












Development of a Web Application for the Sociocultural Diffusion of the Municipality of Lamas, Peru

Pierre Vidaurre-Rojas¹  , Seidy Janice Vela-Reátegui¹ , Lloy Pinedo² ,
Very Rengifo-Hidalgo¹ , Teresa del Pilar López-Sánchez¹ , José Seijas-Díaz³ ,
Luis Salazar-Ramírez², Jorge Raul Navarro-Cabrera² , and Miguel Valles-Coral² 

¹ Facultad de Ciencias Económicas, Grupo de Investigación Gestión ATEC,
Universidad Nacional de San Martín, Tarapoto, Perú
pvidaurre@unsm.edu.pe

² Facultad de Ingeniería de Sistemas e Informática, Universidad Nacional de San Martín,
Tarapoto, Perú

³ Facultad de Negocios Internacionales y Turismo, Universidad Nacional Autónoma de Alto
Amazonas, Yurimaguas, Perú

Abstract. Technology plays an essential role in promoting socioculture by facilitating access to information, fostering intercultural communication, preserving cultural heritage, promoting citizen participation, and stimulating artistic and cultural creation. The objective of the research was to develop a web application for the sociocultural dissemination of the municipality of Lamas. For the development of the application, we used the agile methodology of Extreme Programming (XP), covering the phases of (I) exploration, (II) planning, (III) iterations towards the first release, (IV) deployment, and (V) maintenance; to evaluate the system's usability, we used the System Usability Scale (SUS) survey applied to a sample of 30 end users. As a result, we obtained a robust web application, with modules that met the users' needs, an intuitive and simple interface; and the usability test result was acceptable. We conclude that the development of the web application for sociocultural dissemination represents a valuable tool that contributes to promoting the cultural heritage of the region, allowing potential visitors to explore and plan their trip in a more informed manner.

Keywords: Digital content · Digital tourism · Extreme Programming · Tourist promotion

1 Introduction

Globally, socioculture is one of the fundamental dimensions of societal development [1]. It is a differentiating and distinctive factor, encompassing aspects such as history, traditions, artistic expressions, language, and values shared by a group of individuals [2]. Its importance lies in its ability to strengthen identity and social cohesion, as well as to

preserve and pass on cultural heritage from generation to generation [3]. Furthermore, it plays a crucial role in promoting intercultural understanding and respect, fostering diversity, inclusion, and peaceful coexistence [4].

The valorization of socioculture plays a significant role as a source of tourism, social, and economic development for communities [5]. Through its rich and diverse traditions, it attracts visitors and tourists, thus generating income flows for local economies [6, 7]. This directly benefits producers and entrepreneurs, creating jobs and strengthening supply chains [8]. These findings support the importance of recognizing and supporting the role of socioculture as a cornerstone of sustainable societal growth [9].

In the Peruvian context, socioculture is key to national identity and the country's development. Peru is globally recognized for its cultural heritage, ranging from ancient pre-Hispanic civilizations, like the Incas, to the influence of Spanish culture and the diverse ethnic groups that make up its population [10]. The city of Lamas, located in the San Martín region, is a prime example, renowned as the folkloric capital of the Peruvian Amazon [11]. The cultural identity of this city manifests in various artistic expressions and traditions deeply rooted in its inhabitants' daily lives [12].

However, Lamas, despite its privileged sociocultural heritage, faces limitations in promoting its attractions in the era of globalization. The lack of optimal strategies hinders other sectors from fully understanding the Lamista culture. It is crucial to use innovative resources to avoid missing the region's valuable cultural benefits. Given that globalization demands authentic and unique experiences [13], Lamas has the potential to meet these expectations. However, to achieve this, it is essential to adapt to new dissemination media and seize the opportunities offered by the digital age [14, 15].

