ABSTRACT

This report is a study about the worthiness of investing into a service company within the unmanned multicopter industry by the beginning of 2014. Nowadays, there are lots of activities that can be performed by using Unmanned Aerial Vehicles (UAVs) technology, in substitution of conventional methods. Through the use of this technology, the company offers solutions that reduce time, cost and effort; increasing safety, effectiveness and efficiency.

The idea is to incorporate a company oriented to provide aerial imaging services, basically in three lines of business: surveillance, infrastructure analysis, and thermal analysis; using on board systems such as video cameras (standard and high definition) and infrared sensors.

All the typical sections of a business plan have been developed: Environmental and market analysis, strategy definition, operations plan, organization structure and incorporation form, marketing plan, financial plan and conclusions about the whole work done.

As a general conclusion, it can be said profitability is assured even if the identified risks arise. This industry is an emerging market that for sure will increase exponentially once the legislation is set, and Imaginaeri is currently step-forward positioned to exploit this opportunity.
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1. INTRODUCTION

1.1. The idea

Have you ever realized how many activities require to extend or adapt human capabilities? There are many places which are hard or risky to access, and also many tasks for which human vision is not the most adequate one.

Imaginaeri harnesses new technology to provide safe and reliable solutions for everyday needs. The systems used allow to analyze different infrastructures, such as airport beacons, solar panels or buildings in less time and in a more accurate way. Thermal analysis can be carried out to detect the focus of a fire or to search people in difficult environments. Furthermore, high definition cameras can be used for aerial filming or surveillance tasks.

Imaginaeri provides solutions to these and more issues through the use of unmanned multicopters.

This idea is represented in Imaginaeri’s value proposition:

“New solutions for old problems”

1.2. Outline of the Business Plan

Imaginaeri’s business plan is structured as follows:

In Chapter 2, the Environmental analysis is presented. The Political, Economic, Social and Technological contexts and their influence in the project are studied.

In Chapter 3, an analysis of the Unmanned Aerial Vehicles (UAVs) market is carried out. The company and its industry are introduced, showing the industry size and the forecasts for its different segments. Here lies also the Porter analysis, for which an analysis of possible competitors, suppliers, customers and substitutes is developed. Finally, the main distribution channels are introduced.

Chapters 4 and 5 explain the SWOT analysis and the strategy derived respectively. While in Chapter 4 different possible strategies are introduced, Chapter 5 states the concrete mission, vision, values and strategy followed by Imaginaeri.
In Chapter 6 is collected the operations plan. This chapter details the services that Imaginaeri offers, and the platforms and airborne systems used in order to provide them. The logistics, facilities and IM systems involved are defined, and the commercial, production and support processes are explained. A first analysis of the costs and investments required for the project is carried out, estimating also the demand and the expansion plan. Finally, Imaginaeri’s value chain is presented.

In Chapter 7 the Marketing plan is developed. The segmentation, targeting and positioning of the company is gathered and also the four Ps analysis is explained: Product (Service), Pricing strategy, Promotion and Placement. Furthermore, the marketing budget is broken down.

Chapter 8 includes the Incorporation form and the organization structure of the company: Values, employees, salaries and outsourced activities are detailed.

In Chapter 9 the financial statements are analyzed. The Work Breakdown Structure (WBS) and Cost Breakdown Structure (CBS) are detailed. Imaginaeri’s financial sources are presented, the amortization plan and sales forecasted are explained and the Profit and Loss account, Balance Sheet and Cash Flows are analyzed. After that, the main ratios and conclusions about Imaginaeri profitability are extracted. Finally, a sensitivity analysis is performed and some mitigation and contingency measures in case of an adverse scenario takes place are proposed.

Finally, in Chapter 10, the conclusions of Imaginaeri’s business plan are exposed.
2. ENVIRONMENTAL ANALYSIS

2.1. Political Analysis

a. Overview

Traditionally politics has been undertaken within national political systems. National governments have been ultimately responsible for maintaining the security, economic welfare of their citizens, the protection of human rights and the environment within their borders. With global ecological changes, an ever more integrated global economy, and other global trends; political activity increasingly takes place at the global level.

Under globalization, politics can take place above the state through political integration schemes such as in the European Union. In this European environment, political and legal factors (derived from the translation of the power of states to Brussels) may be dominant. In many cases, changes perceived in this general environment are merely delays of this globalization phenomenon which affects all factors so far mentioned.

b. European objectives

Europe is nowadays legislating in relation to UAVs which is directly affecting the Spanish situation. In the STAR 21 (Strategic Aerospace Review for the 21st century) [1], European Union expressed its strategic objectives for the aviation sector in the long term. Below are stated the most relevant ones for the development of civil UAVs industry:

- The aviation industry is vital to achieve the European objectives in economic growth, security and quality of life.
- Europe must remain at the forefront of new technologies.
- The European aeronautics industry must remain competitive in order to keep an outstanding position in world markets.

In recent years there has been an interest from various government agencies in the development of UAV applications for the civil market and in the enactment of the necessary legislation. The development and subsequent implementation of UAV technology represents an opportunity to meet the above objectives. The European Union has funded several projects with a budget of 15€ million for studies applying technology in civil applications of UAVs.
c. Pitfalls

However, and as many voices state [2] [3], the lack of regulation is the real problem companies have in order to make a realistic business plan of the civil UAVs industry. The level of technological development of this industry is already a fact. But Spain, in particular, and Europe in general are facing a problem of regulation. It could be said that reality once again goes above the law and the slowness with which Europe legislates and takes decisions reopens a gap between the old and the new continent.

While the US congress has just approved a plan for inserting the UAVs’ operation in the airspace of the country in 2015 [2] [4], and so the Federal Aviation Administration (FAA) has issued a recommendation, Europe is still studying what to do with “our UAVs”. Regarding this, it could be said that the industry has an answer for the market, but the widespread use of these systems, especially for civil applications where its projection is more than evident, requires responses from regulatory authorities.

However, to be perfectly honest, it has to be said that the US boost has woken up European authorities and there are already several committees working in the insertion of UAVs in the European airspace. This suggests that Europe is starting up, but always following the trend of the US’ lead.

It is worth to say that is new regulation is strongly boost by society, that is, society is claiming a self-regulating organization that will train and oversees UAVs operations [4]. Official organisms such as the Federal Aviation Administration are also considering new UAVs organizations. Different research groups of the FAA are realizing that they need to regulate more and in a more detailed way. An example may be to regulate UAVs according their weight and make different “driver licenses” for the different categories, just as driver licenses are distinguished by vehicle class — trucks or limos or motorbikes or cars [5]. All these examples are good proof that UAVs regulation will be very soon a fact.

d. Evolution

The civil UAVs industry will experience subdued growth in Europe in post-recession period with most companies pinned down by lack of civil regulations for certification and operation in the national air space. Efforts of European civil aviation authorities to rationalize civil certification procedures will be a key factor for future growth.

For the past 5 years Flightech Systems has been developing the FT-ALTEA, the first UAV with an Experimental Airworthiness Certificate with registration EC-008, issued by the AESA (State Aviation Safety Agency) [6].
The State Air Safety Agency (AESA) and the Spanish Civil Aviation Authority (DGAC) have been working on the development of legislation for UAS since 2006, when Flightech Systems presented the FT-ALTEA file for its certification [6].

The UAVs evolution has only just begun and hopefully its civil and commercial use will substantially increase in the near future. However, its definitive take off will have place when a unified regulatory framework takes place, not only in Spain, but also in European an international territory [2].

2.2. Economic Analysis

The economic environment must be taken into account always there is an interest for starting a business. Economic factors affect the purchasing power of potential customers and the firm’s cost of capital. Some of these economic factors are highlighted in the following sections.

a. Spain interest rate

The interest rate shown in Figure 1 refers to the central bank benchmark interest rate. Usually, the central bank benchmark interest rate is the rate at which central banks make loans to the commercial banks under their jurisdiction [7]. Moving the benchmark interest rate, the central bank is able to make an impact on interest rates of commercial banks, inflation level of the country and national currency exchange rate. Reduction of interest rates should bring increase in business activity, a rise in inflation rate and weakening of national currency. Imaginaeri could take advantage of this, since the interest rates of loans would be lower but the prices will not fall.

![Figure 1. Benchmark Rate - European Central Bank](https://example.com/benchmark-rate.png)
b. Spain Inflation Rate

Figure 2 represents the Inflation Rate in Spain reported by the Spanish National Statistics Institute (INE). As it is predicted by the evolution of the benchmark rate of the European central bank [8], the inflation will grow slightly in the following years. However, it will not reach so high values as in the previous ones and the tendency during some years is pretty stabilized.

![Figure 2. Spain Inflation Rate [8]](image)


c. Spain Growth rate

GDP Annual Growth Rate in Spain is reported by the INE. The biggest industries of the economy are services, industry, construction and energy in this order. As shown below, Figure 3, it will take time to recover the values of GDP previous to the crisis. However, although the GDP growth rate is expected to maintain or increase slowly (mainly due to the lack of contribution of the construction industry), the INE forecasts an increase of the GDP per capita, and therefore per company, what is a good point to get investors and loans to start a business.

![Figure 3. Spain GDP Growth Rate [9]](image)
Despite the relatively good figures, the crisis period Spain is going through cannot be forgotten. If 2008 is considered as the beginning of the current crisis, 2013 has been the sixth year of a major global crisis that is shaking the foundations of the system. The most favorable reports indicate 2014 as the year in which some serious and reliable first green shoots can be seen, while 2013 has been a year of extreme hardship again.

Economic crisis leads to economic policies to reduce expenses, security and defense budgets, and to loss welfare and public services. On the other hand, when economic and security crises are related, society focus instinctively on crimes, what makes people think about civil security and surveillance field as a possible target market. Taking into account the slow but constant recovering of the economy and the global predictions for the UAVs industry, there are reasons to be optimistic.

Even though defense spending is expected to remain constricted in post-recession years, demand for unmanned aircraft systems is expected to increase at a positive rate. As countries all over the world face complex security and surveillance challenges, the prospects of UAV for non-military use is also encouraging with increasing use of UAV for myriad applications, such as firefighting, aerial photography, advertising, surveying and law enforcement.

Before finishing this economic analysis, there is a positive aspect for Imaginaeri which is worth to mention. Despite the national and international financial crisis, there is an increasing number of economic and financial initiatives to promote and support entrepreneurs, start-ups and all kinds of business initiatives [10].

2.3. Social Analysis

In a general view, it can be said that lifestyle is continuously changing and society is using more and more electronic devices that make society’s life easier. Education and cultural patterns are also following this trend, and it is said that nowadays children are part of an “Electronic generation”. This fact, in combination with the consumerist attitude that is extending globally, could let think that there is a place for Imaginaeri in today’s society.

However, many other aspects which might be a barrier to Imaginaeri, have been taken into account. The main ones are developed in the following sections.

a. Safety

Some people are afraid of seeing UAVs flying over their heads, since they are scared of the accidents these new products could generate. This part of the society think these devices could
drop or fly out of control hitting someone or causing situations that could threat personal integrity. Moreover, the fact of flying without an operator inside always transmits less safety.

Other aspects related to safety issues are listed below:

- License should be required to all operators.
- Clear definition in case of accident.
- Flying forbidden in case of bad meteorology.
- Stability control in certain applications and performance accuracy.

b. Privacy

Some sectors of society may have concern about losing privacy in their personal life, as could be the case of celebrities. People in general do not want to be recorded without being aware and without knowing who is taking that recorded data, for example, when entering a place where cameras are recording.

c. Security

This type of products can lead to terrorist uses or criminality in general:

- Transport of illegal or dangerous goods without police control.
- Delinquents could be able to steal personal belongings or even kidnap people.
- The military concept of drone provides these devices a negative stereotype, since it has war connotations. These products could be used as a weapon.

However, and as it has been said previously, the technology is already available, what means it is already available for criminals regardless whether there is a lack of regulation or not. Therefore, a good starting point would be that the different state security forces use the same cutting-edge technologies as criminals in order to fight them successfully.

d. Massive use

If this type of product becomes a commodity, its use could be massive. This could lead to difficulties in flight control and airworthiness, interferences with radio, mobile phones, or other electronic devices or some environmental issues, such as, visual and acoustic pollution, birds damage or garbage creation if they were abandoned in the street.
e. Employment

These products could be rejected by society if people think that machines replace some jobs. Moreover, and related to security, the fact of having a Chinese supplier could have a negative connotation. However, people are aware that once the technology is developed and available, the countries with the cheapest production are the ones which manufacture the products. Imaginaeri knows this, and seeks to introduce a positive effect in terms of employment, since the company is focused on services which need employees not only selling them, but also developing and implementing the customized solutions.

f. Positive aspects

To conclude with the social analysis, some positive aspects are observed. For instance, these products are friendly environment, as they are electrical and do not pollute. Moreover, its applications serve to improve personal life quality of users, as they satisfy their needs. But certain uses also affect indirectly (but in a positive way) to people’s life. That is, if multicopters are used to control the traffic or they replace distributors or delivers; the traffic density and traffic jams are reduced.

2.4. Technological Analysis

a. General context

The technology applied in UAVs and multicopters, in which Imaginaeri’s operations are based, not only exists, but its massively broadcasting. This, together with its widely range production makes the required technology totally available to use. As a consequence, setting up Imaginaeri and carrying out its commercial exploitation turns out to be completely feasible. In addition, the manufacturers and suppliers of this technology are well known permitting to contact them easily in order to develop Imaginaeri’s products and services without problems.

b. Electronic devices

Considering all the types of technology involved in Imaginaeri’s products and services, the electronic devices have a strong weight regarding the product itself. Many of them are intrinsic parts of the product such as engines, batteries, integrate circuits, etc., whereas others are part from annexed components related to the final mission of the product: sensors, cameras, etc.

The current extended use of them, makes increase the competition giving as a result a wide range of devices offered with an adjusted price.
In addition, the established trend of minimizing component sizes in electronic devices enhances their quality to be used in products and applications as the ones at issue. Less size in electronic devices means less weight and lower electric power consumption.

c. Level of obsolescence

Nowadays the use of different technology has become essential in everyone’s daily life and its continuous improvement is getting quicker. Technology life cycles are shrinking but this period between the emergence phase and the obsolescence is quite variable depending on the kind of technology.

![Figure 4. Example of obsolescence curve](image)

The obsolescence risk is always present in projects. In this case, it is mainly caused by the strong weight that electronic devices have on it. Although forecasting products life cycles is a difficult task [11], it is known that electronic devices are products which have one of the shortest life cycles within the world of technology.

Nevertheless, this risk can be mitigated following some strategies as the followed by the aeronautical manufacturing industry [12]. In this industry, products have a large amount of electronic components, being under development even decades. However thanks to these techniques its products turn out to have long life cycles keeping updated during them.

As it has been said before, the continuous improvement of technology is getting quicker. Therefore, it is worth to analyze the future trends, since they could affect the development of the project at issue. Many kinds of technology could be applied eventually to the project but the most related one are encompassed within the fields of manufacturing and robotics.
Among all the technologies shown in the figure above, the improvement of power storage techniques will represent a good opportunity for Imaginaeri’s operations in the future. This is because multicopters are driven by electric power and as in laptops, cell phones, electric cars and so on, storing energy at high density is crucial to longer operation.

d. Research and Development

Technology and its development are supported worldwide because governments and society in general, are aware of their repercussions for the economy’s growth and life’s comfort.

In spite of above mentioned, and although the growth intensity of technology is getting higher, the current crisis situation is turning out in budget reductions in R&D due to austerity policies.
In the case of Spain this budget reduction is even higher as a result of the strong impact that the crisis is having in the economic situation.

This fact has almost no effect on Imaginaeri’s development, since its main objective is to provide services, nothing to do with research and development, once the technology needed is already developed as it was previously stated. The most innovative point is the development of customized solutions, what is performed by the own employees of the company.

Figure 6. Spanish R&D - Budget evolution in million € [14]
3. **SECTOR ANALYSIS**

3.1. Company

Imaginaeri’s mission is to meet society needs through UAVs (Unmanned Aerial Vehicles) technology, providing economical affordable solutions within a safe and environmentally friendly framework.

Imaginaeri provides customized services by the use of multicopters, which are equipped with vision capability for services which need to extend or adapt human vision. A multicopter is a small aircraft which is lifted and propelled by more than two rotors. Imaginaeri adapts these multicopters to its clients’ needs and provides any support, technical or personal, its customers may need. Imaginaeri has qualified and trained people able to control and obtain the best of its products for the service Imaginaeri’s clients require.

Imaginaeri’s products are equipped with the technology needed for a wide range of services. These services are focused on aerial imaging, surveillance and analysis applications, which may require specific sensors, stealth or vision over difficult terrains for human access or dangerous areas. Some of the services Imaginaeri provides are:

- Aerial imaging and surveillance
  - Traffic look-out
  - Government (law enforcement)
  - Private security
- Thermal analysis
  - Firefighting
  - Support of major disasters: people search
- Structure analysis
  - High power lines, airport beacons, wind power farms etc.

Imaginaeri bets for continuous innovation and development of new services, in order to provide economical solutions for any challenge. More information about the business is set in Chapter 5.
3.2. Main actors

The main actors involved in the industry are obtained by performing a market research whose gathered information is encompassed in Appendix III. This section seeks to summarize what has been described in the Appendix just mentioned.

<table>
<thead>
<tr>
<th>Company</th>
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</thead>
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<tr>
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<td>-</td>
</tr>
<tr>
<td>ING Robotics</td>
<td>🇨🇦</td>
<td>Conventional UAV (Helicopter and aircraft)</td>
</tr>
<tr>
<td>Service Drone</td>
<td>🇮🇪</td>
<td>-</td>
</tr>
<tr>
<td>Ascending Technologies</td>
<td>🇩🇪</td>
<td><strong>Falcon 8, Firefly, Pelican, ...</strong></td>
</tr>
<tr>
<td>Microdrones</td>
<td>🇩🇪</td>
<td><strong>md4-200, md4-1000</strong></td>
</tr>
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<td>DJI Innovations</td>
<td>🇺🇸</td>
<td>Phantom, Spreading Wings 800</td>
</tr>
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<td>Draganfly Innovation</td>
<td>🇨🇦</td>
<td><strong>Draganflier X4, Drag X6, Drag X8</strong></td>
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<td>Parrot</td>
<td>🇫🇷</td>
<td>AR Drone 2.0</td>
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<tr>
<td>ZeroUAV</td>
<td>🇨🇳</td>
<td><strong>ZERO Steadi470</strong></td>
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<tr>
<td>OFM</td>
<td>🇨🇳</td>
<td>OFM Brute, OFM Seeker, OFM Mate</td>
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</table>

*Table 1. UAVs’ companies*
Table 1 shows a compilation of the main companies which are currently in the market. The list of companies is divided into product providers (that is, manufacturers) and service providers. These different agents have been also classified as possible suppliers or potential competitors. Both groups of companies are extended worldwide, being some countries as Germany, global powers in the sector.

There are two big corporations that being manufacturers, are also service oriented:

- Ascending Technologies: company that sells products and makes research.
- Microdrones: multicopter supplier that has subsidiaries all around the world.

At this point, one may question what differences are between Imaginaeri and the companies mentioned above. Imaginaeri provides complete solutions, which cover the service, the customized product but also the after sales service. Products and services converging on a single solution.

CUSTOMIZED PRODUCT + SERVICE + AFTER SALES = SOLUTION

*Figure 7. Business Formula*

Imaginaeri places its customer in the center of its business. The company is integrated in the value chain of its clients.
Figure 8 shows the existing products that are in bold in Table 1.

Looking at the multicopters above, it is easy to realize that the number of possibilities is as numerous as the number of companies. Some other different products exist, but this chapter collects the most representative ones for Imaginaeri’s purposes.

- On the right side of Figure 8, AscTec Pelican and AR Drone are two products with a low performance which could be used only for surveillance or entertainment. They are the cheapest ones.
- On the left side of Figure 8, Draganflyer, md4 and AscTec Falcon are the best in terms of specifications, but also the most expensive ones.
- Finally, Zero Steadi (Figure 8) is in between high performance and low price. It is a Chinese manufactured multicopter commercialized by the toy company Hobbyking.

The following figure (Figure 9) shows some criteria to compare products, attending to the three main factors that concern Imaginaeri:

- Payload: that is the weight of the mission systems it can take.
- Endurance: also known as autonomy or time that the device is able to be flying.
- Price.
The key point here is not only the conclusions obtained, but also the fact that a rule to assess or evaluate a product in comparison to others has been established. For example, in the case of payload versus price, it is clear that for a price over 20000€ there are two products, but the green one can take over 4 times the payload the blue one can take. In this aspect it will be better.

As a conclusion of this chapter, it can be said that Imaginaeri’s service is fulfilled by a multicopter placed in the band between 20 and 40 minutes of endurance and with payloads determined by the different mission to accomplish. Price is the best as possible within the offer that satisfy the latter conditions.

a. Manufacturers / Suppliers

Nowadays, basically two different groups of multicopters are manufactured:

- Cheap, small, simple and low performance multicopters.
- Expensive, big, complex and high performance multicopters.

There are several companies which produce multicopters, and most of them have from one to three different products or lines. However, very few companies produce and sell worldwide and only three or four provide a high level of quality and standards of service. In the near future, this is expected to change, as currently this is an emerging market.
b. Importers / Exporters / Retailers

The market diversity varies from providers which supply customers the multicopters *Ready To Fly* (RTF), to suppliers which sell simple products or spares. The trend is to buy the whole product and sometimes to buy the maintenance or the service performed with the product.

Some examples of companies which operate multicopters constructed by big manufacturers have been given, but all of them are currently in development. Very few companies provide a high standard service to a considerable portfolio of clients.

c. Competitors

Competitors are different if the multicopter business is oriented to manufacture or to provide service. In a general view, it can be said that:

- Manufacturers are few but well established.
- Services providers are numerous and diverse, but they seem to be small and start-up.

The entry of new competitors can also be divided following the same criteria:

- A new manufacturer should compete to the big existing ones, and the way to do it would be to produce cheaper, perhaps importing components from cheaper countries/suppliers.
- A new service provider could find easy to entry in the market, but very hard to differentiate from others and gain market share. Developing new technology and services implies high investments, what makes harder, economically speaking, the entry into the market.

d. Customers

Customers are very different, as different as the product or service provided is. For surveillance service, the customer are usually the governments through any of their institutions, that is, the army, the police or fire brigades. Private companies which afford private security services, can also be customers of aerial imaging surveillance.

For the hobby or toy sector, customers can be people who want to have a multicopter. This is not the case that concerns Imaginaeri, since the company focuses on the profile of customer described previously.
Potential Customers

In short term, Imaginaeri is envisaged to reach companies and government entities which require standard services with a low degree of customization. Besides, firefighting and government services are the applications for which a quicker development has been forecasted [15]. Therefore, a representation of Imaginaeri’s potential customers in short term is the following one.

- **Aerial Imaging enterprises**
  - Suravia
  - DGT
  - Mundocopter
  - Isdefe

- **Construction & Industrial companies**
  - Iberdrola
  - Acciona
  - Ferrovial
  - Aena

- **Firefighting & People searching groups**
  - Fire brigade

- **Events organizers**
  - Hevents
  - Queens

In a more elapsed period, apart from those aforementioned, Imaginaeri also considers some companies which need customized projects, and also some applications, such as communications and broadcasting, which could take more time to be regulated. In this period, security enterprises, government law enforcement and big media producers are included:
• Private Security Enforcement companies
  - Prosegur
  - Securitas
  - ADT

• Emergency & Law Enforcement entities
  - Guardia Civil
  - Protección Civil
  - Policía Nacional

• Media Producers (Cinema & TV)

3.3. Porter Analysis

The Porter Analysis is a different way of displaying the information developed before. The Porter Analysis introduces a new concept: the Substitute. This term refers to any product or service which could replace Imaginaeri’s ones. A substitute for the whole UAVs market is the “conventional UAV”, that is, that one with fixed wings and which is more similar to a small airplane. There are also others which emulate a helicopter. Both of them have engines powered by gasoline or other kind of combustible, but never electric batteries.

Difference between Multicopters and UAV

*Figure 10. From the left to the right: Multicopter, Conventional UAVs (airplane shape, helicopter shape)*
The definition of UAV (Unmanned Aerial Vehicle) or UAS (Unmanned Aerial System) attends to vehicles or systems that can fly without an operator inside. In this aspect, a multicopter is contained inside the definition. Therefore, all multicopters are UAV/UAS, but not all UAV are multicopters. The main differences between a multicopter and a conventional UAV aircraft shaped with fixed wing are:

- Multicopters are easier to control
- Multicopters provide different performance
  - VTOL (Vertical Take-Off and Landing)
  - Hover flight

Regarding UAV helicopter shaped, the main differences multicopters show are:

- Multicopters are easier to manufacture and maintain
- Multicopters are electrical engines (batteries) instead of fuel
  - Ecological
  - Safer – No fuel handling
The previous explanation, jointly with the information developed in previous sections can be displayed as follows:

![Diagram of Porter's Five Forces Model]

3.4. Industry size

Global market for UAVs has witnessed remarkable growth in the recent past, and it is expected to sustain the growth during the forthcoming years, primarily owing to the increasing reluctance to risk human lives and proliferation of numerous civil and military operations. A research conducted by Frost & Sullivan [15] indicates that between 2004 and 2008, the number of UAVs deployed globally on operations has increased from around 1000 to 5000 systems. The number of UAVs in 2010 according to The Spanish Economy and Competitiveness Ministry [16] was 9000 and the Teal Group Corporation [17] forecasts an annual growth of around 2500 systems from 2012 to 2015, which would lead to around 21600 systems by 2015.
In terms of money, [18] stands that the global market for UAVs is expected to increase from $3.9 billion\(^1\) in 2012 to around $6 billion by 2022, around 4.6€ billion.

World production forecast by region is shown in the following tables [17].

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Table 2. World Production Forecast by Region (in Units) [17]

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</table>

Table 3. World Production Forecast by Region (in Million $) [17]

At present, constantly changing technological preferences, and special customer requirements are the prime factors driving the market for UAVs.

