Incorporating digital technologies in points of geographical interest and cultural heritage: the development of a mobile application for mountain Olympus and its trails.

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A thesis submitted in partial fulfilment of the requirements for the degree of

MASTER OF DIGITAL MEDIA, COMMUNICATION AND JOURNALISM
Specialization: Digital Media, Culture and Communication

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May 2021
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Abstract

This dissertation was written in partial fulfilment of the requirements for the degree of Master’s in Digital Media, Communication and Journalism. Taking for granted that technology constitutes an integral part in our lives nowadays, this dissertation aims to illustrate the link between digital technologies and points of geographical interest and cultural heritage. To achieve the aforementioned, its scope is to explore the idea of suggesting and developing a high-fidelity interactive application prototype along with a promotional website that could potentially be used to ameliorate user experience and reach broader audiences. A case study about mountain Olympus, the highest mountain in Greece, has been designed, presented and analysed.

Keywords: Digital Technologies, High-fidelity Prototype, Augmented Reality, Points of Geographical Interest, Cultural Heritage

Useful Links

Application Prototype:  
https://olympusapp.invisionapp.com/prototype/ckm7nwr7b008e9i014bomuze7/play

Application Website:  
https://feniavamvakou.wixsite.com/my-site
Chapter 1

Introduction

Looking back at history, technology has been remarkably developed – with the last three decades being a real breakthrough. In particular, the field of information technology has made important steps forward, both in software and hardware development. This advancement allowed new technologies to emerge and enabled an evolution that seemed unattainable a few decades ago.

The advent of the Web 2.0 has dramatically transformed the distribution of influence and power in comparison with the traditional media. This shift to the so-called transmedia storytelling reflects upon the dynamic elements which allow users to communicate and interact in an advanced level. Leading the discussion to the mobile computing, the strong wireless networking in combination with advanced location-based technologies have given the users a big array of capabilities. Users can now be identified as creators by taking advantage of iconic features and, what is more, they have become the protagonists themselves in this new transmedia path.

This paper presents the implementation of the “Olympus” application and website through the phases of Analysis, Design, Development and Evaluation. By answering typical research questions regarding the impact on the target audience, it aims to showcase the existing link between digital technologies and points of geographical interest and cultural heritage, and how visitors and users perceive this connection or the lack of it.

The second chapter covers the theoretical and methodological background to support the progress made in technological devices. Moreover, it analyses the Software, Web and Application Development Models that are mainly used when developing an application. Finally, it presents the research questions upon which the project is based and provides the work plan of the application project.

Chapter three analyses the current landscape in this field, and next, it defines the purpose and the motivation of the project. Furthermore, the target audience is defined, as are the basic designing tools.

The fourth chapter presents the theory relevant to the design of the application. After all theories being defined, the first screens of the low-fidelity prototype are presented. The name and the logo of the application are introduced at the end of the chapter.

Chapter five narrates step by step the development process of the high-fidelity prototype. The chapter is divided into the production phase, which deals with the gathering of the material, the authoring phase – which analyses the project development in Invision Studio – and the promotion phase which presents the comprehensive development of the promotional website.
The sixth chapter includes the formative and summative evaluation of the project as a whole, while chapter seven primarily focuses on the experimental results drawn from the evaluation.

Last, the seventh chapter illustrates the research findings as they are emerged by the conduct of the evaluations, while presents the novelty and the contribution of the project as a whole. Future directions of the application are also to be commented.
Chapter 2

Theoretical and Methodological Background

This chapter provides the theoretical and methodological background of the project. A brief introduction to Olympus – the subject of the application – will be presented. In addition, the chapter will reflect upon the major theories and methods adopted for the realisation of this project. What is more, the research questions of the thesis are to be presented, as well as the overall planning of the project.

2.1 Mountain Olympus Experience and Visitation

Olympus is not just a mountain; it is a whole world of natural beauty, history and mythology. Being the highest mountain in Greece, it rises at 2,918m, while it is known worldwide mainly for its mythological context, as according to Greek mythology, it was the home of the Gods, and the peak of Stefani was considered the “Zeus’ Throne”.

Regarding flora and fauna, scientists have counted more than 1,700 species of plants, which represent 25% of the Greek flora in total. The fauna of Olympus, which has not been systematically studied to date, includes a significant variety of important, rare and endangered species. The large mammals that once lived in the area, such as the deer, have now become extinct (Nezis, 2019). According to ancient recordings, in antiquity there were lions living in the mountain, while at least until the 16th century bears lived in Olympus, too. Due to its natural beauty Olympus was the first area being declared as a National Park in Greece in 1938. The European Community has included Olympus in the list of “The most important bird areas of the European Community” and in 1981, UNESCO declared Olympus as a “Biosphere Reserve” (UNESCO, 2015).

Apart from the wide array of hiking and climbing activities, the magnificent trails, and the sports events organised, a visitor would be surprised by the rich cultural heritage of the mountainous area. The large number of churches and monasteries are of exquisite beauty and attract hundreds of visitors throughout the year. Some of them date back to the 11th century (Kyritsis, 2002). Anyone visiting mountain Olympus, realises that it is a place with a unique atmosphere, which bears a history of many centuries.

Although there is not an official record of visitation, local authorities roughly estimate that approximately 10,000 climbers from all over the world ascent mountain Olympus per annum; not all of them reach the elusive top of 2,918m, though.
2.2 Interactivity in points of geographical interest and cultural heritage

The recent progress on mobile computing has paved the way to new forms of interaction among the users and the available mobile devices and applications. The strong wireless networking along with the state-of-the-art location-based technologies on lightweight and small devices offer a wide range of capabilities to the users; some of them could only be seen on the big screen until recently. Augmented Reality is one of the ways to enrich the visual experience of the user and improve their interaction with the world by igniting memories or creating new stories (Marimon et al., 2010).

What is more, the advent of Web 2.0 – the second generation of the web – has transformed the way users perceive and interact in any online platform. The sharp increase in connectivity and the establishment of advanced designing tools have empowered users to create high-quality content on their own – user-generated content – and display it to the public. This completely new reality, owing to the effortless online creation and contribution, has revolutionised the way humans communicate their concepts and ideas on the web.

2.2.1 Mobile Augmented Reality (MAR)

The era we live in is largely characterised by the rapid development of digital advances, which have allowed new technologies to bloom. Computers, smartphones and smart devices are inextricably linked to our contemporary lifestyle and everyday tasks. This incessant technological breakthrough of the last decades has led to many emerging concepts to come up. Augmented Reality (AR) is one of the most attractive technologies incorporated in computer or mobile devices, since the tools for evolving it continue to enhance in a fast pace (Larsson, 2018).

To define the concept of Augmented Reality, it is wise to go back to the definition given by Donald T. Azuma (1997) which states that Augmented Reality is a technology which enables computer generated virtual imagery to exactly overlay physical objects in real time. Any system which combines real and virtual, is interactive in real time, and is registered in three dimensions can be defined as an AR system (Azuma 1997). This sense of perceiving the virtual information as if it truly exists in the real world is driven by the movement of the observer (Werner, 2018), who shall determine the information displayed by changing physical position or simply moving the device to different direction.

Moving a step further in the discussion, it could be said that the field of Augmented Reality intertwines a variety of emerging concepts. One of these is Mobile Augmented Reality (MAR), which is characterised as “a technology providing the same feature as Augmented Reality, but without the physical restrictions of a research facility or testing area location” (Aurelia et al., 2014). It is obvious that Mobile Augmented Reality is one of the emerging technologies which is increasingly gaining in popularity, owing to its successfully being integrated to smartphones – a mobile device accessible to the overwhelming majority of the so-called “western world” (Dimoulas et al., 2014).
The Mobile Augmented Reality feature can be applied in different fields and for various purposes; the tourism industry and the exploration of points of geographical interest and cultural heritage are some of them. It is an innovative way to bridge the gap between recreation and education by assisting users to explore a specific point of interest and make the most of their visit (Vlahakis et al., 2002). In this case it could be argued that the Mobile Augmented Reality services are targeted to users – either tourists or local people – who are eager to discover a destination and enrich their visit with multimedia and location-based information (Marimor et al., 2014).

Figure 2.1. (a) Ruins of the temple of Hera in their present state and (b) augmented temple with rendered model on top of live video (Vlahakis et al., 2002, p. 57).
2.2.2 User-Generated Content (UGC)

As mentioned earlier, the advent of the Web 2.0 has dramatically transformed the landscape in public’s contribution to media. As participatory media, Web 2.0 refers to the second generation of web-based services such as blogging, podcasting, and social networking websites which empower users to cooperate and share material online, focusing on User-Generated Content (Lefebvre, 2007). That is to say that the online world is moving rapidly to an era of user empowerment in which every individual is in a position to influence other users or even whole markets by contributing their own User-Generated Content.

O’Hern and Kahle (2013) define User-Generated Content as “original contributions that are created by users, are expressed in a number of different media and are widely shared with other users and/or with firms”. User-Generated Content can be categorised in three groups according to Trosow et al. (2010): (i) Creative content authored and distributed by individuals or small informal groups, (ii) Software modifications or applications written by individuals to operate within or augment specific previously existing datasets or hardware or software platforms (iii) Content collaboratively produced and disseminated.

Based on the aforementioned, it could be argued that User-Generated Content has become an umbrella term for any type of content is created by non-professionals. This content creation reveals that the users are in the spotlight as not only do they act as consumers, but also as producers of online material (Arrigara and Levina, 2008). This power on behalf of the users can shape opinions, create trends and promote different interests online – either in a professional or an amateur manner; in any case, all these aspects are increasingly gaining their ground while modifying the global landscape in the world of internet.

When it comes to the points of geographical interest and cultural heritage – which belong to the broader category of travelling and recreation – it could be said that the User-Generated Content has successfully replaced the dynamics of the traditional word-of-mouth (Mendes-Filho and Tan, 2009). By such a powerful tool in their hands, visitors of any site can instantly have access to useful information, make their own reviews and create their memories. The User-Generated Content concept is here to stay and as many scholars believe it shall completely replace any traditional methods of promotion in the near future.

2.3 Software, Web and Application Development Models

Well before designing an application or a website, it is of utmost importance to define the suitable method for the design and development process. The so-called software development life cycle (SDLC) is a task that incorporates all stages required so as a project to be complete; from its inception to its deployment and maintenance (Ruparelia, 2010). Thus, an SDLC model is a descriptive guide used to define the steps that are followed within a life-cycle framework. There are diverse SDLC models to cover the needs and requirements of every project. According to Dimoulas (2015) the SDLC models can be categorised in the sequential / structured, iterative, and evolutionary models.
The sequential model is a linear one in which the completion of one stage irreversibly leads to the initiation of the next one. The Waterfall model constitutes a characteristic example of this category. In iterative models the steps are executed in a circular manner, meaning that they are repeated until final outcome emerges. RAD (Rapid Application Development and prototyping) is an example of the iterative model. The evolutionary model introduces the separation of the project into different parts where multiple models can be combined. Prominent examples in this category are the Spiral, the Star or the Component-Based Software Engineering (CBSE) models (Dimoulas, 2015).

