



ESCOLA SUPERIOR
DE TURISMO E
TECNOLOGIA DO MAR

PIXAIR DRONE INSTITUTE

An Institute to promote the learning of aerial photography, which will promote the academic tourism in Portugal, help in the formation of destination image and promote sustainable tourism in Portugal.

Asma Sheikh

2019

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A project submitted to the School of Tourism and Maritime Technology of Polytechnic Institute of Leiria in partial fulfillment of the requirements for the master's degree in Sustainable Tourism Management

Business plan conducted under the supervision of

Professor Doctor Michael Schön and Professor Doctor Rui Martins.

Dedication and Motivation

Pixair Institute is dedicated to all Drone and Aerial Photography enthusiasts, who seek professional institute where they can learn and gain all the skills and knowledge required for professional Aerial photography, from the most experienced and skillful team of drone instructors, with the latest and best quality equipment, flexible learning at affordable price within Europe, without the need to travel far to other countries across the world.

I would like to express my gratitude towards my Professors for guiding me and turning my concept into reality, without their guidance and help I would have never turned this concept into a real business plan.

Furthermore, I would like to thank all the participants, pilots, instructors and educational institutes for helping me and providing me with valuable insight during my research process, it has really helped me to complete my research topic and design my business plan successfully.

Lastly, I would like to thank my husband, my son and my dear family for supporting me, and providing me with help and information required in the field of UAV's and my entire journey.

Abstract

This business plan is focused on promoting sustainable academic tourism and destination image of Portugal. Pixair Institute acts as a medium for achieving this by attracting international students, promoting student mobility and providing the students in Portugal the opportunity to, learn UAV pilot skills, aerial photography and enhance their career opportunities, maintaining sustainability by keeping the guiding principles required for economic, environmental and socio-cultural sustainability.

Pixair focuses on providing attractive training services, with the cutting-edge equipment and expert staff, at a reasonable cost and flexible learning hours in the most attractive city of Portugal, Lisbon. The aim of Pixair is to combine the concept of achieving academic tourism by encouraging student mobility, and create destination image of Portugal, with aerial photography services through UAV, and promote Lisbon as a competitive destination for providing aerial photography and UAV pilot skills, compared to other institutes around the world.

The plan focuses on analyzing the needs of Portugal, in terms of social, economic and environmental aspects and designing its structure and objectives required. Focusing on using an approach required for planning business model, such as Business Model Canvas determining the external market and internal environment by conducting questionnaires, competitor analysis and using it efficiently to plan effective strategies required for implementing the plan.

Lastly designing a work plan and milestones required as a benchmark for analyzing the business financial projections for the next 5 years to determine the profitability and feasibility of Pixair.

Pixair received a good response from students, photographers, and businesses for providing this opportunity in Portugal by promoting academic and sustainable tourism in Portugal by encouraging and promoting this new niche-segment of tourism in Portugal.

Keywords

Academic Tourism, Student Mobility, Destination Image, Aerial Photography, Sustainability.

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Introduction

This business plan is based on the idea of creating an Institute in Portugal in the field of Unmanned Aerial Vehicle (UAV) pilot training to trainers and professionals at beginning, intermediate and advanced levels for aerial photography, which plays an important role in the formation of destination image and promote sustainable tourism in Portugal.

The Business Plan of **Pixair Institute** which stands for “Pixels Resolution in Air” has the aim to fill the gap for the need for drone pilot training for “**Aerial Photography**,” which can be used to build a career in film making and videography, as well as to provide individual services for companies regarding the aerial photoaged, it also plays a major role for creating **Destination Image formation** essential for promoting tourism in Portugal.

It also plays a major role in promoting “**Academic tourism**” in Portugal, by encouraging **student mobility** and exchange programs, as well as encourage the students to study within Portugal rather than going outside, by providing training and education facilities in this new emerging field of UAV pilot training and aerial photography at an affordable price, with expertise staff and certification resulting in a more **sustainable** tourism in Lisbon Portugal, by being beneficial economically, environmentally and socio-culturally.

The aim of this Business plan is to achieve *Sustainable academic tourism in drone pilot training as well as to promote destination image formation through the art of aerial photography and promote tourism of Portugal*, which can be achieved through Pixair Institute.

Our Institute will provide the students and the photographers the opportunity to learn the skills and knowledge required for flying and capturing aerial photography, which can be used for enhancing their career, provide independent services or for professional photography.

Chapter 1

Literature Review

The focus of this chapter is to elaborate the literature linked to this research for a better understanding between the relation of tourist and photography (Lo, McKercher, Lo, Cheung, & Law, 2011). Specifically, aerial photography and how photography can be used effectively for the formation of destination image for promoting their destination. To understand the broad perspective of tourism and academic tourism, destination image formation, photography in general, the theoretical framework and market analysis to see whether there is a link between all three components sustainable tourism, aerial photography and destination image formation.

1.1 Tourism

‘Etymology’ of the word tourist was first used by Griffiths, R. & Griffiths, G. E. (1772), and tourism by Douglas A. Harper in 1811. The word tour which is originated from the Latin word, ‘tornare’ and attained from Greek ‘tornos.’

Represents a lathe or circle; movement around a central circle or axis which was later spelt as ‘one’s turn’, whereas the suffix -ism is defined as ‘an action or process; while the suffix -ist represents ‘one that performs a given action’, when these words are aligned with tour it forms an act of moving around the circle where the starting and ending point is the same, similarly tour represents a journey in which there is a round trip.

Tourism Industry plays a major role in influencing a notable part of the economic and non-economic activities in developed and developing countries all over the world represented by **UNWTO, (World Tourism Barometer)**. The total International Tourism Arrival worldwide is estimated to reach **1.4 billion** two years ahead of the long-term forecast of **UNWTO** issued in 2010. The tourism industry contributes to the economy by providing significant benefits such as increased job employment, encouraging political legitimacy and deployment of economic capital. (Blanke & Chiesa, 2013; Nunkoo, 2015; Hesam et al., 2016; Saarinen, 2006).

The focus of many tourist destinations for long term success is to create a strong destination image. (Ritchie & Ritchie, 1998; Caldwell & Freire, 2004). In order to increase the revenues and overall image of destination for tourism, the focus of managers and destination marketers is to create strong destination branding (Gretzel et al., 2006).

The tourism industry worldwide is facing huge competition growth (Blanke & Chiesa, 2013); as a result of this increased competition, there is a need for continuous innovative and differentiative services to attract customers and overtake competitors to provide a competitive edge for themselves, (Buhalis, 2000).

Many destinations nowadays are using strategies and Destination Marketing Organizations (DMO); to attract tourists and become irreplaceable tourist destination, (Pike & Page, 2014). In order to achieve this, it is important to use various marketing strategies to build a strong brand (Morgan et al., 2003).

According to tourists' perception, a destination with a strong image and identity has higher preferability compared to other destinations with beautiful landscapes (Ilieş & Ilieş, 2015; Mao, 2008).

Governments also encourage tourism-related events as a source for regional development, as such events have the capacity to generate favorable commercial outcomes for host destinations (Van de Wagen, 2005; Getz, 2007), and within the last 20 years there is a significant difference in quality of life and regional differences with transition in various economies. (Bartlett et al; 2010). The conventional belief and link between regional development and tourism can be seen long before in existing studies such as Sharpley & Telfer (2002), Rayan (2010) and Stabler et al. (2010).

1.2 Portugal as Tourism Destination

Portugal has experienced tourism long back since the 12th century, when Sintra and Evora were known as popular vacation sites for aristocrats, (Costa et al., 2014).

Tourism industry is playing a crucial role in the contribution of Gross Domestic Product of Portugal, over the last several years there has been a steady rise in tourist activity in Portugal, according to a report of UNWTO (United Nations World Tourism Organization World Tourism Barometer, volume 17. 2019)ⁱ.

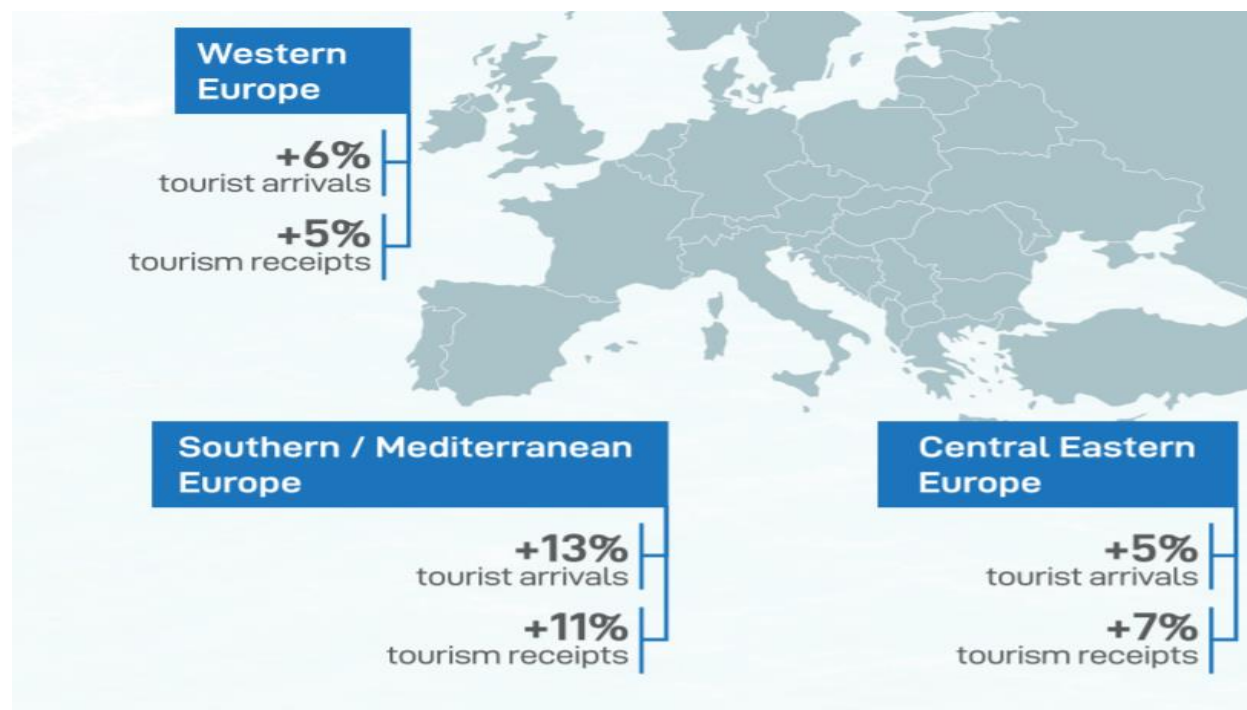
The number of international tourist arrivals in 2018 has increased by 6 % compared to 2017, whereas international tourism receipts have increased by 3.2%, and \$17,119 million US dollars. Showing a gradual rise from \$18,200 million US dollars to \$21,200 million US dollars (UNWTO, tourism highlights 2019).

Tourism is the most productive sector of Portugal, representing a rise of (+11%) growth in receipts then in arrivals, (UNWTO, Tourism Barometer 2019), 10.4% in Travel and Tourism GDP creating 1/10 jobs which is 9.9% of global employment (WWTC, Economic Impact 2018). A direct contribution of Travel and tourism to GDP was €13.2 billion, 6.8% of total GDP in 2017, which is expected to rise 2.6% pa from (2018-2028). Total contribution of €33.5 billion expected to rise by 2.4% pa, 20.5% GDP in 2028, creating total employment of 20.4% of employment of (967,500) and is expected to rise by 1.3% pa to 1,151,000 in 2028, (World Travel and Tourism council 2018).

The tourism industry plays a strategic role in the economy, environment, and culture and can be considered soon to be the main contributor to the conservation of the natural environment of Portugal.

Since Portugal is in Southern Mediterranean Europe below in **Table 1** are the statistics regarding the increased tourism arrivals and receipts, in comparison to Western Europe and Central Europe the Southern/Mediterranean Europe shows most recovery with leading countries such as Turkey, Italy and Spain with increased arrivals.

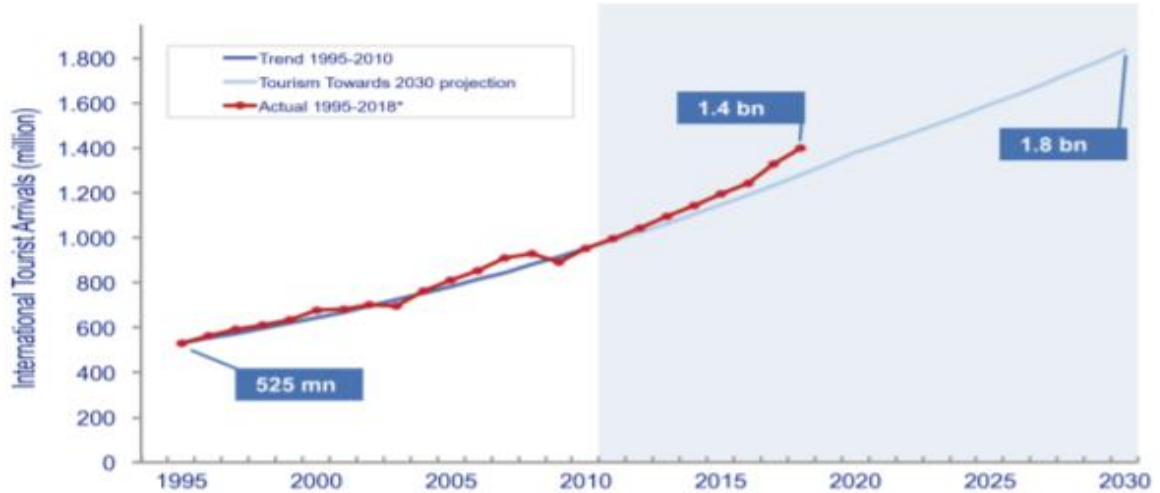
Table 1 International Tourist Arrivals and Receipts.



Source Regional Results of Tourist arrivals (UNWTO) January 2019, page 9 of 20.ⁱⁱ

Table 2 Actual Trends Vs Tourism 2030 Forecast-World.

Actual Trends vs Tourism 2030 Forecast- World

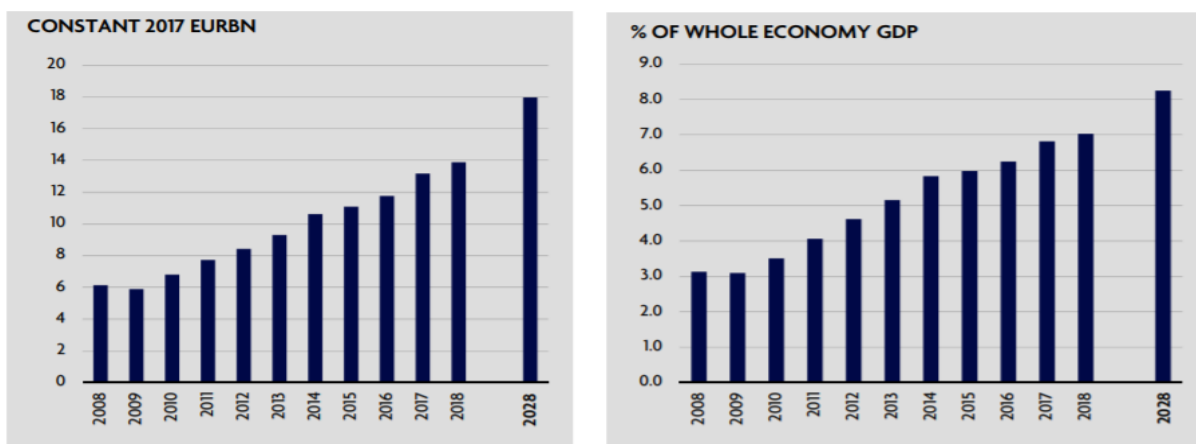


Source World Tourism Organization (UNWTO) January 2019 page 2 of 7.ⁱⁱⁱ

We can see that in **Table 2** there is a gradual rise in all, trend, actual and forecasted tourist arrivals, the trend tourist arrivals from 1995-2010 shows 525 million international tourist arrivals, whereas the actual international tourist arrivals from 1995 to 2019 were 1.4 billion and estimated to rise to 1.8 billion by 2030.

Table 3 Direct Contribution of Travel & Travel to GDP.

PORTUGAL: DIRECT CONTRIBUTION OF TRAVEL & TOURISM TO GDP



The total contribution of Travel & Tourism to GDP (including wider effects from investment, the supply chain and induced income impacts, see page 2) was EUR33.5bn in 2017 (17.3% of GDP) and is expected to grow by 5.1% to EUR35.2bn (17.8% of GDP) in 2018.

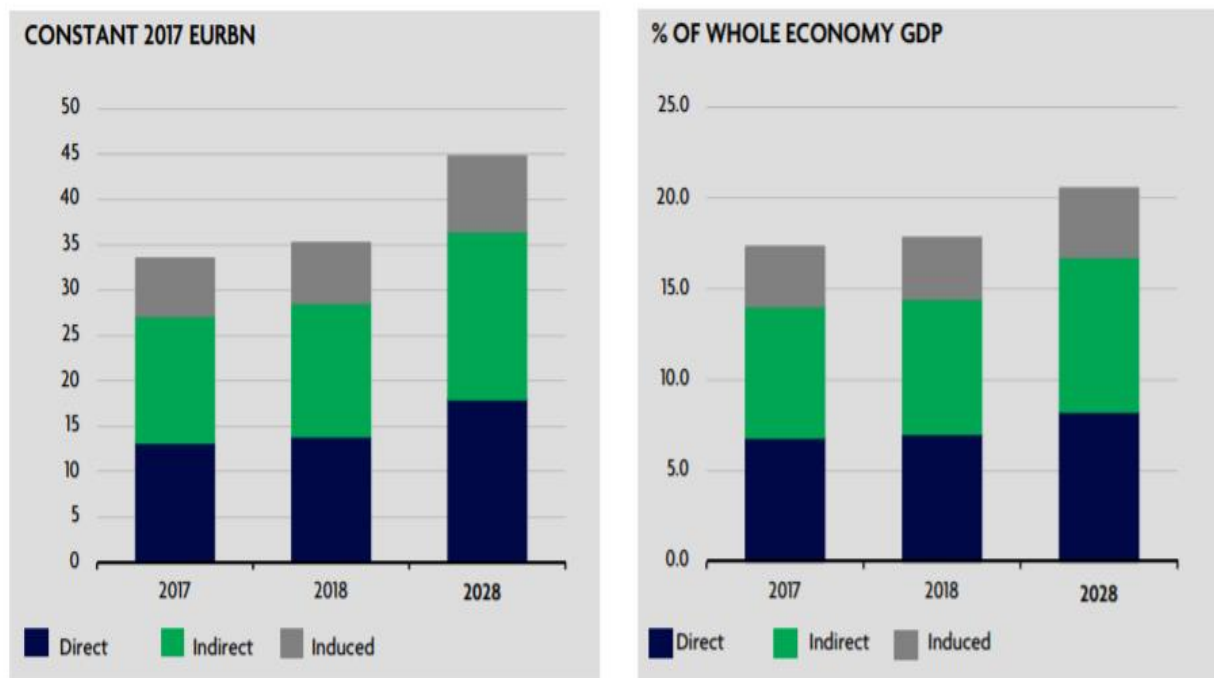
Source Travel & Tourism Economic Impact 2018 page 7 of 24.^{iv}

Table 3 represents the direct contribution of travel and tourism to GDP, and economic growth of Portugal, and rose from 6 billion euro from 2008 to 13.8 billion euro in 2018 and estimated to grow to 18 billion euro by 2028. And % of whole economy GDP rose from 3.1% in 2008 to 7 % in 2018 and expected to rise to 8.2% by 2028.

Table 4 Portugal: Total Contribution of Travel and Tourism to GDP.

UNWTO WORLD TOURISM ECONOMY SURVEILLANCE REPORT

PORTUGAL: TOTAL CONTRIBUTION OF TRAVEL & TOURISM TO GDP

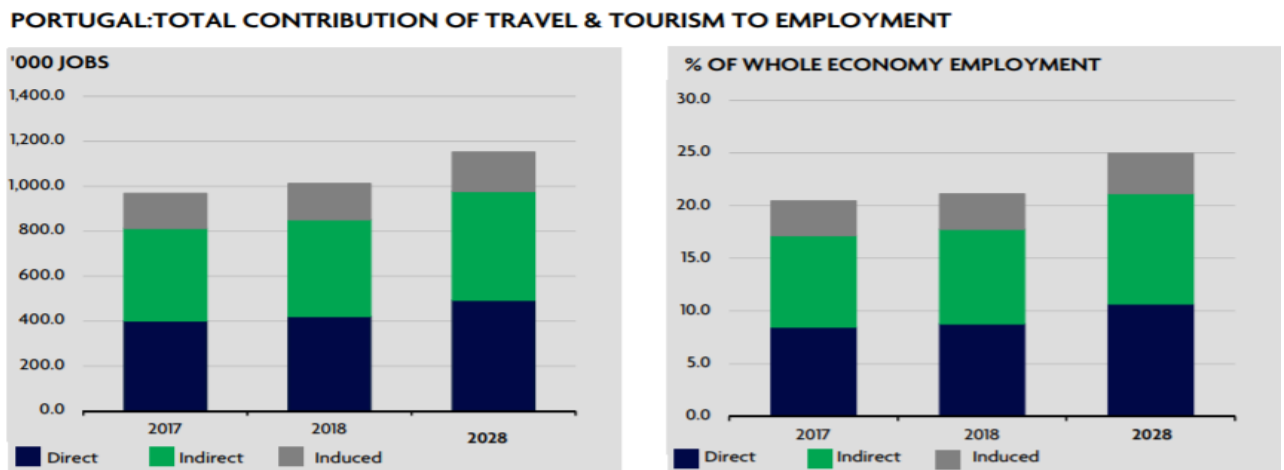


¹All values are in constant 2017 prices & exchange rates

Source Travel & Tourism Economic Impact 2018 page 7 of 24.^v

Table 4 shows the total contribution of Travel and Tourism to GDP was 33.5 billion Euro in 2017, which is expected to grow by 5.1% to 35.2 billion euro in 2018.

Table 5 Portugal: Total Contribution of Travel and Tourism to Employment.



Source World Travel & Tourism Council Economic Impact 2018 page 8 of 24.^{vi}

Table 5 Represents the total contribution of Travel and Tourism in Portugal to employment, and we can see a gradual rise in employment with passing years, direct rise in 2017 from 0 to 400,000 jobs, indirect rise from 400'000 to 800,000 and induced from 800'000 to 960,000 jobs. Whereas in 2018 its has reached to 1,000,000 plus and is expected to rise to 1,160,000 in 2028. Contributing to 25% of whole economy employment by 2028.

1.3 International Academic Tourism

Nowadays an increasing trend of student mobility for higher education is seen, where the students go to other countries for higher education other than their country of residence also known as “International Academic Tourism” from European and Non-European countries due to the easy access of student mobility programs, and scholarships available which provide students and researchers the chance to learn about new cultures, languages and gain new experience (Rodriguez et al., 2012).

There is a common belief that this type of distinct tourism is for all students of higher education institutes living outside their original destination for a time period of less than one year, with the main purpose of completing their degree level courses or language courses organized by these institutions.

The World Tourism Organization (WTO) which acts as a sub-organization of United Nations Organization, states that tourism is described as a travel for recreational, leisure, educational, health, business and other purposes [**UNWTO statistics Guidelines: 2010**].

UNWTO (United Nations of World Tourism Organization) defines tourists as individuals, “traveling to and residing in places outside their usual residential environment for not more than one consecutive year for leisure, business and other purposes” (**International Recommendations for Tourism Statistics 2008**).

There are many factors for engaging in tourism activities and ways to determine what effects destinations interest, as stated by UNWTO’s declaration of “ and other purposes” in the definition of tourism mentioned above. However, globalization resulted in new trends rising in tourism sector compared to the conventional trends, and therefore academic tourism has experienced a steady rise in demand in recent years as a result of internationalization of education system itself (Munch & Hoch 2013).

It has been seen that in Europe academic tourism is promoted by offering more mobility programs or programs specially designed for international students, resulting in better economy due to the influx of visitors in the campus, more consumption of goods and services benefiting the economy. Academic tourism differs from conventional tourism based on few factors such as nature of stay and pattern of consumption of goods and services which are similar to the residents and the nature of accommodation is preferably shared apartments, hostels, bedsits with families etc., (Pawlowska & Martínez Roget, 2010; Pawlowska 2011).

1.4 Portugal as an Academic Tourism Destination

Globalization has resulted in easy mobility and more opportunities for students to study in countries other than their resident country. Similarly, the researchers and professionals seek to attain and exchange more knowledge and experience from each other in a multilingual environment, resulting in greater demand for International exchange programs in the universities and institutes.

However mostly for such events and conferences the time of formal communication and meeting is limited, resulting in the need for organizing social activities and tours for more interaction and exchange of knowledge, which is preferred by many researchers through social activities such as according to (Pelucio-Grecco MC, 2015: 4:2)“ I attended a congress in

Portugal, where the participants were shown tour sites, church and castle, resulting in great information being exchanged and future opportunities developed.”

According to Economic and Innovation Councilor of Lisbon city council (Graca Fonseca); “the current executive of Lisbon city has defined that one of her most important strategies is to have many collaborations with other universities to make Lisbon as one of the competitive cities for Academic tourism” (W Student Housing Review (PDF). (2013) Lisbon: Worx).

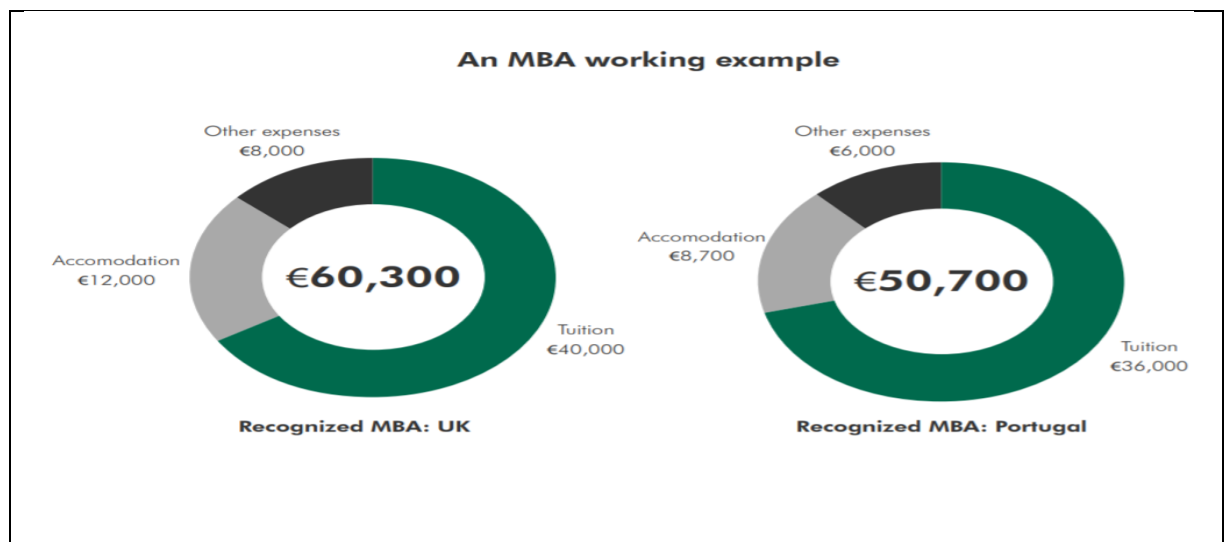
Lisbon city has 140,000 students currently residing in it and 16,000 researchers in various academic fields (Worx, 2013). The number of international students in universities in Portugal rose by 30% from (2013-2017).^{vii}

In 1994, The WTO described three forms of tourism in its recommendations on Tourism Statistics and can be described below as:

Figure 1 Different types of Academic Tourism.

Domestic Academic Tourism: where the resident students travel within the country for academic purposes.
Inbound Academic Tourism: where the non-resident students travel in the given country for academic purposes.
Outbound Academic Tourism: where the resident students travel outside the given country for academic tourism.

