BARBARA PINTAR

BIRDADVISOR 360°

A digital support for birdwatching tourism in Algarve

2017

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Scientific Report

Mestrado em Design de Comunicação para o Turismo e Cultura

Work made under the supervision of:

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Escola Superior de Educação e Comunicação

University of Algarve

2017

BIRDADVISOR 360° - A DIGITAL SUPPORT FOR BIRDWATCHING TOURISM IN ALGARVE

Work Authorship Declaration

I declare to be the author of this work, which is unique and unprecedented. Authors and works consulted are properly cited in the text and are in the listing of references included.

Barbara Pintar

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Thank you very much everyone!

Abstract

Portugal is currently considered one of the most interesting European destinations for birdwatching and the Algarve, in particular, has been growing as an important field for sustainable tourism. Birdwatching gives tourists the great opportunity to observe such rich biodiversity in some unique ecosystems, like Ria Formosa. Design and design research are playing an important role in the development of strategies in order to satisfy the needs of users and/or the communities involved in tourism and their promotion.

The purpose of associating birdwatching, tourism and communication design brought about our research question « Can the development of a specific digital support for birdwatching activity in Algarve help birdwatchers to have better experiences? ». To answer the research question we used non-interventionist methodology and techniques such as: literature review, case studies, personas, usability testing with in-person observations, and data collection surveys which led to the development of a prototype to prove our hypothesis.

Birdadvisor 360˚ is a software application designed to be a guide. Thus it includes useful bird information and navigates its user across the Algarve's best birdwatching spots. For the present study we surveyed the demographic characteristics of our target public, the User Interface (UI) and the User Experience (UX) aspects through the usability testing. The gathered data outcome enabled the identification of some issues and revealed what necessary improvements had to be made. All the participants expressed the excitement over the application and strongly believe it can provide them better experience. So our research question was positively answered and proved our hypothesis, suggesting that this mobile application can boost the birdwatching experience.

We consider this research and its practical outcome might contribute to a more sustainable tourism for birdwatching in Algarve and enhance this nature tourist sector.

Keywords: *Nature tourism, Birdwatching, Mobile Application, Communication Design, Interaction Design*

Resumo

Na economia portuguesa, o turismo é um setor prioritário em franca expansão. Portugal faz parte da região mediterrânica e é uma das áreas climáticas mais importantes do mundo em termos de biodiversidade e diversidade paisagística. Esta zona climática alberga uma grande variedade de habitats e a maior diversidade de aves em toda a Europa. Portugal é, atualmente, considerado um dos destinos europeus mais interessantes para a prática de observação de aves e, a região do Algarve em particular, tem-se desenvolvido como uma área de crescente importância no que concerne um turismo sustentado.

Estima-se que existam cerca de 100 milhões de observadores de aves no mundo sendo que o Reino Unido representa a maior fatia com cerca de 2.4 milhões de observadores, seguido de perto pelos restantes países do Norte da Europa. Contudo, mais recentemente, os países mediterrânicos têm conquistado maior espaço neste mercado.

Os observadores de aves (*birdwatchers*) podem ser categorizados de acordo com diferentes motivações: os *soft birdwatchers* (que representam um mercado mais generalizado, cujo intuito é observar de forma inespecífica), os *hard birdwatchers* (que representam um visitante interessado em adquirir um pacote de observação mais completo (que inclua a lista de espécies alvo) e que possui um conhecimento significativo sobre as espécies e seus habitats), os *twitchers*, (que representam um observador mais específico cujo objetivo é recolher dados sobre novas espécies e que viaja em busca de espécies ainda não identificadas) e os fotógrafos (que procuram aves diferentes para realizar fotografias originais).

A atividade de observação de aves oferece aos turistas a oportunidade de contactar com a flora e fauna de ecossistemas únicos do ponto de vista ecológico, como são, por exemplo, a Ria Formosa e a Lagoa dos salgados. Consequentemente, o desenvolvimento de atividades turísticas nestas zonas sensíveis e protegidas deve ser cuidadosamente planeado e implementado. Contudo, as atividades de observação de aves existentes ainda não disponibilizam uma ferramenta moderna, em formato digital que ofereça mobilidade, facilidade de uso, atualizações em tempo real e,

sobretudo, a substituição dos velhos e ultrapassados guias de identificação que, juntamente com o telescópio ou binóculos que são essenciais à atividade, podem tornar as caminhadas bastante penosas.

O design e o design de investigação têm, de forma crescente, desempenhado um papel importante no desenvolvimento de estratégias que satisfaçam as necessidades dos utilizadores e/ou das comunidades envolvidas no turismo e na sua promoção. O design de comunicação fornece uma UI (Interface de Utilização) prática e soluções de design em UX (Experiência de Utilização) que ajudam a criar novas e melhores experiências para os utilizadores. O design de comunicação visual está intimamente ligado com os avanços na tecnologia e, consequentemente, maior atenção se tem dado às noções de interação entre o público e a informação. O design de comunicação é o planeamento e formatação de um conteúdo numa mensagem com intuito de partilhar ideias com os outros de forma efetiva, expressiva e persuasiva. Está focado na resolução de problemas e em alcançar a audiência alvo, seja esta visual, auditiva, táctil, olfativa, gustativa ou qualquer combinação destas.

A associação destas três áreas – observação de aves, turismo e design de comunicação – levanta a questão que é o foco principal da presente investigação: «Poderá o desenvolvimento dum suporte digital específico para a observação de aves no Algarve ajudar os observadores a obter melhores experiências?» Com base em métodos e técnicas não invasivas tais como: revisão bibliográfica, casos-de-estudo, personas, testemunhos, testes de usabilidade com observação direta e levantamento de dados, desenvolvemos um protótipo cujo intuito é responder à nossa hipótese.

Birdadvisor 360˚ é uma aplicação digital desenhada para ser um guia. É uma ferramenta promocional anual direcionada para o turismo de observação de aves que inclui informação útil sobre as aves e que permite aos seus utilizadores navegar pelos melhores *spots* de observação de aves do Algarve. Está otimizado para utilizadores iniciantes, intermédios e experientes.

No presente estudo foram analisadas as características demográficas do público-alvo e os aspetos relacionados com a IU e a UX através do teste de usabilidade. Os resultados demonstram que o público-alvo é composto por 50% de portugueses (residentes/locais e turistas domésticos) e 50%

de turistas, sobretudo provenientes de Inglaterra, Eslovénia, Alemanha, Espanha (Catalunha) e Bélgica. Existem, aproximadamente, o mesmo número de utilizadores do sexo feminino e do sexo masculino o que demonstra equidade no que respeita ao género. Metade dos inquiridos situam-se na casa dos 35-55 anos de idade, um quarto são jovens (abaixo dos 35 anos) e o outro quarto são séniores (acima dos 55 anos). Os resultados desta investigação demonstram ainda que mais de 60% dos participantes já observaram aves (desde principiantes a experientes). Os observadores experientes assumem que a maior parte das suas viagens são programadas com o intuito de observar aves; os observadores intermédios combinam a atividade de observação de aves com a fotografia da natureza e lazer; os amadores e principiantes normalmente viajam em lazer e podem combinar as suas férias com atividades relacionadas com a natureza. Os observadores experientes e intermédios assumem viajar preferencialmente com os seus companheiros, sem crianças, em grupo de amigos ou sozinhos. A maioria dos participantes preferem um acesso à aplicação através dum ato único de pagamento ou a versão gratuita com publicidade (pagando para retirar a publicidade). Poucos demonstraram interesse em pagar as ofertas no aplicativo de compras ou consideraram o pagamento de uma mensalidade para aceder à aplicação.

O protótipo da aplicação inclui muitas características importantes de forma a responder às necessidades do observador no campo, tais como: imagens e sons das aves, a descrição dos melhores *spots* de observação de aves do Algarve e a lista de aves com informação adicional sobre cada espécie. Está também incluída uma notificação para ‘aves raras na sua área’ e as suas características sociais. A aplicação fornece ainda a possibilidade de partilhar com outros utilizadores ‘roteiros’, ‘avistamentos’ e a lista de ‘espécies similares de aves’ que ajudam a identificar as espécies alvo.

Os dados reunidos nesta tese possibilitaram a identificação de alguns problemas relacionados com a implementação deste projeto, mas revelaram também quais as melhorias que deverão ser feitas de forma a beneficiar do seu potencial máximo e permitir a criação dum guia móvel ideal para a observação de aves no Algarve. Todos os participantes manifestaram contentamento com a possibilidade de concretização da aplicação e expressaram uma forte convicção de que esta aplicação lhes proporcionará uma melhor experiência na observação de aves. Assim, a nossa

questão inicial foi respondida de forma positiva, provando a nossa hipótese de que Birdadvisor 360º poderá impulsionar a experiência na observação de aves no Algarve e no mundo.

Por tudo aqui anteriormente considerado, concluímos que esta investigação e os seus resultados práticos poderão contribuir para um turismo mais sustentável no Algarve no campo da ornitologia e reforçar o setor turístico da natureza. A aplicação Birdadvisor 360˚ como nova proposta para um guia de observação de aves também pode ser uma ferramenta importante para o envolvimento das comunidades no turismo e na sua promoção. Poderá funcionar como facilitador e promotor de uma experiência turística positiva e memorável na fase de antecipação, no momento ou no pós-viagem.

Palavras-chave: *Turismo da natureza, Observação de aves, Aplicação móvel, Design de comunicação, Design de interação*

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AOU	American Ornithologists' Union
APP	Application (Computer Program)
CD	Communication Design
CIT	Congresso Internacional de Turismo / International Congress on Tourism
ECO	Related to Ecological or Environmental Terms
EHTA	Escola de Hotelaria e Turismo de Faro / School of Hospitality and Tourism Faro
EU	European Union
GPS	Global Positioning System
HCI	Human-computer Interaction
HF	Human factors
IA	Information Architecture
ICNB	Institute of Nature Conservation and Biodiversity
ID	Industrial Design
IOS	Mobile Operating System by Apple
IxD	Interaction Design
RFNP	Ria Formosa Natural Park
RSPB	Royal Society for the Protection of Birds
SPEA	Sociedade Portuguesa para o Estudo das Aves / Portuguese Society for the Study of Birds
UALG	Universidade do Algarve / University of Algarve
UI	User Interface
UIE	User Interface Engineering
UNEP	United Nations Environment Programme
UNWTO	United Nations World Tourism Organization
UX	User Experience
VIREO	Visual Resources for Ornithology

CHAPTER 1. Introduction

1.1. Scope, opportunity and object of study

The relation between birdwatching, tourism and communication design is the main purpose of this study and of this project, in order to develop a new digital platform, yet missing, to support birdwatchers and for the promotion of this type of tourism in Algarve. Therefore, to be able to propose the most efficient and useful tool to the target public, we are going to study some good examples of communication and interaction design, learn what birdwatching activity is and who are the potential users, as well as scope the tourist market and its trends.

Portugal is a privileged European destination for birdwatching and it gives tourists an opportunity to discover the rich nature biodiversity and experience some unique ecosystems namely in the Algarve region: Ria Formosa, Lagoa dos Salgados or Península de Sagres (Turismo de Portugal, 2012). Birdwatching is a nature tourism activity and it's growing as an important area for a sustainable tourist offer in Algarve.

Contrarily to the traditional sun-and-sand resorts mass tourism, which has already reached a steady growth stage, ecotourism, nature, heritage, cultural and soft adventure tourism as well as sub-sectors such as rural and community tourism are taking the lead in tourism markets and they are predicted to grow most rapidly over the next two decades (UNEP-UNWTO, 2012). Algarve has strongly developed the sun-and-beach tourist offer and by promoting other types of tourism – nature, cultural heritage, gastronomy, and others – high-peak seasons can be avoided and tourists may come to visit the region throughout the year.

It is estimated that the global spending on ecotourism is increasing at a higher rate than the industry-wide average growth and the nature-based tourism is an important economic component of the entire tourism market (UNEP-UNWTO, 2012). The development of tourist activities in protected or sensitive zones implies a greater sense of responsibility (*ibid*), indicating the need of development of a new guided platform for the birdwatching activity in Algarve. There is the

opportunity to create a product to sustain and promote this activity, a new digital platform - a modern, mobile tool which will be easy to use and accessible on smartphones to everyone.

Design and design research are playing an important role within the development of strategies in problem-solving, focusing on satisfying the needs of the communities involved in the tourism and their promotion.

Therefore, we believe that our hypothesis of creating a digital support tool for birdwatching in the Algarve, with multiple tools for searching and observing birds, will help users to have a better experience and to fully enjoy this activity on the field. Thus is the answer to our research question: users can discover new locations through our birdwatching app, record their route, mark the observed birds and share their experience with other users on this platform without the constraints of heavy gear. Birdadvisor 360º app might as well become an important tool for promoting this kind of tourism in Algarve.

1.2. Relevance of the problem and research question

The new approach to birdwatching tourism will be oriented towards developing a new technological asset which will be easy to use and accessible to everyone on mobile platforms.

In order to promote this type of tourism in the region this project proposes the development of a mobile application that will work as a specific digital support tool for birdwatching and help bird observers to have a better experience. Therefore, the purpose of the research can be identified as: digital tool for sustainable tourism which is tending to answer the following research question:

Can the development of a specific digital support for birdwatching activity in Algarve help birdwatchers to have better experience?

1.3. Aims and objectives

The aim of this project is to connect three main areas of study: birdwatching, tourism and communication design.

The experience of our first birdwatching activity with a group of experts and experienced birdwatchers gave us the opportunity to learn about it *in loco*. Everyone there was using binoculars, some of them were carrying cameras or big telescopes on a tripod and most of them were using paper book guides to help them identifying the species. However, it didn't seem very handy to carry around all the equipment while searching the book guide to identify the bird species. Participants were also focused on hearing the bird sounds attentively, as the birds can be spotted much faster by the sound than by the eye. Besides, the book guides don't support this type of media.

This field experience brought us clarity and we came up with the idea of developing a mobile tool for birdwatchers which should be smaller and handier than paper book guides and should support the visual and sensorial content needed for this activity. Upon studying the areas of birdwatching, tourism and communication design we projected a solution that was creating a tourist birdwatching field guide for mobile devices. It would help the users to explore the most important bird-observatory places, individually or in a group, and would provide information on bird species living or flying past the Algarve. It would also be an important information asset for the ornithologists with the user's «reports of seen birds» during each recorded activity. As a new technological component it would enrich this nature tourist sector.

The general objectives are to promote birdwatching tourism in Algarve by creating a mobile application (App) as a new guided platform in a digital platform and modernise the paper birdwatching guides. New technologies can be used as facilitators and promoters of a positive and memorable tourist experience, in the anticipation phase, *in situ* or post-trip.

1.4. Adopted methodology

The adopted Non-intervention research methodology includes qualitative and quantitative dimensions.

The empirical research task will determine whether our hypothesis of creating a digital support for birdwatching activity in the Algarve, to help users to have a better experience in birdwatching on the field, is correct or not. This type of research usually involves the creation of experimental conditions associated with a clear methodological design as well as a systematic evaluation and interpretation of all information, especially at results levels (Silva, 2010).

The methodology consisted of the following research techniques: literature review on tourism, communication design, birdwatching (selection, collection, analysis, and synthesis) and case studies (analysis of the existing Apps and identifying their strong and weak points). Additionally, was used the methodology of creating personas for better understanding the potential user of our project and the usability testing. It included careful observation of participants during the testing process and collecting surveys for the evaluation of the Application.

The results gathered with the Non-interventionist methodology led to the prototype, proved our hypothesis and positively answered our research question, suggesting that a mobile application can help birdwatchers to have a better experience in their activity.

1.5. Scientific report structure

This scientific report is divided into five parts, described as follows:

Chapter 1. “Introduction” presents the scope, opportunities and objects of study and explains the aims and objectives of the project. It focuses on the importance of the product along with the research question and the research adopted methodology.

Chapter 2. “Tourism” contains a comprehensive review of tourism in general terms scoping the research on tourism in Portugal and Algarve. The distinction between Nature tourism and Ecotourism is made clear and birdwatching is described as a tourist activity.

Chapter 3. “Communication Design” describes the concepts of Communication Design, Interaction Design, User Experience Design, and User Interface Design. It focuses on examples of birdwatching applications for tourism as the state-of-art and presents the two selected case studies: Audubon Birds of North America and the Sibley eGuide to Birds App.

Chapter 4. “Proposal: Birdadvisor 360°” presents the target public and audience by creating personas and bringing about aims and objectives. It describes the conceptual, semantic and technical characteristics, as well as the structure of the App and its functionalities. It includes a presentation of the final evaluation along with procedures, results and discussion of the results.

In the final chapter 5. “Conclusions”, are presented specific and general conclusions as well as the answer to the research question. It describes the contributions of the App and recommendations for future work.

CHAPTER 2. Tourism

1.1. Tourism

Tourism is a multidisciplinary area of study that is evolving and playing each year a more important role in today's world. The World Tourism Organisation Network defines tourism as a *"social, cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purposes. These people are called visitors (which may be either tourists or excursionists; residents or non-residents) and tourism has to do with their activities, some of which imply tourism expenditure*" (UNWTO, 2008, p.1). Its increment over the years has a huge impact on economic, social, cultural, environmental and employment development. Because of all these impacts, it is required that all stakeholders involved in tourism produce more goods and services.

According to the latest UNWTO World Tourism Barometer, the overall results show that international tourist arrivals grew by 4.4% in 2015 and reached a total of 1,184 million. Some 50 million more tourists (overnight visitors) travelled to international destinations around the world last year as compared to 2014. Year 2015 marks the 6th consecutive year of above-average growth, with international arrivals increasing by 4% or more every year since the post-crisis year of 2010 (UNWTO, 2016) (See Figure 1).

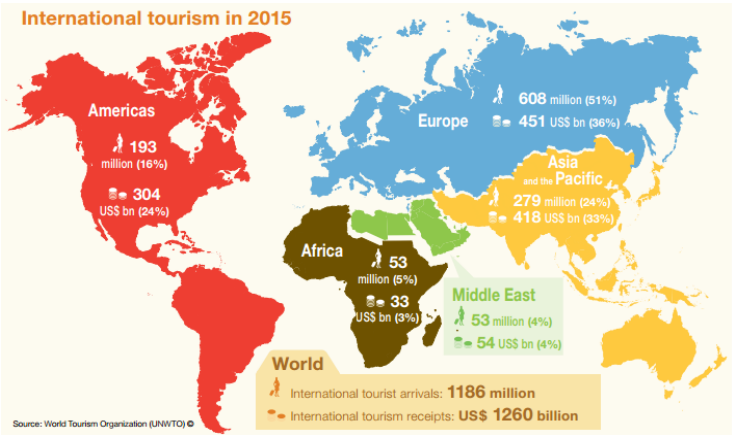


Figure 1. International tourist arrivals 2015 (in million), (UNWTO, 2016, p.2).

The European Union's tourism industry occupies an important place in the economy of the Member States with tourist activities representing a large potential source of employment. Any evaluation of its competitiveness requires a good knowledge of the volume of tourism, its characteristics, the profile of the tourist and tourism expenditure and the benefits for the European economies (Eurostat, 2016).

There are many different ways and purposes for travelling. The statistics for the world for the year 2015 are showing that: 53% (of 632 million) of all international tourist arrivals were accounted to travel for holidays, recreation and other forms of leisure; 27% of them were traveling for visiting friends and relatives (VFR), religious reasons and pilgrimages, health treatment; 14% were travelling for business and professional purposes; and 6% of arrivals were not specified (UNWTO, 2016) (See Table 1).

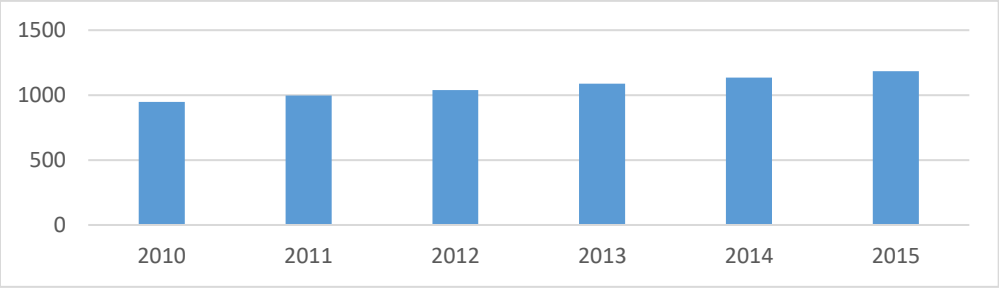


Table 1. World international tourist arrivals in millions. Adapted from UNWTO, 2016.

Europe is the top region with international tourist arrivals in the world with 608 million of visits (51%) in the year 2015. Of those, 225.2 million visits chose Southern Europe and the Mediterranean zone (UNWTO, 2016). Europe (+5%) led growth in absolute and relative terms supported by a weaker Euro vis-à-vis the US dollar and other main currencies. Arrivals reached 608 million, or 27 million more than in 2015. Central and Eastern Europe (+5%) rebounded from last year's decrease in arrivals. Northern Europe (+7%), Southern Mediterranean Europe (+5%) and Western Europe (+3%) also recorded sound results, especially considering the many mature destinations they comprise (UNWTO, 2016) (See Table 2).

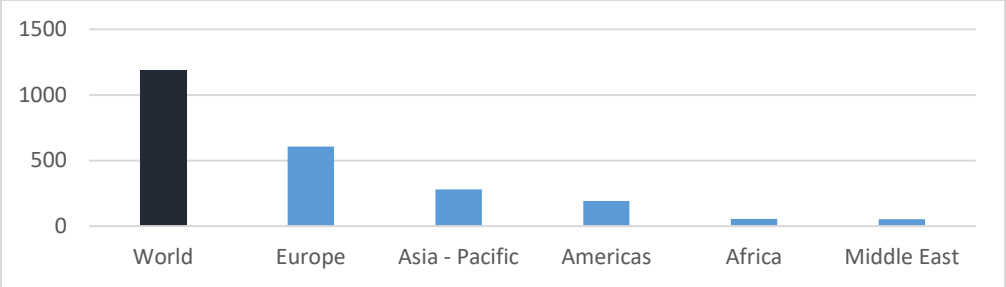


Table 2. Total of international tourist arrivals by destination in 2015. Adapted from: UNWTO, 2016.

The region's growth of international tourist arrivals was driven largely by Southern and Mediterranean Europe (+14%) in 2015 (see Figure 4). Portugal grew by exceptional 10% comparing with the previous year: from 9.3 million in 2014 to 10.17 million in 2015 (Instituto Nacional de Estatística, 2016) (See Table 3).

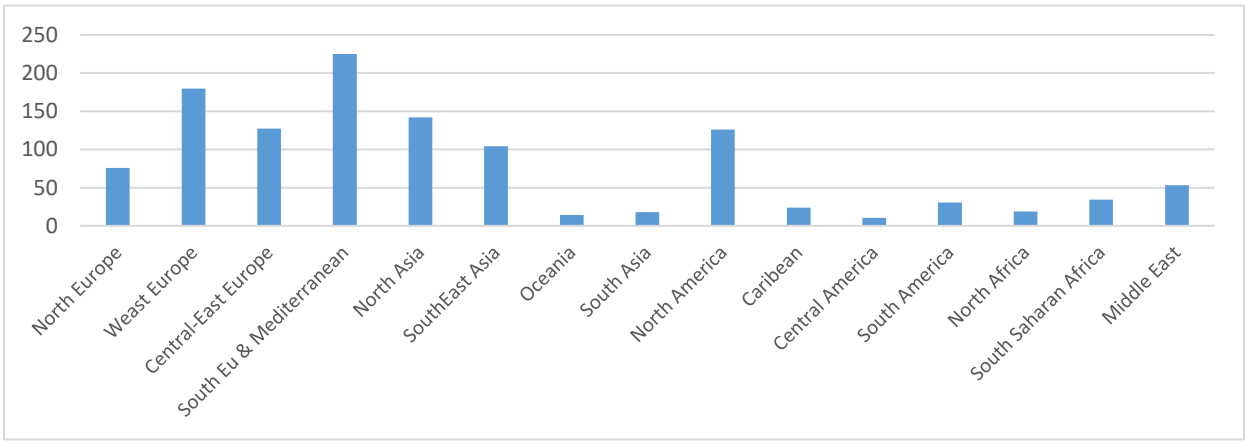


Table 3. Total of international tourist arrivals by principals sub-regions destinations in 2015. Adapted from: Instituto Nacional de Estatistica, 2016.

2.1.2. Tourism in Portugal and Algarve

Tourism is a priority sector for the Portuguese economy representing 2 billion euros of total revenues for the overnights, to which are added the effects on other sectors such as transport, agribusiness, culture, traditional products of the textile and footwear business (Crescimento Verde, 2015). Tourism's increasingly important role in economy was about 6% of the direct contribution and 15.7% in total contribution to the Portuguese Gross Domestic Product in 2015. Those values are forecast to rise each year and reach values up to 6.9% of direct contribution and 17% of total contribution by 2026 (WTTC, 2016) (See Table 4).

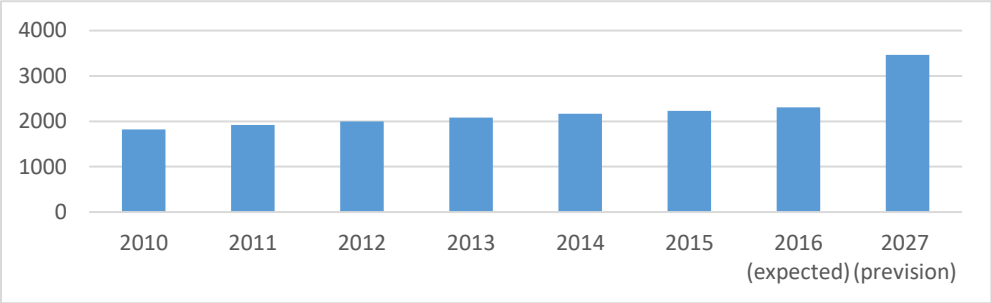


Table 4. Total Contribution of Travel & Tourism to GDP 2015. Adapted from: WTTC, 2016.