2.3.1 The Waterfall Model

The waterfall model, which was first recorded by Benington in 1956 and amended by Winston Royce in 1970, has underpinned all other models since it set the foundation for defining the requirements before any designing or development process (Ruparelia, 2010). A crucial aspect of the waterfall model is the need for recording, that is why Royce (qt. in Ruparelia, 2010) proposed at least six types of documentation:

i. Requirements documentation during the initial stage.
ii. Preliminary design specification during the preliminary design stage.
iii. Interface design specification during the design stage.
iv. Final design specification that is actively revised and updated over each visit of the design stage; this is further updated during the development and validation stages.
v. Test plan during the design stage; this is later updated with test results during the validation or testing stage.
vi. Operations manual or instructions during the deployment stage.

The waterfall is a straightforward model as every stage includes specific deliverables and follows a defined audit procedure, thus it may work almost flawlessly in small scale projects (Lewallen, 2005). Nonetheless, it is extremely difficult for the author to reverse and modify something that was not accurately planned in the initial stage, constituting it a less stable model for complex tasks which need constant revisions (Kyeremeh, 2019).

2.3.2 The Agile Model

This model reflects the agile software development methodologies, as they have been documented by a number of independent software consultants. The need to update the existing methodology, by involving higher rates of change in software requirements and customer expectations, has led to the creation of the agile methodologies (Williams, 2010). Any practice of the agile methodology promotes a constant interaction of development and testing; to achieve the aforementioned the entire project is divided into small incremental builds (Pocsova et al., 2020).
The concept of the agile methodologies is based on two pillars. To begin with, there is much emphasis on delivering a functioning part of the application in an efficient way, which is achieved by paying more attention to software testing activities and less to the detailed software documentation. What is more, this methodology suggests close cooperation across the team and with the clients; upon the completion of each iteration the stakeholders review the progress, evaluate the priority of tasks and reconsider the alignment with business goals and user needs (Shiklo, 2019).

2.3.3 Component-Based Software Engineering

The Component-Based Software Engineering (CBSE) method is widely used in multimedia projects. The methodology allows the use of existing elements and codes for the production of multiple projects. The method is popular among freelancers or authors who are inexperienced in multimedia authoring and do not have the skills to build their project upon a more inflexible methodology. Apart from that, companies working on large scale similar projects for multiple clients, can take advantage of the existing components and save time and money (Moulaloudi, 2017). As Hasselbring states (2002), “the promises of component-based software engineering are cost reduction and increased quality through reuse of proven components, as well as better maintainability through flexible software architectures”.

According to Dimoulas (2015), the Component-Based Software Engineering model includes the core phases of analysis, design, development and evaluation, while proposes the multimedia content be designed and developed from scratch. Furthermore, the method allows the author to modify or directly reuse the existing components, after being contextually adapted to the requirements (Figure 2.2). It is also noted that the Component-Based Software Engineering model involves copyright regulations regarding the use of existing software and components, therefore its application should be extra careful and precise.

![Component-based software engineering model](image)

*Figure 2.2. Component-based software engineering (Dimoulas, 2015, p. 96 translated; Sommerville, 2011).*
The Component-based software engineering model has been used in the Olympus multimedia project, as it was considered to cover all major needs in this particular case. First of all, it is a small-scale project including a high-fidelity application prototype and a promotional website, which do not require an extremely complex development process. What is more, the final outcome is supposed to be evaluated both by a team of experts and the target users in a way to receive feedback and improve the design. Furthermore, as creating an online prototype, it could be said that its nature is unpredictable; therefore, the CBSE model would greatly facilitate the creation procedure. Last but not least, as mentioned earlier on, it is a model that can more easily be employed by authors who lack in expertise and skills in the multimedia field. While applying the CBSE model, there was a constant review to avoid any kind of copyright infringement.

2.4 Research Aims and Deployed Methodology

After analysing the theoretical and methodological background, it is wise to define the research questions upon which the project is based.

RQ1: Is the audience interested in applications about specific points of interest and are they familiar with interactive practices?

RQ2: Will the users find the application useful as a whole?

RQ3: Would the users use the application in the context of an adventure in mountain Olympus?

To answer the above research questions there will be two questionnaires conducted. More specifically, the first one will focus on the tendency of the audience to use applications of this content and the general attitude towards interactivity and similar practices. The second questionnaire will be distributed along with the final application prototype and users will be asked to firstly explore the application and, afterwards, complete the survey regarding the usefulness and other crucial points. The results of both evaluations as well as the feedback given by a group of people who will review the application prototype on a regular basis are presented in the following chapters.

2.5 Project Scheduling

To effectively execute this aspiring project, there was a need to precisely plan all major steps until the realisation of the Olympus application high-fidelity prototype. Table 2.1 shows all stages which have led to the completion of the project:
Table 2.1. Suggested plan for the multimedia authoring project.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Definition of project specifications, analysis of target audience, research on related work and project novelty</td>
</tr>
<tr>
<td>2</td>
<td>Design of logo and low-fidelity prototype; get acquainted with Invision Studio and the Wix platform</td>
</tr>
<tr>
<td>3</td>
<td>Gathering of the production material</td>
</tr>
<tr>
<td>4</td>
<td>Development of high-fidelity interactive prototype in Invision Studio; design of promotional website in Wix</td>
</tr>
<tr>
<td>5</td>
<td>Formative and summative evaluation</td>
</tr>
<tr>
<td>6</td>
<td>Implementation of changes and validation of the final project</td>
</tr>
<tr>
<td>7</td>
<td>Experimental results and discussion</td>
</tr>
</tbody>
</table>

2.6 Summary of Chapter 2

Chapter two covered the theoretical and methodological background of this project. It started with a short presentation of mountain Olympus, while the main focus was on reflecting upon the methods and strategies adopted for the realisation of the project. In this notion, the Augmented Reality feature and the capability of User-Generated Content were analysed as part of the interactive nature of the application. Furthermore, the most important Software, Web and Application Development Models were presented in a way to decide the most suitable model to be applied. Last but not least, the research questions were posed, as well as the methods used to answer them. The chapter ends with the precise planning of the whole project.
Chapter 3

Analysis

3.1 Overview of the current landscape

The first step before the creative process was to identify any existing applications dedicated to or specialised on Mt Olympus. There was an extensive research conducted on App store and Google Play with relevant keywords – both in Greek and English – for this purpose. Apart from that, following the same procedure, there was a similar approach on all major social media networks – Facebook, Instagram and Twitter – in a way to find any clues and deduct some conclusions that would be useful to this project. The research showed no relevant results, thus there is no application dedicated – on the whole – to Mt Olympus. However, it should be mentioned at this point that through the research on Google there was an interesting finding. An article on the local newspaper “Olympio Bima” dated back to 2017 presented an application under the name “Olympus Companion” which was supposed to provide factual information regarding the mountain and Litochoro – the village on the foot of the mountain – cover the major routes, inform about focal points on the mountain and provide the weather forecast. The article did not mention the creator or any other relevant information. After that, there was a thorough search, but the application could not be found neither on Google Play nor on App Store. The only indication that it existed was a Facebook page under the name “Olympus Companion”, which however is inactive and includes no contact details. Therefore, one can assume that it was an effort to present Mt Olympus via a mobile application, but there is no clear indication if it was ever realised and, if so, for how long.

All the above leads to the initial assumption that there is not a comprehensive application devoted to Mt Olympus meaning that there is an existing gap that could be bridged by the proposal of this project.

3.1.1 Applications with relevant content

During the research there was a need to find applications with relevant content in order to identify some of the key points that could be useful to this project. There was a research with various relevant keywords in order to get some fruitful results. In an international level, there is a plethora of applications for every taste, with generic or more specialised content. Two of them are to be briefly presented as examples of good practices.

The Ski Mont Blanc application (Figure 3.1) is addressed to adventurers and skiers of Mont Blanc. As seen in the screenshots, the home screen provides the user with all the available features; they can choose for accommodation, check the weather or find maps for the most popular trails. One of the most striking features of the application is the ability to activate the interactive map and explore the place around by accessing extra information and tips. Apart from that, the application allows the user to create their own account and join the Ski Mont
Blanc community by uploading their personal skiing achievements, while they can interact with other members of the community. In a nutshell, it could be said that it is an application which provides generic information to potential visitors of the place, while at the same time, it promotes interactivity and user-generated content.

**Ski Mont Blanc**

![Figure 3.1. Screenshots of the mobile application Ski Mont Blanc.](image)

**Grouse Mountain**

![Figure 3.2. Screenshots of the mobile application Grouse Mountain.](image)

The Grouse Mountain is an application dedicated to the respective mountain in Vancouver (Figure 3.2). The home screen provides all relevant features, while on the right up corner the users are cleverly invited to switch between winter and summer period; based on the selection,
the activities and events are adapted accordingly. The richest screen is the one with the What’s
Open Today option, where all major events are presented according to availability. Apart from
all other features, the users can create their own profile and join the Grind community, where
they can set their personal goals in hiking or other adventures, earn Badges and connect with
friends. A useful addition is the Ticket option in which all e-tickets and digital passes for events
can be saved. It should be noted, however, that the maps provided are not interactive and can
only be downloaded to one’s device.

Doing the same research for mountains in Greece, it was almost impossible to find any
applications purely dedicated to other mountains, so the research was focused on applications
regarding geographical points in Greece.

It was a tough process because there were not many organised attempts that could be used as
a directive in this project, however in this sub-chapter two of the examined applications are to
be presented as examples containing some good practices.

Ithaca Trails

![Ithaca Trails Screenshots](image)

Figure 3.3. Screenshots of the mobile application Ithaca Trails.

Ithaca trails (Figure 3.3) is an application developed to present and promote the major hiking
routes of the island. The home screen introduces the user directly to the paths; by scrolling
down one can quickly skim the trails along with some basic information like difficulty or
duration. Clicking on one of the paths, the user can see a more elaborated screen which includes
pictures, a map, some detailed information, the description of the trail and some points of
interest. This elaborated screen is well-organised and provides the user with details that could
be quite useful. There is a helpful info screen with transportation links to Ithaca and another
screen with a small description of the island. One could argue that Ithaca Trails is a fairly
decent proposal for presenting factual information and tips to the users and potential visitors.
Crete Guide is an application about the island of Crete (Figure 3.4). Although it is not purely dedicated to points of geographical interest, the application holds some features that could be used as examples of good practice. Once the user chooses the preferable Cretan city from the home screen they are directed to the next screen with the available options. They can choose between the “Nature and Parks” and “Culture and History” categories and move to the respective screen with all relevant information. Apart from these, one of the reasons this application was chosen is because the user has the ability to create a profile by giving their personal information. Once they log in, they can interact with other users, add comments and save their favourite spots, by using the respective buttons, as shown in Figure 3.4.

Figure 3.4. Screenshots of the mobile application Crete Guide.