We must consider that some tourist cities' failure to leverage technological resources leads to various limitations that negatively affect tourist demand, consequently reducing social and economic benefits [16, 17]. The lack of knowledge and technological skills among key players in tourism promotion, such as local governments or industry entrepreneurs, limits the ability to effectively use available digital tools [18, 19]. This makes it challenging potential tourists to find relevant information about city attractions and services.

Moreover, there is resistance to change and a lack of understanding about the potential of technologies in tourism promotion [20]. Some tourist cities still cling to traditional marketing and promotion methods, like printed brochures or advertising in local media, not realizing that these approaches are no longer sufficient in the digital age [21]. The failure to adapt to new trends and the lack of knowledge about the most effective digital tools limit these cities' ability to reach international audiences and make a significant impact on tourist demand [22, 23].

In this regard, the positive impact of technologies on tourism promotion is undeniable, as these tools significantly expand advertising reach, breaking geographical barriers and exposing a population's sociocultural attractions to interested sectors [24, 25]. Thanks to digital platforms and social networks, cities can reach global audiences, attractively presenting their cultural heritage and unique tourist experiences [26, 27]. This widespread exposure generates an increase in potential visitors' interest, which in turn drives the growth of the tourism sector and positively impacts the benefits the local population can obtain [28].

Based on this, the vast array of technological tools for cultural promotion, this study stands as an innovative vanguard, proposing a concrete solution for the municipality of Lamas, Peru. First, adopting the agile methodology of Extreme Programming (XP) demonstrates a modern and flexible approach to development, ensuring a product effectively adapts to changing needs and user expectations. Second, the usability evaluation using the System Usability Scale (SUS) provides a quantitative and qualitative perspective that supports the application's effectiveness and efficiency. This is not just a digital tool, but one meticulously designed to offer an optimal user experience.

Moreover, innovations do not stop at methodology or evaluation. The application's content, ranging from festivities to handicrafts, is presented in intuitive modules, transforming the way visitors and locals interact with cultural heritage. It is a revolutionary transition from traditional methods of cultural promotion to an interactive digital platform that not only informs but also engages and captivates. This initiative reflects the perfect convergence of tradition and technology, setting a precedent for future efforts in promoting cultural heritages in the digital age.

2 Methodology

We used the agile software development methodology "XP" or Extreme Programming, proposed by Kent Beck, which is based on the values of simplicity, communication, feedback, respect, and courage [29]. According to [30, 31], XP is focused on addressing the activities of the development process through the principles of writing code, testing, listening (planning), and designing. Therefore, we covered the following phases:

2.1 Exploration

In this phase, we explored the project requirements based on the needs of the clients through meetings with influential stakeholders in decision-making related to the preservation of Lamas municipality's heritage. Nine officials from units or departments of institutional image, heritage control, social development, and economic development participated.

This phase was finalized by defining the purpose of the web application: To strengthen the socio-cultural dissemination of tangible and intangible heritages of Lamas as an accessible digital channel for any local, national, or international user. Additionally, the web platform supports heritage preservation by providing permanent cultural information that can be consulted for academic, social, and other purposes, thus preserving them over time.

2.2 Planning

It is the stage in which we establish the most important and priority user stories for the development of the web application together with municipal collaborators (clients). This technique allowed us to describe the specific functionalities that the system must provide. They were written in a simple and understandable language for all members of the development team made up of three full stack programmers and a tester. Table 1 shows the recorded histories:

Table 1. User stories

Number	User	Description	Priority
1	Administrator	As an administrator, I want to enter the application from any device to facilitate maintenance	High
2		As an administrator, I want to register, modify and eliminate the cultural heritage according to the technical sheets of the municipality	High
3		As an administrator, I want to register, modify and delete the data of the heritage registrar	High
4		As an administrator, I want to register, modify and delete referential images or videos of assets	High
5		As an administrator, I want to register, modify and delete the sponsors of the web application	Half
6		As an administrator, I want to register, modify and delete the collaborators of the web application	Half
7		As an administrator, I want to verify the report of registered assets	Low
8		As an administrator, I want to register, modify and delete the social networks of the municipality	Low
9		As an administrator I want to register, edit and delete contact information for the municipality	Low
10		As an administrator, I want to register the geographical location of the municipality	Low
11	Final user	As an end user, I want to access the web application from any device	High
12		As an end user, I want to navigate easily and intuitively	High
13		As an end user, I want to explore cultural heritage and filter by tangible and intangible	High
14		As an end user, I want to be able to recommend assets not registered on the portal	High
15		As an end user, I want to explore representative photos of the municipality	Half
16		As an end user, I want to explore the history of the municipality	Half
17		As an end user, I want to explore old photos of the municipality	Half
18		As an end user, I want to obtain contact information and location of the municipality	Low