The direct contribution reflects the "internal" spending on Travel & Tourism by residents and non-residents for business and leisure purposes. The total contribution includes the indirect and induced impacts on the economy that measures the GDP and jobs supported by the spending of those who are directly or indirectly employed by the Travel & Tourism industry (*ibid*).

In 2015, the Travel and Tourism revenue has continued to increase (+9.3%) reaching EUR 11.4 thousand million, while expenditure had 8.9% growth. The balance of this item reached EUR 7.8 thousand million, reflecting a 9.5% rise (+15.4% in 2014). It directly supported 363.000 jobs which represents 7.9% of total employment in Portugal and indirectly supported 882.000 jobs (19.3%). Those values are also expected to rise by 11% till 2026 of direct contribution and 22% of total contribution (WTTC, 2016). (See Table 5).

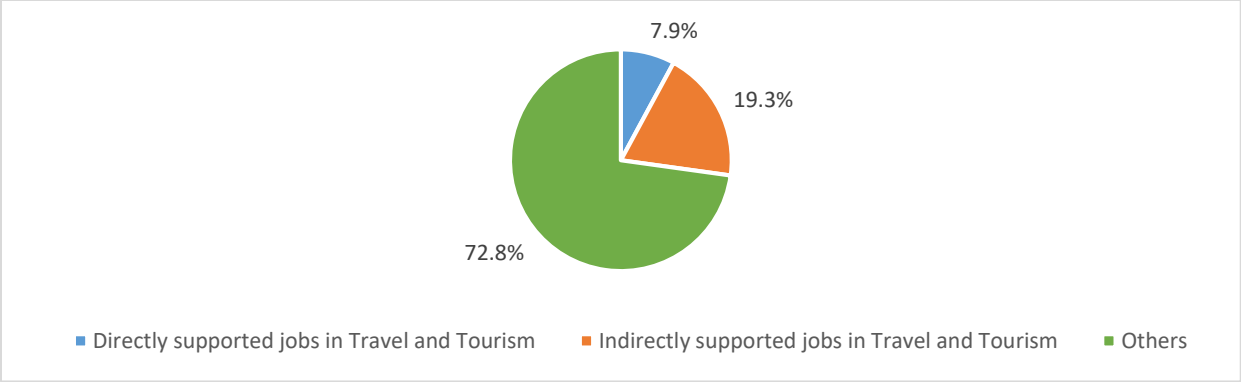


Table 5. Total employment in Portugal in 2015. Adapted from: WTTC, 2016.

In the same year, the number of guests totalled 19.2 million and overnight stays were 53.2 million, representing increases of 10.9% and 9.1% respectively (+13.9% and +12.1% in 2014). As for total revenue, it amounted to EUR 2.4 billion (+ 13.5%) and lodging income totalled 1.7 billion euros (+ 15.3%). These results are slightly above the previous year (+12.9% and +13.7% respectively). The hotel industry (excluding local accommodation, tourism in rural areas and housing) represented 69.3% of total overnight stays, followed by hotel apartments (14.8%) (Instituto Nacional de Estatística, 2016).

In 2015, hotel accommodation activity hosted 16.3 million guests and 46.5 million overnight stays. Comparing to previous year, results increased by 8.6% and 7.0%, respectively, but not as much as in 2014 (+12.6% and +11.0%) (Instituto Nacional de Estatística, 2016, p.7) (See Table 6).

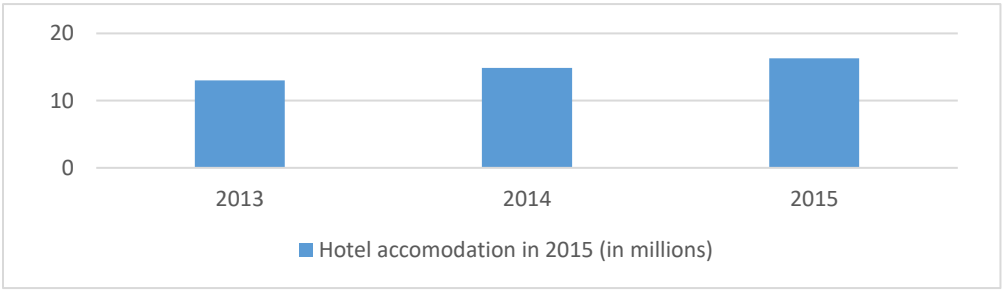


Table 6. Hotel accommodation in Portugal 2015 (in millions). Adapted from: Instituto Nacional de Estatística, 2016, p.7.

The UK was the main source market (24.6% of non-resident overnight stays) and recorded a growth of 9.7%. The evolution of the German market was also notable (+10.1%, with a share of 13.9%), and so was Spain (+3.1%; 10.6% of the total) and France (+12.0%, corresponding to a share of 9.5%). Also worth mentioning is the impressive growth results of Poland (+22.3% overnight stays), Switzerland (+17.4%) and Belgium (+19.2%). Of the major markets, only Brazil recorded a slight decrease (-4%) (Instituto Nacional de Estatística, 2016) (See Table 7).

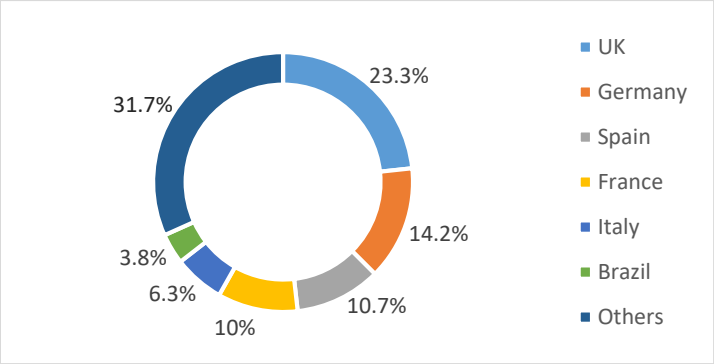


Table 7. Total of international tourist guests by origin in 2015. Adapted from: Instituto Nacional de Estatística, 2016.

Portugal is holding the 15th place in the world ranking that reveals the most competitive countries in the tourism sector. Spain, France and Germany occupied the top spots in 2015, followed by the United States America which is the only country outside Europe in the first five positions. Data according to the Global Travel & Tourism Competitiveness Index 2015, prepared by the World Economic Forum, which explores the weaknesses but also the strengths of each country in different areas of tourism assessing issues such as security, quality of transport or support service tourist (Marketeer, 2015).

The main tourist areas in Portugal are: North, Centre, Lisbon, Alentejo, Algarve, Azores and Madeira Island. In 2015, the guests remained in hotel properties located in the regions of Algarve (38%), Lisbon (19.9%), North (13%), Center (12.1%) and Madeira (9.6%) (Instituto Nacional de Estatística, 2016) (See Table 8).

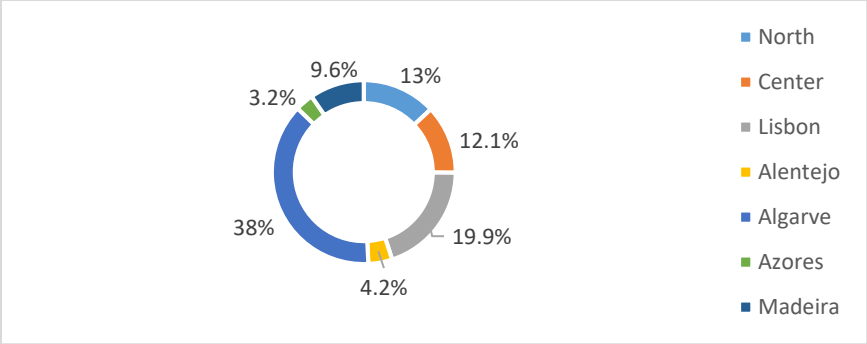


Table 8. The main tourist areas in Portugal in 2015 by hotel guests. Adapted from: WTTC, 2016.

The Lisbon region registered 4.9 million guests, mostly foreigners (+ 68% - 3.3 million). The overall development of the region (+ 13.4%) was due not only to the growth of foreign guests (+14.1% - 411.000) but also to residents (+ 12.2% - 169.500). The Algarve received 3.6 million guests, of which 2.5 million (70%) were foreigners. The total number of guests increased in the region for 14.6%, driven by the evolution of foreigners + 12.2% (271.100) and residents + 20.1% (187.000) guests. In 2015, hotels accommodated 19.2 million guests (+10.9%) contributing with 53.2 million overnight stays (+9.1%). Algarve region registered 35.1% of total overnights, mostly foreigners, followed by Lisbon (24.9%) and Maderia (13.6%) (Instituto Nacional de Estatística, 2016) (See Table 9). The region Algarve was positioned in 1st place in 2015 for the internal market, with 7.4 million overnight stays and also marking an absolute increase of 870.700 overnight stays (+ 19.3%) as compared to 2014 (Turismo de Portugal, 2016).

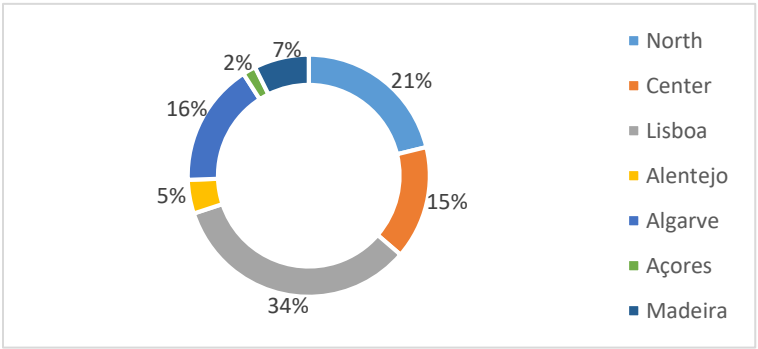


Table 9. Total of international tourist guests by Portugal region destination, 2015. (Instituto Nacional de Estatística, 2016).

2.2. Nature tourism and Ecotourism

A Nature tourist seeks tranquillity, rest and authenticity provided by rural tourism and performs multiple activities at the destination, such as eco resorts, agritourism and other cultural nature activities/sports (Turismo de Portugal, 2013). Some of the growing activities that stand out are tours on foot, tours by bike, horseback riding and birdwatching. A presumable annual growth of these tourist products is 5% in the coming years (*ibid)*. The main markets of Nature tourism at European level are Germany, UK, Netherlands, Scandinavia, France and Italy, which represent 91% of the European market (Turismo de Portugal, 2013).

Nature tourism is, according to Fredman and Tyrväinen (2010, p.179), the act of "*travelling to and staying overnight in locations close to protected areas, forests, lakes, the sea or the countryside and participating in activities compatible with the location's natural qualities*".

This sector includes *soft* and *hard* nature markets (AEP, 2015):

- *Soft* nature stands for the market, represents low-intensity outdoor activities (walks, excursions, hiking and wildlife observation);
- *Hard* nature market represents the activities where experiences are related to the practice of sports in nature (rafting, kayaking, hiking, climbing) and activities which require a high degree of concentration or knowledge, such as birdwatching. This market is representing about 80% of the total travel Nature markets.

According to the International Ecotourism Society, ecotourism is defined as "responsible travel to natural areas that conserves the environment and improves the well-being of local people". While "nature-based tourism" is simply described as travel to natural places, ecotourism is a type of nature-based tourism that benefits local communities and destinations environmentally, culturally and economically (TIES, n.d.). Nevertheless, we will be further using the broader term of nature tourism, since the project includes a wider audience.

The United Nations Agency, who is in charge for the promotion of responsible, sustainable and universally accessible tourism, is emphasising that there is a need for a holistic approach to tourism development, management and monitoring in order to formulate and implement national and local tourism policies as well as the necessary international agreements or other processes in respect of tourism (UNWTO, 2008). The European Tourism Indicator System claims that one of our biggest challenges, however, is to reinforce sustainable tourism development and to improve it in order to ensure the long-term competitiveness of the industry (European Commission, 2013). Therefore, it was created an assessment of the development of tourism over two decades from 2010 to 2030; a broad research project for a long-term forecasting of tourism development of UNWTO Tourism Towards 2030 which became a worldwide reference for international tourism forecasts.

The key outputs of Tourism Towards 2030 are quantitative projections for international tourism demand over a period from the year 2010 to 2030. The updated forecast were enriched with an analysis of the social, political, economic, environmental and technological factors that have shaped tourism in the past, and which are expected to influence the sector in the future, according to the World Tourism Organisation (UNWTO, 2015a).

By managing tourism in a sustainable way, the limits and capacity of the tourism resources can be recognised and their development encouraged, balancing as well as optimising the immediate economic, environmental and socio-cultural benefits, whilst also ensuring the long-term future for our European tourism industry, states out European Tourism Indicator System (European Commission, 2013).

2.3. Birdwatching

Birdwatching activity is considered a nature-based form of tourism where the main motivation of the tourists is the observation and appreciation of nature as well as of the traditional cultures prevailing in natural areas. It contains educational and interpretation features and it is generally, but not exclusively organised by specialised tour operators for small groups (UNWTO, 2002).

Birdwatching or birding is a method for the observation and study of birds. The observation of birds can be done with the naked eye or through a magnifying device such as binoculars or telescope. It also involves audio components, since many species can be identified by the sound appearance. Most bird observers are performing this activity mainly for recreational or social reasons unlike ornithologists who engage in the study of birds using formal scientific methods (Dunne, 2003). There is always an advantage if we are comparing birdwatching with other nature related activities, because this activity doesn't require much physical effort, it can be done anywhere, anytime and by everyone. The Turismo de Natureza do Algarve (Turismo do Algarve, 2014), groups the practitioners of birdwatching with different motivations and supporters of certain types of activities in:

- Soft birdwatching, representing a wider market of people. They want to see birds in general;
- Hard birdwatching, includes the type of visitor who purchases pure package birdwatching and has a list of target species to observe and is quite a connoisseur of the species that exist in the regions to be visited;
- Twitchers, who collect data on new species and travel in search of species not yet seen;
- Photographers, who are travelling in search of different birds for the purpose of making photographs (digiscoping).

Ornithological tourism is a continuously growing sector with the worldwide interest of specialists and birdwatchers. The world market of birdwatching estimation points out the existence of around 100 million birdwatchers. The largest market is represented by the USA with 47.7 million adults (in 2006) and over $85 billion of direct and indirect economic benefits (Moore, Scott & Moore, 2008). In Europe, the largest market is represented by the UK with 2.4 million birdwatchers (Ministro & Miguel, 2009). Birdwatching is strongly present in Northern European countries, but is also gaining importance in Mediterranean countries such as Spain, Italy and Portugal (Turismo de Portugal, 2012). Portugal is located in the Mediterranean region which is one of the most important areas for biodiversity and landscape diversity worldwide. It includes mountains and plains, embedded valleys and marshlands, extensive forests and assembled rocky shores and beaches, estuaries and coastal lagoons (Turismo de Portugal, 2012a). With such a large variety of

habitats, Portugal also has the greatest diversity of birds in Europe, with around 360 regularly occurring species (*ibid*). The Algarve region has many important birdwatching hotspots, like Castro Marim, Lagoa dos Salgados and the Ria Formosa Natural Park (RFNP), therefore the interest and the potential for birdwatching activities is widely recognised and showing a significant potential in the development of birdwatching tourism in Algarve (Costa, 2015, Turismo de Portugal 2012 & Machado, 2011). The major strengths for birdwatching in Algarve are the bird diversity as well as the favourable conditions towards the practice of birdwatching, such as climate and accessibility. "*Tourism in the Algarve can certainly benefit from a major promotion of birdwatching tourism, particularly in off-peak seasons, when fewer crowds of tourists are visible, and particularly interesting birding opportunities present themselves (e.g. bird migration)*" (Machado, 2011, p.102).

According to the Birdwatching guide to the Algarve, around 40% of the Algarve region is included in the Natura 2000 European Ecological Network, both as a Special Protected Area for Birds and as a Special Area of Conservation. This network includes sites across the region with different biophysical characteristics, many of which also have other protection statuses, including two natural parks, one nature reserve and two areas of protected local landscape (Turismo de Portugal, 2012). In addition to these sites, the Algarve also has a number of areas recognised internationally for their importance to birds, called IBAs (Important Bird Areas) – Costa Vicentina, Serra de Monchique, Serra do Caldeirão, Ria Formosa and Castro Marim – which is a designation awarded by the worldwide organisation BirdLife International, which is represented in Portugal by SPEA (Portuguese Society for the Study of Birds) (See Figure 2).

Figure 2. Protected areas and Important Bird Areas (IBA's). Adopted from: Turismo de Portugal (2012, p.11).

CHAPTER 3. Communication Design

3.1. Communication Design

According to Frascara (2004), Visual Communication Design developed its essential components in the 1920s. It changed in the 1950s when Psychology, Sociology, Linguistics and Marketing attracted the attention of designers to change their objective to make more effective communication. In the present day, Visual Communication Design is deeply connected with developments in technology, which lead to increased attention paid to notions of interaction between the public and information (*ibid*).

Communication Design is a practice of planning and shaping a message in content, with effective, expressive and persuasive ways to share ideas with others. It is focusing on problem-solving and reaching the target audience which can be visual, but also auditory, tactile, olfactory, gustatory, or any combination of these (Luminant Design, 2014a).

According to Frascara (2004), Visual Communication Design involves a method (design), an objective (communication), and a medium (vision). Communication Design is creating a need to communicate a specific message and obtaining the desired response in different forms. Its focus is on touching people and transmitting ideas (Luminant Design, 2014a).

As stated by Frascara (2004), the designer should be able to provide a clarity of form and content, facilitation and stimulation of reading (publication design) and consider several aspects of all projects in communication:

- Clarity of form and content (perception and understanding) in the presentation of individual elements (letters, numbers, pictograms, diagrams, maps, charts, graphs, signs, symbols, signage, or control panels) and the organisation of communicational sequences, including categorisation of complex information (announcements, timetables, study programmes, learning aids, legal documents, rules and regulations, theatre tickets, emergency instructions, instruction manuals, websites, or user interfaces).

• In publication design we make a strong selection of the surrounding stimuli, processing only a small amount of the information and this supports the need to communicate the content of a message through its most immediately visible elements.

• Consideration of cultural, social, economic, technological and ecological aspects of all projects in communication, as well as involving making information understandable, usable, interesting, pleasing, and it should generate the expected reaction from the public.

Design methodology is a set of actions which is trying to create successful solutions to specific problems. Bruno Munari, an Italian designer describes the design methodology in a simple way: a recipe for cooking a dish. His individual approach to design can serve as a guide to identify the user needs and help to provide simple and effective solutions. Furthermore, his methodology can be applied to any design problem.

"The design method is nothing more than a series of operations necessary, arranged in a logical order dictated by experience. Its purpose is to achieve maximum results with minimum effort" (Munari, 1981, p.20).

3.2. Interaction Design

According to Saffer (2007), Information Architecture (IA), Industrial Design (ID), Communication (or graphic) Design (CD), User-experience (UX) Design, User Interface Engineering (UIE), Human-computer Interaction (HCI), Usability Engineering (UE), and Human Factors (HF) are formal disciplines who are still defining themselves. The same goes for the Interaction Design (IxD).

Interaction Design is trying to understand the communication between users and technology and consequently facilitating the interactions between them (Usability.gov, 2016). It is a practice of planning and shaping a product through a perspective of behaviour and experience, therefore it's behaviour-oriented design which aims to understand user's goals, needs and motivations (Cooper, Rimann, Cronnin, & Noessel, 2014). According to Padia, K. (2015) and Preece, Rogers & Sharp

(2007), Interaction Design primarily defines how the user can interact with the interface, giving clues to the users about behaviour. They are taking into consideration the system feedback and response time and simplifying the interface as best as possible (*ibid*).

Information Architecture (IA) is the art of organising an information and structure of content: how to best structure and label content so that users find the information they need. A visual language is created by Communication Design in order to communicate content, Industrial Design (ID) is making physical objects and connecting their use as well as functionality for human, assuring those objects are adapted to the limitations of the human body (Saffer, 2007). Human-computer Interaction (HCI) is focusing on how humans relate to computers, and the focus of Interaction Design is humans' relation to the world (Moggradge, 2007). User-interface Engineering focuses on the controls of a digital device, while Usability Engineering is about testing products to assure they make sense to users (Saffer, 2007).

Most of the disciplines overlap at least partially with the User-experience Design, the discipline of looking at all aspects of visual design and interaction design (see Figure 3). Most successful products, especially digital products, involve multiple disciplines working in harmony (*ibid*).

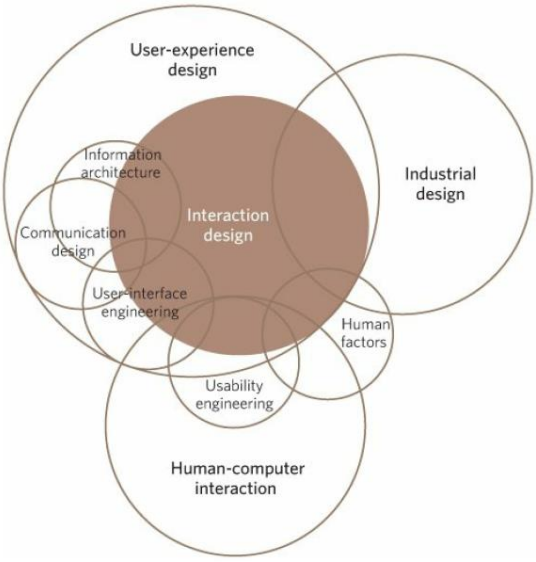


Figure 3. The overlapping disciplines of interaction design. Adopted from the Dan Saffer (2007, p. 21).

There are four approaches to finding design solutions and creating successful products: User-centred Design (UCD), Activity-centred Design (ACD), Systems Design and Genius Design (Saffer, 2007). For our research we will focus on the User-centred and Activity-centred Design which focus on user's goals, needs, tasks and activities that need to be accomplished.

In the User-centred approach users guide the design and the designer translates the user needs and goals, while in Activity-centred approach the users perform the activities while designers create tools for those actions (see Figure 4).

Approach	*Overview*	*Users*	*Designer*
User-Centered Design	Focuses on user needs and goals	Guide the design	Translates user needs and goals
Activity-Centered Design	Focuses on the tasks and activities that need to be accomplished	Perform the activities	Creates tools for actions
Systems Design	Focuses on the components of a system	Set the goals of the system	Makes sure all the parts of the system are in place
Genius Design	Relies on the skill and wisdom of designers used to make products	Source of validation	Is the source of inspiration

Figure 4. Four Approaches to Design. Image taken from: Dan Saffer (2007, p. 3).

According to Cooper, Rimann, Cronnin & Noessel (2014), the use of Interaction Design principles, values and patterns helps us to appropriately sequence the decisions, to define and design a desirable and effective product. Interaction Design principles are guidelines for the design of useful and desirable products, systems, and services. They are applied throughout the design process, helping us translate tasks and requirements that arise from scenarios into formalised structures and behaviours in the interface (Cooper et al., 2014). The purpose of design principles is to optimise the experience of the users when they engage with a product and to minimise their work. Principles operate at several levels and cross-platforms, from the general practice of Interaction Design to the specifics of Interface Design and they are categorised as: design values, conceptual principles, behavioural principles and interface-level principles (*ibid*).

1. Design values – are guidelines for the successful, ethical, effective and appropriate practice of design (Cooper et al., 2014). These guidelines are a set of rules based on our values, and their core lies in the technology that should serve people and in our experiences which should be structured in accordance with our abilities of perception, cognition, and movement. Therefore, designers should create design solutions that are: *ethical* – (considerate, helpful) do no harm and are improving human situations; *purposeful* **–** **(**useful, usable) help users achieve their goals and aspirations; *pragmatic* **–** **(**viable, feasible) help users to achieve their goals and accommodate business and technical requirements; and *elegant* **–** efficient, artful, affective and represent the simplest complete solutions, possess internal (self-revealing, understandable) coherence and appropriately accommodate and stimulate cognition and emotion.

2. Conceptual principles – help to define what digital products should be like. How their structure fits into the broader context of use required by their users (*ibid*). This includes designing for intermediates, designing behaviour and form, and for a specific platform and posture, designing for a desktop software, websites and web applications or mobile devices (phones, tablets and digital cameras). The orchestration and flow should be always flawless in order to ensure that the users remain productive and engaging, and that products support their intelligence and effectiveness. Designing for intermediates means that all digital products should be optimised for beginners and intermediates and help them becoming quickly familiar and comfortable with navigation and functionality. Interaction and Interface design are addressing the needs of beginners and expert users with a single, coherent interface. The right platform must support the needs and context of our users and the product posture must present its best behavioural and aesthetic stance in harmony with the chosen posture. To create a sense of flow, our interaction with software must become transparent – we become unaware of the intervening software (Cooper et al., 2014).

Moreover, well-orchestrated user interfaces have to be designed with harmonious interactions, by including the users' mental models, the "less is more" strategy, keep tools close at hand and provide modeless feedback. Design has to provide for the probable Ad and provide for the possible, comparisons, direct manipulation and graphical input. It has to reflect object and application status and avoid necessary reporting as well as the blank slates. It has to differentiate between command

and configuration, provide choices and optimise for responsiveness and accommodate reaction time *(ibid*).

3. Behavioural principles – define how a product should behave in general and in specific contexts.

4. Interface-level principles describe the effective strategies for organisation, navigation, communication of behaviour and information (Cooper et al., 2014).

All these principles serve to optimise the user experience and this optimisation means *minimising* our memory, along with our cognitive, visual and physical work. For minimising our memory work a device has to remember product behaviours – command vectors, passwords, names and locations of data objects and controls, and other relationships between objects – instead of us. For cognitive work the comprehension of product behaviours, as well as text and organisational structures, is of the utmost importance. Visual work means figuring out where the eye should start on a screen, finding one object among many, decoding layouts, and differentiating among visually coded interface elements (such as list items with different colours). Lastly, the keystrokes, mouse movements, gestures (clicking, dragging, double click), switching between input modes, and number of clicks required to navigate are representing the physical work (*ibid*).