3.2 Purpose

The purpose of the Olympus mobile application is to provide the users with comprehensive information regarding mountain Olympus and in a way to bridge the existing gap as it was identified beforehand. The application aims to improve the user’s experience both on site and at home, before or after their visit. While browsing, the user finds structured pieces of information in coherent categories, such as the most popular trails and cultural sites, the existing refuges and the major sports events with all supplementary tips and the respective photographic depictions. Apart from providing pure informative details, the application further aims to supply the users with the chance to apply substantial AR abilities through the use of their smartphone camera, thus, to enjoy a more sophisticated use of the application. Another goal is to encourage users and potential visitors to generate their own content from the various mountainous spots, such as photos, posts, videos, and to actively invite them to upload it in the application aiming to create a community sharing common interests and views.
3.3 Motivation

The motivation and the most intriguing part for the realisation of this project is the scarcity of any similar projects targeting to mountain Olympus. Although digital technologies are core part of our everyday lives nowadays, there is not a coherent attempt regarding mountain Olympus in which the user can fully rely on, in order to cover different aspects of formal orientation. The digital tools and technologies introduced in the “Authoring for Interactive Media” course of the master’s degree programme “Digital Media, Communication and Journalism” of Aristotle University of Thessaloniki gave the initiative to further examine this specific field and identify the existing link – and the lack of it – between digital technologies and points of geographical interest. This initial incentive provided fruitful data throughout the research for the purposes of this dissertation.

3.4 Target audience

The application is targeted to multiple audiences, ranging from professional climbers with significant knowledge to amateur groups and mountain lovers. As stated earlier on, for the time being there is not a particular application regarding mountain Olympus, so by using this one, visitors from different backgrounds would have the chance to gather major information in one place.

In order to shed light in the user needs and preferences, there was an interview conducted with people involved with mountaineering in a way to detect the existing links and gaps between the use of digital technologies and mountain Olympus, as well as any existing strategies implemented for the promotion of the mountain. The most useful parts of the interview are presented in the following sub-chapter.

Apart from that, there was also a small-scale survey conducted in an attempt to identify whether users would find the idea of this application appealing and to specify some of the major characteristics that they would like to see in it. A total of 76 responses from people of multiple age and education backgrounds was gathered. The questionnaire was disseminated by email to all participants. The whole process up to the final results is described in the following sub-chapter.

3.4.1 Interview with people in charge

At this point it should be mentioned that the initial plan was to visit the Olympus Park Management Agency in the wider area of Litochoro, meet with the members of the team there, get some useful information and conduct interviews. However, the restrictions due to the pandemic did not allow such gatherings to take place, so there was only one in person interview conducted, with two people who are fully conversant with mountain Olympus and, at the same time, behold an institutional role in official organisations; Mr Aris Nikas the president of the Olympus Park Management Agency and Mrs Eleni Sofianidou, board member of the Olympus Marathon organisation. The interview had the format of a semi-formal discussion and was in
Greek language. For the purposes of this dissertation the focal points were translated into English.

What is the target group of people climbing mountain Olympus was the first question with Mr Nikas saying “Although there are not any official records of the climbers on a yearly basis, it could be said for sure that we are talking about thousands of people from all over the world between 20-55 years old”. He stresses out that “due to its versatile nature Olympus attracts all kinds of climbers, ranging from professional individuals to family groups.”

The discussion moves further to the ways in which information is organised and disseminated to the people interested; Mrs Sofianidou states “This has been a rough edge for a long time. Being in contact with climbers from around the globe, I am usually called to provide very specialised pieces of information and I have to admit that there is not an official comprehensive source to cover all raised issues.” This was an interesting point to elaborate, so further clarification was asked. “As far as we know the information is scattered in different sources – meaning that you may need to check two or three different sources to find details about routes, events and cultural points for example – which makes it difficult for both Greeks and foreigners to access all points of question fully. We sometimes resort to obsolete methods like providing old-school maps or brochures to help.” While broadly discussing the whole project and some very initial ideas that were in mind back then, they were asked if there is a gap that could be bridged by an application regarding Olympus. “Interactivity is the number one issue nowadays”, mentions Mr Nikas; “In a world where everyone produces and interacts with UG content, there should be a platform or an application to provide exactly this opportunity to its users. There are media to provide basic information about the mountain, but smartphones can do more than that”. Mrs Sofianidou concludes by saying that “an application could promote places of interest and spots that may not be well known to the broader visitors, but only to locals. It could be helpful to find basic information and hidden gems all gathered in one place.”

It was a very fruitful discussion based on their experience and role, which definitely added extra insight on the vision of this project.

3.4.2 Analysing the questionnaire results

As mentioned beforehand, there was a small-scale survey conducted, in a way to identify the intention of the audience to welcome an application about points of geographical interest, and what is more, to record some of the features they would like to see in an application about mountain Olympus. In the next paragraphs, the questionnaire results will be presented and analysed.

The first questions were supposed to be interest-getting so as to have the participants more engaged to the procedure. In the question “Have you ever used an application for an adventure you had?” the results were split as 43.4% said no while 46.1% answered positively, which was an unexpected and encouraging result for this project. The 67.1% of the respondents said that they have never used an application regarding a specific mountain site; making pretty clear that
there is an existing gap in this field. Furthermore, the majority of the respondents supported that they have climbed mountain Olympus either as independent climbers/hikers or as part of a professional climbing team, a result not at all surprising as Olympus is the most popular mountainous destination in the country. When asked if they would use an application about Mt Olympus 68.4% replied positively which was definitely a quite important outcome for this project (Figures 3.5, 3.6, 3.7, 3.8).

*Figure 3.5.* Previous usage of similar applications results on user analysis questionnaire.

*Figure 3.6.* Usage of application about a mountain site results on user analysis questionnaire.
The next set of questions was focused on the application itself and intended to record the potential user preferences. In the question “How would an application about Mt Olympus be useful?” the majority of the respondents (67.1%) chose a combination of the answers provided, stressing the usefulness of the application in different time phases. Apart from that, the 63.2% of the participants supported that a combination of various information – news and events, tips, historical information, maps – would be interesting to be included. Respectively, the vast majority (80.3%) said that they would like to see varied content in the application, including text, photos, videos. Last, the participants were asked if they would upload their own content and more than half of them (53.9%) responded positively – a very encouraging result, as UG content is one of the initial aims for the development of this project (Figures 3.9, 3.10, 3.11, 3.12).
Figure 3.9. Usefulness of application results on user analysis questionnaire.

Figure 3.10. Piece of information results on user analysis questionnaire.

Figure 3.11. Type of content results on user analysis questionnaire.
In the last set of questions, the participants were asked to indicate what device they mostly use to access the Internet and 68.4% said they use a smartphone. It is more than obvious that this percentage seems very interesting as the application is targeted to smartphone users. Regarding the demographic details, female and male participants were almost equal (51.3% and 46.1% respectively). They belonged to different age groups with the majority of them (53.9%) falling in the 25-34 category. As far as the educational background is concerned, most of them (40.8%) hold a master’s degree (Figures 3.13, 3.14, 3.15, 3.16).
Figure 3.14. Gender specification on user analysis questionnaire.

Figure 3.15. Age group on user analysis questionnaire.

Figure 3.16. Educational background on user analysis questionnaire.
The answers in the above questionnaire indicate that the potential creation of the Olympus application would add some useful insight to everyone interested in this field – ranging from amateurs to professionals. The users are expected to see a variety of information and content whereas they are willing to contribute themselves by generating content while on site.

3.5 Analysis of Tools

The original idea came into reality with the use of two major tools – namely the InVision Studio and the Wix.

InVision Studio is a prototyping and animation tool that lets you create advanced, vector-based screen designs fast thanks to flexible layers and infinite canvas. It is considered one of the best high-fidelity prototyping tools that let production teams have seamless alignment in their design workflow. With InVision, it is easy for users to share links for quick feedback and give instant comments. InVision Studio is part of the InVision suite of tools, which also includes InVision Cloud, where you can connect, store and share your complete product design workflow, and InVision DSM, a design system manager and library where you can store and control all of your brand and UX components (Pietroluongo et al., 2020). This is useful, especially when going through multiple iterations of a design. Vaughan (2011) mentions that such authoring software provides access to a unified environment by combining the content of the design with the necessary functionality of a project. All the aforementioned, in combination with the fact that the platform provides the users with some very explanatory tutorials, made InVision the ideal choice for realising this project.

Regarding the dissemination channels of the application, there was a promotional website created by using Wix, in order to introduce the final product to the target users. Wix.com is a cloud-based web development platform that allows users to create HTML5 web sites and mobile sites through the use of their online drag and drop tools (Wix, 2021). The interface of the Wix website followed similar aesthetics compared with the interface of the application.

3.6 Summary of Chapter 3

The aim of the Olympus application is to provide the users with useful information while on site, as well as before and after their visit. Furthermore, the user should be free to use the AR features by using the smartphone camera and share a unique experience.
In the process of creating this project, there were a lot of applications of relevant content that were examined in order to obtain a concrete idea of how this project would be realised. The personal contact with people who work in this field and the execution of the questionnaire added valuable insight to the whole procedure.

In the last part of this chapter there was a brief presentation of the InVision Studio and the Wix platform, as being the basic tools used during the development and promotional phases of the high-fidelity prototype.
Chapter 4

Project Design

This chapter will touch upon the design process of the application. All major design theories will be presented, in a way to further explain and justify most of the choices made in the designing procedure. On a second level, this chapter includes the first steps in the creative process, by presenting the low-fidelity prototypes of the application. The aim is to set the grounds for the actual creative process, by clarifying the factors which should be taken into account when designing a prototype application.

4.1 Garrett’s Model: The importance of Design Shaping in the User Experience

Everyone working in the marketing industry struggles to employ the most effective strategies to ensure customer loyalty. In practice, it is not that approachable to build strong ties with your clientele; however, when achieved the businesses hold a strong asset in their hands. Being loyal to a particular product or service indicates that there is a stable relationship between the customer and the business, thus the latter is in a position to use this given engagement to raise profits and consolidate its position in the marketplace. This is accomplished most of times because loyal customers are, on the one hand, eager to pay for the product or service they get familiarised with and, on the other hand – since their loyalty is considered certain – they feel comfortable enough to share their experience with others. The fast pace in which technology evolves, facilitates any kind of good or bad rumours to spread and – if used appropriately – this is also another arrow in the quiver of every business in the competitive marketplace. This constant need to ensure customer loyalty will be examined under the prism of Garrett’s model which accounts for the design elements of user experience. Garrett’s model (Garrett, 2006) is illustrated at a set of five planes along a continuum from abstract to concrete (Figure 4.1).

![Garrett's Model](image)

*Figure 4.1. Garrett’s Model of Designing Experience: it can be visualised as a set of five planes along a continuum from abstract to concrete (Garrett, 2006 p. 36).*
Strategy constitutes the basis of every user experience; to achieve success, there should be a balance between the business aims for the product and the customer’s needs and expectations. Second in the continuum is the scope which encompasses all set of features – both functional and informational. The former defines the set of operations the product will allow the user to perform, while the latter refers to the information needed to be conveyed to the user. According to Garrett (2006), these two parameters should perfectly match the user needs and expectations in order to build this relationship of familiarity and loyalty.

Structure is the actual building of the product and balances between the interaction design and information architecture – core disciplines in the building process, as they actively contribute to the deeper understanding of the psychology of the user, thus they add value to the customer loyalty process. This means that the way the content is structured and relayed can trigger positive or negative emotional impact on the users.