2.3 Interactions Towards the First Delivery

According to the user stories, we planned 15 delivery interactions according to modules and submodules in a period of three months (Table 2). Regarding the architecture, we apply the client-server model, where communication is done through a network, generally using standard communication protocols, such as HTTP for web applications. In this architecture, the client requests services or resources from the server and displays the results to the user; In addition, you can also handle the user interface and the presentation of the data.

Table 2. Customer Interactions

Interaction	Module	Submodule	Month
1	Login	Login	1
2	Institution	Institution	
3	Administration	People	
4		Location	
5		Social groups	
6		Areas	2
7	Subscopes		
8	Files		
9	Social networks		
10	Collective		
11	Sponsors		
12	Collaborators		
13	Estates	Heritage list	3
14		Heritage registry	
15	Security	Users	

2.4 Productionizing

For the deployment, we used a web hosting service with CPanel, where we carried out the upload process through a Zip file, which contained both the source code of the page and the web application, as well as the SQL script for the database. After extracting these files, we loaded and configured the database, also set the credentials for the database and the Laravel session manager. In addition, we generate a specific subdomain (admin.patrimonioslamas.com) to deploy the administration system for the website.

Both the web page and the content management system use PHP 8 as a programming language on the server side (Backend) through the Laravel 8 Framework, running on

an Apache HTTP server version 2.4.57. For the client side (Frontend) we mainly use JavaScript through the Vue 3 library to provide a behavior typical of a SPA (Single Page Application). The database was MySQL in its version 5.7.34. The web application is available at <https://patrimonioslamas.com/>.

Next, we show the characteristics of the server:

- Operating System: Linux
- Kernel version: 4.18.0-147.8.1.el7h.lve.1.x86_64
- RAM (Main memory): 1 GB
- Hard Disk (Storage): 200 GB.

2.5 Maintenance

In this phase, we made improvements and fixes to the web application based on the verification of user story compliance. In this stage, we identified new functionalities that the system would need to incorporate in a second version, such as the application displaying information in English and adding a statistical module to verify the number and place of origin of users accessing the municipality's heritage.

During this cycle, we also conducted quality tests on the application. First, we applied a black box test to verify the software functionalities, starting with the interaction of the admin user. Here, we identified input errors in the forms and the sending of heritage recommendations, which were addressed by the development team. In a subsequent phase, we evaluated the usability of the application with the participation of 30 end-users who were exploring the web application for the first time. The users were gathered in the municipality's office and received an explanation of the system's functionalities; then, after interacting, they answered the System Usability Scale (SUS) survey from [32] in the Spanish version proposed by [33]. This survey consists of 10 questions – 5 positive and 5 negative – where 1 means strongly disagree and 5 means strongly agree.

3 Resulted and Discussion

We built a web application that facilitates the dissemination of sociocultural information of the municipality of Lamas, in line with the tangible and intangible heritages that have been cataloged. The software consisted of two main interfaces. The first is oriented towards the administrative side of the web application (Fig. 1), which is used by the municipality officials in charge of maintaining or updating the cultural heritages. The developed forms were easy and understandable to use. Moreover, we ensured the compliance with both functional and non-functional requirements based on the user stories. We took into consideration the statements by [34, 35], who mention that web design is a sensitive process. For this reason, users should be prioritized during the requirement gathering phase of the system, and an iterative design approach should be followed to fully discover the user's requirements.