Interaction design patterns also called as *general repeatable solutions* are the model examples to specific classes of usability problem in interface design or interaction design (Folmer, n.d). They concern the structure and organisation of elements as well as dynamic behaviours and changes in elements in response to user activity (Cooper et al., 2014).

Patterns can serve to reduce design time and effort on new projects. They can improve the quality of design solutions, educate designers and facilitate communication between designers and developers. The core of each pattern lies in the relationships between objects and the user's goals (*ibid*). According to Cooper et al. (2014), design patterns can be organised by posture, structure or behaviour:

• Postural patterns - can be applied at the conceptual level and help determine the overall product stance in relation to the user. An example of a postural pattern is “transient,” which means that a person uses it for only brief periods of time so that a larger goal can be achieved elsewhere.

• Structural patterns - solve problems that relate to the arrangement of information and functional elements on the screen. Structural patterns consist of views, panes and other element groupings and have become increasingly documented, especially with the rising popularity of mobile user interfaces and platforms such as iOS and Android.

• Behavioural patterns - solve wide-ranging problems relating to specific interactions with functional or data elements.

According to Tidwell (2011), there are many patterns and dynamic techniques to use when designing for mobile devices. The visual framework, centre stage and grid of equals represent the visual hierarchy of the page/screen, regardless the type of content. For presenting content visible at one time, it can use scrollbars, module tabs, and accordions, collapsible or movable panels. Right/left alignment and diagonal balance work with the spatial relationships among the text and controls. The responsive disclosure, responsive enabling and liquid layout patterns deal with the dynamic aspects of content layout. Ones are guiding user through a series of options by indicating what can be done step by step while others are arranging a page that can change size and shape at the user’s whim (*ibid*).

According to Saffer (2007), users are not going to engage with the product if an interface does not display the attributes of good interaction design and flow. All of these characteristics, along with the principles of interaction design are guiding the products and services. Therefore, interaction design should always attempt to be:

- Trustworthy - we have to trust the tool. That it can do the job and if we trust it, we are more likely to deeply engage with it. A trustworthy product or service is one that users will take the time to examine and learn, because they are not afraid of discovering and using more features.

- Appropriate – designer's solutions need to be appropriate to the culture, situation, and context that they live in. Understanding the specific situation that a product or service will work in and the emotional context of that situation is essential.
- Smart - The products and services we use need to be smart, prevent us from making mistakes or do the things we have trouble doing rapidly: perform computations, infallibly remember things over the long and short term and detect complicated patterns.
- Responsive – the "conversations" with products and services need to be responsive. The responsiveness of digital products can be characterised by these four basic levels, determined by the time between an action and the product's response: Immediate (product responds in 0.1 second or less); Stammer (responds in 0.1 – 1 second); Interruption (1 second or more); Disruption (more than 10 seconds).
- Clever - clever products and services predict the needs of their users and then fulfil those needs in unexpectedly pleasing ways, which leads to moments of delight and this is one of the most sublime emotions to experience, leading to long-lasting good feelings.
- Ludic – means playful. Designing products or services is providing the environment and means for users to play with a product or service. Through serious play, we seek out new products, services, and features and then try them to see how they work.
- Pleasurable – products and services can be pleasing in two ways: aesthetically and functionally. An aesthetically and functionally pleasing object, product or service works better for users due to its appeal.

Furthermore, Cousins (2015) and Saffer (2007) claim that interaction design should create good user experience based on the key elements of interaction design: motion, space, time, sound and appearance. Motion is representing the activate elements in design, like swiping or taping on the 2D or 3D environment. The amount of time should be appropriately balanced with the interactions; they should not be too long, nor too short. When using sound (pitch, volume or timbre), there must be a disable function, because not everybody wants it. The design should function with or without the sound. Appearance of how something looks gives us clues as to how it behaves and how we should interact with it: size, shape, weight, texture, as well as colour, typography, contrast and readability (Cousins, 2015).

3.2.1. Personas

A powerful tool for interaction design of descriptive models, the called personas (composite archetypes) result from researching users and patterns that indicate what are their desires, motivations and goals. They can show us their precise way of thinking and communicating, how new groups of users behave, how they think, what they want to accomplish, and why (Cooper, Rimann, Cronnin & Noessel, 2014). Designing personas play an important role in understanding user goals and focusing on certain types of users.

According to Cooper et al. (2014), the definition of personas helps designers firstly to determine what the product should do and then how it should behave. Persona goals and tasks provide the foundation for the design effort that follows: communicating with stakeholders, developers, and other designers and providing a common language for discussing design decisions. It also helps keep the design centred on users at every step in the process.

Personas reduce the need for elaborate diagrammatic models, meaning, they resemble real people and it is therefore easier to relate to them than to feature lists and flowcharts. To measure the design's effectiveness, design choices can be tested on a persona in the same way that they can be shown to a real user during the formative process. It provides a powerful reality-check tool for designers trying to solve design problems. And lastly, it contributes to other product-related efforts such as marketing and sales plans (*ibid*).

Personas can also solve issues that come up during product development (Cooper et al., 2014): The elastic user – designing for the elastic user gives a product team license to build what it pleases, while still apparently serving "the user"; Self-referential design – occurs when designers project their own goals, motivations, skills, and mental models onto a product's design. They might understand and like it, but not necessarily the audience; The Edge cases – personas help to prevent designing from situations that might happen, but that usually won't for most people. Edge cases must be designed and programmed for, but they should never be the design focus. They provide a reality check for design and prioritise functions with great clarity.

By using personas, which are a critical tool for ideating and validating design concepts, as user models, we can develop an understanding of our users' motivations and goals in specific contexts. They engage the empathy of the design and development team around the users' goals. If personas provide the context for sets of observed behaviours, goals are the drivers behind those behaviours. Goals are not tasks or activities, they are the expectation of an end condition, as activities and tasks are an intermediate steps that help someone to reach their goals. User goals help designers to consider a product's functions. Functions, along with behaviour, must address goals through as few tasks as necessary (Cooper et al., 2014).

3.2.2. User experience design

User experience (UX) design concerns three areas: form, behaviour and content (See Figure 5). It specifically *designs the behaviour* of complex interactive systems, and the design of informational systems have to work smoothly in synchrony with each other in order to deliver optimal experience to the users (Cooper et al., 2014, Saffer, 2007).

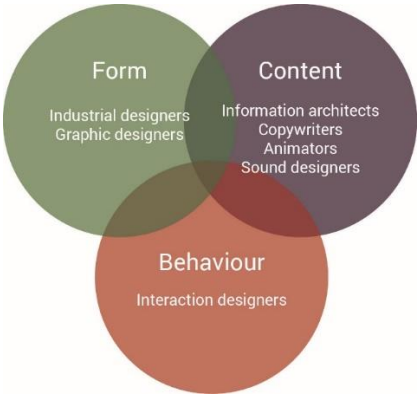


Figure 5. User experience concern areas. Adapted from: Cooper et al., 2014).

User Experience (UX) is critical to the success or failure of a product in the market. Many times UX is confused with usability which partly describes how easy a product is to use and it is true that UX as a discipline began with usability. However, UX has grown to accommodate rather more

than usability and it is important to pay attention to all facets of the user experience in order to deliver successful products to market (Kellingley, 2016a).

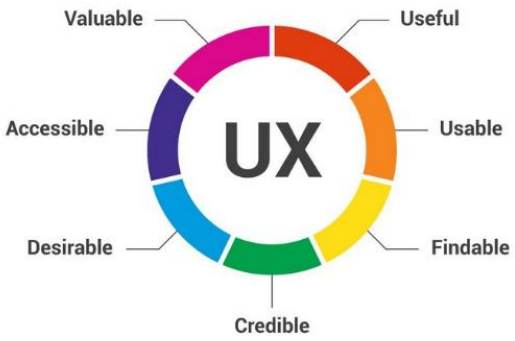


Figure 6. The 7 factors that influence the user experience. Adopted from: Kellingley (2016a).

According to Peter Morville (2004), a pioneer in the UX field, there are 7 factors that contribute to a valuable and meaningful user experience (see Figure 6): the provided content should be original and easy to use in order to be useful and usable. The design elements as image, identity and others should evoke an emotion and appreciation, so that the product becomes more desirable. The content needs to be navigable, accessible to the people with disabilities and trustworthy to the users in order to achieve credibility. Our products must deliver value to our users and contribute to improve the customer satisfaction (*ibid*).

3.2.3. User interface design

The user interface of mobile applications is a mix of hardware and software components so users can accomplish the application‘s intended and desired goal (Pilomia, 2011). While the interface is a critical component to the interaction, it is a product's function that directly responds to a user's goal and should drive a product's form during design development. The user interface form should arise from the function and selected activity (Luminant Design, 2014b). According to Saffer (2007), we can only engage with digital products through some intermediary, called interface,

which connects us with digital devices. The interface design is only *experienced representation* (what we see, hear or feel) and it is only a part of Interaction Design (*ibid*).

According to Cooper et al. (2014), Visual Interface Design is concerned with the processing and arrangement of visual elements to communicate behaviour and information. Every element in a visual composition has a number of properties that work together to create meaning and allow users to make sense of content and of the graphical interface. These elements of visual interface represent: context, shape, size, colour (value, hue and saturation), orientation, texture, position, text and typography, information hierarchy and motion. On the other hand, mobile devices can offer some wonderful non-visual features that can be perceived also by other senses, such as: voice integration, gestural input, haptic feedback (bumps and vibrations), and other features like location and camera (Tidwell, 2011). The non-visual interface can be used as a voice activation for placing a call, answering the call by opening the flip lid on a phone or using a voice activation for hands-free use. The more transient the phone's interface is, the better (Cooper et al.,2014).

Our brains manage the data by discerning visual patterns and establishing priorities to the things we see and their recognition is what allows us to process visual information so quickly (*ibid*). Here are some of the most important visual interfaces principles that can help making your visual interface more compelling and easier to use: (1) Convey a tone / communicate the brand; (2) Lead users through the visual hierarchy; (3) Provide visual structure and flow at each level of organization; (4) Signal what users can do on a given screen; (5) Respond to commands; (6) Draw attention to important events; (7) Build a cohesive visual system to ensure consistency across the experience; (8) Minimize the amount of visual work and (9) Keep it simple.

3.2.3.1. Designing for a Mobile devices

When the first iPhone was introduced by Apple in 2007 and a year later Google introduced Android, the multi-touch operating system, gestural and navigational idioms changed drastically the mobile device user experience. Before the mobile user experience had small keyboards on the device surface or hidden within a sliding drawer and tiny mono-touchscreens (see Figure 7). With

so many internet users on their smartphone nowadays, it is reasonable to expect an aggressive increase in the number of mobile websites (Cooper et al., 2014; Rocheleau, 2016).

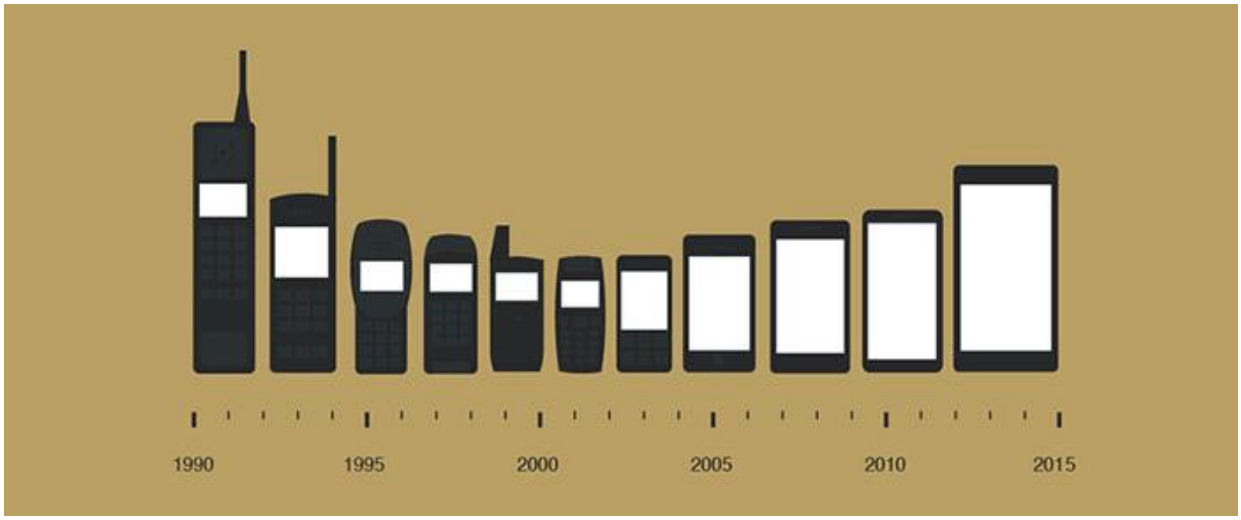


Figure 7. Revolution. Image adopted from: Marsh (2015).

The user experience was never the same after introducing the big, high-resolution, multi-touchscreen and on-screen controls for fingers, a set of new-iconic gestural idioms for mobile apps and multi-touch tablets, including the set of sensors delivering contextual information about orientation, location, ambient light, and movement (Cooper et al., 2014).

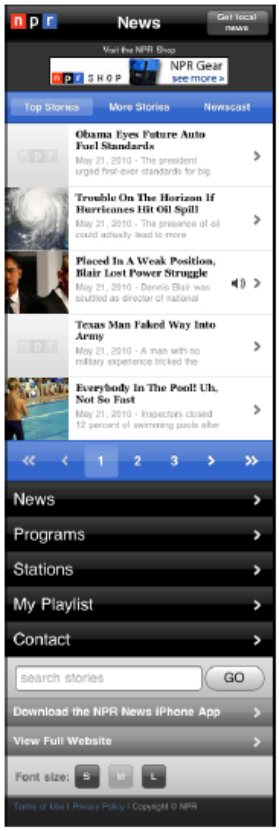
According to the same author the modern multi-touch mobile devices fall primarily into three form factor categories:

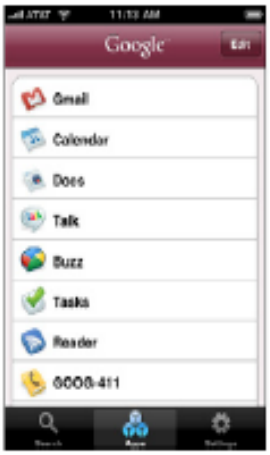
1. Hand-held devices are designed specifically for mobile use, therefore they must be small, lightweight, economical in power consumption, and easy to manipulate concerning the size, clarity of display, ease of input and control, and sensitivity to context.
2. Tablet format apps have more space surface than handhelds. The aspect ratio and large screen sizes insure more space for navigational and functional controls.
3. Mini-tablets are popular, inexpensive and handy mobile devices. From a user experience perspective the 16:9 aspect ratio supports both screen orientations, and a small size represent challenges for a designer of touch-based experience.

Therefore the challenges of mobile design are represented by tiny screen sizes and variable widths, touch screen or difficulties of typing the text. The challenging physical environments such as bright sun outside, dark rooms, or when we are in motion can represent obstacles for designers, as well as social influences and limited attention (Tidewell, 2011).

The best approach to mobile design is to focus on user's needs in different situations, provide fast information, entertainment, social media connection, notifications or location information. The key is also to focus on most important tasks for users, and use the device features such as: GPS, camera, and voice integration, gestural input, haptic feedback (bumps and vibrations) or multitasking. Linearize the content to maximise the readability by using the vertical stack pattern, and optimise the most common interaction sequences to make the tasks as easy as possible. This can be achieved by reducing the typing, use as few page loads as possible, reducing scrolling, sideway dragging as well as the number of taps (ibid).

A mobile application needs a way to show its top-level navigational structure and they continue to use some of the same basic layout patterns, namely: vertical stacks of UI elements (see Figure 8) and Thumbnail-and-Text Lists including lists, grids, bars, and drawers (see Figure 9, 10, 11) (Tidwell, 2011 and Cooper et al., 2014).





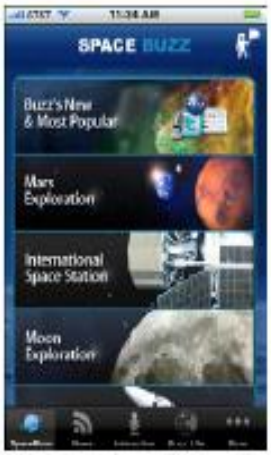


Figure 8. NPR's vertical Stack and Bottom Navigation. Image taken from: Tidewell, 2011 (p. 458).

Figure 9. The Thumbnail-and-Text Lists of iBird Explorer. Tidewell, 2011 (p. 461).

Figure 10. The Thumbnail-and-Text Lists of Google Iphone app. Tidewell, 2011 (p. 461).

Figure 11. The Thumbnail-and-Text Lists of Buzz Aldrin's Portal to Science and Space Exploration. (*ibid)*

Newer structural patterns provide high-performance, high-resolution graphics and multi-touch screens and can be presented in a top or bottom page toolbar, tabs, full-page menus, touch tools, thumbnail-and-text list and infinite list or filmstrip (carousels, swimlanes and cards). They are now widely recognised mobile idioms (Cooper et al., 2014).

Screen carousels are a top-level pattern, most appropriate for dash-boards with multiple instances, where users can swipe between identically laid-out screens. According to Tidewell (2011), a Filmstrip is like a Carousel, the difference is that a Carousel usually shows information about the item or page and context, such as fragments of the previous and next pages.

3.2.3.2. Mobile navigation, content and control idioms

Desktop, web applications and mobile applications share many controls and from their form and multi-touch input technology have evolved a set of idioms especially suited to mobile app use (Cooper et al. 2014). However, designing for the mobile web is a different operation from designing for a common web, therefore new design standards and practices are greatly required for a better mobile design with smooth user experience (Rocheleau, 2016). There are many usability concepts to consider for your users who will be searching the content on a smartphone by tapping, flicking, and swiping: screen size, inline images, hyperlinks, font sizes, and page navigation, (*ibid*). The most important idioms by Cooper et al., (2014) are browsing controls, navigation and tool bars, drawers, tap-to-reveal, as well as direct manipulation. To browse and select content is much easier than input data because mobile apps have developed a rich set of patterns around browsing through content, such as: Lists – revealing hierarchically the modal pop-up or screen with options for controlling the item and they can allow finite or infinite scrolling (see Figure 12); Grids – which are used to organise the content into rows and columns (see Figure 13); Content carousels – use horizontal swipe gesture to navigate between similar full-screen layouts containing different data (see Figure 14); Cards – a self-contained interactive object combining media, text, web links, and social actions such as commenting, sharing, tagging, and adding media (see Figure 15); and Swimlanes – a vertical stack of carousels, scrolled horizontally. It also allows multiple categories of content browsing with minimal navigation (see Figure 16);

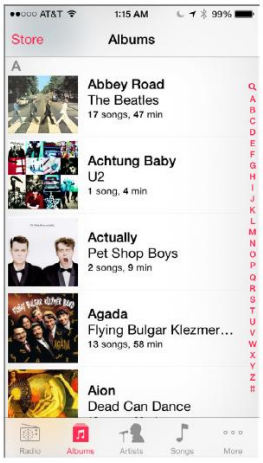


Figure 12. Representation of Lists (Cooper, et al, 2014, p.519-528).

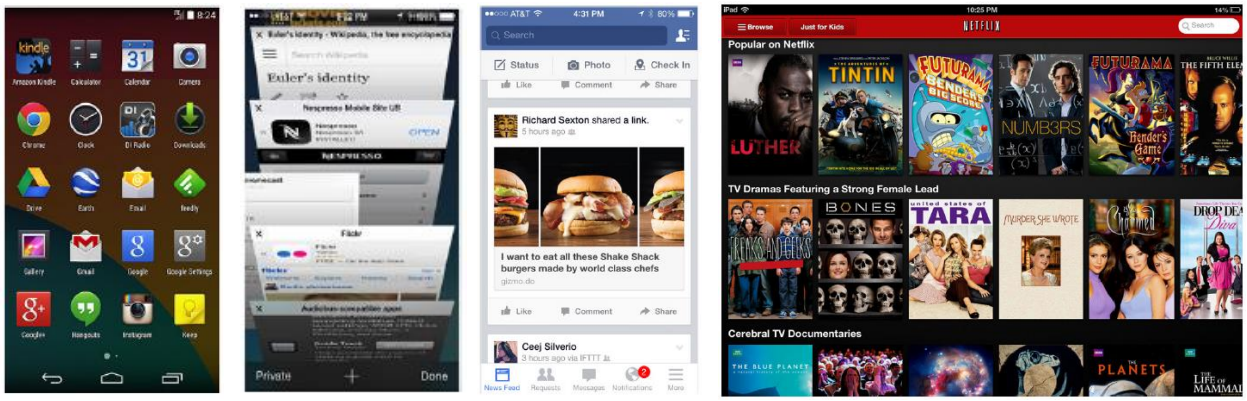


Figure 13. Representation of Grid (Cooper, et al, 2014, p.519-528).

Figure 14. Representation of Carrousel (Cooper, et al, 2014, p.519-528).

Figure 15. Representation of Cards (Cooper, et al, 2014, p.519-528).

Figure 16. Representation of the Swimlane example and Hamburger menu (Cooper, et al, 2014, p.519-528).

Navigation and tool bar idioms are narrow horizontal or vertical regions at the top or bottom of the screen that consist of the following patterns: tab bars, tab carousels, navigation bars and action bars, tool bars, palettes, vertical tool bars and carousels and tool carousels. Menu bars are an idiom which should be avoid in mobile.

Drawers are a clever idiom that provides access to a vertical list of navigational elements similar to tabs. The drawer icon is also called the hamburger menu (see Figure 16) due to its shape: three short, stacked lines. They include: secondary-action drawers, double drawers, item-level drawers, drawer behaviours to avoid and drawer controversy.

The tap-to-reveal and direct manipulation are the main differences between the touchscreen mobile apps and the desktop apps. Searching, sorting, and filtering are helpful ways to minimise the effort in search. The variations of searching are: implicit/explicit searching, building search queries (voice search, auto-complete, tap-ahead, recent/frequent searches, auto- or categorised suggestions), sorting and filtering. Welcome and help screens guide users on how to learn a mobile interface. Welcome screens provide guidance on what are the important activities in the app and how to perform them. Help screen in a mobile context provides much the same information, but

on demand when the user requests it. There are: guided tours (orient the first-time users), overlays (explicate gestures) and tooltip overlays (provide a ToolTip-like display of all primary functions on a single overlay screen).

The Multi-touch gestures are the most important part of the mobile experience provided by tap to select, activate or toggle, tap-and-hold, drag to scroll, drag to move, drag to control, swipe up/down or left/right, pinch in/out, rotate and multi-finger swipes.

According to Richeleau (2016a), usability is the most important component of mobile UI design and a great usability often involves microinteractions. These microinteractions are small responses from an interface, which define behaviours, encourage engagement, and help users visualise how an interface should work as an animated response to the user's gesture (pull to refresh, hamburger menus, card animations and exercise animations with elastic bounce effect, etc.). These increase the value of the quality user experience (Richeleau, 2016a).

3.3. Applications for tourism

Based on the research and study of mobile applications for birdwatching, we have identified a large number of examples in the market. They can be categorised by serving different purposes and by groups of larger geographical areas.

Alongside our research, and upon the reviews of Mortensen (2011, 2012a, 2012b, 2016), Timothy Boucher (2013), Zach Slavin (2015), Fiona Outdoors (2015), GBBC (2016) and Grant McCreary (2014) we have identified categories of purpose for birdwatching: active identification of birds, filed guides, bird-finding guides, song-learning apps and the applications for citizen sciences. Besides, the geographical groups include the following areas: America (North, Central, Caribbean, and South), Europe, Africa, Asia, Australia and Pacific Islands or worldwide (for complete list of apps see Annex A).

Categories of purpose:

- Active identification of birds:

Figure 17. Active identification of birds: Merlin Bird ID, Birdsnap, BirdSong ID.

Active identification of bird applications help you identifying unknown birds. Some are: Merlin Bird ID, Birdsnap, BirdSong ID and the newest (launched in Summer 2016) is the BirdGenie (see Figure 17).

- Field guides:

Figure 18. Field guides: Audubon Birds, iBird, Sibley Birds, National Geographic Birds and Petersons Birds.

Field guides, as Sibley, Audubon, National Geographic, Peterson and iBird are the most direct competitors with the classic paper field guides and they have some features that leverage the technology and go beyond the contents of the paper versions (see Figure 18).

- Bird-finding guides:

Figure 19. Bird-finding guide: BirdsEye app.

Bird-finding guides (BirdsEye Bird Finding Guide) help you locate specific species of birds in the field based on citizen science programmes reports such as eBird or through the accumulation of decades of local knowledge (see Figure 19).

- Song learning apps:

Figure 20. Song learning apps: Chirp! Bird Song USA and Larkwire Birdsong Master Birder.

Song learning apps help you learn bird songs and calls, such as Chirp! Bird Song USA and Larkwire Birdsong Master Birder (see Figure 20).

- The applications for citizen science:

Figure 21. App for citizen science: eBird app.

The applications for citizen science, such as eBird, allow people to participate, to share bird data with researchers and to make birdwatching more valuable to conservation and help tracking the observations over time (see Figure 21). eBird is a real-time, online checklist programme, which has revolutionised the way that the birding community reports and accesses information about birds. The website was launched in 2002 by the Cornell Lab of Ornithology and National Audubon Society. It provides rich data sources for basic information on bird abundance and distribution at a variety of spatial and temporal scales. Its goal is to maximise the utility and accessibility of the vast number of bird observations made each year by recreational and professional birdwatchers. The observations of each participant join those of others in an international network of eBird users, and then share these observations with a global community of educators, land managers, ornithologists, and conservation biologists (eBird, 2016).