After defining the structure, the Skeleton issues follow and try to give flesh and bones to the desired user experience. Being the most practical procedure so far, the Skeleton aims to form the information design, the interface and the navigation. Last in Garrett’s model one shall find the Surface which encompasses the visual choices like colour palettes, sound elements and typography. Sensory design can be quite influential when it comes to customer loyalty – as it can trigger deep human emotions – however, it should align with the other planes so as to ensure it does not undermine any of the functionalities.

4.2 Design Principles

Designing an application for a mobile device differs a lot from designing some kind of service for the Web and there are quite few obvious reasons to support the above. The small-sized display constitutes the first reason as designers are many times expected to limit their creative ideas so as to fit in the screen capabilities. Moreover, it is widely accepted that mobile services are most of times used “on the go”, meaning that the users are exposed to external noises or distractions, which normally leads to less concentration on the information wanted. On the same notion, users are usually expected to use their mobile devices to obtain important information when being in various hectic or busy situations which force them to be unable to wait – normally things run more smoothly when working on a desktop. Indicative of this is the fact that users of mobile services more often than not choose to search with keywords rather than browsing. All these constrains reflect upon the designing process and clearly define the way major decisions are made.

The aforementioned suggest that the positive mobile user experience is a complex equation which, according to Oinas-Kukkonen (2000), can be achieved via a strong correlation between perceived usefulness and fluent navigation (Figure 4.2).
To support this view, Oinas-Kukkonen and Kurkela (2003) have defined seven principles for mobile services design. The first principle refers to Mobility, as such services are expected to bring on accurate and rapid results on the move, while the next one on the list is Usefulness – taking into account that they should facilitate user’s life to a great extent. Relevance and Ease of use shall be the next principles since, due to the on-the-go nature, mobile services are expected to be precise and user-friendly in order to gain in popularity. Fluency of navigation is a core principle when it comes to the design process as the user should always be in a position to locate the most striking pieces of information easily. What is more, User centeredness plays a crucial role in mobile services design; in other words, navigational structure and general terminology of the service shall be arranged based on the way the potential users think. To enforce the above, the last principle – Personalisation – suggests that such services should be adapted to the individual needs and abilities of every user.

Discussions and suggestions can be endless due to the rapid changes in the mobile services field, however, there are some unbiased constrains, as well as some principles that shall set the grounds for the design basics. Clear navigation structure, comfortable use, user-centred information and simple content are some of the core features that can achieve user satisfaction.

### 4.3 Visual Hierarchy and Page Layout Patterns

Layout patterns and visual hierarchy are core parts of web designing. This is because on the web people tend to scan a page instead of reading every single block text, which practically means that they try to minimise the time and effort needed to find what they are looking for. This behavioural pattern of people using the web has been taken into account and led designers to adopt specific visual and layout practices so as to effectively attract the readers’ attention. Pernice (qtd in Nielsen and Norman, 2019), via the eye-tracking research conducted on behalf of Nielsen and Norman identifies four prevalent patterns used by people to scan text on the web; the F-pattern, the Spotted pattern, the Layer-cake pattern and the Commitment pattern are the ones that could be useful to every web designer.

The F-pattern indicates that the users have the tendency to focus horizontally on the words at the beginning and at the top of the page. This scanning behaviour resembles the capital letter F – after which the pattern was named. According to Pernice (qtd in Nielsen and Norman,
this pattern illustrates that important information should feature on the left and top of the page, leaving less important elements on the right or bottom page.

The Spotted pattern is used to grab the user’s attention on specific words spread throughout the page. The users feel comfortable in this pattern as they focus on words they stand out in the text because of their style and typography and, what is more, they generally tend to scan a page for individual words that shall fit to their query.

The layer – cake scanning pattern has the fixations placed on the headings and subheadings, allowing the users to locate the block of text they want to read, based on the heading. In the eye-tracking research, this pattern consists of a set of horizontal stripes and blank spaces between them, just like a layer cake. According to Pernice (2019), this pattern is considered to be the most efficient when it comes to the scanning process.

The Commitment pattern puts aside scanning and illustrates traditional reading. Users focus on all or most content in the page, which leads to the best understanding, although the procedure seems more time-consuming. This pattern occurs when users are highly motivated to read the text – university students and academics are characteristic examples of this pattern. Motivation comes to readers when they know and trust the source, have built a loyal relationship with the brand and acknowledge they are in the right place to find information.

All the aforementioned patterns demonstrate a general perception of the way users respond to the web page reading and can prove to be valuable insight for web designers. Visual hierarchy is not, of course, limited to these four patterns as web design is an emerging field with new ideas and needs occurring in rapid rates.

4.4 Colour Theory

Apart from the structure and layout patterns another crucial element in web design is the colour scheme. Colours play an important role in triggering emotions and can be influential upon the preferences, the psychology and the perception of humans (Rider, 2009). Applying this to the broader concept of designing – in which colour schemes have been used to build whole brands – it could be stated that colours shall shape the user’s attitude and contribute to this sense of familiarity or ignorance towards a specific product or service. When it comes to web design, colour theory is relayed as “the interaction of colours in a design through complementation, contrast and vibrancy” (Cannon, 2012).

Complementation explains how humans perceive colours in conjunction with other colours. In light of this, Cannon (2012) explains that colours which are diametrically opposite in the colour spectrum direct humans to see a design as more attractive – thus the viewers tend to trigger more positive emotions for it. This kind of balance provided by the colours of opposite ends works complementary and promises a refined final outcome.
Contrast is a core feature of colour theory as it ensures the clarity required to get the user’s attention focused on the desired elements on a page. The deliberate selection of text and background colours is a characteristic example of how contrast works. Directing the focus of the user to a specific part of the design is of primary importance when it comes to the usability of a web design.

Vibrancy triggers the emotion of the design. More specifically, brighter colours make the users more active and aware towards a design, whilst the darker ones direct them to a more relaxed state of mind, allowing more time to get focused.

The big question is how to choose the right colour scheme for a web design. According to Cannon (2012), there are three popular structures – the triadic, the compound and the analogous. Adopted by web designers and adapted with the aid of the relevant designing tools, each of these structures can contribute to the success of a design, of course, along with other elements.

4.5 Low-fidelity Prototyping

Before moving to the actual design and development stages, it is wise to present the first steps of the “Olympus” application. There was a need to draw from scratch the basic screens, so as the project would start having flesh and bones. There are various ways to get the first ideas and impressions of the prototype depicted like using an online designing tool or editor. These tools most of times allow the user to create low-fidelity prototypes by adding basic functionalities and specifications. However, online editors can often be time-consuming and distracting for non-experts; this is one of the reasons why in this project the low-fidelity prototypes have been created by hand. Apart from that, following the traditional depiction by using pen and paper proved a much more comfortable way to add and remove features back and forth.

Low-fidelity depictions (Figure 4.3-4.6) will give some insight on the initial idea of this project. The first screen gives the user the opportunity to select the preferred language; the potential application aims at an international audience that is why there are four languages offered. Once choosing the language, the user navigates to the Home screen where they can see all available categories of the application and unfold them one by one to explore their features (Figure 4.3). The Home screen includes the categories of Trails, Refuges, Cultural Sites, Plant Identifier, Sports Events and Explore and was meticulously created from the very beginning; thus, it is one of the screens that underwent little editing through this project.
The next step was to start developing the screens for each category of the application. The Trails category will be used as a template in the following paragraphs so as to illustrate the general pattern behind the creation of the basic categories (Figure 4.4).

Once entering the trails, the user finds a scrollable screen with all major paths in the mountainous area of Olympus. Each path is illustrated by a picture along with the three most important characteristics of it – namely the level of difficulty, the kilometres covered, and the average time needed. There is a reason behind this particular structure, which will be further analysed in the Development phase. By selecting a trail, the user is transferred to the appropriate screen where they should find a map and more pictures of the path, a generic description and every important detail that a climber should be familiar with (Figure 4.4).
As shown in the above figure, at this stage there was an initial attempt to create the lower bar of the application, which is supposed to include the Home, the Information, the MyOlympus button and probably the SOS button; the bar has been evolved a lot through the whole process until the final result, as the main purpose was to offer the user the freedom to navigate effortlessly from every screen. Further details on this feature will be supplied in the Development phase.

Another example of the screens that were developed at an early stage, is the Information screen, as shown below in Figure 4.5.

![Low-fidelity prototype by hand: The Information screen.](image)

*Figure 4.5. Low-fidelity prototype by hand: The Information screen.*

The Information screen was considered one of the most important from the very beginning, as it provides the users with specific details regarding their smooth navigation in the application. The layout changed quite a few times – Figure 4.5 shows one of the first attempts – however the content remained consistent from the beginning; namely the About section offers generic information regarding the mountain itself, enriched with some geographical and historical elements. Apart from that, there is a clear explanation regarding the use of the SOS button to ensure that everyone using the application should know exactly how to handle this crucial feature when in need. Last, in this screen there are guidelines on how to use the MyOlympus feature – which appears at the lower bar – in terms of creating an account and contributing to the MyOlympus community by uploading user-generated content.

As discussed in the previous chapters, a crucial feature of this application is the Augmented Reality feature which is introduced in different parts of the prototype. That is to say, the user is required to open their camera at various points in order to fully enjoy the capabilities of the application. For space economy reasons, the Plant Identification screens were chosen to be presented in this chapter, as a characteristic example of this feature (Figure 4.6).
Once clicking on the Plant Identifier icon, the smartphone camera is enabled, and the user has the ability to instantly capture the best angle of a plant. After the plant having been identified, the next scrollable screen provides a detailed description of it along with more pictures (Figure 4.6).

All the above constitute the first attempts to capture the initial idea by hand with a lot of reformative movements during the process. It is understandable that a lot of elements and additions are missing in this low-fidelity prototype, along with every single piece of vectors, icons and visual depictions. The complete prototype with all features and capabilities will be presented in the Development phase.

4.6 The Name and the Logo

A crucial part in the designing process is to define the identity of a product and make it distinctive in the business market. To build brand awareness, it is of primary importance that the customers or viewers get accustomed with a particular name and logo, thus identify the product or service offered.

In this particular case, the first step was to decide the name. The initial idea was to create a name made of two words like “Olympus Experience” or something similar in this more playful attitude; however, as mentioned already, due to the scarcity of any similar products about mountain Olympus – that is to say, it was estimated that there would be no confusion created – it was decided to name the project “Olympus.” for various reasons. First of all, the actual name of the mountain creates instantly the biggest possible impact on the user who identifies with the content immediately, whilst it gives to the whole project this sense of grandeur which definitely follows the mythical mountain. The full stop in the name sets the tone for the general minimalistic pattern of the product.
After deciding the name, there was an idea to play with letter “m” of the word and the mountain itself, so the first sketches in paper were trying to combine these elements in the most functional way (Figure 4.7).

![Paper sketch of the Name.](image)

**Figure 4.7.** Paper sketch of the Name.

After finalising the paper sketch, the name was designed with the help of Adobe Illustrator. Adobe Illustrator is a software application used to create digital and printed charts, diagrams, graphs, logos and illustrations. The official website offers a variety of tutorials to facilitate even the inexperienced authors to visualise their idea. It took several attempts and experimentations during the designing process until finally reaching the desired result (Figure 4.8).

