters.
cluster, these differences were not significant. The content of the Web sites in the first cluster was less well developed than that of the Web sites in the second and third clusters, and these first-cluster Web sites had lower overall scores and less prominent profiles than did the Web sites in the other two clusters. Thus, the Web sites in the first cluster did not appear to have made any clear choices regarding content.

The difference between the second and third clusters of Web sites relates to their profile regarding tourism versus World Heritage. The Web sites in the second cluster \((n = 4)\) seem to present their World Heritage Site as a touristic attraction with important cultural or natural value. Their visitor information scores were relatively high whereas their UNESCO status, education, and community participation scores were relatively low. The Web sites in the third cluster \((n = 8)\) seem to present themselves as cultural or natural World Heritage Sites with touristic possibilities. Their visitor information was less comprehensive, but they scored higher on UNESCO status, education, and community participation.

**Conclusions**

Several conclusions might be drawn from our research. First, our functional analysis shows that an optimal online presence of UNESCO World Heritage

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**Table 5. Differences Between the Three Clusters of Web Sites.**

| Content Element | Cluster 1: Less Developed | Cluster 2: Predominantly Touristic | Cluster 3: Predominantly UNESCO | Significance |
|-----------------|---------------------------|-----------------------------------|-------------------------------|-------------|
| Visitor information* | 3.47 (1.59) | 8.75 (0.50) | 6.75 (1.75) | 1–2,* 1–3,* 2–3** |
| UNESCO status* | 2.41 (1.54) | 3.00 (1.83) | 4.88 (1.64) | 1–3,* 2–3** |
| Virtual experience | 1.53 (1.23) | 1.50 (1.29) | 2.83 (1.06) | — |
| Education* | 2.41 (0.94) | 1.50 (1.00) | 4.63 (0.74) | 1–3,* 2–3* |
| Destination marketing* | 1.53 (1.01) | 2.26 (0.96) | 2.75 (0.89) | 1–3* |
| Community participation* | 1.00 (0.94) | 0.50 (0.58) | 2.88 (1.25) | 1–3,* 2–3* |
| Advertisements | 0.18 (0.39) | 0.50 (0.80) | 0.00 (0.00) | — |
| Overall score* | 12.53 (3.73) | 18.00 (3.37) | 24.25 (2.71) | 1–2,* 1–3,* 2–3* |

*Significant at \(p < .05\). **Marginally significant at \(p < .10\).
sites is multifaceted, both from the tourism and the World Heritage perspectives. All functional areas that we distinguished, with the possible exception of advertisements, should at least be considered for World Heritage Web sites. To do so would make World Heritage Web sites complex and comprehensive, which, in turn, could place high demands on the usability of the Web sites.

Furthermore, our findings show that World Heritage Sites do not use their Internet presence to its full potential. During our selection process, we found that only 77 of the 188 World Heritage Sites (41%) in countries with English as their official or dominant language had their own official Web site. And our analysis of 30 of these Web sites made clear that many potentially relevant content elements are currently missing on them. Often missing were basic visitor information and information regarding the UNESCO status of the World Heritage Site. The Web sites appeared to be most aware of their educational function: All Web sites provided relevant background information about the sites although there is much room for improvement. Uses of destination marketing elements, virtual experience, and community participation are generally at early stages on the World Heritage Web sites.

Our cluster analysis of these Web sites reveals that World Heritage sites, intentionally or unintentionally, position themselves on the continuum between tourism and World Heritage. Among the more developed Web sites, we discerned an orientation toward tourism (Cluster 2) and World Heritage (Cluster 3) information, which relates to the dilemma between tourism and World Heritage conservation (Garrod & Fyall, 2000; Li et al., 2008) and to fundamental decisions in the positioning of World Heritage sites. The less well-developed Web sites might not yet be at the stage of making such decisions about positioning. But we feel that it is possible to find synergy between the two orientations because they do not inherently conflict. For instance, adequate visitor information does not preclude sufficient information about the UNESCO status or vice versa. Perhaps the two separate orientations are only manifest in the current phase of development and will disappear when the World Heritage Web sites reach higher quality. The functional analysis approach and the content requirements we formulated can be used by World Heritage Web sites to further optimize their online presence.