The web application features four main modules: Cultural Heritage, Institution, Administration, and Security. Within the Cultural Heritage module, there is a display

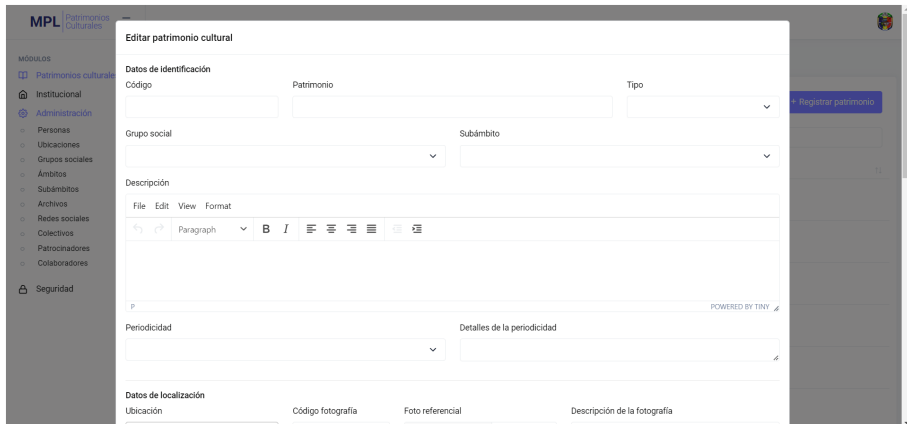


Fig. 1. Admin user interface (Back End)

of the list of registered heritages, and it has a sub-module named Heritage Registration, which is grounded on the technical inventory sheets employed by the municipality. The Institution module captures the municipality's institutional information, such as its representative, mobile phone, address, email, etc. In the Administration module, 10 sub-modules facilitate the registration of individuals involved in the heritage recording process and system users. It covers the location of the heritages, social groups, sub-areas, files encompassing reference images and videos of the heritages, social networks sharing the cultural information, collectives, application web sponsors, and collaborators in the portal's development and maintenance. Lastly, the Security module allows the registration, modification, or removal of permissions or roles for using the application from the administrator's standpoint.

On the other hand, the web application provides an interface for the end-users, who are individuals interested in exploring or learning about the cultural heritages held by the municipality of Lamas (Fig. 2). To access the web application, one needs to connect to an internet network and visit the webpage link, which is secured with a certification and remains continuously available.

Users who visit the web portal have access to extensive information on the cultural richness of the municipality of Lamas. The programmed interface is straightforward and intuitive and consists of six main modules: Home, Cultural Heritages, Gallery, History, Recommendation, and Contact. In this regard, we adhere to the guidelines laid out by [36], who assert that a website's content, architecture, information, and navigation should cater specifically to the priorities of the tourist. While exploring the web application, users can interact with the story behind each heritage, viewing a representative photograph; they can also request more information through the provided contacts or, if appropriate, recommend heritages that belong to the municipality but were not registered by the officials. For [37], capturing potential tourists' interest is imperative by providing accurate and comprehensive information about the tourist destination in question: its location, specifics, and other relevant details. These aspects form the essential