\(^1\) It is important to remark that the billions used in this reports are US billions.
a. Military and civil markets

The military use of UAVs is not something new. UAVs were used on military operations in Vietnam, in Lebanon, and in every subsequent conflict following the Gulf War (1990). The US and Israel have really pioneered the adoption of UAVs for military applications, with European States beginning to make use of the technology on military operations from the mid-1990s. A US Congress report on the proliferation of UAVs (February 2012) has confirmed a huge rise in the number of countries that nowadays have military unmanned aerial systems. The report states that between 2005 and December 2011, the number of countries that possess UAVs rose from 41 to 76. Nevertheless, the great majority of this industry is driven by the United States, whose budget and current need is larger than any other country in the world. European and United States forecasted future investment in military UAVs procurement is compared below:

![Figure 12. Expenditure on Military UAV (Europe and USA), 2007-2016](image)

On the other hand, the civil and commercial market for UAVs is in its incipient phase with significant potential, sometimes unrealized, in a wide number of applications. The available technology offers the opportunity to replace existing solutions, and possibly to be applied in new areas where there is no existing solution yet. The market for UAVs in civil and commercial applications can be segmented as follows:
It is expected that these markets will not emerge simultaneously, but gradually one after another. Government users are expected to be the first adopters within the civil market, based on knowledge of past and ongoing activities. The next figure represents the forecast in function of the market segment within civil industry.

**Figure 14. European Civil and Commercial UAVs Market forecast by [15]**

Despite of the rapid growth of UAVs operations for governmental and commercial purposes, it is extremely difficult to determine the actual commercial market size in light of the many regulatory and technological obstacles to be overcome before UAVs can be integrated into
civilians in civilian air space. This is why Figure 14, estimated in 2007, is more pessimistic than various studies which have been conducted later on regarding the future market opportunities for civil UAVs sales worldwide. Many analysts are bullish on market growth and on the emergence of regulation in a short future. However, there is wide variance in views about actual market growth, which range from 10-15% per year to order of magnitude growth in civil market opportunities. According to [17], world civil UAVs production is forecasted to make up 8.7% of the $3.4 billion in 2011 global production value, what is equal to around 231€ million.

Civil UAV World production forecast by region by [17] is shown in the following tables.

<table>
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*Table 4. Civil UAVs World Production Forecast by Region (in Units) [17]*

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*Table 5. Civil UAVs World Production Forecast by Region (in Million $) [17]*

It is important to remark that these studies are not specific for the UAVs used by Imaginaeri, but in general for conventional UAVs with fixed wings and petrol engines. Imaginaeri UAVs belongs to the category of multicopters, UAVs with several rotors and electric batteries. Although they are Unmanned Aerial Vehicles, they represent an emerging market, not regularized yet and therefore not forecasted specifically by any study. The price of these
copters is much lower than the price of conventional UAVs and this is why the number of units with the forecast investment would be much higher than the one showed by the studies.

Taking into account this consideration, the higher investment when regulation is launched and the government policies for supporting start-ups and research and development activities, Imaginaeri can be optimistic about its business.

b. Types of UAVs

The market of UAVs can be classified in function of the payload of the UAV itself and the range and altitude of the flight. This classification is shown in the following figure.

![UAVs market segmentation](image)

*Figure 15. UAVs market segmentation [15]*

Military applications use generally bigger UAVs with larger range. In the US, for instance, spending on UAVs is mainly for MALE UAVs type.

There is also an emerging new category, which considers Micro-UAVs. Micro-UAVs are very small air vehicles (under 30 cm), which can be held in the hand and usually they weigh less than a kilogram. These, are powered UAVs using miniaturized cameras. The requirement is that they have a range up to 10 km, speeds up to 30 mph, and endurance of 20-120 min.
Imaginaeri multicopters could be classified within this new category (Micro-UAV), due to its size, weight, endurance and range. However, regarding its speed, they would belong to Mini-UAV classification, and if its range is considered (around 3km) they should be included in the Vertical Take Of Landing (VTOL) group. Taking into account the scope of the references consulted, Mini-UAV category happens to be the most suitable for Imaginaeri multicopters.

Mini-UAVs are tactical systems intended for small unit reconnaissance, perimeter security and similar applications. They are small enough to be man-portable, and are either hand launched or use some form of launch assistance such as a bungee cord or a small electronic platform. This kind of UAVs are big enough to carry the payload required for the services Imaginaeri provides but small enough to obtain a competitive price, much lower than the bigger UAVs. Besides, their small size makes them manageable but more robust than Micro-UAVs.

Civil Mini-UAVs represent a small percentage in terms of money of the whole market share. The main reasons are that the civil industry is not very expanded yet, and that they are much cheaper than the bigger ones, specialized for military applications. However, studies by Teal Group Corporation [17] conclude that Civil Mini-UAVs market is expected to grow in the following years, representing an investment of $2350 million, more than 1800€ million. As it has been mentioned before, Imaginaeri multicopters are not fixed-wing UAVs and they use electric batteries instead of petrol. That is why the same investment corresponds to many more units than the ones show in the graphic below.

![Total $ million 2012-2012](Figure 16. World Production Forecast by type (in Million $) [17])
Looking at these numbers, it can be concluded that Imaginaeri works in a growing segment of the whole market, with large potential and an important investment forecasted.

3.5. Distribution Channels

Despite the intense growth that the UAVs market has shown in the recent years, it continues being a specific market focused on singular clients. As a result, in most of the cases there are few distribution channels.

The most common technique is to offer the products and services through an own website. Nevertheless, as many potential customers are quite big and special; as governments, private security enterprises, etc.; other option widely extended is to address directly the customers.

Segmenting more the market in multicopters and services related, the above mentioned distribution channels remain. However, the differences between them and conventional UAVs permit other kind of strategies followed by some companies.

Some big ones, oriented to sell worldwide, have a resellers network in order to provide easily sales and support depending on the world area the client is located.

Due to the small size and low price in comparison with conventional UAVs, many companies use as resellers airplane modeling or hobbies websites. Besides, has to be taken into account that there are companies selling some varieties of multicopters as toys. This channel is also useful in order to sell spares.
As it is deeply explained in Chapter 5, Imaginaeri is focused on providing services, therefore the most suitable option for the company is to address directly the customers. However, a website it is also necessary, since this is a useful tool for customers to look deeper what they have been previously informed. Besides, a website is a good supporting tool to the ‘word to mouth’ promotion.

As also stated in Chapter 5, a strategic objective of Imaginaeri is to penetrate other countries in a medium-long term scenario. For achieving this goal the company will look for local partners.

4. SWOT ANALYSIS

This chapter aims to explain and analyze Imaginaeri’s SWOT. This analysis and the conclusions obtained are used to define and set the business strategy followed by Imaginaeri.

In Figure 18 are shown the principal strengths, weaknesses, opportunities and threats that affect Imaginaeri’s business.

![SWOT Analysis Diagram](image)

Figure 18. Imaginaeri’s SWOT Analysis

Note: (*) represents the main factor within the category

In addition, these factors are analyzed using the so-called confrontation matrix. This method uses a weighted assessment confronting internal and external factors affecting the business.
The fulfillment of the confrontation matrix has been carried out using a scale from -3 to +3 to assess the effectiveness of strengths to take advantage of opportunities and counteract threats; and the influence of weaknesses to prevent from taking advantage of the opportunities and to cause the exposure to the threats.

These internal and external factors are explained more deeply in the following tables, and then the confrontation matrix is shown explaining the conclusions and strategies derived from its analysis:

<table>
<thead>
<tr>
<th>STRENGTHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imaginaeri is a services oriented company (main strength)</td>
</tr>
<tr>
<td>This provides flexibility, quick adaptation to changes and, comparing with manufacturers, lower initial investment and lower time needed to establish the business.</td>
</tr>
<tr>
<td>High-performance products</td>
</tr>
<tr>
<td>Imaginaeri is offering solutions through high quality and performance products. This makes it to stand out from competitors and other available alternatives.</td>
</tr>
<tr>
<td>Reduced cost</td>
</tr>
<tr>
<td>Comparing Imaginaeri’s solution with similar services available, costs are less in most cases, specially considering that Imaginaeri provides whole solutions.</td>
</tr>
</tbody>
</table>

*Table 6. Strengths*
### WEAKNESSES

<table>
<thead>
<tr>
<th>Weakness</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting finance (main weakness)</td>
<td>Getting finance is the main aim for all start-ups in order to start definitively the business.</td>
</tr>
<tr>
<td>Special clients</td>
<td>Although there are many potential customers, most of them are big enterprises and the government, which may have specific need, tight budgets and different profiles. Besides, they may be affected for being located in Spain in the current crisis situation</td>
</tr>
<tr>
<td>Lack of experience</td>
<td>This is a new market, and Imaginaeri’s founders do not have previous experience managing businesses.</td>
</tr>
</tbody>
</table>

*Table 7. Weaknesses*
# OPPORTUNITIES

## Emerging market (main opportunity)

Starting up a business in an emerging market always gives more chances of succeed, less entry barriers, more market share, more visibility and other advantages.

## High-tech environment

Human beings are living in a high tech environment in which every new technology that makes easier our daily life is firstly accepted and eventually widely welcome.

## Absence of substitutes

Nowadays it does not exist other companies using multicopters, which can really compete with the services provided by Imaginaeri. During the last months, an important interest in the sector has risen and different names have been heard, however, there is still no company operating.

*Table 8. Opportunities*
### THREATS

#### Lack of regulation (main threat)

This is the main threat that Imaginaeri and other civil UAVs and multicopters companies are facing nowadays. Nevertheless, all the current political, legislative and even commercial movements make foreseen an imminent positive change on this aspect.

#### Economic crisis

As all Spanish and European companies, Imaginaeri has to deal with the economic crisis. However, there are optimistic forecasts about the evolution of the economy.

#### Entry of new competitors

As in all the emerging markets, the entrance of new competitors is always a threat to be taken into consideration, especially in a trendy market as this one.

*Table 9. Threats*
### Opportunities

<table>
<thead>
<tr>
<th></th>
<th>Emerging market</th>
<th>High-tech environment</th>
<th>Absence of substitutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Services oriented</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>High performance products</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Reduced cost</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

### Threats

<table>
<thead>
<tr>
<th></th>
<th>Lack of regulation</th>
<th>Economic crisis</th>
<th>Entry of new competitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Services oriented</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>High performance products</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Reduced cost</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

### Horizontal sum

|                | 3 | 1 | 2 |

### Vertical sum

|                | 10 |

---

**Table 10. Confrontation matrix**

It can be observed in the confrontation matrix (Table 10) that the most important factors are the strength of being a services oriented company and the weakness of getting finance. In addition, it is worth to mention the lack of regulation is the most important threat, however, it does not affect the scoring since neither strengths nor weaknesses can influence it.
Following, some conclusions derived from a deep analysis of this assessment are shown, as well as the main Imaginaeri’s strategies according to them:

- **Attack Strategies:**
  - Being a services oriented company, Imaginaeri has many chances to take advantage of the multicopters emerging market. It provides whole solutions, having as a consequence more potential clients. This point also helps to have a price not easily comparable due to the whole service package.
  - A high quality and performance product, as the offered by Imaginaeri, is always more welcome than less quality ones in an increasingly technological environment.
  - Services provided through high quality products, always updated technologically, permit Imaginaeri to offer tailored and adapted solutions depending on the customer needs.

- **Defense Strategies:**
  - Being a services oriented company with reduced cost product helps Imaginaeri to deal with the economic crisis in a better way than others.
  - The fact of being pioneer providing services with high quality and performance, makes more difficult new competitors affect deeply Imaginaeri’s business.

- **Strengthening Strategies:**
  - In order to take full advantage of the multicopters emerging market and to have strong presence in the current technological scene, Imaginaeri has to have reliable ways to getting finance as needed.

- **Withdrawal Strategies:**
  - Analyzing the worst possible scenario, having clients with special needs in an economic crisis context and with the risk of entrance of new competitors might have as a result the Imaginaeri’s need of reorienting its strategy. Concrete action plans are detailed in Chapter 9.9.

Finally, and according to the global assessment, it can be concluded that Imaginaeri has large possibilities to turn out into a complete success and as consequence becoming into a business in which is well worth investing on.
5. STRATEGY ANALYSIS

5.1. Mission, Vision and Values

Mission

“Imaginaeri’s mission is to meet the needs of civil institutions and companies through UAVs technology, providing adapted solutions for services which needs to extend or adapt human vision, complemented by the highest standard of product support and service”.

Vision

- Integrate UAVs technology in the common activities of society
- Leading UAVs services companies
- Overcome customers’ expectations and provide them support to integrate our technology in their businesses

Values

- Customer Focused
- Enhancing shareholders and investors value
- A diverse and involved team, people working together, integrity.
- Environmentally friendly, sustainable growth and good corporate citizenship
- Continuous innovation for industry leadership and new customized solutions

5.2. Positioning

Imaginaeri is not a UAVs technology manufacturer; it is a company which provides complete solutions. Products are tailored in function of customer needs and a high qualified and trained team manages the services.

Imaginaeri fosters a continuous flow of views with its customers, encouraging new ideas and technical feedback on its products and services in order to improve and adapt them to emerging needs. This is the reason why Imaginaeri’s products and services support team is composed by a group of passionate people always willing to help the client.
Imaginaeri’s solutions include the product, a specific payload, the possibility of specific platforms, the operations of the multicopters, technical and personal support, continuous updates and counseling and so and so forth. All this together makes Imaginaeri a company with a close relationship with customers, what makes harder the entry of new competitors. This positioning, values and ideas define the value proposition of the company:

“New solutions for old problems”

Services

Taking into account the studies mentioned in Chapter 3.4 and the forecast made for the use of UAVs in different industries, Imaginaeri is focused on applications which require to extend or adapt human vision. These services may require specific sensors, stealth or vision over difficult terrains for human access or dangerous areas.

The main services Imaginaeri provides are represented in the figure below:

![Figure 19. Imaginaeri’s main services](image)

Table 14 and Table 15 contain more detailed the information about the platforms and payloads used to provide the services showed above (Figure 19). Chapter 6.3 and Table 63 include more examples about services provided by Imaginaeri.
Priority markets

Regarding the priority markets to enter, the forecast made in [17] explains how the use of Civil Mini-UAVs will not start at the same time in all countries. As it has been explained in Table 4 and Table 5, Europe will be the third largest area to adopt UAVs technology, after USA and Asia-Pacific.

Imaginaeri will adapt itself in function of the final regulations in order to penetrate the industry in one country or another. Considering that all the countries in the EU will adopt the law nearly at the same time, EU has been considered a good place to start the business. Specifically, France or United Kingdom present the best forecasts within Europe, while Spain could be one of the latest adopters of UAVs technology. The forecasted production in France and Spain is shown in the following tables.

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Mini-UAV</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>600</td>
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<tr>
<td>Small Tactical UAV</td>
<td>50</td>
<td>25</td>
<td>-</td>
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<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>5</td>
<td>15</td>
<td>25</td>
<td>-</td>
<td>45</td>
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<tr>
<td>MALE UAV</td>
<td>-</td>
<td>-</td>
<td>5</td>
<td>5</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>3</td>
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</tr>
<tr>
<td>Naval VTUAV</td>
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<td>-</td>
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<td>3</td>
<td>3</td>
<td>3</td>
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<td>9</td>
</tr>
<tr>
<td>Neuron UCAV</td>
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<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Civil Mini-UAV</td>
<td>-</td>
<td>-</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>10</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
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</tr>
<tr>
<td>Civil MALE UAV</td>
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<td>2</td>
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<td>6</td>
</tr>
</tbody>
</table>

*Table 11. France Production Forecast [17]*

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</thead>
<tbody>
<tr>
<td>Mini-UAV</td>
<td>-</td>
<td>30</td>
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<td>-</td>
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<td>-</td>
<td>-</td>
<td>30</td>
</tr>
<tr>
<td>Small Tactical UAV</td>
<td>-</td>
<td>5</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>25</td>
<td>40</td>
</tr>
<tr>
<td>Tactical UAV</td>
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<td>-</td>
<td>-</td>
<td>4</td>
<td>4</td>
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<td>-</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>MALE UAV</td>
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<td>-</td>
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<td>-</td>
<td>-</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Naval VTUAV</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Civil Mini-UAV</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>-</td>
<td>30</td>
</tr>
<tr>
<td>Civil MALE UAV</td>
<td>-</td>
<td>-</td>
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<td>-</td>
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<td>-</td>
<td>2</td>
<td>-</td>
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</tr>
</tbody>
</table>

*Table 12. Spain Production Forecast [17]*

However, these forecasts will depend a lot on the regulations and, in the case of Spain or other countries in a bad economic situation, on the price of the final product. It must not be
forgotten than the studies are generally focused on fix-wing UAVs which use engines powered by gasoline while Imaginaeri’s multicopters use several rotors and electric batteries, what makes the product much cheaper than the usually considered one. That is why, considering a similar investment than the forecasted for Civil Mini-UAVs, the number of units would be much higher. Due to these reasons, and to our deeper knowledge about Spanish industry and regulation, the company is focused initially on Spain market.

Another country to be watched out is Russia since the forecast for this country is especially positive. However, due to the possible entry barriers, Russia will not be a priority market.

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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mini-UAV</td>
<td>15</td>
<td>45</td>
<td>60</td>
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<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>540</td>
</tr>
<tr>
<td>Tactical UAV</td>
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<td>10</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>5</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>MALE UAV</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>10</td>
</tr>
<tr>
<td>HALE UAV</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>

*Table 13. Russia Production Forecast [17]*

5.3. Strategy

As it has been detailed in the previous section, Imaginaeri’s solutions are different because of its customer focalization. The company offers two alternatives for its clients:

a. Outsourced standardized solutions

In this case Imaginaeri uses its own product (Multicopter + specific payload) and offers services in real time. The company owns different equipment which can be slightly adapted in function of the customer’s needs. This offer is useful for clients who require an isolated work or a periodical service which they want to outsource due to strategic or economic reasons, i.e.: study possible leaks in airport beacons or surveillance tasks.

b. Customized solutions

This offer is oriented to customers who want to have specific equipment. For this purpose, Imaginaeri designs tailored solutions for customer’s needs (Multicopter + payload required + platform if required). These solutions are adapted to a specific business and industry. For example, Imaginaeri could design a specific platform to be placed in the rooftop of a police car.
carrying a multicopter ready to be launched whenever it is needed. The multicopter would be manageable by a trained person and could follow another car and take pictures if it is required. This solution is completely different to the one which could be requested by The Spanish Electricity Network or by a construction company for other specific applications. This option will be offered from the third year onwards. In this case, Imaginaeri makes the integration of all the systems needed for the operations and offers consulting tasks, counseling and periodical technical reports. At a first stage, Imaginaeri operates also these multicopters. From the fifth year onwards, Imaginaeri will study if offering also the possibility of buying the equipment with an adapted configuration in order to be operated by the client/final user. In this case, the company would also offer training and qualification for the operators.

After-Sales support

Imaginaeri’s team is always willing to contact with its clients to provide any technical support. The customer may require some reports or additional processing of the data obtained after the service is carried out.

Our strategy is to start by offering alternative a) in order to gain experience and clients. This alternative is less risky since the same or similar service can be provided for different companies. After a couple of years learning, Imaginaeri will start also selling tailored solutions which are more complex and require a higher investment in research and development.

A detailed products and clients plan is provided in Chapter 3.2.

Objectives in 5 years

- Introduce the use of copters as a solution for daily tasks required by governments or civil companies, starting in Spain and later on in Europe, focusing in the countries with better expectations, like France and UK.

- Start providing services as externals for companies which require solutions quite standardized like aerial imaging, surveillance or analysis applications. Make our products known and start developing specific solutions for new clients by the fourth year, for example for the Spanish Ministry of Interior.

- To recover the whole investment and to generate benefits, having up to then around 30 multicopters able to provide between 900 and 1100 services per year. By then, Imaginaeri will be established in Spain and starting to penetrate other countries’ market by looking for local partners.
6. OPERATIONS PLAN

6.1. Services portfolio and Imaginaeri’s multicopter platforms

a. Introduction

Imaginaeri uses the finest multi rotor VTOL (Vertical Take Off & Landing) unmanned aerial vehicles to provide our customers with the advantages of having a sensing machine in the air. This technology allows Imaginaeri to deliver high quality services to a wide range of industries and customers as detailed in Chapter 3.2.

As previously aforementioned in Chapter 5.3, Imaginaeri is envisaged to start developing its operations as a subcontractor of companies which require specific services, since either not fulfilled with their own capabilities or they are susceptible to be outsourced, involving multicopters usage.

b. Suppliers: the right choice

Imaginaeri has carefully selected, from an extended list of manufacturers and assemblers, a top-notch Ready-to-Fly Multicopters producer that provides outstanding performing machines at a suitable range of prices. The main supplier for Imaginaeri services will be OFM (Only Flying Machines) [19].

OFM is a small to medium sized supplier based in China, which assembles with standard parts and spares from big and prestigious manufacturers from multi rotor UAVs’ industry based in different countries: China, US and Canada. Having the option to order parts and spares from other suppliers gives Imaginaeri more bargaining power in our relationship with its suppliers and will help cutting down maintenance and airworthiness costs of its platforms.

These Aerial Vehicles are in the quick process to become really standardized, allowing thus for a high scale customization with a minimum effort. One of the main strategic objectives of Imaginaeri is that its product and service portfolio must remain flexible and innovative as technology evolves. This is one reason more for the selection of OFM, as one of the main advantages that this supplier offers is the rate of innovation and the continuous evolution of its platforms.
c. Services offered

Regarding the service to customers, Imaginaeri’s technical staff creates the appropriate, specific and custom configuration or combination of platforms its customer might demand depending on the requirements of the task to be developed. An introduction to the services Imaginaeri provides is in Chapter 5.2.

In order to set up the final service configuration Imaginaeri employs three different multicopter platforms depending on the requirements of the task:

<table>
<thead>
<tr>
<th>IA Pigeon</th>
<th>Small and versatile, able to withstand up to 20 minutes flight endurance with a light camera, this quadcopter is the most affordable option.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA Falcon</td>
<td>Fast and reliable, this device may be used in services requiring high speed or high endurance. The IA Falcon can reach speeds of up to 105 km/hour, and this makes it the perfect choice when high speed and time matters.</td>
</tr>
<tr>
<td>IA Phoenix</td>
<td>Able to lift heavy payloads, the IA Phoenix can carry a Sony NEX 7 EVIL 24px professional camera. With the largest battery, the IA Phoenix can endure service time up to 40 minutes.</td>
</tr>
</tbody>
</table>

Table 14. The three multicopter platforms employed by Imaginaeri

*IA stands for Imaginaeri.

The table hereunder (Table 15) contains a comparison of the three platforms in terms of:

- **Speed**: is the maximum speed that the multicopter can deliver. More stars means higher speed.
- **Price**: is the price is in terms of rental. More stars means lower price.
- **Endurance**: is the time that the platform can withstand in the service delivery without replacing the battery. More stars means longer endurance.
- **Weight**: refers to how much heavy is the multicopter platform. More stars means lower weight.
- **Payload**: describes how much weight the platform can carry. The bigger the payload the most configurable it is and the most number of different services may be provided. More stars means more payload capabilities.

- **Range**: this is the maximum distance that the copter can fly away from the operator. More stars means more effective control range.

Table 15. Imaginaeri multicopter platforms comparison
Below there is a brief table (Table 16) depicting Imaginaeri’s services portfolio. This table summarizes the most important criteria used to configure the solutions that are offered by Imaginaeri.

<table>
<thead>
<tr>
<th>Service Group</th>
<th>Platform</th>
<th>Systems onboard</th>
<th>Operators</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerial Photography (High Definition)</td>
<td>IA Pigeon</td>
<td>×</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td></td>
<td>IA Falcon</td>
<td>×</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td></td>
<td>IA Phoenix</td>
<td>×</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>Aerial Video (Standard Definition)</td>
<td>IA Pigeon</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>IA Falcon</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>IA Phoenix</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Infra-red Inspection</td>
<td>IA Pigeon</td>
<td>×</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td></td>
<td>IA Falcon</td>
<td>×</td>
<td>×</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>IA Phoenix</td>
<td>×</td>
<td>×</td>
<td>✓</td>
</tr>
</tbody>
</table>

*Neither the cost of the operators nor trips’ one has been considered. This fact is taken into account in order to calculate the price of each mission in Chapter 7.

In order to clarify the type of mission, here there are some examples: an example of high definition aerial photography services are those requested for instance by an independent movie maker. This possible customer wants to record aerial footage of a scene, but this person does not want to contract the services of expensive helicopters. Therefore, he decides to hire Imaginaeri’s services. The independent movie maker will then record perfect footage by using the IA Phoenix with continuous recording capabilities for forty minutes with a professional 24 megapixel camera.

Consider now a security enforcement company with several service contracts for vigilance. This represents an example of the standard aerial photography services. The company is actually considering hiring more employees because they have very big properties to watch.
out for. According to this specific situation, the company hires the security enforcement package which allows it to watch out big areas at high speed (up to 105Km/h).

For the *industrial infrared inspection services*, can be considered another example, that is, a bidder for the administration of an eolian power generation field. In order to cut costs in the regular maintenance, the company contacts Imaginaeri. The company requests for a services’ contract for the joint inspection and maintenance tasks of the wind turbines. Imaginaeri offers then the appropriate number of IA Phoenix in accordance to the extents of the premises. The IA Phoenix develops inspection actions with cameras incorporating infrared sensors, avoiding the need of putting workers at the top of the wind turbines and consequently the risks it involves.

Other *infrared inspection service* is the detection of the so-called corona discharge effect, produced at high power lines which results in power loss, electromagnetic interferences and audible noise among other consequences. Corona discharge and leakages can be detected at power lines by using infrared cameras which analyze the gases around lines, making possible to solve this problem before it is too late. In addition, this equipment can be also used in other kind of services as rescue and people searching activities.

6.2. Imaginaeri’s multicopter platforms

a. The IA Pigeon

A miracle in the multicopter industry. Without any GPS position hold and expensive flight controllers, this is a quadcopter with amazing stability, easy to fly.

The IA Pigeon runs on a single three serial cell battery configuration, this machine can endure missions for up to 20 minutes.

*Figure 20. IA Pigeon Platform*

The IA Pigeon offers outstanding simplicity in the control and system’s configuration. The radio controller comes with an In Video Receiver and a color 3.5inch LCD that shows the view of the quadcopter in ranges up to 1000m thanks to a customization of the radio set (tweaked with a 100MW power amplifier on the receiver).
Main Features

- Devo F4 Radio system with Video Receiver and a 3.5inch LCD Screen built in.
- Onboard DV04 High resolution camera and HD Recording module.
- Onboard 5.8Ghz Video transmitter.
- 2200mAh three serial cell battery configuration

b. The IA Falcon

Offering dual axis stabilized camera mount, a controllable tilt angle to get a clear bird’s eye view (camera pointed to ground), the IA Falcon is able to fly up to 20 minutes and carrying good payload.

The IA Falcon is able to deliver great speed capabilities thanks to the perfectly tweaked configuration of high voltage power supply and the high efficiency brushless motors. The IA Falcon can reach 105Km/h, which allows it to fulfill the requirements of the most demanding customers in the field of security and law enforcement.