Regarding the most downloaded applications by Google play for Android apps: in America, Audubon would be the first with a range of 100.000 to 500.000 downloads, following is iBird, Sibley and BirdsEye with over 10.000 downloads; in Europe, the application with most downloads

would be the RSPB eGuide to Britis Birds and Ornithopedia in Europe – from 10.000 to over 50.000 downloads). The most frequently mentioned and reviewed Apps for North America are Audubon Birds, iBird, Sibley Birds and National Geographic Birds (Mortensen, 2012; Boucher, 2013; Slavin 2015; Outdoors, 2015; GBBC, 2016; McCreary, 2014).

These birdwatching applications are rely on the handheld devices, therefore the UI elements in navigation tool bars include lists, thumbnails and screen carousels, demonstrating the rich database of bird sounds and species, represented with quality photographs or illustrations that can be zoomed in/out with multi-touch gestures. The orientation layout is adapted for both, horizontal and vertical view. The structure of the content is represented with the grid, drawers, pop-up panels and function hierarchy, where is applied fast and smart searching, sorting and filtering of birds. Whatever the purpose of the specific app – as some are taking more advantages of mobile devices such as GPS navigation and camera – each of them provides a good UX for the birdwatchers with useful, valuable and credible information.

As mentioned previously, not all applications have the same options and this is the reason why birdwatchers use several apps at the same time: each tool for specific needs during the activity, and only few applications have the possibility to upload or connect to the eBird platform. Although, there are Audubon Birds, which has the ability to find birds by using eBird sightings, and Birdseye App, the latter is not primarily designed as a digital field guide app.

For a designer of a new application, user's needs and user's experiences are the most valuable information and the main motivator to design a better and quality product for the potential users. Therefore, the tendency of this project is to create a product which will try to include the most important features in just one birdwatching guide app.

Framing the outcomes in the new product, we settled it must reveal positive results and a better experience for birdwatchers on the field. According to the analysis and reviews of the authors – Mortensen's (2012), Timothy Boucher (2013), Zach Slavin (2015), Fiona Outdoors (2015), GBBC (2016) and Grant McCreary (2014) – these are the important and most wanted features for birdwatchers:

- quality bird photos or illustrations;
- variations of bird sounds, calls, songs;
- ability to record and maintain sightings lists within the app;
- quick search tool wherein one types the name of the bird;
- range maps of birds;
- explanatory text;
- ability to compare two similar bird species on the same screen;
- search limited to birds common within the target area;
- list of similar appearing species;
- search feature to I.D. birds, wherein one can enter the bird characteristics;
- ability to share sightings with other people;
- ability to submit bird sightings to eBird;

3.3.1. Case studies

The following examples of case studies were selected on the parameters of the most important mobile field guide applications and the most representative UI and UX designs which are used for birdwatching activity. The selection was also made regarding the reviews of Mortensen (2011, 2012a, 2012b, 2016), Timothy Boucher (2013), Zach Slavin (2015), Fiona Outdoors (2015), GBBC (2016) and Grant McCreary (2014) for the most preferable app choices.

We realised Audubon Birds and Sibley Birds guides are the most desired apps, direct competitors with the classic paper field guides and they have some features that leverage the technology and go beyond the contents of the paper versions. They provide the most complete spectre of the bird content and are one of the most popular applications among the users. In these two case studies it will be analysed interaction design principles along with the patterns and elements, structure of the contents and main graphic elements.

3.3.1.1. Audubon Birds App

Audubon bird guide is a mobile field guide to North America, available for Android and iOS devices. The app includes 821 species, advanced gallery view for easy comparison and search, field mark call outs, a «Find Birds with eBird» feature powered by the Cornell Lab of Ornithology and a social community of birdwatchers who observe, identify, and share their observations and photos in the mobile app and online (Audubon, 2016).

3.3.1.1.1. Content of the Audubon Birds App

Identifying the app features and needs of birdwatchers when doing this activity, it checks that they can use the following features in the app to identify the birds: they can browse the birds with quality photographs; have access to several bird sounds, as well as to the list of similar species. They can also find more specific information of the bird, the range map and migratory routes. For fast identification of the species, they need smart filters for searching birds by common, scientific or family order as well as for searching by shape, colour and area. In the advanced searching birds can be searched by using more filters: habitats, wing shapes, song or call types and patterns and locomotion (the motion of spotted birds: soaring, rapid wingbeats, running, etc.). Audubon Bird app also gives the possibility to find birds with eBird and provides detailed information on birds in the feature «All about birds». There can be found information about birds families, plumage and molt, explanation of birds parts, classification and conservation, they even include the list of endangered and threatened species in North America. Moreover, they provide information on how to bird and identify the species, a natural history of birds and glossary. Users can preview all their sighting in «My sightings» feature. In the «NatureShare Community» feature everyone can see the sightings of other users and is given the possibility to comment on shared observations.

3.3.1.1.2. UI and UX analysis in Audubon Birds App

In its first page the application provides browse controls: advanced search (by shape, habitats, regions, sizes, colours, even wing shapes, song calls types and patterns); brows for the birds; and find the birds with eBird. It provides comprehensive information on birds (families, plumage, classification, conservation, and endangered species in North America), gives tips on how to do birdwatching and helps to identify the species presented in a larger text which is usable but the visual display is poor. The app uses a drawer with additional navigation information: home, user's profile and other information. The list of birds are presented in a grid of three vertically scrolling columns or a grid of thumbnails, including a top bar navigation with fast and additional searching filters (see Figure 22).

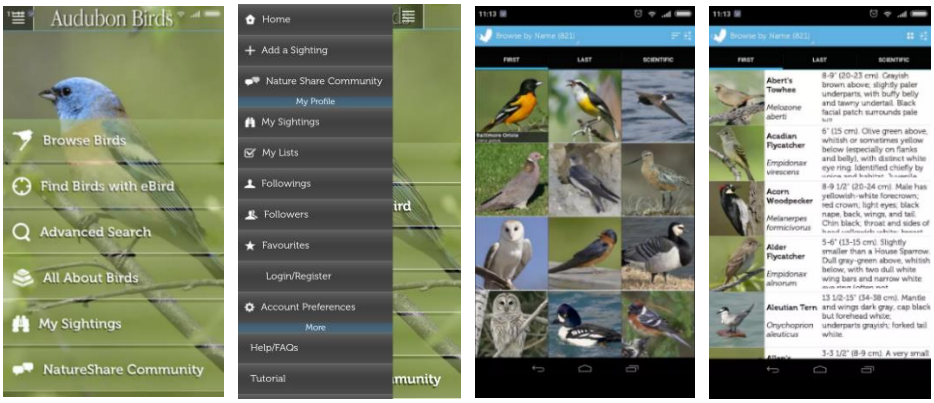


Figure 22. The Audubon App layouts: browse controls, user drawers, grid view layer and thumbnails. Audubon, (2016).

When clicking on a species, it displays images in a finite carousel view with a navigation widget, alongside with the descriptive text. On the top bar user can find different tabs with icons for description of its content (range, voice, similar, sightings). The voice tab is using a card idiom, combining the text and sound tools. In the sightings tab, the visual presentation of the markers could provide the marker groupings for easier and clearer view (see Figure 23).

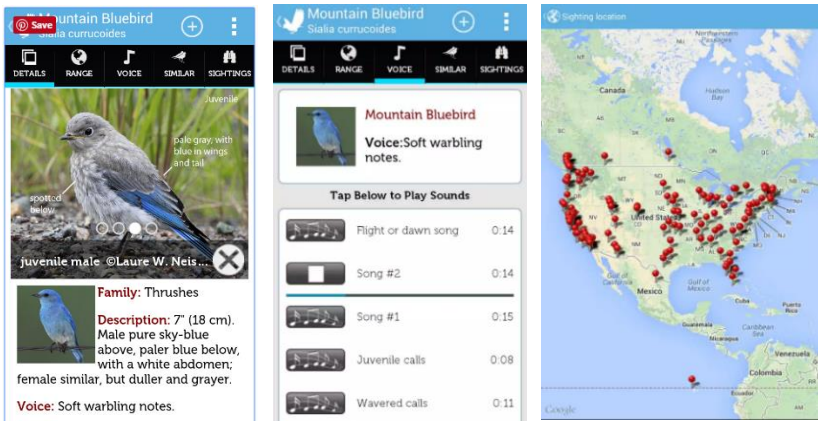


Figure 23. The Audubon App layouts: carousel, cards and markers. Audubon, (2016).

The Audubon App provides purposeful and elegant design solutions for the birdwatchers. The smartphone platform with a handheld posture is a trustworthy and pleasurable app which is satisfying the birdwatcher's needs while is in the field.

The interface design provides clear visual structure and flow; it is responsive to the commands which make the user experience useful and usable. It does not include the transition to the horizontal view of the content but includes some basic and new layout patterns, such as lists, bars, drawers, marker widgets and carousel. The text size is appropriate although the typography could be more modern and simple from San Serif family. The colours of the involved elements, top blue bar and menu bar colour are not such strong choices because they do not continue the branding – the red coloured logo and blue-black-greenish colour palette are not matching. However, the quality images are making the app visually more valuable and desirable.

Of all representative field guides (iBird, Sibley, National Geographic and Petersons Birds), the Audubon has the most pleasant interface design, even though it could have some upgrades.

3.3.1.2. Sibley eGuide to Birds App

The Sibley Guide to Birds is the most popular, most comprehensive, and fastest-selling printed field guide to North American birds, according to Info et al., (2011). It is also available digitally as an app for several mobile phone platforms. The entire content of the Sibley Guide to Birds includes over 6600 images of 810 species in which every species is illustrated in flight and perched, and every major variation of age, season or sex is shown. It provides detailed descriptions of songs and calls, options for comparing similar species, detailed coverage of subspecies and regional variation and the maps show winter and summer range, with migration and rare occurrence. It includes audio recordings of over 2300 different calls and songs, filter species to show only the birds found in a single state or province, or only the most commonly-seen species, filter species by colour, shape, size, habits and it has personal sightings log (Info et al., 2011).

3.3.1.2.1. Content of the Sibley eGuide to Birds App

Identifying the birds with the Sibley app can be done by browsing in taxonomic or alphabetic order. Birds are presented with quality illustrations, which is a distinguishing mark for Sibley applications. Each species includes a text description of plumage, size and voice, but also includes various sounds for listening. Their strong feature is the ability to present two species in one screen for comparison and better identification.

Each species is accompanied by a short text description, additional bird information by connecting to Wikipedia, and a range map. Moreover, users can compare all this information displayed on one screen and have the possibility to save the bird to their sighting list. Sibley app does not give the possibility to find birds with eBird but gives more options to search birds by displaying only the common birds near your area and to include or exclude the saltwater birds. Users can select the

additional features of bird's appearances, like patches of wings and tails, if a bird has crest, or bold eyestripe/eyebrow, etc. They can also filter by type of bird (water birds, duck-like, tree-climbing, etc.) and by size (sparrow-size, chicken-size or duck-size, etc.). In the end, Sibley also provides the possibility of displaying a bird's name in four languages: Latin, English, French and Spanish.

3.3.1.2.2. UI and UX analysis of the Sibley eGuide to Birds App

Large base of information is available in an easy-to-navigate portable format on many system devices. The navigation of the app is easy and intuitive, requiring a minimum of clicks to get to important information. In the first page users can quickly find the browse controls, find any species either by typing a few letters of its name or by scrolling through the list (alphabetically or taxonomically).

They can filter species by region, and also by the most commonly seen species in that region, by size, colour, shape, and habits. Scroll down through the full series of images for each species and see the images in full screen view. The location tab allows user to select a state or province where all further browsing and searches will be limited to birds found in that state/province (see Figure 24).

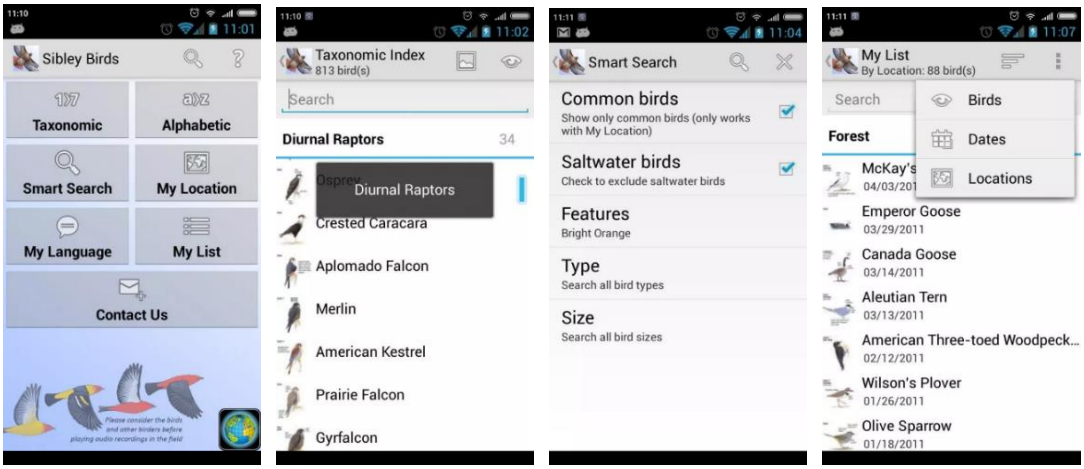


Figure 24. The Sibley App layouts: browse controls, searching and filtering (Sibley, 2016).

Sibley Guide to Birds App includes the following functionalities: swipe to move to the next or previous species; one-tap enlargement of images with extended zoom; nearly all species are represented with multiple examples showing the range of vocalisations; and the ability to compare any two images, maps or sounds, side by side on the screen and filter by state/province, so that you see only the species likely to occur in your location (see Figure 25).

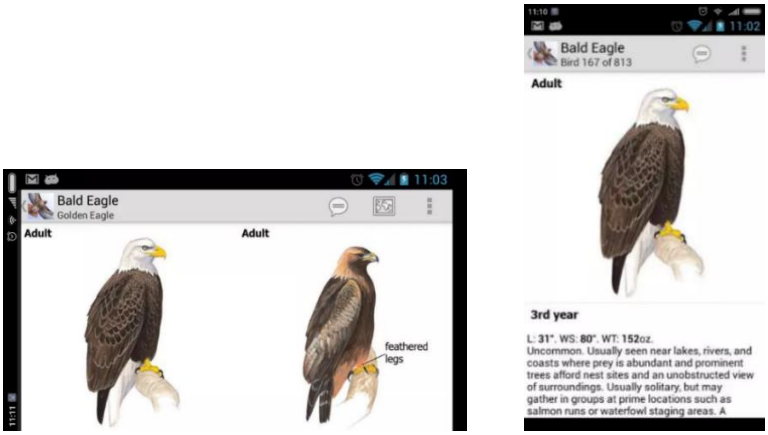


Figure 25. The Sibley App portrait and landscape layouts and comparison of two species (Sibley, 2016).

The identity is well presented and integrated inside the app. They are using clean white background and blue coloured bars which are repeating elements of their brand identity. The image in the logo is well represented and continues the concept of Sibley's most well-known illustrations. Furthermore, the application has characteristics of good design: it's trustworthy, responsive and pleasurable providing good user experience.

Regarding the illustrative case studies presented previously, the mentioned features above will be considered further in our project. All the principles, along with the characteristics of good interaction design will be used as a guide for the development of Birdadvisor 360˚ app within the aim of creating a quality product for users. This is the topic of the following chapter.

CHAPTER 4. Proposal: Birdadvisor 360˚

4.1. Public target and characterization of audience

The primary motivation for birdwatchers is to see bird diversity. Getting personal rewards such as improving knowledge or enjoying the bird's aesthetics is another motivation. Casual birdwatchers besides birdwatching also appreciate other aspects while experts find the sightings of specific birds, exceptionally rewarding (Machato, 2011). The proposed birdwatching guide to the Algarve is focused on groups of users who are beginners, intermediates and experts. The content of the app can be as much motivating for the beginners as for the specialists at this activity.

In the research into the birdwatching profile, Costa (2015) describes the socio-economic characteristics of birdwatchers in Ria Formosa Natural Park (RFNP). Her research showed the target consists of British (39%), Dutch (17%) and Portuguese (17%) birdwatchers. The majority of them are male (55%) and married (51%). The average age is 50 years old and they are highly educated (74% have an academic degree). Concerning profession, the most frequent answer was retired (41%) (Costa, 2015). According to these characteristics, the application's focus is on both tourists and Portuguese birdwatchers.

In order to have a deeper understanding of our users and their goals in specific contexts, the persona methodology was used. Therefore, were created descriptive models of two personas to whom were applied the socio-economic characteristics mentioned above.
A persona encapsulates a distinct set of behaviour patterns regarding the use of a particular product, along with specific motivations or goals. Personas are also referred to as composite user archetypes because they are assembled by grouping related usage patterns observed across individuals in similar roles during the research phase (Cooper, Reimann & Cronin, 2007).

According to Nielsen's (n.d.) article from Interaction Design Foundation, the persona method has developed from being a method for IT system development to being used in many other contexts, including development of products, marketing, planning of communication and service design. They provide us with precise information on ways of thinking and communicating: how users

behave, how they think, what they wish to accomplish, and why. They are based on the behaviours and motivations of real people we have observed and thus represent them throughout the design process (Cooper, Reimann & Cronin, 2007).

In the examples below, we describe two different personas, who are the target audience of Birdadvisor 360˚ application for the region of Algarve. They have different needs and goals. Furthermore, we made up a scenario in order to justify intended designs in order to create the most effective interaction and desirable application for the potential users:

Age: 54
Work: PhD, Professor at University
Family: Married, no kids
Location: London, UK
Character: Ornithologist

Charles Y. Woods (54) is a professor at London's University and holds a PhD in Biology. He is married and has no kids. His profession is ornithologist and he spends most of his time teaching, researching and evidencing the bird species. For his work he likes to use new technologies which help him to keep track of the results of his research and observations.

His main motivations are to use modern, fast and mobile tools for searching birds, for his work purposes and for his free time. He would like to share his results with other colleagues and to use the app tool for searching birdwatching tours available. His goals are to take information off the app's features, he wants a tool he can use on the field, a smartphone app for his work and free time when birdwatching. He also likes to use new technologies while he travels and to access tour guides or hotel bookings over the app. Therefore, he would be an ideal customer user of the Birdadvisor 360˚ App. He wants to experience the opportunity of using a professional mobile tool in his search on birds as it would simplify collaborative work with his fellow colleagues at University and bird records could be a tap away.

Age: 51
Work: Designer
Family: Married, 2 kids
Location: Den Haag, the Netherlands
Character: Beginner in birdwatching

Anna Hoggard (51) is a graphic designer and a bird lover. She is married and has got 2 children. She works as a designer in a Dutch company in Den Haag. Sometimes, after work she likes to go birdwatching and she enjoys learning about birds.

Her motivation is to find a mobile app for beginners in birdwatching. She could use it in the field, save her bird list in the app and keep upgrading it for better motivation. The app should be easy to use and have an attractive UI. Her main goal is to have a suitable application designed for her level of knowledge where she could also access information about the birds and their natural habitats. One the one hand she wants to use the app as a field guide in areas she travels to, on the other hand she seeks to discover new spots by herself through the app. As a non-expert birder, she wants to have the opportunity to explore the natural areas while learning more about birds. The mobile tool would lead her way in the field and by following suggestions she would get more information on the habitats and in time find birds faster and easier. So she would be a suitable user of the Birdadvisor 360˚ App.

4.2. Objectives

The general objectives of this project proposal are to replace the paper birdwatching guides and create a new guided platform for birdwatching tourism in Algarve. It would help the users to explore the most important bird-observatory places and provide information on the birds, namely where they live or when they flock to the region. It would also be an important information gadget for the experts and ornithologists. The app would provide clearly defined content and provide a

good visual and sensorial experience for all types of birdwatchers. The mobile application platform would be also a good promoter of ornithological tourism for Algarve region.

A smartphone application for birdwatching activity in Algarve will help users to enhance their experience (see Figure 26). Creating an application with multiple tools for searching and observing the birds would help birdwatchers to fully enjoy this activity in the field. They could record their route, mark the observed birds, save their notes or share their experience with other users.

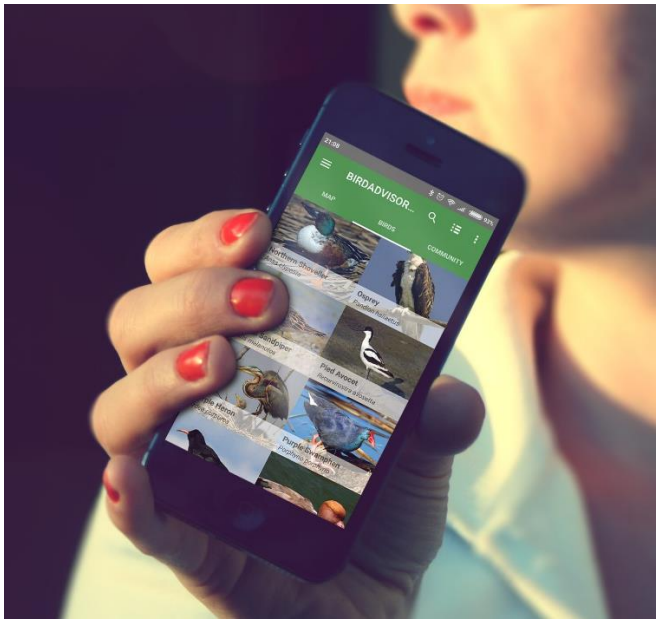


Figure 26. Birdadvisor 360˚, a new designed app platform for birdwatching in Algarve.

The app specific objectives are to:

- introduce the Algarve region to users and the best birdwatching spots to observe;
- show the hotspots suggested by the application with a specific description of the area, birds and the 360˚ photo sphere view of the exact location;
- navigate users to the selected destinations;
- present nearly 400 bird species that live or winter in the Algarve region;
- offer a quick search on birds upon typing few letters;
- filter birds by common name, scientific name or family order;
- present bird's status, phenology and abundance;

- present the birds with quality photographs, description of species and several bird sounds;
- present similar species of the selected bird;
- create a user account so that saving bird lists and sharing them with other users is possible;
- offer a note taking possibility on each observed species on one's own track list;
- create a community where users can share and comment their experience;
- offer a «rare birds in your area» notification.

4.3. Brand identity - conceptual characteristics:

This project is aiming to create innovative and quality communication design of a new digital platform for birdwatching in Algarve. Upon our first investigation on the birdwatching with experts we identified the need for a more modern approach/tool that could promote and support birdwatching tourism in the region. Further on, we came up with the idea of creating a portable pocket-size guide which could replace the book guides and that could be reachable on mobile devices. This way communication design would contribute in the best way to displaying information that could always be up to date and easily accessible to everyone.

The concept of the brand story is based on three elements: the Portuguese southernmost region Algarve, the birds of this region and the 360˚ Sphere photo view of suggested locations. The brand identity consists of a special bird named Purple Swamp-hen, also called Western Swamp-hen (*Porphyrio porphyrio*), which is a symbol of Ria Formosa. This bird went almost extinct in Algarve, however, throughout the 1990s the species recovered remarkably.

It colonised small wetlands to the west of Ria Formosa and due to the adoption of protective measures and the creation of new ponds, some of which located on golf courses, (Natura Algarve, n.d.), the species is no longer an endangered one. (See Figure 27).

Figure 27. The brand name and logo.

The bird-shaped logo is designed as a pin marker and it represents the Map feature (tracks), the app's suggestions of best birdwatching locations in Algarve. The brand name came from the suggestion of the previously mentioned elements: map suggestions and birds. Therefore, the name Birdadvisor is giving advice on where to find specific bird species. It holds a connotation with the TripAdvisor – an American travel website company – though our app focuses mainly on the birds and their relevant content. However, the name TripAdvisor can have a positive effect on our brand's name in terms of recognition, positive recall and memorability.

The number 360˚ in the brand's name is clearly attached to the most important feature of the application – the 360˚ view of recommended locations for birdwatching.

4.4. The content

This application is aiming to provide clarity of content, good user experience and interface design. It would help users to understand the environment of birds, where to look for them, learn about bird's habitats and become more independent in this activity.

With all the suggested features available in one app, users will have a better experience when they are birdwatching and find all the needed tools in one spot.

The Birdadvisor 360˚ App will include the following features:

- 10 best birdwatching areas in Algarve;
- Suggested routes in each area;
- List of around 400 birds species of Algarve (www.avesdeportugal.info);
- Smart filtering and quick search for birds by alphabetical, taxonomic and family order;
- List of similar appearing birds species;
- Quality photographs of birds;
- Bird sounds (several calls and songs);
- Possibility to record the route and sightings of birds;
- Possibility to make notes on the observed species;
- Share personal sightings with other users;
- A 360˚ Photo Sphere view of each suggested route;
- Information on the habitat and a suggested list of birds by each suggested location;
- Notifications of rare species in the area.

The content in the application consists of four main areas: Map, Birds, Community and the Profile drawer. The Map includes two action buttons. The first button contains Suggested tracks, User tracks, eBird hotspots, Birdwatching tour guides, Birding-friendly hotels and a short presentation of the region. Birdadvisor 360˚App suggests the routes in each important birdwatching area and then the map is marked with light colours. All routes are accompanied with a short description, list of birds likely to be observed in this specific location and the 360˚ photo view of the location.

The second action button allows users to create their own route with selected time and date of action and create a list of birds they have seen on the way. They can add/edit the number of seen species and make a comment on each one. In the end of the activity, they have the possibility to save it locally or share it with other users.

The Birds tab, includes a list of 400 bird species (following the list at www.avesdeportugal.info) including residents, migratory, wintering or summer visitors of the Algarve, as well as the rare birds. Each bird is described in a short text (identification, status, abundance, phenology and

distribution map), together with quality photographs and a list of sounds (calls and songs). Alongside the selected bird appears a list of similar species, so that users can identify the species faster and easier.