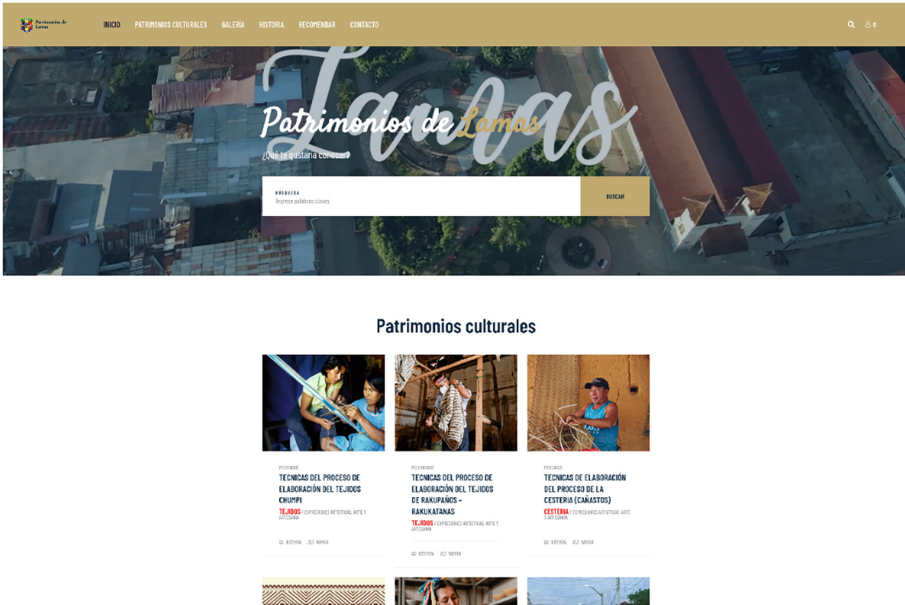


Fig. 2. End user interface (Front End)

knowledge most keenly sought by potential visitors. Browsing the official tourism promotion website, potential tourists find precisely what interests them, thus generating an emotional evaluation of the destination in question.

The transition from conventional dissemination to online spread of Lamas’ socio-cultural heritage is crucial in the new era of digital society, where internet access is increasingly prevalent even with the shifts caused by the COVID-19 pandemic. Indeed, [38] align with the findings of this study by empirically reporting that 100 state museums in Italy did not halt their activities due to social confinement. Instead, there was a significant surge in online cultural initiatives using social media, prompting fresh reflections on the future trajectory of digital approaches in the cultural sphere.

From another perspective, [39] note that technologies like Big Data are revolutionizing the cultural-tourist ecosystem by being used for audience segmentation, personalized recommendations, price optimization, attendance prediction, among other disruptive solutions. Thus, implementing digital platforms in the cultural sector can bring benefits such as new means of dissemination, promotion, and attracting visitors to destinations with tourism potential.

Now, to obtain the usability test results of the implemented web application, we added the average results of each question on the SUS scale, considering that for odd-numbered questions we subtracted 1, and for even-numbered questions, we subtracted 5; then we multiplied the final average by 2.5 [32]. Table 3 displays the procedure carried out for usability assessment.

The usability test result for the web application promoting the socio-cultural heritage of the municipality of Lamas was 80, positioning it within an acceptable range

Table 3. Usability evaluation procedure

Average responses	5, 2, 4, 2, 4, 2, 4, 1,4, 2
SUS algorithm	$((5-1) + (5-2) + (4-1) + (5-2) + (4-1) + (5-2) + (4-1) + (5-1) + (4-1) + (5-2)) * 2.5$
Simplification	$(4 + 3 + 3 + 3 + 3 + 3 + 3 + 4 + 3 + 3) * 2.5$
Result	$32 * 2.5 = 80$

according to the theoretical SUS metric interpretation. It falls within the 64 to 100 percentile, with a grade of A- (78.8 to 80.7). In this regard, to achieve these results, we considered the recommendations of [40], which suggest that to improve usability, one should eliminate unnecessary multimedia content, compress images, combine different CSS files, and utilize content caching. Likewise, we adhered to the design set defined by [41], who mentions that the users' perspective is key to the success of online businesses and websites, yielding optimal-acceptable results in system usability.

In this sense, implementing a web application with a high degree of usability will ensure proper use by users who will access and interact to obtain socio-cultural information from the municipality of Lamas. As referenced by [42], institutions that disseminate cultural heritages through digital platforms must guarantee the User Experience (UX). Visitor satisfaction and the intent to return and spread positive word of mouth are closely related to the overall success of the destination, allowing cultural heritage exploration before, during, and after visits.