Main Features

The IA Falcon’s comes with DJI Naza M GPS, which offers stunning features:

- Failsafe Auto Return to home and Land if the vehicle goes out of control range.
- Intelligent Orientation control, Course lock and home lock features.
- Attitude hold and solid GPS Position hold flight modes.
- Fast and stable manual flight mode.
- Auto Return to home and land on demand.
c. The IA Phoenix

The Ultimate quadcopter for professional aerial filming and professional missions. Designed especially for high endurance and heavy payload purposes, the IA Phoenix offers a level of service not found in other competitors.

![IA Phoenix Platform](image)

Easily convertible to octacopter for added payload capabilities, this platform offers a great plethora of stabilized gimbals and room for custom payloads allowing the best configuration capability in Imaginaeri’s portfolio. Due to this fact, it is the best choice for infrared missions or infrastructure analysis.

**Main Features**

- Superb Flight performance and better payload handling
- Full Autonomous flight capable with IOS, and ANDROID support
- Great range of operation (up to 3km)
- Outstanding flight endurance (from 30 and up to 45 minutes depending on payload)

See Appendix IV for IA Falcon and IA Phoenix technical features.
6.3. Multicopter generic components

The figures below represent a brief explanation of the components of a generic autonomous VTOL multicopter:

**The frame:** Is the skeleton of the aircraft and is normally constructed with light materials as composites or high resistance plastics. This is normally the 40% or 50% of the cost in a multicopter.
**The rotors:** the rotor is constituted by one engine and one table. The ‘de facto’ standard is to use brushless DC rotors with high KV. The election of the rotors is important as they determine the endurance, acceleration and speed of the multicopter (along with the battery).

![Figure 25. Multicopter’s rotors](image)

**The arms and the Electronic Speed Controller:** what the arm contains at the end beside the rotor is an embedded microcontroller that modulates the voltage and current withdrawn to the rotor in order to maintain the angular speed as it is needed to obey command from Ground Remote device. Each rotor has one of these.

![Figure 26. Multicopter’s arms and Electronic Speed Controller](image)
The **main board**: needed electronics to command communications and the rotors according to the signals emitted by the ground control device. In the last year many low price HW license free products have appeared in the market (see the example of Arducopter, or Ardupilot). This hardware is based on arduino designs and thus is similar to the GNU non-restrictive licenses utterly known from the free software industry. This composes around 30% of the cost of the multicopter.

![Figure 27. Multicopter's main board](image)

The **ground control device**: is the device used to command the multicopter using normally a wireless connection that allows for control in a range of 1 and up to 3 km of service. The ground control can be in charge of the telemetry for the sensor or not, depending on the characteristics of the system.

The **battery**: in charge of giving power to the whole system the battery is composed normally with a certain number on serial and parallel lithium polymer cells. There is also some sort of ‘de facto’ standard for these, and it is the 3 serial X parallel cell configuration offering 11.3V and an amount energy no less that 4000mAh for medium size multicopters. The big ones may carry up to 3 or 4 big batteries. As an example the IA Phoenix is carrying three 10900mAh offering 32700mAh (parallel configuration).

![Figure 28. Multicopter's batteries](image)

The **FPV Combo**: is a wireless video link. This combo is composed of an embedded circuit onboard the aerial system and an electronic goggles that show the video link from the multicopter. The stock setup effective range for these is usually 100 to 300 meters, but applying some tweaks and augmenting the power delivered to the antenna the signal may offer a solid 1km range.
The operator: nowadays there is no need for a licensed operator since regulation is not ready yet, but in the future operator will likely be in similar conditions as any other vehicles drivers (cars, bus, aircraft, etc.) and will need licenses and liability insurances.

The Electronic Stabilized Gimbal: Is a platform that sustains the Imaging system. Whether is a Sony NEX or a GoPro, these cameras are sensitive to the quick movements and tilts that the rotors generate and therefore the image is blurry. The Stabilizer uses a gyroscope to detect the deviation in azimuth and sideways and compensate it by applying the contrary skew.

![Figure 29. Multicopter's Electronic Stabilized Gimbal](image)

The Flight Control and GPS: is the union of a (normally 5.8 GHz) antenna and a GPS receiver. These are connected to the main board and play together to allow the multicopter to fly to specific programmed waypoints or routes or fly statically at a certain point. There is one big manufacturer globally for these devices, is DIY which produces NAZA and the Wookong M.

6.4. Image Systems

Multicopters are envisaged to carry a plethora of sensor and cameras onboard; and connect to ground systems by communication electronics. In the ground control system the data is treated to produce valuable information for customers.

In this chapter some cameras and sensors characteristics are detailed and explained.
a. GoPro Hero 3

The GoPro Hero 3 is a Wi-Fi controlled action camera. With only 74 grams, it can shoot 12 megapixels photos and record 4K video at 15 frames per second. The camera is linked to mobile platforms using Wi-Fi and allowing thus control of the exposition and the capture.

The GoPro Hero 3 is robust and waterproof and will withstand the vibrations thanks to the built in.

*Figure 30. GoPro Hero 3*

b. Sony NEX 7K

The Sony NEX 7K delivers extraordinary picture quality thanks to the ultra-high resolution 24.3 megapixel Exmor™ APS HD CMOS sensor. This sensor offers phenomenal imaging performance: like a DSLR camera, but without the size and weight. The user can see the difference with richly detailed, low-noise pictures, even in low light.

*Figure 31. Sony NEX 7K*

This camera located on top of the flying vehicle allows amazing professional footage that can be priceless to a media enterprise.

c. FLIR Tau 2

FLIR’s Tau 640 is a 640×512 LWIR uncooled focal plane array (FPA) camera with a pixel size of 17 microns. This system is a slow video core; this exempts the camera from export license requirements (US Government Military Export license). The slow video rate is 7.5 fps for NTSC and 8.3 fps for PAL.

*Figure 32. FLIR Tau 2*
A number of optional accessories provide additional Tau connectivity, including a Photon replicator board that enables backward compatibility with Photon accessories, and a VPC (video/ power/ communications) expansion board that features power & communication over USB.

FLIR’s Tau 2 thermal imaging cameras offer an unmatched set of features and capabilities, making them well-suited to many demanding applications.

See Appendix V for Image Systems technical features.

6.5. Expansion Plan

Having studied the sales forecasted for Civil Mini-UAV at Europe, Table 4 and Table 5, and knowing that the medium price for a multicopter with Imaginaeri’s characteristics is 10000€, it is possible to calculate the number of multicopters equivalent to the budget forecasted for Europe.

However, it is also necessary to remember that the amount of money estimated in the survey includes a high percentage dedicated to fixed wing Mini-UAVs, which are between 5 to 10 times more expensive than Imaginaeri’s multicopters. Therefore, the number of dollars dedicated to multicopters is considered to be just a 3% of the number of M$ forecasted for the whole market in Europe. The units of multicopters can be calculated by dividing this percentage by the price of a single multicopter.

Finally, considering the production forecast made by country [17], which is partially shown in Table 11 and Table 12, it can be concluded that the market share corresponding to Spain is around 1/9 of the budget forecasted for Europe.

The results of these operations are shown at the following table Table 17.

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe Total M$ [17]</td>
<td>365</td>
<td>631</td>
<td>721</td>
<td>921</td>
<td>1018</td>
</tr>
<tr>
<td>Europe Multicopter M$</td>
<td>11</td>
<td>19</td>
<td>22</td>
<td>28</td>
<td>31</td>
</tr>
<tr>
<td>Europe Multicopter Units</td>
<td>823</td>
<td>1423</td>
<td>1626</td>
<td>2077</td>
<td>2296</td>
</tr>
<tr>
<td>Spain Multicopter Units</td>
<td>91</td>
<td>158</td>
<td>181</td>
<td>231</td>
<td>255</td>
</tr>
</tbody>
</table>

*Table 17. Multicopter market forecast for Europe and Spain*
a. Geographic plan

At a first stage, Imaginaeri focuses on Spain. The main reason is that this is the market Imaginaeri better knows and therefore it is easier to penetrate. Besides, government applications are forecasted as one of the main target group of applications: big, stable and pioneer; and it is clear that it is easier to start building relationships with the own government of the country where the company is located.

At a second stage, Imaginaeri will start expanding to Europe, especially to the countries which present the best forecasts. These are mainly France and UK.

Finally, Imaginaeri will look for local partners and it will spread to more countries in Europe, or even later to Russia, which presents, apart from US, the best-forecast regarding UAVs commercialization.

The geographic plan is represented in the figure hereunder (Figure 33):

![Figure 33. Geographic plan](image)
b. Services and clients plan

In order to build this plan several facts have to be considered:

- To provide standardized services is easier and less risky than develop customized solutions, training and post-sale service. Therefore, Imaginaeri starts making itself known by its standardized solutions.

- The most standardized services are surveillance and thermal analysis services, since the payloads associated can be used for several applications.

- Government applications are forecasted as the most profitable within the civil industry followed by firefighting applications.

Conclusion: At a first stage Imaginaeri focuses on building relationships with the government and companies which require standardized solutions. Imaginaeri’s staff provides these solutions. At a second stage, once Imaginaeri already has a reputation and also a more comfortable economic situation, it will start to work on customized projects. This implies to build relationships with more specialized companies and to continue working with the government, big companies and some SMEs. Finally, once Imaginaeri has an experienced knowledge of the business, and a leader position in Spain, the company will try to penetrate the European market by building relationships with European companies and/or local partners.
The whole products and clients plan is represented in the following figure (Figure 34):

**Milestones**

1. Start: First investment, conditioning of the industrial unit, procurement, SW and systems installation.
2. Relations with the government and companies
3. 45 or more services contracts
4. 200 or more services contracts
5. 340 or more services contracts
6. Relations with more specialized clients
7. Working on customized solutions and 750 services contracts
8. Relations with other European countries
9. Having around 15 copters and providing between 900 and 1200 services

**1st stage: 2014 - 2017**

- Start: First investment, conditioning of the industrial unit, procurement, SW and systems installation.
- Focus on services which are more standardized: Surveillance and thermal analysis
- Prioritization of services for which a higher growth is forecasted: government and fire fighting
- Focus on big companies and government: Fire Brigade, M.del interior, ADIF, Suravia, Mundocopter...

**2nd stage: Starting at 2017**

- Start developing customized solutions
- Continue relations with previous clients and Build new relations with more specialized companies: Aena, Prosegur, National Police...
- From 2018, start building relations with other European countries’ companies and/or local partners

*Figure 34. Products and clients plan*
Multicopter units bought by Imaginaeri and corresponding market share at Spain by years are estimated in Table 18:

<table>
<thead>
<tr>
<th>Region</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imaginaeri's units</td>
<td>5</td>
<td>5</td>
<td>10</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>% Market share</td>
<td>5.47%</td>
<td>3.16%</td>
<td>5.53%</td>
<td>4.33%</td>
<td>5.88%</td>
</tr>
</tbody>
</table>

Table 18. Estimation of multicopters bought by Imaginaeri and Spanish market share per year

As it is stated in the Strategic Objectives (Chapter 5.3), Imaginaeri aims to be leader of the market of companies which provides services by using multicopters’ technology. Therefore, a 5.88% of market share, just in products; it is a very good number. The market share regarding services would be much higher.

The forecast regarding services sale, represented in Figure 34, can be broken up if the standard services Imaginaeri provides are considered. These standard services are described in Chapter 6.1. Figure 34 represents the forecast of services by year and type.

<table>
<thead>
<tr>
<th>Service / Mission</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerial Photography (High Definition)</td>
<td>12</td>
<td>50</td>
<td>85</td>
<td>187.5</td>
<td>275</td>
</tr>
<tr>
<td>Aerial Video (Standard definition)</td>
<td>12.96</td>
<td>54</td>
<td>91.8</td>
<td>202.5</td>
<td>297</td>
</tr>
<tr>
<td>Infra-red / Thermal Inspection</td>
<td>23.04</td>
<td>96</td>
<td>163.2</td>
<td>360</td>
<td>528</td>
</tr>
<tr>
<td>TOTAL SERVICES</td>
<td>48</td>
<td>200</td>
<td>340</td>
<td>750</td>
<td>1100</td>
</tr>
</tbody>
</table>

Table 19. Estimation of services sold depending on the type of mission per year

6.6. Investment Plan

The following Gantt diagram (Figure 35) shows the investment-scheduled year by year, differentiating between tangible and intangible assets.
Based on the previous diagram, it is possible to break down all the costs and infer the investment planned by year, and of course, the initial investment required. This value provides an idea about the loan and the capital needed to establish the company. The conclusions are shown in the following table (Table 20). The initial investment required comes to 63000€.

<table>
<thead>
<tr>
<th>Year</th>
<th>Investments</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>First multicopters + payloads: 2 IA Phoenix, 2 IA Falcon and one IA Pidgeon.</td>
<td>35000€</td>
</tr>
<tr>
<td></td>
<td>Industrial unit conditioning and adaptation</td>
<td>5000€</td>
</tr>
<tr>
<td></td>
<td>Warehouse tools and workshop equipment</td>
<td>12000€</td>
</tr>
<tr>
<td></td>
<td>Computers and licenses</td>
<td>3500€</td>
</tr>
<tr>
<td></td>
<td>Customized management software</td>
<td>6000€</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL FIRST YEAR</strong></td>
<td><strong>63000€</strong></td>
</tr>
</tbody>
</table>


*Table 20. Break down of investments per year*
The multicopters acquisition for each year is shown in hereunder (Table 21):

<table>
<thead>
<tr>
<th>Year</th>
<th>Multicopters purchased (IA Phoenix + IA Falcon + IA Pidgeon)</th>
<th>Total number of multicopters</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>2+2+1</td>
<td>5</td>
</tr>
<tr>
<td>2015</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>2016</td>
<td>2+2+1</td>
<td>10</td>
</tr>
<tr>
<td>2017</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td>2018</td>
<td>2+2+1</td>
<td>15</td>
</tr>
</tbody>
</table>

*Table 21. Breakdown of multicopters purchased per year*

Until 2016 Imaginaeri has 5 multicopters (2 IA Phoenix, 2 IA Falcon and one IA Pidgeon). Two of them will be converted into infrared configuration (one IA Phoenix and one IA Falcon), being loaded with a FLIR onboard. The rest will have a conventional camera for aerial imagery, one of them with high definition camera (IA Phoenix) and the other two with standard definition one (IA Falcon and one IA Pidgeon).
# 6.7. Cost Analysis

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2.0.0.</td>
<td>COSTS</td>
<td>- €</td>
<td>174685.39€</td>
<td>190650.33€</td>
<td>243406.30€</td>
<td>359903.53€</td>
<td>452473.80€</td>
<td>1421119.35€</td>
</tr>
<tr>
<td>1.2.1.0.</td>
<td>DIRECT COSTS</td>
<td>- €</td>
<td>124055.48€</td>
<td>162247.91€</td>
<td>211177.41€</td>
<td>316565.81€</td>
<td>412442.91€</td>
<td>1226489.53€</td>
</tr>
<tr>
<td>1.2.1.1.</td>
<td>SALARIES</td>
<td>- €</td>
<td>115183.06€</td>
<td>149441.79€</td>
<td>198280.17€</td>
<td>295631.52€</td>
<td>386723.48€</td>
<td>1145260.03€</td>
</tr>
<tr>
<td>1.2.1.2.</td>
<td>TRANSPORT</td>
<td>- €</td>
<td>8305.92€</td>
<td>12689.42€</td>
<td>12656.84€</td>
<td>20686.68€</td>
<td>25719.42€</td>
<td>80058.29€</td>
</tr>
<tr>
<td>1.2.1.3.</td>
<td>OPERATOR LICENSES</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
</tr>
<tr>
<td>1.2.1.4.</td>
<td>MATERIALS</td>
<td>- €</td>
<td>566.50€</td>
<td>116.70€</td>
<td>240.40€</td>
<td>247.61€</td>
<td>0.00€</td>
<td>1171.21€</td>
</tr>
<tr>
<td>1.2.2.0.</td>
<td>INDIRECT COSTS</td>
<td>- €</td>
<td>50629.91€</td>
<td>28402.41€</td>
<td>32228.89€</td>
<td>43337.72€</td>
<td>40030.89€</td>
<td>194629.82€</td>
</tr>
<tr>
<td>1.2.2.1.</td>
<td>FACTORY RENTING</td>
<td>- €</td>
<td>11330.00€</td>
<td>11669.90€</td>
<td>12020.00€</td>
<td>12380.60€</td>
<td>12752.01€</td>
<td>60152.51€</td>
</tr>
<tr>
<td>1.2.2.2.</td>
<td>INVOICES</td>
<td>- €</td>
<td>3708.00€</td>
<td>3819.24€</td>
<td>3933.82€</td>
<td>4051.83€</td>
<td>4173.39€</td>
<td>19686.28€</td>
</tr>
<tr>
<td>1.2.2.3.</td>
<td>OUTSOURCED SERVICES</td>
<td>- €</td>
<td>5562.00€</td>
<td>5728.86€</td>
<td>5900.73€</td>
<td>6077.75€</td>
<td>6260.08€</td>
<td>29529.41€</td>
</tr>
<tr>
<td>1.2.2.4.</td>
<td>INSURANCES &amp; WARRANTIES</td>
<td>- €</td>
<td>1653.15€</td>
<td>1858.70€</td>
<td>2157.04€</td>
<td>2431.10€</td>
<td>2910.94€</td>
<td>11010.93€</td>
</tr>
<tr>
<td>1.2.2.5.</td>
<td>MARKETING</td>
<td>- €</td>
<td>13441.76€</td>
<td>4795.27€</td>
<td>7670.94€</td>
<td>6578.60€</td>
<td>1762.10€</td>
<td>34248.66€</td>
</tr>
<tr>
<td>1.2.2.6.</td>
<td>IM (INFORMATION MANAGEMENT)</td>
<td>- €</td>
<td>515.00€</td>
<td>530.45€</td>
<td>546.36€</td>
<td>562.75€</td>
<td>579.64€</td>
<td>2734.20€</td>
</tr>
<tr>
<td>1.2.2.7.</td>
<td>TRAINING (OPERATOR &amp; OTHERS)</td>
<td>- €</td>
<td>14420.00€</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>14420.00€</td>
</tr>
<tr>
<td>1.2.2.8.</td>
<td>R&amp;D CUSTOMIZED SOLUTIONS</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>11255.09€</td>
<td>11592.74€</td>
<td>22847.83€</td>
</tr>
</tbody>
</table>

*Table 22. Direct and Indirect Cost of Operation*
Every payment quoted in the 5-year program study can be allocated into three main groups: investment (that have been enumerated in the latter section), direct costs and indirect costs.

For Imaginaeri direct costs are those directly linked to services provided, being basically salaries, transport and materials. Indirect costs are those that remain independent on the services, being associated to the factory maintenance and renting, administration and marketing. The last one is developed in deep in Chapter 7.

6.8. Commercial Processes

As derived from Imaginaeri’s strategy (Chapter 5), the company is focused, at least at a first stage, on providing services to large and special clients, therefore the distribution channel chosen by the company is to address directly the customers (Chapter 3.5).

In order to address directly the customers, a specialized member of Imaginaeri’s staff visits the potential clients of the company. Seeing the work scenarios of these clients and being aware of the difficulties they have, the employee offers them the different customized solutions Imaginaeri can provide them. Imaginaeri also makes customized demonstrations to its customers. In this way, Imaginaeri and its clients establish a solid and trustworthy relation.

Imaginaeri also has a website (Chapter 7.4) through which the company advertises its services. Clients can also contact Imaginaeri through its website and afterwards Imaginary’s staff contacts them back, following the standardized procedure of addressing directly the customers.

Once, a member of Imaginaeri’s staff has visited a client and this latter asks for a service, the information of the solution needed is processed at Imaginaeri’s site and the corresponding employees integrate the different tools needed for providing the customized solutions.

As soon as the multicopter is customized for its purpose and therefore ready to be used, a member of the staff contacts the customer to arrange a date. On the agreed date, an operator of Imaginaeri moves to the client’s site, where the execution of the service is performed.

Imaginaeri contracts include a Service Level Agreement (SLA). This clause typically includes a MTBF (Mean Time between failures) and a MTTR (Mean Time To Repair). These clauses could be negotiated in function of the customer, although for a standard contract the company agrees the following:

“Imaginaeri guarantees its clients that the service contracted will be repeated the times required until the result agreed is achieved. This time will not require more than a 30% extra time over the initial time agreed, and the company will assume all the costs derived. In case
the extra time to accomplish the service is higher than a 30% of the initial time, the company will pay the customer a 10% of the contract.

In case of meteorology constraints, the company is not responsible for the additional time the service may take. However, the service will be re-scheduled without any cost for the customer.”

SLAs are not considered as guarantee expenses but as risks, since no money is paid unless the company breaks the terms of the contract.

6.9. Production Processes

As it has been exposed along the present document, Imaginaeri is a services oriented company, which implies that manufacturing processes are simple and really limited. These so called manufacturing processes are in most cases customizations or combinations of products directly acquired from suppliers.

These products acquired directly from suppliers are principally three:

- Flight platforms (multicopters), as transport units of the airborne systems.
- Airborne systems, which have different features depending on their mission.
- Software solutions used for navigation control and data acquisition.

Once these components are tailored and joined in a whole package, they are ready for testing and assessing their quality. If all the tests and requirements are satisfactorily accomplished, the process continues with commercialization.

Operator instruction is another aspect needed since it is part of the solution finally offered to clients. Calling operators the employees in charge of managing and flying the multicopters. This instruction is provided by multicopters’ suppliers. Furthermore, if Imaginaeri develops a customized solution, the training required for this particular implementation is instructed by Imaginaeri’s staff. In this way, operators are able to use completely all the tailored products developed.

It is essential to mention that the entire production process is always focused on the customer. Actually, the initial concept is designed starting from the initial customer need, being the final objective the development of a solution that is not only able to fulfill the need, but also surpasses customers’ expectations.
The so defined production process can be assimilated to a feedback process having as benefits the continuous learning and improvement. A flow chart representing this process is shown below (Figure 36):
6.10. Logistics, storage and supply chain

From the point of view of logistics, storage and supply chain, Imaginaeri is not a very complex business.

All the products and spares supplied to Imaginaeri can be mailed or provided directly by suppliers, being kept in a small storeroom inside the industrial unit or directly in shelves in the workshop area. Their small size and reduced number make this an effective and efficient solution.

Inside the workshop takes place all the customization and combination process of physical parts. The tailored software development, if required, is performed inside the Information Technology department in the office area. Afterwards, the software is engaged finishing the full product which is now ready for testing and quality assessments.

Imaginaeri only needs a reduced number of finished products to provide services to clients, being these small sized: according to the sales plan, between 5 units at the beginning and 15 after five years of operation. Consequently, all finished products can be stored together in a small room inside the industrial unit. This place is located next to the exit in order to load and unload company vehicles in a fast and easy way.

Regarding this load and unload process, it has been planned to place a new door directly communicating this storeroom with the exterior of the industrial unit. This would avoid the necessity of entering vehicles inside the workshop, making this process easier, less interfering and less time consuming (Figure 37 and Figure 39).

All the process previously described is not continuously happening due to the business model Imaginaeri has. As a result, there is no lead time or takt time strictly defined. The situations in which these concepts could be critical are solved having always extra finished products kept in reserve. This fact guarantees a quick response in case of any problem arises (urgency, breakdown, etc.).

6.11. Industrial unit and facilities

The characteristics of the business at the initial stage make large facilities, warehouses or factories unnecessary. Employing between 5 and 10 people and having more or less the same number of finished products, one industrial unit of small size is enough to host all the products, spares, offices, employees and critical production processes; and even all the other business activities as finance, commercial, human resources and so on. This business concentration has several advantages as cost and time reduction.
As the business target market at the beginning is focused on Spain, the city of Madrid is a good place to locate the industrial unit because it is where are based the majority of potential clients being at the same time centered in the country.

Following with the location, it is preferred an industrial area in the suburbs, since it is cheaper and it allows to perform multicopters’ flight tests and demonstrations far from populated areas.

The southwest area of Madrid is the final election to locate the industrial unit. Besides of meeting all the requirements above mentioned, that area is also where are located the greatest number of aeronautical companies in Spain [20] (the main industry is located in Getafe). This is an important factor to be taken into account in the Imaginaeri’s business development regarding suppliers, distributors, partners or future joint ventures.

The industrial unit definition has to be specific, sizing the space needed and not more, because it would incur in unnecessary costs. Appropriate measures for Imaginaeri’s facilities are around 200m² surface.

Regarding how to acquire the industrial unit three options are available: purchase, construction and renting. According to market prices, the purchase of an industrial unit meeting all the requirements mentioned costs around 275000€ and the construction reaches the amount of around 200000€, 90000€ the land plus 110000€ the construction (price ready for final use, including electricity and water supply, HVAC, firefighting etc.). The last option of renting the industrial unit costs around 10000€/year [21] [22] [23].
Industrial unit and facilities

<table>
<thead>
<tr>
<th>Options</th>
<th>Image</th>
<th>Cost</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase</td>
<td><img src="image1.png" alt="Image" /></td>
<td>275000€</td>
<td><a href="http://www.milanuncios.com">www.milanuncios.com</a> [24]</td>
</tr>
</tbody>
</table>
| Construction | ![Image](image2.png) | 200000€     | [www.interempresas.net](http://www.interempresas.net) [22]  
|           |                    |              | [www.lanaveindustrial.com](http://www.lanaveindustrial.com) [23] |
| Renting   | ![Image](image3.png) | 10000€/year | [www.milanuncios.com](http://www.milanuncios.com) [21] |

Table 23. Acquisition options available for Imaginaeri’s industrial unit

According to the mentioned above, the option finally elected is to rent the industrial unit because both, the amount of money to spend and the risk involved are lower than in the other scenarios. Moreover, the industrial units available for renting meet Imaginaeri’s needs in a better way.

Following, it is carried out a full description of the rented industrial unit: location, features, rooms layout, processes allocation and so on.

The Industrial unit is located in Getafe, at Los Olivos industrial area, including private security and parking lot. It has 7 meters high and a complete surface of 225 squared metres. The available surface is broken down in one workshop area on the ground floor of 180 squared metres, and an office area in the first floor of 45 squared metres.

Imaginaeri’s facilities placement (Figure 37), some pictures and its interior layout (Figure 38, Figure 39 and Figure 40) are shown hereunder.
Figure 37. Imaginaeri’s facilities placement
Figure 38. Imaginaeri’s facilities interiors (before adaptation)
Figure 39. Imaginaeri’s facilities layout: allocation
Figure 40. Imaginaeri’s facilities layout: production processes
Regarding the equipment and their installation it is not needed complex or expensive machines due to the tasks performed in the workshop. It is enough with 2 or 3 common workshop tools set (manual and electrical) and some specific machines related with multicopters service and maintenance. As usual, the office area includes several electronic devices as phones, computers, printers, scanners, network, etc. The next table includes some costs related with the Imaginaeri facilities.