Table 6 Comparison between student expenditure in UK and Portugal.



Source Attraction for International Student in Portugal 2018.^{viii}

Table 6 represents a comparison between total budget of doing an MBA in UK and MBA in Portugal, with a total difference of €9,600. Portugal being cost friendly in all aspects compared to UK (accommodation, other expenses and tuition).

1.5 Student Mobility Programs

In the last few decades there has been an increase in student mobility worldwide, which provides students the opportunity to study abroad and take their degree whether graduate or postgraduate and enhances student's overall growth and competence building (Brandenburg, et. al., 2014; Cubillos & Ilvento, 2012; Douglas & Jones-Rikkens, 2001; House of Lords Select Committee, 2012; Jacobone & Moro, 2014; Findlay, A.M. and King, R. 2010; Messer & Wolter, 2007).

Student mobility provides opportunity to learn new languages, socialize, experience new culture and educational systems. The increase in student mobility programs, provided in the form of student grants, scholarships, etc., Play a big motivational role in student mobility, (Rodriguez et al., 2012).

1.6 Erasmus Process

“**ERASMUS** known as (European Region Action Scheme for the Mobility of the University Students) was founded in 1987, promotes student mobility with a constant rise in the number of students participating in exchange programs with the budget of €2.6 billion.

With an increase in funding of 13% compared to 2016, Erasmus provided student grants for training and studying abroad to 797,000, 84,700 organizations (**Erasmus + Annual report 2017**).

Erasmus program has supported 9 million people to study, train, volunteer and gain professional experience since its inception in 1987 (**Erasmus + Annual report 2017**).^{ix}

2017 was considered a successful year for **International Dimension of Erasmus+** .

Where 23,000 higher education students from worldwide came. With total of **306** projects, with **2700** organizations for a budget of **€146.8 million**. In 2017 mobility was included in 65% of projects (**Erasmus + Annual Report 2017 page 46**).

Table 7 Adult Education Trend between year 2014-2017.

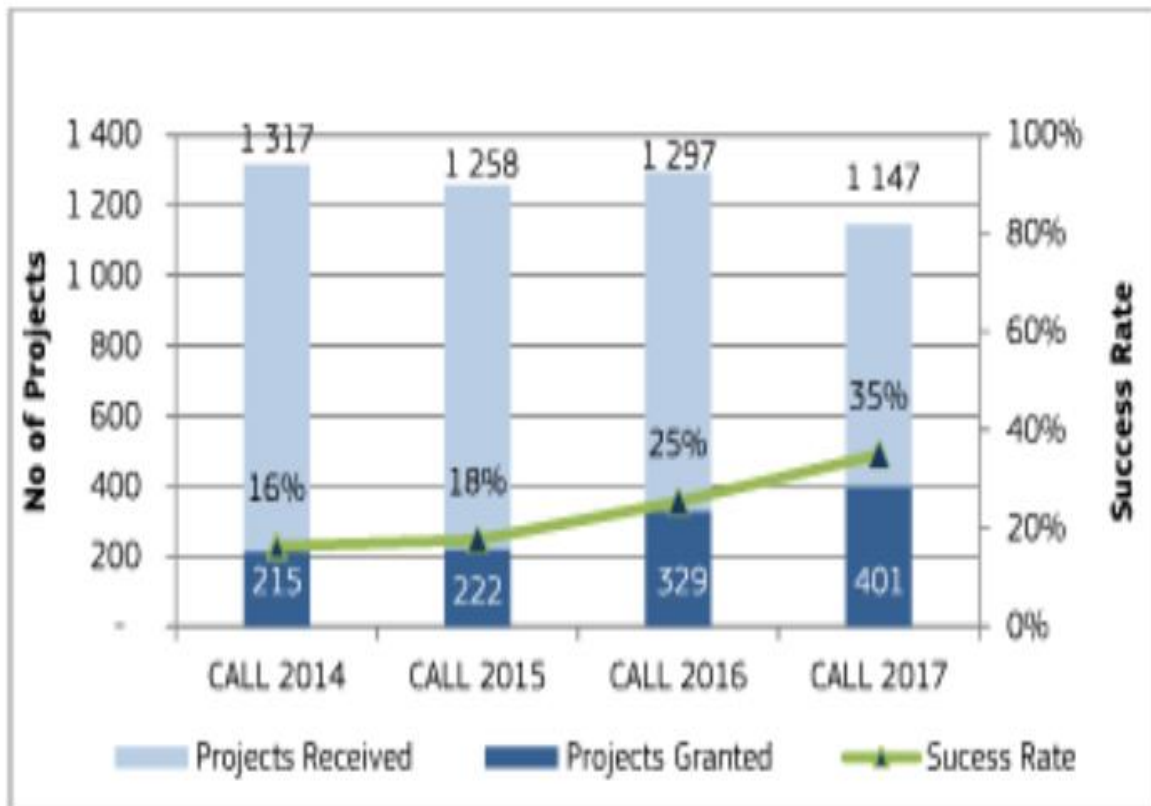


Figure 26 - KA204 Adult Education Trend 2014-2017

Source Erasmus + Annual Report 2017 page 50 of 102.^x

Table 7 represents the statistics for Projects received, Granted and the success rate. 16% projects were received in 2014 with a gradual rise to 35% in 2017, the projects granted also rose from 215 in 2014 to 401 in 2017 and a rise in success rate from 16% in 2014 to 35% in 2017.

Erasmus: is considered the first Facebook page in the field of student mobility with an increasing number of pages liked every year.

Table 8 International Students visiting Portugal.

Students in International Mobility*				
TO ACHIEVE	2013/14	2014/15	2015/16	2016/17
Degree	14,883	16,888	19,815	22,194
Credits	11,687	12,151	13,282	14,980
Total	26,570	29,039	33,097	37,174

*students who came to Portugal with the specific purpose of taking part (credits) or complete (diploma) an superior course

Source Direção Geral de Estatísticas de Educação e.^{xi}

Table 8 represents the international student mobility for Portugal, with total of 26,570 students in 2013/14 and 37,174 in 2016/17, which shows a positive trend and a rise for in incoming students to Portugal in the past years.

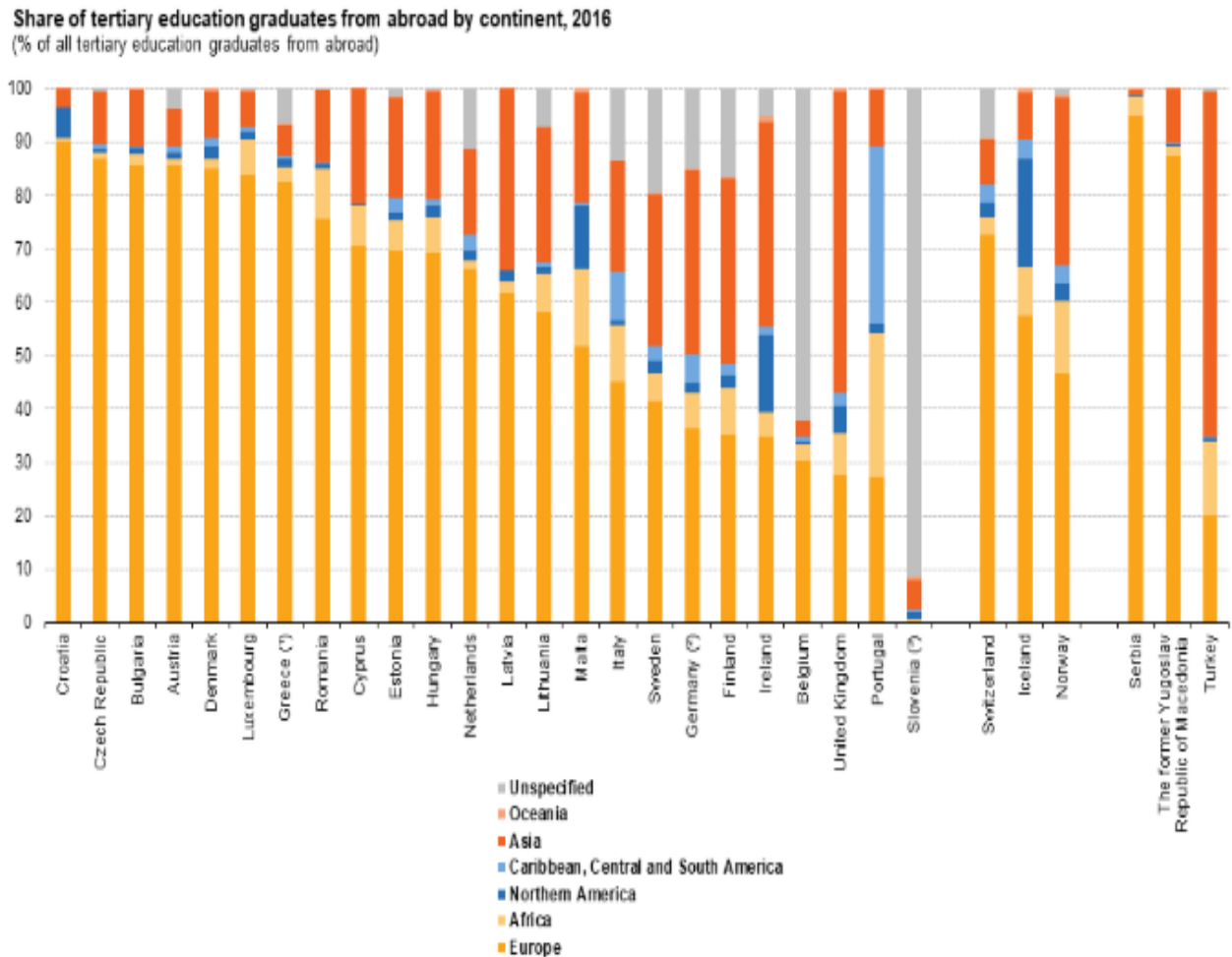
With the success of **ERASMUS** program there is a clear relationship between academic tourism and globalization, according to statistics the five top destinations which believe mobility programs have led to strengthened European attitude are Southern and Eastern Europe (each 85%), Bulgaria (90%), Portugal (89%) and Italy (87%), followed by the United Kingdom with 88% (Erasmus Impact Study Regional Analysis January 2016).

According to Erasmus + The Eu program for education, training, youth and sport (2014-2020), a total budget of €14.7 billion is allocated of which 2/3 budget is for learning opportunities abroad, whereas 1/3 budget is for partnerships and reforms of education and youth sector. Providing opportunity to 3.7% of young people within Europe, to tackle youth unemployment and support people with less opportunities. (European Commission, 2018. Erasmus + General Factsheet page 1 of 2).^{xii}

However, the event organizers need to keep in mind that apart from organizing academic conferences, training workshops and higher education courses they need to build an attractive element to attract the academic tourists, by not only focusing on the quality of the sessions arranged but also keeping in consideration the facilities for the tourist's sites and managing a good social network to attract them.

Resulting in the rise and promotion of academic tourism which is a great opportunity for the tourism industry as well as academic seekers and researchers worldwide and has a lot of potential for promoting destinations as well as entrepreneurs.

Table 9 Statistics of student mobility and exchange programs worldwide.re



Source Student Mobility statistics 2016.^{xiii}

Table 9 represents the tertiary graduates from different countries worldwide, Portugal representing 28% of inbound students from Europe, 26% from Oceania, 4% from North America, 32% from Caribbean, Central and South America and 11% from Asia. The greatest number of student mobility from Europe and lowest from North America.

Table 10 student mobility from different countries for year 2014-2017.

Erasmus+ UK Higher Education Mobility													
Table 5. Outgoing student numbers by host country													
Host Country	Code	2014/15			2015/16			2016/17			Total Cumulative		
		Study	Work	Total	Study	Work	Total	Study	Work	Total	Study	Work	Total
Argentina	AR	0	0	0	3	0	3	4	0	4	7	0	7
Austria	AT	208	134	342	213	94	307	232	134	366	653	362	1,015
Australia	AU	0	0	0	8	0	8	2	0	2	10	0	10
Belgium	BE	194	142	336	186	171	357	156	202	358	536	515	1,051
Bulgaria	BG	2	25	27	2	22	24	7	31	38	11	78	89
Brazil	BR	0	0	0	9	0	9	12	0	12	21	0	21
Canada	CA	0	0	0	0	0	0	9	0	9	9	0	9
Chile	CL	0	0	0	1	0	1	4	0	4	5	0	5
China	CN	0	0	0	3	0	3	23	0	23	26	0	26
Cyprus	CY	32	59	91	37	68	105	32	48	80	101	175	276
Czech Republic	CZ	150	26	176	203	71	274	197	72	269	550	169	719
Germany	DE	1,266	861	2,127	1,312	941	2,253	1317	1,004	2321	3,895	2,806	6,701
Denmark	DK	267	41	308	322	69	391	355	89	444	944	199	1,143
Estonia	EE	19	2	21	24	7	31	10	10	20	53	19	72
Spain	ES	2,036	1,254	3,290	2,131	1,403	3,534	2153	1,614	3767	6,320	4,271	10,591
Finland	FI	205	34	239	193	34	227	169	40	209	567	108	675
France	FR	2,414	1,773	4,187	2,388	1,812	4,200	2173	1,700	3873	6,975	5,285	12,260
Greece	EL	25	64	89	10	50	60	25	84	109	60	198	258
Croatia	HR	17	2	19	17	2	19	12	7	19	46	11	57
Hungary	HU	73	17	90	73	21	94	66	46	112	212	84	296
Ireland	IE	55	209	264	54	251	305	51	289	340	160	749	909
Israel	IL	0	0	0	0	0	0	2	0	2	2	0	2
India	IN	0	0	0	0	0	0	4	0	4	4	0	4
Iceland	IS	16	5	21	29	2	31	26	4	30	71	11	82
Italy	IT	768	295	1,063	687	375	1,062	748	454	1202	2,203	1,124	3,327
Liechtenstein	LI	1	3	4	0	1	1	0	5	5	1	9	10
Lithuania	LT	2	14	16	4	18	22	8	38	46	14	70	84
Luxembourg	LU	4	17	21	1	11	12	1	21	22	6	49	55
Latvia	LV	3	13	16	6	8	14	2	11	13	11	32	43
Morocco	MA	0	0	0	0	0	0	2	0	2	2	0	2
Montenegro	ME	0	0	0	0	0	0	2	0	2	2	0	2
Macedonia	MK	0	0	0	0	1	1	2	2	4	2	3	5
Macau	MO	0	0	0	0	0	0	1	0	1	1	0	1
Malta	MT	61	91	152	49	161	210	72	129	201	182	381	563
Mexico	MX	0	0	0	1	0	1	2	0	2	3	0	3
Malaysia	MY	0	0	0	2	0	2	13	0	13	15	0	15
Netherlands	NL	650	224	874	701	285	986	840	349	1189	2,191	858	3,049
Norway	NO	136	24	160	167	35	202	223	41	264	526	100	626
New Zealand	NZ	0	0	0	0	0	0	2	0	2	2	0	2
Peru	PE	0	0	0	1	0	1	0	0	0	1	0	1
Poland	PL	64	20	84	69	34	103	75	51	126	208	105	313
Portugal	PT	107	43	150	147	72	219	176	111	287	430	226	656
Romania	RO	5	24	29	5	26	31	9	18	27	19	68	87
Serbia	RS	0	0	0	0	0	0	2	0	2	2	0	2
Russia	RU	0	0	0	1	0	1	8	0	8	9	0	9
Sweden	SE	367	49	416	442	72	514	376	128	504	1,185	249	1,434
Singapore	SG	0	0	0	1	0	1	0	0	0	1	0	1
Slovenia	SI	23	4	27	17	7	24	18	8	26	58	19	77
Slovakia	SK	11	1	12	5	5	10	4	20	24	20	26	46
Thailand	TH	0	0	0	3	0	3	0	0	0	3	0	3
Turkey	TR	68	14	82	78	21	99	25	10	35	171	45	216
Taiwan	TW	0	0	0	0	0	0	4	0	4	4	0	4
United States	US	0	0	0	1	0	1	34	0	34	35	0	35
Uruguay	UY	0	0	0	0	0	0	1	0	1	1	0	1
South Africa	ZA	0	0	0	0	0	0	2	0	2	2	0	2
Total		9,249	5,484	14,733	9,606	6,150	15,756	9,693	6,770	16,463	28,548	18,404	46,952

Source: The outgoing student number from Portugal as well as other countries.^{xiv}

Table 10 Represents the outbound number to students from Portugal to other countries, 107 in 2014/15, 147 in 2015/16, 176 in 2016/17 and total cumulative of 430.

Table 11 Outgoing number of staff for training from different countries year 2014-2017.

Host Country	Code	2014/15			2015/16			2016/17			Total Cumulative		
		Teach	Train	Total	Teach	Train	Total	Teach	Train	Total	Teach	Train	Total
Albania	AL	0	0	0	1	0	1	1	0	1	2	0	2
Armenia	AM	0	0	0	0	0	0	2	0	2	2	0	2
Argentina	AR	0	0	0	3	0	3	1	2	3	4	2	6
Austria	AT	34	24	58	36	29	65	21	30	51	91	83	174
Australia	AU	0	0	0	0	0	0	1	1	2	1	1	2
Azerbaijan	AZ	0	0	0	0	0	0	1	1	2	1	1	2
Bosnia and Herzegovina	BA	0	0	0	1	1	2	6	2	8	7	3	10
Bangladesh	BD	0	0	0	0	0	0	1	0	1	1	0	1
Belgium	BE	49	21	70	50	55	105	46	33	79	145	109	254
Bulgaria	BG	32	1	33	25	4	29	17	0	17	74	5	79
Brazil	BR	0	0	0	2	0	2	6	3	9	8	3	11
Botswana	BW	0	0	0	0	0	0	1	1	2	1	1	2
Belarus	BY	0	0	0	0	0	0	2	1	3	2	1	3
Canada	CA	0	0	0	0	0	0	0	3	3	0	3	3
Chile	CL	0	0	0	1	0	1	4	1	5	5	1	6
China	CN	0	0	0	6	1	7	33	25	58	39	26	65
Cuba	CU	0	0	0	0	0	0	2	0	2	2	0	2
Cyprus	CY	19	9	28	14	23	37	15	15	30	48	47	95
Czech Republic	CZ	41	16	57	41	29	70	39	34	73	121	79	200
Germany	DE	197	87	285	190	109	299	178	150	328	566	346	912
Denmark	DK	40	34	74	46	40	86	28	58	86	114	132	246
Algeria	DZ	0	0	0	0	0	0	1	1	2	1	1	2
Estonia	EE	13	2	15	8	13	21	10	8	18	31	23	54
Egypt	EG	0	0	0	0	2	2	2	5	7	2	7	9
Spain	EL	50	7	57	56	15	71	51	23	74	157	45	202
Finland	ES	151	86	237	164	178	342	155	217	372	470	481	951
France	FI	110	75	185	101	80	181	86	110	196	297	265	562
Greece	FR	147	45	192	124	67	191	138	94	232	409	206	615
Georgia	GE	0	0	0	1	0	1	1	6	7	2	6	8
Croatia	HR	10	3	13	8	4	12	7	5	12	25	12	37
Hungary	HU	27	12	39	17	20	37	19	22	41	63	54	117
Indonesia	ID	0	0	0	0	0	0	4	0	4	4	0	4
Ireland	IE	4	12	16	9	15	24	16	26	42	29	53	82
Israel	IL	0	0	0	2	0	2	2	4	6	4	4	8
India	IN	0	0	0	6	6	12	11	10	21	17	16	33
Iceland	IS	11	12	23	13	11	24	9	32	41	33	55	88
Italy	IT	124	36	160	151	64	215	129	88	217	404	188	592
Jordan	JO	0	0	0	0	0	0	0	1	1	0	1	1
Japan	JP	0	0	0	2	2	4	0	6	6	2	8	10
Kazakhstan	KZ	0	0	0	0	5	5	7	8	15	7	13	20
Lebanon	LB	0	0	0	2	2	4	1	0	1	1	2	3
Liechtenstein	LI	0	0	0	1	0	1	1	0	1	2	0	2
Sri Lanka	LK	0	0	0	0	0	0	3	3	6	3	3	6
Lithuania	LT	23	1	24	13	11	24	9	8	17	45	20	65
Luxembourg	LU	0	3	3	0	0	0	2	1	3	2	4	6
Latvia	LV	12	6	18	6	8	14	9	6	15	27	20	47
Morocco	MA	0	0	0	0	0	0	1	2	3	1	2	3
Moldova (Republic of)	MD	0	0	0	0	0	0	0	1	1	0	1	1
Montenegro	ME	0	0	0	1	0	1	3	1	4	4	1	5
Macedonia	MK	0	0	0	1	0	1	1	0	1	2	0	2
Macau	MO	0	0	0	2	0	2	1	3	4	3	3	6
Malta	MT	21	25	46	27	17	44	25	25	50	73	67	140
Malawi	MW	0	0	0	0	0	0	2	0	2	2	0	2
Mexico	MX	0	0	0	1	0	1	0	0	0	1	0	1
Malaysia	MY	0	0	0	3	0	3	8	10	18	11	10	21
Netherlands	NL	75	43	118	82	100	182	67	105	172	224	248	472
Norway	NO	31	36	67	50	41	91	43	33	76	124	110	234
New Zealand	NZ	0	0	0	0	0	0	0	1	1	0	1	1
Peru	PE	0	0	0	1	0	1	1	0	1	2	0	2
Pakistan	PK	0	0	0	0	0	0	0	1	1	0	1	1
Poland	PL	53	9	62	57	20	77	46	25	71	156	54	210
Palestine	PS	0	0	0	0	0	0	3	5	8	3	5	8
Portugal	PT	28	17	45	41	27	68	24	26	50	93	70	163
Paraguay	PY	0	0	0	0	0	0	1	0	1	1	0	1
Romania	RO	15	7	22	15	16	31	25	7	32	55	30	85
Serbia	RS	0	0	0	2	1	3	3	3	6	5	4	9
Russia	RU	0	0	0	9	2	11	20	23	43	29	25	54
Sweden	SE	60	49	109	53	64	117	42	74	116	155	187	342
Slovenia	SI	16	3	19	19	9	28	14	20	34	49	32	81
Slovakia	SK	1	7	8	5	3	8	7	1	8	13	11	24
Thailand	TH	0	0	0	7	3	10	4	4	8	11	7	18
Turkey	TR	29	9	38	27	12	39	13	7	20	69	28	97
Tanzania (United Republic of)	TZ	0	0	0	0	0	0	0	2	2	0	2	2
Ukraine	UA	0	0	0	1	0	1	5	11	16	6	11	17
Uganda	UG	0	0	0	0	0	0	0	3	3	0	3	3
Uruguay	UY	0	0	0	0	0	0	0	1	1	0	1	1
United States	US	0	0	0	1	0	1	5	10	15	6	10	16
Uzbekistan	UZ	0	0	0	2	0	2	3	2	5	5	2	7
Vietnam	VN	0	0	0	0	0	0	3	3	6	3	3	6
Kosovo	XK	0	0	0	0	0	0	3	1	4	3	1	4
South Africa	ZA	0	0	0	0	0	0	3	1	4	3	1	4
Total		1,423	697	1,022	1,505	1,109	2,614	1,454	1,455	2,909	4,382	3,261	7,643

Source Represents the number of outgoing staff for training from Portugal as well as other countries.^{xv}

Table 11 represents outbound staff for training from Portugal in 2014/15 around 45, 2015/16 around 68 and 2016/17 around 50, showing a gradual rise in outbound academic tourism from 2014-2016, and a fall in 2016-2017.

Table 12 Outgoing number of students for Audio-Visual Techniques year 2014-2017.

Subject Area Description	2014/15		2015/16		2016/17		Total Cumulative	
Accounting and taxation	58	0.39%	46	0.29%	35	0.21%	139	0.30%
Agriculture	8	0.05%	0	0.00%	0	0.00%	8	0.02%
Agriculture, forestry, fisheries and veterinary	1	0.01%	0	0.00%	0	0.00%	1	0.00%
Agriculture, not elsewhere classified	2	0.01%	6	0.04%	6	0.04%	14	0.03%
Agriculture, not further defined	0	0.00%	5	0.03%	6	0.04%	11	0.02%
Architecture and construction	94	0.64%	0	0.00%	0	0.00%	94	0.20%
Architecture and construction, not elsewhere classified	5	0.03%	20	0.13%	21	0.13%	46	0.10%
Architecture and construction, not further defined	21	0.14%	85	0.54%	121	0.73%	227	0.48%
Architecture and town planning	95	0.64%	132	0.84%	102	0.62%	329	0.70%
Arts	172	1.17%	0	0.00%	0	0.00%	172	0.37%
Arts and humanities	129	0.88%	0	0.00%	0	0.00%	129	0.27%
Arts and humanities, inter-disciplinary programmes	80	0.54%	188	1.19%	76	0.46%	344	0.73%
Arts, not elsewhere classified	44	0.30%	81	0.51%	108	0.66%	233	0.50%
Arts, not further defined	52	0.35%	272	1.73%	495	3.01%	819	1.74%
Audio-visual techniques and media production	132	0.90%	152	0.96%	144	0.87%	428	0.91%
Biochemistry	57	0.39%	59	0.37%	76	0.46%	192	0.41%

Source The number of outgoing students in the field of audio/visual and media production and represents the trend in the field of Photography.^{xvi}

Table 12 represents outgoing number of students in field of media and audio/visual of 132 on 2014/15, 152 in 2015/16 and 144 in 2015/16, which shows an increase in demand for audio/visual and media production programs.

1.6 Bologna Process

Another student mobility program known as the ‘**BOLOGNA**’ process across European Institutes has also favored the inflow of academic tourism (Brenn-White & Van Rest, 2012).^{xvii}

“Bologna Process was founded in 1999, by 29 European countries ministers responsible for higher education. However, it originally started in the Sorbonne Conference and Declaration of 1998.”^{xviii} It has been adopted by 48-member states and regarding ministerial meetings and agreements by European countries has one objective “to ensure more proportionate, consistent and rational higher education systems in Europe,”^{xix} declared by (European Higher Education Area EHEA). And focuses on 4 key points, “Implementation of key commitments, learning and teaching, employability and social inclusion.”^{xx}

The Bologna-programme has provided great support in legitimizing the universities to reach higher International standard, (Brenn-White & Van Rest, 2012). “results show that currently in Portugal there are approximately 362,000 students, of which 34% are from Lisbon, and 20% from Porto, around 37,000 foreign students responding to total rise of 10% from past, with majority coming from former Portuguese colonies, Spain and Italy (Students Housing in Portugal, CBRE 2018),^{xxi}to help “facilitate the exchange of students at higher education institutions and degree programs depending on their personal preferences and skills sets” (Munch & Hoch 2013).

Once we have observed the trend of academic tourism and the role of student mobility in assisting the academic tourism, we will look closely into the factors that helps a student to choose the destination with good reputable institution, affordable price, course offered, and destination image. Below we will see in detail the role of destination image for tourism.

Chapter 2

Destination Image

2.1 Role of Destination Image in Tourism Industry

Destination Image has been one of the most researched topics over the past few years, and has been defined in various definitions and ways, Phelps (1986: p.168) describes “destination image is a sum of beliefs, ideas and impressions that a person has of destination”. Reynolds 1965:70 explains Image as the formation of mental expression derived from few impressions based upon information received.

In terms of Destination Image, the flood of information input is derived from external factors such as advertisements, brochures, social media, friends and family, magazines. Travel agencies, websites, news, documentaries, photographs, literature, movies, etc., Moreover by “visiting the destination itself, the image will be modified further based upon feelings and emotions from experience and information” (Echtner & Ritchie 2003: p.38).

Similarly Reynolds, (1965:p.70), states that the word “Image” often represents the reputation associated with it regarding “what people believe about the institution or individual, versus character, what the individual or institution are in actual.” in terms of travel and tourism destination, there is an endless search on consumers side, (Leemans 1994: p.23).