Comparing the findings of this research with previous studies, we evidenced the effectiveness of web applications as a digital medium for disseminating cultural heritage, presenting itself as an alternative or complement to social networks. In this context, a digital platform is convenient since it allows the dissemination in one place of a wide range of information related to tangible and intangible heritages of a destination. This information can be harnessed for tourist, academic, and even scientific purposes. It is pertinent to highlight that cultural tourism is in constant growth, attracting millions of tourists in search of cultural experiences. Thus, its dissemination and promotion are necessary for seeking the preservation and cultural conservation, as well as enhancing the socio-economic development of communities.

4 Conclusions

The findings reveal that the development of a web application for the socio-cultural dissemination of the municipality of Lamas represents a valuable tool that contributes to the enrichment and promotion of the region's cultural heritage. The application offers an interactive and accessible platform that allows users to explore and learn about various cultural and social aspects of the municipality, such as festivities, traditions, history, crafts, and other elements representative of the place's cultural identity.

This initiative is relevant in an increasingly digitized world, where information and communication technologies play a fundamental role in the preservation and dissemination of local cultures. Moreover, it boosts cultural tourism by providing a tool that allows potential visitors to explore and plan their trip more informedly.

We recommend that municipalities implement these types of digital tools, as they contribute to the preservation and dissemination of cultural heritages. Furthermore, they serve as an effective communication mechanism with broad reach and accessibility.

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References

1. Soler Marchán, S.D.: La perspectiva sociocultural para la actuación patrimonial con actores sociales y articulantes en el desarrollo local. *Univ. y Soc.* **12**, 31–40 (2020). <https://rus.ucf.edu.cu/index.php/rus/article/view/1807>
2. Lexhagen, M., Ziakas, V., Lundberg, C.: Popular culture tourism: conceptual foundations and state of play. *J. Travel Res.* (2022). <https://doi.org/10.1177/00472875221140903>
3. Achille, C., Fiorillo, F.: Teaching and learning of cultural heritage: engaging education, professional training, and experimental activities. *Herit.* **5**, 2565–2593 (2022). <https://doi.org/10.3390/HERITAGE5030134>
4. Rapanta, C., Trovão, S.: Intercultural education for the twenty-first century: a comparative review of research. In: *Dialogue for Intercultural Understanding*, pp. 9–26. Springer, Cham (2021). https://doi.org/10.1007/978-3-030-71778-0_2
5. Uslu, A., Alagoz, G., Gunes, E.: Socio-cultural, economic, and environmental effects of tourism from the point of view of the local community. *J. Tour. Serv.* **11**, 1–21 (2020). <https://doi.org/10.29036/JOTS.V11I21.147>
6. Zhuang, X., Yao, Y., Li, J.: Sociocultural impacts of tourism on residents of world cultural heritage sites in China. *Sustain.* **11**, 840 (2019). <https://doi.org/10.3390/SU11030840>
7. Terkenli, T.S., Georgoula, V.: Tourism and cultural sustainability: views and prospects from cyclades. Greece. *Sustain.* **14**, 307 (2021). <https://doi.org/10.3390/SU14010307>
8. Méndez-Picazo, M.T., Galindo-Martín, M.A., Castaño-Martínez, M.S.: Effects of sociocultural and economic factors on social entrepreneurship and sustainable development. *J. Innov. Knowl.* **6**, 69–77 (2021). <https://doi.org/10.1016/J.JIK.2020.06.001>
9. Milán-García, J., Uribe-Toril, J., Ruiz-Real, J.L., de Pablo Valenciano, J.: Sustainable local development: an overview of the state of knowledge. *Resource* **8**, 31 (2019). <https://doi.org/10.3390/RESOURCES8010031>
10. Negro, S.: Reflexiones sobre el patrimonio cultural del Perú, contextos y perspectivas. *Tradic. segunda época.* **19**, 169–177 (2019). <https://doi.org/10.31381/TRADICION.V0I19.2636>
11. Congreso de la República del Perú: *Ley que redeclara a la ciudad de Lamas como la capital folklórica de la región San Martín.* (2003)
12. Tian, D., Wang, Q., Law, R., Zhang, M.: Influence of cultural identity on tourists’ authenticity perception, tourist satisfaction, and traveler loyalty. *Sustainability* **12**, 6344 (2020). <https://doi.org/10.3390/SU12166344>
13. Correia, A., Kozak, M.: Past, present and future: trends in tourism research. *Curr. Issues Tour.* **25**, 995–1010 (2021). <https://doi.org/10.1080/13683500.2021.1918069>
14. Korsakien, R., Varotsis, N.: Digital entrepreneurship and creative industries in tourism: a research agenda. *Economies* **10**, 167 (2022). <https://doi.org/10.3390/ECONOMIES10070167>