![Designing the name: One of the attempts (a), final choice (b).](image)

**Figure 4.8.** Designing the name: One of the attempts (a), final choice (b).

The two snowy peaks designed to be incorporated in the name of the application are also used as the logo of the product and shall be identified by the user throughout their navigation experience.

### 4.7 Summary of Chapter 4

This chapter focused on the major aspects of the designing process. Designing a product or service for the web requires a lot of background knowledge, therefore the chapter tried to establish a bond between the user experience and the designed product. To achieve the above Garrett’s model - with the five planes – was analysed. In continuation of this, the chapter presented the design principles which shall shape usefulness and navigation and lead to a
positive user’s experience. The most important visual hierarchy patterns were also presented in a way to shed light to the designing process and, at last, some of the basic colour theories were demonstrated to stress out the importance of colours in directing people’s behaviour and emotions regarding a design. The second half of the chapter focused on the low-fidelity prototypes made on paper and the presentation of some core features before probing the prototype application in InVision Studio. The last thing presented in this chapter was the designing procedure of the logo and the name of the application. The initial idea along with the sketching process up to the final design are analysed in detail.
Chapter 5

Project Development

The development of the high-fidelity prototype constitutes a demanding process and requires some careful preparatory planning. It was the most challenging part of this project since it required large amounts of information to be coordinated while the actual prototype needed to be presented in a coherent and comprehensive way. The development chapter is divided into three major phases: the production, the authoring and the promotion phase.

5.1 The Production Phase

The production phase includes the creation from scratch and the gathering of the material to be used in the high-fidelity prototype. The first thing under consideration was the creation of the logo. Apart from this, the nature of this particular product required a plethora of visual elements to be assembled in order to reach the desired result, thus in the next sub-sections all types of visual content used in the Olympus prototype will be presented.

5.1.1 The Images

One of the most important parts in the production phase was, also, the gathering of all the photographs needed to accompany the respective categories and features in the application. The demands were huge, so there was a need to remain consistent and obtain the wanted material in the most formal way. Thus, it was determined to use pictures taken from the photo collections of the Olympus National Park Management Agency official website as they included high-quality visual material. For the purposes of this project, the president of the Olympus National Park Management Agency, Mr Aris Nikas, was contacted in order to get the respective permission to use the images.

In the category of Cultural Sites – where the users can use the Augmented Reality feature to see how a cultural point was in the past – there was a need to find some old pictures juxtaposing the particular spots in another era. It was quite impossible to find this material, so Mr Nikas kindly granted, for the purposes of this project, two pictures of important mountainous spots from his personal digitised collection (Figure 5.1).
Furthermore, the picture of the mountain peaks in the Explore section – where the users explore the area by the use of their camera – was captured from the Google Earth application after entering the precise location. The picture was then edited in Abode Illustrator to add extra features in order to depict the Augmented Reality capability in the prototype.

As a final remark, it should be stated that in the MyOlympus section – where users can view and upload their own content – all the featured pictures are actual photos taken in the mountain and were kindly granted by close friends and family to support this project and the prototype application (Figure 5.2).
5.1.2 The Text and the Vectors

As it is understandable, all sections of the prototype include big chunks of factual information. Each section incorporates a description and details regarding a specific geographical or cultural point. All pieces of information were obtained by official online sources; namely the official website of Olympus National Park Management Agency and the official website of the municipality of Dion-Olympus. All descriptions were adapted to the needs of the project; thus, each text block is actually a combination of the information found in the aforementioned sources. In some cases, like the Sports Events section, the information was adapted based on the Covid-19 updates.

This project would be incomplete without the extensive use of vectors. They were chosen to be placed in core parts of the prototype in a way to avoid using extensive text blocks, therefore facilitate the user in their experience. All vectors used were downloaded by the flaticon.com which is a database of free vector icons. Once downloaded, the vectors can be adapted to fit any particular purpose. In this case, more than 50 vectors were chosen and adapted in terms of size and shade so as to perfectly fit the demands of the high-fidelity prototype.

5.2 The Authoring Phase

After gathering all the appropriate material that would be used, the actual development of the application started. As mentioned earlier on, the Invision Studio was the platform used to generate the high-fidelity prototype – thus the finalised product for the purposes of this dissertation. The whole process of creating the prototype lasted almost three months during which there were constant revisions.

Invision Studio is a user-friendly and practical application which offers the author a variety of tools and options to work with; all of them will be thoroughly discussed in this subchapter. The first thing that should be mentioned is that for this application, the artboard of the iPhone XS was chosen in combination with the Space Gray frame of the device, as this matching was decided to be of general acceptance by the audience (Figure 5.3).
The aesthetics of the application, all the categories and the major features selected to be applied will be further presented and analysed in the next sub-sections.

5.2.1 Aesthetics and first screens

Before applying any of the features and designs, it was very important to define the aesthetics of this high-fidelity prototype. The main goal was to create a user-friendly, explicit prototype that would be the user’s assistant. Following the same pattern as with the logo, the aesthetics kept the analogy of a simple and unadorned pattern in black and white colours. To enforce this view, the font was also decided and separately installed in the InVision Studio to perfectly match the desired aesthetics. The above actions are justified for two basic reasons; the first being the complexity of the prototype – big chunks of informative text with visual elements and different features appearing in all sections would create a rather dazzling final result if the aesthetics was pompous itself; the author’s major viewpoint in the aesthetic depiction of this project was the second reason for the quite plain lines chosen.

The first three screens can give an idea of the aforementioned while they can be used to infer some first estimations of the whole project (Figure 5.4).
As promised, the plain logo along with an arrow invite users to move in the language selection screen. There, one can find the language options starting with Greek for obvious reasons and English – as being the universal language. French and Spanish were added as there were thought to be among the next most popular languages spoken by potential visitors of Olympus. The social media icons appearing at the bottom of the screen invite the users to follow the application in different platforms.

Once choosing the language, the Home screen appears where all pillar categories are featured; namely, the six categories are the Trails, Refuges, Cultural Sites, Plant Identifier, Sports Events and the Explore. Each one along with its features will be presented on the next sub-chapter. The bar at the bottom, featured in all screens, provides the users with the choice to return to Home screen, find more information and upload content and register to the Mycommunity.

In terms of the buttons, the back button appears at the top left corner as – taking into account a variety of other applications – this position is thought to facilitate the user to move back. The SOS button at the top right corner will be further discussed later on, in terms of position and usage. Both buttons appear in all screens to ensure a smooth navigation.

In the technical part of it, all buttons are activated through the Interactions section, found in the Inspector panel at the right of the Invision Studio platform. The author can define all interactive details there, like the kind of trigger, the navigation screen and whether the transition would include motion. Where each interaction goes to is indicated in blue arrows as shown below (Figure 5.5).
After stating the aesthetics and the general remarks about the development of the prototype, the major categories will be further analysed, so as to justify all the significant choices made. In the next sub-sections, the most important features used will be introduced through the presentation of the high-fidelity prototype, in a way to give reason for the final outcome produced. The following sections are organised based on the relevance of the features and capabilities of each category on the high-fidelity prototype so as to facilitate the reading flow.

### 5.2.2 Trails, Refuges and Sport Events

The categories of Trails, Refuges and Sports Events provide factual information to the users in the most coherent way. The first screen of each category opens up with a clear presentation of the respective content. Next to the name and the picture of each trail, refuge or event, the user can find a couple of very brief details, so as to decide at a glimpse whether a particular site would be of their interest – thus they would click on it for further details (Figure 5.8).
Figure 5.6. Main screens: Trails (a), Refuges (b), Sports Events (c).

The first challenging part here was that these screens had to scroll down in order to present the full list of items, however, some elements, like the bottom bar, should not change position at any case. The solution behind this lies in the “pin” button; by choosing the wanted elements the author can first define the position they shall be placed and then click the “pin” button to get them pinned (Figure 5.7).

Figure 5.7. How to pin elements from the Inspector panel.
The bottom bar was decided to be pinned in all screens so as to facilitate the user, the same applies to the back button and the SOS button at the top.

When clicking on a particular trail, refuge or sports event, the user is introduced to the desired screen where they find a small description and concise information. To avoid presenting extensive text blocks, the idea was to relay all important information with vectors and in this way to invite users find confidently what they want (Figure 5.8).

![Figure 5.8. Detailed screens: Trails (a), Refuges (b), Sports Events (c).](image)

When it comes to each trail or event, the respective pages provide not one but two distinct photos; the one depicting the actual route on the map and the second capturing the respective spot. To achieve that in InVision Studio, the author needs to change the scrolling to “Horizontal” and modify the customised width of the iPhone XS from 375px to 750px, so as to fit the second picture in the space generated (Figure 5.9).
To optimise the above, it was important to use the “pin” button and keep in place all elements on the artboard, other than the two pictures, so they would remain still when scrolling horizontally. To facilitate the user and achieve a smooth transition, there is a subtle indication below the pictures saying, “swipe left and right”, inviting them to swipe horizontally (Figure 5.10).
5.2.3 Cultural Sites, Explore and Plant Identifier

As mentioned earlier on, the subsections in this chapter are organized according to the features presented. The screens analysed in this section share a common feature – the use of the camera by the potential user. Each of the following paragraphs describes the process of planning and creation of the screens.

One of the initial goals when designing this high-fidelity prototype was to give the users the opportunity to use more advanced features like Augmented Reality in their mobile devices. The advantages of Augmented Reality have been extensively analysed earlier on, thus the most challenging point was to decide by which means it could be incorporated in the Olympus application.

Mountain Olympus hosts some very beautiful cultural sites; most of them bear a history of hundreds of years. As it was impossible to include all of them, for the purposes of this dissertation, the most important and popular ones were decided to be included in the category of Cultural Sites.

When the user chooses one of the sites, they get to the first screen which provides a small description of the particular place. On a second level, when being on the particular site themselves, they can click on the hand button and activate their camera. Moving the camera and clicking anywhere on the screen, the users are presented with the picture of the site as it was before and the trivia – historic information related to a particular era or past event (Figure 5.11).

Figure 5.10. Trails: Litochoro – Prionia before scrolling horizontally (a), Litochoro – Prionia after scrolling horizontally (b).
In technical terms, to achieve the above trick with AR, there was a need to extend the screen and change the scrolling position in Inspection panel to “Horizontal”, as it happened with all relevant screens in the Cultural Sites category.

Taking the discussion of Augmented Reality, a little further, it is wise to mention the Explore category, as well. Once triggered, the Explore function is designed to offer real-time view of the mountain, provided that the user is on-site. With the use of the camera, the users can observe the sites or routes that are near them. They are also invited to click on the respective buttons in order to get some more specific information (Figure 5.12).

*Figure 5.11. Cultural Sites: structure of main screens with AR feature.*
To make the above feature as realistic as possible, there was a need to use Google Earth application and capture a picture of one of the most popular routes in mountain Olympus – the route to Stefani peak. The picture was then edited in Adobe Illustrator in order to add the dashed line showing the route to the top. The extra text was added in the InVision Studio.