Gathering all the information the consumer creates an “Image or Prototype” represents the travel experience, (Tapachai & Waryszak 2000: p.37), since tourism industry offers intangible services, the image plays a big role in promoting the tourism destination then the reality, (Gallarza et al.2002: p.57).

The overall destination Image demonstrated by information will play a big role in influencing the perceived destination Image by consumers. However, consumers also perceive Image based on certain attributes, functional consequences, and physiological characteristics which consumers often link with specific destination or service, (Echtner & Ritchie (1993): p. 4; Padgett & Allen (1997): p. 50; Tapachai & Waryszak (2000):p.38), and hence the demonstrated Image of destination affects both the destination Positioning and consumers buying behaviors.

2.2 Impact of Destination Image on Tourists’ Perception

The realm of tourism over the last few years is being one of the most studied and researched topics (Echtner & Ritchie, 2003: p.38, Stepchenkova & Morrison 2008, Pan & Xiang, 2011). Hunt (1975:1), defines Destination Image as “an image a person or persons hold regarding a state they do not reside in.”

Crompton (1979: p.18), describes “destination image as a result of perceptions, ideas or beliefs a person has of destination.” Phelps (1986:168) defines destination image as “perception of a place”, From the above definitions we can conclude that a destination image is based on the perceptions and ideas that are formed in a person’s mind based on different factors, knowledge and information collected represented or portrayed regarding the destination to tourists through various sources.

There are various approaches for the formation of a destination image, (Campo, Brea & Muñiz, 2011). Baloglu & Brinberg (1997) and other authors (e.g. Baloglu & McCleary, 1999), defines destination image as a conception based on two components, **Cognitive and Affective**.

Cognitive defines the information or knowledge a tourist has regarding the destination that is attained naturally or through external media.

The affective component that is based upon the feelings of tourists regarding the destination whether positive, negative or neutral. Echtner and Ritchie (1991, 1993), defines the destination image concept with the help of a three-dimensional framework based on (attribute – holistic,

functional-psychological and common-unique), the attribute features regarding the actual image whereas stereotype image is what a person perceives regarding a destination, and the functional features regarding the variance between measurable and intangible attributes of a destination.

2.3 Destination Image Formation and Structure

The destination Image can be formed based on two forms of information, **naturally** occurring which are often captured by non-tourism organizations such as Television, news, local people, geography etc., or **induced** that is captured by tourism organization for promotional purposes in the form of magazines, brochures, booklets, etc., Gunn (1972), and can be differentiated into structured that uses semantic differentials to measure attributes of images.

However, it fails to represent the holistic impression (Echtner & Ritchie, 1993) or unstructured and do not use any standardized scales. Instead, it uses a free approach to describe the complexity of the images by the respondents (Bovin, 1986). However, in order to avoid any false results, it is safe to use standardized scale and open-ended questions for measuring the destination image.

Tourism destinations use promotional and marketing communication strategy to influence destination image (Beerli & Martín 2004: p. 667; Fridgen 1984: p. 25-26; Gartner 1993: p.197-201). It is believed that destinations can impact image formation through secondary and indirect resources with consumers, also known as “vicarious experiences” (Kim & Richardson 2003), which plays a role inducing imagination such as Motion pictures, Tv shows, media, etc., (Cohen-Hattab & Kerber, 2004).

However, tourism promotions in-terms of destination image building is dependent on many other factors that are often seen as biased in nature and influence decision making as well as perceived images.

Baloglu and McCleary (1999: 869), focus on examining the relationship between image, behavior, destination Image and other variables such as destination preference and visitation intention, destination knowledge and preceding visitation experiences, the geographical location of tourists, nature of trip, situational or secular impact, image displayed by destination, and tourist’s sociodemographic characteristics.

A destination image can be build based on various factors and strategies, however the strategy focus on the tourism “product” created by the tourism development strategy using the authenticity and identity of the place, whether real or staged, (Cohen 1988; Cohen-Hattab & Kerber 2004; MacCannell 1973).

Building a tourism Image by using the marketing and communication or vicarious experiences also known as “induced destination image formation agents” Gartner (1993: p. 197-201). Which can be further enhanced with the help of internet. However, if the destination image formed fails to deliver the portrayed real destination’s identity it can create a tourism strategy gap.

Secondly, even before a tourist visits a destination an image can be perceived in their mind through advertisements and secondary place communications which can be resolved through person’s identity, (Baloglu & McCleary 1999; MacKay & Fesenmaier 2000; Sirgy & Su 2000), which can be due to situational influences or physically environmental, (Gartner & Hunt 1987), self-determining agents Gartner (1993: 201-203), interaction with customers directly or indirectly (Riedl et al. 2002) or can be the spontaneous or approached Organic Agents in Gartner’s terminology (1993: 203-204).

The above knowledge helps to build up tourist’s quality expectations regarding the destination, once the importance of destination image formation is known we will look closely into the formation of image and the role photography plays in its formation.

Chapter 3

Photography and Tourism

3.1 Photography

Photographs are often used as an essential tool by marketers and businesses to attract tourists through the eye of the camera by capturing images and beauty of the destination in the form of brochures, travel websites, billboards, videos, vlogs. Similarly, it is also observed that tourists use photography as decision-making tool too while deciding for visiting a destination, representing a significant impact photographs have on tourism which results in marketers to invest more in this visual stimulation tool as part of their marketing tool and focusing on professional photographs, colors and techniques to attract tourists.

3.2 Photography and Tourism

The tourism industry requires exposure and destination image formation to represent the destination to tourists, as due to lack of knowledge regarding the destination it is hard for them to relate or get attracted to a place that's when photography and videography places a huge role in destination image formation and promoting tourism states Madison (2010: 1).

Despite the universal benefits of photography in measuring tourists' experience (Urry, 1990, 1992), recently performing it (Dinhopl & Gretzel, 2016; Tribe & Mkono, 2017), the present tourism research still predominantly focuses on texts (Balomenou & Garrod, 2014).

Photography is seen as a fainted resource of research data for tourism, As in 1970's and 1980's many social scientists avoided considering visual data for their academic research for tourism, resulting in consistent reliance on textured data compared to visual data for academic research of tourism.

However, it has been seen that a tourist experience relies on elements of performance, (Haldrup & Larsen, 2009, 2001; Scarles, 2011,2012). Which are absent in other forms of search such as interviews, questionnaires, and observation (Latham, 2003).

Photographs are a legal way of inquiry not just along with text (Pink, 2013), and provides tourism researchers and companies with a different perspective to embrace the expression of experience (Bell & Davison, 2013; Emmison & Smith, 2000).

Although through photography the realization of few characteristic such as "the feeling," cannot be demonstrated directly (Simpson, 2011), however other features such as "its descriptive and aesthetic features" works together as "equal music of rationality and emotion in their making" (Spencer, 2010: 202).

Thus, photographs are believed to achieve a multisensory effect for transmitting composite meanings as well as visualizing recognition. However, despite all the connections photographs tend to be underused in tourism research (Balomenou et al., 2017; Grimwood, Arthurs, & Vogel, 2015; Smith et al., 2015).

Travelling is often associated with the best memories of tourists; therefore, photographs are an essential part of most of the tourist's activities done by tourists to capture those moments (Cederholm, 2004). Photographs are also believed to capture independent moments in time

(Rakić & Chambers, 2012), resulting in static images by interrupting the three-dimensional scenes of that time.

However, these images act as unnatural stimuli with the ability to access and arouse deep emotional reactions of the audiences (Goldstein, 2007). Technologies and social media inventions enabled photography to be viewed instantly by many people and made it an important factor for documentary and photography (Ferdous, 2014).

It is observed that tourism and photography are interlinked (Lo et al., 2011). Similarly, many tourist destinations attract the tourists by capturing beautiful destination images in the form of photographs (Jenkins, 2003) and is used by many marketers as a major marketing tool for attracting tourists. (Cederholm, 2004).

Websites provide a great opportunity for tourists to have visual information from them and see the destination images itself (Cao et al., 2010). It is seen that visual colors and images of a photograph also plays a major role in advertisement recognition (Percy & Rossiter, 1983).

3.3 Photography and decision-making process of tourists

Photographs are seen to play an important role in the decision-making process of tourists, influencing their behavior and indicating the satisfaction of tourism places (Garrod, 2008,2009). Various photographs can represent various angles and attractions of tourist destination such as some photographs represents the natural landscapes and scenic architecture (Shavely et al., 2006).

Some represent wonderful scenery and geographic locations (Cao et al., 2012). While some use graphic effects and various lightening to attract tourists (Lynn et al., 2013). However, there is still ongoing research done to prove the strength and capability that different photographs have on tourist behavior of decision making.

Although it is seen that professional photographs influence tourism decision making, but due to the lack of knowledge regarding which specific elements of photographs (angles, colors or effects) attracts and lead to tourism motivation might result in limited outcome.

Some researchers such as (Luo et al. (2011), proposed a Photo Quality Assessment with the help of global feature which portrays the quality of landscape photograph using Hue composition and Scene composition, to determine the aesthetic evaluation on the reaction of

tourists towards photographs (Galanter, 2012). In order to convey the destination image in the most competitive way to attract tourists, marketers need to aim for photographs representing the best view and image of the destination to attract tourists (Tuohino & Pitkanen, 2004).

It is seen that every element of a photograph has an emotional influence on a tourist, whether it is the technique of capturing the colors, composition, the media used or the scenery (Albers & James, 1988).

Travel and Tourism Businesses spend a lot of budget every year to advertise and promote their travel destination by creating a competitive edge and brand awareness (Ali Shah & Akbar, 2008). However, due to the lack of effective photographs used for advertisements, the overall efficiency and money invested for advertisement can fail and go in vain.

Up till now, there is very minimal research done on photography, especially aerial photography and its link to consumer behavior perspectives, and on the view of tourists. Therefore, the intention of this research is to examine the impact of Aerial Photography on tourists' intentions for destination image formation whether for pleasure or academic purposes, by analyzing the difference between tourists or consumers perspective towards visiting Portugal when viewing a normal photograph and aerial photograph.

The previous paragraph provides general information and background regarding the link between photography and tourism, later in this paragraph, we will see more detailed literature review, broad perspective of theoretical framework, photography in tourism and tourists' perspectives regarding aerial photography or normal photography for destination image formation in the form of surveys.

Theoretical Framework of Photography in Tourism

3.4 Photo Quality and Assessment

If we look at S-R Model, which focuses on Stimulus-Response (Mehrabian and Russell, 1974), later proposed a well-known model known as Stimulus-Organism-Response (S-O-R), in which the model focuses on Consumer Behavior on various aspects (Chang et al., 2011, Kim & Lenon, 2013, Thang & Tan, 2003).

A Stimulus is seen as an external factor or view consisting of (time and space) and (elements or objects) that belong to those situations (Belk, 1975, 2011). Stimulus is believed to have a

direct effect on human perceptual thinking and physiological feeling which is called organism (Bagozzi, 1986).

Representing the overall behavioral response as final action according to S-O-R Model. (Mehrabian & Russell, 1974).

Figure 2

S-O-R Model



Source: Situational Variables and Consumer Behaviours, Journal of consumer research.^{xxii}

Belk (1975b) extended SOR concept by dividing the stimulus construct in two separate dimensions; situations and objects.



Situation reflects the relation between a holistic environment at a time, whereas objects are elements that represent the consumer's response, and is a significant source of behavior influence (Belk, 1975a,2011). Hence all the situations representing time, space and objects affect the organism and produces a response due to internal reaction.

3.4.1 Hue and Scene composition

Differentiates the theoretical framework of Belk (1975b, 2011), based on stimulus

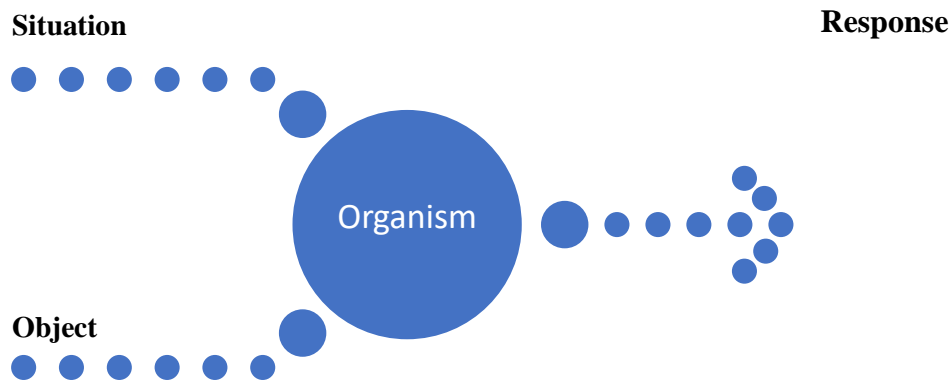
Time: aerial photographs taken at different times of the day, and night for comparison.

Space: beach seen geographically as space.

Situation: is represented by destination images.

Object: will be used to determine the color tones of the photographs.

Figure 3 The revised S-O-R model by Belk (1975b).



Source S-O-R Model.^{xxiii}

*Luo et al. (2011), focused on content-based quality assessment and proposed a model to measure the quality assessment of landscape photographs. Whereas the regional features focus on clarity of subject area and its background, Global feature focus on hue and scene composition all these components play a role in capturing image and destination image formation.

Hue composition focuses on color composition schemes and is considered an element of landscape photographs (Luo et al., 2011).

The color design process focuses on selecting objects of the same color scheme tones or provided the option of selecting contrast colors by selecting different color scheme tones (Tokumaru et al., 2002). Example of hue composition can be explained as taking multiple photographs at different times of the day in various color tones representing a byproduct of the time of the day with varied quality of the photograph, whereas scene composition focuses on spatial structure and semantic lines of the photograph for attracting audiences (Luo et al., 2011).

3.4.2 Affective and cognitive organism in tourism

Affective and Cognitive organisms have been lately studied a lot and supported by a lot of literature (Gross, 2002; Michel & Shoda, 1995; Oliver, 1993) representing that tourism destinations have both affective and cognitive components and Tourists respond affectively and cognitively to a travel destination (Baloglu & Brinberg, 1997).

Decrop (1999), states **cognitive component** as an internal process of brain activity relating the **internal processing believing** and **understanding** which promotes learning & attitude.

Whereas **Affective** component shows the **internal feelings** and **emotions** of people associated with products and travel destinations, affective & cognitive components play a significant role in forming destination image and attracting tourists (San Martin & Del Bosque, 2008). It is believed that “tourists travel for pleasure” which states a feeling of happiness and represents human emotions and gestures (Mogilner et al., 2012), plays a major role in affecting their emotions and choices. Because they tend to make choices when they are happy and tend to select those products that provide them happiness, relaxation, and peace. (Mogliner et al., 2012) states happiness as a by-product of excitement and relaxation.

The cognitive component represents information from tourists representing their belief, understanding, and perception (Decorp, 1999).

Pearce (2011) explain the various motivations for tourist travel. (Baloglu & Brinberg, 1997), states that affective component is more powerful compared to the cognitive component for tourism destination.

3.4.3 Link between color and Affective Organism

(Babin et al., 2003), states that every color tone differs from each other due to various wavelengths which emit different hues and can secrete effective factors which result in various emotional responses. Therefore, the photographers use the colors and tones of photographs in an artistic way to provoke the emotions and moods of the viewers through their artwork (Luo et al., 2011). Hence the professional photographers focus on manipulating the specific colors to bring the desired results and photographs required for attracting tourists and forming destination image (Luo & Tang, 2008).

3.4.4 Link between color and Cognitive organism

Professional photographers spend a lot of time to find the perfect angle and location to capture the desired color tone for perfect photograph (Simon, 2011) and manipulate the viewers (Gallagher et al., 2004). Photographs tend to be influential by portraying nature and realism and could make people deviate from stress (Goldman & Papson, 1996).

3.4.5 Aesthetic Evaluation in Photography

According to (Crilly et al., 2004), people demonstrate aesthetic impressions, and might take an impression of them aesthetically by finding them visually attractive for example many tourists by looking at destination images of Portugal might find it attractive tourist place compared to other destinations which can be positive or negative depending on the neuro-esthetic circuits in human brain (Calvo-Merino et al., 2010). Moreover, can rate the stimulus object aesthetically into various categories such as attractive/unattractive, beautiful/not beautiful, pleasing/unpleasing, relaxing/not relaxing (Lam & Mukherjee, 2005).

Neuroesthetics circuits play a big role in providing aesthetic impression towards stimuli by activating the ability to judge, evaluate and interpret effectively (Calvo-Merino et al., 2008).

However, it varies for different photographs such as landscape photographs angles and techniques for capturing, various color tones, light, and composition.

All is believed to create aesthetic perceptions (Datta et al., 2006). It is believed that in tourism industry beach photographs are considered most attractive amongst the tourists (Phillips & House, 2009), and are believed to be the top cognitive features to attract tourists to travel to destinations (Baloglu & Mangaloglu, 2001). Hence many destinations consider such attributes to create destination images of beautiful places and attract tourists to travel and re-visit their destinations again (Rittichainuwat et al., 2001).

3.4.6 Visual Style of Processing

There are various styles and ways people process information some are better at visual while others are better at verbal processing (Ramsey & Deeter-Schmelz, 2008), different individuals have varied cognitive styles to process information, visualizer and verbalizer are the two main styles understudy and contribute to the discipline (Kozhevnikov et al., 2005). That's why we are exposed daily to verbal and visual style of marketing to determine the consumer's way of processing information (Ramsey & Deeter-Schmelz, 2008), and while considering photography it is essential to focus on style of processing and angles and lights that play a significant role in influencing.

3.4.7 Affective & Cognitive Organisms and General Attitude

As mentioned earlier above colors and objects both play a significant role in demonstrating as external stimuli and attract tourists to visit the destinations (Josiam et al., 1999). Pike & Ryan 2004 states the importance of cognitively develop information and affectively evaluate it for destination positioning as they both play a major role in attracting tourists and influencing their choice and attitude (Del Bosque & San Martin, 2008). Attitude can be described as a response to a person, object or other choices or agreement and disagreements that influences the behavior of a person (Hassanein & Head, 2007).

Kim & Morris (2007), states consumers tend to respond more positively towards affective construct compared to cognitive construct in terms of attitude. (Huang and Hsu 2009) show a positive connection between affective factors such as pleasure and enjoyment and attitude variables, or one of the push factors to influence the tourists to seek opportunities to visit other unique destinations (Kim 2007). To seek pleasure and relaxation which is considered as motivation for travel (Pearce & Lee, 2005; Rojek 1993). And hence making escape as one of the travel motivations as a cognitive dimension of attitude.

Aerial Photography

3.5 Rising Trend of Aerial Photography and the use of UAV'S drones

Drones are aerial robots that carry visual sensors, navigation systems, cameras and sometimes even equipped with weapons. They come in all shapes and sizes and with various names known as remotely piloted aircraft or unmanned aerial vehicles or drones. Unmanned Aerial Systems (UAS) are the aircrafts that can fly without pilots or manned crew and can be programmed to "Auto Pilot" systems to fly a safe flight, UAV and Drones all are identified under same category, that are designed to fly a route autonomously or designed to be flown a route remotely by external pilot. The idea of building UAV generated since World War 1 and World War 2, and initially were operated through TV and Radio signals, and then eventually adopted a more strategic approach to form better remotely operated versions of UAV.

UAV acts as a source for providing information worldwide instantaneously and can be used to deliver things or to be reused and equipped with different implements. UAV's are operated by pilots on the ground and can be operated through several different spots at varying distance and fly a pre-designed route by autopilot system.

UAVs are of two kinds Winged and Unwinged Quadcopters, however the basic principles to fly them are the same.

Few advantages of using UAV's for Surveillance mission:
<i>“The only reason we need UAVs is because we do not need an enlarged cockpit for the pilot to fit in”</i> . (General George S Brown).
<i>“Drones are compatible for high-risk flying, saves lives”</i> (General John Meyer).
UAS has free range to go to higher altitudes beyond a normal fight pilot can go.

3.5.1-Winged UAV for Military Usage / Unwinged UAV for Non-Military Usage

Table 13

Winged UAV's uses for Military Purpose:	Unwinged UAV's for Non-Military Usage:
Target and decoy live-fire exercises.	Environmental Activism.
Surveillance and Reconnaissance.	Aerial Photography and Filming.
Offensive Combat capabilities.	Oil & Gas companies.
Logistics Research and Development.	Disaster Response Team.
Commercial Activities.	Farming and Agriculture Surveillance.
Border Patrol.	Storm & Atmospheric administration.

Source Winged UAV's/Unwinged UAV's.^{xxiv}

3.5.2 Commercial benefits of UAV's for companies

Residential and commercial companies, Law enforcement agencies, Aerial filming and photography, Factories, Security companies, Real estate and construction companies, Tourism, Marketing and advertising companies, Sports department, Remote inspection, and Insurance companies.

3.5.3 Unwinged Drones Multi-copters and Quadcopters

Unwinged Drones are usually equipped with six or eight rotor blades and has usually X shape or H shape body which can hover up and down or rotate 360 degrees, to produce smooth results. Most drones are safe to fly however, a drone pilot should follow the FAA (Federal Aviation Authority) regulations of the country to ensure a safe flight for everyone such as: “(FAA safe flying elevation is 4000 meters, batteries should be charged before flight to prevent accidents, each drone has specific specifications depending on its characteristics, height, weight, etc.,

must be flown in open air space).”^{xxv} Drones can be used to do high quality “aerial photography and filming using Global Positioning System (GPS), and can be used for commercial photography, surveys, 2D and 3D Mapping, 360 Degree Aerial Panoramas, 3D Virtual tours for commercial and residential purposes.”^{xxvi}

3.5.4 Advantages of Aerial Photography by Drones

Table 14

Advantages of UAVs for Aerial Photography
Taking the photography and Filming services to a new level using UAVs.
Makes the Aerial photography less disruptive compared to conventional helicopters, planes and is more cost-effective.
Equipped with a high range camera, aerial photography can provide high definition up to 20 megapixels images and 4k videos.
Aerial Photography can cover 360-degree panoramas and 3D virtual tours, for commercial and residential properties.
Corporate Video’s, 3D Mapping, 2D Mapping, Indoor Drone Filming.

Source Advantages and disadvantages of UAV. ^{xxvii}

Drone technology is currently used in many fields and the industry is bound to grow leading to greater trend towards drone technology such as aerial photography and filmography which are used to explore new avenues and places which were not visible to human eyes before.

Photoshoots done by drones in the form of Aerial Photography adds more creative and pristine touch to the destination image, because it is believed Aerial photography adds new perspective and angle to the locations which can promote tourism. Photographs and videos usually consist of accommodations, territories, events, entertainment, advertisements related to tourism.

There is also an increased trend of Aerial photography in municipalities, tourism boards and tourism promotions bodies to create a better destination image for marketing to attract tourists as it provides “unique aerial view of landscapes and attractions, which attracts greater customers and brings excitement and emotional involvement”^{xxviii}.

Aerial Photography do not rely on expensive drones equipped with heavy gears, if the pilot masters the skills of capturing good quality image through sky and can fly safely around the environment then they can easily learn to be a professional aerial photographer.

Figure 4 Course for Aerial Photography

Aerial Photography Course is Based on 5 Step Frameworks	
•	Need to learn and demonstrate a degree of Drone pilot skills, ability to fly and manoeuvre safely in the air.
•	Visualize like a professional photographer or a filmmaker, learning skills to shift from drone pilot to drone cinematographer.
•	Techniques to create interest in the work, by building compositions to add depth and interest to your pictorial image, in order to attract tourists and your audiences' eye and attention through frame or photos.
•	Another important factor is to add motion while shooting the photographs that can enhance the image, light adjustments, and compositions that impact the final product, and make it impressive for the audiences and tourists.

Source Pros and Cons of UAV.^{xxix}

Figure 5 Course Syllabus

✂ The state regulations and requirements.	✂ Techniques/lights used in aerial photography.
✂ Flight preparation and routine on simulator and on ground.	✂ Hazard analysis and risk management/repair and setup.
✂ Basic and advanced Drone settings.	✂ Equipment setup and specific information.
✂ Aerial picture composition and shots.	✂ Creation of a story for aerial photography.
✂ Specifics of various available payloads/ cameras equipment.	✂ Flight training and repairing.
✂ Appreciation and analysis of aerial photos and films.	✂ Examinations of theory and practical flight test.

Aerial photography through drones is a latest trend leading to new inventions and technology advancements in this field to provide customers and businesses with better products and services which differ from previous products based on characteristics such as easy to fly, camera with high resolution and stability, long-lasting battery, latest features and smaller equipment size, better access to sites etc.

3.5.5 Unwinged Drones for Aerial Photography

DJI T600 Inspire 1 Quadcopter with 4K Video This model eliminates the need for using separate personalized camera mounted for capturing the photographs and video making, and is composed of all equipment in one piece, as aerial filming drone.

Pro's:
Easy navigation system can fly indoors and outdoors.
Efficient, strong build and light camera, suitable for producing clear and sharp images of 12 Mega Pixels.
Can be operated through Mobile apps rather than conventional receivers.
Easy controls and 360-degree view.

DJI 4K Phantom Vision 4

It is designed efficiently with visual sensors to avoid obstacles and crashes, can climb effortlessly and plunge, comes with 5 different cameras to get complete view and capture aerial photographs.

3D Robotics solo

Provides easy access for users to transfer the Aerial photoaged and HD videos from Go-Pro camera to mobile, smartphone/tablet. Due to its easy handling and smart shot technology, it is also known as “World’s first smart Drone” and makes it easy to fly indoors and outdoors.

DJI Phantom 3 Professional Quadcopter 4K UHD video camera Drone

Easy to use, safe, budget-friendly and efficient battery life, captures high-resolution images using 12 Mega Pixels camera, Global Positioning System equipped makes aerial photography comparatively easy and can be operated through mobile app for mobile phones, smartphones and tablet users.

DJI S 1000 Octa-copter

This Aerial unmanned drone comes with eight legs, very light, secure and moveable to use with the ability to carry 11 kg of weight, the 8 rotor blades provides greater stability and vibration reduction mechanism provides minimum disruption and clear image.

Source Top five best drones for Aerial Photography.^{xxx}

Critical Analysis

3.6 Arguments Against Photography

Firstly it is believed that according to Goldstein (2007), and Linfield (2011), photographs fail to make exact representations compared to human eyes as the camera fails to provide results comparable to the natural depth of field adjustments, speed, light, colour and the intensity of human eye, thus photographs just presents a mere image of the actual dependent on the audience for interpreting the image.

Secondly it is believed that photography only represents a mere image which provides few choices from the countless time and space and according to (Chang, 2007), Urry and Larsen (2011), and Chalfern (1987), believes that a photograph fails to capture all the story behind the frame and they exclude as much as they include.

Thirdly photographs tend to lie to fit in the subjectivity criteria of understanding the world set by humans (Kenyon 1993), states that experiences do not live objectively and therefore are pre-constructed images of experience built by expectation, Goldstein (2007) suggests that people might express their opinions differently for same situations (Mojtahedi et al., 2017), and might have different recollections of the similar situations.