<table>
<thead>
<tr>
<th>Concept</th>
<th>Description</th>
<th>Fixed cost (€)</th>
<th>Variable cost (€/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rent</td>
<td>230 square metres in Getafe (Madrid)</td>
<td>-</td>
<td>11000</td>
</tr>
<tr>
<td>Adaptation</td>
<td>Industrial unit adaptation</td>
<td>9000 [25]</td>
<td>-</td>
</tr>
<tr>
<td>Workshop equipment</td>
<td>Workshop tools set and special multicopter tools</td>
<td>3100 [26]</td>
<td>-</td>
</tr>
<tr>
<td>Offices equipment</td>
<td>phones, printers, network etc.</td>
<td>7500</td>
<td>-</td>
</tr>
<tr>
<td>Maintenance</td>
<td>25% of renting</td>
<td>-</td>
<td>3600</td>
</tr>
<tr>
<td>Invoices</td>
<td>Phone, water, light, etc. (25% of renting)</td>
<td>-</td>
<td>6000</td>
</tr>
<tr>
<td>Vehicles</td>
<td>2 cars fleet</td>
<td>-</td>
<td>5472 [27]</td>
</tr>
</tbody>
</table>

Table 24. Breakdown of Imaginaeri’s facilities costs

6.12. Value Chain

It is really interesting to look for along the main primary and support activities Imaginaeri develops in its business, those in which the highest economic margin is obtained and/or in which the value added to the final product is the greatest.

In Imaginaeri’s particular case, as it has been said before along this Chapter, inbound and outbound logistics are not really important compared to others primary activities (Chapter 6.10).

Regarding operations, the product combination process although important is not at the top level because both, the cost involved and the added value to the final solution provided, are not really remarkable. In the case of customization process the cost involved and the added value would be higher because the extra effort made is oriented to customers’ specific requests, whose fulfillment are directly linked with their satisfaction.
The most value added to the final solution comes from the staff performing the services and also the after sales support provided. This is the cornerstone of Imaginaeri’s business activities, and the main reason to be differentiated from competitors and to have an outstanding position inside the market.

Marketing and sales also are essential in order to guarantee the viability of the business. Being an emerging market is essential to gain visibility and address potential customers to have a strong market impact. More information about these processes are detailed in Chapter 7.

Regarding the support activities, procurement is key since, after some modifications, all the products and spares used are acquired directly from suppliers. Other important support activities are the recruitment of new employees, because they are the face of the company in front of the final customers, and all the financial activities, since the current economic situation makes every company to be focused in aspects as getting funding and account tracking.

6.13. Support Processes

The production process, commercialization and aftersales service are supported by other activities included in the whole business and operating process, such as:

- **Procurement and Commercial**: in charge of all commercial activities and acquiring all the raw materials needed to develop Imaginaeri’s business activities contacting directly with suppliers.

- **Finance**: in charge of approving and validating all the investments and expenses made by Imaginaeri. Regarding the operation plan can be pointed out the investments and expenses on procurement, employees and Human Resources, facilities and equipment.

- **Human Resources**: in charge of employees policies (training, recruitment, wages, etc.)

- **Legal**: advisory in legal issues.

- **Information Technology**: in charge of developing the tailored software solutions and supporting all the computer devices and communications net inside Imaginaeri’s structure.
Some of the activities previously mentioned, as some legal and information technology ones, are susceptible to be outsourced, since they are not part of the critical processes of Imaginaeri’s business.

### a. Operations Headcount

At the beginning, Imaginaeri only has three employees in the operations department. Therefore, the chart of the operations departments in 2014 is:

![Operations Department Organization Chart](image)

The Chief Operations Officer is responsible for all Imaginaeri’s operations, reporting directly to the Chief Executive Officer (Figure 56). This person is also responsible for I+D+i and IT activities.

The two Operations technician integrate the systems in the multicopters according to customers’ needs, bring the solutions directly to the customers and provide the service required by operating the multicopters.

This production staff will increase according Imaginaeri’s growth needs. The estimated growth for the Operations department is shown in the following table (Table 25):

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of employees (Operations department)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>3</td>
</tr>
<tr>
<td>Year 2</td>
<td>4</td>
</tr>
<tr>
<td>Year 3</td>
<td>4</td>
</tr>
<tr>
<td>Year 4</td>
<td>6</td>
</tr>
<tr>
<td>Year 5</td>
<td>9</td>
</tr>
</tbody>
</table>

*Table 25. Operations department growth*
More information about the skills, requirements, duties, responsibilities, etc. of the production headcount is developed in the Human Resources Section (Chapter 8).

b. Information Management

Inside of the main processes to support the business are the Information Management Systems. Being Imaginaeri a business with specific needs and a complex network of clients, it has been decided to order specific management software tailored for the company. This solution allows Imaginaeri to manage in an easy and customized way lists of spares, orders, platforms, products, etc. But it will also be used to manage the clients’ portfolio of the company, with their different needs, i.e.: deadlines, customization, sales, etc. What means that this solution will act as an ERP and a CRM system in one.

Figure 42 shows the production process and the steps in which IM is involved:

- Activities with implication of the specific management software requested
- Activities with other IM Systems implication
- Rest of activities

Figure 42. IM Systems implications in the production process
Of course, this kind of solutions, which are even able to be integrated with PDAs systems, have a high initial cost Imaginaeri is willing to face. After asking for different budgets to different enterprises, the company chosen to carry out the project is SAGE [28]. A medium investment for this software has been quoted around 6000€ initially, and 500€ more each year for support, updates and small adaptations. Some screenshots of this software are shown in Figure 43 and Figure 44.
Besides this tool, Imaginaeri requires navigation software and systems for multicopters, which are provided by the supplier and modified by Imaginaeri’s staff in order to customize the products. Since this navigation software is free-license, it implies no extra cost.

The company will also own six computers of around 500€ each. The price of programs licenses (Microsoft Office, Navigation SW, interface etc.) represents around 1000€.
7. MARKETING PLAN

7.1. Market research, segmentation, targeting and positioning

The first step in order to develop a proper marketing strategy is to carry out a complete market research. In Imaginaeri’s case the market considered as benchmark to carry out this analysis is the worldwide complete UAVs market (analysis performed in Chapter 3.4). This is because currently the multicopters market has not enough size and development, having quite reduced number of players and little time of existence, to be considered representative in order to extract trends or global conclusions. However, this fact has permitted to perform a more specific analysis of this market and players inside, being really useful to support some business strategies and decisions (analysis carried out in Chapter 3.2 and Appendix III).

The second stage is to define what market segment is going to be the target of Imaginaeri’s business. Regarding this, Imaginaeri is targeting all the possible activities encompassed in the civil market of UAV. In short term, Imaginaeri is envisaged to reach companies and government entities which require standard services with a low degree of customization. In a more elapsed period, Imaginaeri also considers some companies which need customized projects such as security enterprises, government law enforcement and big media producers. Within this segment, Imaginaeri begins its operations targeting only the Spanish market. However, following years is foreseen an expansion through other European countries. This market expansion has been analyzed in the Chapter 6.5.

As it has been explained before, Imaginaeri is positioned offering affordable but high quality solutions, providing services through top-level multicopters and its qualified operators. These kinds of solutions are much cheaper than the ones provided by using conventional UAVs, but with high valued features that allow them to be highly competitive. These concepts have been developed deeply along this document, especially in Chapter 3.4 and Chapter 3.3.

Once the target market and the positioning are defined, a complete marketing strategy must be establish based on this two concepts and taking into account all the surrounding conditions. These conditions have been analyzed in the Environmental Analysis (Chapter 2) and SWOT Analysis (Chapter 4).
7.2. Solutions provided

One of the most important points to be defined in all companies, if not the most, is the products or services offered. Therefore this point is also important when defining the company’s marketing strategy being one of the cornerstones of the marketing mix.

Regarding Imaginaeri, this concept has been widely explained along this document (especially in Chapter 3.1 and 5.3). To sum up, the following state can be set up: Imaginaeri is providing full-integrated solutions to clients. These solutions consist in complete services carried out by Imaginaeri’s qualified employees (operators), using their tailored products (Multicopters + Airborne systems) adapted to customer needs. These tailored products joint with the services provided have been defined in Chapter 6.1. Imaginaeri’s full-integrated solution concept can be encompassed in the following formula:

CUSTOMIZED PRODUCT + SERVICE + AFTER SALES = SOLUTION

*Figure 45. Imaginaeri’s business Formula*

Going deeply in this concept, some standard packages of solutions offered have been defined taking into consideration the complete resources needed and especially the typical missions requested by clients. These missions are predicted based on the forecasts for the following years explained in Chapter 5. Chapter 6.1 contains further information about the airborne systems according mission or platform.
These packages are shown in Table 26:

<table>
<thead>
<tr>
<th>Mission</th>
<th>Example of applications</th>
<th>Flight Platform</th>
<th>Operators per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aerial Photography (High Definition)</strong></td>
<td>Movie makers who want to record aerial footage of a scene for 40 minutes with a professional 24 megapixel camera.</td>
<td>IA Falcon</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IA Phoenix</td>
<td>2</td>
</tr>
<tr>
<td><strong>Aerial Video (Standard Definition)</strong></td>
<td>Security enforcement companies which want to watch out different areas for 20 minutes without charging the multicopter at high speed (up to 105Km/h).</td>
<td>IA Pigeon</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IA Falcon</td>
<td>1</td>
</tr>
<tr>
<td><strong>Infra-red/Thermal Inspection</strong></td>
<td>Maintenance inspections at high speed: high power lines (analysis of corona discharge effect), airport beacons, wind turbines, etc.</td>
<td>IA Falcon</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>People searching over long distances, in conditions of reduced visibility for 40 minutes.</td>
<td>IA Phoenix</td>
<td>2</td>
</tr>
</tbody>
</table>

*Table 26. Solution packages*

These standard packages are provided in order to offer a general idea about Imaginaeri’s services, platforms and prices. However, it must be reminded that the company’s services are customizable, so the final characteristics and price will depend on the customer requirements. In the following chapter is explained how the price of these solution packages have been fixed.

### 7.3. Pricing Policy

Price is the only component of marketing mix which impacts directly in company turnover, being one of the most important elements when defining the company’s marketing strategy.

In order to establish the prices on Imaginaeri’s services portfolio, some factors analyzed below have been taken into consideration.
a. Fixed and variable costs

As it has been previously stated, Imaginaeri is focused on selling customized services. This kind of services has been denominated full integrated solutions. The level of customization increases from the fourth operation year onwards when, apart from these services, specific hardware or software developments could be provided. Considering the initial investment and adding the direct and indirect costs estimated in Chapter 6.6 and Chapter 6.7 the total annual expenses remains around 310000€, amount necessary to recover. Considering the number of services sold per year estimated in Figure 34, the total cost per day of service is around 200€. As a previous step, it is not advisable selling for a lower price than this one to obtain benefits. Besides, other costs as interests appear when the financial analysis is carried out.

The standard solutions packages will have similar prices during the whole period. However, other variables will take place in the non-standard solutions, in which the level of customization is higher due to the new hardware or software developments mentioned above. As a result, there will be unknown costs involved in each non-standard solution designed, so particular business cases will be performed. These extra costs will be a critical variable affecting the final sale price.

b. Competition

Most of the competitors, production enterprises and manufacturers that commercialize ready-to-fly multicopters are placed out of Spain and the Spanish market. Regarding services providers the situation is almost the same as it was explained in Chapter 3.2 and Appendix III.

Considering Spain, there are only small enterprises which seem to be service oriented. The main one is Intelligenia Dynamics, placed in Granada. Company devoted to develop and commercialize UAVs for Unmanned Exploration Services. However, this company does not seem to have any activity since May 2012.

There is also another services oriented company that operates by the name of Grupo Acre. It is running services in Spain and mainly in Latin America, powered by a German enterprise solution. Its prices policy has been studied in order to adapt Imaginaeri to the market.

Since the company is customer oriented, this fact involves a great advantage. Imaginaeri’s goal is to sell services directly to the customers, therefore, being established in the country and sharing the same language are important factors, being at the same time entry barriers in case of possible foreign competitors come to scene.
c. Additional Pricing Policies

The positioning strategy, the target group and its willingness to pay are important aspects already mentioned which have been taken into account. Additional pricing policies agreed are:

- Salespeople have certain freedom to decide the price to charge in function of the situation and the customers. However, there will be a limited price gap and in general there will be only price discounts in the following situations:
  - Quantity discount: The more the client buys, the cheaper it becomes.
  - Trade discount: In cases in which the client is considered strategic. For instance if Imaginaeri gets broad visibility in the market, if it is likely to have a long profitable relationship with the client or if the client demands are in line with Imaginaeri’s strategic development objectives. In the last case, offering the service will help us to develop a new prototype which can be used in the future for other clients.
  - Sponsoring: In the same line as trade discounts, if a client advertises our products by wearing our logo and brand and it is likely to have a strong impact for Imaginaeri’s visibility, then a price reduction will take place. It could be even possible to pay a company in order it to advertise us if an important impact is forecasted.
  - Cash discount: A deduction granted only to loyal customers for paying their bills within a specified period of time.
  - Promotional discount: Oriented to low yield products, new launchings, seasonality, and so on. Although these kinds of discounts are out of the scope at the beginning.

d. Pricing strategy

Imaginaeri’s solutions are new, distinctive and desired. They are penetrating the market at an early moment in the product life cycle, when demand is inelastic. Furthermore, economies of scale are not possible yet, and the presence of competitors is low. Finally, underpricing hurts the product as much as overpricing does. If the price is too low, potential customers will think it cannot be very good.

Therefore, the Imaginaeri’s market entry pricing strategy set is a Market-Skimming Pricing. Imaginaeri can set an initial medium-high price and protect itself with entry barriers, such as building strong relationships with its customers, having always the option of readapt the
pricing strategy reducing them. Therefore, the product's availability and the possibility of near substitutes will be studied periodically just in case a change in the pricing strategy is required.

Table 27 collects some of the typical services offered and their average price:

<table>
<thead>
<tr>
<th>Mission</th>
<th>Platform</th>
<th>Operators per unit*</th>
<th>Average Price per day **</th>
<th>Average Price per hour **</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerial Photography (High Definition)</td>
<td>IA Falcon</td>
<td>1</td>
<td>600€</td>
<td>150€</td>
</tr>
<tr>
<td></td>
<td>IA Phoenix</td>
<td>2</td>
<td>700€</td>
<td>175€</td>
</tr>
<tr>
<td>Aerial Video (Standard Definition)</td>
<td>IA Pigeon</td>
<td>1</td>
<td>420€</td>
<td>105€</td>
</tr>
<tr>
<td></td>
<td>IA Falcon</td>
<td>1</td>
<td>520€</td>
<td>130€</td>
</tr>
<tr>
<td>Infra-red / Thermal Inspection</td>
<td>IA Falcon</td>
<td>1</td>
<td>1200€</td>
<td>300€</td>
</tr>
<tr>
<td></td>
<td>IA Phoenix</td>
<td>2</td>
<td>1400€</td>
<td>350€</td>
</tr>
</tbody>
</table>

* The price of an additional operator if required is 90€ per day

**Prices do not include: Taxes, transport expenses for trips longer than 50 km, image processing or cartography projects, video edition, data backup and so on. For trips longer than 50 km, the company will charge 1€ / km.

7.4. Promotion

The promotion is a key value in the marketing strategy and in Imaginaeri’s marketing pitch is even more important as the business is not as known and widespread as other cases in other industries.

Since the use of UAVs for civil aerial services have not enjoyed of any media visibility so far, they do not have presence in the basic culture for the bulk of society. Even it is likely that having prospect clients, they are not aware about the existence of these kinds of solutions for
their business. Therefore, Imaginaeri’s strategic objective for the first years of operations in terms of promotion is to boost awareness of the people, especially prospect clients, about the availability of these services, being placed at the same time as leader and benchmark of this market in Spain. However, as the budget is limited the Promotion efforts have to be focused specifically on the target group already defined.

a. Communication Strategy

There are several factors influencing in Imaginaeri’s communication strategy being the most important the lack of awareness of people about the civil multicopters services, and the reduced marketing budget available due to the business size. These facts turn out into the necessity of focusing and rationing marketing efforts.

Prospect clients’ visits:

According to what is explained above, one of the strategies followed by Imaginaeri is to spot big and important prospect clients addressing them directly and offering on site demonstrations (a wide range of prospect clients are analyzed in Chapter 3.3). This strategy meets with the statement of focusing efforts to counteract the lack of awareness, and developing the customer oriented approach already set in Imaginaeri’s objectives.

Website, social networks and Search Engine Optimization (SEO):

Nowadays, having presence and visibility on Internet becomes mandatory for every company whatever the market it is taking part. Due to this reason, Imaginaeri has its own website as first channel of communication with interested people and prospect clients who can watch the services portfolio and easily contact with the company. This concept is further explained in Chapter 7.5.

Moreover, two additional techniques have been carried out in order to increase the visibility on internet: carrying out a search engine optimization strategy and fostering a strong presence in the most widespread social networks. These techniques increase the number of webpage visitors and support its operation through additional communication channels.

These services could be provided by outsourced companies (consultancy agencies, community managers, SEO experts, etc.) having a wide range of prices depending on different parameters of the service elected. For a start-up like Imaginaeri, and due to the high prices of a professional SEO and Community manager, only the website development will be contracted. The website maintenance and social networks management will be carried out by the head of the marketing area. Therefore, no additional costs are derived from these activities.
The following figure shows a screenshot of Imaginaeri’s website

![Website scheme](image)

**Figure 46. Website scheme**

**Video, pictures and brochures:**

Although having online presence is key, it is also necessary to have some physical elements supporting Imaginaeri’s commercial activities. One of these elements should be a set of professional pictures to be used on advertisements, wallpapers, slideshows and so on. It is necessary also to have some brochures in order to deliver them in events, fairs or visits to prospect clients.
Figure 47 shows an example of Imaginaeri’s brochures:

![Imaginaeri Brochure Example](image)

**Figure 47. Imaginaeri’s Brochure example**

To develop a video promoting Imaginaeri and its activities is highly recommendable. This is a resource which can be used in many platforms and occasions, having a strong impact in watchers, actually more than any other way of communication.
Figure 48 shows a screenshot of the Imaginaeri’s promotional video:

![Image of promotional video screenshot](image)

*Figure 48. Imaginaeri’s promotional video screenshot*

![QR Code for BIDI code](image)

*Figure 49. Imaginaeri’s promotional video BIDI code*
b. Promotion at media

This is probably the technique in which many companies invest the bigger amount of the marketing budget. Although it has costs in some cases prohibitive, its effectiveness is fully proved. Although Imaginaeri has not enough purchase power to develop a strong media promotion, it can perform some slightly but effective movements inside this field.

**Internet banners:**

It is evident that Internet will become, if not yet, in the most broadcasted and widely ranged media channel worldwide. In order to take advantage of this, Imaginaeri is setting some Internet banners in some online places carefully elected (prospect customers’ suppliers, high tech web pages, top sites and so on). The possibility of choosing among a large offer with different features and prices makes of it a really attractive option.

Figure 50 shows an example of an Imaginaeri’s banner

![New solutions for old problems](image)

*Figure 50. Imaginaeri’s Internet banner example*
Magazine advertisements:

There are some specialized magazines that can help Imaginaeri to promote successfully its services awareness among its principal customer target group.

*Figure 51. Imaginaeri’s magazine advertisement example*
c. Promotion at events

Start-ups contests:

Imaginaeri's is a technology based enterprise with a young team as founders that makes it a perfect match and potential winner of start-up contests. There are several funds in Spain that can provide finance to such start-ups and Imaginaeri will apply to some of them in the pursuit of some “cheap” financing for its projects.

<table>
<thead>
<tr>
<th>Contest Logo</th>
<th>Name</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Image]</td>
<td>Emprende con Vodafone</td>
<td><a href="http://emprendoconvodafone.com/bases-del-concurso-del-plan-de-emprendedores-vodafone/">http://emprendoconvodafone.com/bases-del-concurso-del-plan-de-emprendedores-vodafone/</a></td>
</tr>
</tbody>
</table>

Table 28. Some attractive start-ups contests in which Imaginaeri can participate

Exhibitions and fairs:

New technologies and innovations always have to break ice in corporate world somehow. A more than adequate way to get in touch with enterprises, look for corporate contacts and to promote these new technologies are Technological Events and Fairs. One big chapter of Imaginaeri’s Promotion strategy is based on Promotion at customized stands in business related fairs.
Some examples of the type of fairs that are part of Imaginaeri’s promotion efforts are:

<table>
<thead>
<tr>
<th>Logo</th>
<th>Type</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Security Enforcement</td>
<td>19th SICUR, Salón Internacional de la Seguridad (Madrid, February 2014)</td>
</tr>
<tr>
<td></td>
<td>Crops and Agriculture</td>
<td>FEGASUR, Feria Agraria y Ganadera del Sur (Jerez de la Frontera, November 2014)</td>
</tr>
<tr>
<td></td>
<td>Media Producers</td>
<td>BROADCAST IT, Feria de Productores del sector Audiovisual y telecomunicaciones (Madrid IFEMA, October 2014)</td>
</tr>
<tr>
<td></td>
<td>Event Organizers</td>
<td>MOMAD 1001Bodas, Feria de Servicios para Bodas (Madrid IFEMA, September 2014)</td>
</tr>
</tbody>
</table>

Table 29. Fairs related to Imaginaeri’s business

d. Specific actions

These specific actions have to do with the explained previously in Chapter 7.3. Any time a prospect client is aware about the fact it can be the objective of some discounts, can be considered as a promotional action.

e. Corporate Image

Imaginaeri is a young dynamic company with no barriers, built upon the use of flying vehicles. This is why our corporate image booklet (company logo, product logos, company colors, web design, etc.) is based on the use of birds colored in tones present in the sky as the blue cyan and the light cloudy gray.

Our Service portfolio is powered by three flying platforms that take the name of three birds that shall inspire a first idea of the devices offering the service:
• The IA Pigeon was named to represent the following: small, and versatile. Here is the brand logo:

![IA Pigeon Image brand logo](image)

*Figure 52. IA Pigeon Image brand logo*

• The IA Falcon was named this way because is fast and accurate. Here is the brand logo:

![IA Falcon Image brand logo](image)

*Figure 53. IA Falcon Image brand logo*

• The IA Phoenix is the biggest machine on Imaginaeri’s catalogue, and also the most endurable machine. Here is the brand logo:

![IA Phoenix Image brand logo](image)

*Figure 54. IA Phoenix Image brand logo*

## 7.5. Placement: Sales Strategy

As it has been already introduced and justified in Chapter 6.5, Imaginaeri sells addressing directly the customers.

This way of selling implies the need of having a specialized sales force. When a company addresses clients directly, it is projecting its image and values through the salesmen. Therefore, they must be people totally involved in the business and with the same vision and values that the company fosters.

Besides, salesmen must have a complete knowledge about the solutions and customizations that can be offered, so they can advise the customers in function of their needs. In this way salespeople should be also able to report upwards about the client’s feedback, needs and
expectations, thus being active part in both: the market research, and continuous improvement process.

In addition, at least at the beginning due to the initial company headcount, the salesmen must be also able to make customized demonstrations to the customers, so they must be able to operate the system and being certified if required.

Currently, the retailer distribution industry must work with clients who value ease of access, delivery times and assistance quality, almost as much as the product’s features. This is even more patent when it is related to the sale of services.

Due to all these reasons, Imaginaeri will only use its own sales force, not outsourcing this service. This way, Imaginaeri and its clients establish a solid and trustworthy relation. Imaginaeri sales force is made up of a Head of Sales, who is the Commercial director of the company, and supported by the Operations team (the Chief Operations Officer and two Operators technician) in order to be able to perform the demonstrations to the customers. The Chief Commercial Officer is in charge of signing all the contracts and reviewing the requirements and questions made by the clients through the webpage. The Chief Commercial Officer is also the person responsible to apply or not the discounts mentioned before. However, in order to visit the prospective customers, there will be always an Operator technician, while the Chief Commercial Officer could be optional. The Operators technician have the certification to drive multicopters in case it is required.

Although Imaginaeri sales strategy is based on addressing directly the customers, nowadays it has become mandatory to have a website as open communication channel. On it, Imaginaeri shows its mission, vision, values, strategic objectives and it transmits its corporate image. Furthermore, as many other companies do, the website is a support tool, used as catalogue. Clients may contact Imaginaeri to ask for services or to request a particular price depending on their needs. Once a client has contacted with the company, the salesmen will contact him back, following the standardized procedure describe at Chapter 6.5. A screenshot of Imaginaeri’s website is shown in Figure 46.