The third main area of content is the Community. It is our proposal that users can interact with other users by saving their favourite birds or tracks, sharing them and also commenting on the posts of other users. Therefore, creating an account will be required and data on user's favourite tracks, birds (list of observations) and locations as well as the access to the personal and general settings can be saved.

Profile drawer of the user saves the tracks of the user, the list of observed birds and his favourites: tracks of other users, area or birds. Along the personal data there is also a list of shortcuts to other contents of the App and its additional settings.

4.5. Structure

In the scheme below is presented the structure of the application and content connections. We can see the main activity is divided in three sliding tabs: map, birds, community, and the sliding navigation drawer of the user profile on the left side. The map tab is carefully structured by activities as: filter tracks (users tracks/suggested tracks/eBird hotspots/hotels/tour guides), edit/preview tracks, and create new activity. The bird gallery has two possible views, gallery grid or thumbnail list, and that is where bird information and audio can be found. By sliding left-right, users can find information on birds or a list of similar species. The third tab, named community is representing the users and their shared posts (see Figure 28).

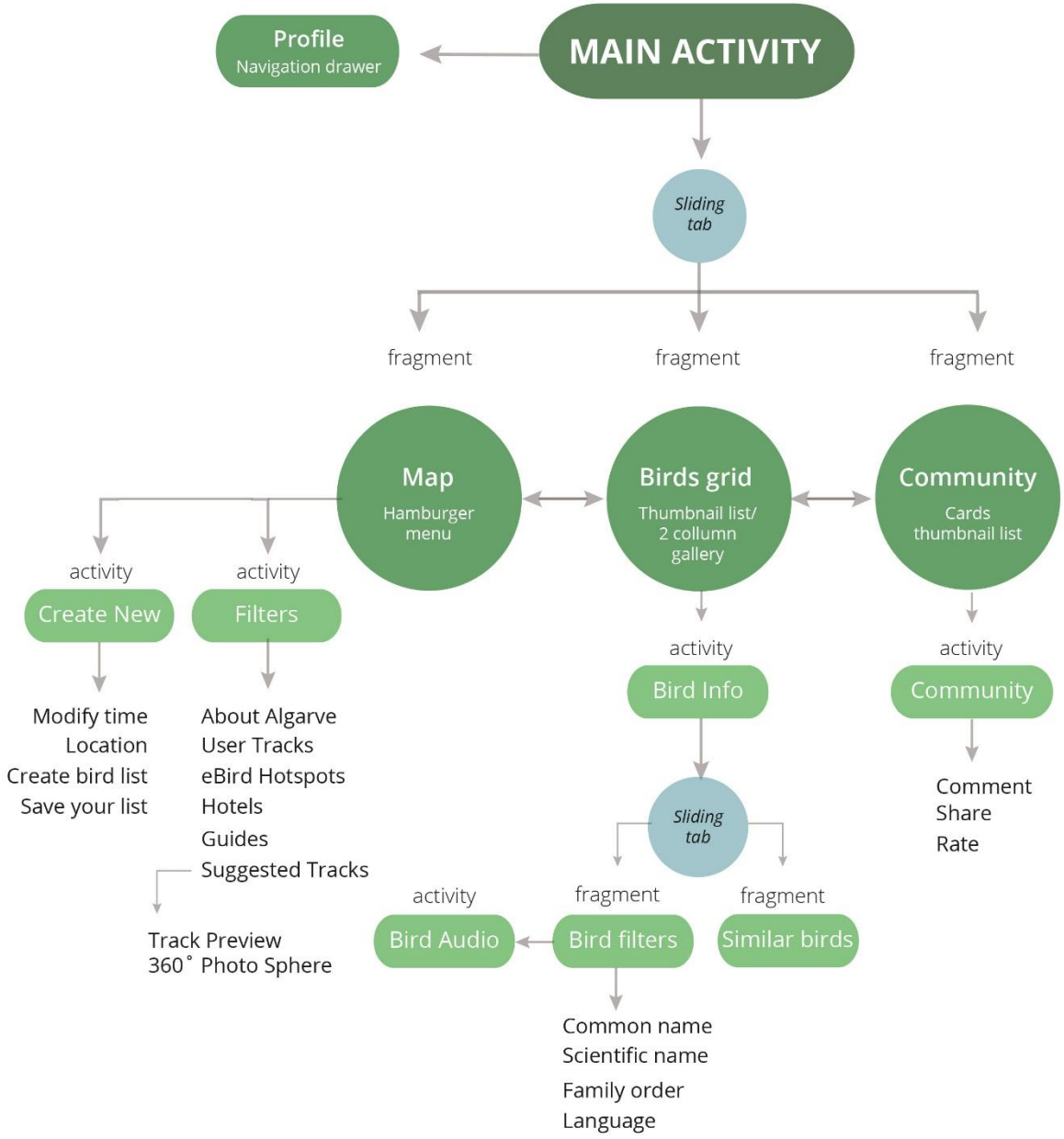


Figure 28. Application structure.

4.6. Interaction Design characteristics, UX and UI

As Frascara (2004) argued the app should provide the clarity of form and content in the presentation of individual elements and the in the organisation of communicational sequences, including categorisation of complex information. Interaction Design is facilitating the interactions between users and technology and it is planning and shaping a product through a perspective of behaviour and experience, therefore it is a behaviour-oriented design (Cooper et al., 2014 and Usability.gov, 2016). The purpose of design principles is to optimise the experience of the users and to minimise work. Our application is focused on the user-centred and activity-centred design which emphasises user's goals, needs, as well as the tasks and activities that need to be accomplished.

The Birdadvisor 360˚ app aims to provide smooth interaction and flow that will engage users on their discovery of the Algarve. The app will use the Google's «Material design guidelines» (Google, 2017) and design elements (typography, grids, space, scale, colour, and imagery) to create hierarchy, meaning and focus on user experience. The layouts (principles, structure and responsive UI), components (buttons, cards, grid lists, menus, slider, tabs, toolbars and widgets) and patterns (gestures, navigation, navigation drawer and transitions, notifications, permissions, scrolling and search) will be organising the visual interface elements – functions (*ibid*). They will minimise the work for the user and keep it simple in order to create a useful, usable and desirable product experience.

Birdadvisor 360˚ app is designed for beginners, intermediates and expert users. It is designed for mobile devices and its posture is oriented vertically and horizontally. The content navigation is structured in three main slide tabs: map, birds and community, and a navigation drawer of the user data and the content shortcuts (see Figure 29). The UI design of the app includes three navigation slide tabs: Map, Birds and Community. The Map tab has one action button to start new activity at the bottom left side, and the second action button of content placed at the right bottom corner (see Figure 29). There are inserted suggested tracks, user tracks, eBird hotspots, hotels, tour guides and a short presentation of the Algarve area (see Figure 30).

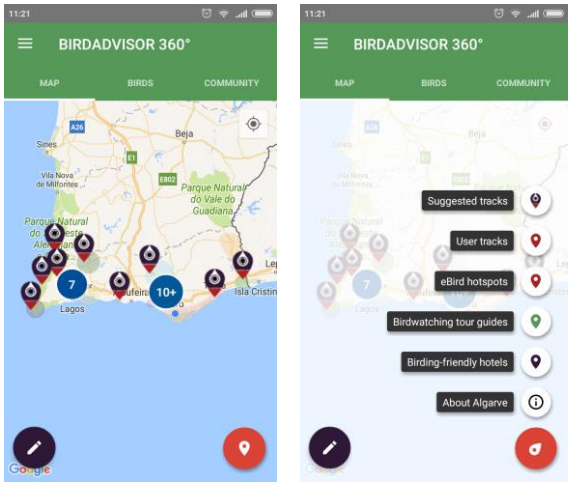


Figure 29. Map tab: The slide tabs Map, Birds and Community with the two action buttons.

Figure 30. The action button with suggested tracks, user tracks, eBird hotspots. Hotels, tour guides, about Algarve.

The navigation tab of Birds can be viewed as a list of thumbnails or as a two-vertical column gallery (see Figure 31). The user drawer can be accessed through a button at the left up corner or by sliding it over the content area. There are also additional navigation elements (see Figure 32).

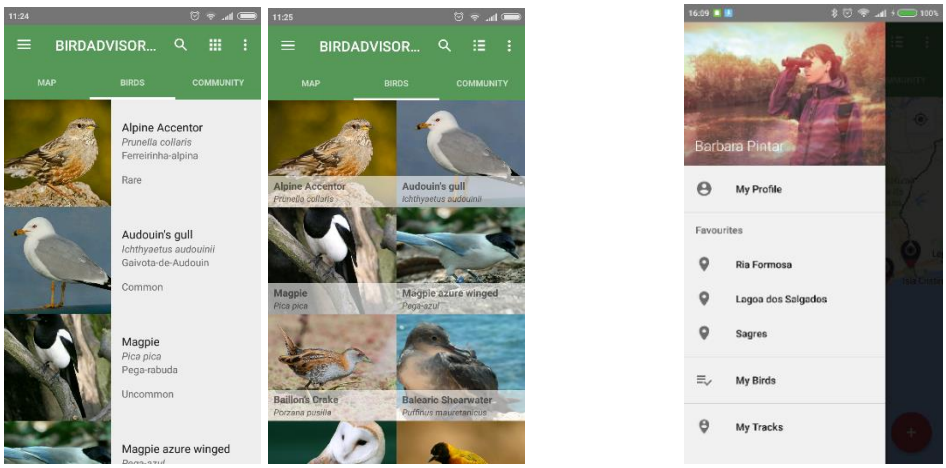


Figure 31. Birdadvisor 360˚: sliding tab of birds presented in a list of thumbnails or a 2 vertical column grid.

Figure 32. The user drawer with navigation elements.

The slide tab «Community» was designed with thumbnail list where users can see other users' names, the area where and when they were observing birds and how many birds they have spotted (see Figure 33).

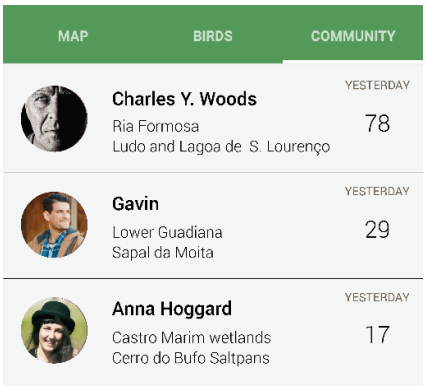


Figure 33. Birdadvisor 360˚: community presented with a thumbnail list.

The Birdadvisor 360˚'s suggested tracks are promoting the routes where users can find in a vertical stack the following information: the route with the GPS navigation, description of the track. The 360˚ view of the location in Photo Sphere and the list of birds they can observe in the area can be reached in the floating button(s) at the upper right corner (see Figure 34).

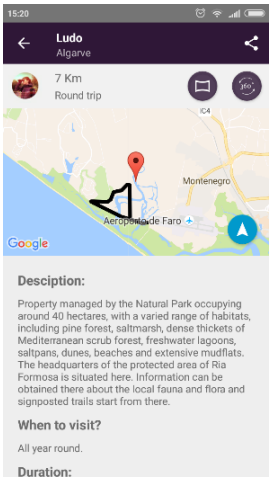


Figure 34. Birdadvisor 360˚: the preview of a suggested track in Ludo, Ria Formosa.

The action button contain a 360˚ photo sphere, additional information about the habitat (text) and the suggested bird list (scrolling thumbnail list) in a pop-up screen (see Figure 35).

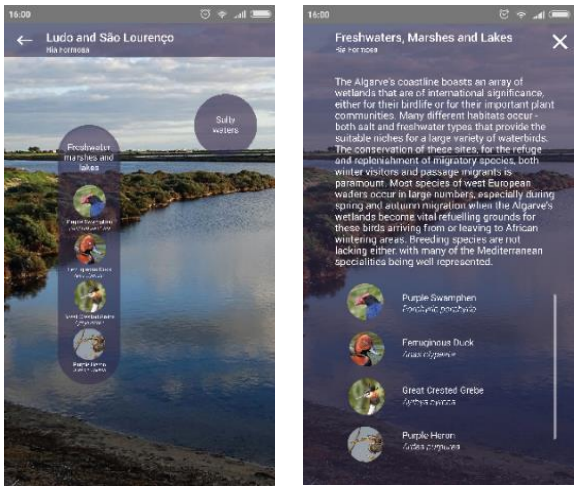


Figure 35. The 360˚ Photo Sphere view of the area with list of birds and description of habitat.

In the navigation tab Birds, by selecting a bird, the information of the species is displayed with an image carousel and text description in one tab and a thumbnail list of similar species presented on the right sliding tab (see Figure 36). The bird sound button is displayed at the right upper corner (see Figure 37). The sound content appears in a pop-up layer with a list of content (see Figure 38).

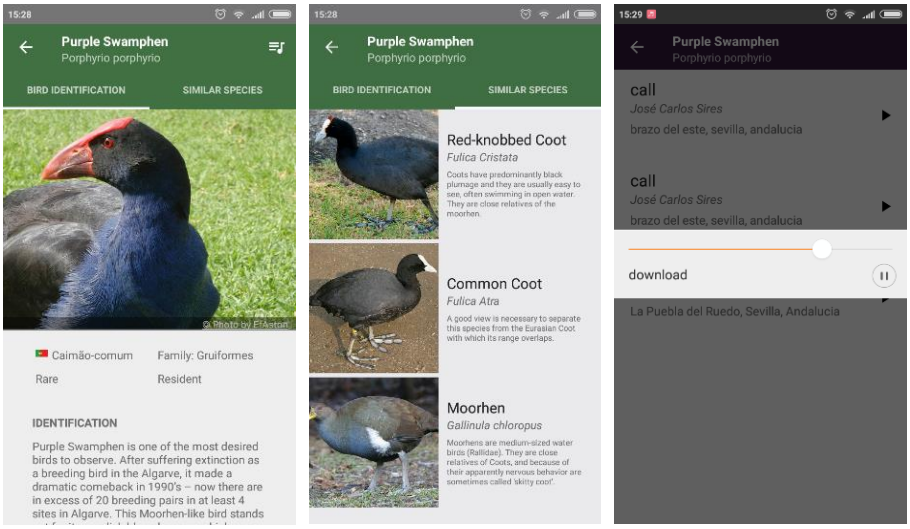


Figure 36. Birdadvisor 360˚: layout of bird information. Figure 37. A thumbnail list of similar species.

Figure 38. The sound display on the right.

The application has the advanced search which allows users to search each selected content by auto-suggestion. In the community tab, users can filter the content by date, location or by species. Bird data can be filtered by common name, scientific name and family order and is presented in a two-column gallery scroll or a thumbnail list with images and short text. The list of community is presented the same way.

When starting a new activity, a pop-up panel appears and users can modify the information (date, hour, location) according to the time of their activity. The date and hour are displayed in a pop-up menu with the option of tapping the selected numbers. Location can be inserted manually by inserting a name or simply by clicking on the pin marker. The location will be saved as a hotspot (see Figure 39). Once the initial information is set, the spotted birds can be added by selecting the bottom right button (see Figure 40). Then it displays a new panel of bird list, search and add option. In the user's list, the information of selected birds can be modified by increasing the number of seen species or by removing any from the list (see Figure 41). When the list is complete, it can be saved with the right upper tick and it will be shown as a new pin marker in the map as well as in your profile drawer of personal list of tracks.

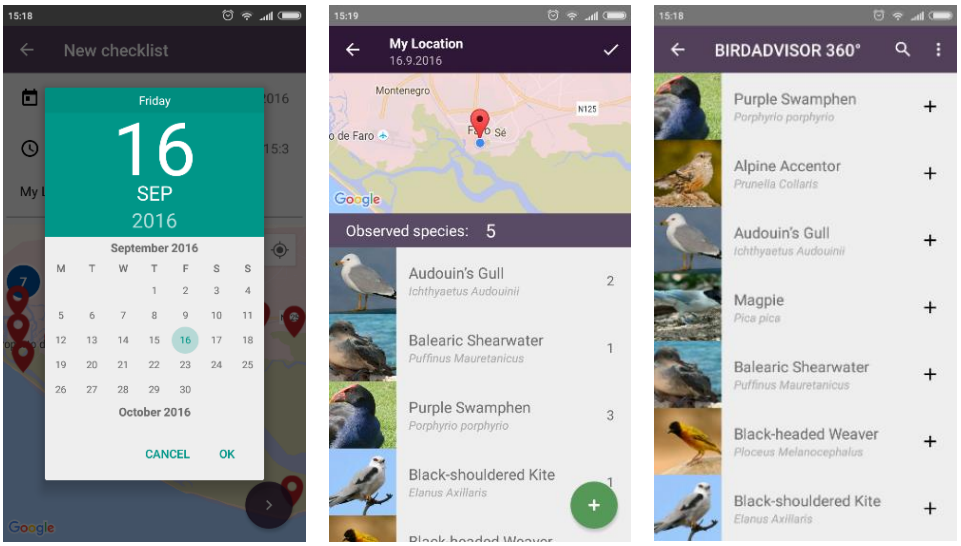


Figure 39. In a pop-up panel user can modify the information (date, hour, location).

Figure 40. The tool for adding/manipulating the bird list and preview the action in the thumbnail list before saving.

Figure 41. Birds displayed in new panel where users can select spotted birds and add it to their list of observations.

The colour palette consists of three main colours: green, purple and red. Colours were chosen from the Purple Swamp-hen – purple from plumage and red from its beak colour. The light pastel green colour is reflecting nature (see Figure 42).

Figure 42. Colour palette and typography.

The official typography of the brand identity name chosen was the Myriad Pro and Actor, and it must be respected in any communication material. In external communication – advertising, publications or others – different colour combinations of the typography can be used or else the black and white version. For the application's content was chosen the standard typeface on Android, a Google font Roboto (see Figure 42).

4.6. Evaluation procedures

Usability testing is a research tool with its roots in classical experimental methodology for conducting a controlled experiment, which employs techniques to collect empirical data while the observing representative (end user) is using the product to perform realistic tasks. This approach is more informal, but still with experimental rigor at its core which is essential for any study that one conducts (Rubin & Chisnell, 2008).

The basic elements of usability testing that were followed in this research are:

- Use of a representative sample of end users;
- Representation of the actual work environment;

- Observation of end users who either use or review a representation of the product;
- Controlled interviewing and probing of the participants by the test moderator;
- Collection of quantitative and qualitative performance and preference measures;
- Recommendation of improvements to the design of the product.

According to Barnum (2011), the usability testing is easy and affordable because it does not necessarily require a fancy lab, expensive equipment, or even a dedicated room for testing. These days, you can do usability testing anywhere. Therefore, based on this approach, the usability testing was made right on the field, in the observatories constructed for birdwatchers, nature photographers or simply for people who appreciate wildlife: «*Once you have a good idea, who your target users are and the task goals they have, walk-throughs are used to explore how a user might fare with a product by envisioning the user's route through an early concept or prototype of the product*» (Rubin & Chisnell, 2008, p. 18).

When conducting the on-site usability testing, firstly we did a short presentation to every involved participant so that they knew what we were doing and what their role in the testing was. The explanation included a short introduction to the background of the project, its aims and objectives, and to the features and functionalities of the application at this stage. They were not explained how to use the app, but they were aware of the testing observation during their experience. In the end of the testing, they were kindly asked to answer a survey and share their experience and recommendations for future improvements of the UI and UX design of the application.

4.7. Evaluation

In the next stage of the research we implemented the evaluation procedures of usability testing and collected surveys. 52 surveys were collected in a paper form and 4 were collected online, nevertheless all of the respondents participated and were observed during the testing. The collection of 56 surveys was conducted between 2nd of October and 18th of November 2016, and included all types of birdwatchers – from beginners to experts, those with no experience in this field, tourists as well as residents. All the participants were older than 18 years of age.

The survey consisted of 18 short questions divided into 2 groups: identification and evaluation. In order to simplify and guarantee the engagement of participants, the survey contained mainly rating and ordinal-scale (1-5) questions, such as: 1-not successful/important to 5-very successful/important or failed to complete the tasks; the multiple choice questions, open-ended, partly-open-ended and closed-ended questions (see Appendix A).

The 7th edition of the Birdwatching Festival in Sagres was taking place at the time – September 30th to October 5th, 2016 – and as this festival is considered the largest festival of the kind in Portugal gathering the largest concentration of birdwatchers, we presented our project and conducted the first part of surveys there. We expected a higher number of participants, however we managed to collect 11 surveys. Other conducted surveys (20) were collected in the bird observatory in Quinta do Lago (RFNP). This observatory was chosen for testing because it was the most probable place to find a larger concentration of birdwatchers at all levels of expertise, as well as nature photographers, domestic tourists or tourists from abroad. Finally, surveys were also conducted by arranged meetings with birdwatchers, photographers and other individuals relevant to the project (25). Of all conducted surveys, 2 of them were not valid because of incomplete results, therefore we will be analysing 54 valid surveys further on.

4.7.1. Results

In the conducted survey, the demographic variables of the respondents' profile were identified through the nationality, gender, age range and a level of birdwatching expertise.

29 of respondents were Portuguese (53.7%), one with the residency in Switzerland. Tourists represented 46.2% including the following nationalities: 11 English (20.3%), 7 Slovenian (35.7%), 4 respondents have German nationality (7.4%), but 2 of them are living in Portugal, 2 Catalans (Spain) (3.7%) and one from Belgium (1.8%) (see Annex D). The question on foreign or domestic tourists was answered by 35 (64%) participants, of which 11 (31.43%) responses were domestic tourists and 24 (6857%) foreign tourists. The results we are displaying in the table below were analysed by the previous demographic question and calculated more precisely (see Table 10).

Regarding the tourists in Algarve, there were 4 domestic tourists: 2 from Lisbon and 2 from Coimbra (7.4%), and 24 foreigners (44.4%) among those 2 lived in Faro district (see Table 10).

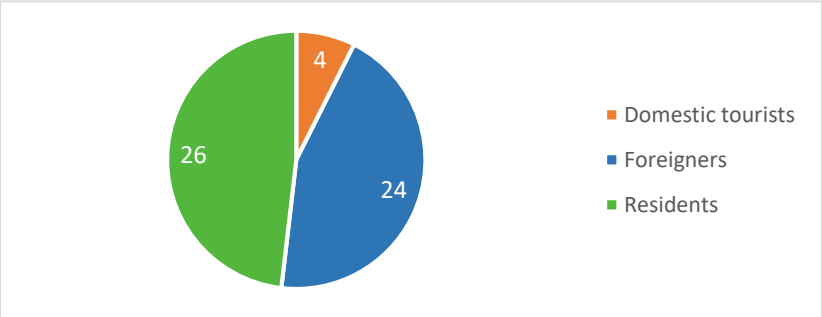


Table 10. Domestic tourists and foreigners.

The gender of the participants was quite equivalent: 51.8% (28) represented male and 48.2% (26) of them were female (see Table 11). The majority of the respondents (28) were between 35-55 years old (51.8%), while 25.9% were younger than 35 (14), and 20.3% represented the population over 55 years old (see Table 12).

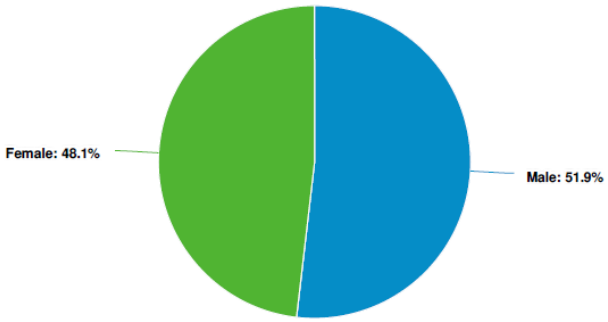


Table 11. Gender.

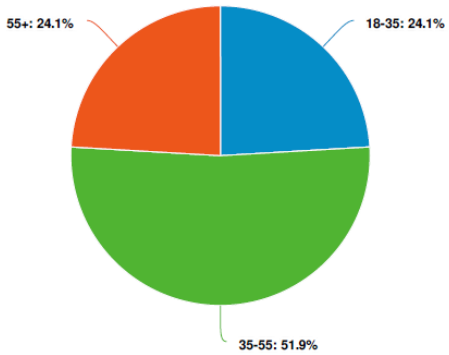


Table 12. Age range.

According to the level of birdwatching experience, 29.6% are beginners in birdwatching (16), 22.2% are intermediates (12), there were 6 experts (11.1%) and 37% (20) of them represented the respondents with no experience in birdwatching activity (See Table 13).

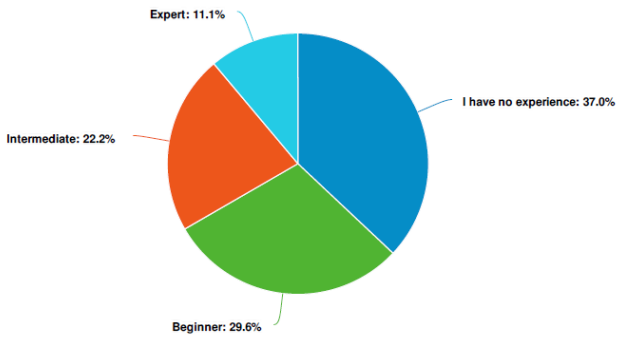


Table 13. Level of expertise.

The travelling purposes: in total, participants selected 37 times (45.68%) leisure as the preferable choice for travelling, 18 (22.22%) chose nature related activities, 13 (16.03%) nature photography and 13 (16.05%) selected birdwatching as travelling purpose. The results in the table below provide more detailed information on each group of expertise and their travelling purposes (see Table 14).

36 (68.5%) out of the 54 respondents travel for leisure purposes in combination with nature related activities 18 (22.2%); 13 stated to travel for nature photography (16%) and 13 (16%) for birdwatching activity (see Table 13). The group of experts and intermediates 18 (72%) preferably travel for birdwatching activity, then the beginners and non-experienced group, 36 (66%), who usually travel for leisure purposes (see Table 14).