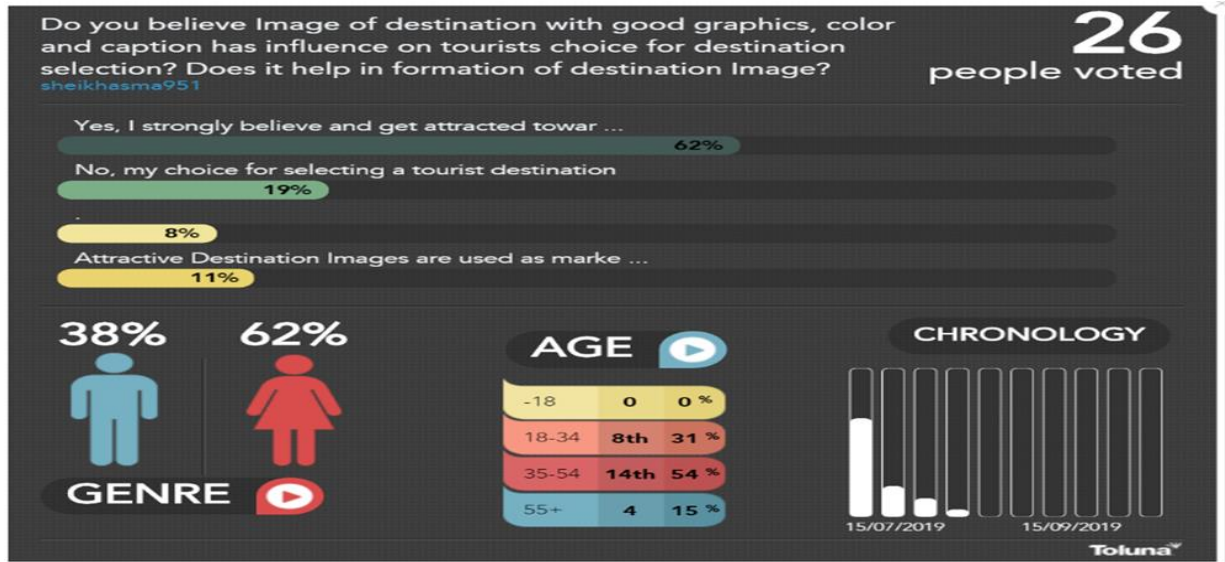
However, to determine whether aerial photography does have an impact on influencing the decision-making process by tourist and common people and influences their decision making for the formation of destination Image, we conducted market analysis for more detailed research.

3.6.1 Market Analysis for Photography and Destination Image Formation

From the tourist's poll conducted on survey site Toluna Influencers, a website used worldwide to get an insight of community and for conducting surveys and gain information from community worldwide, as well as provide detailed knowledge regarding their participant's gender, age, and education. The focus is on collecting research data from public, potential tourists and how they respond S-O-R (Stimulus organism response) towards a normal photograph taken of a tourist destination and an aerial image taken of the same tourist destination, to show the link towards affective and cognitive organism, colour and cognitive organism, colour and affective organism and affective & cognitive organism and general

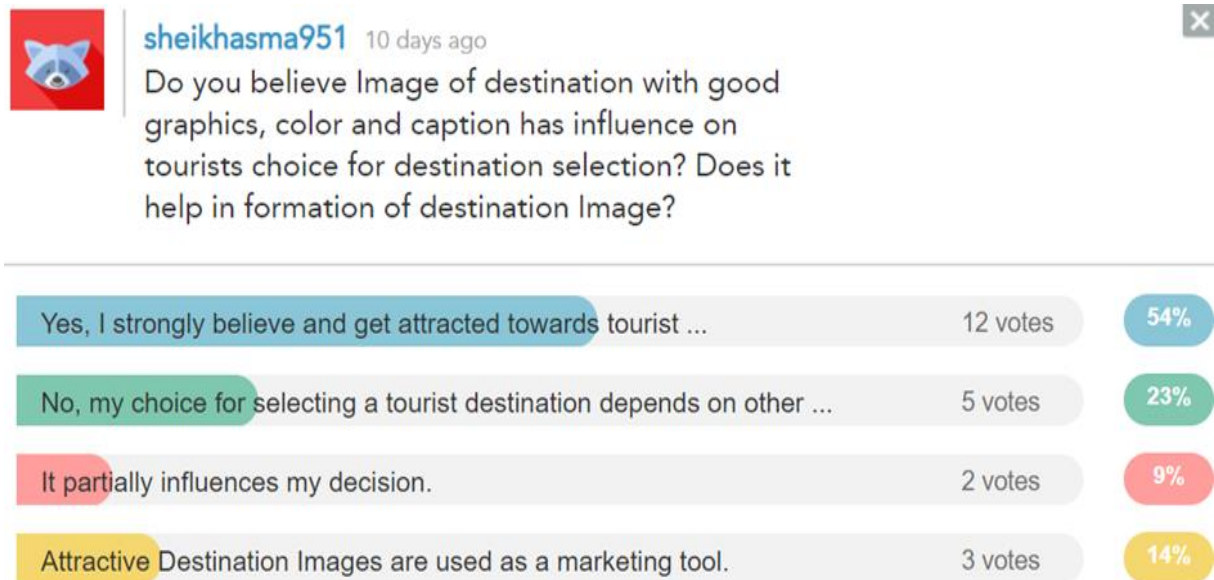
attitude to see whether there is a link between these stimulus and general attitude of tourist information of destination image and promoting tourist destination.

Table 15 Survey



Source: Toluna Portugal Surveys.^{xxxii}

Table 16 Survey



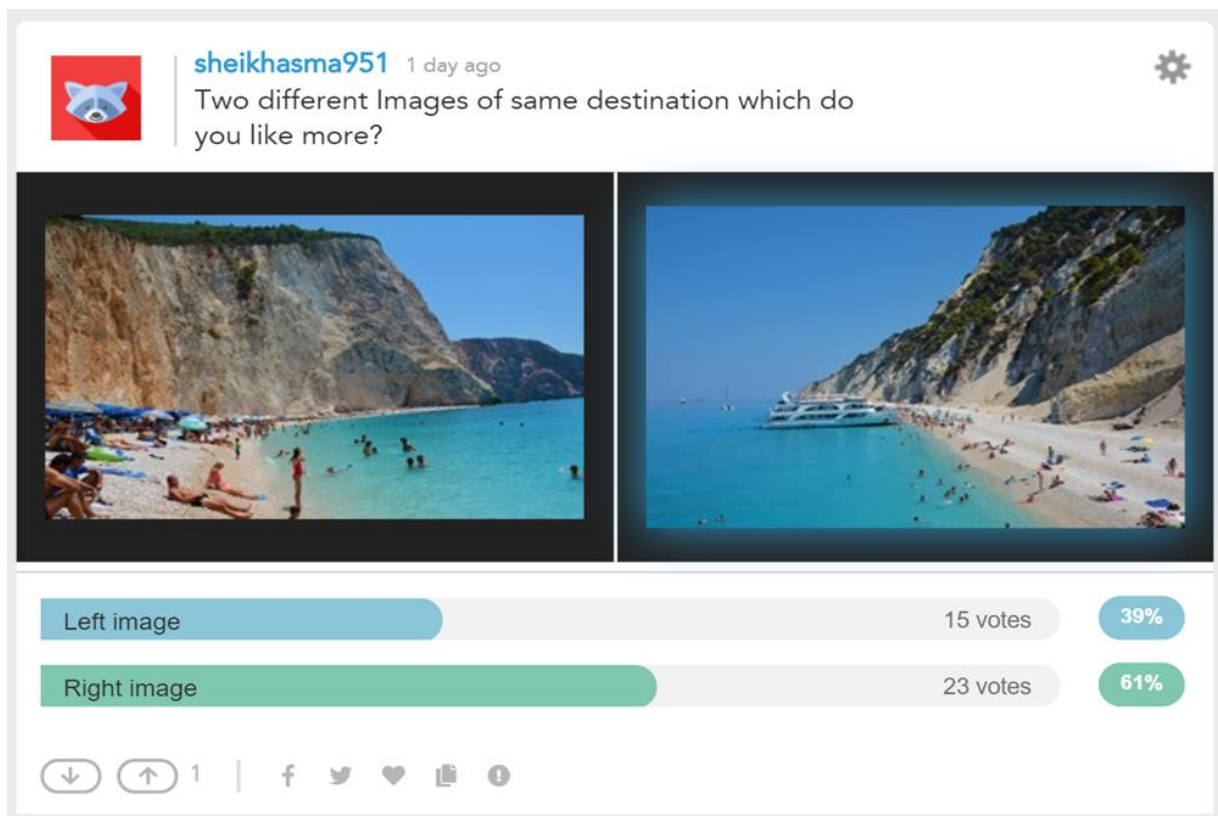
Source Toluna Portugal Surveys.^{xxxiii}

The poll conducted above shows that good graphics, colour and caption has a significant impact on the formation of destination image and selection of tourist destination compared to other

factors, whether it's an emotional connection towards tourist destination or general attitude towards colours and objects of external stimuli.

From above response we can see that colours and objects within a tourist destination play a significant role to attract tourists as described above in the literature review, as Colour and Affective organism represents that colour tones secrete various effective factors resulting in the emotional response of tourist, therefore photographers emphasize on using perfect colour and tones within photographs to provoke the emotional response and mood of tourist and viewer, (Luo et al., 2011), and using different techniques such as Aerial photography by photographers can be much more helpful and effective in manipulating the specific colours to bring desired results (Luo & Tang, 2008), required for formation of a destination image and promote tourism.

Table 17 Comparison between normal photoaged and Aerial photoaged.



Source Toluna Portugal Surveys.^{xxxiii}


The above research was carried to show and prove a link between Colour and Cognitive organism, where two different images were taken of the same beach, at the same time of the day, but with different angles, the left image was taken from a normal camera and right image was an aerial image taken from a drone, to show a link between colour tones and perfect angle

on tourist's perception and Aesthetic evaluation, whether tourists perceives a destination by visually looking at images or destination itself, and the results show that a perfect angle and colour tone plays a role for perfect image, as 61% tourist's voted for right image which is an aerial image captured with drone, whereas only 39% tourist's voted for left image which was captured using a normal photography camera, giving us a better cognitive understanding regarding tourists perceptive and beliefs (Decorp, 1999).

Table 18 Customers response regarding opening a UAV Training Institute.

The image shows a screenshot of a social media post and its replies. The post is from user 'sheikhasma951' and asks for opinions on a UAV training institute. Below the text is a photograph of a white UAV drone on a runway. There are two replies from user '19600906' expressing positive views on the technology's future applications.

sheikhasma951 1 day ago
unmanned aerial vehicle
 Talking about UAV drones, it is an emerging field around the world, be it drones used for military purposes, surveillance, filmography, aerial photography, etc., in Portugal, what is your opinion about the concept of having a vocational education institute and professional certification? For future drone riders, do you think people will be interested in exploring this new field area? Your valuable information and opinions would be greatly appreciated.



19600906 1 day ago
 I think this technology in the future will make a difference in many fields. We must invest in this aspect quickly, both at the educational and industrial, military and technological levels. Thank you. [Reply](#)

19600906 2 dias atrás
 The drones is a new open field, may be the future. We can use the drones in many things, in the forests, in the citys, in the citys trafic and in the frontiers. Thank you very much

Source Toluna Portugal Surveys.^{xxxiv}

There was a positive response seen among the public with this new concept of UAV training institute, although generally a lot of public is still unaware of this emerging field and its benefits, the people with knowledge showed a positive response.

3.7 Achieving Sustainable Academic and Aerial Photography Tourism in Portugal

The aim of this Business plan is to achieve “*Sustainable academic tourism in drone pilot training as well as promote destination image formation through aerial photography and promote tourism of Portugal,*” which can be achieved through Pixair Institute.

Pixair specializes in providing flying lessons for UAV training and aerial photography which not only promotes the tourism industry of Portugal, but also aim to provide new career and business opportunities related to Unmanned Aerial Vehicles (UAV) field. Pixair will be based in Lisbon, as it has the potential to be the perfect destination for educational activities as well as for aerial photography.

However, for the plan to be successful it is also very important to attain sustainability. Brundtland Report, World Commission of Environment and Development (1987: 15),^{xxxv} states sustainable development as: “a development that fulfills the needs of the present generations, without compromising the future generations from fulfilling their needs.”

Similarly, the World Travel and Tourism Council (WTTC, 2010), states that sustainability stands for creating an equilibrium of respect between the local environment, societies, and cultures. Munasinghe (1993),^{xxxvi} says that sustainability can be achieved or accessed based on three dimensions the economic, environmental and social factors. The economic sustainability can be achieved to its maximum by considering the market trends, growth area and carefully utilizing them. However, it’s also important to take into consideration the environmental and social dimensions, Brundtland Report WCED, (1987: 11).

It’s essential to respect the socio-cultural reality of the host destination in-order to gain sustainability, The academic tourism tends to have greater sustainability because the educational students living in same destination for longer duration tend to leave a positive impact on local institutes, have a similar lifestyle like the residents and are more intertwined with local community which results in economic benefits compared to conventional mass tourists, and plays a more sustainable role towards the economy, environment and socio-culture of the destination.

Chapter 4

Analyzing the Needs

4.1 Methodology

In the first section, we are going to analyze the current economic and social needs of Portugal required for a sustainable business, whether the economic conditions of Portugal favor the business plan.

For designing methodology of Pixair, we will consider Positivism as **theoretical aspect of methodology**, where we believe in reality that is external and objective and the knowledge gained is based on observation from practical aspects, and use **deductive process** to analyze the knowledge and theories existing for the practicality of business plan, structure of business it's mission, visions and business objectives. Taking a look at **the secondary data** of other successful **business model plans**, while building the Business Model Canvas enables us to get a detailed insight of organization, the external market and consumers perspectives regarding the business, we can obtain more detailed view of drone pilots and manufacturers by conducting **focus group discussions** which focuses on semi-structured questionnaires, to analyze the views of drone instructors and manufacturers regarding best products in market, their opinion regarding opening a UAV training institute.

The progress this field has made and the future of this field, also get detail knowledge regarding the UAV products launched and new innovations being made by conducting **Interviews** with UAV manufacturers at **Air Summit Portugal**, by conducting competitor analysis to understand the external competitors, such as the top drones institutes and drone manufacturers worldwide as well as conduct **SWOT analysis** to determine the internal environment of the business it's strengths, weaknesses, opportunities and threats and plan **successful strategies** required for **profitable business**.

In-order to design Workplan and Milestones necessary for running a competitive business in the market, and lastly make financial projections for next 5 years to get a detailed insight regarding cash inflows and financial performance.

4.2 Social Needs

As discussed earlier, there are multiple benefits for a country if they have sustainable tourism considering the academic tourism in this plan Portugal's economy can have great benefit overall by attracting International students, trainers and professionals. However due to lack of resources and availability of institutes offering courses in English language, Portugal still stand far behind for student mobility and academic tourism compared to other countries.

“The internationalization of the student body promotes knowledge gained during the entire length of course and provide career opportunities to students living in the host country, resulting in stronger networking possibilities which can be beneficial for the future economic relations between the participating countries due to increased trade,” (Munich, Hoch 2013). and social benefits for students and trainers due to increased cross-cultural relations.

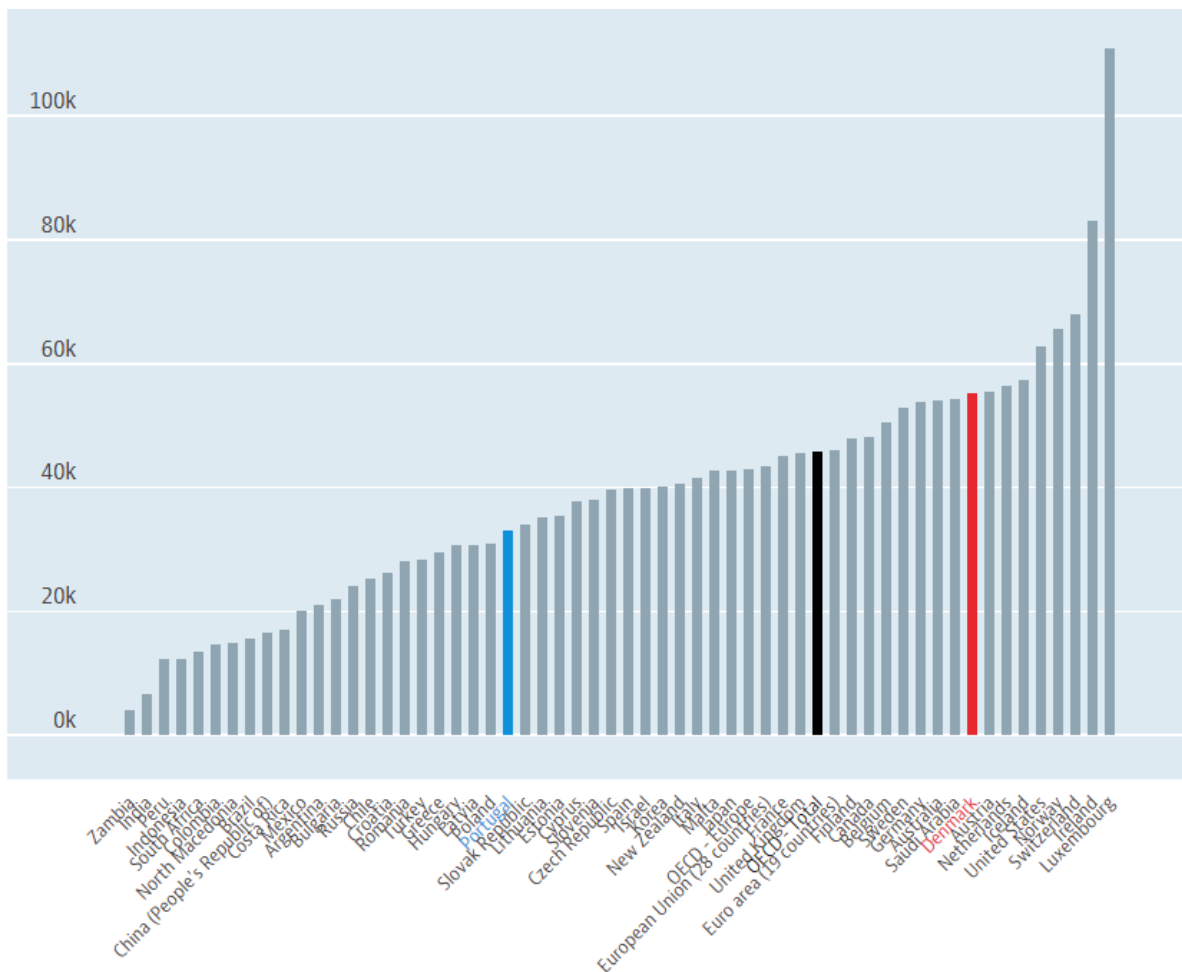
The solid expansion will continue			
% change	2018	2019	2020
Gross domestic product (GDP).	2.1	2.1	1.9
Private consumption	2.2	1.8	2.0
Government consumption	0.7	-0.1	-0.1
Gross fixed capital formation	4.5	5.6	4.7
Exports of goods and services	6.0	4.5	3.7
Imports of goods and services	6.2	4.7	4.2
Unemployment rate	7.1	6.4	5.7
Consumer price index	1.3	1.3	1.4

Table 19

Source: OECD Economic Outlook Database. Surveys Portugal February 2019.^{xxxvii}

Table 19 represents GDP % of Portugal to fall from 2.1% in 2018 to 1.9% in 2020, whereas decrease in unemployment rate from 7.1% to 5.7%, decrease in export of goods and services from 6.0 in 2014 to 3.7 in 2020, which shows a fall in economy and need for implementing more successful strategies for promoting better more sustainable economy.

Table 20 OECD Gross Domestic Product Indicator 2019.



Source OECD (2019), Gross domestic product (GDP) (indicator). doi: 10.1787/dc2f7aec-en (Accessed on 29 September 2019)^{xxxviii}.

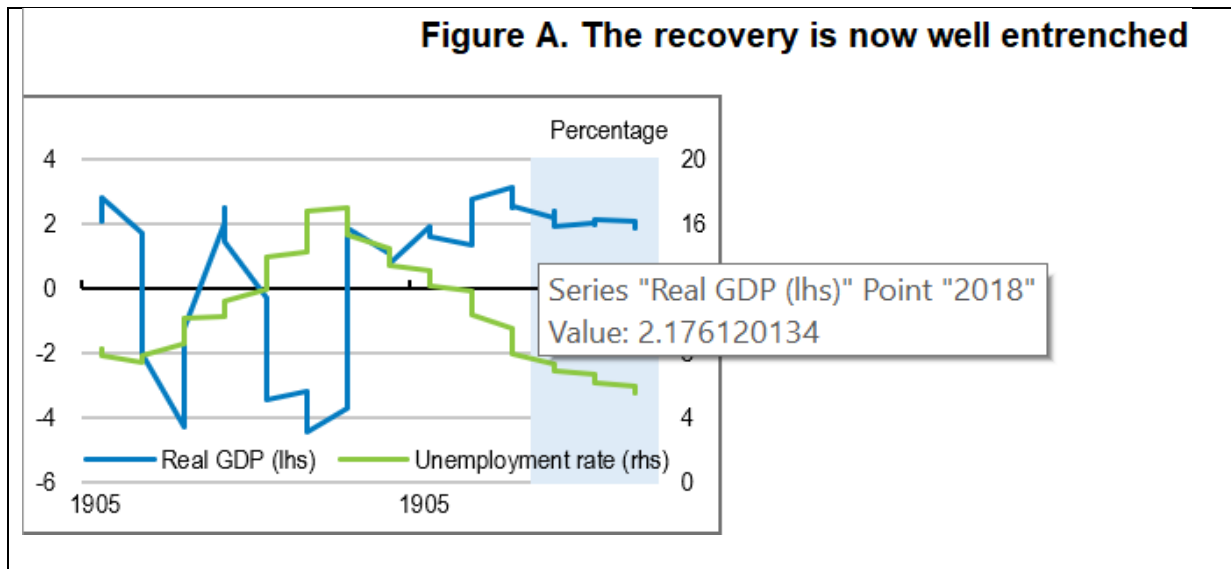
Table 20 represents % of total spending country wise, with Luxembourg being highest with more than 100k, followed by Ireland of 83k and Portugal on 36th number with spending of 36k.

4.3 Economic Needs According to the economic survey of Portugal in February 2019, Published under the responsibility of the **Economic and Development review committee (EDRC)** of **OECD** (Organization for Economic Co-operation and Development).

The economic conditions of Portugal have improved and there is a rise in **GDP** from the pre-crisis level, resulting in **an increase of employment rate** from **10%** to **7%** since **2013**, however the legacy of the crisis and poverty still exists, with only a rise of 2% between years 2018 and 2020. Portugal is contributed to **increased tourism** and **exports**, which will result in a rise in **GDP**, as increased tourism also leads to regional development more business and jobs to local people resulting in overall growth.

4.3.1 Economic Outlook

Table 21 Rise in Real GDP and Fall in Unemployment rate.



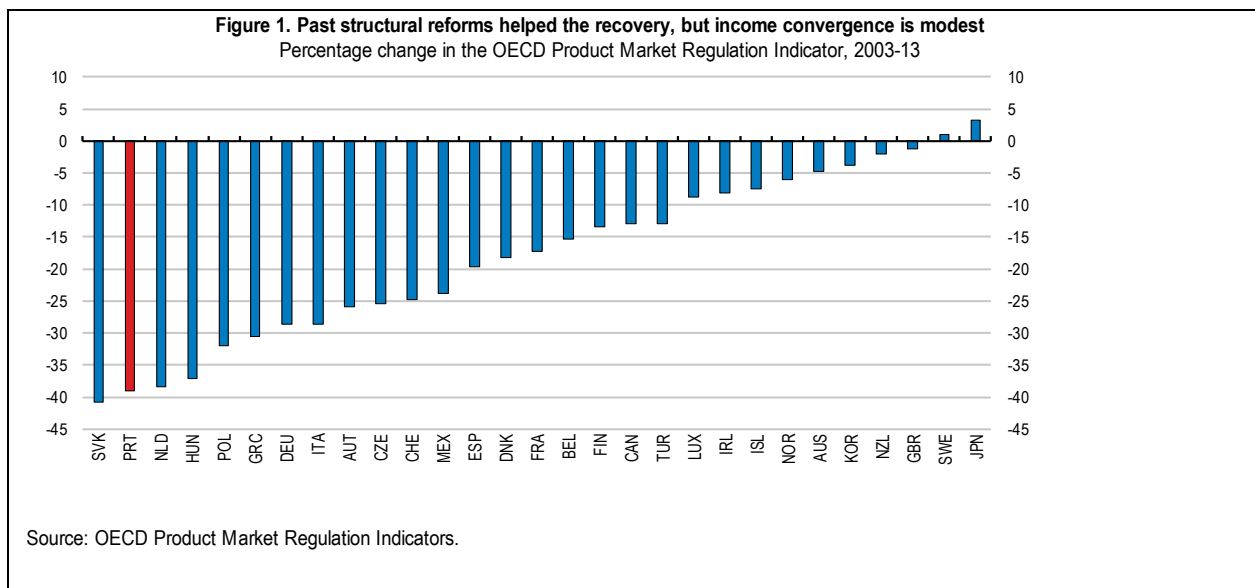
Source: OECD Economic Outlook: Statistics and Projections (database) November, February 2019.^{xxxix}

Table 21 represents a steady rise in Real GDP and a decreased unemployment rate.

The Portuguese economy is believed to have improved steadily, with better structural reforms and global economic conditions, and an improved export performance since 2010, resulting in **decreased unemployment rate** from **17%** to **7%**.

Another reason for improved economy is the cut down of unnecessary **red tape** for businesses (**Simplex and Simplex + programmes**), improving the **Capitalizer programmes**, promoting innovation collaborations (**Interface programme**), changing labour policies and promoting the use of digital services among population (**INCoDe 2030 and Partnership Digital Skills + programmes**). And witnessed between **2003** and **2013** as the second-largest country in **OECD** to witness decline in **OECD Product Market Regulation Indicator**.

Table.22 OECD Product Market Indicators.



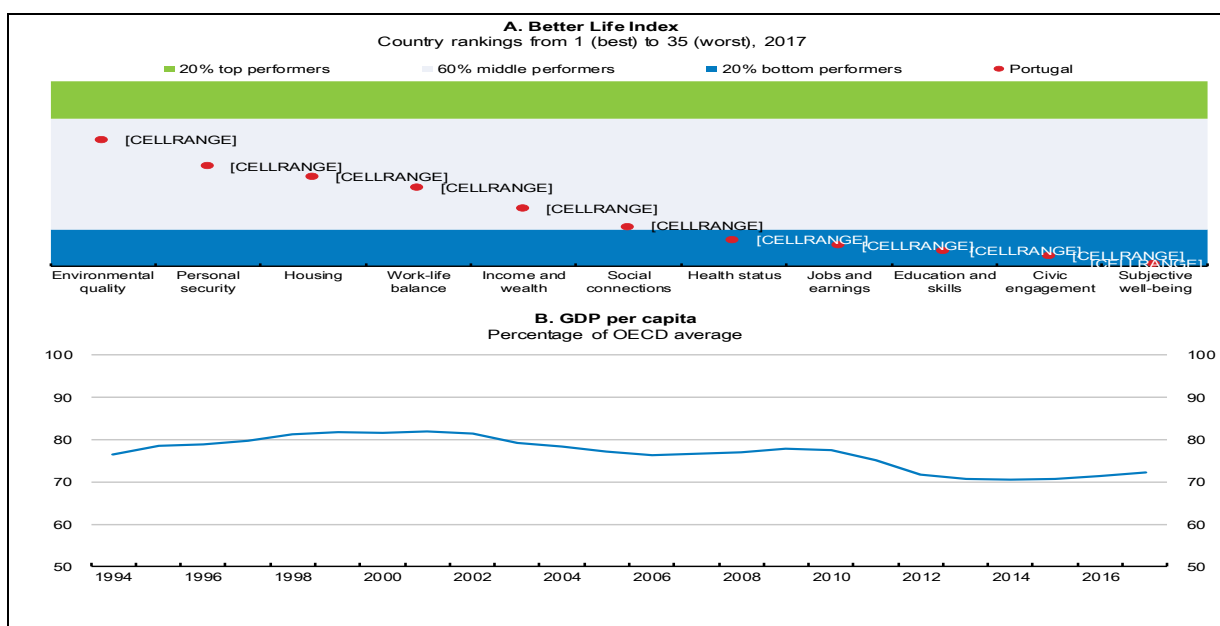
Source: OECD Product Market Regulation Indicators, OECD Economic Surveys: Portugal 2019.^{x1}

Table 22 represent Portugal as second largest country in OECD to witness a decline in OECD product market regulation indicator.

4.3.2 Life Quality Index

However even though Portugal ranks above average in personal security and environmental quality, it falls far below compared to other OECD countries in areas of health, skills, earnings and job and civic engagement representing a lack of convergence.

Table. 23 Better Life Index.