### 7.6. Marketing budget

Most of the marketing activities imply an expense for the company. However, there are some activities, such as clients visiting or community management which are financed through transversal costs, for example salaries or transport. The percentage of these transversal costs and therefore, the total marketing budget, is detailed in the Total Cost Breakdown structure in Chapter 9.
The marketing activities and the main milestones per year are represented in the diagram hereunder (Figure 55):

**Figure 55. Marketing activities - Gantt Diagram**
Figure 36 represents the marketing expenses breakdown per year:

<table>
<thead>
<tr>
<th>Concepts</th>
<th>Marketing Activities</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>Total Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Strategy</td>
<td>Website Design and server maintenance</td>
<td>900</td>
<td>20</td>
<td>20</td>
<td>570</td>
<td>20</td>
<td>1530</td>
</tr>
<tr>
<td></td>
<td>Search engine optimization</td>
<td>3000</td>
<td>3000</td>
<td>3000</td>
<td>3000</td>
<td>3000</td>
<td>15000</td>
</tr>
<tr>
<td></td>
<td>Promotional video</td>
<td>300</td>
<td>-</td>
<td>-</td>
<td>300</td>
<td>-</td>
<td>600</td>
</tr>
<tr>
<td></td>
<td>Commercial photographs</td>
<td>200</td>
<td>-</td>
<td>-</td>
<td>200</td>
<td>-</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>Brochures</td>
<td>275</td>
<td>-</td>
<td>-</td>
<td>275</td>
<td>-</td>
<td>550</td>
</tr>
<tr>
<td></td>
<td><strong>Subtotal</strong></td>
<td><strong>4675</strong></td>
<td><strong>3020</strong></td>
<td><strong>3020</strong></td>
<td><strong>4345</strong></td>
<td><strong>3020</strong></td>
<td><strong>18080</strong></td>
</tr>
<tr>
<td>Promotion at media</td>
<td>Internet banners positioning</td>
<td>1000</td>
<td>500</td>
<td>500</td>
<td>1000</td>
<td>500</td>
<td>3500</td>
</tr>
<tr>
<td></td>
<td>Magazine advertisements</td>
<td>1000</td>
<td>500</td>
<td>500</td>
<td>1000</td>
<td>500</td>
<td>3500</td>
</tr>
<tr>
<td></td>
<td><strong>Subtotal</strong></td>
<td><strong>2000</strong></td>
<td><strong>1000</strong></td>
<td><strong>1000</strong></td>
<td><strong>2000</strong></td>
<td><strong>1000</strong></td>
<td><strong>7000</strong></td>
</tr>
<tr>
<td>Promotion at events</td>
<td>Exhibitions and fairs</td>
<td>3500</td>
<td>2000</td>
<td>2000</td>
<td>3500</td>
<td>2000</td>
<td>13000</td>
</tr>
<tr>
<td></td>
<td>Start-ups contests</td>
<td>50</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td><strong>Subtotal</strong></td>
<td><strong>3550</strong></td>
<td><strong>2000</strong></td>
<td><strong>2000</strong></td>
<td><strong>3500</strong></td>
<td><strong>2000</strong></td>
<td><strong>13050</strong></td>
</tr>
<tr>
<td>Corporate Image</td>
<td>Logos design</td>
<td>400</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>10625</strong></td>
<td><strong>6020</strong></td>
<td><strong>6020</strong></td>
<td><strong>9845</strong></td>
<td><strong>6020</strong></td>
<td><strong>38530</strong></td>
</tr>
</tbody>
</table>

*Table 30. Marketing expenditures breakdown per year [29-32]*
8. ORGANIZATION & HUMAN RESOURCES PLAN

8.1. Incorporation

Imaginaeri is incorporated as a Limited Liability Company (LLC) because it is the form that best fits its needs. A LLC is not a corporation; it is a legal form of a company that provides limited liability to its owners. This type of society has been chosen since it has many benefits such as:

- Easy Set-Up
- Initial capital required lower than in a Corporation
- Protected assets
- Tax Flexibility
- Heightened credibility
- Less Bureaucracy
- Limited compliance requirements
- Flexible management structure
- Few restrictions
- Limited Liability

The Limited Liability Company has one Delegate Council and the rest of the administrators and founders are also workers, since this simplifies processes substantially.

It is worth to say here that all the legal and fiscal requirements requested for incorporating the company, such as: the issue by the Spanish Central Mercantile Register of a certificate of clearance for use of the name of the new company or the execution of the public deed, are properly carried out in order to proceed with the society.

8.2. Insurances

One of the cost items to be taken into account in every company is the insurances’ cost. Within these there are a minimum of them that every company must have by law the so-called compulsory insurances. These are:
• Vehicle Insurance: All vehicles must be insured at least to a third party liability level (in Spain). In Imaginaeri’s case this insurance is included in the fleet rental contract.

• Personnel Insurance: This policy covers all the employees in the event of sickness, accident or illness. In Imaginaeri's case the Social Security covers this aspect.

• Public Liability Insurance: It provides both defense and damages if the employees or the products or services cause or are alleged to have caused Bodily Injury or Property Damage to a third party.

• Building and content insurance: This policy covers company's property and its contents and/or stock against different kind of damages such as fire, water, explosions, burglary, theft and so forth depending on the contracted coverage.

Following a table shows a breakdown of the Imaginaeri’s insurances costs:

<table>
<thead>
<tr>
<th>Yearly cost (€)</th>
<th>Vehicless</th>
<th>Personnel</th>
<th>Public Liability [36]</th>
<th>Building and content [37]</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>420€</td>
<td>1185€</td>
<td>1.605€</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>459€</td>
<td>1293€</td>
<td>1.752€</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>518€</td>
<td>1456€</td>
<td>1.974€</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>576€</td>
<td>1584€</td>
<td>2.160€</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>669€</td>
<td>1842€</td>
<td>2.511€</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1000€</td>
</tr>
</tbody>
</table>

*Table 31. Imaginaeri’s insurances Cost Breakdown*

Apart from these compulsory insurances, there are more that can be contracted [38]. At the beginning, and in order to prevent an excessive cost incurrence, Imaginaeri has only contracted these compulsory ones. However, during the business development it will be always the opened possibility of acquiring more policies in order to achieve a higher level of financial security.

In addition, the Spanish Ministry of Industry is currently assessing the introduction of a new compulsory patent insurance. Despite of not affecting Imaginaeri activities at the beginning, it is worth to keep watching the evolution of this initiative in order to be prepared to take some actions in the future if needed [39]. This kind of insurance has a lot of benefits in case of
Imaginaeri develop some innovations resulting eventually on patents. Therefore, it would be contracted in the future if this situation arose.

8.3. Organization Structure

As it was stated in Chapter 6.11 the location chosen for starting the business is Getafe, in the southwest area of Madrid. At a first stage, this is the only location for Imaginaeri; therefore, all its employees are located there.

As a first step, Imaginaeri starts with five employees.

<table>
<thead>
<tr>
<th>No.</th>
<th>Job position</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CEO &amp; Chief Administrative &amp; Financial Officer</td>
</tr>
<tr>
<td>2</td>
<td>Chief Commercial &amp; Procurement Officer</td>
</tr>
<tr>
<td>3</td>
<td>Chief Operations Officer</td>
</tr>
<tr>
<td>4</td>
<td>Operations technician</td>
</tr>
<tr>
<td>5</td>
<td>Operations technician</td>
</tr>
</tbody>
</table>

*Table 32. Imaginaeri’s position allocation*

According to Table 32, Imaginaeri’s organization chart is:

*Figure 56. Imaginaeri’s organization chart*
From Table 32 and Figure 56, it may be deduced Imaginaeri’s employees integrate some functions and positions in the same person. For instance, Imaginaeri’s CEO is also the Chief Administrative & Financial Officer.

Although having a CEO, and therefore a certain hierarchy, Imaginaeri’s seeks to have a flat structure, forming a very cohesive group. At a first stage, Imaginaeri does not have a large number of employees; thus, a flat structure helps to increase employees’ responsibility in the organization and their involvement in the decision-making process. This is a key characteristic in Imaginaeri’s philosophy, where although everyone is specialist in their respective positions, all employees are sought to be able to develop other activities. That is, Imaginaeri seeks, at least at a first stage, multi-task employees who can perform the activity of a colleague whenever it is needed, either due to variations in the working flow and demand or to any type of temporal illness. This allows Imaginaeri to be a company completely focused on customers, since every employee can develop whatever activity needed in order to achieve the entire customer’s satisfaction.

Imaginaeri plans to increase its number of employees according to the working growth. This staff growth is shown in the table hereunder (Table 33):

<table>
<thead>
<tr>
<th>Year</th>
<th>CEO</th>
<th>Commercial Department</th>
<th>Administrations &amp; Finances Department</th>
<th>Operations Department</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>1*</td>
<td>1</td>
<td>1*</td>
<td>3</td>
<td>5*</td>
</tr>
<tr>
<td>Year 2</td>
<td>1*</td>
<td>2</td>
<td>1*</td>
<td>4</td>
<td>7*</td>
</tr>
<tr>
<td>Year 3</td>
<td>1*</td>
<td>3</td>
<td>2*</td>
<td>4</td>
<td>9*</td>
</tr>
<tr>
<td>Year 4</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Year 5</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>9</td>
<td>17</td>
</tr>
</tbody>
</table>

*Note: until the 3rd year, the functions of CEO and Chief Administrative & Financial Officer are integrated in the same person.*

In the 3rd year a new Chief Administrative & Financial Officer is hired and the CEO leaves to integrate both positions.
a. Descriptions of Jobs

<table>
<thead>
<tr>
<th>Job Title: Chief Executive Officer</th>
<th>Reporting to: Shareholders</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
<td></td>
</tr>
<tr>
<td>Location: Madrid, Spain</td>
<td></td>
</tr>
<tr>
<td>Status: Full Time Employee</td>
<td></td>
</tr>
<tr>
<td>Job Category: Management/Business Development/Sales/Finance</td>
<td></td>
</tr>
<tr>
<td>Relevant Work Experience: 7 to 10 Years</td>
<td></td>
</tr>
<tr>
<td><strong>Main Accountabilities &amp; Tasks:</strong></td>
<td></td>
</tr>
<tr>
<td>- Must have a thorough understanding of the company’s policies and overall mission, and how each is best executed</td>
<td></td>
</tr>
<tr>
<td>- Accountable for the company as a whole</td>
<td></td>
</tr>
<tr>
<td>- Maintain the efficient running of the company</td>
<td></td>
</tr>
<tr>
<td>- Maintain company goals</td>
<td></td>
</tr>
<tr>
<td>- Translate company objectives and figures to Shareholders</td>
<td></td>
</tr>
<tr>
<td>- Be a role model in projecting and applying Imaginaeri’s Philosophy (focused on customers) and promote the values of the company (Productivity, Quality, Excellence and Teamwork)</td>
<td></td>
</tr>
<tr>
<td>- Make sure that finances are kept up to date and in order</td>
<td></td>
</tr>
<tr>
<td>- Ensure that both, the Chief Commercial &amp; Procurement Officer and the Chief Operations Officer are looking after their teams adequately</td>
<td></td>
</tr>
<tr>
<td><strong>Skills / Education:</strong></td>
<td></td>
</tr>
<tr>
<td>- University degree in Engineering (Industrial, Telecommunications or Aeronautical) and/or Economic degree/MBA</td>
<td></td>
</tr>
<tr>
<td>- Broad experience in Business Management, Finances and Engineering</td>
<td></td>
</tr>
<tr>
<td>- The ability to work to strict timescales as part of an integrated, multidiscipline team</td>
<td></td>
</tr>
<tr>
<td>- Good people management skills</td>
<td></td>
</tr>
<tr>
<td>- Good motivation &amp; leadership skills</td>
<td></td>
</tr>
<tr>
<td>- Organizational Agility &amp; Business Acumen</td>
<td></td>
</tr>
<tr>
<td>- Good communication skills</td>
<td></td>
</tr>
<tr>
<td>- Good at conflict diffusion</td>
<td></td>
</tr>
<tr>
<td>- Calm under pressure</td>
<td></td>
</tr>
<tr>
<td>- Building Effective Teams</td>
<td></td>
</tr>
<tr>
<td>- Fluent in Spanish and English, both oral and written expression. Other languages would be a plus</td>
<td></td>
</tr>
</tbody>
</table>
**Job Title:** Chief Administrative & Financial Officer  
**Reporting to:** CEO

**Description:**
- Location: Madrid, Spain  
- Status: Full Time Employee  
- Job Category: Finances/Administrations  
- Relevant Work Experience: 5 to 7 Years

**Main Accountabilities & Tasks:**
- Responsible for the company’s financial situation  
- Prepare and assist with analyzing financial statements on a monthly basis and report on variances  
- Assist with preparing tax returns and corporate reporting requirements  
- Assist in documentation and monitoring of internal controls  
- Analyze revenues, commissions and expenses to ensure they are recorded appropriately on a monthly basis  
- Responsible for Human Resources activities  
- Manage all the administrative tasks, such as: invoices, payments, salaries, wages and related costs (pensions, incentives, supplements, and other employee benefits, etc.)  
- Employees’ recruitment process (including employees’ recruitment cost)  
- Agree employees’ training together with their immediate superiors

**Skills / Education:**
- University degree in Business Administration/Economics or Engineering + MBA  
- Broad knowledge in the Finance area. Experience in Engineering would be a plus  
- The ability to work to strict timescales as part of an integrated, multidiscipline team  
- Organizational Agility  
- Good people management skills  
- Business Acumen  
- Add value oriented  
- An analytical, independent and target oriented way of working  
- Good knowledge of MS Office  
- Fluent in Spanish and English, both oral and written expression. Other languages would be a plus
<table>
<thead>
<tr>
<th>Job Title: Chief Commercial &amp; Procurement Officer</th>
<th>Reporting to: CEO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
<td></td>
</tr>
<tr>
<td>Location: Madrid, Spain</td>
<td></td>
</tr>
<tr>
<td>Status: Full Time Employee</td>
<td></td>
</tr>
<tr>
<td>Job Category: Commercial (Sales and Marketing)/Procurement</td>
<td></td>
</tr>
<tr>
<td>Relevant Work Experience: 5 to 7 Years</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Main Accountabilities &amp; Tasks:</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Lead Commercial negotiations with customers</td>
<td></td>
</tr>
<tr>
<td>- Foster and promote the commercial point of view in capture planning and campaign selection</td>
<td></td>
</tr>
<tr>
<td>- Responsible for all commercial aspects in bid preparation</td>
<td></td>
</tr>
<tr>
<td>- Monitoring of Scope evolution and ensure contract updates</td>
<td></td>
</tr>
<tr>
<td>- Manage and follow up response &amp; payment</td>
<td></td>
</tr>
<tr>
<td>- Lead Marketing policies and campaigns</td>
<td></td>
</tr>
<tr>
<td>- Lead Procurement Processes and Policies</td>
<td></td>
</tr>
<tr>
<td>- Perform the negotiation of the main procurement agreements and changes</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Skills / Education:</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- University degree in Engineering (Industrial, Telecommunications or Aeronautical) and/or Business Management/MBA/Marketing master</td>
<td></td>
</tr>
<tr>
<td>- Experience in contract negotiations and basic legal knowledge as well as in setting up drafts for commercial proposals</td>
<td></td>
</tr>
<tr>
<td>- Experience in the Engineering field</td>
<td></td>
</tr>
<tr>
<td>- Broad knowledge in the Commercial and Marketing area (e.g. Pricing, Costing, etc.)</td>
<td></td>
</tr>
<tr>
<td>- Excellent communication, negotiation, managerial and organizational skills</td>
<td></td>
</tr>
<tr>
<td>- The ability to work to strict timescales as part of an integrated, multidiscipline team</td>
<td></td>
</tr>
<tr>
<td>- Flexibility for frequent business travel</td>
<td></td>
</tr>
<tr>
<td>- Customer Focus</td>
<td></td>
</tr>
<tr>
<td>- Result oriented</td>
<td></td>
</tr>
<tr>
<td>- Add value oriented</td>
<td></td>
</tr>
<tr>
<td>- Fluent in Spanish and English, both oral and written expression. Other languages would be a plus</td>
<td></td>
</tr>
<tr>
<td>Job Title: Chief Operations Officer</td>
<td>Reporting to: CEO</td>
</tr>
<tr>
<td>----------------------------------------------------------</td>
<td>-------------------</td>
</tr>
</tbody>
</table>

**Description:**
- Location: Madrid, Spain
- Status: Full Time Employee
- Job Category: Operations/Commercial
- Relevant Work Experience: 5 to 7 Years

**Main Accountabilities & Tasks:**
- Responsible for all the operations of Imaginaeri
- Manage the operations team
- Carrying out and certifying tests, guaranteeing the application of safety rules
- Responsible for Research & Development
- Support the Chief Commercial Officer in pre-sales activities
- Support in preparation and release of price lists, re-selling activities and other instruments to promote sales
- Collaborate with the Chief Procurement Officer in the procurement process
- Complaint Management & Control
- Monitor Claim Status
- Lead management of improvement projects

**Skills / Education:**
- University degree in Engineering (Industrial, Telecommunications or Aeronautical) + MBA
- At least 5 years of experience in the Engineering field. Experience in finance, sales and/or marketing would be a plus
- The ability to work to strict timescales as part of an integrated, multidiscipline team
- Flexibility for frequent business travel
- Customer Focus
- Initiative & proactivity
- Pragmatic & result oriented
- Good Communication Skills
- Assertiveness
- Business Acumen
- Fluent in Spanish and English, both oral and written expression. Other languages would be a plus
**Job Title:** Operations Technician  
**Reporting to:** Chief of Operations

**Description:**
- Location: Madrid, Spain  
- Status: Full Time Employee  
- Job Category: Operations/Commercial  
- Relevant Work Experience: 3 to 5 Years

**Main Accountabilities & Tasks:**
- Make the reception of multicopters and other spares  
- Integrate the systems in the multicopters according to customers’ needs  
- Bring the solutions directly to the customers and provide the service in situ  
- Response technical queries  
- Responsible for technical publications  
- Support the Chief Commercial Officer and the Chief Operations Officer in pre-sales activities  
- Support improvements Projects

**Skills / Education:**
- Education: Engineering degree (Industrial, Telecommunications or Aeronautical)  
- At least 3 years of experience in the Engineering field. Experience in sales would be a plus  
- The ability to work to strict timescales as part of an integrated, multidiscipline team  
- Flexibility for frequent business travel  
- Good communication skills, creativity and hands-on way of working  
- Customer Focus  
- Initiative & proactivity  
- Pragmatic & result oriented  
- Fluent in Spanish and English, both oral and written expression. Other languages would be a plus

**8.4. Corporate values**

Imaginaeri seeks to have an entire and coherent philosophy and culture, which together with its mission and vision, allows Imaginaeri to provide high quality services and achieve its objectives.

A company is how its employees are. Therefore, if the company wants to have certain corporate values, it has to seek for employees who also share them. To achieve its objectives,
Imaginaeri requires great people who are bright, creative and energetic, and who share the following values:

- **Customer Focus**: Having a customer focus philosophy is usually a strong contributor to the overall success of a business. Hence, Imaginaeri wants to ensure that all aspects of the company put customer’s needs first. Imaginaeri also works for maintaining an effective customer relations and service programme.

- **Continuous innovation for industry leadership and new customized solutions**: Imaginaeri wants to be a leader in its sector and therefore technological innovation is a major competitive differentiator.

- **Environmentally friendly, sustainable growth and good corporate citizenship**: Imaginaeri is committed to making a sustainable and measurable difference to the world where society lives and works. Imaginaeri believes that strong corporate governance is critical to long-term value creation, and Imaginaeri ensures that every financial or environmental aspect of its business operates in accordance with the highest standards of ethics and integrity.

- **Integrity**: First and foremost, Imaginaeri’s employees are committed to integrity in all they do. They are honest with strong moral principles.

- **Eagerness to improve and dedication**: Employees have to be committed to personal excellence and self-improvement.

- **Respect**: Imaginaeri’s employees respect and have a polite behaviour towards every individual, not only customers, but also other employees, subcontractors, etc. Imaginaeri believes there is a great benefit from the diversity and entrepreneurial spirit of each individual.

- **Professionalism**: It is Imaginaeri’s duty to perform the highest standards of professionalism. The company is determined to deliver outstanding quality so that Imaginaeri unites with its clients and have long lasting relationships.

- **Teamwork**: It is the essence of Imaginaeri’s ability to succeed as a trusted vendor of training solutions to its clients. Imaginaeri learns continuously from its employees, consultants and strategic partners – sharing skills, resources, and experiences to benefit its clients as well as itself.

- **Engagement**: Imaginaeri seeks for “engaged employees” who are fully involved and enthusiastic about the business activities, and therefore act in a way that furthers Imaginaeri’s interests.
• Enhancing shareholders and investors value. Imaginaeri does not forget its investors. They are a key part in the business and Imaginaeri wants to provide them their respective dividends and also the increase their satisfaction towards the business and add value to them.

These are the corporate values of Imaginaeri; therefore, its employees must have them. These values are not only sought on staff levels, but also, and even more important, in management levels, since managers are the ones who have to lead with the example.

8.5. Staff development

Imaginaeri seeks continuous improvement; therefore, staff development is essential. The company is starting; therefore and considering this initial situation it allocates a responsible amount of money to training courses, this figure rise to 14420 € for 2014. This money is mainly used for training the Operations department for operating the multicopters. A smaller proportion of this amount is allocated for multicopters’ trade shows, where some of our employees go in order to be aware of the last innovation in multicopters’ field.

These resources are reasonable for the initial phase of the company. Imaginaeri considers employees’ training as a very important factor within the company; therefore in future scenarios, Imaginaeri wants to actively participate in the development of employees’ soft skills. By this period of time, which will be after the first 5 years, Imaginaeri will allocated a more important amount of money for training courses. The idea with these training courses will be to cover the deficiencies and the main tasks and accountabilities each employee has. For instance, the employees of the Commercial department may carry out a Problem Solving Course. This course will provide them and adequate understanding of customer needs and expectations. This course will improve both service and sales skills to become a service sales specialist.
8.6. Salaries

The company is a new venture and it is assumed that the people who come on board to start the business do it because they believe in the idea and they like their jobs. But of course, they also expect an acceptable salary. Every employee receives a monthly salary and yearly dividends as shareholders once the company starts to obtain benefits.

a. Fixed Remuneration

The baseline gross salaries that the company applies are formed in 3 bands:

- Executive management (CEO) = 30000€ per year
- Senior management (Chief Officers) = 25000€ per year
- Operation technician = 17000€ per year

The CEO, who also integrates Administrative and Financial Functions, only receives the salary corresponding to the Executive management. The table hereunder (Table 34) shows the quantity Imaginaeri has to pay to the Social Security per month.

<table>
<thead>
<tr>
<th></th>
<th>Annual Gross Salary</th>
<th>Company Contribution Payments (23.6% Social Security)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive management</td>
<td>30000€</td>
<td>7080.00€</td>
</tr>
<tr>
<td>Senior management</td>
<td>25000€</td>
<td>5900.04€</td>
</tr>
<tr>
<td>Operation technician</td>
<td>17000€</td>
<td>4011.96€</td>
</tr>
</tbody>
</table>

*Table 34. Imaginaeri’s Social Security Payments [40]*

Employees also have to pay to the Social Security (Table 35):

<table>
<thead>
<tr>
<th></th>
<th>Monthly Gross Salary</th>
<th>Monthly Employees Contribution Payments (4.7% Social Security)</th>
<th>IRPF</th>
<th>Monthly Net Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive management</td>
<td>2500.00€</td>
<td>117.50€</td>
<td>642.13€</td>
<td>1740.37€</td>
</tr>
<tr>
<td>Senior management</td>
<td>2083.33€</td>
<td>97.92€</td>
<td>525.47€</td>
<td>1459.95€</td>
</tr>
<tr>
<td>Operation technician</td>
<td>1416.67€</td>
<td>66.58€</td>
<td>340.00€</td>
<td>1010.08€</td>
</tr>
</tbody>
</table>

*Table 35. Employee’s Social Security Payments [40]*
b. Variable Remuneration

Besides the fixed remuneration, it is applicable a variable remuneration scheme, like the following:

- Imaginaeri retains 5% of the Net Profit as reserves (Retained Earnings), to finance Research & Development and cover possible incidentals.
- 5% of Imaginaeri’s Net Profit is dedicated as dividends for the shareholders.

8.7. Outsourced Activities

Imaginaeri outsources the daily cleaning and small repairs of electricity, locksmithing, plumbing, painting, air conditioning, etc. According to the budgets that different companies located in Madrid offer, Imaginaeri spends 700€/month. The security service is also an outsource activity but it cost is included in the price of the factory rental.

In Chapter 2.1 are explained the difficulties Imaginaeri may face due to the lack of regulation. In order to deal with this important matter, Imaginaeri contracts the services of a legal consulting company. This consultancy helps Imaginaeri with the new multicopters’ regulation on which the EU is working and also on daily legal aspects. The budget allocated to this outsourced activity is 150€/month.

9. Financial Plan

9.1. Work Breakdown Structure (WBS) and Cost Breakdown Structure (CBS)

All costs have been quoted as WBS, although the data analysis and treatments have been made following the CBS. This means that all the costs and expenditures have been computed regarding to all tasks, activities, materials and other concepts related to the company. Then, they have been aggregated attending to their financial properties, that is, if they are investments, direct cost or indirect costs.

See Appendix VI for a more detailed explanation about the WBS.
Table 36 shows the costs for CBS concept:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0.0.0.</td>
<td>IMAGINAERI</td>
<td>63.080.92€</td>
<td>174685.39€</td>
<td>229485.55€</td>
<td>243406.30€</td>
<td>401103.82€</td>
<td>452473.80€</td>
<td>1564235.78€</td>
</tr>
<tr>
<td>1.1.0.0.</td>
<td>INVESTMENTS</td>
<td>63080.92€</td>
<td>-€</td>
<td>38835.22€</td>
<td>-€</td>
<td>41200.29€</td>
<td>-€</td>
<td>143116.44€</td>
</tr>
<tr>
<td>1.1.1.0.</td>
<td>INVESTMENTS</td>
<td>63080.92€</td>
<td>-€</td>
<td>38835.22€</td>
<td>-€</td>
<td>41200.29€</td>
<td>-€</td>
<td>143116.44€</td>
</tr>
<tr>
<td>1.1.1.1.</td>
<td>MULTICOPTERS &amp; SYSTEMS</td>
<td>36605.92€</td>
<td>-€</td>
<td>38835.22€</td>
<td>-€</td>
<td>41200.29€</td>
<td>-€</td>
<td>116641.44€</td>
</tr>
<tr>
<td>1.1.1.2.</td>
<td>FACTORY</td>
<td>1697500€</td>
<td>-€</td>
<td>-€</td>
<td>-€</td>
<td>0,00€</td>
<td>-€</td>
<td>16975.00€</td>
</tr>
<tr>
<td>1.1.1.3.</td>
<td>IM (INFORMATION MANAGEMENT)</td>
<td>9500.00€</td>
<td>-€</td>
<td>-€</td>
<td>-€</td>
<td>0,00€</td>
<td>-€</td>
<td>9500.00€</td>
</tr>
<tr>
<td>1.2.0.0.</td>
<td>COSTS</td>
<td>-€</td>
<td>174685.39€</td>
<td>190650.33€</td>
<td>243406.30€</td>
<td>359903.53€</td>
<td>452473.80€</td>
<td>1421119.35€</td>
</tr>
<tr>
<td>1.2.1.0.</td>
<td>DIRECT COSTS</td>
<td>-€</td>
<td>124055.48€</td>
<td>162247.91€</td>
<td>211177.41€</td>
<td>316565.81€</td>
<td>412442.91€</td>
<td>1226489.53€</td>
</tr>
<tr>
<td>1.2.1.1.</td>
<td>SALARIES</td>
<td>-€</td>
<td>115183.06€</td>
<td>149441.79€</td>
<td>198280.17€</td>
<td>295631.52€</td>
<td>386723.48€</td>
<td>1145260.03€</td>
</tr>
<tr>
<td>1.2.1.2.</td>
<td>TRANSPORT</td>
<td>-€</td>
<td>8305.92€</td>
<td>12689.42€</td>
<td>12656.84€</td>
<td>20686.68€</td>
<td>25719.42€</td>
<td>80058.29€</td>
</tr>
<tr>
<td>1.2.1.3.</td>
<td>OPERATOR LICENSES</td>
<td>-€</td>
<td>-€</td>
<td>-€</td>
<td>-€</td>
<td>-€</td>
<td>-€</td>
<td>-€</td>
</tr>
<tr>
<td>1.2.1.4.</td>
<td>MATERIALS</td>
<td>-€</td>
<td>566.50€</td>
<td>116.70€</td>
<td>240.40€</td>
<td>247.61€</td>
<td>0,00€</td>
<td>1171.21€</td>
</tr>
<tr>
<td>1.2.2.0.</td>
<td>INDIRECT COSTS</td>
<td>-€</td>
<td>50629.91€</td>
<td>28402.41€</td>
<td>32228.89€</td>
<td>43337.72€</td>
<td>40030.89€</td>
<td>194629.82€</td>
</tr>
<tr>
<td>1.2.2.1.</td>
<td>FACTORY RENTING</td>
<td>-€</td>
<td>11330.00€</td>
<td>11669.90€</td>
<td>12020.00€</td>
<td>12380.60€</td>
<td>12752.01€</td>
<td>60152.51€</td>
</tr>
<tr>
<td>1.2.2.2.</td>
<td>INVOICES</td>
<td>-€</td>
<td>3708.00€</td>
<td>3819.24€</td>
<td>3933.82€</td>
<td>4051.83€</td>
<td>4173.39€</td>
<td>19686.28€</td>
</tr>
<tr>
<td>1.2.2.3.</td>
<td>OUTSOURCED SERVICES</td>
<td>-€</td>
<td>5562.00€</td>
<td>5728.86€</td>
<td>5900.73€</td>
<td>6077.75€</td>
<td>6260.08€</td>
<td>29529.41€</td>
</tr>
<tr>
<td>1.2.2.4.</td>
<td>INSURANCES &amp; WARRANTIES</td>
<td>-€</td>
<td>1653.15€</td>
<td>1858.70€</td>
<td>2157.04€</td>
<td>2431.10€</td>
<td>2910.94€</td>
<td>11010.93€</td>
</tr>
<tr>
<td>1.2.2.5.</td>
<td>MARKETING</td>
<td>-€</td>
<td>13441.76€</td>
<td>4795.27€</td>
<td>7670.94€</td>
<td>6578.60€</td>
<td>1762.10€</td>
<td>34248.66€</td>
</tr>
<tr>
<td>1.2.2.6.</td>
<td>IM (INFORMATION MANAGEMENT)</td>
<td>-€</td>
<td>515.00€</td>
<td>530.45€</td>
<td>546.36€</td>
<td>562.75€</td>
<td>579.64€</td>
<td>2734.20€</td>
</tr>
<tr>
<td>1.2.2.7.</td>
<td>TRAINING (OPERATOR &amp; OTHERS)</td>
<td>-€</td>
<td>14420.00€</td>
<td>-€</td>
<td>-€</td>
<td>-€</td>
<td>-€</td>
<td>14420.00€</td>
</tr>
<tr>
<td>1.2.2.8.</td>
<td>R&amp;D CUSTOMIZED SOLUTIONS</td>
<td>-€</td>
<td>-€</td>
<td>-€</td>
<td>-€</td>
<td>11255.09€</td>
<td>11592.74€</td>
<td>22847.83€</td>
</tr>
</tbody>
</table>

Table 36. Cost Breakdown Structure
The origin and quantity of each cost have been explained in the Operations Plan (Chapter 6).