Travel purpose:					
Expertise:	Respondents (total 54)	Birdwatching	Nature photography	Nature-related activities	Leisure
No experience	21	0	2	9	14
Beginner	15	0	2	2	13
Intermediate	12	8	7	4	8
Expert	6	5	2	3	1

Table 14. Purpose of travelling.

Most respondents usually travel with their partner and no children 28 (34.7%) or with a group of friends 15 (23.4%). 11 (17.1%) of participants travel alone and 10 (15.6%) of them claimed they travel with family and children (see Table 15).

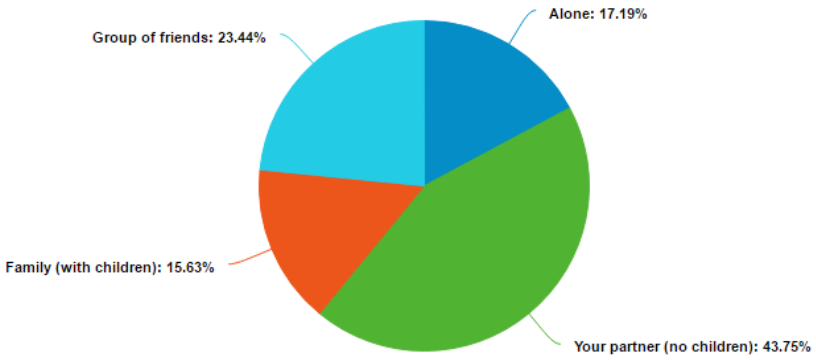


Table 15. With who do they usually travel?

Regarding the UI and UX design, the participants answered on 6 rating-scale (1-5) questions, 1 partially open-ended question and 3 open-ended questions.

First rating-scale (1-5) question was asking how successfully they had identified the four main contents: Birds, Community, Map and the Profile drawer (see Table 16). Generally, identifying the Bird content did not represent big issues, regarding the observation of the participants during the test. They were having small doubts with some of the features that were not yet functional. After explaining the situation, they understood and continued with success.

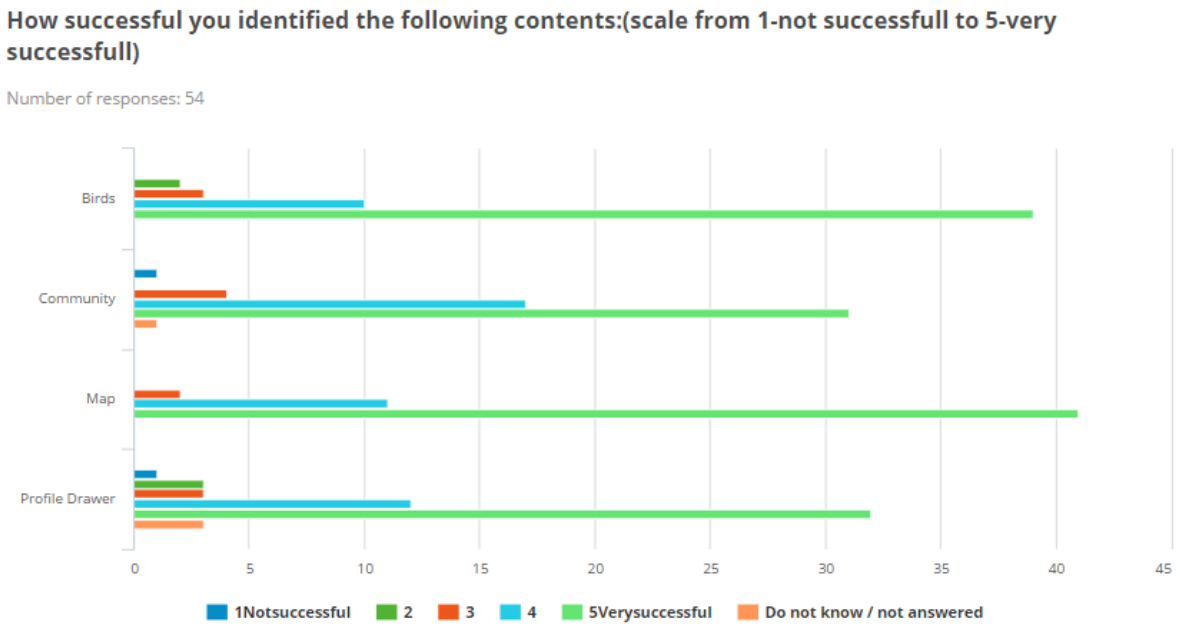


Table 16. Identification of the contents.

The results for the Birds content are showing that 39 of the respondents (72.2%) answered very successful in finding the birds, 10 (18.5%) successful, 3 (5.5%) moderately successful and 2 poorly successful (3.7%). None of them stated to fail to identify this content. In identifying the Community one respondent (1.8%) was unsuccessful and one (1.8%) didn't know/didn't respond. 31 of the respondents (57.4%) were very successful, 17 (31.5%) successful and 4 (7.4%) moderately successful in identifying the content.

The easiest content to identify was Map, where all the respondents were successful: 41 (75.9%) very successful, 11 (20.4%) successful and 2 (3.7%) moderately successful. Lastly, the Profile Drawer was a more challenging task, mostly because the respondents did not have any "walk-through" guidance and did not know what to expect. With some guidance and sub-questions they continued with success. The results show that 32 (59.5%) were very successful, 12 (22.2%) were successful and 3 (5.5%) of the respondents were moderately successful. 3 respondents (5.5%) were poorly successful, 1 (1.8%) was unsuccessful and 3 (5.5%) of them didn't know/didn't respond.

On the next question, the participants were identifying the features (see Table 17) in each of the contents (Birds, Map, Community and Profile).

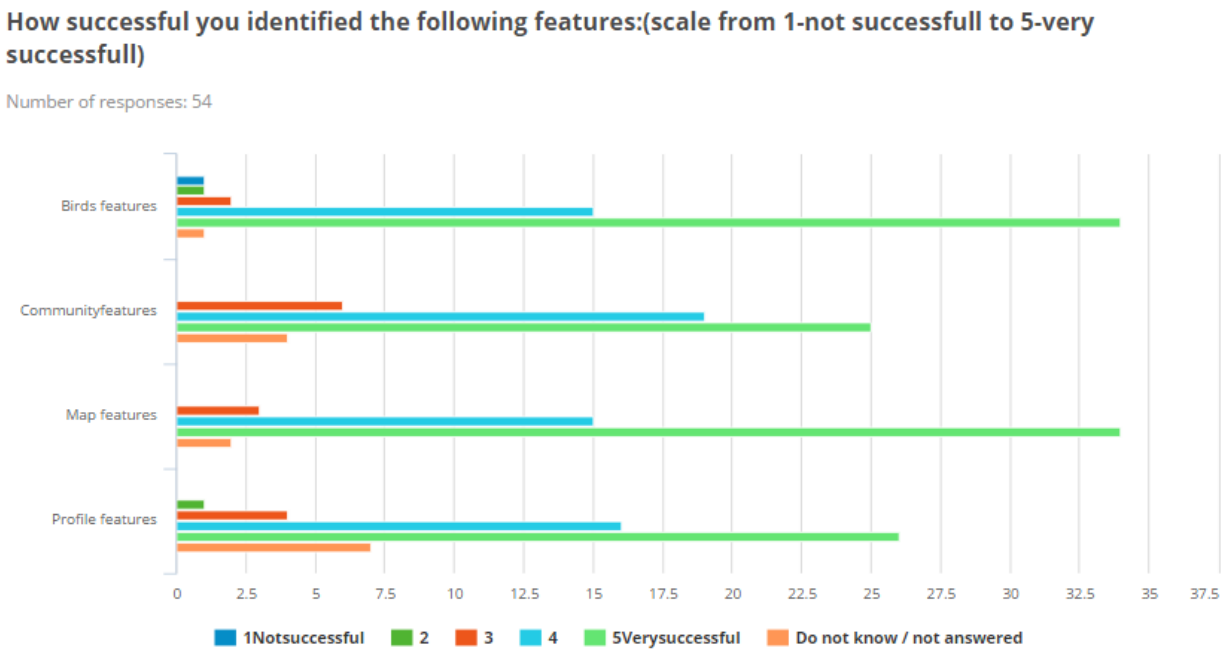


Table 17. Identification of the features.

In identifying the Birds features, 34 (62.9%) of the respondents were very successful, 15 (27.7%) were successful and 2 (3.7%) moderately successful. The poorly successful (1) 1.8% and unsuccessful respondents (1) 1.8% had difficulties in finding the bird sounds. That was taken into account and was changed later on. The Community features represented in general a mid-satisfaction range, regarding the non-functional features displayed in the app. Nonetheless, 25 (46.2%) of respondents were very successful in identifying the features and understood the purpose of it with no problem, 19 (35.1%) of them were successful and 6 were moderately successful. When identifying the Map features, 4 of the respondents (7.4%) did not know/answer on that question and 2 (3.7%) of the respondents did not know/respond on this question. 3 (5.5%) of them were moderately successful, 15 (27.7%) successful and 34 (62.9%) were very successful in identifying all the Map features. Profile drawer was easily identified by 26 (48.1%) of the respondents, 16 (29.6%) of them were successful and 4 (7.4%) moderately successful. Regarding

the sliding movement to reveal the drawer, one of the respondents was poorly successful in identifying the features and for 7 (12.9%) of them, this task represented a big challenge, therefore they did not know or answered this question.

The following (1-5 scale) question about how easy or not it was to create a new activity if they went birdwatching. It was a bit of a challenge for some participants (see Table 18). 21 (38.8%) of the respondents did not have any difficulties in finding the floating button in the Map, edit the data and add bird species to the list. For 18 (33.3%) of them it was easy and for 8 (14.8%) respondents was neither easy, nor difficult. One respondent had some difficulties, and 2 (3.7%) respondents claimed it was not easy to do. 4 (7.4%) respondents did not know/answer to this question due to lack of information or lack of time, when doing the test.

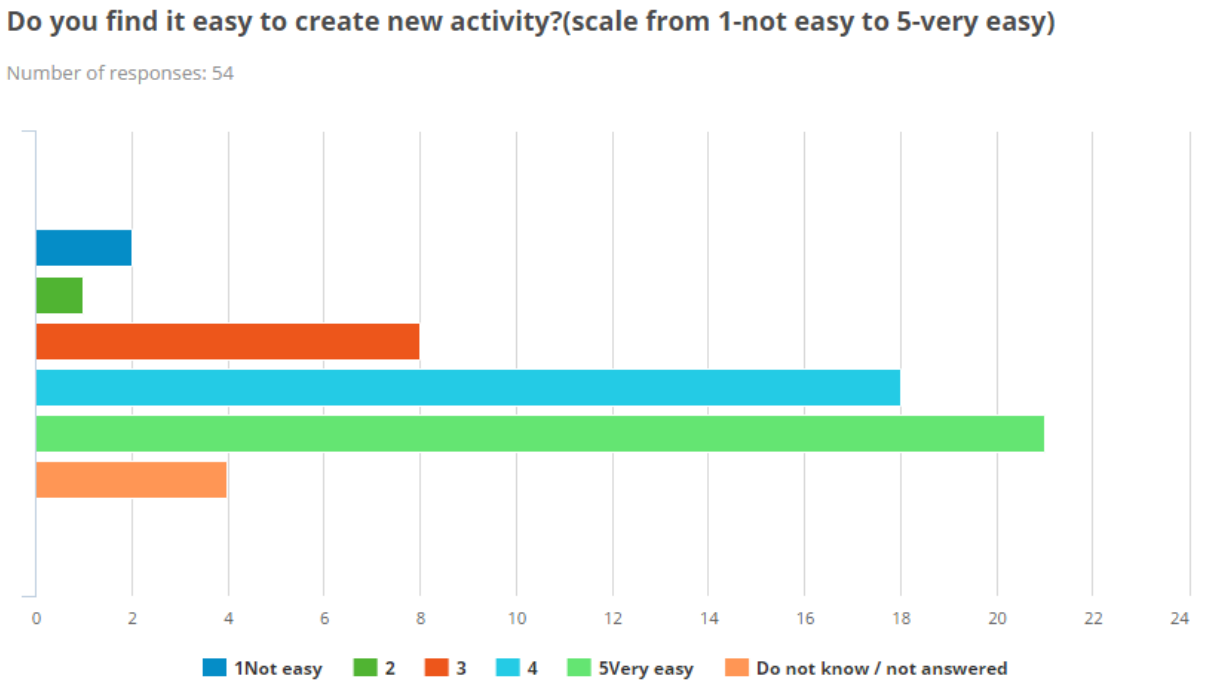


Table 18. Creating new activity.

On the next open-ended question we were asking the participants if the proposed features were adequate for a successful birdwatching activity. We gathered 38 out of 54 valid responses (70.3%) stating that they do believe the proposed features are adequate or suitable for successful

birdwatching (see Table 19). The results in the table below are adapted, nevertheless all the answers are available in the Annex D.

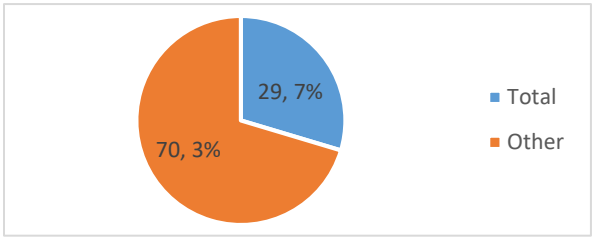


Table 19. Adequate features for successful birdwatching.

The next (1-5) scale question was trying to gather the results of user experience (see Table 20). Regarding the most highly-marked responses (5) - 40 (74.0%) of the respondents consider the app very useful, 39 (72.2%) respondents find the app very accessible, 37 (69.5%) that it's visually clear designed and 35 (64.8%) believe it is functional and usable. 34 (62.9%) find the app very aesthetical, pleasurable and valuable and 32 (59.2%) of them believe the app is easy to navigate.

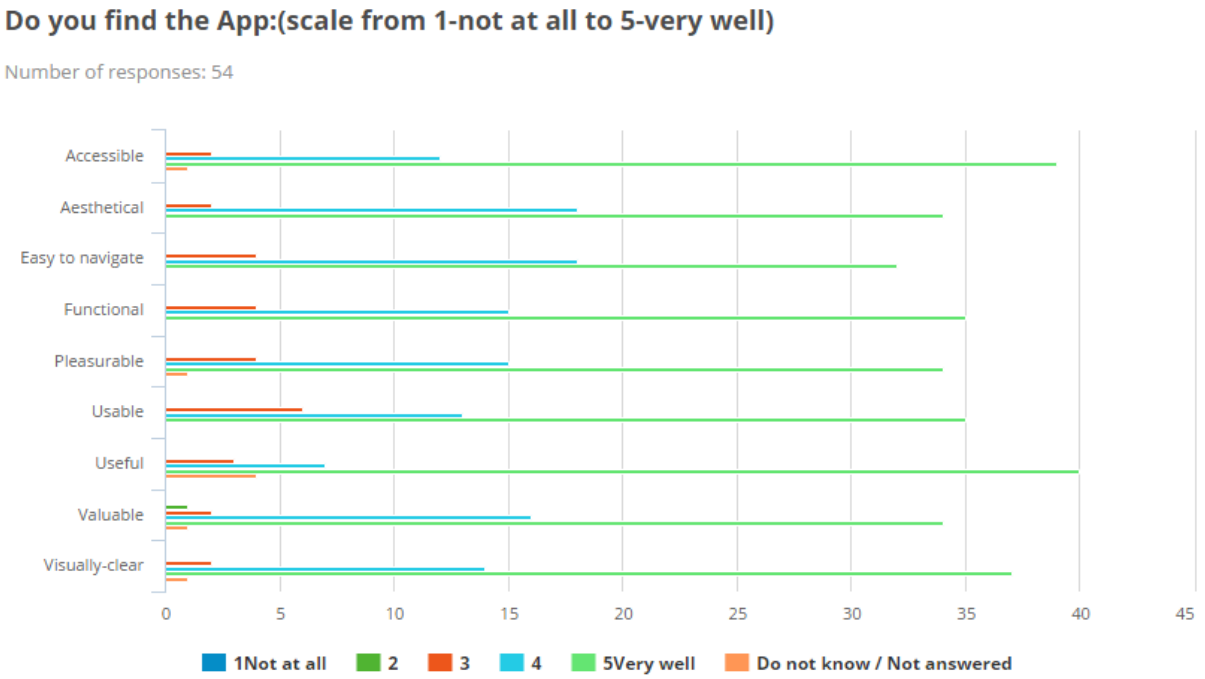


Table 20. Testing UX.

The respondents that did not know or did not answer to the question: 1 (1.8%) were regarding accessibility, 1 (1.8%) to visually clear design and 1 (1.8%) to the pleasurable aspect of the app. 4 (7.4%) respondents were not convinced if the app was useful, according to their level of experience in birdwatching.

Nevertheless, all the participants evaluated the experience of use the application positively. Regarding the 1-5 rate of the respondents (1 meaning not good and 5 meaning very good): 38 (70.3%) marked their experience as very good, 13 (24.0%) as good and 3 (5.5%) as fairly good experience (see Table 21).

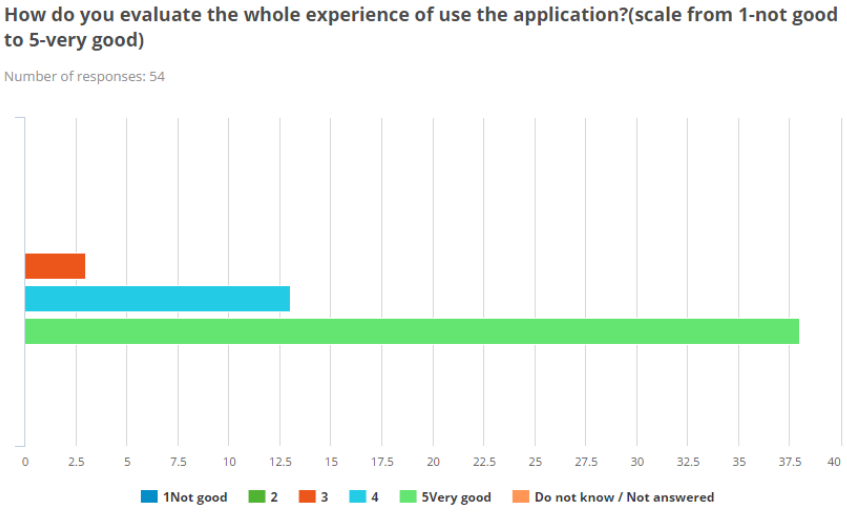


Table 21. Experience of use.

The survey also included a question, which would be helpful information for future decisions, on the payment for the application (see Table 22). 64% of the respondents consider the one-time payment for the app and 29.6% are considering using a free app with publicity (pay to remove ads). 3.7% of them are willing to pay offers in-app purchases and 1.8% of respondents are willing to pay a monthly fee.

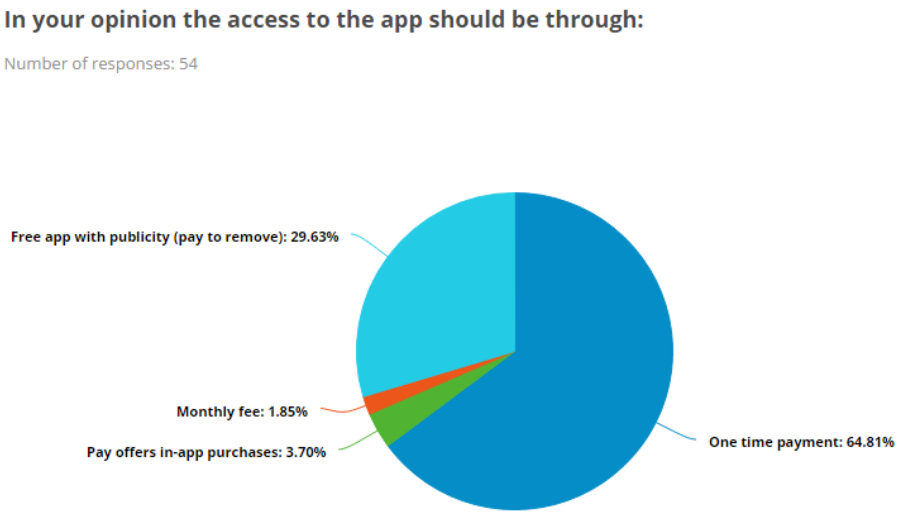


Table 22. Access to the app.

In the survey we were also asking the participants for their opinion about the importance of the features in the app, regarding their level of birdwatching experience (see Table 23).

The 1-5 scale question (1 not important and 5 very important) the respondents stated the following: Description of Algarve's best birdwatching spots is very important for 42 (77.7%) of the respondents, for 9 (16.6%) of them is fairly important and 3 (5.5%) state it's important for them. The Suggested tracks are very important to 39 (72.2%) of the respondents, for 12 (22.2%) of them are fairly important, for 2 (3.7%) are important and for 1 (1.8%) respondent the suggested tracks are slightly important. The rate of the location view in 360˚ Photo Sphere was very important for 32 (59.2%) respondents, 13 (24.0%) fairly important and 7 (12.9%) important. For 1 (1.8%) of them it doesn't have any importance and 1 (1.8%) didn't know/answer to this question. The suggestion of the birds by specific vegetation (habitat) very important to 29 (53.7%) of the respondents, 20 (37.0%) say it's fairly important and to 4 (7.4%) of them this suggestions are important. 1 (1.8%) of the respondents did not know/answer this question. Tour guide offices and hotels are very important to 15 (27.7%) respondents, 19 (35.1%) fairly important, to 13 (24.0%) important and to 7 (12.9%) of them they are slightly important. Regarding the eBird hotspots and the ability to save the sightings were very important to 30 (55.5%) of respondents, 16 (29.6%) say it's fairly important and 4 (7.4%) stated it as important. For 2 (3.7%) of them this is not an important feature.

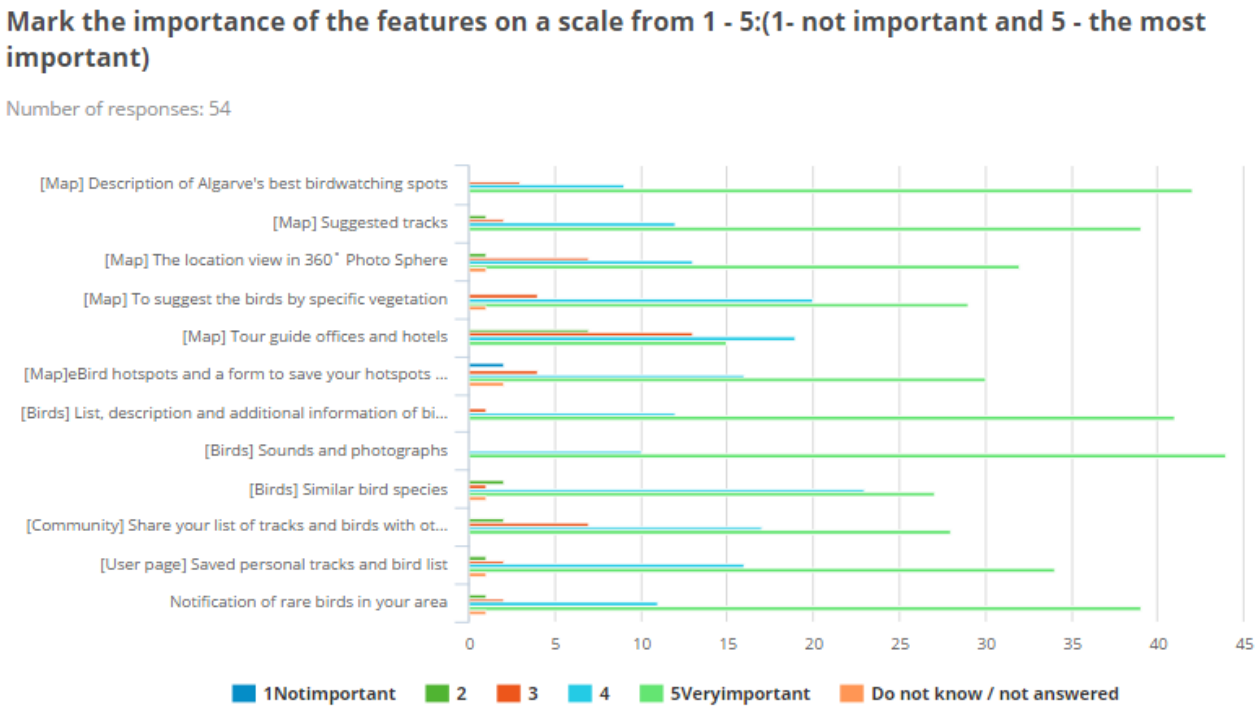


Table 23. The importance of the features.

The list of birds, their description and additional information is very important for 41 respondents, fairly important for 12 (22.2%) and important for 1 (1.8%) respondent. Regarding the sounds and the photographs of the birds, 44 (81.4%) agree this is very important and 10 (18.5%) stated it is a fairly important part of the app. Similar bird species are very important to 27 (50%) respondents, 23 (42.5%) say it is fairly important and 1 (1.8%) respondent say this is an important information. 2 (3.7%) of them say this is slightly important and 1 (1.8%) did not know/answer to this question.

The possibility of sharing the tracks and bird sightings with other users represents a very important feature for 28 (51.8%) respondents, fairly important to 17 (31.4%) and important to 2 (3.7%) of the respondents. 1 (1.8%) of them did not know/respond and to other (1.8%) this doesn't represent an important feature. The notification of rare birds in your area represent very important feature to 39 (72.2%) respondents, 11 (20.3%) fairly important and important for 2 (3.7%). For one respondent (1.8%) this doesn't represent an important feature and 1 (1.8%) did not know/respond.

The last three questions were the open-ended type. Firstly, we were asking the participants if they believe that the app can provide better experience in birdwatching (see Table 24). The results show that all 54 (100%) of the participants replied positively to the question. 46 (85.1%) stated that it can provide better experience for users in the field, as well as the app is useful (4 or 7.4%), 1 (1.8%) that app is informative, 1 (1.8%) facilitate and 1 (1.8%) valuable (see Table 24).