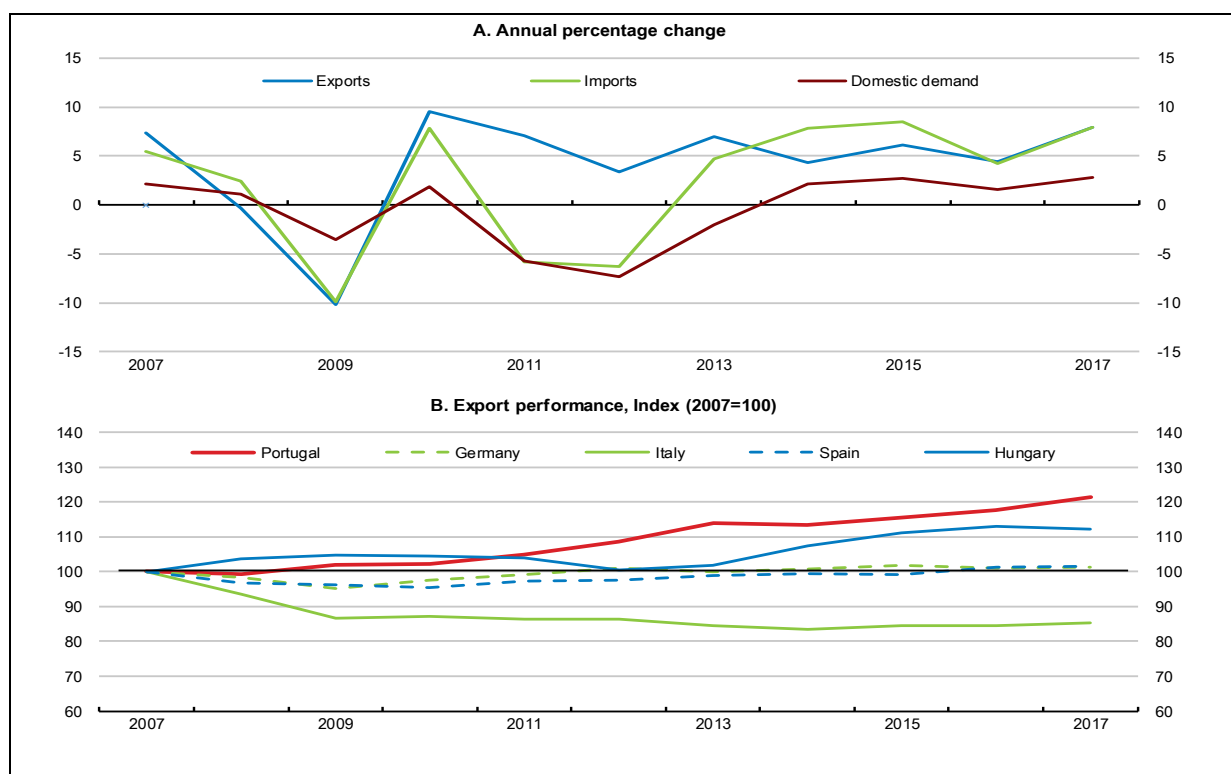


Source: OECD (2017), Better Life Index, 2017, and OECD Compendium of Productivity Indicators.^{xli}

Table 23 represents the life quality index of Portugal with Environmental Quality, personal quality, housing, work life balance, income and wealth and social connections as 60% middle performers, whereas health status, job and earnings, education and skills, civic engagement and subjective wellbeing as 20% bottom performers.

4.3.3 Recent Macro Economic Developments and Short-Term Prospects

Table 24 Export Performance Index of Portugal.



Source: OECD Economic Outlook (database), September 2018.^{xliii}

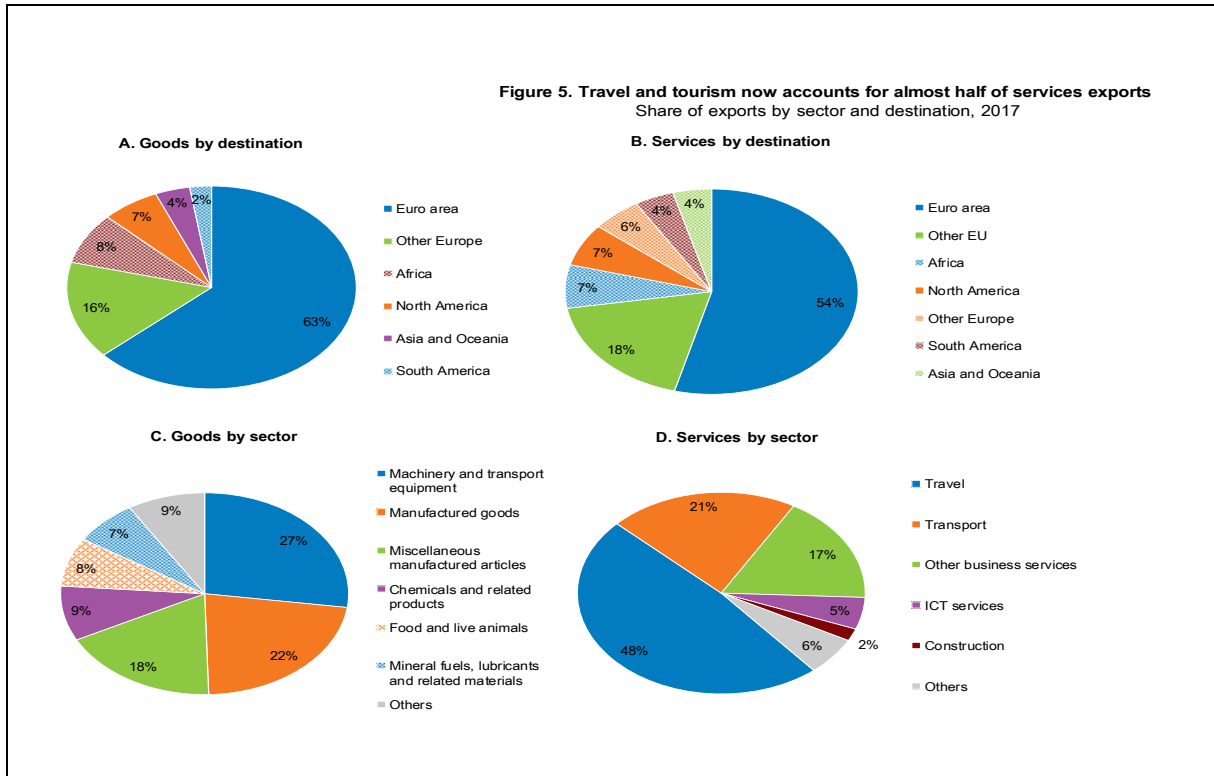
Table 24 represents the growth and export performance of Portugal compared to Germany, Italy, Spain and Hungary, with Portugal in 2007 at 100, where as in 2017 at 120 well above Hungary, Spain, Germany and Italy.

The **recent macro-economic developments** show strong exports sustained the economic activity as well as the financial crisis, exports rose mainly due to improved performance of the tourism sector between 2010 and 2017. There has been a rise in travel and tourism export by 10% nearly about half of all exports were due to tourism.

4.3.4 Growth in Tourist Arrival

Strong growth in tourist arrival has led to an increase in demand for tourist accommodation and low-cost airlines as well as increased security in competitor markets.

Table 25 Travel and Tourism in-terms of services export.



Source OECD International Trade Statistics.^{xliii}

Table 25 shows that travel and tourism in-terms of services export, whether services by destination or good by destination leading continent is Europe, with travel being the high demand services by sector.

From the above economic condition and report of Portugal, it shows that Portugal requires an increase in tourist arrivals as a source for improved economic stability, therefore business such as Pixair, would benefit the economy of Portugal by promoting the tourism as well as improving education, career opportunities, employment, businesses and reducing the chance of students or trainers going to other countries to seek skills and training for Aerial Photography.

4.4 Environmental Needs

There is a big concern from the public and government when it comes to new businesses starting up regarding its impact on environment, therefore it's the responsibility of the business management to make sure their products and services are according to the safety regulations and do not pose any harm to the environment. According to the Environmental Implementation Review (European Commission, 2019), there is substantial progress in the transition of circular economy which has improved the **National Action Plan for circular economy (2017-2020)**. However, it still needs further improvement in **waste management** and **Nature conservation**.

There has been progress in terms of **marine management** and some progress in terms of **water management**, and there are further programs planned for more **sustainable development**. In 2017 **iFAMA** was introduced responsible for agriculture, environment, and sea, ensuring improved efficiency of public services to companies and citizens. **E-GAR** also launched in 2017 is responsible for waste shipments.

The **Single Environmental Permitting Platform** is another program responsible for standardizing and linking many permits. Pixair institute makes sure it follows all the environmental safety regulations, in order to avoid any hazards or pose any danger to the local community, by using products from reputable companies with minimum noise, minimum pollution and wastage.

Chapter 5

The Business Plan

5.1 Mission Statement

Is to provide the opportunity to young talented students, trainers and professionals to improve their flying skills, career opportunities and excel in their business by providing them the opportunity to learn from a reputable institute based in a culturally rich destination with wonderful environment and culture.

The focus of Pixair is to provide a learning platform to such individuals at an affordable price, by providing them with best-learning facilities and environment at flexible time and package. To gain its objective and goals, Pixair aims to create and build best customer care relationships

with the customers and drone manufacturers, to gain an insight of their unfulfilled needs, desires and the area they want to gain expertise and obtain the best products at affordable price.

5.2 Vision Statement

PIXAIR aims to establish itself within a span of few years as a “reputable and leading” Institute for providing professional training and skills in the field of UAV’s and Aerial photography and promote Portugal as a sustainable tourist destination.

Pixair Institute’s vision is to provide the trainers and photographers the opportunity to learn the art of aerial photography in order to improve their photography and filmmaking skills, by portraying the best images and beauty of Portugal required to attract and impress the clients, provide services and enhance their businesses.

5.3 Business Description

Pixair focuses to provide UAV training at beginner, intermediate and advanced level for flying drones and aerial photography and videography, to people seeking for professionalism in the field of photography and videography to expand their career and business opportunities. By providing services of aerial photography and videography to other businesses such as travel agencies, hotels and tourism companies seeking paid service or videography, resulting in better advertisement of travel and tourism business, better formation of destination image of Portugal, and more sustainable tourism.

5.4 Business Operational Structure

PIXAIR, is founded by three drone Pilots: Mr. Waqas Tariq, Mr. Pedro and Mr. Paulo to be registered as a Private Limited Company, as they are most suitable for small to medium-sized organizations, as in case of bankruptcy it protects the directors from any debt collection keeping in account only are to be used paying back the debtors.

Table 26 Pixair Objectives.

BUSINESS OBJECTIVES:

To achieve sustainable market growth and profits.

To establish as a reputable institute for drone pilot training and aerial photography.
To develop a strong customer relationship and build a strong market image as a business.
To adopt effective marketing strategies to target more customers and market segments.
Gain product innovation by building strong ties with the best drone manufacturing companies to take advantage of the latest products and equipment.
Provide best possible course prices and latest equipment to overcome competitor institutes.
Adopt good management skills and effective strategies to cut down unwanted expenditure and costs.
To generate greater revenues than the initial cost of investment.
To use environmentally friendly products and achieve sustainable tourism.
Plan effective strategies for successful business.

Source (Goals and Objectives, p.5 of 44).^{xliv}

5.5 The Business Model

According to (Henry Mintzberg 1987), a known expert in the field of management and strategy believes that strategic planning is different from strategic thinking, considering the traditional approach for strategic planning, which is a step by step process for strategy development, lacks strategy thinking which is a mixture of (creative thinking, being intuitive and nonlinear). The traditional method focuses on the strategic plan.

Where-as successful strategy planning, requires thinking strategically, is lengthy and time-consuming, more assumptive and lacks the approach of buying customer, rather successful strategy planning relies on diverse cross-section of members within the organization and participants from outside the organization. Whereas the business model focuses on the rationale of how an organization can successfully build, deliver and secure values. Building a business model concept provides a platform for discussion and description and is understandable for everyone.

By getting an insight into potential buyer and the consumer state. Minimum designing, precise and understandable, as well as maintaining the complexity of the functions. The process of designing a business model is divided into several sections such as:

The Canvas model: which is used as an effective tool for defining, evaluating and designing the business model.

The Pattern: focuses on the concept of leading business thinkers.

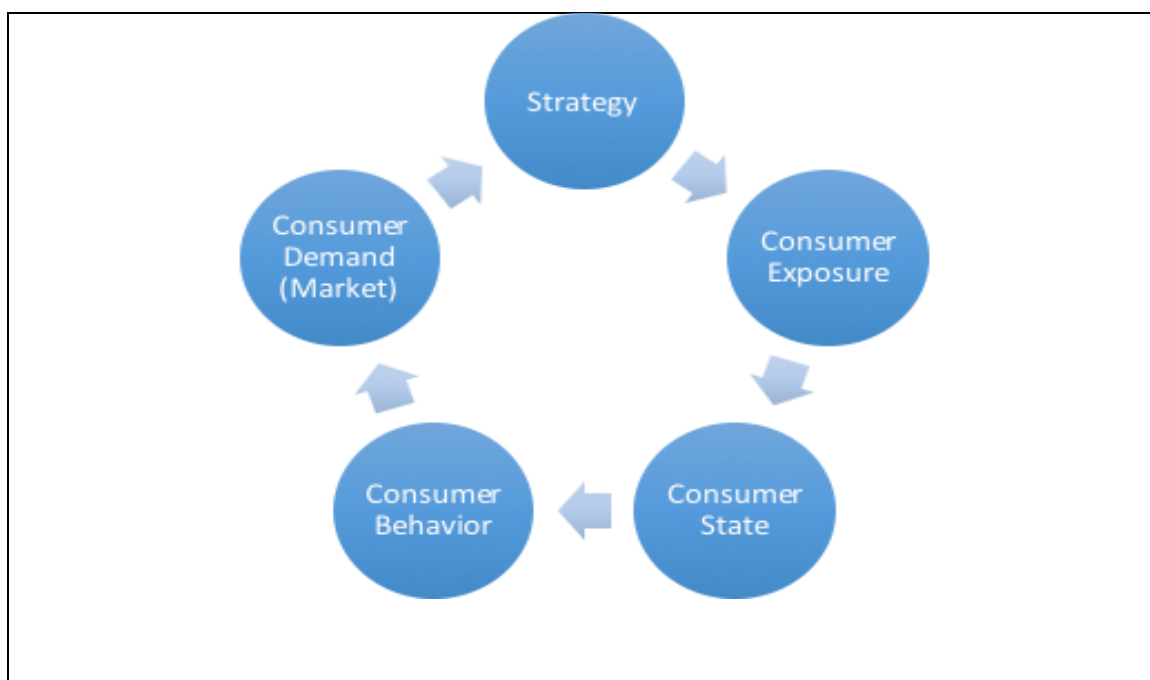
Design method: are the techniques used for designing the business model.

Planning Strategy: Interpreting and re-using the strategies in an effective way for a successful business model.

Process method: is also used for designing and building an effective business model, by collaborating all the concepts, techniques and tools in business model generation.

All these steps together help to make an effective business model for PIXAIR institute which will be beneficial for the stakeholders to see the effectiveness of this business in the future.

Figure 6 Virtuous cycle of strategy and change in consumer behaviour.



Source Consumer Exposure/ State/ Behaviour/ Demand Cycle.^{xlv}

5.6 The Canvas Model

Once the vision, mission and business objectives are clearly stated, participants from all diverse groups within the organization participate to design an effective strategy for each of the three sections of canvas, value chain stakeholders from outside the organization the present competitors and any other enterprise due to its ability and capability to determine and participate in the process.

The business model has been used in well-reputed businesses such as IBM, Ericsson, Deloitte, the Public Works, Government services of Canada and so on. The model works by acting as a

medium of shared language to successfully explain and manipulate the business models to create a strategic alternative and is based on nine building blocks that focuses on customers, offer, infrastructure and financial viability and interprets on how a company can successfully make money, and acting as a blueprint for the strategy to be implemented. The key nine building blocks are:

Customer segments, Value Propositions, Channels, Customer relationships, Revenue streams, Key Resources, Key Activities, Key Partnerships, Cost structure.

Customer Segments are those group of people the organization aims to reach as their market, such as for PIXAIR, the customer segments are the **photographers, filmmakers, trainers, tourist agencies, hotels, companies for advertisements.**

It is important to take customers into consideration as they are the main group the organization focuses on to make profits and meet their needs.

Niche Market and diversified: The focus of this business model is on **niche market segment** such as **photographers, trainers and travel agencies**, In-order to tailor their diversified needs specifically, which are different from each other such as the **photographers for learning aerial photography** has different needs then **travel agencies** who required **aerial photography services** to promote their travel business by **creating destination image** of the main destination through photography.

Value Propositions: Are the bundle of product and services, or the main motivators for the customers to be loyal to the company and prevent them from switching to other competitor companies. And focus on providing unique and specific features to customers which are different from other companies offering the same services such as:

Newness: PIXAIR is the only institute in Portugal to provide such unique and **specialized training services** for aerial photography which are **more professional** than normal photography and **filmmaking course** and provides a unique feature and value to its trainers which other institutes do not.

Performance: providing training **with the latest aerial drones**, specialized with **better speed, resolutions, pixels, stability, angle of rotation, battery life and easy to setup**. As well as providing training with **improved simulators** to provide fool proof training and more command over the flying techniques.

Customization: Providing **customized services** to **trainers, or companies** depending on their need, such as **trainers** learning **aerial photography** at beginner level, or professional photographers learning aerial **photography** and **videography** for improved **career opportunities**, or **travel agencies** or **advertisement agencies** who are interested in getting a **service** provides customers opportunity to get **varied customized services** from one place according to their need.

Getting the job done: as mentioned above getting the job or services done for **advertisement companies, travel agencies, hotels or other businesses** allow them to rely on the product delivered, by not worrying about doing it and focusing on their chores.

Design: Focusing on teaching the trainers and providing the other businesses with **specific designs** of **photography and filmmaking** to provide a distinct feature to the service.

Price: Providing **affordable price range** in the form of **various packages** to trainers and companies enables customers from various sectors to avail the services.

Risk Reduction: Minimizing the **risk** allows customers or trainers to **join or avail** the services more freely, such as a **one-week trial option** for the course or else **refund** the fee, allows the risk-free participation of the trainers.

Accessibility: by making the services easily accessible to those who lacked the access before makes it more valued to the customers, such as providing **partial online courses** for those who have time restraints and providing them the opportunity to save time and learn as much as they can while attending only the practical classes for practice.

Convenience Usability:

By providing training for using drones that can **be operated** through **phones and tablets** saves money for investing in expensive remote controls and make it more accessible.

Channels: play a very important role in how as a company we communicate and deliver the value propositions to the customer segments such as the **trainers, photographers, travel agencies** and the **advertising agencies**, and they play a major role in creating awareness regarding the service as well as promoting it, helping customers to analyse the value proposition offered by PIXAIR, providing them the opportunity to get customized services such as **filmmaking services** for advertisement, or **drone pilot training** for aerial photography, and providing after purchase services as well.

The channels come in five different phases and are mainly distinguished between **direct** and **indirect channels**, the channel suitable for our Institute is direct channel as it is focused on

owned websites and **sales force** for direct link with the customers, to provide them with efficient customer services and maximize the profits.

Customer Relationships: Plays a vital role in building customer relationships with a specific segment and allows PIXAIR Institute to have various differentiated relationships with different customer segments. The focus of our institute will be on three main forms of customer relationships such as:

Personal Assistance: is where the **trainers** and other **business representatives** can communicate **directly** with the **administration staff** to resolve the issues or difficulties or get the specific information, they desire to get via **face to face communication** or **via emails** or **chat**.

Automated Services: the institute also believes in making a **specific login portal** for each candidate where they can have their **message history**, or **payments details** stored and makes it easy for the customer to have the **records** and **data**, or **time table** and **schedule** of the **program**, **payment deadlines**, and **holidays information**.

Co-creation: we also believe in making a **student portal** and **customer review section** on our **website**, where **the trainers** and other **companies** can give review regarding our services and training facilities and specialties and provide us with **feedback** on areas to improve or positive feedback to let others know regarding the **service offered**.

Revenue Streams: is very essential to enable the business to analyse what value can each customer segment pay? Or is the business making the most out of a customer and can be one-time payment from customer, or reoccurring revenues from ongoing services to customer segments. The method applicable for our Institute is the:

Usage Fee: the fee charged for the usage of the services, such as list prices for trainers who pay **fixed price** for specific number of courses of varied length until they get command in it, or **customer segment dependent** such as for the advertisement agencies or travel businesses who pay differently for different services of specific length and requirements to be done accordingly.

Key Resources: Are the most important building blocks for the business to be successful, as they enable the business to create and offer a **value proposition**, to reach **the target markets**, **to build stronger relations** with specific **customer segments** and **earn revenues** and can be

seen in various forms such as **intellectual, physical, financial** or **human**. The main key resources essential for PIXAIR are:

Human: resources play a major role in **knowledge-intensive** and **creative industries**, similarly the main key resource or asset for our Institute is also the **human power** to teach the specific and unique skills of **drone pilot training** and **aerial photography** which are most crucial for the training, which is not offered everywhere and is only **limited to personal experience** and **knowledge skills** that can be transferred to other by **training**, or by providing **services** to other business and deliver them the **desired product** required to boost their sales by utilizing **creative ideas** of the **instructors** for **photography or filming**.

Physical: assets also play a crucial role in our business model of PIXAIR institute to be successful, as it relies on **machinery** and **technical** equipment such as **drones, cameras, editing software, simulator for training, etc.**

<p>Key Activities: are the essential activities a company must use to function successfully and play a major role in creating and offering value proposition to customers, reach the markets, maintain good customer relationships and earn profits. The key activities essential for our business model for PIXAIR are:</p>
--

<p>Problem Solving: focuses on using knowledge management skills and continuous training to provide problem-solving facilities to customers and resolve their issues.</p>
--

<p>Network/Platform: Focuses on platform and network-related activities to resolve the issues of customers related to their personal platforms, or websites and focuses on improving platform management, service provisioning, and platform promotion.</p>

Key Partnerships: Also plays an essential role for the business models to be successful, by forming partnerships to reduce their risk, acquire resources and enhance their current business model, and the partnerships can be of different forms such as:

Strategic alliances between the non-competitor businesses.
--

Coopetition: that focus on strategic partnership between competitors.

Joint venture for developing new businesses.
--

Buyer-supplier partnership for secured continuous supplies.

The key partnership most appropriate for PIXAIR institute is **Buyer-supplier partnership** where there is continuous supply of **technical equipment** from **partner supplier to business** required for carrying the activities, such as **technical equipment, simulators, screens, high-resolution cameras, latest drones and quadcopters**, and other **technical material** required for the **repair** of the **drones**. Such partnerships enable the business to not focus on everything by sharing the resources and as a result reduce costs as well as maximize the allocation of resources and production.

Cost Structure: This last building block focuses on the sum of the costs that occurred or will occur while operating the business model of PIXAIR institute such as the purchase costs, maintaining the customer relationship costs as well as the other miscellaneous costs on the setup. The focus of PIXAIR institute business model cost structure would be a mixture of **cost-driven** and **value-driven**:

Cost driven structure: where the focus of the business step is to minimize costs wherever possible, on the **infrastructure of the building** set up, and **staff** as well as **equipment**, and providing **affordable prices** to **trainers**.

Value-driven however, the PIXAIR institute business model will also focus on value-driven model characteristics by implementing strategies such as **Premium Value Propositions** and **high-quality customized services** for the companies who are looking for high quality customized services such as **advertising agencies** and **travel companies**.

PIXAIR Institute can use both structures by incorporating strategies such as:

Fixed costs: costs that are fixed despite the services availed, such as **salaries, rent, bills, marketing costs**, etc.

Variable costs: which vary every month or semester depending on the **number of services provided**, or **trainers trained**.

Economies of Scope represents that the business model also favours costs, by using the same equipment for multiple operations, whether to train the trainers, photographers or for providing customized services to other businesses.

Figure 7 Represents business model and cost structure.

Key Partnership	Key Activities	Value Propositions	Customer Relationships	Customer Segments
Technical equipment. Simulators. High-resolution cameras. Technical material.	Personal platforms.	Specialized training services.	Face to face communication.	Photographers. Filmmakers. Travel agencies. Hotels. Trainers. Advertisements. Journalists.
	Service provisioning.	Advanced filming course.	Email/chat. Login portal.	
	Platform management.	Latest equipment.	History of payments.	
	Platform promotion.	Improved simulators.	Time table/schedule.	
	Knowledge management skills.	Customized services.	Customer feedback.	
	Key Resources	Affordable price packages. Partial online course. Trail option/refund. Safety regulations.	Channels	
	Knowledge skills.		Personal website.	
	Creative ideas.		Salesforce.	
	Aerial photography		Exhibition, Air Summit.	
Cost Structure (\$)		Revenue Streams		
Sales, rents, bills, marketing costs, salaries, setup costs.		Varied on customers' fee and depending on profits from customer segments.		

	Private services from advertisements, and tourism agencies.
--	---

Source: **Business Model Canvas** (Business Model Generation: p. 44).^{xlvi}

5.6.1 Business Model Pattern

Usually discusses the business models that share similar alignment of business building blocks, characteristics and similar behaviours with your business model, and provide inspiration to the company to build their model effectively, therefore in order to build a business model for Pixair institute we will also consider models with similar patterns for better understanding, there a few concepts on which the “**Business Model Patterns**” are based and main goal of using these business model patterns are to reinterpret the business concepts effectively in to “**Business Model Canvas**” described above.

A business model pattern is based on several concepts such as **Unbundling, the long tail, Multi-sided platforms, FREE and open business models**, which are often used in a business model canvas to compare them and recast them in a more standardized form to better design and re-invent a single business model composed of many different business model patterns.

Unbundled co-operation: focuses on three different types of business with different **economic, competitive and cultural imperative**, the pattern most suitable and closely linked is **customer relationship building**, that focus on creating differentiated services, of Aerial photography which is not provided by other companies which are of core importance for the business and satisfy the customers by gaining a larger share of market segment and retaining them with good service and healthy relationship.

The Focus of Pixair

<p>Economics: by entering early in market with varied and new service and products offered of aerial photography and videography services, which enables the company to charge premium price for its services and gain a larger share in target market.</p>
--

<p>Culture: it is easier to enter in market, low competition and barriers and survival is easy for small companies.</p>
--

<p>Competition: focuses on the talented team of workers and instructors.</p>

Considering the other business patterns such as **Unbundling the Mobile Telco**, we can see that the company shifted its focus from competing on networking quality to focus solely on building customer relationships and their brand. Considering the three important building blocks for business model canvas, such as Infrastructure Management, Product Innovation and Customer Relationships, all play important role in development and success of PIXAIR, Unbundling them will make it easy for company to focus on the main priority of providing differentiated product and service in market of aerial photography.