15. Kalia, P., Mladenović, D., Acevedo-Duque, Á.: Decoding the trends and the emerging research directions of digital tourism in the last three decades: a bibliometric analysis. *SAGE Open*. **12** (2022). <https://doi.org/10.1177/21582440221128179>
16. Rodríguez Sánchez, I., Williams, A.M., García Andreu, H.: Customer resistance to tourism innovations: entrepreneurs' understanding and management strategies. *J. Travel Res.* **59**, 450–464 (2019). <https://doi.org/10.1177/0047287519843188>
17. Williams, A.M., Rodríguez Sánchez, I., Škokić, V.: Innovation, risk, and uncertainty: a study of tourism entrepreneurs. *J. Travel Res.* **60**, 293–311 (2020). <https://doi.org/10.1177/0047287519896012>
18. Pai, C.K., Liu, Y., Kang, S., Dai, A.: The role of perceived smart tourism technology experience for tourist satisfaction. *Happiness Revisit Intention. Sustain.* **12**, 6592 (2020). <https://doi.org/10.3390/SU12166592>
19. Cai, W., Richter, S., McKenna, B.: Progress on technology use in tourism. *J. Hosp. Tour. Technol.* **10**, 651–672 (2019). <https://doi.org/10.1108/JHTT-07-2018-0068>
20. Ashcroft, E., Tuomi, A., Wang, M., Solnet, D.: Resistance to the Adoption of ICTs in Independent Restaurants: Insights from China & the UK. *e-Review Tour. Res.* **16**, (2019). <https://ertr-ojs-tamu.tdl.org/ertr/article/view/323>
21. de Souza, J., Mendes-Filho, L., Buhalis, D.: Evaluating the effectiveness of tourist advertising to improve the competitiveness of destinations. *Tour. Econ.* **26**, 1001–1020 (2019). <https://doi.org/10.1177/1354816619846748>
22. Sakas, D.P., Reklitis, D.P., Terzi, M.C., Vassilakis, C.: Multichannel digital marketing optimizations through big data analytics in the tourism and hospitality industry. *J. Theor. Appl. Electron. Commer. Res.* **17**, 1383–1408 (2022). <https://doi.org/10.3390/JTAER17040070>
23. Roziqin, A., Kurniawan, A.S., Hijri, Y.S., Kismartini, K.: Research trends of digital tourism: a bibliometric analysis. *Tour. Crit. Pract. Theory.* (2023). <https://doi.org/10.1108/TRC-11-2022-0028>
24. Mariani, M.: Web 2.0 and destination marketing: current trends and future directions. *Sustainability* **12**, 3771 (2020). <https://doi.org/10.3390/SU12093771>
25. Leung, R.: Development of information and communication technology: from e-tourism to smart tourism. In: *Handbook of e-Tourism*, pp. 1–33. Springer, Cham (2022). https://doi.org/10.1007/978-3-030-05324-6_2-1
26. Liu, X., Mehraliyev, F., Liu, C., Schuckert, M.: The roles of social media in tourists' choices of travel components. *Tour. Stud.* **20**, 27–48 (2020). <https://doi.org/10.1177/1468797619873107>
27. Blanco-Moreno, S., González-Fernández, A.M., Muñoz-Gallego, P.A.: Big data in tourism marketing: past research and future opportunities. *Spanish J. Mark. - ESIC.* (2023). <https://doi.org/10.1108/SJME-06-2022-0134>
28. Madanaguli, A., Srivastava, S., Ferraris, A., Dhir, A.: Corporate social responsibility and sustainability in the tourism sector: a systematic literature review and future outlook. *Sustain. Dev.* **30**, 447–461 (2022). <https://doi.org/10.1002/SD.2258>
29. Navarro Cadavid, A., Fernández Martínez, J.D., Morales Vélez, J.: Revisión de metodologías ágiles para el desarrollo de software. *Prospectiva* **11**, 30–39 (2013)
30. Beck, K.: *Extreme Programming Explained: Embrace Change* [1a ed.]. Addison Wesley (1999)
31. Pressman, R.S.: *Ingeniería del software: un enfoque práctico*. McGraw-Hill (2005)
32. Brooke, J.: SUS: a “quick and dirty” usability scale. In: *Usability Evaluation In Industry* (1st Edition). Taylor & Francis (1996)
33. Hedlefs Aguilar, M.I., Garza Villegas, A.A.: Análisis comparativo de la Escala de Usabilidad del Sistema (EUS) en dos versiones. *Rev. Iberoam. las Ciencias Comput. e Informática.* **5**, 44–58 (2016). <https://www.reci.org.mx/index.php/reci/article/view/48>