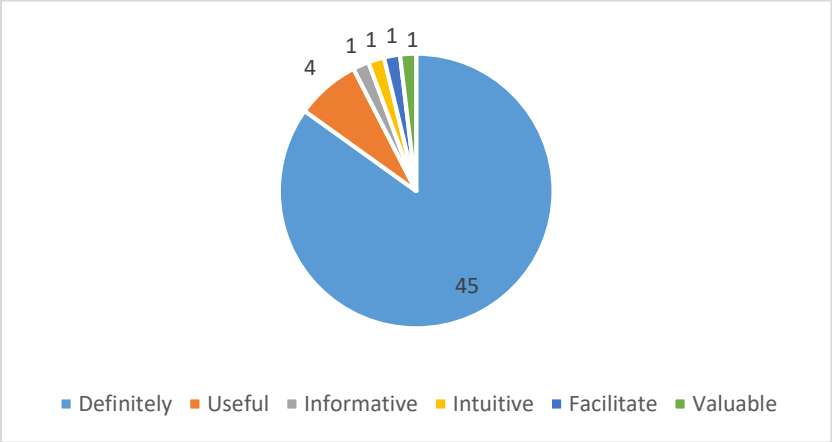


Table 24. The app provide better birdwatching experience.

On the next open-ended question, we were asking participants if they would use the Birdadvisor 360˚App for their birdwatching activity. 50 (92.59%) of participants stated yes, 1 (1.8%) probably, 1 (1.8%) maybe, 1 (1.8%) didn't know and 1 (1.8%) stated he has no phone on holidays (see Table 25).

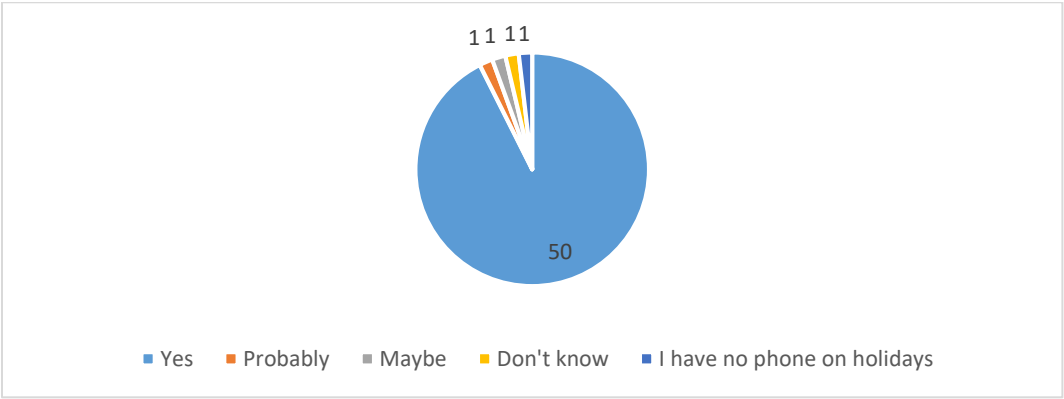


Table 25. The app provide better birdwatching experience.

The last question we proposed to participants was asking for any suggestions they might have for the application (see Table 26).

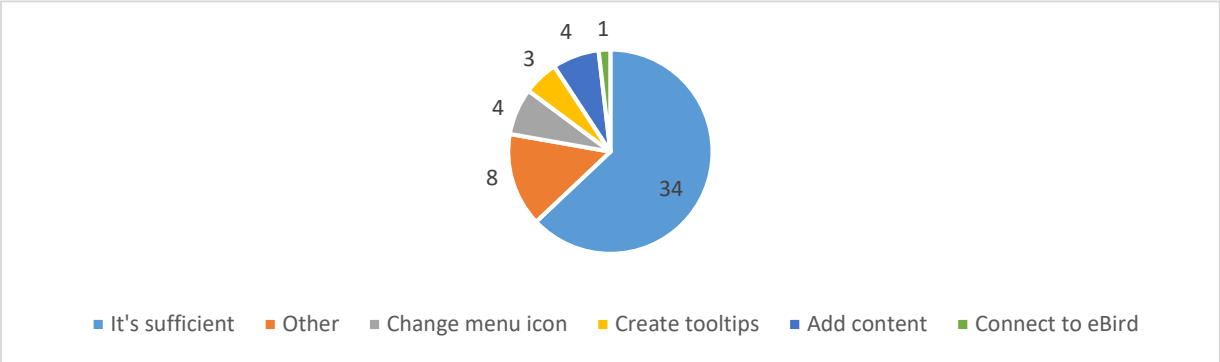


Table 26. The suggestions of the participants.

What they would add or change so order that we could improve for them in the future. 34 (62.96%) of the respondents stated they think the app has sufficient features for successful birdwatching. Other 20 (37.03%) of participants gave various suggestions, among them 4 (7.40%) said to change the menu icon, 3 (5.55%) to create the tooltips to guide through the app, 4 (7.40%) to add more content and various photos and 1 (1.8%) to connect the app with the eBird platform (see Table 26). Other responses are available in Annex D.

4.7.2. Discuss the results

The majority (53.7%) of respondents were Portuguese (residents and domestic tourists), while the foreigners represented 46.2%, of which 20.3% were English tourists, 35.7% were Slovenian, 7.4% German, 3.7% Catalan (Spain) and 1.8% were Belgium (see Table 10). The gender of the participants was almost equivalent, 51.8% were male respondents and 48.2% represented female respondents (see Table 11).

51.8% of the respondents were between 35-55 years old, while 25.9% were younger than 35 years old. Population older than 55 years old represented 20.3% (see Table12). According to the level of birdwatching experience, the participants stated they are beginners (29.6%) in birdwatching, 22.2% are intermediates, 11.1% experts and the 37.1% of them claimed they have no experience in birdwatching activity (see Table 13). There is a thin line separating intermediates from experts, because some of them have a very humble opinion on their knowledge of birdwatching. Nevertheless, if we join the experts and intermediates (33.3%), and the non-experienced with the beginners (66.7%), we can understand what their motives to travel are. More experienced groups stated they give preference to birdwatching activity (24.0%), or they do it in combination with photography (16.6%) and leisure (16.6%). On the other hand, the less experienced respondents and beginners claim they travel for leisure (50%) in combination with nature related activities (20.3%). The more experienced birdwatchers (total 18) usually travel with their partners without children (8 or 44.4%) or with a group of friends (8 or 44.4%).

The evaluation of the UI and the app's contents (rating from 3-moderately successful to 5-very successful), users stated (96.3% or 52) they were successful at identifying the Birds contents and they perform the same success (96.3%) at identifying the Community contents. The participants stated they were 100% successful at identifying the Map contents and 87% claim they were successful at identifying the Profile Drawer. To the participants, the identification of the contents represented smaller doubts because some of the features were displayed but not functional. After explaining the situation, they fully understood and continued with success (see Table 16).

Regarding the features identification, 51.4% of the respondents successfully identified the Birds features. The poorly successful or unsuccessful respondents (3) claim their main difficulty was

finding the button for the bird's sounds. The Community features were 92.6% successfully identified, while the Map features were successfully identified by 96.3% of the respondents. Profile features were easily identified by 85.2%, stated by the respondents.
The most challenging part of the tasks, claimed respondents, represented the new activity, where they had to find a floating action button to start their own activity. 87.03% (47) stated they were successful in doing so, while 12.9% (7) of them claimed to find it difficult (see Table 17). The most difficulties were representing the two action buttons on the Map – to start a new activity and the button of content, which functionalities did not appear very clear.

Furthermore regarding the user experience, 74% of the participants consider the app very useful, 72.2% accessible, 69.5% visually-clear, 64.8% functional and usable. 62.9% consider the app aesthetical, pleasurable and valuable and 59.2% believe the app is easy to navigate. Nevertheless, all the respondents positively evaluate the experience of using the application (Table 18). We can also see that 64% of the respondents claim they are considering to buy the application with one-time payment, 29.6% are considering a free app with publicity (pay to remove ads), while 3.7% of them are willing to pay offers in-app purchases and 1.8% of respondents are willing to pay a monthly fee (see Table 19).

The respondents stated that the most important features (responses marked only with 5-vey high value), are the sound and photograph description of the birds (81.4%), description of Algarve's best birdwatching spots (77.7%), and the list of birds, their description and additional information (75.9%). The suggested tracks and the notification of rare birds in the area are the next equally important features (72.2%), claimed the respondents. The tour guide offices and hotels are representing the least important feature (selected answers 1-not important and 2-slightly important) for the inexperienced respondents (11.1%), while this feature is more appreciated among respondents with more experience in birdwatching.

Lastly, 100% of the participants claim that this application can provide better experience for users in the field, and 90.7% of them would absolutely use the Birdadvisor 360˚App for their birdwatching activity.

CHAPTER 5. Conclusions

5.1. Specific conclusions

Based on the usability testing, following the steps of Rubin & Chisnell (2008), the demographic characteristics of the target public were inferred. This survey shows that the target public is constituted by 50% Portuguese (including both residents and domestic tourists) and 50% tourists, mainly from England, Slovenia, Germany, Spain (Catalonia) and Belgium.

There was approximately the same number of male and female birdwatchers, which shows us the equity in usage by gender. Half of the respondents are between 35-55 years old and the other half is represented by one quarter of young people (under 35) and the other quarter of people is over 55 years old.

The research results show us that over 60% of the participants have experience in birdwatching (beginners to experts). The experts stated they mostly travel for birdwatching purposes, and intermediates combine birdwatching with nature photography and leisure. Non-experienced participants and beginners generally travel for leisure purposes or combine their holidays with nature related activities. The birdwatching experts and intermediates stated they mostly travel with their partners without children or a group of friends, or alone.

Creating the prototype for this research was also helpful for us to understand the issues that occurred during the usability testing and have to be resolved in order to improve the experience for users. Regarding the results of UI, the participants stated they were very successful at identifying all the app contents, features and at creating new birdwatching activity. They had some difficulties to identify the action buttons to start a new activity and the button of content. There was also an issue with the visibility of the button for bird's sounds, which must be relocated to a more visible location. The respondents claimed they were missing the tooltips or guidance through the app.

Regarding the features, the respondents were successfully identifying all of them and they do believe the features are adequate for their level of birdwatching skills. However, in the Map and

Birds content there are many options of use, and users were missing an on-board guidance for introduction to the app.

The research also indicates that the app is considered very useful, accessible, visually-clear, functional and usable, though, it needs more improvements on the UI. Likewise, the experience of use was positively evaluated by all of the respondents.

In the research is gathered information of preferable access to the app which will be useful in the future accomplishment of the project. The majority of the participants prefer to access the app through one-time payment or get a free app with publicity (pay to remove ads). Fewer were the number of those willing to pay offers in-app purchases or consider a monthly fee to access the application.

The main advantage of the research was the revelation of the hierarchy of the most important features for birdwatchers, namely: the quality bird photographs and sounds, the description of the Algarve best birdwatching spots, and the list of birds with additional information for each species. The notification of rare birds in your area also represents an important feature. The next important social feature is the possibility to share the tracks and bird sightings with other users, and the list of similar bird species which can help identifying bird species.

The results of the conducted surveys and usability testing observations enabled us to identify the issues and necessary improvements to be carried out, in order to extend the potential of this project and provide a new birdwatching guide for the touristic offer in Algarve. All the participants expressed their excitement over the new proposed tool and delivered their expectations in the future as of paramount importance.

5.2. General conclusions.

Portugal is a privileged European destination for birdwatching and it is growing as an important area for a sustainable tourist offer in Algarve. Birdwatching gives tourists the great opportunity to discover its rich flora and fauna and biodiversity in some unique ecosystems, such as Ria Formosa or Lagoa dos Salgados. Therefore, the development of tourist activities in protected or sensitive zones has to be implemented with a greater sense of responsibility. Based on the evaluations of the research, we believe the development of a new guiding tool gives way to a sustainable tourist offer and promotion of Algarve through the app. It is a modern tool for mobile platforms, supporting quality visual and sensorial content, which is beyond the capabilities of a paper book guide and can be useful and accessible to every birdwatcher.

This research connects birdwatching and tourism with communication design. We designed an app and created a prototype as a practical design solution, including the most important aspects of a good UI and UX for birdwatching, and optimisation of interface for the beginners, intermediates and expert users. Regarding the results, we included in the app many important features for birdwatcher's needs in the field, such as: variety of photographs, description, sounds and the suggested tracks around the region. As a result we have the evidence that users strongly believe this app can provide them positive and memorable experience, in anticipation phase, *in situ*, or post-trip, and they would undeniably use Birdadvisor 360˚App for their birdwatching activity.

Therefore, our research study of a digital tool for sustainable tourism in Algarve, positively answered our research question, and proved our hypothesis, suggesting that a mobile application can help birdwatchers to have a better experience in their activity. The usability testing suggests that development of a new mobile platform is satisfying the needs of birdwatchers, as they can discover new locations, record their route, mark the observed birds and share their experience with other users through this application, as well as access quality information on birds, photos and their various sounds. We believe that Birdadvisor 360ºApp can also be an important tool for involving communities in tourism and their promotion. It can be used as facilitator and promoter of a positive and memorable tourist experience and enrich this nature tourist sector.

5.3. Identifications of limitations

The general limitations of the work development are representing the lack of information sources we could include in the app as well as the financing for the material (photographs, sounds, information, tracks) we want to provide. In order to collect a certain number of users for further business opportunities, the application should include this material.

Our limitation is also the time available of our developer or funding stakeholder to contract others in order to proceed with the development of the app and the changes that need to be applied. Furthermore, for the same reasons, we are focused now on the Android platform only.

The survey presents some limitations with some flaws identified during the testing, which can be developed in future as an opportunity for further research and continuous improvement. Our expectation was to conduct more surveys at Sagres Birdwatching Festival. As this was our first time visiting and participating in this huge event, we believe, the reason for a low number of participants regards the festivals' mainly outdoors activities. Naturally, birdwatchers came to observe the birds, therefore our expectations of many collected surveys was not very fruitful. We will keep this in mind for the next opportunities of future research.

5.4. Recommendations for future work

For the implementation of the app it is important to be in contact with birdwatching associations, public and private investors and people who are interested in birdwatching and willing to participate in developing this project. Furthermore, we will try to attend more birdwatching events, seminars and conferences which will help to disseminate our project and build a successful future path.

The results of usability testing also brought some valuable suggestions and new ideas for future UI and UX improvements:

- To replace the action button of creating a new activity;
- To include more detailed information on birds (identification, habitat, abundance, etc.);
- To include various photographs of species, representing the age stages, plumage, colours, etc., in order to engage more experts to use the app;
- To link the app with eBird and provide the credibility of records;
- To create a tooltips and on-boarding for a quicker and more intuitive use of app's UI;
- To include the norms of Natural parks, restriction areas and public transport;
- The possibility to zoom in the route of the tracks and give more information on the specific track (when is the best time to visit place, mark the observatories, etc.);
- The ability for users to rate the tracks and to comment on the user's tracks in general.

The general recommendations for future steps of the project are that the development of the application is planned, thus creating a business opportunity for birdwatching tourism in Algarve.

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Annex A.

The complete list of birdwatching apps found in our research.

Worldwide:
BirdsEye
BBI – World Bird Guide

Europe:
Birds of Europe
Collins Bird Guide
Ornithopedia Europe
Birds of Northern Europe
Bird Id – British Birds
Birder – Guide to birds of Britain and Ireland
UK Birds – Birdwatching App
Birds of Britain and Ireland
iBird UK and Ireland Guide to Birds
RSPB eGuide to British Birds
Mediterranean Birds –BirdLife International
Birding in Extramadura
Trujillo Birdwatching – Extramadura
Aves de España
ObsMapp

North America:
Audubon Birds – A field Guide to North American Birds
iBird,Ultimate Guide to Birds
Sibley Birds eGuide to the Birds of North America
Peterson Birds of North America
Cornell Lab Bird
National Geographic Birds: Field guide to North America
BirdJam
Sparrows/Wrablers
BirdLog
NatureTap
Larkwire
Chirp! Bird Songs
Birder
Birds USA
Bird Codes
Bird Watcher's Digest
Scotts Bird ID
Birding
Birdwatcher's Diary
My Bird Observations
BirdTunes
Wild about Birds!
eyeC,
BirdBeat
Birding RSS
US Birding Checklist
Happy Birding Journal

Central America and Caribbean:
Costa Rica Birds Field Guide
The Birds of Haiti and the Dominican Republic
Panama Birds Field Guide
Puerto Rico and Virgin Islands Birds in photo and audio

South America:
Birds of Brazil
Birds of Colombia
Birds of Ecuador
Hummingbirds of Ecuador

Asia:
eGuide to Birds of the Indian Subcontinent
Japanese Birds
Birds of Korea Pro
eGuide to Birds of Middle East
Birds of Singapore

Africa:
eGuide to Birds of East Africa
Newman's Birds of Southern Africa
Roberts Multimedia Birds of Southern Africa
Sasol eBirds of Southern Africa

Australia and Pacific Islands:
eGuide to the Birds of Australia
Pizzey & Knight Birds of Australia
Birds of New Zeland

Annex B.

The survey in English:

Birdadvisor 360°- a digital support for birdwatching tourism in Algarve

This survey is part of the final scientific report which is integrated in a Master of Communication Design for Tourism and Culture at the University of Algarve. It's important to understand the birdwatchers needs and the satisfaction on content structure of the Birdadvisor 360° application, the proposed digital support for birdwatching tourism in Algarve, so your opinion is very important for us.

The survey will take only 15 minutes of your time. Your answers will be confidential and used only for scientific purposes.

Thank you for your time!

Identification

Please insert the following information *

Nationality:

Country of residence:

District:

Gender: *

- Male
- Female

Age: *

- 18-35
- 35-55
- 55+

Your birdwatching experteese: *

- ○ I have no experience
- ○ Beginner
- ○ Intermediate
- ○ Expert

If you are a turist in Algarve, you are: *

- ○ Foreign tourist
- ○ Domestic tourist

What are your main reasons to travel? *

- ○ Birdwatching
- ○ Nature photography
- ○ Nature related activities
- ○ Laisure

With who do you usually travel? *

- ○ Alone
- ○ Your partner (no children)
- ○ Family (with children)
- ○ Group of friends

Evaluation

How successful you identified the following contents:
(scale from 1-not successfull to 5-very successfull) *

	1 Not successful	2	3	4	5 Very successful	Do not know / not answered
Birds	○	○	○	○	○	○
Community	○	○	○	○	○	○
Map	○	○	○	○	○	○
Profile Drawer	○	○	○	○	○	○

How successful you identified the following features:
(scale from 1-not successfull to 5-very successfull) *

	1 Not successful	2	3	4	5 Very successful	Do not know / not answered
Birds features	○	○	○	○	○	○
Community features	○	○	○	○	○	○
Map features	○	○	○	○	○	○
Profile features	○	○	○	○	○	○

Do you find it easy to create new activity?
(scale from 1-not easy to 5-very easy) *

1 Not easy	2	3	4	5 Very easy	Do not know / not answered
○	○	○	○	○	○

Are the proposed features adequate for a successful birdwatching activity? *

Do you find the App:
(scale from 1-no to 5-very) *

	1 No	2	3	4	5 Very	Do not know / Not answered
Accessible	○	○	○	○	○	○
Aesthetical	○	○	○	○	○	○
Easy to navigate	○	○	○	○	○	○
Functional	○	○	○	○	○	○
Pleasurable	○	○	○	○	○	○
Usable	○	○	○	○	○	○
Useful	○	○	○	○	○	○
Valuable	○	○	○	○	○	○
Visually-clear	○	○	○	○	○	○

How do you evaluate the whole experience of use the application?
(scale from 1-not good to 5-very good) *

1 Not good	2	3	4	5 Very good	Do not know / Not answered
○	○	○	○	○	○

In your opinion the access to the app should be through: *

- ◯ One time payment
- ◯ Pay offers in-app purchases
- ◯ Monthly fee
- ◯ Free app with publicity (pay to remove)

Mark the importance of the features on a scale from 1 - 5:
(1- not important and 5 - the most important) *

You can select multiple options per row.

	1 Not important	2	3	4	5 Very important	Do not know / not answered
[Map] Description of Algarve's best birdwatching spots	◯	◯	◯	◯	◯	◯
[Map] Suggested tracks	◯	◯	◯	◯	◯	◯
[Map] The location view in 360° Photo Sphere	◯	◯	◯	◯	◯	◯
[Map] To suggest the birds by specific vegetation	◯	◯	◯	◯	◯	◯
[Map] Tour guide offices and hotels	◯	◯	◯	◯	◯	◯
[Map] eBird hotspots and a form to save your signtings	◯	◯	◯	◯	◯	◯
[Birds] List, description and additional information of bird	◯	◯	◯	◯	◯	◯
[Birds] Sounds and photographs	◯	◯	◯	◯	◯	◯
[Birds] Similar bird species	◯	◯	◯	◯	◯	◯

[Community] Share your list of tracks and birds with other users	○	○	○	○	○	○
[User page] Saved personal tracks and bird list	○	○	○	○	○	○
Notification of rare birds in your area	○	○	○	○	○	○

Do you believe the app can provide better experience in birdwatching?

Would you use this app for birdwatching avtivity? *

Do you have any further suggestions for the app? *

Annex C.

The survey in Portuguese:

Birdadvisor 360˚ - Ferramenta digital de apoio ao turismo sustentável e observação de aves no Algarve

Este inquérito faz parte do relatório científico final que é integrado no Mestrado de Design de Comunicação para o Turismo e Cultura da Universidade do Algarve. É importante compreender as necessidades dos observadores de pássaros e a sua satisfação na estrutura do conteúdo da aplicação Birdadvisor 360˚, o suporte digital proposto para o turismo de observação de aves no Algarve.

O inquérito levará apenas 15 minutos do seu tempo e a sua opinião é muito importante para nós. As suas respostas são confidenciais e usadas apenas para fins científicos.

Obrigado pelo seu tempo!

Identificação

Por favor, insira as seguintes informações *

Nacionalidade:

País de residência:

Distrito:

Género *

- Masculino
- Feminino

Idade: *

- 18-35
- 35-55
- 55+

A sua experiência em observação de aves *

- ○ Não tenho experiência
- ○ Principiante
- ○ Intermédio
- ○ Especialista

Se você é um turista no Algarve, escolha por favor:

- ○ Turista estrangeiro
- ○ Turista Nacional

Quais são os seus principais motivos para viajar? *

- ○ Observação de aves
- ○ Fotografia de natureza
- ○ Atividades relacionadas com natureza
- ○ Lazer

Com quem costuma viajar? *

- ○ Sozinho
- ○ Seu parceiro (sem filhos)
- ○ Família (com crianças)
- ○ Grupo de amigos

Avaliação

Com que facilidade identificou os seguintes conteúdos:
(Escala de 1-sem sucesso a 5-com muita facilidade) *

	1 Sem sucesso	2	3	4	5 Com muita facilidade	Não sabe / não respondeu
Aves	○	○	○	○	○	○
Comunidade	○	○	○	○	○	○
Mapa	○	○	○	○	○	○
Perfil	○	○	○	○	○	○

Com que facilidade identificou as seguintes funcionalidades:
(Escala de 1-sem sucesso a 5-com muita facilidade) *

	1 Sem sucesso	2	3	4	5 Com muita facilidade	Não sabe /não respondeu
Funcionalidadesde Aves	○	○	○	○	○	○
Funcionalidadesde Comunidade	○	○	○	○	○	○
Funcionalidades de Mapa	○	○	○	○	○	○
Funcionalidades de Perfil	○	○	○	○	○	○

Com que facilidade conseguiu criar uma nova atividade?
(Escala de 1-sem sucesso a 5-com muita facilidade) *

1 Sem sucesso	2	3	4	5 Com muita facilidade	Não sabe / não respondeu
○	○	○	○	○	○

São as funcionalidades propostas adequadas para uma atividade de observação de aves bem sucedida? *

Você acha a Aplicação:
(Escala de 1-pouco a 5-muito) *

	1 Pouco	2	3	4	5 Muito	Não sabe / não respondeu
Acessível	○	○	○	○	○	○
Agradável	○	○	○	○	○	○
Estética	○	○	○	○	○	○
Funcional	○	○	○	○	○	○
Fácil de navegar	○	○	○	○	○	○
Fácil de usar	○	○	○	○	○	○
Valor	○	○	○	○	○	○
Visualmente-claro	○	○	○	○	○	○
Útil	○	○	○	○	○	○

Como você avalia toda a experiência de uso da aplicação?
(Escala de 1-desagradável para 5-muito bom) *

1 Desagradável	2	3	4	5 Muito bom	Não sabe / não respondeu
○	○	○	○	○	○

Na sua opinião o acesso à aplicação deve ser através de: *

- ○ Pagamento único
- ○ Pagamento com oferta de saldo em outras aplicações
- ○ Taxa mensal
- ○ Aplicativo gratuito com publicidade (pagar para remover)

Marque a importância das características numa escala 1-5:
(1- pouco importante e 5 - muito importante) *

	1 Pouco importante	2	3	4	5 Muito importante	Não sabe / não respondeu
[Map] Descrição dos melhores pontos de observação de aves do Algarve	○	○	○	○	○	○
[Map] Roteiros sugeridos	○	○	○	○	○	○
[Map] A vista da localização em 360° Photo Sphere	○	○	○	○	○	○
[Map] Sugerir aves por vegetação específica	○	○	○	○	○	○
[Map] Pontos de informação turística e hotéis	○	○	○	○	○	○
[Map] eBird hotspots e um formulário para salvar suas observações	○	○	○	○	○	○
[Birds] Lista, descrição e informações adicionais da ave	○	○	○	○	○	○
[Birds] Sons e fotografias	○	○	○	○	○	○
[Birds] Espécies de aves similares	○	○	○	○	○	○
[Community] Partilha da sua lista de roteiros e aves com outros utilizadores	○	○	○	○	○	○
[User page] Guardar roteiros e lista de aves	○	○	○	○	○	○
Notificação de aves raras na sua área	○	○	○	○	○	○

Acredita que esta aplicação pode proporcionar uma melhor experiência na observação de aves?