Our research made clear that there is a lot to gain in the online presence of World Heritage Sites. Most Web sites we analyzed have a professional look and feel and seem attractive, but our analysis shows that their content deserves more attention. Managing and maintaining a place of worldwide
extraordinary importance involves important responsibilities that include drawing and facilitating visitors and educating the public. The Internet is a potentially strong channel for providing people with information for all kinds of uses: for preparing a visit, cherishing memories, deepening their knowledge, and taking the place of a real visit. We hope that our analysis and checklist will help World Heritage Sites improve their online presence.

More generally, our findings emphasize that selecting content to be included on a Web site is a crucial and so far underexposed step in the Web site design process, particularly when functional complexity is involved. The procedure we described, with a functional analysis and a comparison between the core elements of similar Web sites, appears to be a fruitful way of getting a grip on Web site content.

The functional analysis approach might also be useful to uncover problems with finding information on Web sites. Our study focused entirely on the presence or absence of content elements; however, when scrutinizing the Web sites for specific content elements, we also encountered problems with navigation. For instance, in several cases, visitor information was scattered across the Web site. Our approach might also help in organizing the information on a Web site and evaluating it. The approach, however, is less suitable for investigating the quality of textual and visual content (e.g., comprehensibility of the information).

Limitations and Suggestions for Future Research

Our study does have some limitations. We only included Web sites originating from English-speaking countries, and our sample was limited to 30 Web sites. But there are no a priori reasons to assume that the results would be different for other languages, and the mean scores’ 95% confidence intervals indicate that World Heritage Web sites are not likely to include more than half of the content elements contained in our checklist.

Another limitation is that we used an analytic approach and did not collect data from the users of World Heritage Web sites. Many handbooks on user experience, Web design, and content strategy nowadays argue that engaging prospective users or other stakeholders is essential for generating useful content on Web sites. To some extent, we agree with this position, especially when specific and detailed content of one particular World Heritage Web site is involved. But our research shows that a thorough reflection on the functions of such Web sites can already provide many valuable insights. Further, the functional analysis approach can incorporate perspectives of many potential user groups, which might be hard to incorporate
adequately in user research. This observation can also be found in discussions about user-focused evaluation approaches (cf. De Jong & Schellens, 1997, 2000b; Elling, Lentz, & De Jong, 2012) versus text- or expert-focused approaches, such as scenario evaluation (De Jong & Lentz, 2006) or heuristics (De Jong & Van der Geest, 2000; Nielsen, 1994; Welle Donker-Kuijer, De Jong, & Lentz, 2008).

A related limitation is that our research focused on the overall picture of the content provided on UNESCO World Heritage Web sites, not on specific Web sites. Of course, there might be valid reasons for a particular World Heritage Web site to not include certain content elements, or a particular World Heritage Web site might need to include specific information that was not covered by our content checklist.

Finally, we did not include users’ perceptions in our research. We focused only on content, checking whether content elements were present or absent. This approach lowered the threshold for the Web sites, as it is possible that users, due to usability problems, might never find the information that we found after extensively examining the Web sites. For instance, some of the Web sites that contained much of the visitor information presented this information in many different places. We also did not address in detail the quality of the information offered. All Web sites, for instance, presented background information (in the education category), but the background information appeared to be of varying quality. Users could shed light on the actual or perceived quality of the information. Such research might focus on either the usability of the Web site and findability of the information (e.g., Van den Haak et al., 2007) or the quality of the information offered (e.g., Elling et al., 2012).

Future research should, in our view, focus on user experience. But such research will only become relevant after World Heritage Web sites have considered and implemented the many suggestions we have presented here. At this stage, conducting user research would be like climbing a tree for the high-hanging fruit while there is still a lot of low-hanging fruit to be harvested. Another direction for future research would be to analyze specific content elements more qualitatively and in-depth, focusing on the ways that World Heritage Web sites provide such information and identifying best practices.

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