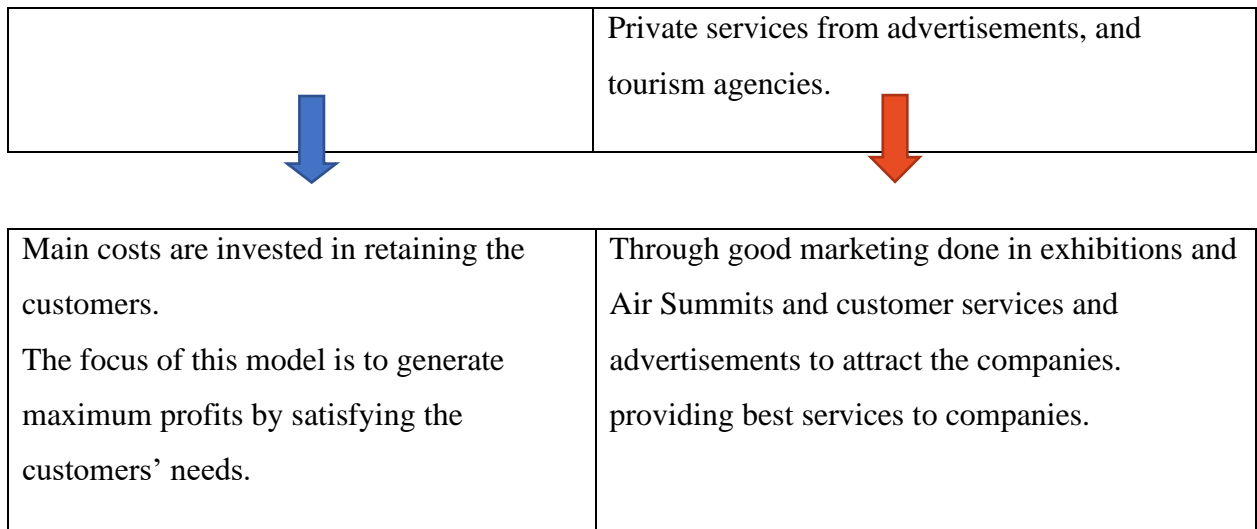
5.6.2 Unbundled Business Model Pattern

UNBUNDLED BUSINESS MODEL PATTERN
<p>Infrastructure management: can be distributed by renting and sharing the building with drone manufacturing company such as DJI'S for selling drones, as well as share the costs and bills, and do the related marketing for aerial photography from drones and their products, providing people the chance to buy drones as well as opportunity to get training courses available as well, also provide the trainers the opportunity to buy spare parts from shop, and aerial photographers to purchase equipment.</p>
<p>Customer relationship building: be the main key strategy for building stronger market share and customer segment in the market for product and services, by demonstrating high quality aerial images for building better destination image of Portugal, as well as attract many tourists and build strong relationship with customers, trainers and aerial photographers and gain their trust in market regarding your new differentiated services being offered, and retain those customers for future, to gain competitive advantage and greater profits.</p>
<p>Product Innovation: can be achieved successfully by considering the good reputable drone manufacturing companies and high-tech equipment manufacturing and supplying better quality and new innovative products at a faster speed for re-inventing more desired cameras with greater resolution, such as GO-PRO company that specializes in making high resolution cameras with less distortion and noise, more stability, lightweight, and easily manageable to work for creating more differentiated customer-friendly products suitable for drone trainers of all levels and aerial photographers.</p>

Figure: 8 Unbundled business model patterns for Pixair

5.6.3 UNBUNDLED BUSINESS MODEL PATTERN FOR PIXAIR

Infrastructure Management		Product Innovation	Customer Relationship Building	
Key Partnership	Key Activities	Value Propositions	Customer Relationships	Customer Segments
Technical equipment. Simulators. High-resolution cameras. Technical material.	Personal platforms. Service provisioning. Platform management. Platform promotion. Knowledge management skills.	Specialized training services. Advanced filming course. Latest equipment. Improved simulators. Customized services. Affordable price packages. Partial online course. Trail option/refund. Safety regulation.	Face to face communication. Email/chat. Login portal. History of payments. Timetable/schedule. Customer feedback.	Photographers. Filmmakers. Travel agencies. Hotels. Trainers. Advertisements.
	Key Resources		Channels	
	Knowledge skills. Creative ideas. Aerial photography		Personal website. Salesforce. Exhibition, Air Summit.	
Cost Structure (\$)		Revenue Streams		
Sales, rents, bills, marketing costs, salaries, setup costs.		Varied on customers' fee and depending on profits from customer segments.		



Source: (Business Model Generation: p. 64).^{xlvii} (“Unbundling the Corporation.” Harvard Business Review. Hagel, John, Singer, Marc. March–April 1999).

5.6.4 The Long Tail Business Pattern

Is also applicable, by focusing on selling the niche product such as drones and other equipment in larger number for market which sells relatively less, focusing on low inventory costs and providing platform such as PIXAIR, to interested buyers to buy equipment only or training as well.

5.6.5 The Design Method

Focuses on various design methods used worldwide to design an improved business model. The main aim of the designer is to think out of the window and generate new ideas as well as create value for users. To imagine new ideas that do not exist, and designing process is applicable in different forms such as designing organizations, strategies, business models, processes and projects and must consider other factors such as existing competitors, technology and legal environment.

To make our business design successful we need to have appropriate business tools, there are six business models tools such as **Customer Insights, Ideation, Visual thinking, Prototyping, Storytelling, and Scenarios.**

Considering the **Customer Insights** perspective for designing our business model for PIXAIR is very helpful, as it focuses on customer thinking regarding what they want or prefer to see in

a product and enable the managers to design or innovate a new product or service with greater opportunity and business skills, and allows PIXAIR to consider Customer perspectives for analysing the choice made for designing Value Proposition, Distribution Channels, Customer Relationships and Revenue Streams.

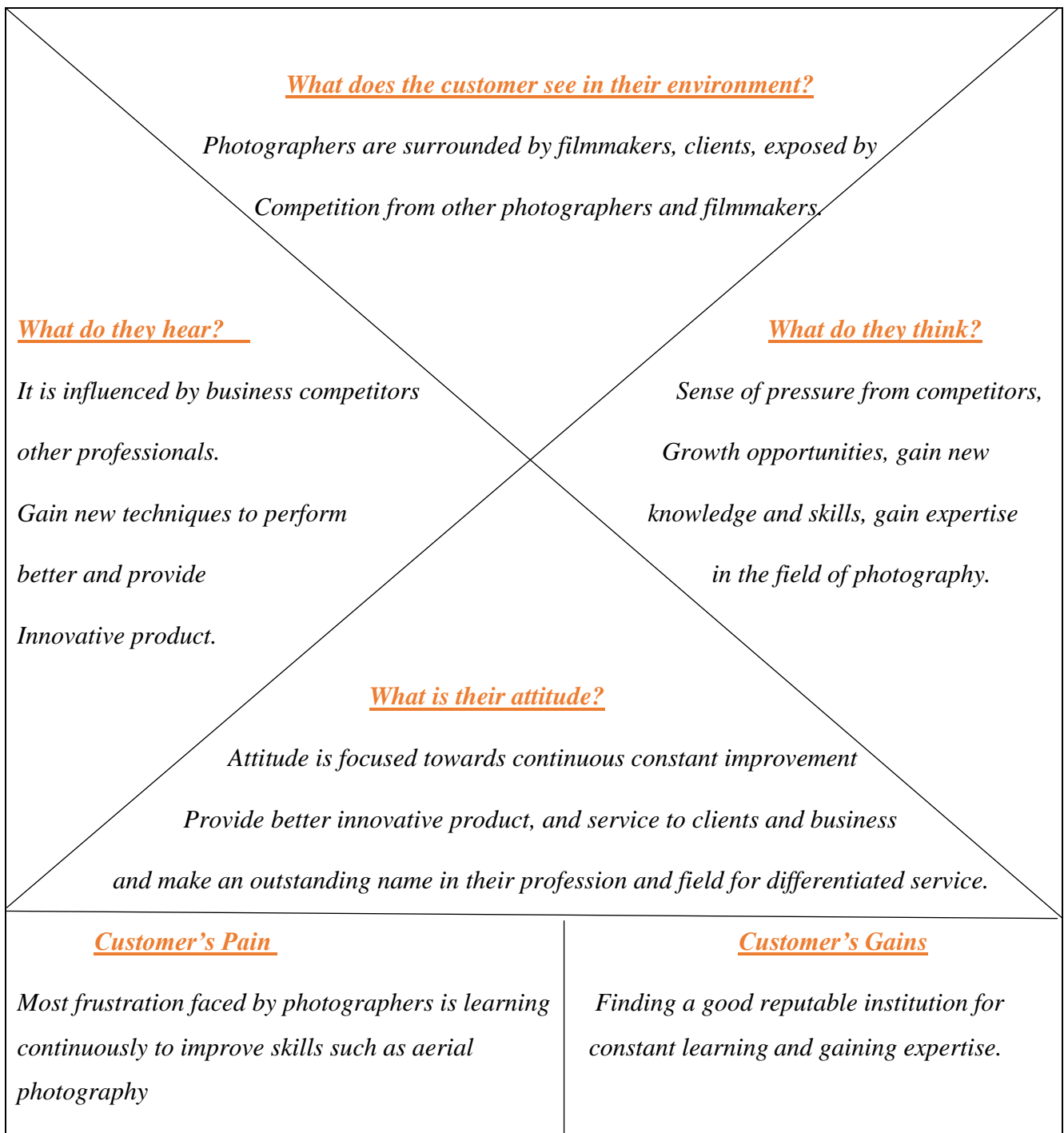
Which focuses on the existing customers as well as the new targeted customers for future by focusing on their unmet needs and demands for successful growth. As we unbundled the business pattern and shift our focus on building Customer Relationships.

Therefore, to focus on that we need to consider customer perspectives and insights for designing better services and gain better knowledge regarding their unmet needs and demands and what they expect to gain or see in the future.

5.6.6 The Empathy Map helps the designers to know more in detail regarding their selected customer segment other than demographic characteristics, such as knowledge regarding their aspirations, environment, behaviour, and concerns. And would enable PIXAIR to design better Value Propositions, know more about the customer and build stronger Customer Relationships for profitable business.

The customer segments mentioned above in business model canvas are Photographers, Trainers, Advertisers, Film Makers, Travel Agencies and Hotels.

Table 27 The Empathy Map Customer Segment Photographer.



Source (Business Model Generation, Alexander Osterwalder and Yves Pigneur: p. 131).^{xlviii}

Adapted from X Plane.

Table 28 Trainers/Pilots.

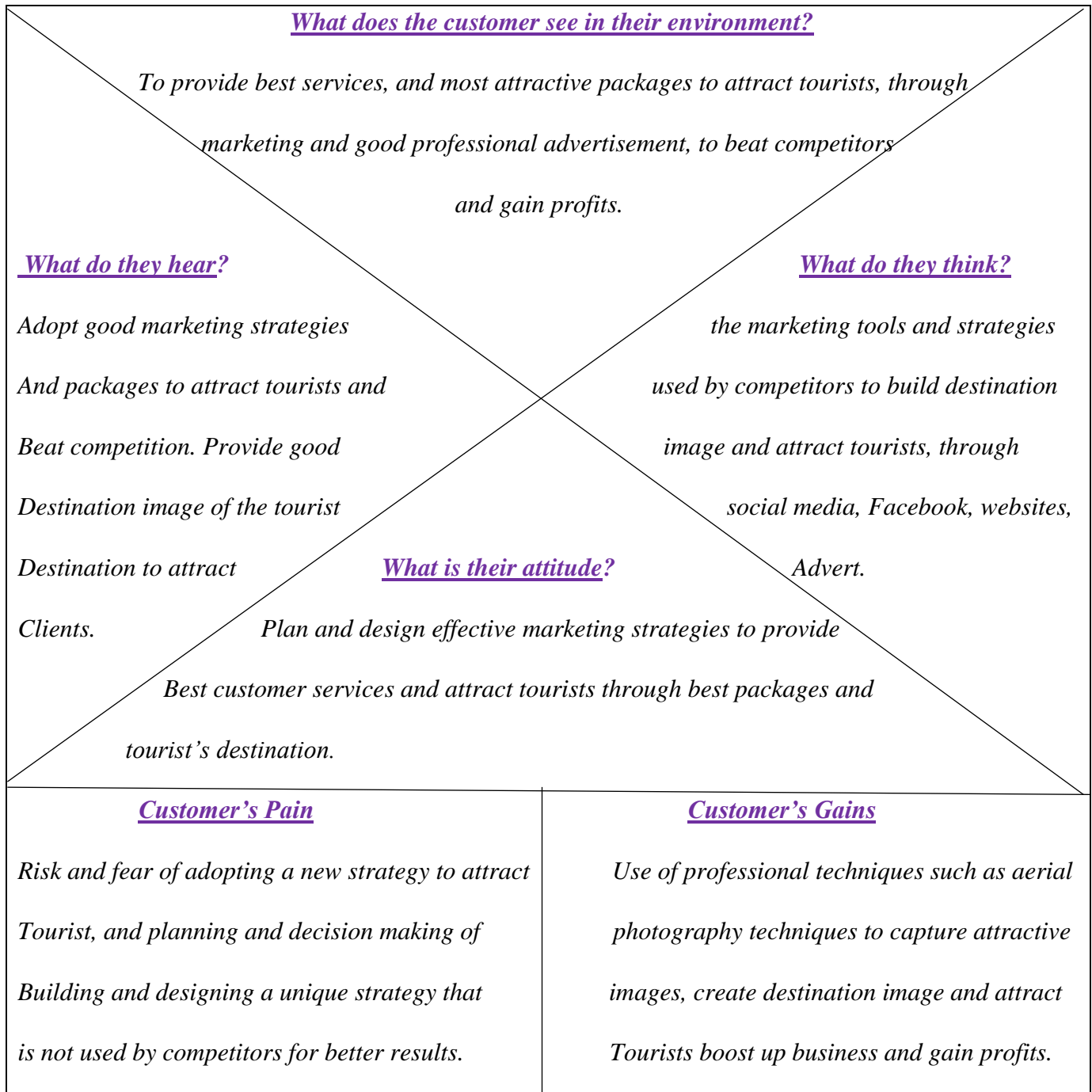
<p><u><i>What does the customer see in their environment?</i></u></p> <p><i>Trainers are individuals interested in learning drone UAV flying, whether at Beginner, intermediate or advanced level, to pursue a career or enhance professional skills or as a hobby.</i></p>	
<p><u><i>What do they hear?</i></u></p> <p><i>The reason they are influenced is due To increased demand for aerial flying New upcoming career opportunities and Advancements related to this field.</i></p>	<p><u><i>What do they think?</i></u></p> <p><i>The most important factor for trainer is to reach their goals, as hobby or professional skills, and through reputable Institute.</i></p>
<p><u><i>What is their attitude?</i></u></p> <p><i>Their focus is to learn the best skills from good Reputable institute at affordable prices and good packages, Offered by quality instructors and would prefer to get flexible learning Courses at various times throughout the year for completion.</i></p>	
<p><u><i>Customer's Pain</i></u></p> <p><i>The main fear of customers is to get the best services And professional experience for maximum learning. Friendly staff and flexible classes for busy schedules. Near to them for easy access, language of learning visa issues, environment, food and weather friendly.</i></p>	<p><u><i>Customer's Gains</i></u></p> <p><i>The main success factor for customer is to achieve and learn the desired flying skills, for the goal, whether photography, hobby film making, career opportunity from certified Institute at affordable cost.</i></p>

Source: (Business Model Generation, Alexander Osterwalder and Yves Pigneur: p. 131).^{xlix}

Adapted from X plane.

Since we are only going to consider only three customer segments for The Empathy Map, even though all other customer segments are of equal importance for PIXAIR, however for the third option we will select **Travel Agency**.

Table 29 Travel Agency.




Source (Business Model Generation, Alexander Osterwalder and Yves Pigneur: p. 131).¹


Adapted from X plane.

5.6.7 Ideation

Is another very appealing business model designing technique which we will consider while designing our model for designing more creative and innovative business model in order to create more value and gain more revenues from PIXAIR, meet the unsatisfied new or existing needs of customers which are our main focus, building and providing customer relations and meeting their needs.

Ideation can be applicable in two stages

Idea Generation  whereas many ideas as possible are generated.

Synthesis  where all provided ideas are discussed and best and most relevant are selected as options and can be suggestions or innovations to improve the revenues and overcome competitors.

Ideas can be generated through two methods “business model canvas” or “what if” questions.

To generate ideas as mentioned above we can take into consideration the **Business Model Canvas** designed above and starting point can be either **resource-driven, finance-driven, offer-driven or customer-driven.**

Our focus will be on **Customer Driven** as starting point because the main focus of PIXAIR, is to build and provide best customer relationships, meet their hidden or unfulfilled needs and wants by providing best services and training facilities in aerial photography and drone flying not provided by other institute and services to companies in best possible way to boost their business and promote tourism.

5.6.8 Customer-Driven for Pixair

Figure 9 Represents Business model focusing on best customer relationships building.

Key partnership	Key activities	Value Propositions	Customer Relationships	Customer Segments
Technical equipment. Simulators. High-resolution cameras. Technical material. Flight training.	Personal platforms. Service provisioning. Platform management. Platform promotion. Knowledge management skills.	Specialized training services. Advanced filming course. Latest equipment. Improved simulators. Customized services. Affordable price packages. Partial online course. Trail option/refund. Safety regulation.	Face to face communication. Email/chat. Login portal. History of payments. Timetable/schedule. Customer feedback.	Photographers. Filmmakers. Travel agencies. Hotels. Trainers. Advertisements. Journalists.
	Key resources Knowledge skills. Creative ideas. Aerial photography		Channels Personal website. Salesforce. Exhibition, Air Summit.	
Cost Structure Sales, rents, bills, marketing costs, salaries, setup costs.		Revenue Streams Varied on customers' fee and depending on profits from customer segments. Private services from advertisements, and tourism agencies.		

Source: (Business Model Generation, Alexander Osterwalder and Yves Pigneur: p. 139).^{li}

It can be further relied upon **Offer-Driven**, as well as if the company focuses on providing offers of services not existed before it could really have competitive edge over other business competitors, such as filming for an advertisement through aerial drone photography or

filmography, or filming for a hotel for surveillance or security purpose as well as providing the advertisement companies with adds within short period and schedule can provide a different angle and value.

5.6.9 Offer Driven for Pixair Figure 10 Represents business model focusing on services.

Key partnership	Key activities	Value Propositions	Customer Relationships	Customer Segments
Technical equipment. Simulators. High-resolution cameras. Technical material. Flight training.	Personal platforms. Service provisioning. Platform management. Platform promotion. Knowledge management skills.	Specialized training services. Advanced filming course. Latest equipment. Improved simulators. Customized services. Affordable price packages.	Face to face communication. Email/chat. Login portal. History of payments. Timetable/schedule. Customer feedback.	Photographers Filmmakers. Travel agencies. Hotels. Trainers. Advertisement. Journalists.
	Key resources	Partial online course.	Channels	
	Knowledge skills. Creative ideas. Aerial photography	Trail Option /refund. Safety regulation.	Personal website. Salesforce. Exhibitions, Air Summit.	
Cost Structure		Revenue Streams		
Sales, rents, bills, marketing costs, salaries, setup costs.		Varied on customers' fee and depending on profits from customer segments. Private services from advertisements, and tourism agencies.		

Source: (Business Model Generation, Alexander Osterwalder and Yves Pigneur: p. 138)^{lii}.

5.6.10 “WHAT IF”

Questions are useful in the ideation process by questioning the ability of the organization in a challenging way, whether it can perform well and consist of several steps:

Team Composition in-order to generate effective and creative ideas for the business model, it is essential to have a diverse team in terms of age, experience, talent and rank to have differentiated ideas and creativity, therefore for Pixair we focus on building an effective team with qualified, experienced staff.

Mr Waqas Tariq- (Instructor pilot)

Is a qualified drone pilot instructor with a degree of Masters in UAV engineering, as well as 6 years of professional experience in Instructor pilot in Dubai, Nigeria and Portugal, makes him the best and most suitable instructor for the institution.

Will be the head instructor responsible for providing training and lectures, theoretical and practical for drone flying and aerial photography as well as composing films and storytelling. The focus will be providing the training and will be theoretical as well as practical flying skills and capturing videos and photographs through simulators and then practically by drones.

Mrs Asma Sheikh – (Marketing and website maintenance)

Marketing plays a crucial role in understanding the changing needs of customers, what do they want and gain a knowledge of competitor as well, therefore Mrs Asma sheikh with a degree of Bachelors of Arts (HONORS) in business studies from UK, and four years of past experience in marketing and human resources is very suitable for understanding and building customer relations with trainers and business and build confidence as a new business.

Secondly website and student portal also play a vital role as this is the main form of communication between institute and trainers, or business for providing services or classes and gain an insight of them through their feedback.

Mr Pedro – (Photography, Videography and Editing)

Has extensive international experience in aerial photography and videography and is best known for adding story to the video, with excellent skills of composing a wonderful film by capturing excellent professional shots keeping in mind the warm and cool tones and finally tourists and customers are attracted by what they see, so it is in the hand of the photographer to form an image in the eye of the observer through the art of photography.

Mrs Sonia – (Content and Communication)

Is qualified BSc. (Honour) in business management, and is responsible for creating and maintaining all the necessary communication links with trainers and businesses required by PIXAIR, to establish and build a strong customer relationships, as well as responsible for updating websites and articles required for updating the businesses and trainers regarding the courses, packages and timings offered.

5.6.11 Steps for Designing a Final Business Model Plan for Pixair

Immersion: is an important step while designing a business model, such as getting enough information regarding the existing competitor business models for aerial photography or drone flying, extensive research regarding customer and trainer's needs, and companies priorities for services getting relevant information regarding the technology and equipment used for aerial photography and the skills required by flyers for professional photography.

Expanding: is where the whole team and staff focuses on generating as many effective ideas as possible, rather than criticizing and focusing on generating greater quantity of ideas.

Criteria Selection: is the stage where the management of PIXAIR, will shortlist the most relevant and creative ideas based on several important factors such as customer resistance, time for implementing, the costs required and revenue generated, and the possible competitive advantage the business can be benefited by implementing the ideas.

Prototyping is the stage where the team will shortlist the most relevant final ideas to a maximum of three and five and will apply using the business model canvas mentioned above sketch the ideas as a business model prototype.

Source: (Business Model Generation p. 142).

Chapter 6

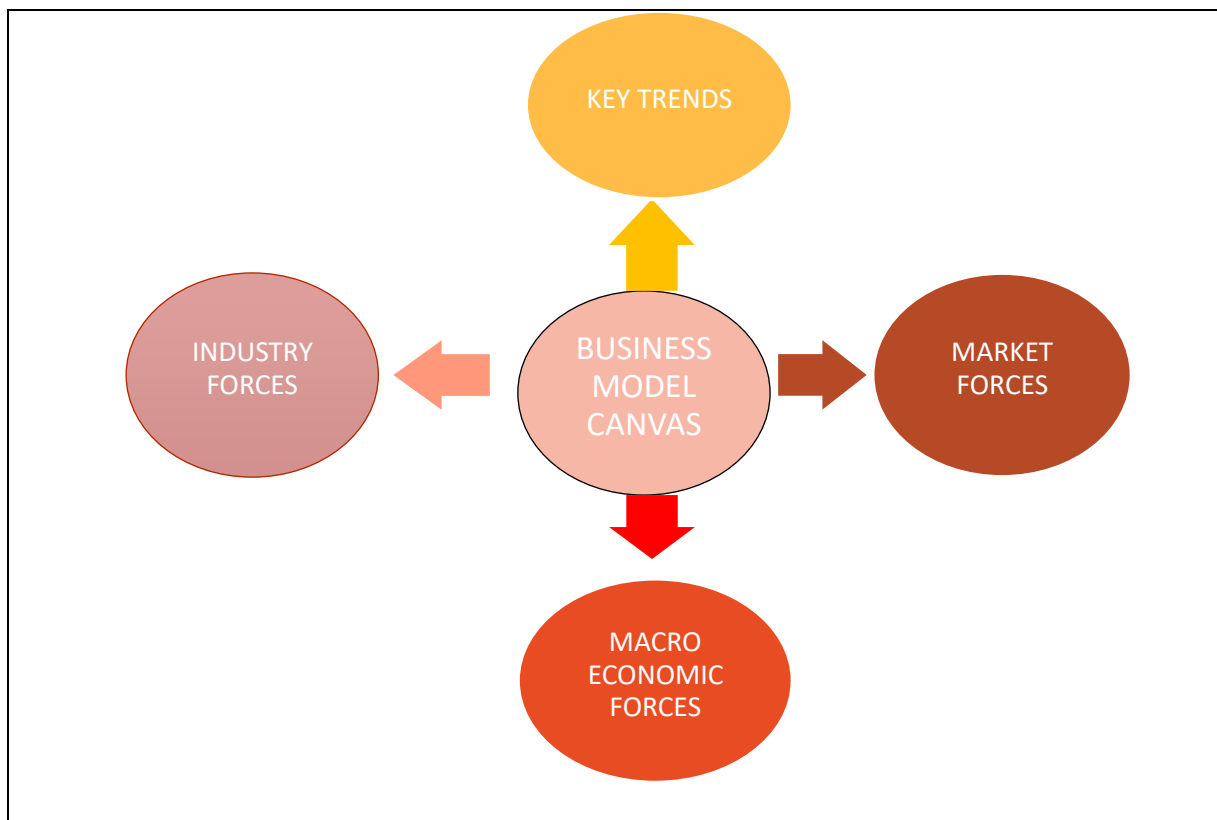
Strategy Planning

6.1 Understanding the External Environmental Forces

Once the designing process of business model plan is completed the final stage is to adopt an effective strategy to execute it, as the last step enables new businesses such as Pixair, to examine the already existing businesses in this field if any and evaluate the existing environment of the business in which Pixair will function, because for a successful business it is very important to get a detailed insight of the environment as well as knowledge regarding the competition and market trends.

Figure 11

The Environmental Forces



Source (Business Model Generation: p. 201).^{liii}

Figure 11 represents the existing external forces to be faced by the business model canvas designed for the business in the form competitors, the economic conditions, the emerging and changing new technology trends and market needs of customers needs and demands unfulfilled.

Industry Forces: can be competitors such as other institute giving training for Aerial photography, Stakeholders such as Customers, Employees, Public, New entrants in the same field, Suppliers with minimal charges and time and substitute products that are better performing and cost friendly.

Macro Economics Forces: can be the economic conditions of Portugal whether it favours PIXAIR, commodities, prices for resources required, current capital conditions and the global market conditions for running the business smoothly.

Market Forces: Customers' needs and desires, market needs in terms of PIXAIR business, market segments, revenue attractiveness, market issues for starting a business in this field.

Key Trends: new emerging technology trends are we providing the latest equipment? The socio-cultural trends: are there an increasing trend of people towards this business? Regulatory trends and socio-economic trend: are they budget-friendly? Does it fit for mass-market or niche market?

6.1.1 Competitor Analysis: Is a tool used by all businesses but especially is of great importance for start-up businesses, as it enables them to understand their competitors' strengths and weaknesses and make them aware of the marketplace. Makes you prepare effectively to compete with your competitors, would provide a clear picture of competitive advantages and disadvantages, an understanding of competitor's strategies, to form effective strategies to gain competitive advantage and the returns the company will make in future.

Below we are going to look at top UAV schools in terms of courses, fee, staff, location and the top drone manufacturing companies in terms of equipment, prices, market share and services and the information gathered is through secondary data published on websites and social media, annual reports and articles.

Once the strategies have been designed effectively it is important to have a detailed market analysis regarding the competitors of PIXAIR, in-terms of drone training institutes and drone manufacturing companies to make sure our institute provides courses of same style and at much reasonable rate compared to its competitors, use equipment better than the competitors for better results.

Table 30 Represents the Competitor Analysis of Top 8 Drone Institutes of the world.

6.1.12 Competitor Analysis of Drone Institutes.

Drone UAV Training school/Academy.	Courses Online/On-site.	Fees (\$. €) Including tax.	Staff Qualification/number	Students Total number.	Website
1)Barcelona Drone Centre Spain.	Remote sensing, Drone pilot training. Customized training. 50 hours of online content + 40 hours of in-person classes.	€1350 + VAT. € 50 + VAT for quadcopter. € 250 + VAT for multi-copter. € 200 + VAT for Winged UAV.	Ultralight & Drone Pilots, Aeronautical engineer, Aerospace engineer.	600 + students from across the world. 70 + nationalities.	https://www.barcelonadronecenter.com/drone-pilot-course/
2)DJI UTC Space 53 Campus, Netherlands	Aerial photography full version.	€2150 Aerial photography full edition for 4 days course.	150 + Global training centres.	25,000 + trained UAS professional	https://www.uastc.com/nl/utc_strengths/
DFC Campus, the Netherlands	Aerial photography filmmaking edition. Industrial inspection.	€2150 for aerial photography filmmaking. €6450 for industrial inspection 10 days.	700+ professional training instructors.		