The only way to create this Augmented Reality effect in the Explore category was to change the width of the screen and the scrolling position. After that, the initial screen with the edited picture had to be duplicated and the descriptive text had to be added on the second screen (Figure 5.13). To achieve a successful result, all other elements were pinned – the process has already been shown before – on both screens while the scrolling was set in “Horizontal” in the Inspector panel.
The last category that requires the use of a camera is the Plant Identifier. It is well-known that mountain Olympus encompasses more than 170 species of plants, representing the 25% of all Greek flora. This feature was designed so as the user can take advantage of all capabilities offered by a potential application, thus acquire information regarding a specific plant. In a user-friendly screen, the user is invited to open the camera, scroll the screen horizontally and capture the desired plant from the most suitable angle. Once the photo is taken, the user is transferred to the next screen, where the application is supposed to have recognised the plant and gathered the information relevant to it (Figure 5.14). The main target in this section is that anyone using the application shall quite easily and, in a few clicks, capture a plant and get useful knowledge instantly – a feature offered in many mobile applications nowadays.

Figure 5.14. Plant Identifier: Main screens of capturing a plant and relaying information.

5.2.4 MyOlympus, SOS and Information

This sub-section will initially focus on the My feature of the prototype. As stated already, interactivity was one of the key features when designing the prototype. It was thought that this would be a preferred method to greatly engage the audience, by creating a community, and at the same time to potentially promote the application and Olympus itself.

Found at the right corner of the bottom bar, this button – which is a combination of the possessive My and the logo of the application – transfers the user to the screen where they can find the content uploaded by other users and visitors. Once entering, they can scroll down to enjoy all the captured moments, or they can use the respective hashtags to categorise the content. By clicking on an individual photo, it opens up in a new screen, where users have the opportunity to interact with the content (Figure 5.15).
There is also the ability for anyone to upload their own generated content as soon as they sign in or sign up using their credentials (Figure 5.16).

Another key element of the bottom bar is the Information button, featuring in the middle of the bar. As revealed by the name this screen was created to facilitate the users and ensure a smooth
navigation through the application. The users can anytime resort to the Information section where they can find useful insight regarding the mountain they are visiting, the SOS button and how it works, and, of course, helpful guidelines about the My feature (Figure 5.17). It should be noted here that despite the black and white aesthetics of the prototype, red colour was chosen when explaining how the SOS button works, to effectively strike the attention of the users when reading the guidelines.

![Info screen: Scrolling page (a), scrolling page (b).](image)

*Figure 5.17. Info screen: Scrolling page (a), scrolling page (b).*

Last but not least, while exploring the high-fidelity prototype one can find the SOS button at the top right corner of every screen. The feature is activated with a double tap – it is the sole button with this double interaction – and instantly directs the potential user to the calling screen where 112 – the European emergency number – is being called (Figure 5.18).
Figure 5.18. SOS button appearing in top right corner (a), redirection to 112 (b).

Its position was a matter of great discussion as there were two suggestions; to be placed at the top right corner or in the middle of the bottom bar. After much concern, it was decided to be placed in the top right corner for various reasons. First of all, from the technical viewpoint, this corner was left blank, in terms of text or any functional button in all screens of the prototype, so this button would not seem like a distraction no matter the category or the feature the user chooses. Most importantly, the SOS button reveals an imminent situation of the user, therefore it should appear in an easily accessible and at the same time distant spot, to avoid mishandling. For all the above, the top right corner was deemed as the most suitable position of the SOS button. To ensure a smooth navigation, and to minimise the risk of careless mistakes, the button functions with a double tap, while explicit guidelines regarding its use can be found in the Info section.

This section of the Development chapter touched upon the whole creative process in InVision Studio. The descriptions and the illustrations tried to shed light in the most important issues raised during this procedure which lasted for several months until the final outcome. Working with InVision Studio was a challenge and a constant attempt to find the most precise and accurate way to depict one’s creative ideas.
5.3 The Promotion Phase

After finalising the authoring phase, one should wonder about the ways the final product would become known to the public. This transitional step between creating and using a new application or service is referred as the promotion phase.

There are multiple ways to promote a new product nowadays, depending on the nature of it and the impact to be made in the audience. Digital media and the Web play a definite role in the promotion of any product or service, as the latter could become known and state availability with a blink of an eye. In case of the Olympus application – as being only a high-fidelity prototype – it was decided to create a webpage by using the Wix tool.

5.3.1 Development with Wix

The creation of a promotional Wix Website would provide a short description of what the application has to offer, and it would be supportive to the goal of creating a mobile application relevant to the mountain Olympus. On top of that, the website can potentially work as a supplementary platform to the interactive prototype in a way that it shall be enriched with articles, experiences and generally content relative to the mountain adventures. The Wix platform, apart from being user-friendly, offers a wide variety of templates, aesthetics and possibilities for creating a website.
One of the aims for the website of the Olympus application was to be contemporary since its goal would be to engage people to download the application. Therefore, after reviewing quite a few templates, the one most relevant was found and used in a way to illustrate the amenities of the application in a modern and appealing way.

After determining the template to be used, the creative process started by keeping some existing elements, deleting others, and of course, adding the ones that would perfectly cater the needs of the Olympus application. The first thing to be designed was the top right menu, which actually informs the audience about the distinct sections in the webpage; there are five pillars upon which the menu was designed – About, Features, Testimonials, Your Moments and Download (Figure 5.20).

![Olympus.](image)

*Figure 5.20. Top menu.*

The About section is comprised by a small description of the application while the section of Features highlights the most important capabilities of the product in a concise and clear way. The Testimonials category relay the experience of people having used the application; thus, it is one way to urge others to do the same. The Your Moments section promotes the interactive attitude the application wishes to establish and invites the audience to be part of the Olympus community. Last, there is the option to download the application directly from the website through App Store and Google Play. All elements in the top menu were pinned with the aid of the Wix tools, so as to stay intact in all pages.

In order to link the top menu options with the correct sections there was a need to use the Anchor feature which actually links a created button with the appropriate section and directs the user to the respective part. The left side column in Wix enables the creator to perform such actions (Figure 5.21).
After deciding the desired type of anchor, the author is asked to define the respective page (Figure 5.22). This procedure was followed in order to link all elements from the top menu with their pages.
Next, it was important to create the Home page, the first impression the visitor gets when actually entering the promotional website. Wix provides a wide selection of images to be used, while it allows the creators to upload their own material. To do so, one should open the left side column, click on Add button and decide among the suggestions offered; either to upload a picture or to use one of the free Wix images (Figure 5.23).

![Add picture feature in Wix.](image)

*Figure 5.23. Add picture feature in Wix.*

In this particular case, the concept of engaging the audience from the very first moment, led to the decision to upload a majestic picture of Olympus along with the name of the application (Figure 5.24).
Furthermore, clicking on the About, the user is directed to a short video of a mountain in sunset accompanied with a small description of the application (Figure 5.25). The short video was selected from the free Wix video collection and added as it is thought to trigger this sense of serenity and inspiration to travel to the audience.

When choosing the Features, the user is transferred to the page which presents all focal capabilities of the Olympus application. There, one should get a glimpse of the product, in a way to feel more confident to download it (Figure 5.26).
The next page to be presented is the Testimonials which was one of the easiest to be created as almost all Wix templates include a section about testimonials. The template used had this feature already in place, so the major concern was to link the Testimonials from the menu to the correct page, with the way already mentioned. After that, the blank page was filled with information relevant to people relaying their experience with the application (Figure 5.27).

The “Your Moments” links to the page were users see the user-generated content uploaded by others and are invited to use the #Olympus and upload their own material (Figure 5.28). This section was intentionally left at the end of the website, as it was important to create this inspiring attitude of becoming part of a community and have the audience hooked as a last impression.
At the final part of the website, one shall find the ways they can download the application in their mobile device. All relevant buttons for Google Play and App Store as well as all icons related to social media are provided in the free version of Wix, so the only challenging point was to arrange the structure of this last section (Figure 5.29).

Before completing this sub-chapter, it is wise to mention the Live Chat box which features in all pages. Wix enables the author to choose from a variety of templates for this purpose and add it in the desired spot. The small black box was chosen owning to its minimalistic design.
and was also pinned to appear in all pages. In case the potential user clicks on it, a live conversation with someone in charge is supposed to start.

5.4 Summary of Chapter 5

Chapter five covered the lengthy process of developing the high-fidelity prototype. There were three major phases described – the production, the authoring and the promotion – each of which caters a distinctive role in the development process. The production phase relayed all the major procedures that took place before the actual development, including details about the name, the logo, the vectors and all material that needed to be gathered before the moving ahead. The authoring phase, being the most challenging part, depicts the whole designing process in InVision Studio with comprehensive descriptions and justifications of the features employed. Last, the promotion phase aims to present the way the application was chosen to be advertised to the audience. A website was created and apart from the advertising role, it is supposed to be used as a supplementary platform to the application by providing relevant content. The Wix platform helped in the creation of the website and all steps followed are carefully introduced in this section.
Chapter 6

Evaluation

Evaluation is of major importance when it comes to any kind of software or multimedia authoring applications. As a method, evaluation is a process which aims to define the usability of the product or service produced, and it can be formative or summative. This chapter focuses on the core usability heuristics upon which the high-fidelity prototype was created, while it describes the evaluation methods used in order to draw some fruitful conclusions for the potential development of this project.

6.1 Defining Usability

Before applying any evaluation method, it should be wise to define one of the most important pillars in the design and development phases, the usability. According to Juristo et al. (2007), usability refers both to the user interface – with all buttons, colours, menus etc. included – and the user-system interaction as a whole, including any type of arrangement in information exchange between the system and the user. One might support that usability is the prerequisite to ensure a high level of quality of a product or service, whilst offering the desired satisfaction to the users. Nielsen (qtd in Pande, 2018) has defined 10 broad rules for the user interaction design – known as heuristics of usability; the principles are presented in the table below (Table 6.1).

Table 6.1. 10 Usability Heuristics for User Interface Design (Nielsen, qtd in Pande, 2018).

<table>
<thead>
<tr>
<th>10 Usability Heuristics for User Interface Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Visibility of system status</td>
</tr>
<tr>
<td>2. Match between system and the real world</td>
</tr>
<tr>
<td>3. User control and freedom</td>
</tr>
<tr>
<td>4. Consistency and standards</td>
</tr>
<tr>
<td>5. Error prevention</td>
</tr>
<tr>
<td>6. Recognition rather than recall</td>
</tr>
<tr>
<td>7. Flexibility and efficiency of use</td>
</tr>
<tr>
<td>8. Aesthetic and minimalist design</td>
</tr>
<tr>
<td>9. Help users recognize, diagnose, and recover from errors</td>
</tr>
<tr>
<td>10. Help and documentation</td>
</tr>
</tbody>
</table>
6.2 Evaluation Methods

The process of assessing the usability of a multimedia project touches upon the desired impact on the users. Thus, it is crucial that the impact to be created be precisely defined in the early stages of the design or development phases. This is the most efficient way to achieve the highest level of user satisfaction and quality of product as a final outcome. According to Dimoulas (2015), there are two types of evaluation; the formative and the summative. The former is used so as the team to get precious feedback during the phases of the analysis, design and development, while the latter is used to deduce some final remarks regarding the multimedia project as a whole.