34. Shrestha, D., Wenan, T., Maharjan, S., Gaudel, B., Chun, J., Jeong, S.R.: A UML based approach for analysis and design of tourism web portal. In: Proceedings - International Conference on Smart Electronics and Communication, ICOSEC 2020, pp. 236–243. Institute of Electrical and Electronics Engineers Inc. (2020)
35. Pedraza-Gutiérrez, S.I., Romero-González, J.F., Güiza-Rodríguez, J.C., Giraldo-Henao, E.W.: Diseño centrado en el usuario y experiencia de usuario en el sistema de control de acceso de la Universidad Libre. *Rev. Cient. Sist. Inform.* **3**, e426 (2023). <https://doi.org/10.51252/rcsi.v3i1.426>
36. Shrestha, D., Wenan, T., Rajkarnikar, N., Shrestha, D., Jeong, S.R.: Study and evaluation of tourism websites based on user perspective. *J. Internet Comput. Serv.* **22**, 65–82 (2021). <https://doi.org/10.7472/JKSII.2021.22.4.65>
37. Ekawati, R., Puspitasari, D.: Generic structure of tourism promotion website of madura natural wonders. *Ling. Cult.* **13**, 223–230 (2019). <https://doi.org/10.21512/LC.V13I3.5833>
38. Agostino, D., Arnaboldi, M., Lampis, A.: Italian state museums during the COVID-19 crisis: from onsite closure to online openness. *Museum Manag. Curatorsh.* **35**, 362–372 (2020). <https://doi.org/10.1080/09647775.2020.1790029>
39. Pesce, D., Neirotti, P., Paolucci, E.: When culture meets digital platforms: value creation and stakeholders' alignment in big data use. *Curr. Issues Tour.* **22**, 1883–1903 (2019). <https://doi.org/10.1080/13683500.2019.1591354>
40. Agrawal, G., Dumka, A., Singh, M., Bijalwan, A.: Assessing usability and accessibility of indian tourism websites for visually impaired. *J. Sensors* 2022, (2022). <https://doi.org/10.1155/2022/4433013>
41. Huang, Z.: Usability of tourism websites: a case study of heuristic evaluation. *New Rev. Hypermedia Multimed.* **26**, 55–91 (2020). <https://doi.org/10.1080/13614568.2020.1771436>
42. Konstantakis, M., Caridakis, G.: Adding culture to UX. *J. Comput. Cult. Herit.* **13**, 1–17 (2020). <https://doi.org/10.1145/3354002>