3) Dart Drones Salt Lake City, Utah, U.S.A.	In-person courses, Basic Flight Training, and Flight 107 test prep. Aerial Photography.	Aerial Mapping & Modelling with drone deploy workshop \$1,490.00 Aerial roof inspection workshop \$1,490.00/Aerial photography online is \$100 for 6 months.	45+ flight instructors. 40+ cities nationwide. 11,000+ UAS instruction hours.	10,500+ pilots trained.	https://www.dartdrones.com/custom-on-site-uav-training-for-organizations/
	Pilot Hub, Consulting, AUVSI trusted operator program.	Basic drone flight training \$580. Flight test prep			
	Onsite/online custom training.	Online \$250. In-person + online \$670.			
	Drones for beginners.	Drone for beginners \$20.			
	Night operations.	Night operations \$299.			
	Disaster response.	Disaster Response \$299.			

	How to set up drone business.	How to setup drone business \$300.			
4)Drone Pilot Ground School United States of America.	Hands-on Drone Training.	1 student 90 minute \$199.	Drone Pilots.	17,500+ trained pilots.	https://uavcoach.com/
	FAA certified drone pilot course and Part 107 online Test prep.	2 students 2 hours \$ 350. 3 students 2.5 hours \$450. 4 students 3 hours \$550. 5+ students custom 4-8 hour. \$ 299. Additional \$107 for industry-leading Part 107 online test prep.			
5)Embry-Riddle Aeronautical university Prescott A.Z campus, U.S.A.	Bachelor of Science in Unmanned Aircraft Systems,	Undergraduate \$36,858 + Room and Board \$11,718= \$48,576.	Drone Pilots, Aeronautical engineer.		http://erau.edu/degrees/bachelor/unmanned-aircraft-systems https://erau.edu/deg

At Worldwide & Online Campus. At worldwide & Online Campus.	Bachelor of Science in Unmanned Systems Applications.	\$ 28,002 tuition fee + \$1400 books=\$29,402.			rees/bachelor/unmannedsystems-applications
	Master of Science in Unmanned systems.				https://erau.edu/degrees/master/unmanned-systems
6)Kent State University U.S.A.	Unmanned Aircraft systems Minor.	Undergraduate Ohio resident \$10,012 + \$11,362 room & board.	Certified flight Instructors	38,000+ students in 8 campuses.	https://www.kent.edu/facts-figures/faculty-expertise
		Non-Ohio resident fee is \$18,714 + \$11,362 room & board.	More than 27,000 fulltime and part time faculty from 6 continents.		
7)Commercial drone training U.K.	PFCO ground school & theory test, flight test, practical experience, operations manual	£1250 including VAT. Full residential course 5 nights £1479. £1450 for 4 nights.	Certified Drone pilots and Engineer.	Lecture theatre with a maximum capacity of 40 students.	http://commercialdronetraining.co.uk/

	completion workshop including Drone deploy, Aerial survey, Litchi, 360 Pano, Video editing.	<p>£1425 for 5 nights no food.</p> <p>£1399 for 4 nights no food.</p> <p>£1274 for 5 nights double room.</p> <p>£1250 for 5 nights single room.</p> <p>PFCO application fee is £247.</p>			
8)The Aerial Academy U.K.	Full certification course required by CAA for commercial drone pilot.	<p>Flight training £400 + VAT for full-day training.</p> <p>£225 + VAT for half-day training.</p>	Experienced drone pilots and operators.	Maximum of 5-6 places per class.	https://drone.training.co.uk/
		<p>PFCO course 2-day Ground training and operational flight assessment are £1140 including VAT.</p> <p>Standard flight Assessment costs £300 + VAT.</p> <p>£253 for CAA application initial cost and £190</p>			

		renewal fee annually.			
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Source: Competitor Analysis.^{liv}

Table 31 Represents the top 4 drone manufacturing companies in the world.

6.1.13 Competitor Analysis for Drone Manufacturing Companies.

Drone Manufacturing company.	Product specific ation, model.	Prices (\$, €).	Description.	Customer Reviews.	Website.
DJI headquartered and based in Shenzhen China, has now offices in United States, Hongkong Germany, Netherlands, Japan, South Korea, Beijing and Shanghai.	DJI Phantom 4 pro.	\$1699.0	Includes 1-inch 20MP Exmor R CMOS sensor, longer flight time of 30 minutes, smarter features.	Easy to fly, raw videos/photos for good post-production colour correction. Bugs, camera not so professional not good battery life and specs.	https://airdronecraze.com/drone-manufacturers/ https://store.dji.com/shop/mavic-series?from=menu-icon&mavic-filterable-product-section-823=mavic-pro https://www.dji.com/pt/company
	DJI Mavic Pro.	\$999.0	Best portable drone, with increased endurance and quiet flight, control range 7 km, flight time 30 mins, gimbal 3-Axis, camera resolution 12 MP, videos 4k.	Great price for features and beginners and non-professional use, no	https://store.dji.com/product/mavic-pro-platinum

	DJI Spark.	\$499.0	Is a mini drone, best for beginners, 16-min battery, speed 50km/hour, 2-Axis Gimbal, pixels 12 MP.	warranty for product. Gimbal motor overload issue.	https://store.dji.com/product/spark?vid=24641
	Mavic Air Drone.	\$849.0	21-minute flight time, 32 MP Sphere Panoramas, 3-directional environmental sensing, 3-Axis Gimbal & 4k video, foldable.	Great battery life, picture results, storage & portable.	https://store.dji.com/product/mavic-air?vid=38961
	Mavic 2 Pro.	\$1499.0	31 minutes of flight time. 4k videos, obstacle sensing.	Amazing camera and low-light capabilities, controllable aperture.	https://store.dji.com/product/mavic-2?vid=45291
	Mavic 2 Zoom.	\$1249.0	Has the same functions but 2x optical zoom.	Extended time for battery life, 10-bit HDR video, 20 MP CMOS sensor, 10-bit Dlog-M color profile.	https://store.dji.com/product/mavic-2?vid=45291

				12 MP CMOS sensor, 48 MP resolution photo, 4x lossless zoom FHD video, Dolly zoom.	
<p>Yuneec Electric Aviation is a known leader in electric aviation with headquarters based in Kunshan, Jiangsu, China. And offices in North America, Europe, Asia.</p>	<p>Typhoon H plus</p>	<p>€1,899.0</p>	<p>Hexacopter with new flight controller and PX4, C-23 one-inch sensor camera, 20 megapixel, 4k videos, 40% reduction in noise, ST165 Ground station receiver, 7-inch integrated screen for full view, 2x battery.</p>	<p>Extended ISO range, 3-axis gimbal with rotation 360° image capture.</p>	<p>https://shop.yuneec.com/eu/camera-drones/typhoon-h-plus-with-intel-realsense-and-backpack-uk-version/</p>
	<p>Yuneec Typhoon 4k</p>	<p>€449.0</p>	<p>Android touch screen controller, 4k videos, captures 1080p/120fps slow-motion pictures, ST10+ transmitter, 5.5+ inch touchscreen.</p>	<p>CGO3 camera, shoots 4k videos, photos 12 megapixels, operating temperature - 5°C – 50 °C.</p>	<p>https://shop.yuneec.com/eu/camera-drones/typhoon-4k/refurbished-typhoon-4k-eu-version/</p>

	Mantis-Q	€499.0	Foldable and convenient travel drone, voice control, visual control, flight time 33 minutes.	4k video resolution, 1080p image stabilization, speed 72 km/h, GPS indoor positioning, PX4 based flight controller.	https://shop.yuneec.com/eu/camera-drones/mantis-q/mantis-q/
	Yuneec Breeze & controller	€179.0	Small portable, can be flown indoors and outdoors, suitable for beginners, 4k video and 12 MP photo, flight mode, pilot selfie.	Flight time 12-minute flight time, operating temperature 0°C-40°C, 13 megapixels, blue tooth.	https://shop.yuneec.com/eu/camera-drones/breeze-4k/breeze-4k-controller-free-felt-bag/?c=6
Go-Pro	Karma drone plus Hero 6 camera.	€629.99	Easily foldable, stabilizer records, touch display, pre-flight training equipment and flight simulator, Go-pro passenger app allows a friend to watch your videos and control your flight, equipment easily replaced.	Good quality, lack of waterproof body for filming, GPS system needs more development in-case of loose no recovery.	https://pt.shop.gopro.com/EMEA/accessories-2/karma-with-hero6-black/QKWXX-601-EU.html

Parrot	Anafi thermal	\$1900 including VAT.	Lightweight 315 grams, foldable design, 2 cameras Thermal FLIR®, and 4K HDR 21 MP Sony sensor, 3-Axis rotation, total flight time 78 minutes.	https://www.parrot.com/us/drones/parrot-bebop-2
	Bebop 2 drone, Sky controller and cockpit glasses.	\$599.99	Lightweight of 500grams, total flight time of 25 minutes, high-performance specs for brilliant photography and filming indoors and outdoors.	https://www.parrot.com/us/drones

Source: Competitor Analysis.^{lv}

6.1.2 Focus Group Discussion

Is additional methodology considered for Pixair Institute to gain a better insight regarding this business model, as it is used occasionally as qualitative approach to gain an insight of people regarding their thoughts and opinions, and therefore this method focuses on obtaining data from certain suitable individuals with required knowledge in that field rather than randomly selected sample from mass population.

Focus group is a collective group interview from three or more people regarding the research topic (Hannam & Knox, 2010). Usually focus groups are less effective compared to individual interviews, therefore my research is a combination of individual interview and focus group interview. According to (Smith, 2017 p. 144), focus group also have distinctive characteristics such as:

It generates relevant information regarding the research topic.
The research decides and create the group for research.
The researcher is responsible for the interpretation of the data collected from interview.

Focus group research is also seen as “cost-effective” and “promising alternative” in research (Morgan, 1997), allowing researchers to participate and provide various views (Guba or Lincoln, 1994, 1992). Focus group approach has been used since 1926, (Merton, 1987) till currently have been used effectively by many organizations to get an insight about their product and help them obtain an in-depth knowledge regarding the relative attitudes, perceptions, beliefs and opinions of peoples regarding specific issue or research (Dilorio et al., 1994; Greenbaum,1988; then 1996).

The focus group approach is a blend of group process theory and qualitative research (Dilorio, Hocken-berry-Eaton, Maiback, & Rivero, 1994; Morgan & Krueger, 1993; then 2000).

Focus group discussion can be conducted in any form such as interviews, mainly semi-structured such as “one to one” or “group interviews” (Parker & Tritter, 1995, 2000, 2006), and enable to gain a better insight of people’s perceptions and values (Hargreaves, 1967; Lacey, 1970; Mac an Ghail, 1994; Sewell, 1997; Skeggs, 1997).

6.1.3 A Focus Group Discussion is Based on Four Major Steps

Research design, Data Collection, Analysis and Reporting of results (Morgan et al., 1998).

Research Design: is based on collecting data qualitatively from people, through semi-structured questionnaires, as it has advantages of both structured and unstructured interviews, it has open, informal questions and includes opinions from both researcher and the interviewee, and requires a moderator guide to provide a clear outline of what is needed to be achieved from the interview beginning to the end (Vaughan et al., 1996).

The moderator guide includes engagement questions, exploration questions, and exit questions, usually from the drone pilots (Internal & External) and drone manufacturers who can provide insight regarding this field, how it has progressed so far? And What are the prospects of this profession? How people and young generation are showing interest in this new emerging field?

As it is believed, Participants observations are different from interview. In an interview the interviewee can express their views and concerns regarding the research topic, which cannot be obtained from an observation (Hansen, 2014). In previous section for destination image we focused on observation, whereas in the latter half of research we prefer interviews, because there is a link between a life, which is lived and the life which is expressed in words (Thomson,

et al., 2002). As a researcher it is important to get a detailed insight and knowledge regarding the interviewee's experience and perspectives regarding the research topic (Kvale, 2007).

The Data Collection: was done in the form of semi-structured questionnaires conducted through email, Air summit and Exhibition to get an insight from UAV pilots and drone manufacturers, regarding their perspective for UAV training Institute, the products preferred, improvements to be made, the future of UAV industry. How it has evolved from the past in recent years? The questionnaires conducted can be reviewed in **Appendix.2** at the end of the business plan.

Analysis: Is based on data collected from external environment such as competitors, interpreted from the response of drone pilots towards drone flying and scope of it as a career or business in future. The swot analysis to be conducted to determine the internal environment of Pixair and to determine and plan effective strategies necessary to achieve the business objectives. Play an essential role in determining Pixair work plan and milestones, and financial projections required to analyse the viability of the business plan for the upcoming years.

Reporting of Results: Be the final step of the research to reach a conclusion.

6.1.4 Competitor and External Market Analysis Outcome

According to the competitor and market analysis conducted to determine the external environment, data collected from questionnaires from drone pilots and manufacturers we can see there is a positive relationship between customers and trainer's response for UAV training Institutes. Between DJI drones as product and UAV pilots' preferences, drone manufacturers and service providers preference for the products of DJI in terms of its quality, cost and user-friendly option.

However, to analyse and determine the market conditions for Pixair, it is important to evaluate the internal environment for business such as Swot analysis, for determining the effective strategies.

6.2 The SWOT Analysis

Swot analysis is done within an organization to determine its strengths and weaknesses, threats and opportunities, and design effective strategies to enhance its strengths in order to take advantage of the possible opportunities and encounter the threats in-order to overcome the weaknesses (Neil Retson, Strategic management; 2008).

Swot analysis of PIXAIR, would enable us to determine our company's internal environment as well as the external environment of competitors in an effective way, and evaluate various alternatives suitable for planning and achieving the major goals in the future.

Figure 12 Swot Analysis of external and internal environment of Pixair.

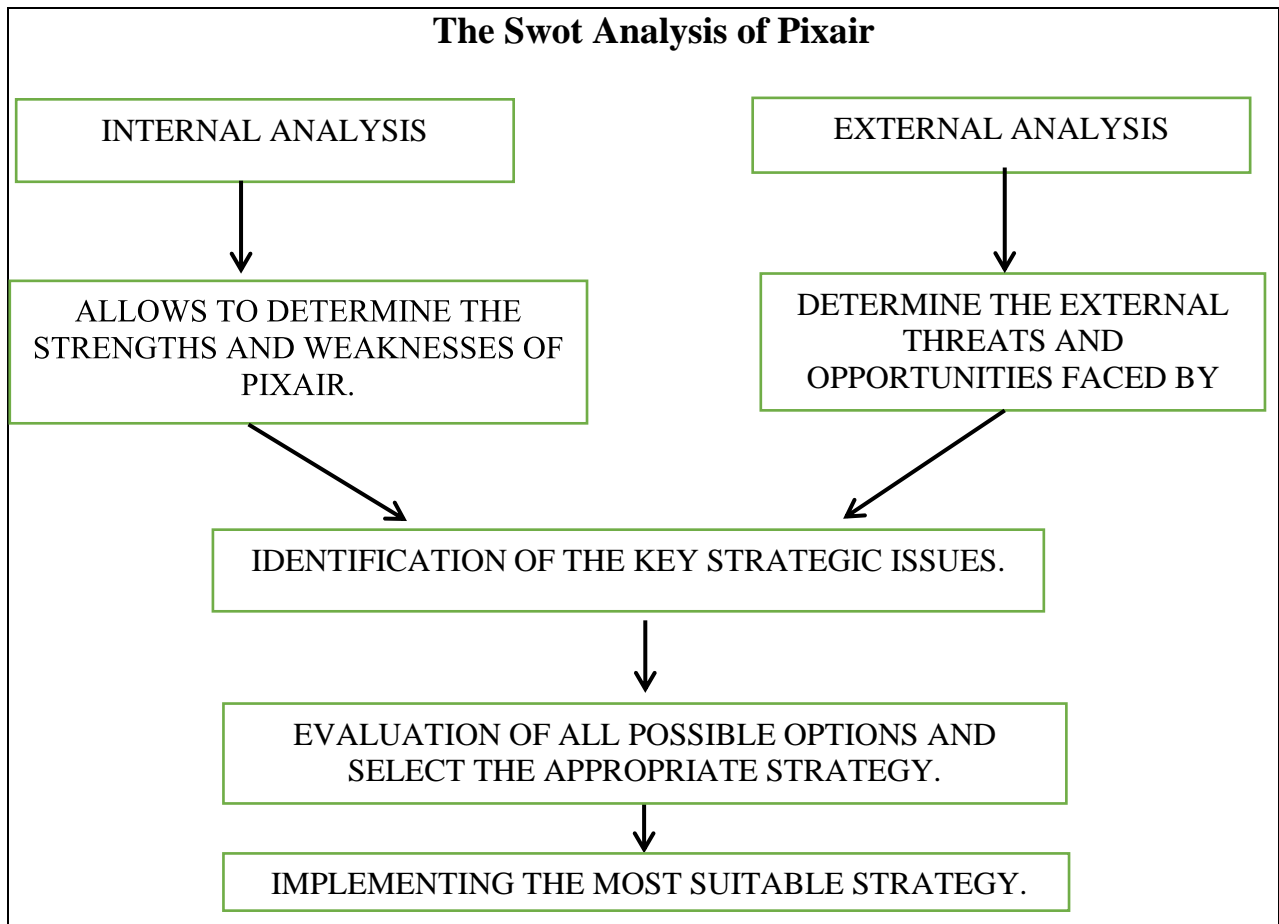
Strengths	Weaknesses
<p>Its cost-effective, one-time investment of equipment and can be used for a very long time effectively.</p> <p>Ability to be flown remotely by a pilot, or autonomously by autopilot, it is safe and does not risk the life of pilot or trainer.</p> <p>Environmentally friendly.</p> <p>Is easily deployable with minimal accessories, able to capture images of higher precision areas easily and more accurately.</p> <p>PIXAIR, being the first UAV pilot training institute in Portugal provides insulation from strong competitive pressures.</p> <p>Superior technological skills.</p> <p>Low marketing costs due to effective strategies.</p> <p>Good climate, gastronomy, and culture makes Lisbon an attractive place for studying.</p>	<p>Weak market Image due to lack of marketing.</p> <p>Narrow Product line due to fewer companies producing UAV'S, and availability.</p> <p>Legislation and security issues for flying zones due to public safety.</p> <p>Lack of public knowledge and interest in this emerging field compared to other professions.</p> <p>Visa issue related problems for international students.</p> <p>Language barrier for international students.</p> <p>Missing a few key skills due to constant evolution.</p> <p>Involves risk in case of crash causes damage to equipment and loss of funds for repair.</p> <p>Lack of management skills and infrastructure.</p>

<p>Effective customer relationship building strategies.</p> <p>Affordable course fees and living expenditure compared to other institutes around the world.</p> <p>Effective and well-experienced team.</p> <p>Private services to other companies apart from UAV pilot training courses provide greater revenues.</p>	
<p>Opportunities</p>	<p>Threats</p>
<p>Great opportunity in the future to expand the UAV training to other fields and market segments such as aerial mapping, security, surveillance, agriculture and real estate and military.</p> <p>Expand the company into a broader product line such as UAV manufacturing and repair.</p> <p>Expand the company to attract foreign market by opening more PIXAIR branches in other European countries.</p> <p>Ability to grow and expand the business vastly due to increased market demand.</p> <p>Strategically competing the rival firms.</p>	<p>From the entry of low-cost foreign competitors such as China in Drone manufacturing and equipment.</p> <p>Rise in trend of low-cost substitute products such as low-cost lower quality drones.</p> <p>Sudden shift in foreign exchange and trade policies of foreign government can affect the profits adversely.</p> <p>Slow growth in the market due to increased competitors such as DJI drone pilot training school in Netherland.</p> <p>Change in customer needs and interests.</p> <p>Costly legislation and regulatory requirements.</p> <p>Low buying power of customers due to economic crisis.</p>

Source (Business Model Generation: p. 216).

6.3 Swot Analysis of Pixair

Figure 13 Focusing on Internal and External Analysis of Pixair.



Source (Business Model Generation: p. 216).

6.4 Differentiated Strategy Planning

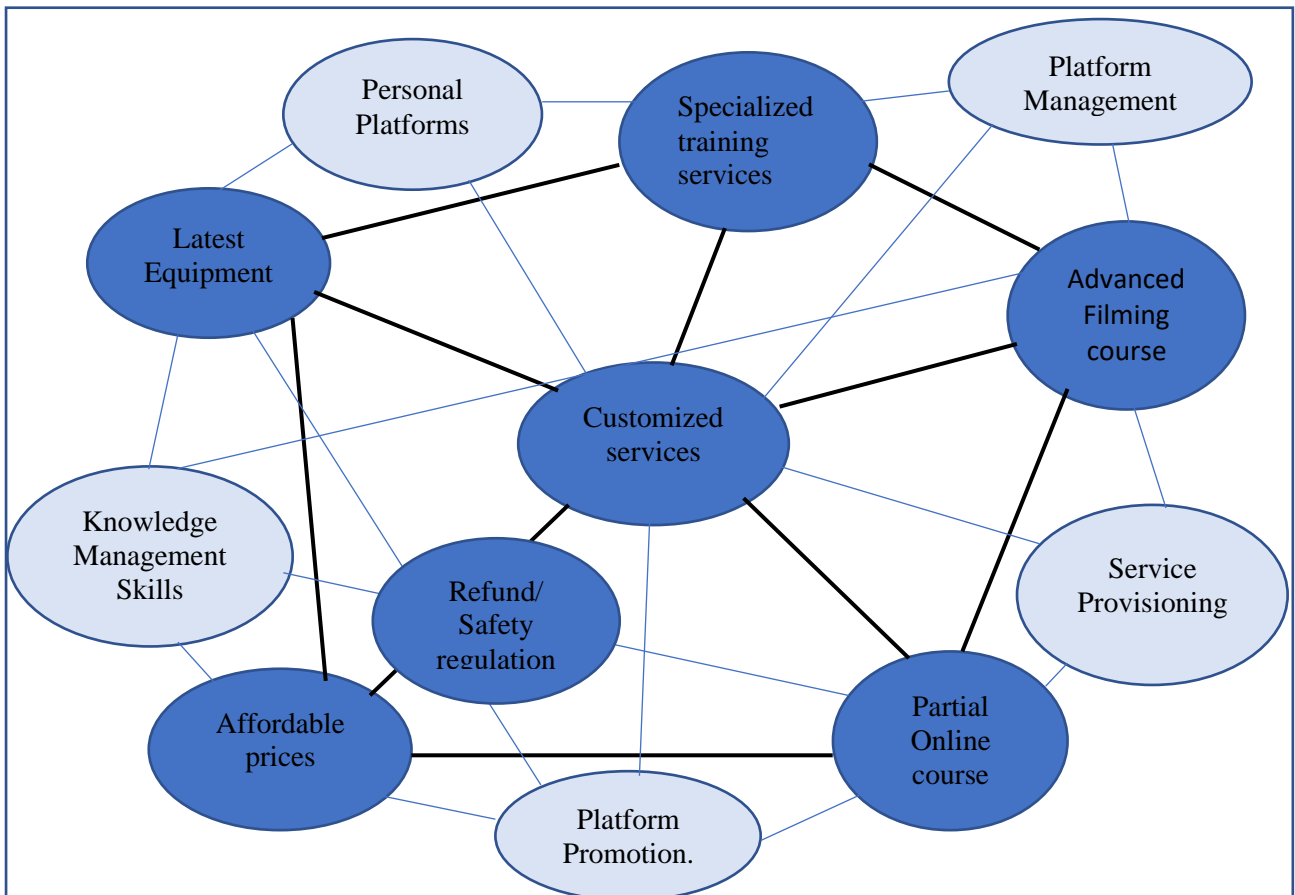
Based on the external environment analysis and internal environment, considering the Business Model Canvas once a strategy is designed effectively, in order to know it fits strategically we need to use a Strategic Fit, concept introduced by Michael Porter, and is usually created using **Activity System Map (ASM)**.

Which are usually analysed by **Blue Ocean Strategy** proposed by (Chan Kim and Renée Mauborgne, 2005), focuses on making the competition irrelevant, and focuses on understanding the main key attributes of consumer or buyer's behaviour, understanding the competitive market and design efficient strategies for providing and fulfilling the unfilled demands of consumers. Hence Activity system Map focuses on Strategic themes produced by Blue ocean strategy and Value Propositions from Business Model Canvas represented by Dark

blue circles and the Key Activities represented by light blue circles to **create strategic differentiation**, making it hard for competitors to copy them.

6.4.1 Activity System Map

Figure 14 Formation of Strategic Differentiation to overcome competition.



Source: Activity System Map Michael E. Porter, “What is Strategy?”, Harvard Business Review, November-December 1996.^{lvi}

Once the Activity System Map is designed effectively, the management of Pixair should design and implement the effective strategies that are differentiated and cannot be easily copied by the competitors, for the successful running of the business.

6.5 Implementation Strategies

Implementing Strategy should focus on enhancing the strengths mentioned above to utilize the opportunities and overcome the weakness by encountering the threats.

- 1) Since its cost-friendly, and requires a one-time initial investment, it can be later used for providing training and services in other UAV related fields such as Surveillance, security, farming, agriculture, aerial mapping, real estate, and military.
- 2) Use its well-experienced team and superior technical skills to expand the UAV pilot training business to UAV manufacturing and repair business as well.
- 3) Affordable course fee and effective customer relationship building strategies provides an easy pass to open more branches of PIXAIR, in other European countries in the future.
- 4) Private aerial photography services to other companies enable us to generate greater revenue and would enable PIXAIR to grow rapidly in the market due to more demand.
- 5) Low marketing cost, course fee, technological skills, experienced staff, and effective strategies enables PIXAIR, to strategically compete with other competitors in the market.
- 6) Increase customer awareness for their change in needs and wants would enable the company to fulfil the missing key skills due to constant evolution.
- 7) Take advantage of low-cost substitute products from china to widen the narrow product line offered by few known companies.
- 8) The rise in trend of low-cost lower quality substitute products would also lower the risk of loss in case of damage or crash of drone.
- 9) Slow growth in the market due to increased competition point towards gearing up the weak marketing strategies to build a stronger image in the market as a reputable Institute, and work on building stronger management skills and infrastructure.
- 10) Costly regulatory requirements for safe flying zones can be solved by certifying the company and hire certified pilots to lower the risk of public safety.

Source (Business Model Generation: p.224).

Once the effective strategies are designed and evaluated to achieve business goals, the next step is to effectively design a work plan and the milestones estimated to achieve these goals and the financial returns we can expect from our business plan.

Chapter 7

Process Method

7.1 Business Model Design Process

The business model design process has five phases, Mobilize, Understand, Design, Implement and Manage.

Figure 15 Steps in Formation of Actual Business Model of Pixair.

Mobilize	Understand	Design	Implement	Manage
Preparing for successful business model design.	Research and analyse the elements required for successful model.	Generate the viable business model options and select the best one.	The business model prototype.	Adapt and modify the business model plan according to market reaction.
Canvas Model.	Swot Analysis and Competitor Analysis.	Patterns, Empathy Map into successful company's business models.	Design Effective Workplan in response to market response.	Implementing the actual business plan, specifying milestones, organizing legal structures and preparing budget and financial projections.
Preparing a successful business model design based on motivation and business objectives.	The collection of relevant information based on customers, technology and institutes from competitors, experts, trainers and pilots.	Transform the idea and design of most suitable business model into functional workplan.	Implement the selected business model into workplan.	Adapt and modify the business model according to market reaction.

Source: (Business Model Generation: p.249).

7.1.1 Workplan

According to the competitor analysis and market analysis outcome, we can determine a suitable work plan for Pixair in terms of its cost structure, course availability, the equipment used, the staff, and mode of communication with the customers.

Considering the most suitable drone manufacturers to work with Pixair as partners in terms of their product cost, product specifications and final results, we can plan the most economical and cost effective fee structure, competitive course structure which includes all the necessary courses and exams required for effective learning, and invest in the best reputable equipment for overcoming the external competitor forces and threats discussed above, to communicate more efficiently with customers as well as minimise the investment costs, and maximize the profits. Considering the top best UAV training schools in the world and UAV manufacturers in terms of product specification, quality and price, we have designed a course that contains all the necessary elements and modules required for a training a drone pilot, or capturing aerial images, industrial inspections or preparing for flight 107 test for certified UAV pilot, as well as hiring the expertise staff with lots of work experience for providing best training programs and techniques.