For the purposes of this multimedia project there were both a formative and a summative evaluation conducted, in a way to combine useful insight deriving from a team of people relevant to the subject – referred as Experts – and the final assessment by real users who evaluated the high-fidelity prototype as a whole.

6.2.1 The Conducted Formative Evaluation

As stated before, the formative evaluation is conducted through the creative stages of analysis and design, and throughout the development phase, by constantly reviewing the initial purpose and adapting to the new perspectives that may arise. This need to repeatedly assess the multimedia project contributes to its constant functional improvement, as well as the debugging process (Dimoulas, 2015).

In case of this particular multimedia project, the formative evaluation was implemented throughout the development process of the high-fidelity prototype. In particular, there was a team of five people – the so-called ‘Experts’ – which was formed so as to evaluate the project while being developed and provide precious feedback from different points of view (Table 6.2).

Table 6.2. Team of ‘Experts’ and their field of expertise.

<table>
<thead>
<tr>
<th>Persons</th>
<th>Field of Expertise</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Expert</td>
<td>Academic with scientific expertise in media technology and multimedia projects</td>
</tr>
<tr>
<td>2nd Expert</td>
<td>Graduate of the Digital Media, Culture and Communications master's degree programme of Aristotle University of Thessaloniki</td>
</tr>
<tr>
<td>3rd Expert</td>
<td>Graduate of School of Architecture with experience in developing applications</td>
</tr>
<tr>
<td>4th Expert</td>
<td>PhD student in Bayesian Inference</td>
</tr>
<tr>
<td>5th Expert</td>
<td>Simple user of mobile devices</td>
</tr>
</tbody>
</table>
To begin with, one of the first things which changed during the first review is the position of the SOS button. It was initially designed and placed in the bottom menu bar in a way to have all major buttons gathered together and provide a more “tidy” interface for the user. However, only after having reviewed all basic screens of the prototype, did it become evident that the SOS button could be easily misused in that position by anyone being in a rush. Thus, the particular button was transferred in the top right corner of the interface – a position which was thought to be distinct and accessible at the same time (Figure 6.1).

![Figure 6.1. Initial position of the SOS button (a), final position of the SOS button (b).](image)

The functionality which has undergone the most severe change is the one of the Plant Identifier. The first screen – which shall indicate the camera activation – was initially designed in a very simple way without any particular explanatory sign. Some of the experts approved this more minimalistic depiction, while others found it rather confusing for the user. After the second review the structure of the screen changed, while a short message was added, so as to inform the users about the need to open their camera. There was still a conflict in the team regarding the position of the message or whether the obligation to read a two-line text before activating the camera would be distracting. The solution and the final design of this screen was proposed by the 1st expert who supported the idea of using a combination of a vector and very short text to convey the message and make users feel comfortable and continue their navigation smoothly (Figure 6.2).
Another debatable topic was the structure of the My section. The general idea was to provide the users with the opportunity to see the content uploaded by other users, once they sign in or sign up. After providing their credentials, they could see the user-generated content and upload their own, as well. In other words, the initial design of this section allowed the users to see the uploaded material, provided they have logged in the application (Figure 6.3).

Figure 6.2. The development of Plant Identifier screen during revisions.

Figure 6.3. The initial structure of My section.
This structure was found to be problematic in the reviews, as it was thought to restrict the users who would just like to view the photo feed and would not desire to give their credentials. Thus, the design has undergone its first change; the new order of functionalities gives full access to the user-generated content, without any prior action to be taken (Figure 6.4).

![Figure 6.4. The final structure of My section.](image)

Another key change in this section is worth mentioning; namely the categorisation of the photos uploaded by the users. The initial design of that screen provided the photos in random order and the user had to scroll down to see every single one. In one of the last revisions of the project, it was suggested to add some popular hashtags – MyTrails, myExplore, MyPlants – so as to categorise the photographic material (Figures 6.5 and 6.6). There was much discussion over this addition – whether it should facilitate or perplex the users – nonetheless, the final result looked definitely more complete, so the whole team of reviewers hailed it.
Last but not least in the revision process was the reconstruction of the Cultural Sites. In the initial planning, each site section was designed to provide a screen with the particular place along with a quite lengthy text block, including historical and background information (Figure 6.7).
This design was believed to be plain enough without any distinctive characteristic, so after discussing, the AR feature – the capability to use the camera, see the place and obtain extra details regarding a particular spot – was added as an option for every cultural site. Due to this change, the long text block in the initial screen was divided into two parts – general description and trivia details – and presented in another separate screen (Figure 6.8).
All the aforementioned changes constitute the most significant ones made during the constant revision process of the interactive prototype. Up until the last review of the project, there were fruitful discussions and disagreements among the author and the experts which shaped the final product.

6.2.2 The Conducted Summative Evaluation

According to Dimoulas (2015), the summative evaluation regards the progress of the entire multimedia project in order to draw relevant conclusions. These final conclusions would be valuable for any future maintenance and development of the product.

Table 6.3. Presentation of the questionnaire regarding the Olympus application prototype.

<table>
<thead>
<tr>
<th>Questionnaire</th>
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<tbody>
<tr>
<td>1. Average time you spend online on a daily basis.</td>
</tr>
<tr>
<td>2. Do you have a Social Media account?</td>
</tr>
<tr>
<td>3. How often do you use a mobile application?</td>
</tr>
<tr>
<td>4. How often do you take part in an adventure (e.g. hiking, climbing, exploring an archaeological site or national park)?</td>
</tr>
<tr>
<td>5. I have climbed mountain Olympus.</td>
</tr>
<tr>
<td>6. I’m interested in climbing or hiking adventures.</td>
</tr>
<tr>
<td>7. The application is useful.</td>
</tr>
<tr>
<td>8. The application covers my informational need.</td>
</tr>
<tr>
<td>9. The application is user-friendly.</td>
</tr>
<tr>
<td>10. The application uses clear language.</td>
</tr>
<tr>
<td>11. The interface is easy to browse.</td>
</tr>
<tr>
<td>12. The colours and aesthetics are appropriate.</td>
</tr>
<tr>
<td>13. The vector icons are explanatory.</td>
</tr>
<tr>
<td>14. I am generally satisfied with the application.</td>
</tr>
<tr>
<td>15. I would recommend the application to a friend.</td>
</tr>
<tr>
<td>16. I would use the application in the context of an adventure in mountain Olympus.</td>
</tr>
<tr>
<td>17. Further features you would like to see in the application.</td>
</tr>
<tr>
<td>18. Please specify your gender.</td>
</tr>
<tr>
<td>19. Please specify your age group.</td>
</tr>
<tr>
<td>20. Please specify your academic level.</td>
</tr>
</tbody>
</table>
In this particular case – due to the nature of the interactive prototype – it was crucial that the audience evaluate the entire project and provide their feedback. For this reason, there was a questionnaire created and disseminated along with the link of the application prototype via email. The questionnaire was created in English, as was the prototype itself, assuming that the Greek audience shall overwhelmingly be familiar with English language and, at the same time, it would be accessible to broader international audience. There were 61 participants who explored the prototype application and filled in the questionnaire.

The questionnaire comprised of 21 closed-ended questions which tried to cover all key aspects in this project. It mainly consisted of linear questions in which the participants were allowed to provide a response from 1 – 5, with 1 stating ‘strongly disagree’ and 5 stating ‘strongly agree’. More specifically, it was organised based on four major categories; the user relationship with the new media, the user relationship with adventures, the feedback provided after exploring the Olympus. application, and the user demographics (Table 6.3).

As described earlier on, the first set of questions concerned the relationship of the audience with the new media. These questions were important in order to create a first impression regarding the background knowledge and familiarity of the users with new technologies (Figures 6.9, 6.10, 6.11).

![Average time you spend online on a daily basis.](image)

*Figure 6.9. Time spent online on a daily basis.*
As shown in the data obtained, most of the users spend 1 – 3 hours online on a daily basis, while 23.3% of them spend 3 – 5 hours. Furthermore, the overwhelming majority of the participants – 96.7% and 98.3% respectively – holds a social media account and uses mobile applications. The above results show a strong engagement with the new media, letting to further assumptions that the audience would welcome a debutant application.

The next set of questions refers to the established relationship with any kind of adventures and activities regarding a mountain site, and the general interest in mountain Olympus (Figures 6.12, 6.13, 6.14).
Figure 6.12. Frequency of taking part in an adventure.

Figure 6.13. Previous experience in mountain Olympus.

Figure 6.14. Participants’ interest in mountain-related adventures.
Commenting the above results, it could be stated that the majority of the participants – 50% and 40% respectively – take part in hiking adventures on an annual or monthly basis, while more than 70% of the participants are interested in hiking or climbing adventures; this is a very encouraging outcome for the purposes of the project. The answers regarding the experience with mountain Olympus are somehow split, with 60% replying positively and 40% negatively. This outcome makes the process to the final goal of this project even more intriguing, as it shall fulfil the expectations of two target groups with distinct background knowledge and experience.

The third category includes questions regarding the usability of the Olympus application. This is the most extensive part of the questionnaire, as the participants were asked to evaluate the usefulness, the ease of use and the satisfaction of the application – thus, for space economy, there would be a selection of the questions presented in this paper (Figures 6.15, 6.16, 6.17, 6.18, 6.19, 6.20).

![Figure 6.15. The Olympus application is user-friendly.](image1)

![Figure 6.16. The Olympus application uses clear language.](image2)
The 83.3% of the participants strongly agreed with the statement that the application is user-friendly and uses clear language, which is one of the most encouraging outcomes so far. It should be noted that there were not any responses stating that the application does not fulfil any of the above purposes.

![Figure 6.17. The colours and aesthetics of the Olympus application are appropriate.](image)

Figure 6.17. The colours and aesthetics of the Olympus application are appropriate.

![Figure 6.18. The vector icons used in the Olympus application are explanatory.](image)

Figure 6.18. The vector icons used in the Olympus application are explanatory.

The 70% of the participants strongly agreed with the colours and the aesthetics of the application, which follow a clear minimalistic style in black and white colours. On top of that, 75% of them found the vector icons to be explanatory, which constitutes some very useful piece of information, keeping in mind that the vectors were carefully chosen to fulfil this exact purpose.
As a general remark of this part of the questionnaire, it could be said that the vast majority of the participants is satisfied with the application (78.3%), whilst the 85% of them would recommend it to a friend. Both numbers demonstrate a strong engagement to the final product, which perfectly matches to the expectations of this project.

The last part of the questionnaire consists of the demographics. As it has already been stated in the previous chapters, they are presented at the end of the questionnaire so as for the participants to get hooked with the more engaging questions at the very beginning (Figure 6.21, 6.22, 6.23).
According to the data obtained, 51.7% of the participants are men and 45% are women. The participants fall in various age groups; 55% of them are between 25 – 35 years old; 18.3% of the participants belongs to the 35 – 44 age group, while the 18 – 24 age group follows (15%).
The groups of 45 – 55 and 55+ represent the lowest percentage of the participants. As far as the academic background, 36.7% of the participants holds a master’s degree while 35% holds a bachelor’s degree; 11.7% of the sample holds a Ph.D.