Usaria esta aplicação para a atividade de observação de aves? *

Tem outras sugestões para a aplicação? *

Annex D.

The results of conducted surveys:

SurveyHero.com

results (all)

Please insert the following information

Number of responses: 54

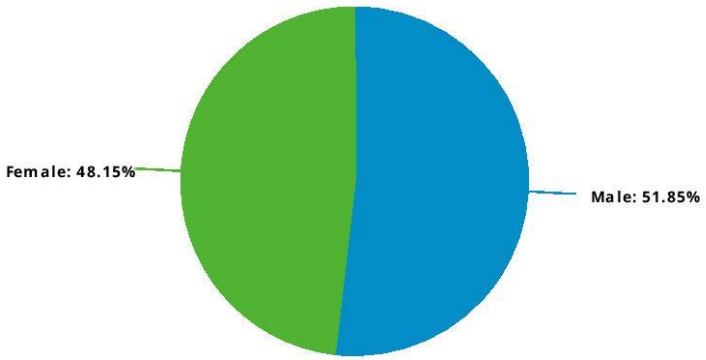
Nationality:	Country of residence:	District:
Portuguese	Portugal	Faro
British	UK	Kent
British	UK	Kent
English	UK	Dorset
English	UK	Somerset
English	UK	Somerset
English	UK	Dorset
Portuguese	Portugal	Faro
Portuguese	Portugal	Faro
English	UK	Devon
Portuguese	Portugal	Lisbon
Portuguese	Portugal	Faro
Portuguese	Portugal	Lisbon
Portuguese	Portugal	Loule
Portuguese	Portugal	Faro
British	England	Co Durham
Portuguese	Portugal	Faro

Slovenian	Slovenia	Skofja Loka
Slovenian	Slovenia	Skofja Loka
Slovenian	Slovenia	Skofja Loka
Slovenian	Slovenia	Kranj
Slovenian	Slovenia	Skofja Loka
Slovenian	Slovenia	Gorenjska
Slovenian	Slovenia	Skofja Loka
Portuguese	Portugal	Coimbra
Portuguese	Portugal	Coimbra
Portuguese	Portugal	Faro
English	UK	Bradford west Yorkshire
German	Germany	Hamburg
British	UK	Hampshire
Belgium	Belgium	Malmedy
German	Germany	Hamburg
British	England	South Nr. Southampton
Portuguese / English	Portugal	Faro
Portuguese	Portugal	Faro
Portuguese	Portugal	Algarve
Portuguese	Portugal	Faro
Portuguese	Portugal	Faro
Catalan	Spain	Costa Brava (Girona)
Catalan	Spain	Costa Brava (Girona)
Portuguese	Portugal	Faro
Portuguese	Portugal	Faro

Portuguese	Portugal	Faro
German	Portugal	Faro
Portuguese	Portugal	Faro
Portuguese	Portugal	Faro
Portuguese	Portugal	Faro
Portuguese	Switzerland	Geneva
Portuguese	Portugal	Faro
Portuguese	Portugal	Faro
Portuguese	Portugal	Faro
German	Portugal	Faro
Portuguese	Portugal	Faro
Portuguese	Portugal	Faro

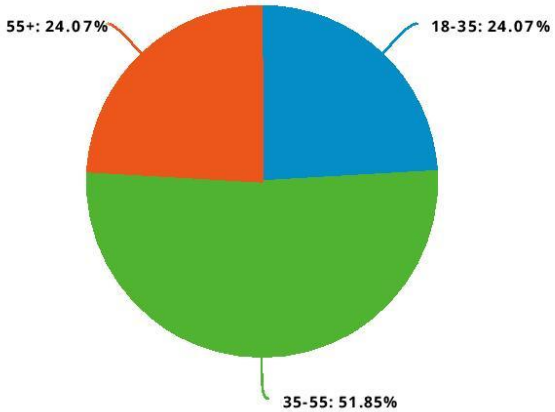
Gender:

Number of responses: 54



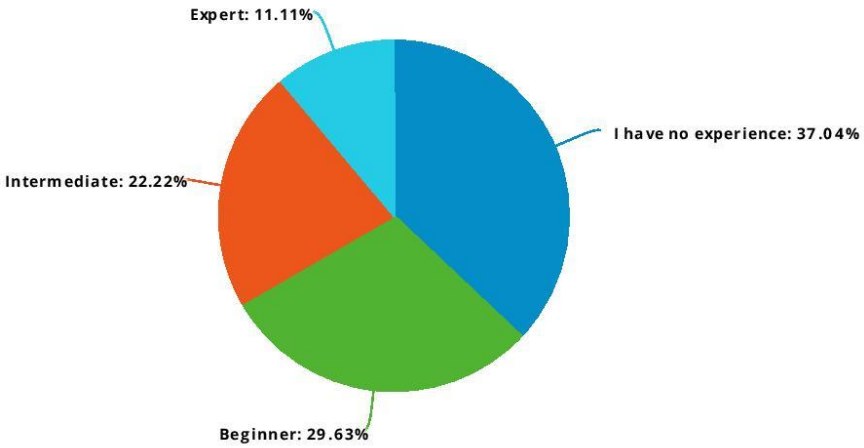
Age:

Number of responses: 54



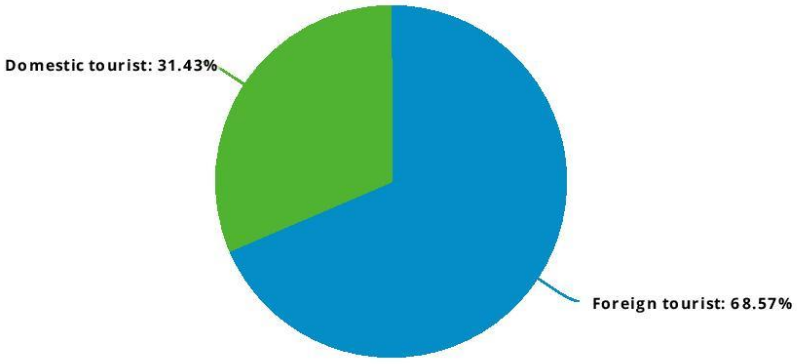
Your birdwatching experteese:

Number of responses: 54



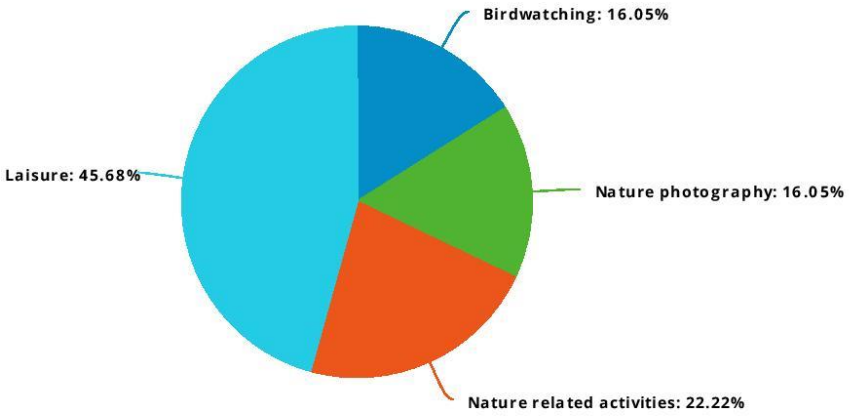
If you are a turist in Algarve, you are:

Number of responses: 35



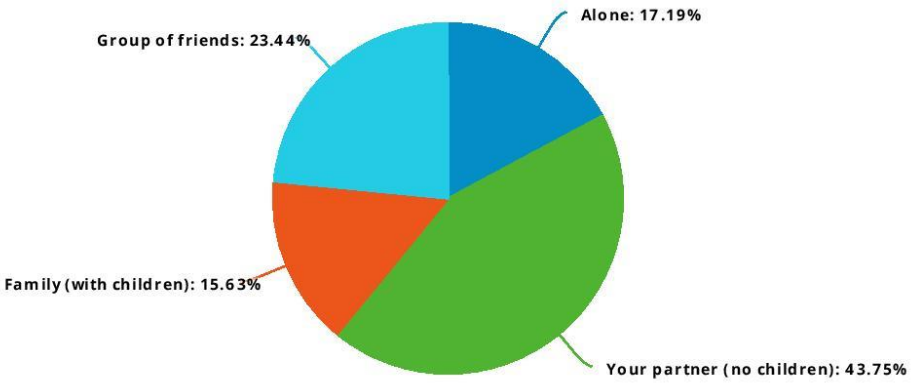
What are your main reasons to travel?

Number of responses: 54



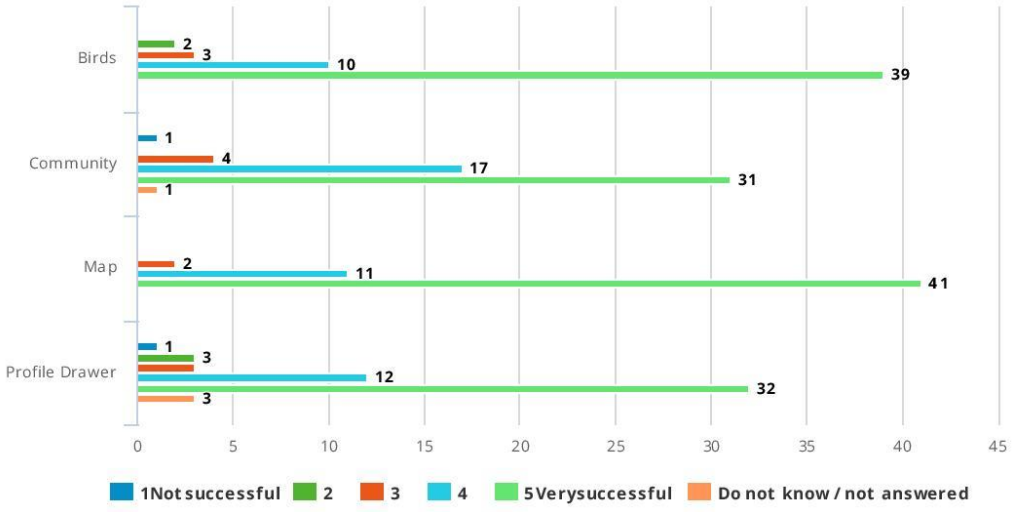
With who do you usually travel?

Number of responses: 54



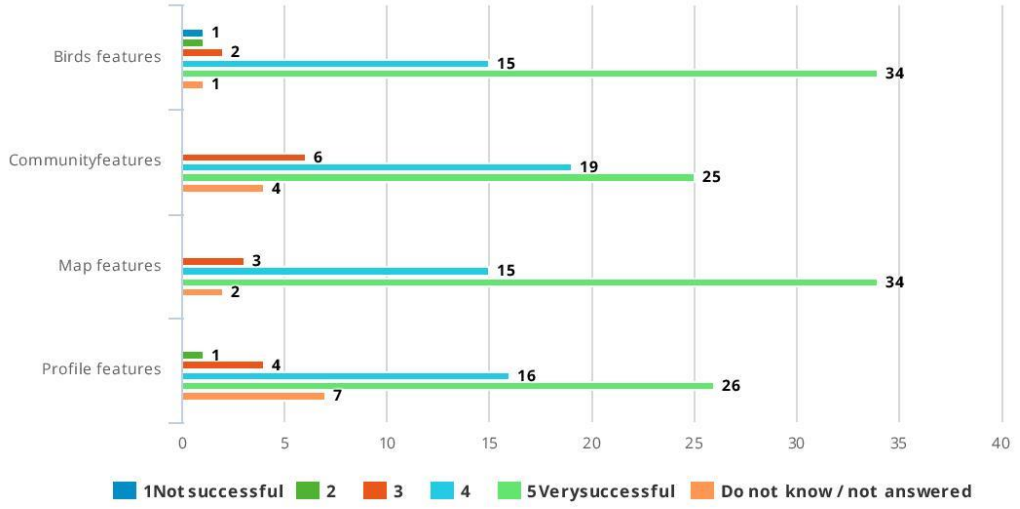
How successful you identified the following contents:(scale from 1-not successfull to 5-very successfull)

Number of responses: 54



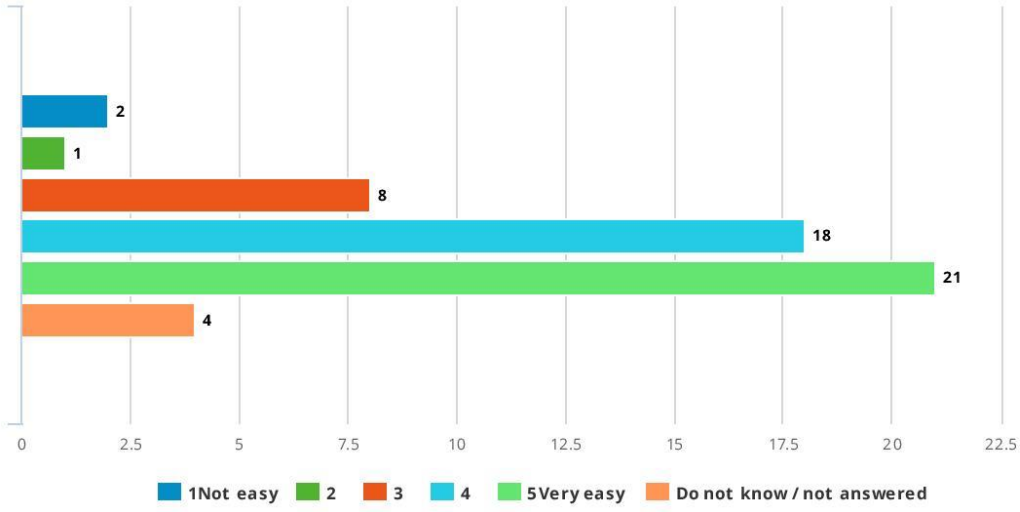
How successful you identified the following features:(scale from 1-not successfull to 5-very successfull)

Number of responses: 54



Do you find it easy to create new activity?(scale from 1-not easy to 5-very easy)

Number of responses: 54



Are the proposed features adequate for a successful birdwatching activity?

Number of responses: 54

Text answers:

yes!

i think so

/

yes

yes

yes

yes

yes

Yes quite simple and intuitive

yes

/

I guess so. I never did any birdwatching in my life. The functionality seems correct.

yes, congratulations

Yes. But there is always room to grow and develop other supporting content, especially for beginners (How to, ...)

I believe so.

yes, images of male and female birds and babies would be really helpful. When bird sounds are available that will be good too.

what happens if I see a band of birds?

yes

/

yes
yes, very.
yes
yes
yes
/
yes
yes, they are suitable.
/
The button for the filter was not very clear to me at first. I would suggest the funnel icon.
yes!
/
yes i think.
/
/
/
/
yes
To photograph the birds, to have more information about the birds and their location.

/

/

yes

yes

yes, they are very appropriate and successful.

/

I think it is very interesting for beginners in birdwatching.

yes to a beginner or intermediate level.

yes

/

/

/

yes

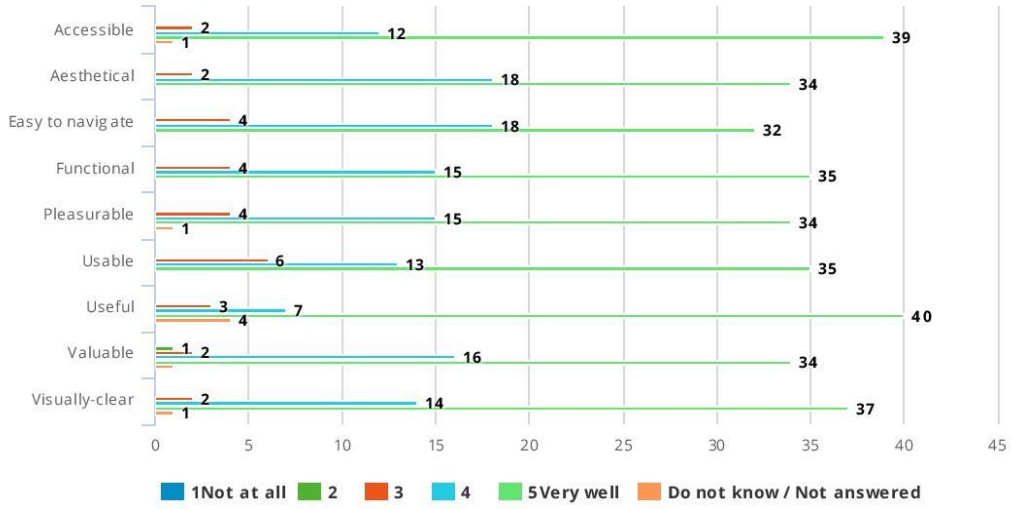
Very much.

yes

I don't have experience in birdwatching, but i believe that the application is very intuitive.

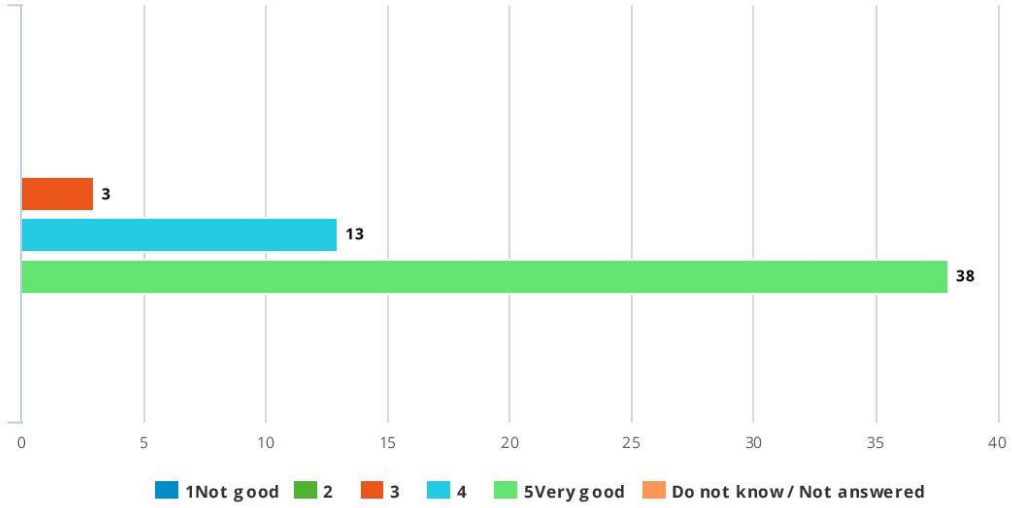
Do you find the App:(scale from 1-not at all to 5-very well)

Number of responses: 54



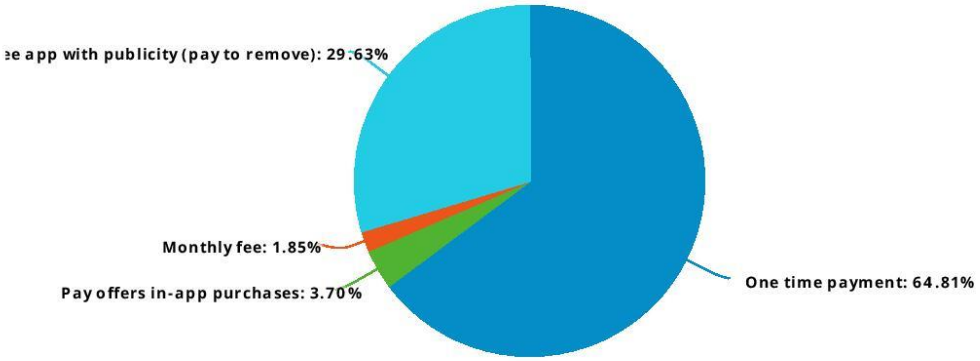
How do you evaluate the whole experience of use the application?(scale from 1-not good to 5-very good)

Number of responses: 54



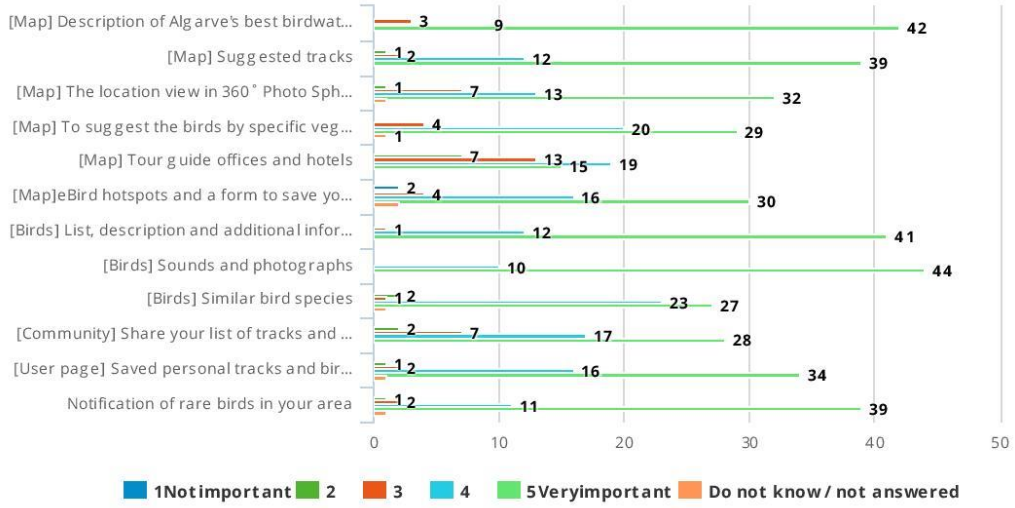
In your opinion the access to the app should be through:

Number of responses: 54



Mark the importance of the features on a scale from 1 - 5:(1- not important and 5 - the most important)

Number of responses: 54



Do you believe the app can provide better experience in birdwatching?

Number of responses: 54

Text answers:

I believe, yes.

yes

yes

a very useful tool when going to a new location.

I am confident that this will prove a very useful tool to enhance the enjoyment of bird watchers.

yes definetley

yes

yes

yes, no doubt

definately

yes

Yes I do. Although I have never done birdwatching myself

yes

Absolutely!
And new learning and tips how to do it.
Apart from encouraging to travel and to know new places and other places associated with tourism and leisure.

yes

yes will help me to identify birds I see - books too heavy to carry around

yes, it encourages people to explore and do more and better birdwatching

yes, absolutely.

yes

yes

yes

yes, of course

yes, of course!

yes

yes

No doubt: very good!

yes, I believe so.

yes

yes, it's very informative and the availability to pictures and sounds id great!

yes definitely.

yes

It can facilitate birdwatching for beginners and pro's. I don't know if pro's will like the facilitation.

yes, indeed

yes. the application is useful for the beginners.

yes

yes. Despite of not having experience it seems to me that may be new tool for beginners.

yes

yes, no doubt.

yes

yes

yes

yes

yes

yes

yes

yes

yes

yes

yes

yes

yes

Yes, very much so. Self-learning / co-learning... Data-bases.. interaction with others.

Yes, because it has a lot of useful information in one application. Easier to consult and carry than of bird guides.

I believe that yes. The app is very intuitive.

Would you use this app for birdwatching avtivity?

Number of responses: 54

Text answers:

yes

maybe, but I know a lot of people who would like to use it
yes
yes
yes
yes
yes
yes
yes
yes
yes for sure
yes
yes
yes!
yes
yes always
yes
yes
yes
yes

yes, of course
yes
yes
yes
yes
of course!
yes
yes
sure
yes
I have no Iphone on holidays.
If i would start the birdwatching for a hobby i think the app is quite helpful. The professionals will probably benefit from the community features and the alarms for the rare birds.
yes
yes
yes
yes, i think so.
yes
yes, of course.
yes

yes

yes

yes, definitely.

yes, no doubt.

yes

yes

probably

yes

yes

yes

yes

don't know

yes

yes

yes

Do you have any further suggestions for the app?

Number of responses: 54

Text answers:

- tips on correct identification of birds: habitat, height of the year and information on abundance
- link to eBird
- credibility of records (revision)

the name is not catchy
no
not at this stage
no
no
no
no
Not for that, I think it is quite complete
Keep developing it.
might change the menu icon. could be a bit confused.
Needs to be more simple and intuitive. Design is a bitch ;-)
Access to the birdwatching list of community elements and a forum for discussion among community members
Partnerships with brands.
Put keywords in some features
More photographs of male, female and babies in same species. For beginners like me a shortlist of distinguishing features as bullet point such as 1 long narrow bill 2 red tail feather 3 etc. Hints to help me decide which bird I see between two similar birds- I often get birds confused and name them incorrectly. Great app - loved it!
it should follow a bit more a material design guidelines. on the map view, there must only be one FAB, and when pressed, the available options should be displayed in ascending order according to importance. on that view, i think the map filters should be displayed in a separate area and not the FAB. The bird sounds info should be more descriptive, there are some titles missing. There could be some tags to

indicate the different types of sounds.
should be supported by the tourism of Portugal.
no
no
no
no
no
no
no
no
no
no
-some kind of feature where you can organize private tours/meet-ups with the community - a connection to Instagram/... for the people who like taking and publishing nature/bird pictures - spellcheck it again (description was spell wrong) other than that, great project! good luck! ;)
no
no
no
Don't sell it too cheap you have a really good product. Good luck.
no
no

no
To improve the contents and modify some icons of access.
Make the tooltips to explain the steps of the use or to explain some of the functionalities.
no
Include the norms of Natural Parks. Restriction areas.
It's sufficient.
no
move the sound button into the bird description area.
no
no
Bring it to the expert level also. Include specific ID details and shelters.
Download in IoS.
no
I think that the Algarve tourism should support / invest in this application for the contents of innovation because it can contribute to the sustainable tourism and nature.
no
no
Full list. More content. Complete description of all species.
no
no