Several analyses could be made from the costs of the company. This paragraph focuses on big numbers. The two following Figures represent Imaginaeri’s Cost Breakdown per year of operation (Figure 57) and for the entire program (5 years) (Figure 58).

**Expenses Distribution (per year)**

```
<table>
<thead>
<tr>
<th>Year</th>
<th>Multicopters</th>
<th>Salaries</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>T0</td>
<td>66%</td>
<td>58%</td>
<td>17%</td>
</tr>
<tr>
<td>2014</td>
<td>18%</td>
<td>19%</td>
<td>15%</td>
</tr>
<tr>
<td>2015</td>
<td>19%</td>
<td>16%</td>
<td>15%</td>
</tr>
<tr>
<td>2016</td>
<td>16%</td>
<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>2017</td>
<td>15%</td>
<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>2018</td>
<td>15%</td>
<td>15%</td>
<td>15%</td>
</tr>
</tbody>
</table>
```

*Figure 57. Imaginaeri’s Cost Breakdown per year*

**Total (5 years) Cost Distribution**

```
<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multicopters</td>
<td>19%</td>
</tr>
<tr>
<td>Salaries</td>
<td>73%</td>
</tr>
<tr>
<td>Others</td>
<td>7%</td>
</tr>
</tbody>
</table>
```

*Figure 58. Imaginaeri’s Cost Breakdown for the entire program*
9.2. Financial sources

As the reality of nowadays’ entrepreneurial panorama recommends, Imaginaeri has decided to fund its cost heavily with its capital, this means that an important part of funding comes from capital investment in equity, both by the five funders and a prospective business angel (BA).

The capital of constitution is described in the following table (Table 37):

<table>
<thead>
<tr>
<th>Ownership</th>
<th>Stocks</th>
<th>Participate Loan</th>
<th>Bank Loan</th>
</tr>
</thead>
<tbody>
<tr>
<td>SH 1</td>
<td>14%</td>
<td>29000€</td>
<td>9500€</td>
</tr>
<tr>
<td>SH 2</td>
<td>14%</td>
<td>29000€</td>
<td>9500€</td>
</tr>
<tr>
<td>SH 3</td>
<td>14%</td>
<td>29000€</td>
<td>9500€</td>
</tr>
<tr>
<td>SH 4</td>
<td>14%</td>
<td>29000€</td>
<td>9500€</td>
</tr>
<tr>
<td>SH 5</td>
<td>14%</td>
<td>29000€</td>
<td>9500€</td>
</tr>
<tr>
<td>BA</td>
<td>30%</td>
<td>30000€</td>
<td>97500€</td>
</tr>
<tr>
<td>Bank</td>
<td>0%</td>
<td>- €</td>
<td>- €</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100%</td>
<td>175000€</td>
<td>145000€</td>
</tr>
</tbody>
</table>

Table 37. Table depicting the architecture of the founding capital

As Table 37 depicts, the amount that needed to be financed in the starting years of operation of the company ascends to 350000€. The funds must be raised in the first year with a non-convertible participative loan. It is defined as non-convertible debt as the founding shareholders do not want to modify the capital structure in the years before losing importance in the decision core.

The conditions of these participative loans, given by the shareholders of the recently constituted company, are really favorable in the sense of financing costs and represent the best way to finance up to 35% of the costs associated with the negative cash flows predicted until 2015.
The concrete conditions for the participative loan are:

- An effective interest of 3% during 5 years.
- Grace period of one year propagating monthly repayment (but not interests) to rest of years in the repayment calendar.

As for the conditions for the long term bank loan are:

- An effective interest of 9% during 5 years.
- No grace period applicable.

Following the repayment calendar of the debt is shown (Table 40):

<table>
<thead>
<tr>
<th>Year</th>
<th>Bank Loan debt</th>
<th>Bank Loan annual payment</th>
<th>Bank Loan effective Interest (9%)</th>
<th>Participative Loan debt</th>
<th>P.L Annual payment</th>
<th>P.L Interest (3%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>30000.00€</td>
<td>- €</td>
<td>2700.00€</td>
<td>14500.00€</td>
<td>- €</td>
<td>- €</td>
</tr>
<tr>
<td>2015</td>
<td>23580.50€</td>
<td>6419.50€</td>
<td>2700.00€</td>
<td>10875.00€</td>
<td>36250.00€</td>
<td>13050.00€</td>
</tr>
<tr>
<td>2016</td>
<td>16488.83€</td>
<td>7091.67€</td>
<td>2122.25€</td>
<td>72500.00€</td>
<td>36250.00€</td>
<td>9787.50€</td>
</tr>
<tr>
<td>2017</td>
<td>8654.56€</td>
<td>7834.27€</td>
<td>1483.99€</td>
<td>36250.00€</td>
<td>36250.00€</td>
<td>6525.00€</td>
</tr>
<tr>
<td>2018</td>
<td>- €</td>
<td>8654.56€</td>
<td>778.91€</td>
<td>- €</td>
<td>36250.00€</td>
<td>3262.50€</td>
</tr>
</tbody>
</table>

*Table 38. Annual debt payment plan*
9.3. Amortization Plan

Although investments that Imaginaeri comprises are not excessive, an amortization plan has been designed to adequately spread the investment over the years of usage of the equipment acquired.

The period of amortization established for the Property, Plant and Equipment is three years. The reason behind the election of this period is the high innovation rate behind these products. Imaginaeri’s aim is to be a top-notch service provider and the high speed in which new features appear with newer machines forces a quick renovation rate.

The investment in Software Property is excluded from this policy and amortized along the five years due to the mature development the software has, and its yearly maintenance and support.

<table>
<thead>
<tr>
<th>Year amount</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investments</td>
<td>- €</td>
<td>19760.31 €</td>
<td>19760.31 €</td>
<td>32705.38 €</td>
<td>14845.07 €</td>
<td>28578.50 €</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year amount</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accumulated</td>
<td>- €</td>
<td>19760.31 €</td>
<td>39520.62 €</td>
<td>72226.00 €</td>
<td>87071.07 €</td>
<td>115649.58 €</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year amount</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investments</td>
<td>53580.92 €</td>
<td>- €</td>
<td>38835.22 €</td>
<td>- €</td>
<td>41200.29 €</td>
<td>- €</td>
</tr>
</tbody>
</table>

Table 39. Amount amortized per year along the period after the investment

9.4. Sales forecast

The number of multicopters Imaginaeri purchases is predicted in Table 21. The services and prices offered by the company are explained in Chapter 7.2 and Chapter 7.3 respectively.

Taking into account the study carried out by Frost & Sullivan [15] about the services with greater growth in the following years, the following percentages of sales have been estimated according to the kind of service:

<table>
<thead>
<tr>
<th>Service / Mission</th>
<th>Percentage over total sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerial Photography (High Definition)</td>
<td>25%</td>
</tr>
<tr>
<td>Aerial Video (Standard definition)</td>
<td>27%</td>
</tr>
<tr>
<td>Infra-red / Thermal Inspection</td>
<td>48%</td>
</tr>
</tbody>
</table>

Table 40. Estimation of the percentage per service over total sales

Considering also Imaginaeri’s capability of providing services (due to the number of multicopters and the number of operation technicians), and assuming a very small demand in
the beginning, but also a quick growth, the number of services forecasted per year is the following:

<table>
<thead>
<tr>
<th>Service / Mission</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerial Photography (High Definition)</td>
<td>12</td>
<td>50</td>
<td>85</td>
<td>1875</td>
<td>275</td>
</tr>
<tr>
<td>Aerial Video (Standard definition)</td>
<td>12.96</td>
<td>54</td>
<td>91.8</td>
<td>202.5</td>
<td>297</td>
</tr>
<tr>
<td>Infra-red / Thermal Inspection</td>
<td>23.04</td>
<td>96</td>
<td>163.2</td>
<td>360</td>
<td>528</td>
</tr>
<tr>
<td>TOTAL SERVICES</td>
<td>48</td>
<td>200</td>
<td>340</td>
<td>750</td>
<td>1100</td>
</tr>
</tbody>
</table>

Table 41. Services forecasted to be sold per year

As it can be seen in the following figure (Figure 60), these services evolution is represented as a convex curse (increasing curvature), especially due to a very low demand in the beginning but high growth in the future. As it has been already seen in previous chapters, Civil UAVs market is still unknown, but its advantages have been already proved and more and more governments and companies are trying to launch it. Therefore, as different articles show [43] [44] [45], an increasing demand is forecasted.

Figure 60. Number of daily services per year
Finally, considering the number of services forecasted and their medium price, the sales forecasted per year are represented in the following table (Table 42):

<table>
<thead>
<tr>
<th>Sales (€)</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerial Photography (High Definition)</td>
<td>7800</td>
<td>32500</td>
<td>55250</td>
<td>121875</td>
<td>178750</td>
</tr>
<tr>
<td>Aerial Video (Standard Definition)</td>
<td>6091</td>
<td>25380</td>
<td>43146</td>
<td>95175</td>
<td>139590</td>
</tr>
<tr>
<td>Infra-red / Thermal Inspection</td>
<td>29952</td>
<td>124800</td>
<td>212160</td>
<td>468000</td>
<td>686400</td>
</tr>
<tr>
<td>TOTAL</td>
<td>43843</td>
<td>182680</td>
<td>310556</td>
<td>685050</td>
<td>1004740</td>
</tr>
</tbody>
</table>

*Table 42. Sales forecasted per year*

9.5. Profit and Loss account

The profit and loss analysis compares the sales forecasted with all the costs and expenditures for each year of operation of the company. As can be observed in the P&L table (Table 43), it is expected to have losses for the first and second year, although from the third year onwards benefits will be generated.

It is noticeable to see that although the total amount of benefits at the fifth year is bigger than at the fourth, the percentage of net profit over total sales is slightly smaller. This is due to the fiscal shield that has been applied in order not to pay taxes the three first years and to pay less the fourth one. Actually, the EBT margin is higher at the fifth year.

It can be also appreciated, that the margins at the fifth year over sales are pretty good. Direct costs represent a 41%, while indirect ones are only 4%. This is because most of the costs are the ones corresponding to the salaries. This is a good fact for Imaginaeri’s business, because the bigger the sales, the higher the margin, since the indirect costs will not grow too much. Finally, EBT margin stands for a 52% of the total sales, what is a very good number.
<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TOTAL SALES (EXPECTED INCOME)</strong></td>
<td>43843€</td>
<td>182680€</td>
<td>310556€</td>
<td>685050€</td>
<td>1004740€</td>
</tr>
<tr>
<td>- COST OF GOOD SOLD (COGS) / DIRECT COSTS</td>
<td>124055€</td>
<td>162248€</td>
<td>211177€</td>
<td>316566€</td>
<td>412443€</td>
</tr>
<tr>
<td><strong>= GROSS MARGIN</strong></td>
<td>-80212€</td>
<td>-20432€</td>
<td>99379€</td>
<td>368484€</td>
<td>592297€</td>
</tr>
<tr>
<td>- INDIRECT COSTS</td>
<td>50630€</td>
<td>28402€</td>
<td>32229€</td>
<td>43338€</td>
<td>40031€</td>
</tr>
<tr>
<td><strong>= OPERATING INCOME (EBITDA)</strong></td>
<td>-130842€</td>
<td>-7970€</td>
<td>67150€</td>
<td>325146€</td>
<td>552266€</td>
</tr>
<tr>
<td>- DEPRECIATION AND AMORTIZATION (DA)</td>
<td>19760€</td>
<td>19760€</td>
<td>32705€</td>
<td>14845€</td>
<td>28579€</td>
</tr>
<tr>
<td><strong>= OPERATING PROFIT (EBIT)</strong></td>
<td>-150602€</td>
<td>-27731€</td>
<td>34444€</td>
<td>310301€</td>
<td>523688€</td>
</tr>
<tr>
<td>- INTERESTS (FINANCIAL RESULT)</td>
<td>2700€</td>
<td>15302€</td>
<td>11550€</td>
<td>7752€</td>
<td>3903€</td>
</tr>
<tr>
<td><strong>= EBT</strong></td>
<td>-153302€</td>
<td>-43033€</td>
<td>22894€</td>
<td>302550€</td>
<td>519784€</td>
</tr>
<tr>
<td>- TAXES</td>
<td>0€</td>
<td>0€</td>
<td>0€</td>
<td>0€</td>
<td>0€</td>
</tr>
<tr>
<td><strong>= NET PROFIT (EAT)</strong></td>
<td>-153302€</td>
<td>-43033€</td>
<td>22894€</td>
<td>263817€</td>
<td>363849€</td>
</tr>
</tbody>
</table>

Table 43. Imaginaeri's Profit and Loss account
9.6. Balance Sheet

Imaginaeri has decided to finance itself heavily with own equity and thus the capital has a great importance in the balance. In the first three years the company throws negative cash flow, but the level of leverage is not expected to climb much high (Table 44).

A company in the role of service provider has some peculiarities in the financial statements; one of these is the Inventory. As it is defined, in the sense of service, Imaginaeri does not have an inventory per se, but only a utilization rate to measure efficiency in time. What appears in the field of inventory is the material used in office equipment.

It is shown in Table 44 and Figure 53 that the percentages belonging to current and non-current assets vary pretty much in function of the year, due mainly to the quick amortization of the multicopters and the regular investment in non-current assets. It is worth to mention the last year, where this difference is especially high since both, the factory and the multicopters, are almost amortized and a new investment would be required for the next year.

However, it can be seen that non-current assets never account for more than a 50%, what is a good point for the liquidity of the company. Since most of the assets are current assets the company is less risky; in case that the sales go down, it would be possible to invest less or to reduce personal without selling any asset needed to carry out the service.

It can also be seen in Table 44 and Figure 54 that long-term debt is chosen over short-term debt because the company is a start-up and it is no possible to pay back the money required for the initial period in short term. Therefore, the percentage of non-current liabilities is higher than the percentage of current liabilities up to the fifth year, when all the debt has been paid back and the equity is very high. This high amount of equity will decrease when the investment required the sixth year to continue with the business is made.
## Imagnaeri | Business Plan

Beyond Human Limits

**Table 44. Table depicting the Balance Sheet for the first five years of operation**

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current Assets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>286919.08€</td>
<td>153670.32€</td>
<td>34799.83€</td>
<td>34695.11€</td>
<td>194027.38€</td>
<td>527170.91€</td>
</tr>
<tr>
<td>AR (Accounts Receivable)</td>
<td>€ 0%</td>
<td>4804.73€</td>
<td>20019.73€</td>
<td>34033.53€</td>
<td>75073.97€</td>
<td>96344.93€</td>
</tr>
<tr>
<td>Inventory</td>
<td>4875.00€</td>
<td>4875.00€</td>
<td>4875.00€</td>
<td>4875.00€</td>
<td>4875.00€</td>
<td>4875.00€</td>
</tr>
<tr>
<td><strong>Non-Current Assets</strong></td>
<td>58205.92€</td>
<td>38445.62€</td>
<td>57520.53€</td>
<td>24815.15€</td>
<td>51170.36€</td>
<td>1650982.70€</td>
</tr>
<tr>
<td>Property, Plant and Equipment</td>
<td>48705.92€</td>
<td>30845.62€</td>
<td>51820.53€</td>
<td>21015.15€</td>
<td>49270.36€</td>
<td>22591.86€</td>
</tr>
<tr>
<td>Software Property</td>
<td>9500.00€</td>
<td>7600.00€</td>
<td>4875.00€</td>
<td>4875.00€</td>
<td>4875.00€</td>
<td>4875.00€</td>
</tr>
<tr>
<td>Other Non-Current Assets</td>
<td>€ 0%</td>
<td>€ 0%</td>
<td>€ 0%</td>
<td>€ 0%</td>
<td>€ 0%</td>
<td>€ 0%</td>
</tr>
</tbody>
</table>

| **Total Assets**   | 350000.00€       | 201795.67€       | 117215.09€       | 98418.79€        | 325146.71€       | 650982.70€       |

| **Current Liabilities** |                  |                  |                  |                  |                  |                  |
| Accounts Payable     | € 0%             | 5098.17€         | 6667.72€         | 8678.52€         | 15611.46€        | 22599.61€        |
| Short Term Debt      | € 0%             | 42669.50€        | 43341.67€        | 44084.27€        | 44904.56€        | - € 0%           |

| **Non-Current Liabilities** | 175000.00€      | 132330.50€       | 88988.83€        | 44904.56€        | - € 0%           | - € 0%           |
| Long-Term Debt       | 175000.00€       | 132330.50€       | 88988.83€        | 44904.56€        | - € 0%           | - € 0%           |

| **Shareholders’ Equity** | 175000.00€       | 21697.50€        | -21783.14€       | 751.44€          | 264630.69€       | 628390.84€       |
| Capital              | 175000.00€       | 175000.00€       | 175000.00€       | 175000.00€       | 175000.00€       | 175000.00€       |
| Dividends            | € 0%             | - € 0%           | - € 0%           | - € 0%           | - € 0%           | - € 0%           |
| Result year / Net income | € 0%            | - 153302.50€     | -43480.64€       | 22534.58€        | 228150.71€       | 277400.06€       |
| Provisions / Retained Earnings | € 0%         | - € 0%           | - € 0%           | - € 0%           | - € 0%           | - € 0%           |
| Accumulated results  | € 0%             | - € 0%           | - 153302.50€     | -196783.14€      | -174248.56€      | -89630.69€       |

| **Total Liabilities** | 350000.00€       | 201795.67€       | 117215.09€       | 98418.79€        | 325146.71€       | 650982.70€       |
Balance sheet evolution (Assets)

Figure 61. Balance Sheet Evolution (Assets)

Balance Sheet Evolution (Liabilities)

Figure 62. Balance Sheet Evolution (Liabilities)
9.7. Cash Flow

Representing costs versus sales, it can be observed that the break-even is expected to happen during the fourth year, in the early 2017 (Figure 63).

Attending to the transference of money into or out of the business, the Cash Flow is calculated for the 5 years of the program. Cash & cash equivalents used into the Balance Sheet are obtained as the sum of three terms: Operational Cash Flow, Investment Cash Flow and Financial Cash Flow.

The Operational Cash Flow, resulting from operating activities of the company, is the same as net profit plus depreciation and amortization, minus changes of working capital needs and retained earnings. The Cash Flow from investment activities during the first 5 years of the company is also known as the Capital Expenditure (Capex). Finally, the Financial Cash Flow consists on the debt repayment and dividends. In this way, the Cash & Cash Equivalents can be calculated, and it represents the whole cash fluctuations for Imaginaeri. It is shown in Figure 64.
Greater details about the Cash Flow are shown in Table 46.

A point which is worthy to have a look at is the working capital changes. Due to the character of the business, the accounts payable period will be shorter than the accounts collection period. As it is shown in the following table, Imaginaeri is expected to gain power once the business is established and clients and suppliers know the company. However, the working capital changes will be always negative in terms of cash due to this fact. This can be seen in Table 45.

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts Collection Period</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>35</td>
</tr>
<tr>
<td>Accounts Payable Period</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>18</td>
<td>20</td>
</tr>
</tbody>
</table>

*Table 45. Account Payable and Collection Periods*
### Imaginaeri Cash Flow

<table>
<thead>
<tr>
<th>Year</th>
<th>PROVISIONS (INITIAL CASH)</th>
<th>NET PROFIT (EAT)</th>
<th>DEPRECIATION AND AMORTIZATION (DA)</th>
<th>WORKING CAPITAL CHANGES</th>
<th>RETAINED EARNINGS</th>
<th>CAPEX (INVESTMENTS)</th>
<th>DEBT REPAYMENT</th>
<th>DIVIDENDS</th>
<th>Free Cash Flows</th>
<th>CASH &amp; CASH EQUIVALENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>350000.00€</td>
<td>0.00€</td>
<td>0</td>
<td>0</td>
<td>0.00€</td>
<td>63080.92€</td>
<td>0</td>
<td>0</td>
<td>-63080.92€</td>
<td>286919.08€</td>
</tr>
<tr>
<td>2014</td>
<td>286919.08€</td>
<td>-153302.50€</td>
<td>19760.31€</td>
<td>6082.41€</td>
<td>0.00€</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-144599.49€</td>
<td>142319.59€</td>
</tr>
<tr>
<td>2015</td>
<td>142319.59€</td>
<td>-43032.90€</td>
<td>19760.31€</td>
<td>13614.76€</td>
<td>0.00€</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-117414.09€</td>
<td>24905.49€</td>
</tr>
<tr>
<td>2016</td>
<td>24905.49€</td>
<td>22894.30€</td>
<td>32705.38€</td>
<td>12965.72€</td>
<td>0.00€</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-712.76€</td>
<td>24192.73€</td>
</tr>
<tr>
<td>2017</td>
<td>24192.73€</td>
<td>263817.02€</td>
<td>14845.07€</td>
<td>33151.09€</td>
<td>0.00€</td>
<td>0</td>
<td>0</td>
<td>13190.85€</td>
<td>135168.64€</td>
<td>159361.37€</td>
</tr>
<tr>
<td>2018</td>
<td>159361.37€</td>
<td>28578.50€</td>
<td>28578.50€</td>
<td>7931.34€</td>
<td>0.00€</td>
<td>0</td>
<td>0</td>
<td>18192.45€</td>
<td>304740.06€</td>
<td>464101.42€</td>
</tr>
</tbody>
</table>

**Table 46. Imaginaeri's Cash Flow**
9.8. Ratios and Conclusions

This section provides a deeper analysis about Imaginaeri’s financial status. Once the Profit and Loss, Cash Flows and Balance Sheet have been analyzed, some ratios are calculated in order to extract conclusions about the company. Is Imaginaeri a company worthy to invest in? How is its profitability? What about the liquidity of the company?

The first thing which attracts the investors’ attention is how long the company takes to recover the initial investment and which is its profitability. This is the Internal Rate of Return (IRR).

Based on Imaginaeri’s cash flows, the Net Present Value (NPV) for an interest rate of 15% is 70,115 €, which is bigger than zero. Actually, the Internal Rate of Return (IRR) is 22%. Therefore, any investor looking for an IRR equal or lower than that value should invest in Imaginaeri.

Furthermore, if the present value of the cash flows is calculated, it can be seen that the payback period of the company is 6 years, which is a very good time frame for a start-up.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash Flows</td>
<td>-63081€</td>
<td>-144600€</td>
<td>-117414€</td>
<td>-713€</td>
<td>135169€</td>
<td>304740€</td>
<td>276162€</td>
</tr>
<tr>
<td>Present Value</td>
<td>-63081€</td>
<td>-125739€</td>
<td>-88782€</td>
<td>-469€</td>
<td>77283€</td>
<td>151510€</td>
<td>342617€</td>
</tr>
</tbody>
</table>

*Table 47. Present Value*

<table>
<thead>
<tr>
<th>Interest Rate</th>
<th>NPV</th>
<th>IRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>15%</td>
<td>70115€</td>
<td>22%</td>
</tr>
</tbody>
</table>

*Table 48. NPV and IRR*

<table>
<thead>
<tr>
<th>Payback period</th>
<th>€</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 years</td>
<td>-49277€</td>
</tr>
<tr>
<td>6 years</td>
<td>Greater than zero</td>
</tr>
</tbody>
</table>

*Table 49. Payback Period*

a. Liquidity

The acid test is used in order to analyze the short-term solvency of the company. The general rule is that the acid-test ratio should be at least 1, which means that liquid assets should equal current liabilities. If the ratio falls as low as 0.5, it may be cause for alarm. As it is shown in the following table, Imaginaeri is always covering its current liabilities. The last year this value is
especially high since no new investment is done and no new loan is asked for, so the cash is very high.