Figures 6.24 and 6.25 provide graph statistics for some of the most critical questions, as discussed above, mostly regarding the overall impact after exploring the application. The mean value and standard deviation rates clearly indicate that the aims and purposes of the project were – to a great extent – fulfilled.

Figure 6.24. Reviews of the Olympus. application based on the most important questions of the formative evaluation.

Figure 6.25. Radar chart of the formative evaluation results, projecting the overall impact after exploring Olympus. application.
6.3 Summary of Chapter 6

This chapter presented the most important methods of evaluating the usability of a multimedia product. In this project, there were two methods of evaluation used; the formative and the summative. In order for the formative evaluation to be realised, there was a team of ‘experts’ organised; the team reviewed the project throughout the development phase, provided useful feedback and suggested improvements. All major modifications proposed by the ‘experts’ have shaped the final product and were presented in this chapter. For the purposes of the summative evaluation there was a questionnaire designed and disseminated to the users of the application. The users were asked to explore the application and its features before completing the questionnaire and submitting their feedback. Their responses contributed to obtain a comprehensive point of view regarding the final aim of this multimedia application project, while they were used to answer the research questions posed in the second chapter.
Chapter 7

Results and Discussion

The Olympus project was realised in terms of this dissertation and this final chapter will reflect upon the conclusions having been drawn. Last but not least, it includes a novelty and contribution sub-chapter which analyses the potential extensions and improvements of the product. It shall be clear that this project followed the academic rules and procedures with no external professional assistance provided; thus, some of the limitations posed are also under discussion in this chapter.

7.1 Research Findings

This research aimed to identify the link between digital technologies and points of geographical and cultural interest. In particular, the focus was placed on how new technologies could be integrated in an application about mountain Olympus. The first step to achieve the above was to set the theoretical and methodological background, by presenting and analysing the theories which led to the definition of the research aims.

One of the most vital points in this project was to define the users’ needs – that is why there was an interview conducted with people working in positions that could give insight to the project. On top of that, there was a questionnaire formed and distributed to the audience, so as to examine the familiarity of the users with new technologies, their experience on mountain adventure and the tendency to take advantage of interactive technologies – for instance, whether they would find the Augmented Reality feature useful or they would be willing to upload their own content – in the context of visiting a site outdoors. The results of the above research were presented in the chapter of the Analysis and formed the characteristics of the application to a great extent; the design and development phases comprehensively narrate all major decisions taken until the final outcome.

What is more, the aforementioned analysis results in combination with the summative evaluation results can be used to answer the research questions posed in chapter two. Based on the former, the vast majority of the audience (67.1%) believes that an application about Olympus would be useful. When asked about creating and uploading their own material, the vast majority of the users responded positively, conveying a message of familiarity with relevant practices. According to the latter, it could be stated that the overwhelming majority of the participants has social media accounts and uses mobile applications. This data, in combination with the significantly large amount of time they spend online, confirms the assumption that new digital media have been established in everyone’s life. Therefore, it seems that all latest digital advances shall be incorporated and find their place in various fields of interest. Apart from that, half of the sample indicated that the participants take part in hiking or climbing adventures at least once a year, while 40% of them on a monthly basis. In an attempt to link the results from both questionnaires, it could be assumed that the audience
would see a new application regarding a mountain site from a positive point of view. Thus, one may argue that the responses shall indicate that the audience may have an interest in learning more things and familiarise with mountain Olympus. The aforementioned data combined answer fully the first research question (RQ1), regarding users’ interest in the application and familiarity with interactive practices.

As far as the usefulness, the ease of use and user satisfaction of the Olympus. interactive prototype is concerned, the high rates indicate that the application appears to have achieved its purpose. With no responses marked as “Strongly disagree” or “Disagree” in any of the major categories, it could be stated that users were – to a great extent – satisfied with the final product. This positive outcome relates with the second research question (RQ2) – whether users will find the application useful as a whole – and based on the responses it is accurate to state that the purpose of the research question is successfully answered, as well.

The third research question (RQ3) aims to identify whether the users would use the application in the context of an adventure in mountain Olympus. Based on the summative evaluation replies – 76.7% of the participants would use the application in a future adventure in mountain Olympus while the 85% of them would recommend it to a friend – some positive deductions are to be made, regarding the practices used and the choices made to ensure a more satisfying audience experience. The above data combined shall validate the third research question.

The creation of this project proved to be quite complex owing to the various functionalities added. For this reason, it was vital to form a team of “Experts” who practically tested the application during different stages in order to identify errors or omissions and suggest new ideas to ensure a smooth navigation. This part of the evaluation was quite contributory to the research as a whole and added extra value to all major decisions taken. To get the research for this project completed, there was a summative evaluation once the application was finished, so as to estimate the users’ views on the subject. The summative evaluation was created in a way to get valuable feedback regarding the final project and its usefulness.

The methodologies and the different research types discussed above, shall be used to answer the research questions posed at the beginning of this project. Based on the combined results – from the analysis and the summative evaluation – the research questions were fully answered, while the project managed to be fulfilled without prior knowledge of any special software and coding skills.

7.2 Novelty and Contribution

This dissertation started with an abstract idea to create an interactive prototype about mountain Olympus, without having examined the gaps existing in this particular area. After searching and evaluating relative products and services in the market, its purpose was clearly defined, as were its original elements.
The project manages to cover the informational needs of the audience, while at the same time, it gives the users the opportunity to enjoy a more comprehensive experience of the mountain with the use of the Augmented Reality features and the creation of user-generated content. Even though there are few applications in the market which offer a descriptive illustration of points of geographical interest, none of them was found to incorporate any interactive elements. On the contrary, most of them lacked in complexity and original ideas in terms of content and user satisfaction. The most intriguing part was to coordinate the large amount of information and present it in the most clear and coherent way, so as the users would love to search further in the application. Thus, one could argue that the contribution of this dissertation regards the successful association between the interactive and informational features in a way to offer a fully featured experience to the users. The Olympus application along with its website promise to promote the mountain in the broader audience, as well as to ensure an advanced user experience both on site and off site.

7.3 Future Directions

Although the project was realised for the purposes of this dissertation, the ideal scenario for the Olympus application would seem to be developed under the aid of an IT team. In this notion, the project could be further evaluated by external users who probably belong to the target audience of the application. One idea so as to reach broader audience would be to disseminate the quantitative evaluation to actual visitors of mountain Olympus in a peak season period. Having a larger sample would allow for more tangible results to be drawn.

Having examined the evaluation results, it is clear enough that most participants have overwhelmingly enjoyed the features and capabilities of the application. However, talking about future extensions and improvements, there is always room for making new additions. In particular, a popular idea would be to add a weather forecast option to allow users check the weather conditions during their mountain adventure. What is more, the Plant Identifier can be accompanied with a relevant animal identification feature. Mountain Olympus hosts a rich fauna which could be captured and identified in a similar way as plants. The list of potential additions and customisation features can be endless so as to improve the user experience; this entails a genuine interest in constantly reviewing the technological advances and sensing the shifting user needs.

Finally, the Olympus application is accompanied by a supplementary website. The first reason for creating it was to promote the features and capabilities of the application to the broader audience. On a second level, this website can be potentially used to offer additional material like photo galleries with thematic collections or featured destinations as suggested by the users. The actual creation of the website provides a well-established outcome to everyone who wants to explore the application; however, the Wix platform sets some limitations to the non-professionals, so the development process cannot reach its full potential at this point. Should this burden be overcome in the future, the interconnection of the two media shall cooperate in a perfect mode.
References


APPENDIX A – The analysis questionnaire and the associated graphs with the results

Olympus
An application regarding Mt Olympus

Have you ever used an application for an adventure you had (eg hiking, exploring an archaeological site or a national park)?
76 responses

- Yes: 43.4%
- No: 46.1%
- Maybe: 10.5%

Have you ever used an application regarding a specific mountain site?
76 responses

- Yes: 67.1%
- No: 31.6%
- Maybe: 1.3%
Have you ever climbed Mt Olympus?
76 responses

- 35.5% Yes, as an independent hiker/climber
- 19.7% Yes, as part of a professional climbing team
- 11.8% No
- 33.8% Others

Would you use a mobile application about Mt Olympus?
76 responses

- 19.7% Yes
- 11.8% No
- 58.4% Maybe
- 7.1% Others

How would an application about Mt Olympus be useful?
76 responses

- 67.1% I can use it before my visit to get helpful tips
- 13.2% I can use it while on site as a guidance
- 15.8% I can use it after my visit to share my experience
- 3.9% All of the above

What piece of information would interest you the most?
76 responses

- 63.2% News and events
- 19.7% Practical tips about trails (equipment, difficulty level, etc)
- 11.8% Historical and cultural background information
- 10.5% Maps
- 1.3% All the above
- 3.9% Other
APPENDIX B – The usability evaluation questionnaire and the associated graphs with the results

Olympus. application

This study complies fully with the rules and regulations suggested by the "Committee on Research Ethics and Conduct" of the Aristotle University of Thessaloniki.

You can leave the study at any time and your data will not be stored. The information collected will be anonymous, confidential, it will only be used for the purposes of the research and it will not be transmitted to third countries.

Any processing of personal data is done in accordance with the General Data Protection Regulation while taking the appropriate technical and organisational measures. Your personal data is kept only for the period required for the lawful purposes it was collected, ensuring its safe destruction when the legally prescribed period has elapsed, or the purpose of processing has ceased to exist, and there is no legal requirement or legitimate interest or right to continue storing it.

Do you have a social media account?
61 responses

![Pie chart showing 96.7% yes and 3.3% no]

Average time you spend online on a daily basis.
61 responses

![Pie chart showing 24.6% < 1 hour, 13.1% 1 - 3 hours, 47.5% 3 - 5 hours, 9.2% 5 - 7 hours, and 0.2% > 7 hours]
Do you use mobile applications?
61 responses
96.4% Yes
No
Maybe

How often do you take part in an adventure (e.g. hiking, climbing, exploring an archaeological site or national park)?
61 responses
50.8% Weekly
39.3% Monthly
4.8% 2 - 3 times a year
2.2% Never

I'm interested in climbing or hiking adventures.
61 responses
21.3% 1 time
8.6% 2 times
27.2% 3 times
33.7% 4 times
32.8% 5 times

I have climbed mountain Olympus.
61 responses
41% Yes
59% No
The application is useful.
61 responses

The application covers my informational needs.
61 responses

The application is user-friendly.
61 responses

The application uses clear language.
61 responses
The interface is easy to browse.
61 responses

The colours and aesthetics are appropriate.
61 responses

The vector icons are explanatory.
61 responses

I am generally satisfied with the application.
61 responses
I would recommend the application to a friend.

61 responses

I would use the application in the context of an adventure in mountain Olympus.

61 responses

Please specify your gender

61 responses

Please specify your age group

61 responses
Please specify your academic level

61 responses

- High school graduate: 37.7%
- Bachelor's Degree: 34.4%
- Master's Degree: 11.1%
- Ph.D.: 11.1%
- Other: 8.0%