Table 32 Workplan of Pixair Institute.

Campus	Cost Structure including tax	Course Flexibility	Equipment	Staff	Website
Pixair Lisbon Campus Onsite/online learning.	€1250 + Vat enrolment. €200 + Vat for Unwinged. €150 + Vat for winged. €45 + Vat for multi- copter.	Online course + Onsite course to provide flexibility for trainers, Online Test Preparation for Flight 107 test, Aerial photography customized	DJI drones, Go-Pro camera, DJI spark, DJI Mavic Pro.	Instructor Pilot, Aeronautical engineer, Aerial Photographer.	www.pixair.com

	€500 Flight 107 test preparation.	course, Industrial Inspection, Aerial Film making course.			
Private services provided to companies.	€500 + VAT for an hour of inspection.	Inspection services to companies, Aerial photography package.	DJI drones, quadcopters, Go-pro camera.	Instructor Pilot, Aerial photographer, Editor.	www.pixair.com

Source: Competitor Analysis.^{lvii}

7.1.1.2 Milestones and the Gantt Chart

Once the work plan for Pixair is completed, it is important to design and articulate milestones which are essential for the development of the business. Therefore, I have considered using the Gantt chart which is used to express the goals required for achieving the business objectives of Pixair over the course of one-year of Business planning, it focuses on Cost structure development, building and achieving strong Customer Relationships, more Sustainable Tourism and Implementation of effective Marketing Strategies required for achieving the goals. The last stage of adaption and designing the business model according to market reaction, Implementing and managing the milestones, legal structure, Budget and financial projections and adopting marketing strategies to successfully achieve the goal.

Figure 16 Essential Steps for consideration in Forming Gantt Chart for Pixair.

Business Planning: which focuses on forming an effective business plan mentioned above focusing on hiring and building a strong effective team and platform for managing activities and lastly to finalize the business plan design method and strategies which will take total of 1 to 3 months.

Cost Structure: is regarding the cost estimations investments initial set up costs and return of sales to determine the cashflow in business and analyse the feasibility of the business plan whether the business can achieve the break even finalizing the partnerships and legal procedures required which can take up to 2 to 4 months.

Customer Relationship Building: focuses on creating channels required for effective communication with the potential customers trainers and businesses which is the most essential part and requires face to face communication social media, advertisements and can be achieved by building effective student portals, websites, platforms for interaction and training the staff effectively for best customer care services which can take about 1 to 5 months.

Marketing Strategies: focuses on ways for promoting the business plan the concept of Pixair and targeting the specific market segment for our institute by effective marketing techniques such as social media, advertisements, exhibitions, Air summits and building strong relationship with travel agents, photographers to get more services which can take about 12 months as it is an ongoing process.

Table 33 Gantt Chart of Pixair for 12 months.

Pixair key Milestones	Months	1	2	3	4	5	6	7	8	9	10	11	12
Business Planning.													
Constitute business plan.		x	x	x									
Developing Platform management and staff.		x	x										
Finalize Business Plan.		x											
Cost Structure.													
Finalize the legal procedures.			x										
Finalizing the partnership with drone manufacturers.					x								
Customer Relationship building.													
Developing a website for interacting with customers.					x	x							
Training effective staff, platform management, login portals, and knowledge management.		x	x	x									
Marketing Strategies.													
Websites, social media, advertisements, exhibition.		x	x	x	x	x	x	x	x	x	x	x	x
Building effective relations with travel agents, photographers for more competitive advantage.		x	x	x	x	x	x	x	x	x	x	x	x

Source: Gantt Chart.^{lviii}

7.2 Financial Projections

Financial Projections are an essential part of the business plan, to determine its viability and make realistic projections for the initial years to make sure it is profitable, for the stakeholders, partners, and government.

According to the work plan constituted above, the main source of income for Pixair is dependent upon the students and trainers getting trained from institute, as well as the individual services of Aerial photography provided to travel agencies, and companies for promoting tourism and inspection.

Individual services if the charges are €500 + VAT per hour for inspection or Aerial photography and takes around 5 hours of inspection on average, or Aerial photography + editing filmmaking, the average cost will be $(€500 + \text{VAT}) * \text{number of packages}$.

Below is the financial plan for providing services to businesses whether its aerial photography or industrial inspection, for the next 5 years usually divided into 3 months making four semesters yearly. 2019 showing an earning of €1,000: 2020 showing a total earning of €2,500: 2021 showing a total earning of €2,500: 2022 with a total earning of € 3,000: 2023 with an earning of €2,500. **Table 34 financial projections for UAV services for year (2019-2023).**

Year	0-3 months	3-6 months	6-9 months	9-12 months
2019	€500*2=€1,000.	-	-	-
2020	€500*2=€1,000.	-	€500*2=€1,000.	€500*1= € 500.
2021	-	€500*3=€ 1,500	-	€500*2= € 1,000.
2022	€500*2=€1,000.	-	€500*1= € 500.	€500*3= € 1,500.
2023	-	€500*1=€500.	€500*4=€2,000.	-

For aerial photography and videography services offered per package (2019-2023).

Considering the financial returns from the students and trainers we will look into 5 years breakdown of minimum 8 students and maximum 15 students, and year divided into 8 semesters of 6 weeks, if Pixair receives $(€1,250 + €200) + €500 + \text{VAT}$, which is (enrolment+ class+ test preparation), per student for one semester which is of 6 weeks, and usually a class will have minimum of 8, 10 and maximum of 15 students, average per semester would be $(€1,950 + \text{VAT}) * 15 = €29,250 + \text{VAT}$, or $(€1,950 + \text{VAT}) * 10 = €19,500 + \text{VAT}$ per semester, $(€1,950 + \text{VAT}) * 8 = €15,600 + \text{VAT}$.

Table 35 Financial Projection for Trainee students for year (2019-2023).

Year	Semester 1 8 students	Semester 2 8 students	Semester 3 8 students	Semester 4 8 students	Semester 5 8 students	Semester 6 8 students	Semester 7 8 students	Semester 8 8 students
	10 students	10 students	10 students	10 students	10 students	10 students	10 students	10 students
	15 students	15 students	15 students	15 students	15 students	15 students	15 students	15 students
2019	€15,600 €19,500 €29,250							
2020		€31,200 €39,000 €58,500						
2021				€62,400 €78,000 €117,000				
2022						€93,600 €117,000 €175,500		
2023							€109,200 €136,500 €204,750	

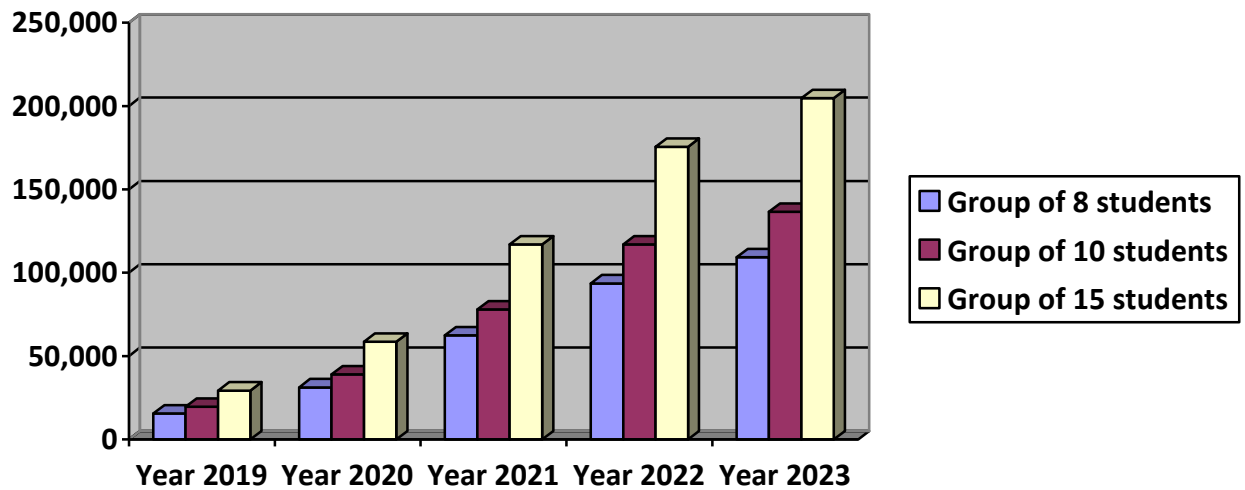
Source Financial Projections from year (2019-2023), for the number of students (8,10,15).

Since initially we have a class booking of 10 trainee students from china of a Drone manufacturing company we will use as initial financial projection for September 2019.Year

2019 with only 1 semester, Year 2020 with 2 semesters booked, Year 2021 with 4 semesters, Year 2022 with 6 semesters booked and Year 2023 with 7 semesters booked annually.

7.2.1 Financial Projections Bar Graph

Figure 17 Comparison of Cash in-flow from 2019-2023.



Shows a comparison of minimum income earned with a badge of 8 students and maximum income earned with a badge of 15 students explained above in table 34.

7.2.2 Drone Service Market Financial Global Analysis 2027

According to Dublin Business-wire, (March 19, 2019), drone service global analysis states that the current drone market accounts for US \$629.2 million in 2018 and is projected to grow by CAGR of 51.1% between 2019-2027 and reach US \$24,882.2 Million In 2027.

This shows that there is an uprising demand in drone and UAV industry which makes it a more sustainable business for the future, and if planned properly can result in one of the emerging most demanding professions for youngsters, and photography professionals.

7.3 Conclusion

According to the results interpreted from the survey website in the literature review we can see a direct link between tourists' perception, observation and preferences for the selection of tourist destination based on destination image formation, depending on Image, angle of photography, colours and graphics shows to create an influence and impression on the emotions

and choice of tourists by making the destination more attractive, thus the votes for selecting Aerial Image compared to normal Image of same destination, captured at same time with same day colours prove that Aerial photography taken from drones proves to improve the destination image formation and thus promoting sustainable tourism of Portugal, and if used effectively by photographers and businesses such as travel agents, hotels and hospitality industry can prove to significantly improve the tourism and promote sustainability by minimising negative impact on environment due to reduction of marketing and advertising alternatives used for promotion.

Reaching to the conclusion for the business plan model of Pixair, we can conclude that the overall business model plan being designed, the objectives set, the competitor analysis conducted for external market, the strategies designed and at the final step of the process method of designing the business model plan described above such as managing, adapting and implementation of business model according to the market reaction, the milestones set, legal procedures, the budget required and financial projections we can see its reliable and effective, shows a positive response for the success of the business plan of Pixair, with gradual growth in the next five years and profits earned.

However, there were few limitations encountered that made our research and designing process and conclusion of the business plan a bit crucial and limited, below are few limitations mentioned that were faced during the designing and execution of the business plan.

7.4 Limitations and Recommendations

Participatory design: was limited and could not include the feedback for the designing process from expertise from different business units and organizational hierarchy, and institutes UAV institutes worldwide, as the research was limited to Torres Vedras and Lisbon with limited expertise and pilots working in this field, However I tried approaching the other institutes for more detailed interview from the staff and management but never got a reply.

Avoid Short-term Focus: another limitation is to avoid short term focus on ideas with large first year revenue focus, unlike big corporations that can achieve absolute growth in first year, the growth factor for this business in first year is very limited due to the new idea being introduced and uncertainty of market growth, leading to limitation of ideas.

Language Barrier and Visa requirements: A lot of students prefer countries with no language barrier, mostly English-speaking countries, Portugal is restricted for student mobility

due to language barrier and visa issues for international students making it difficult for students to come here from worldwide, hence the focus is on providing courses in both languages for students.

Low Economic Earning and Spending Power: the focus is on providing limited courses, with short duration due to low spending power of students and general population, hence comparatively to other institutions worldwide we are not offering complete bachelors and masters courses in this field, rather short courses of short duration and costs.

7.4.1 Future Research

I still considered that the amount of research and effort used for this business plan is limited, as the UAV industry is still new, a lot of areas need to be explored, a lot of new researches are still coming and there are many changes occurring, which need to be researched and implemented with passage of time. In the following research few areas were missing which when included can make a lot of difference in future for example:

The Government: In my research the government sector of education and exchange programs for Portugal, was not considered and discussed, however once the business plan is put into reality, we can get a lot more information regarding the government participation and response regarding this field and business, the environmental concerns and policies.

Statistics: there were not enough statistics regarding UAV, in-terms of incomes and turn over, the student statistics and growth, however I hope that in future research we can also take advantage from more of quantitative data, apart from only qualitative data for better understanding and interpretation.

The community: since the UAV field is still very new to a lot of local community members in Portugal, the research lacks the input of local community reaction regarding the concerns and idea of UAV training, but with more advertisements and knowledge management we can get more detailed knowledge regarding their response and reaction for UAV's.

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APPENDICES

Appendix.1

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Appendix.2

QUESTIONNAIRE: 1
Semi-Structured Interview designed solely for the purpose of research, for master's thesis designed to get a detailed knowledge regarding the role of Aerial photography and UAV'S, their future potential as emerging field and insight regarding the idea of drone institute.
Name: <u>Patricia Silva.</u>
Age: <u>30.</u>
Job Title: <u>Instructor Pilot.</u>
Number of working years in UAV industry: <u>1 Year.</u>
Email Address: patriciagsilva19@gmail.com .
Can you provide some information regarding your work details in UAV industry?
<u>As an internal pilot, I only ensure that the parameters are set to provide a safe operation, as it is very important to monitor the parameters continuously to avoid a failure in flight operation, for the planning of the mission, you have to define your goal, and adjust the failsafe conditions accordingly to the aircraft, payload, and constraints on the terrain.</u>
Looking back at UAV industry, what progress has it made in recent years?
<u>I have only been in the industry for a year, mostly what changed concerns awareness and regulation.</u>
What is the future of UAV industry? Particularly Aerial photography?
<u>I think that Aviation Industry will pin the UAV industry, and allow a more autonomous operation for example, target detection and tracking, the capability of learning target details in flight, autonomous adaption to new flight conditions.</u>
What is the equipment you prefer to use for aerial photography?

We prefer using rotorcrafts/multi-copters for the great amount of detail it can capture.

What are the improvements you would to see or wish to have in future for better performance and results?

I am expecting the arrival of a flawless (or almost) sense and avoid system.

Give an insight regarding UAV training institutes in Portugal? Do you think it would be beneficial to have them?

I would definitely take it, a certification and assessment process are important, it gives the clients confidence to hire professional person for the job or task to be done.

What are the different strategies and methods you think should be adopted or implemented for better promotion of UAV industry and products in Portugal?

May be because I am in the industry, I know a lot of drone enthusiasts, for that reason I believe the drone industry has its seeds implanted, however to make it better and be competitive like other UAV companies worldwide, Portugal should conduct more air shows, exhibition and workshops to promote this emerging field. And introduce this as part of course in science.

Compare to other countries worldwide, how do you see UAV industry in Portugal? Are we compatible enough/ What are the areas we lack?

My knowledge on this is limited, however I believe the cost for commercial usage, the cost is an important constraint, and looking at other reputable brands worldwide it's hard to compete with them cost wise, as the drones and UAV'S designed and manufactured in Portugal are of much higher price compared to other brands worldwide, which should be lowered to cater more business and people.

Thank you very much for providing your valuable information for this survey, is there anything else/opinion you would like to share with us?

Your welcome, as an Internal UAV pilot I wish this industry all the very best in future and hope to see it excel in coming years.

QUESTIONNAIRE: 2

Semi-Structured Interview designed solely for the purpose of research, for master's thesis designed to get a detailed knowledge regarding the role of Aerial photography and UAV'S, their future potential as emerging field and insight regarding the idea of drone institute.

Name: Meneses.

Age: 40.

Job Title: Drone manufacturer.

Number of working years in UAV industry: 7 Years.

Email Address: m.meneses@leitek.com.

Can you provide some information regarding your work details in UAV industry?

We provide services of unmanned aerial vehicle for Fire surveillance, Kits for detection of drugs, Aerial mapping, Drone carriers for protection of people at beach, Security, detection of explosives, agriculture and farming.

Looking back at UAV industry, what progress has it made in recent years?

Yes, very much. Quiet new companies have entered in this industry, and we are looking forward for more upcoming events this year.

What is the future of UAV industry? Particularly Aerial photography?

Yes, I believe a lot can be done more with drones, a lot more to explore, a lot of subject still to study and invent.

What is the equipment you prefer to use for aerial photography?

We prefer to use mostly DJI, Go-pro, for our Aerial photoaged and surveillance.

What are the improvements you would to see or wish to have in future for better performance and results?

To save people's lives from drowning in sea water, by providing them with parachutes equipped with drones for immediate rescue and lifesaving jackets, until the life guards or search and rescue team arrives, that is what we are currently working on and testing on Cascais beach in July 2019, if approved will be supplied to all beaches for search and rescue.

Give an insight regarding UAV training institutes in Portugal? Do you think it would be beneficial to have them?

I believe it's a brilliant idea and must be promoted to introduce this concept and technology in more youngsters and encourage them to learn and enter in this emerging field.

What are the different strategies and methods you think should be adopted or implemented for better promotion of UAV industry and products in Portugal?

I think more strategies should be adopted to promote through internet, social media, Facebook, twitter, Instagram, websites on search engine through public state.

Compare to other countries worldwide, how do you see UAV industry in Portugal? Are we compatible enough/ What are the areas we lack?

It is difficult to answer this, but its recent and is progressing.

Thank you very much for providing your valuable information for this survey, is there anything else/opinion you would like to share with us?

We provide better services compare to other drone manufacturing companies and still hoping for better performance and improvement in future.

QUESTIONNAIRE: 3

Semi-Structured Interview designed solely for the purpose of research, for master's thesis designed to get a detailed knowledge regarding the role of Aerial photography and UAV'S, their future potential as emerging field and insight regarding the idea of drone institute.

Name: Pedro Precioso.

Age: 25.

Job Title: UAV Pilot.

Number of working years in UAV industry: 5 Years.

Email Address: Pedroprecioso@gmail.com

Can you provide some information regarding your work details in UAV industry?

I started working in UAV industry with Aerial filming in 2013, I have also done development and adaptation of UAV aircraft and pilot in four UAV's companies in Portugal.

Looking back at UAV industry, what progress has it made in recent years?

There has been tremendous progress both at the legislative level and in terms of material used in UAVs as well as operationally. People are already more aware that this is not a "toy".

What is the future of UAV industry? Particularly Aerial photography?

The UAV industry has huge potential at all levels. In terms of photography, film as well as surveying, precision farming, pest detection, surveillance among many other possible cases.

What is the equipment you prefer to use for aerial photography?

It depends on the kind of work we are doing. In my preference 'DJI' range fits perfectly. If we are talking about something more professional, we have the "DJI Pro range". I know some Novel and Cinema productions using this material.

What are the improvements you would to see or wish to have in future for better performance and results?

I think most of the law and insurance for UAV use.

Give an insight regarding UAV training institutes in Portugal? Do you think it would be beneficial to have them?

No doubt that would be a benefit for everyone. Nowadays there are UAVs selling in supermarkets accessible to all users and that can endanger a lot, privacy, air accidents and even accidents with the operators themselves.

What are the different strategies and methods you think should be adopted or implemented for better promotion of UAV industry and products in Portugal?

I know that all companies want to evolve fast so as not to lose customers and money, but first we need to test all the material in every possible way and then we can offer high quality services and fight against foreign companies which require more funds for development in this area.

Compare to other countries worldwide, how do you see UAV industry in Portugal? Are we compatible enough/ What are the areas we lack?

I think we are on a good track, perhaps the government needs to understand that this is the future and to make more money available for development and research.

Thank you very much for providing your valuable information for this survey, is there anything else/opinion you would like to share with us?

My opinion is that at this moment in Portugal the rules that were made were made by people who do not understand and put "all in the same bag" we have to know the people who fly UAV for work, the people who do it just for recreation. Laws cannot be the same as their formation.

QUESTIONNAIRE: 4

Semi-Structured Interview designed solely for the purpose of research, for master's thesis designed to get a detailed knowledge regarding the role of Aerial photography and UAV'S, for the formation of destination Image, and how it can promote tourism of Portugal.

Name: <u>Antonio Pedro Maia Brasil.</u>
Age: <u>42.</u>
Job Title: <u>Multirotor and fixed wing UAV Pilot.</u>
Number of working years in UAV industry: <u>Professionally (6 years).</u>
Email Address: <u>maiabrasilhotmail.com.</u>
Can you provide some information regarding your work details in UAV industry?
<u>I have been flying UAV platforms developed by third party company's and same time my own developments with different type of span and sensors.</u>
Looking back at UAV industry, what progress has it made in recent years?
<u>Since of the beginning of the UAV industry I think redundancy of internal flight sensors has been the move on the last years. At the beginning if some peripheral sensor had a fail probably it would cause a crash. Industry then realized that the UAV must get more robust and safer in term of all the systems on board.</u>
What is the future of UAV industry? Particularly Aerial photography?
<u>I think regulation must come in, because at the moment anyone can get into a shop and buy a cheap system and then go outside start making aerial footage and photography without having any knowledge about aeronautical principles and airspace rules.</u>
What is the equipment you prefer to use for aerial photography?
<u>DJI - Phantom 4 PRO.</u>
What are the improvements you would to see or wish to have in future for better performance and results?
<u>For sure, I am waiting for great improvements in the battery's industry. I think the industry will again regain a boost if someone come with a new technology capable of store more energy on less weight and volume. I really wish that time to come and forget about this 20-minute flight time. It will be the real maturity of the industry.</u>
Give an insight regarding UAV training institutes in Portugal? Do you think it would be beneficial to have them?
<u>Yes, and every pilot should run training programs at any case. Same as for a Private Pilot License. With license, logbook registration of flight hours and to be shown to authorities every year.</u>

What are the different strategies and methods you think should be adopted or implemented for better promotion of UAV industry and products in Portugal?

Maturity of the systems, most of the systems used for more specific missions are sometimes not so much mature. This cause many times great stress on the flying teams and they defend themselves waiting for the perfect metrological conditions to do some operations. On the other clients most of the times don't like to see this fragility of this systems. They just want the flight to be done.

Compare to other countries worldwide, how do you see UAV industry in Portugal? Are we compatible enough/ What are the areas we lack?

Not easy answer. Sometimes is usual to see other countries being technologically ahead of Portugal. However, a few years ago I was asked to do some demonstration flight for a IAI – Israel Aerospace Industries which is for sure one of the biggest players on this industry. I realized that day that maybe we are not so far away from the lead in some specific UAV's developments.

Thank you very much for providing your valuable information for this survey, is there anything else/opinion you would like to share with us?

Not at all. Thank you.

QUESTIONNAIRE: 5

Semi-Structured Interview designed solely for the purpose of research, for master's thesis designed to get a detailed knowledge regarding the role of Aerial photography and UAV'S, for the formation of destination Image, and how it can promote tourism of Portugal.

Name: Marco Fernando Bernardes Simões.

Age: 39.

Job Title: Electronics Design Engineer and UAV Internal Test Pilot.

Number of working years in UAV industry: 12.

Email Address: marco.simoes@uavision.com.

Can you provide some information regarding your work details in UAV industry?

I work in UAV industry as Electronics Design Engineer. I design the avionics systems for the UAVs from my company, but because due to lack of Internal UAV pilots in Portugal, I am also working as an internal UAV pilot.

Looking back at UAV industry, what progress has it made in recent years?

In recent years the progress is massive. Today we can buy very good systems with brilliant features at affordable rates, which were too expensive before. A few years ago, only military forces or very large companies could buy such systems but now it is affordable and reachable to common man.

What is the future of UAV industry? Particularly Aerial photography?

I foresee a very good future for the UAV industry since they can be used for surveillance, goods deliveries, power lines inspection, structures inspection, generic aerial photography and filming, human private transport and I am sure in the future airlines will use them too. In particular case of aerial photography there is a whole new world to explore. UAVs have made it possible to have fantastic images at reasonable costs, which were too costly before due to large setup and unreachable places.

What is the equipment you prefer to use for aerial photography?

For aerial photography I prefer rotative wing UAV equipped with gimbal and professional SLR cameras instead of action cameras like GoPro.

What are the improvements you would to see or wish to have in future for better performance and results?

In my opinion there are very good systems in the market with a very good price the image quality is exceptional, but I think there is a need to improve the collision and avoidance systems, indoor navigation and of course the flight time.

Give an insight regarding UAV training institutes in Portugal? Do you think it would be beneficial to have them?

Unfortunately, I do not have enough knowledge regarding UAV training institutes in Portugal because if they exist, I don't know about them. Of course, we should have them because the market needs qualified pilots and I consider it one of the jobs of the future. A lot of times, people flying UAVs lack proper professional UAV training and certification which is not good - specially for the safety.

What are the different strategies and methods you think should be adopted or implemented for better promotion of UAV industry and products in Portugal?

Our security and military forces should be encouraged by the government to buy from Portuguese companies and not from foreign countries. They also should help us to promote our products near-by foreign military and security forces.

Compare to other countries worldwide, how do you see UAV industry in Portugal? Are we compatible enough/ What are the areas we lack?

In Portugal UAV industry started a few years ago, more or less 12 years and has a very small percent of specialized UAV training pilots compared to worldwide, and I think there is a lot of space to grow. Nowadays with all the standards I think we are not compatible enough with other countries. We are good in small and custom-made systems but not good enough in mass market systems.

Thank you very much for providing your valuable information for this survey, is there anything else/opinion you would like to share with us?

No, I think that few questions are enough.

QUESTIONNAIRE: 6

Semi-Structured Interview designed solely for the purpose of research, for master's thesis designed to get a detailed knowledge regarding the role of Aerial photography and UAV'S, for the formation of destination Image, and how it can promote tourism of Portugal.

Name: Paulo Avelino Barreto Marques.

Age: 53.

Job Title: UAS Engineer and Business Developer.

Number of working years in UAV industry: Professionally (6 years).

Email Address: pbarretomarques@gmail.com.

Can you provide some information regarding your work details in UAV industry?

I was responsible by the development of a high lift multirotor in a UAS manufacturer and by representing that company in international financing projects related with this industry. Simultaneously I was also responsible by its business development.

Looking back at UAV industry, what progress has it made in recent years?

Increased reliability has been the main development in the last years. This was achieved by the most robust flight control algorithms and redundancy. Now the challenge is to introduce artificial intelligence into payload, navigation and ground subsystems in order to increase the service level to users.

What is the future of UAV industry? Particularly Aerial photography?

I think the future of the UAV industry in the professional market will be the services in inspections of infrastructures, mapping and terrain analysis in complement to satellite data and safety and security applications. As smartphones or cameras, aerial photography will be a good business for manufacturers but a resource easily available to everyone and only sustainable for the niche of professional photographers who focus on the artistic aspects and not just on the technique of image acquisition.

What is the equipment you prefer to use for aerial photography?

DJI - Phantom 4 PRO.

What are the improvements you would to see or wish to have in future for better performance and results?

Increase the endurance of electrically powered UAVs and increase its autonomy through greater use of artificial intelligence.

Give an insight regarding UAV training institutes in Portugal? Do you think it would be beneficial to have them?

Yes. Although I think the courses will progress from UAV pilot to UAS operator as regulation and technology allow evolve the degree of autonomy.

What are the different strategies and methods you think should be adopted or implemented for better promotion of UAV industry and products in Portugal?

The main problem in Portugal is financing good ideas. Most of the time the promoters do not have the skills to explain the business to the financiers and the investors lack the skills to recognize the potential of a good idea. It is necessary to improve the culture of entrepreneurship in the Portuguese industry to risk in the creation of new products and services. This is true for all companies, particularly those focused on the so-called industry 4.0.

Compare to other countries worldwide, how do you see UAV industry in Portugal? Are we compatible enough/ What are the areas we lack?

Our knowledge is aligned with the state of the art in this industry. The main problem in Portugal is investment.

Thank you very much for providing your valuable information for this survey, is there anything else/opinion you would like to share with us?

You are welcome. I have nothing relevant to add.