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acid test</td>
<td>3.28</td>
<td>1.05</td>
<td>1.30</td>
<td>4.55</td>
<td>27.63</td>
</tr>
</tbody>
</table>

*Table 50. Acid Test*

b. Leverage

The interest coverage shows if a company is able to cover its financial interest through its EBIT. As it can be seen in the following table, the interest coverage of the company is higher every year, getting huge in the last one since no debt is left to pay.

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest Coverage</td>
<td>-55.78</td>
<td>-1.81</td>
<td>2.98</td>
<td>40.03</td>
<td>134.16</td>
</tr>
</tbody>
</table>

*Table 51. Interest Coverage*

c. Efficiency

Assets turnover measures a firm’s efficiency at using its assets in generating sales or revenue, therefore the higher the number the better. The following table shows the assets turnover along the years.

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets turnover</td>
<td>0.22</td>
<td>1.61</td>
<td>3.22</td>
<td>2.11</td>
<td>1.54</td>
</tr>
</tbody>
</table>

*Table 52. Assets turnover*

It can be seen that from the 4th year, the efficiency of the assets seems to decrease, however if a deeper study is made, it can be appreciated that the EBIT Margin is continuously increasing up to a very good value (52.12%). This means that the company is getting a higher profit from the services it is carrying out. Since the shareholders equity and the cash retained grow a lot in the last two years, the assets are also higher and the assets turnover is lower. However an assets turnover of 1.54 is still very high. It will probably decrease a little bit more when the company establishes and still it will be a very good number.

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBIT margin</td>
<td>-343.50%</td>
<td>-15.18%</td>
<td>11.09%</td>
<td>45.30%</td>
<td>52.12%</td>
</tr>
</tbody>
</table>

*Table 53. EBIT margin*
d. Economic profitability

The return on assets (ROA) is an indicator of how profitable a company is relative to its total assets. ROA gives an idea about what earnings were generated from invested capital (assets). As the assets turnover and the EBIT margin, this ratio has very good values. The decrease at the last year can be understood if the ratio is decomposed:

\[
\text{ROA} = \text{EBIT margin} \times \text{Assets turnover}
\]

It is obvious that the increment in assets the last year affects the ratio.

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>-76.52%</td>
<td>-24.40%</td>
<td>35.74%</td>
<td>95.67%</td>
<td>80.34%</td>
</tr>
</tbody>
</table>

*Table 54. ROA*

e. Financial return

The financial return is calculated through the Return on Capital Employed (ROCE), a financial ratio that measures a company's profitability and the efficiency with which its capital is employed.

A higher ROCE indicates more efficient use of capital. ROCE should be higher than the company’s capital cost; otherwise it indicates that the company is not employing its capital effectively and is not generating shareholder value.

The capital employed has been calculated in a conservative way, considering all the assets plus the working capital. Despite that, the ratios are really high.

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROCE = EBIT / Capital Employed</td>
<td>-74.22%</td>
<td>-24.40%</td>
<td>29.68%</td>
<td>95.67%</td>
<td>76.51%</td>
</tr>
<tr>
<td>Capital Employed</td>
<td>202903€</td>
<td>113666€</td>
<td>116066€</td>
<td>324359€</td>
<td>684487€</td>
</tr>
</tbody>
</table>

*Table 55. ROCE*

The reason why the last year the ROCE decreases a little bit is again the high amount of capital which is stopped due to the lack of investment considered in the business plan for the sixth year. However, Imaginaeri will make some investment in the sixth year, at least to repair the information management software which has been amortized already, so the ratio will increase a little bit.
f. Shareholders profitability

In order to see how the company is from the shareholder’s point of view, the Return on Equity (ROE) is calculated. It measures a corporation’s profitability by revealing how much profit a company generates with the money shareholders have invested. \[ \text{ROE} = \frac{\text{Net income} - \text{Priority Dividends} - \text{Retained earnings}}{\text{Shareholders' equity}} \]

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROE</td>
<td>-87.60%</td>
<td>-24.59%</td>
<td>13.08%</td>
<td>150.75%</td>
<td>192.84%</td>
</tr>
</tbody>
</table>

Table 56. ROE

9.9. Sensitivity analysis

a. Adverse scenario

Once a complete financial forecast and analysis have been performed, the next step is to foresee some changes in the initial plan. As starting point it is only worth to analyze a situation that reflects worse conditions than initially planned. Logically better conditions are always welcomed and worse ones are not. These last ones require, depending on the particular case, to take some maneuvers to keep the business alive as for instance an increase of the economic effort or even some investments reduction to overcome them.

It is also important to remark that, along the whole analysis, we have never been optimistic to calculate Imaginaeri’s numbers. For example, the prices have been considered without summing all the possible supplements that the clients could be charged and the additional income due to possible tailored solutions starting at the fourth year has not been included.

In order to analyze this adverse scenario the following risks that can affect Imaginaeri’s operations development have been taken into consideration:

- Higher operating costs than expected
- Less demand than forecasted
- Non – payments arise

Apart from the previously mentioned, a risk related to a delay on Imaginaeri’s operations could have been considered due to the uncertainty about the legal environment evolution. However, this risk does not have to have financial impacts because the initial phase of operations can be delayed until these issues are finally solved. Besides, as it has been stated along this document,
and according to the current evolution of this issue, there are high probabilities to be solved in the near future. Table 59 shows the analysis performed of these risks from a criticality point of view identifying the possible causes and the main effects. The risks assessment matrices used to perform the evaluation are shown in the Appendix VII.
## Table 57. Risks analysis

<table>
<thead>
<tr>
<th>Probability</th>
<th>Impact</th>
<th>Criticality Assessment</th>
<th>Possible Causes</th>
<th>Effects</th>
<th>Financial implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher operating costs</td>
<td>35%</td>
<td>LOW</td>
<td>PROCUREMENT cost increase due to multicopters &amp; systems price increase or suppliers failure.</td>
<td>- Loss of revenue - Delay in Break-even - Increase of finance needs</td>
<td>- Direct costs increase 5%</td>
</tr>
<tr>
<td>than expected</td>
<td></td>
<td>LOW (15)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less demand</td>
<td>30%</td>
<td>MEDIUM</td>
<td>ENTRY OF new competitors Prospective clients not interested Not enough market visibility</td>
<td>- Loss of revenue - Delay in Break-even - Increase of finance needs</td>
<td>- Total sales decrease 5%</td>
</tr>
<tr>
<td>than forecasted</td>
<td></td>
<td>MEDIUM (11)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-payments</td>
<td>40%</td>
<td>MEDIUM</td>
<td>CLIENTS insolvency or with economic problems</td>
<td>- Loss of revenue - Delay in Break-even - Increase of finance needs</td>
<td>- Acc. Collection period increases 25%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MEDIUM (11)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The financial implications shown in Table 57 have been represented inside the financial statements.

It is worth to mention that besides of the conservative way of forecasting the financial scenario, even if all the risks affecting on the adverse scenario are taken into consideration, the financial results are quite good.

In Table 59 and Table 58 are shown the financial results derived from this adverse scenario. It can be seen the impacts on Imaginaeri's cash flow statement and the resulting Net Present Value and Internal Rate of Return for a rate of interest of 12%. The results are pretty good, obtaining an IRR of 12%.
## Table 58. Imaginaeri’s Cash Flow in the adverse scenario defined

<table>
<thead>
<tr>
<th>YEAR</th>
<th>T0 - 2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROVISIONS (INITIAL CASH)</td>
<td>350000.00€</td>
<td>286919.08€</td>
<td>138253.56€</td>
<td>- 606.98€</td>
<td>- 30110.52€</td>
<td>78857.45€</td>
</tr>
<tr>
<td>EAT</td>
<td>- €</td>
<td>- 161697.43€</td>
<td>- 60727.03€</td>
<td>- 3552.10€</td>
<td>244341.10€</td>
<td>314151.00€</td>
</tr>
<tr>
<td>DA</td>
<td>- €</td>
<td>19760.31€</td>
<td>19760.31€</td>
<td>32705.38€</td>
<td>14845.07€</td>
<td>28578.50€</td>
</tr>
<tr>
<td>Working Capital Needs Changes</td>
<td>- €</td>
<td>6728.39€</td>
<td>16389.09€</td>
<td>15492.77€</td>
<td>40499.53€</td>
<td>11570.24€</td>
</tr>
<tr>
<td>CAPEX (INVESTMENTS)</td>
<td>63080.92€</td>
<td>- €</td>
<td>38835.22€</td>
<td>- €</td>
<td>41200.29€</td>
<td>- €</td>
</tr>
<tr>
<td>DEBT REPAYMENT (bank + NC Debt)</td>
<td>- €</td>
<td>- €</td>
<td>42669.50€</td>
<td>43341.67€</td>
<td>44084.27€</td>
<td>44904.56€</td>
</tr>
<tr>
<td>Dividends</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>12217.05€</td>
<td>15707.55€</td>
</tr>
<tr>
<td>Retained Earnings</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- 177.60€</td>
<td>12217.05€</td>
<td>15707.55€</td>
</tr>
<tr>
<td>CASH FLOW</td>
<td>- 63080.92€</td>
<td>- 148665.51€</td>
<td>- 138860.54€</td>
<td>- 29503.54€</td>
<td>108967.97€</td>
<td>254839.61€</td>
</tr>
</tbody>
</table>

### Table 59. Financial results in the adverse scenario defined

<table>
<thead>
<tr>
<th>Financial Indicator</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Present Value (NPV)</td>
<td>968 €</td>
</tr>
<tr>
<td>Internal Rate of Return (IRR)</td>
<td>12%</td>
</tr>
<tr>
<td>Interest Rate (IR)</td>
<td>12%</td>
</tr>
</tbody>
</table>
b. Mitigation and contingency plan

As it has been exposed in the previous chapter, some risks have been identified being able to affect negatively Imaginaeri’s business. Consequently, some mitigation actions have been defined in order to reduce their potential impact and probability of occurrence.

If in spite of these measures, the risks become reality some other actions have been defined as a contingency plan in order to face these situations in the best possible way.

Both, mitigation and contingency actions regarding the risks previously identified are shown in the table below:

<table>
<thead>
<tr>
<th>Higher operating costs than expected</th>
<th>Mitigation actions</th>
<th>Contingency actions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Widespread suppliers portfolio</td>
<td>- Looking for new supplying sources</td>
</tr>
<tr>
<td></td>
<td>- Long term supplier contracts</td>
<td>- Selling prices increase</td>
</tr>
<tr>
<td></td>
<td>- Revision of geographical expansion plans</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Less demand than forecasted</th>
<th>Mitigation actions</th>
<th>Contingency actions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Pushing marketing activities</td>
<td>- Diversifying market options</td>
</tr>
<tr>
<td></td>
<td>- Development of new solutions offered</td>
<td>- Costs reduction</td>
</tr>
<tr>
<td></td>
<td>- Selling prices reduction</td>
<td>- Selling prices reduction</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Non-payments</th>
<th>Mitigation actions</th>
<th>Contingency actions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Getting insurances coverage</td>
<td>- Cost reduction</td>
</tr>
<tr>
<td></td>
<td>- Establishing contract guarantees</td>
<td>- Taking legal actions</td>
</tr>
</tbody>
</table>

*Table 60. Mitigation and contingency actions related to the risks identified*

In addition and according with the cash flow statement previously shown in Table 58 if all the risks analyzed became issues, pretty unlikely situation, it would be needed to increase funding. As it can be seen in the modified cash flow (Table 58), an amount of 40000€ would be adequate being allocated among the third and fourth years of operations.
10. CONCLUSIONS

1. **New solutions for old problems**: Nowadays, there are lots of activities that can be performed by using UAVs technology in substitution of conventional methods. Through the use of this technology, Imaginaeri offers solutions that reduce time, cost and effort; increasing safety, effectiveness and efficiency.

2. **Multicopters**: Imaginaeri’s multicopters present affordable prices, high versatility in their performances, leading technology and ready to use.

3. **Legislation, the starting flag**: In this increasingly highly technological environment, the evolution of the technology and legislation never goes in parallel, usually going the second behind the first one. Imaginaeri is taking a step-forward position in the multicopters’ civil market that guarantees great advantages.

4. **Emerging market**: Imaginaeri will use an effective marketing and sales strategy in order to get a good and strong impact on customers’ mindset and to gain visibility, with the objective to be positioned as the main reference inside the industry.

5. **Complete solutions**: Imaginaeri solutions comprise the customized product, the service and the after-sales support. This fact represent an important differentiation against possible competitors.

6. **Customer focused**: Imaginaeri is a client centered organization that provides tailored services, being the most important goal to get the higher customer satisfaction as possible. This point defines its communication strategy: To address directly the customers and to use a webpage as catalogue and possible contact channel.

7. **Benefits**: Imaginaeri offers an Internal Rate of Return (IRR) of 22% in spite of the conservative way of forecasting its financial figures. In addition, the way of providing dividends to shareholders and employees, as well as the amount kept to reinvest in the company makes from Imaginaeri a complete reliable business in which invest on.

8. **Risks**: To be prepared just in case difficulties arise, Imaginaeri has developed both, mitigation and a contingency plan designed to guarantee the survival, and even the profitability of the business, which would represent an IRR of 12% if an adverse scenario takes place.
## APPENDIX I: ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AESA</td>
<td>Agencia Estatal de Seguridad Aérea</td>
</tr>
<tr>
<td>BA</td>
<td>Business Angel</td>
</tr>
<tr>
<td>CA</td>
<td>Current Assets</td>
</tr>
<tr>
<td>CAPEX</td>
<td>CAPital EXpenditure</td>
</tr>
<tr>
<td>CBS</td>
<td>Cost Breakdown Structure</td>
</tr>
<tr>
<td>CL</td>
<td>Current Liabilities</td>
</tr>
<tr>
<td>CMOS</td>
<td>Complementary Metal Oxide Semiconductor</td>
</tr>
<tr>
<td>COGS</td>
<td>Costs Of Goods Sold</td>
</tr>
<tr>
<td>DA</td>
<td>Depreciation and Amortization</td>
</tr>
<tr>
<td>DGAC</td>
<td>Dirección General de Aviación Civil</td>
</tr>
<tr>
<td>EAT</td>
<td>Earnings After Taxes</td>
</tr>
<tr>
<td>EBIT</td>
<td>Earnings Before Interests and Taxes</td>
</tr>
<tr>
<td>EBT</td>
<td>Earnings Before Taxes</td>
</tr>
<tr>
<td>FAA</td>
<td>Federal Aviation Administration</td>
</tr>
<tr>
<td>FEGASUR</td>
<td>Feria Agraria y Ganadera del Sur</td>
</tr>
<tr>
<td>FLIR</td>
<td>Forward Looking Infrared</td>
</tr>
<tr>
<td>FPA</td>
<td>Focal Pane Array</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GNU</td>
<td>GNU is Not UNIX</td>
</tr>
<tr>
<td>GPS</td>
<td>Global Positioning System</td>
</tr>
<tr>
<td>HD</td>
<td>High Definition</td>
</tr>
<tr>
<td>HVAC</td>
<td>Heating, Ventilating and Air Conditioning</td>
</tr>
<tr>
<td>IA</td>
<td>Imaginaeri</td>
</tr>
<tr>
<td>IFEMA</td>
<td>Institución Ferial de Madrid</td>
</tr>
<tr>
<td>IM</td>
<td>Information Management</td>
</tr>
<tr>
<td>INE</td>
<td>Instituto Nacional de Estadística</td>
</tr>
<tr>
<td>IRPF</td>
<td>Impuesto sobre la Renta de las Personas Físicas</td>
</tr>
<tr>
<td>IRR</td>
<td>Internal Rate of Return</td>
</tr>
<tr>
<td>LCD</td>
<td>Liquid Cristal Display</td>
</tr>
<tr>
<td>LLC</td>
<td>Limited Liability Company</td>
</tr>
<tr>
<td>LWIR</td>
<td>Long Wave Infrared</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>MOMAD</td>
<td>Salón Internacional de Moda de Madrid</td>
</tr>
<tr>
<td>NCA</td>
<td>Non Current Assets</td>
</tr>
<tr>
<td>NCD</td>
<td>Non Convertible Debt</td>
</tr>
<tr>
<td>NCL</td>
<td>Non Current Liabilities</td>
</tr>
<tr>
<td>NPV</td>
<td>Net Present Value</td>
</tr>
<tr>
<td>OFM</td>
<td>Only Flying Machines</td>
</tr>
<tr>
<td>P&amp;L</td>
<td>Profit and Loss</td>
</tr>
<tr>
<td>PL</td>
<td>Participative Loan</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
</tr>
<tr>
<td>ROA</td>
<td>Return On Assets</td>
</tr>
<tr>
<td>ROCE</td>
<td>Return On Capital Employed</td>
</tr>
<tr>
<td>ROE</td>
<td>Return On Equity</td>
</tr>
<tr>
<td>RTF</td>
<td>Ready To Fly</td>
</tr>
<tr>
<td>SEO</td>
<td>Search Engine Optimization</td>
</tr>
<tr>
<td>SH</td>
<td>Shareholder</td>
</tr>
<tr>
<td>SICUR</td>
<td>Salón Internacional de la Seguridad</td>
</tr>
<tr>
<td>SLA</td>
<td>Service Level Agreement</td>
</tr>
<tr>
<td>SME</td>
<td>Small Medium Enterprise</td>
</tr>
<tr>
<td>UAS</td>
<td>Unmanned Aerial System</td>
</tr>
<tr>
<td>UAV</td>
<td>Unmanned Aerial Vehicle</td>
</tr>
<tr>
<td>VTOL</td>
<td>Vertical Take Off &amp; Landing</td>
</tr>
<tr>
<td>WBS</td>
<td>Work Breakdown Structure</td>
</tr>
</tbody>
</table>
APPENDIX II: TECHNICAL ANALYSIS OF A MULTICOPTER

The configuration of a multicopter is basically determined by three parameters, highly correlated between them:

- **Total weight** of the device (Operating Empty Weight + Payload)

- **Power** (available in the batteries and that which the propeller system requires)

- **Endurance** (maximum time it can be flying without recharging its batteries).

Since the mission will define the payload and minimum flight performance, indirectly it will also give us the configuration. Because of this, the first step is to describe clearly the mission (that is, the requirements) and later select the final pattern between the possible ones.
APPENDIX III: MARKET ANALYSIS

a. Global industry overview

In a general view, the market provides lots of companies involved into the drones multicopter industry. The labor done has consisted in classifying these corporations by sector, size and current operation.

<table>
<thead>
<tr>
<th>Producer and Service provider</th>
<th>Link</th>
<th>Country</th>
<th>Markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microdrones</td>
<td><a href="http://www.microdrones.com/">http://www.microdrones.com/</a></td>
<td>Germany</td>
<td>Global: Subsidiaries (Asia, Turkey, Israel, etc.)</td>
</tr>
<tr>
<td>Ascending Technologies</td>
<td><a href="http://www.asctec.de/">http://www.asctec.de/</a></td>
<td>Germany</td>
<td>Research and aerial Imaging</td>
</tr>
<tr>
<td>Service Drone</td>
<td><a href="http://www.service-drone.com">www.service-drone.com</a></td>
<td>Germany</td>
<td>Services: Aerial imaging</td>
</tr>
<tr>
<td>Drone Filmer</td>
<td><a href="http://www.dronefilmer.com">www.dronefilmer.com</a></td>
<td>Ireland</td>
<td>Aerial videography solutions</td>
</tr>
<tr>
<td>ING Robotics</td>
<td><a href="http://www.ingrobotic.com">www.ingrobotic.com</a></td>
<td>Canada</td>
<td>UAV: Helicopters and airplanes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Producer (products oriented)</th>
<th>Link</th>
<th>Country</th>
<th>Markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>DJI Innovations</td>
<td><a href="http://www.dji-innovations.com">www.dji-innovations.com</a></td>
<td>USA</td>
<td>Commercial, Industrial and Hobby.</td>
</tr>
<tr>
<td>Aerion Labs</td>
<td><a href="http://www.aeryon.com">www.aeryon.com</a></td>
<td>Canada</td>
<td>Commercial and Industrial</td>
</tr>
<tr>
<td>Draganfly Innovation</td>
<td><a href="http://www.draganfly.com/">http://www.draganfly.com/</a></td>
<td>Canada</td>
<td>Aerial and video systems</td>
</tr>
<tr>
<td>Oculus Systems</td>
<td><a href="http://www.oculussystems.com">www.oculussystems.com</a></td>
<td>UK</td>
<td>Industrial</td>
</tr>
<tr>
<td>Zero UAV</td>
<td></td>
<td>China</td>
<td>Multicopt. &amp; Components</td>
</tr>
</tbody>
</table>
### Services provider

<table>
<thead>
<tr>
<th>Company</th>
<th>Link</th>
<th>Country</th>
<th>Markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Omnisight</td>
<td><a href="http://www.omnisight.ch/">http://www.omnisight.ch/</a></td>
<td>Switzerland</td>
<td>Use of microdrones company platforms.</td>
</tr>
<tr>
<td>Orbit Geospatial Technologies</td>
<td><a href="http://www.orbitgis.com">www.orbitgis.com</a></td>
<td>Benelux</td>
<td>Use of microdrones company platforms</td>
</tr>
<tr>
<td>AnsuR Birdeye</td>
<td><a href="http://www.birdeye.no/">http://www.birdeye.no/</a></td>
<td>Norway</td>
<td>Use of microdrones company platforms</td>
</tr>
<tr>
<td>Cartogalicia UAV</td>
<td><a href="http://www.cartogalicia.com/">http://www.cartogalicia.com/</a></td>
<td>Spain</td>
<td>Use of microdrones company platforms</td>
</tr>
<tr>
<td>Arborea Intellbird</td>
<td>(In development)</td>
<td>Spain</td>
<td>Deal with Iberdrola in Spain.</td>
</tr>
</tbody>
</table>

*Table 61. Drones companies*

### b. Companies overview – Multicopters & Products

In this section, the most representative companies in the latter list are analyzed. Knowing deeply the products or services they provide, we will place in a certain area of the market that has not been exploited yet, or probably could make us to be supplied by any of them.

#### i) Parrot

Parrot SA is a French wireless products manufacturer company based in Paris, France.

Basically, it has two lines of products:

- **Bluetooth® hands-free systems and kits for cars**
- **Multimedia / Entertainment.** This is the line that concerns to us, and it is divided into:
  - Wireless headphones, Wireless speakers, Photo frames
  - AR.Drone 2.0. The specifications of this product are:
HD video recording: 720p 30 fps, JPEG photo, and Video storage on the go with Wi-Fi directly to your remote device or USB memory drive.

Motors: 3-element Li-Po battery, 1,000 mA/h (Autonomy: 12 minutes). Emergency stop controlled by software. Water-resistant.

Price is over 250€.

It also sells tutorials and apps.

Parrot seems to be a real competitor (for the products line), although it does not provide service. Also, it is currently developing a new line of professional drones by means of a subsidiary, although they are not multicopters and they only sell the product: http://www.sensefly.com/home.html.
ii) Microdrones

Microdrones is a real competitor in the products line, and nowadays many companies are using its quadcopters as platforms to provide services to their customers.

The company sells two products with almost the same shape, but different performance and price:

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Md4-2'00</th>
<th>Md4-1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flight time (min)</td>
<td>35</td>
<td>88</td>
</tr>
<tr>
<td>Payload Mass (g)</td>
<td>200</td>
<td>1200</td>
</tr>
<tr>
<td>Cruising speed (m/s)</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>Price (€)</td>
<td>20.000</td>
<td>40.000</td>
</tr>
</tbody>
</table>

*Table 62. Microdrones’ specifications*
Products are oriented to develop the following services (directly extracted from its webpage):

- **Aerial Mapping Services**
  - Archaeological Site Mapping
  - Aerial Mapping Services Applications

- **Aerial Search & Rescue**
  - Natural Disaster Site Monitoring
  - Aerial Search & Rescue Applications

- **Aerial Inspection Services UAV**
  - Power Line Monitoring
  - Inspection Services Applications

- **Aerial Security UAV**
  - Police Applications
  - Aerial Security Applications

- **Aerial Surveillance UAV**
  - Flight Against Drugs
  - Aerial Surveillance Applications

- **Aerial Scientific Services**
  - Historical Monument Inspection
  - Aerial Scientific Services Applications

- **Aerial Photography UAV**
  - Aerial Survey Monitoring
  - Aerial Photography Applications

- **Aerial Video UAV**
  - Aerial Video Work
  - All Aerial Video Applications
iii) Ascending Technologies

The main products of this company are:

**AscTec Falcon 8 - Facts**
- Up to 750 g payload
- Up to 20 min flight time with standard payload
- 10 m/s maximum wind speed (~6bft)
- Redundant propulsion
- Unique field of view of camera
- GPS, altitude sensor, compass, IMU
- 2.2 kg maximum take-off weight
- Complete system incl. camera, Mobile Ground Station, batteries, charger, transport case: starting at 17,449 €
**AscTec Firefly - Facts**
- Patented redundant propulsion system
- Minimum take-off weight: 1,000 g
- Maximum payload: 600 g
- Maximum wind load (GPS Mode): 10 m/s
- Programmable via AscTec Communication Interface, AscTec Simulink Toolkit and AscTec SDK 2.0
- Carries AscTec Mastermind or AscTec Atomboard
- Many payload options available

**AscTec Pelican - Facts**
- Min. take-off weight: 630 g
- Max. payload: 650 g
- Max. flight time with full payload: 15 min
- Programmable via AscTec SDK and AscTec Simulink toolkit
- Flexible tower design with easy access to all electronics
- Carries AscTec Mastermind or AscTec Atomboard
- Diverse laser scanner and camera options

**AscTec Hummingbird - Facts**
- Light weight and agile
- Easy to repair
- Min. take-off weight: 510 g
- Max. payload: 200 g
- Programmable via AscTec SDK and AscTec Simulink toolkit
iv) DJI Innovations

The main products of this company are:

**DJI Flame Wheel FX50 - Facts**
- Three versions changing the number of arms. (150 g, 280g, 570g)
- Light plastic arm with easy mounting.
- PCB printed center dish.
- Preset Slots for Flight control circuitry.

**DJI Phantom - Facts**
- Light weight and agile
- Attractive design
- Min. take-off weight: 510 g
- Max. payload: Go-Pro Hero 3 with backpack
- Low Voltage Protection on-board prevents battery malfunction.
- Go back home feature for a fail-proof flight.
- Maximum Velocity 10 m/s. (36 km/h)
- Maximum Control Range 300 m.
- Camera mount for Go Pro Hero 3 (Camera not included starting at 400€).
Phantom Diagonal Distance: 350.0mm
(motor center to motor center)

Phantom Remote:
290.0mm x 180.0mm x 50.0mm
DJI Spreading Wings 800 - Facts

- 2.6 Kg Professional Hex-Rotor Platform
- 10Ah / 6 Serial Lithium Polymer Battery
- 6x 320rpm/V Brushless Motors delivering up to 320W
- 30Hz ~ 450Hz ESC allows for quick reaction on steering
- 5 to 7 Kg Maximum Take-off Weight
- High Efficiency Carbon Fiber Propellers
- Perfect for Wookong M Flight Control System
- Wired in PCB printing on the frame
- Interchangeable gimbals for different camera models
v) ZeroUAV (hobbyking)

http://www.hobbyking.com/hobbyking/store/__32306__ZeroUAVZERO_Steadi470_Quadcopter_Aerial_Photography_System_PNF_.html

**ZERO Steadi470 - Facts**
- Max take-off weight: 2.8kg
- Max payload weight: 300-400g
- Flight Endurance: 18 minutes @ no payload, 10-12 minutes @ max payload.
- Operational speed: Max 10.2m/s (adjustable)
- Flight altitude: 1000m (max)
- Price: 2000 USD
vi) Draganfly Innovations

Draganflyer X4 - Facts
• Helicopter Weight (with battery): 680g (24oz)
• Payload Capability: 250g (8.8oz)
• Maximum Gross Take-Off Weight: 980g (33oz)
• Flight Endurance: ~20 minutes

Draganflyer X6 - Facts
• Payload Capability: 500g
vii) Allied drones

Draganflyer X6 - Facts
- $14,250.00
- Total Weight, minus batteries: 4200g / 9.25lbs

viii) Aerion Labs

Aeryon Skyranger - Facts
- Weighs less than 3 lbs (1.4 kg)
- Up to 25-min flight time with payload

Aeryon Skyranger - Facts
- Up to 50-minutes endurance with payload
APPENDIX IV: IMAGINAERI’S PLATFORMS TECHNICAL FEATURES

a. IA Falcon technical features

- Balanced high Efficiency out runner disc motors.
- Cutting edge 20A ESCs specially customized for speed delivery.
- Very easy replaceable ESCs with special multi rotor firmware.
- Four serial cell battery setup.
- Balanced Carbon fiber 9 inch Mark 2 Propellers.
- Futaba T8J Radio system.
- DJI Naza M GPS lite Flight Controller.
- Rigid and tough frame, and arms.
- Specially designed for FPV (First Person View configurations)
- Standard DJI F450 / F550 Arms (easily replaceable)
- Easy to mount Camera gimbals (rubber damping balls. no screws)

b. IA Phoenix technical features

The **Flight Controller** is a DJI Wookong M System. Its features include:

- Autonomous Flight Features
- Route supports up to 50 waypoints
- Click and fly to a point
- RTH and land On demand
- Target lock
- Full flight data telemetry
- 3D Google Earth Map Based Autonomous Navigation
- Support for IOS and ANDROID operative systems
- Support for Windows and Linux on PC or MAC.
The **Ground Control Equipment** can include:

- Futaba 10CG 2.4ghz FASST Radio System
- PC or MAC
- Tablet (IOS or ANDROID)

The **Frame Specifications** are:

- Propellers: 1655 High Efficiency CF propellers (support up to 17 inches)
- Motors High efficiency brushless out-runner disc (330kv to 400kv)
- Electronic Speed Controllers: Customized (40 Amps) for high RPM motors.
- Aluminum Arm (length 0.5 m diameter 25mm)
- Custom Power Distribution board

The **General Specifications** are:

- Diameter 1200mm
- Height 32 cm
- Maximum Flying Weight: 8 kg
- Max Safe Payload: 1.5 kg
- Flight endurance from 30 minutes to 45 minutes
- Effective control range: 3km
APPENDIX V: IMAGE SYSTEMS TECHNICAL FEATURES

a. GoPro Hero Technical Features

- Field of View: 170° or 120°
- Storage: up to 64 GB microSD
- Time Lapse shooting mode
- Low light mode
- Frame Rates: 4K (16:9 and 17:9) @ 12, 12.5, 15fps; 2.7K (16:9 and 17:9) @ 30, 25, 24fps; 1440p (4:3) @ 48, 30, 25, 24fps; 1080p (16:9) @ 60, 50, 48, 25, 24fps; 960p (16:9) @ 100, 48fps; 720p (16:9) @ 120, 100, 60, 50fps; WVGA (16:9) @ 240fps
- Dimensions: 2.30 x 1.55 x 0.08 inches
- Weight: 74 g
- Battery: 12 hr

b. Sony NEX 7K technical features

This system offers the following capabilities:

- Slim, light and compact - DSLR picture quality without the size and weight: small enough to carry with you everywhere.
- 24.3 effective megapixels - Very high resolution Exmor™ APS HD CMOS sensor; captures superb quality, low noise images and allows DSLR-style background defocus.
- BIONZ processor - Powerful image processing ensures clear, detailed, low-noise images and quick, responsive shooting.
- E-mount interchangeable lens system.
- Full HD movie with manual exposure control.
- Very high speed burst shooting.
- XGA OLED TruFinder™ - Precision electronic viewfinder gives bright, high contrast image with 100% frame coverage and wide angle of view.
• Grid lines and level gauge - Switchable framing lines and gauge display in viewfinder; assists accurate composition of landscapes and architectural scenes.

• Precision Digital Zoom - Get closer to the action with smooth, high quality magnification of central portion of image from 1.1x up to 10x.

• Intelligent AUTO - Automatically recognizes common shooting situations, adjusting camera settings for beautiful results.

• Wide sensitivity range from ISO 100-16000 - Very high maximum sensitivity allows natural, low-noise images, even when shooting handheld in low light.

• SteadyShot - Enjoy in-lens optical image stabilization during handheld shooting (with compatible lenses).

• Object Tracking - Keeps accurate focus lock on your selected object, even while it’s moving in the frame.

• Sweep Panorama with 3D Sweep Panorama - Press the shutter and sweep the camera to capture extra-wide panoramic images: also capture 3D panoramas to view on 3D TV.

• Picture Effect Modes - Produce impressive creative effects with no PC needed - including Posterise, Partial Colour, HDR Painting, Soft Focus, Miniature.

• Soft Skin mode - Automatically retouches portraits, removing minor blemishes and wrinkles for beautiful faces.

• D-Range Optimiser - Adjusts brightness of light and dark image areas for more natural, evenly-exposed results with high-contrast backlit scenes.

• Auto HDR - Automatically shoots and combines three images at different exposure settings to capture extreme shadow and highlight detail.

• Handheld Twilight mode - Combines high-speed burst of six frames to create single low-noise image in low-light conditions.

• Anti Motion Blur mode - Combines high-speed burst of six frames taken at fast shutter speed, to create a single low-noise image with minimized blur.

• Shading and aberration compensation - Intelligently corrects vignetting (peripheral shading), lateral chromatic aberration and distortion for each E-mount lens.
c. FLIR Tau 2 technical features

Some key features of the Tau 640 camera are listed below.

- Field switchable between NTSC and PAL video formats
- CMOS and BT.656 digital video options, as well as the legacy Photon LVDS
- High-speed serial camera communication up to 921,600 baud (via the Tau VPC serial-to-USB Accessory)
- Advanced, user-friendly interface for camera control and configuration
- On-board image capture and storage
- Camera power and communication over USB option (via the Tau VPC serial-to-USB Accessory)
- EMI suppression to Class B with rear cover installed, and Class A without rear cover
- Up to 200g shock tolerance
- Discrete camera control functions available to OEMs
- Multiple lens options available in wide and narrow fields of view
- Wide field of view lenses sealed to IP-67
- Threaded WFOV lens barrel for bulkhead mounting or external attachment options
- Field upgradable software/firmware
- Support for user-defined symbology
- Supplemental FFC software feature allows OEMs to calibrate out lens effects to improve image quality
- Low power consumption: ~1.0 W
- Digital Detail Enhancement for clearer imagery and edge sharpening
The Tau 640 has several lens options. See the Options tab above for detailed lens information.

<table>
<thead>
<tr>
<th>Features &amp; Performance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermal Imager</strong></td>
<td>Uncooled VOx Microbolometer</td>
</tr>
<tr>
<td>Display Formats</td>
<td>640 x 512 (PAL)</td>
</tr>
<tr>
<td>Pixel Size</td>
<td>17µm</td>
</tr>
<tr>
<td>Spectral Band</td>
<td>7.5 – 13.5 µm</td>
</tr>
<tr>
<td>Full Frame Rates</td>
<td>25 Hz (PAL)</td>
</tr>
<tr>
<td>Exportable Frame Rates</td>
<td>8.3 Hz (PAL)</td>
</tr>
<tr>
<td>Input Power</td>
<td>4.4 – 6.0 VDC</td>
</tr>
</tbody>
</table>

Table 63. Features & Performance

<table>
<thead>
<tr>
<th>Interface Controls and Connectivity</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CMOS, (14-bit or 8-bit)</td>
<td>✔</td>
</tr>
<tr>
<td>BT.656 (8-bit)</td>
<td>✔</td>
</tr>
<tr>
<td>Legacy Photon LVDS (30Hz, 14-bit or 8-bit)</td>
<td>✔</td>
</tr>
<tr>
<td>NTSC (30Hz) / PAL (25Hz), field-switchable</td>
<td>✔</td>
</tr>
<tr>
<td>Slow Video (7.5Hz NTSC, 8.3Hz PAL), factory set</td>
<td>✔</td>
</tr>
<tr>
<td>Invert/Revert (analog and 8-bit digital)</td>
<td>✔</td>
</tr>
<tr>
<td>Polarity control and Dynamic Range Switching</td>
<td>✔</td>
</tr>
<tr>
<td>2x &amp; 4x Digital zoom</td>
<td>✔</td>
</tr>
<tr>
<td>Gamma Correction and Color Palettes (LUTs)</td>
<td>✔</td>
</tr>
</tbody>
</table>

Table 64. Interface Controls and Connectivity
APPENDIX VI: WORK BREAKDOWN STRUCTURE (WBS)

a. Overview

A work breakdown structure (WBS), in project management, is a deliverable oriented decomposition of a project into smaller components. A work breakdown structure element may be a product, data, service, or any combination thereof. A WBS also provides the necessary framework for detailed cost estimating and control along with providing guidance for schedule development and control.

WBS is a hierarchical and incremental decomposition of the project into phases, deliverables and work packages. It is a tree structure, which shows a subdivision of effort required to achieve an objective. In a project or contract, the WBS is developed by starting with the end objective and successively subdividing it into manageable components in terms of size, duration, and responsibility (e.g., systems, subsystems, components, tasks, subtasks, and work packages) which include all steps necessary to achieve the objective.

A work breakdown structure permits summing of subordinate costs for tasks, materials, etc., into their successively higher-level “parent” tasks, materials, etc. For each element of the work breakdown structure, a description of the task to be performed is generated. This technique is used to define and organize the total scope of a project.

b. Imaginaeri’s WBS

Imaginaeri’s WBS up to level 2 can be seen in Figure 68. In the first level, the eight main pillars for the company are compiled. Each of them is a block independent and different from the others, although they do not have the same importance.

The first one, Multicopters & Systems, includes all the parts and subsystems of the device. This, and the second block, Operator, are enough to provide service to the customer, once the multicopter and the operator are on-site. All the transportation activities have their own block, with the name Transport.

Multicopters are assembled and repaired in the factory, which is included into the block Facilities, which also covers the adaptation, maintenance and related services for the workshop and the offices. Administration & Finance, and the block Commercial Department are auto explicative.
Finally, the blocks *After-Sales* and *R&D Customized Solutions* have been presented to take into account the development of these new activities, but actually, they are the less important into Imaginaeri’s WBS.
Figure 68. Imaginæri’s WBS (up to level 2)
## APPENDIX VII: RISKS ASSESSMENT MATRICES

<table>
<thead>
<tr>
<th>Probability</th>
<th>Unlikely</th>
<th>Low probability</th>
<th>Likely</th>
<th>Nearly certain</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Very high</strong></td>
<td>MEDIUM (8)</td>
<td>HIGH (4)</td>
<td>VERY HIGH (2)</td>
<td>VERY HIGH (1)</td>
</tr>
<tr>
<td><strong>High</strong></td>
<td>MEDIUM (10)</td>
<td>HIGH (6)</td>
<td>HIGH (5)</td>
<td>HIGH (3)</td>
</tr>
<tr>
<td><strong>Medium</strong></td>
<td>LOW (14)</td>
<td>MEDIUM (11)</td>
<td>MEDIUM (9)</td>
<td>MEDIUM (7)</td>
</tr>
<tr>
<td><strong>Low</strong></td>
<td>LOW (16)</td>
<td>LOW (15)</td>
<td>LOW (13)</td>
<td>MEDIUM (4)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Probability scoring</th>
<th>LOW Unlikely</th>
<th>MEDIUM Possible</th>
<th>HIGH Likely</th>
<th>VERY HIGH Nearly certain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability (%)</td>
<td>&lt;=25%</td>
<td>&lt;=50%</td>
<td>&lt;=75%</td>
<td>&gt;75%</td>
</tr>
</tbody>
</table>

*Table 65. Risks Assessment matrices*
APPENDIX VIII: REFERENCES


42. Seremant S.L. *Servicios, Limpiezas y Mantenimiento*. 2013; Available from: [http://www.seremant.com/especialidades/?gclid=CPiUg7LIrroCFSLHtAodfV4Aeg](http://www.seremant.com/especialidades/?gclid=CPiUg7LIrroCFSLHtAodfV4Aeg).


Executive Summary

Jose Caravaca | Pilar Gómez | Pablo Herrero | Raquel Micó | Alberto Pascual
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The Idea 1
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Operations 6
Marketing 8
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The idea

Have you ever realized how many activities require to extend or adapt human capabilities? There are many places which are hard or risky to access, and also many tasks for which human vision is not the most adequate one.

Imaginaeri harnesses new technology to provide safe and reliable solutions for everyday needs. The systems used allow to analyze different infrastructures in less time and in a more accurate way. Thermal analysis can be carried out to detect the focus of a fire or to search people in difficult environments. Furthermore, high definition cameras can be used for aerial filming or surveillance.

Imaginaeri provides solutions to these and more issues through the use of unmanned multicopters.

Imaginaeri’s value proposition is to provide:

New Solutions for Old Problems
The Market

Types of Unmanned Aerial Vehicle

Imaginaeri multicopters can be classified as Micro-UAV (μUAV), due to its size, weight, endurance and range. However, regarding its speed, they would belong to mini-UAV (MUAV) classification, and if its range is considered (around 3km) they should be included in the Vertical Take Of Landing (VTOL) group. Taking into account the scope of the references consulted, Mini-UAV category happens to be the most suitable for Imaginaeri multicopters.

![Diagram showing different types of UAVs with payload capacity and altitude ranges.]

Industry size

The number of UAVs deployed globally on operations has increased from around 1000 to 9000 in four years and a yearly growth of around 2500 systems has been forecasted from 2012 to 2015 by Teal Corporation Group.

![Pie chart showing distribution of UAV types.]

Political Environment

In recent years there has been an interest from various government agencies in the development of unmanned aircraft systems (UAS) for civil applications and in the enactment of the necessary legislation. Although European regulation has not been issued yet, the State Air Safety Agency (AESA) and the Spanish Civil Aviation Authority (DGAC) have been working on the development of legislation for UAS since 2006 and the US congress has approved a plan allowing UAVs’ operation in the country’s airspace in 2015. Besides, the Federal Aviation Administration (FAA) has already issued a recommendation.

Social Environment

Despite possible barriers such as safety or privacy concerns, current changing society is using more and more electronic devices that make life easier. This fact, plus the environmentally friendly character of multicopters, suggest that Imaginaeri services will be welcomed by the society.

Economical Environment

Current economic crisis situation leads to economic policies to reduce expenses, security and defense budgets. However, demand for UAV is expected to increase at a positive rate for myriad applications. Furthermore, there is an increasing number of economic and financial initiatives to promote entrepreneurship and start-ups.

Technological Environment

The technology applied in multicopters and the onboard electronic devices not only exists, but it is massively broadcasting, what makes the amount of possible suppliers higher and therefore the negotiations easier.

The graphic above shows that Civil Mini-UAV has a large potential in the following years, accounting for an investment of $M 2350.

It is expected that the different markets within Civil UAV industry will not emerge simultaneously, but gradually one after another. Governments are expected to be the first adopters based on knowledge of past trends and ongoing activities, followed by fire-fighting activities. The figure below from Frost & Sullivan represents the forecast in function of the market segment.
Manufactures and Potential Suppliers

There are a large set of suppliers, as the ones named below, and most of them have one to three different lines of products. Imagيناer will chose one supplier which produces and sells worldwide and which provides a high level of quality and standards of service.

Potential Competitors or New Entrants

Most of the industry players are manufacturers that commercialize ready-to-fly multicopters and which are placed out of the Spanish market.

Considering Spain, there are only small service oriented enterprises which have been incorporated recently. Since Imagيناer is focused on the service, this fact involves a great advantage. Imagيناer’s goal is to sell services directly to the customers, therefore, being established in this country and sharing the same language are important factors, being at the same time entry barriers in case of possible foreign competitors come to scene.

Imagيناer added value is to provide complete solutions, which cover the service, the customized product and also after-sales support.

Threat of substitutes

Due to all the advantages of multicopters against conventional UAVs the threat of substitutes is low.

Potential Customers

Aerial Imaging enterprises
Construction & Industrial companies
Fire fighting and People Seeking
Events organizers and media producers
The Strategy

Being a customer service oriented company, Imaginaeri has many chances to take advantage of multicopters’ emerging market.

Its solutions provided through high performance products, always technologically up to date, are widely welcome in a more and more high-tech environment.

Objectives in five years

• Introduce the use of multicopters as a solution for daily tasks

• Start providing services as externals for companies which require solutions quite standardized like aerial imaging, surveillance or thermal analysis. Make our products known and start developing specific solutions for new clients by the fourth year.

• Recover the whole investment and to generate benefits, having so far around 30 multicopters able to provide between 900 and 1100 services per year. By then, Imaginaeri will be established in Spain and starting to penetrate other countries’ market by looking for local partners.

Business Strategy

Imaginaeri main differentiation is to provide complete solutions, which cover the service, the customized product and also the after sales service. Products and services converging on a single solution.

The customer is always placed in the centre of its business, taking part in many stages of the solutions’ design and production. This continuous customer feedback turns out into many benefits for Imaginaeri and its business as the continuous learning and improvement of processes.

<table>
<thead>
<tr>
<th>STRENGTHS</th>
<th>WEAKNESSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Services oriented</td>
<td></td>
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<tr>
<td>High performance products</td>
<td></td>
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<tr>
<td>Reduced cost</td>
<td></td>
</tr>
<tr>
<td>Getting finance</td>
<td></td>
</tr>
<tr>
<td>Lack of experience</td>
<td></td>
</tr>
<tr>
<td>Special clients</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>OPPORTUNITIES</th>
<th>THREATS</th>
</tr>
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<tbody>
<tr>
<td>Emerging market</td>
<td></td>
</tr>
<tr>
<td>High-tech environment</td>
<td></td>
</tr>
<tr>
<td>Absence of substitutes</td>
<td></td>
</tr>
<tr>
<td>Lack of regulation</td>
<td></td>
</tr>
<tr>
<td>Economic crisis</td>
<td></td>
</tr>
<tr>
<td>Entry of new competitors</td>
<td></td>
</tr>
</tbody>
</table>

The reduced costs involved in Imaginaeri’s business compared with the conventional UAVs ones, help Imaginaeri to deal with tough economic environments and getting reliable sources of funding.

Being pioneer providing this kind solutions permits to take full advantage of this emerging market, making harder that the entrance of new competitors affects deeply Imaginaeri’s business.

Providing services rather than selling products permits Imaginaeri to offer tailored and adapted solutions, a fact very appreciated having clients with special needs.

Summarizing Imaginaeri has large possibilities to turn out into a complete success and as consequence becoming into a business in which is well worth investing on.
Mission

“Imaginaeri’s mission is to meet the needs of civil institutions and companies through UAVs technology, providing tailored solutions to extend or adapt human vision, complemented by the highest standard of product support and service.”

Vision

• Integrate UAVs technology in the common activities of society.
• Leading UAVs services companies
• Overcoming customers’ expectations and provide them support to integrate our technology in their businesses.

Values

• Customer focused.
• Enhancing shareholders and investors value.
• A diverse and involved team of people working together, integrity.
• Environmentally friendly, sustainable growth and corporate citizenship.
• Continuous innovation for industry leadership and new customized solutions.

Positioning

Imaginaeri’s positioning has been decided considering the following points:

• To provide standardized services is easier and less risky than developing customized solutions, training and after-sales support. Therefore, Imaginaeri starts making itself known by its standardized solutions

• The most standardized services are surveillance and thermal analysis services, since the payloads associated can be used for several applications.

• Government applications are forecasted as the most profitable within the civil industry followed by firefighting applications.

Expansion Plan

First, Imaginaeri focuses on building relationships with the government and companies which require standardized solutions provided by Imaginaeri’s staff. In this phase are included companies such as Iberdrola, Fire-fighting brigade, Aena or Canal de Isabel II. Afterwards, once Imaginaeri gains a reputation and also a more comfortable economic situation, Imaginaeri will start to work on customized projects, training and post-sale services. This implies to build relationships with more specialized companies and to continue working with the government, big companies and some SMEs. For example, Policía Nacional, Private security companies or Mediaset.

Finally, once Imaginaeri has an experienced knowledge of the business, and a leader position in Spain, the company will try to penetrate the European market by building relationships with European companies and/or local partners in the three stages that are explained in the map.
Platforms

**Ready to fly. The most affordable solution**
Small and versatile, able to withstand up to 20 minutes flight endurance with a light camera, this multicopter is the most affordable option.

**The solution. For any mission in any condition**
Able to lift heavy payloads, the IA Phoenix can carry a Sony NEX 7 EVIL 24Mpx professional camera. With the largest battery and range reachable, the IA Phoenix can endure service time up to 40 minutes.

**The speed. Faster than the wind**
Fast and reliable, this device may be used in services requiring high speed or high endurance. The IA Falcon can reach speeds of up to 105 km/hour.

**Systems on board**
- **GoPro Hero 3**: Wi-Fi controlled action camera. It can shoot 12 Mpx photos and record 4K video at 15 frames per second.
- **Sony NEX 7K**: Delivers Extraordinary picture quality thanks to the ultra-high resolution 24.3 Mpx Exmor™ APS HD CMOS
- **Sensor FLIR’s Tau 640**: 640×512 LWIR uncooled focal plane array (FPA) camera with a pixel size of 17 microns. It captures infrared spectrum, useful for thermal and night vision applications.

**Typical Service Provided**

<table>
<thead>
<tr>
<th>Mission</th>
<th>Example of applications</th>
<th>Flight Platform</th>
<th>Operators per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aerial Photography (High Definition)</strong></td>
<td>Movie makers who want to record aerial footage of a scene for 40 minutes with a professional 24 megapixel camera.</td>
<td>IA Falcon</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IA Phoenix</td>
<td>2</td>
</tr>
<tr>
<td><strong>Aerial Video (Standard Definition)</strong></td>
<td>Security enforcement companies which want to watch out different areas for 20 minutes without charging the multicopter or at high speed</td>
<td>IA Pigeon</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IA Falcon</td>
<td>1</td>
</tr>
<tr>
<td><strong>Infra-red / Thermal Inspection</strong></td>
<td>Maintenance inspections at high speed: high power lines (analysis of corona discharge effect), airport beacons, whirlwinds generators, etc. People searching over long distances, in conditions of reduced visibility for 40 minutes.</td>
<td>IA Falcon</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IA Phoenix</td>
<td>2</td>
</tr>
</tbody>
</table>
Supplier: The right choice

Nowadays, the market offers an extended list of top-notch manufacturers and assemblers, that produce Ready-to-Fly multicopters providing outstanding machines at a suitable range of prices.

The main supplier selected for Imaginaeri services will be OFM (Only Flying Machines). OFM is a small to medium sized supplier based in China, which assembles standard parts and spares from big and prestigious manufacturers from multi rotor UAV’s industry, and presents a broad and flexible product portfolio.

Production Process and Value Chain

The services provided are critical adding value to the production process, although Marketing and Sales are essential activities which guarantee the economic viability.

Operations and logistics are important, but they are not at the top level. Within support activities, procurement is key since products and spares will be acquired directly from suppliers.

Investment Plan & Cost Analysis

The investment in multicopters is done in three stages, initially and every 2 years, having each time less impact into overall costs. The main part of the costs are salaries.

Incorporation and Organization

Imaginaeri is incorporated as a Limited Liability Company (L.L.C) with one Delegate Council.

As a first step, Imaginaeri starts with five people as depicted on the right, the CEO an CFO functions converge in the same person for the first three years.

Imaginaeri plans to increase the headcount to 20 by the end of 2018.

![expenses distribution chart]

![organization chart]
Pricing Strategy

In order to define the pricing strategy, Imaginaeri has taken into account the initial investment required, direct and indirect costs and the prices of possible competitors. The market entry pricing strategy set is a “Market-Skimming”.

Imaginaeri’s solutions are new, distinctive and desired. They are penetrating the market at an early moment in the product life cycle, when demand is inelastic. Furthermore, economies of scale are not possible yet, and the presence of competitors is low. Finally, underpricing might hurt the product since potential customers would think it cannot be very good. Therefore Imaginaeri can set an initial medium-high price and protect itself with entry barriers, such as building strong relationships with its customers.

The prices for the typical services offered are represented in the following table:

<table>
<thead>
<tr>
<th>Mission</th>
<th>Platform</th>
<th>Operators per unit*</th>
<th>Average Price per day **</th>
<th>Average Price per hour **</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>First 2 hours</td>
<td>Second 2 hours</td>
</tr>
<tr>
<td>Aerial Photography</td>
<td>IA Falcon</td>
<td>1</td>
<td>60€</td>
<td>150€</td>
</tr>
<tr>
<td>(High Definition)</td>
<td>IA Phoenix</td>
<td>2</td>
<td>70€</td>
<td>175€</td>
</tr>
<tr>
<td>Aerial Video</td>
<td>IA Pigeon</td>
<td>1</td>
<td>42€</td>
<td>105€</td>
</tr>
<tr>
<td>(Standard Definition)</td>
<td>IA Falcon</td>
<td>1</td>
<td>52€</td>
<td>130€</td>
</tr>
<tr>
<td>Infra-red / Thermal Inspection</td>
<td>IA Falcon</td>
<td>1</td>
<td>1 200€</td>
<td>300€</td>
</tr>
<tr>
<td></td>
<td>IA Phoenix</td>
<td>2</td>
<td>1 400€</td>
<td>350€</td>
</tr>
</tbody>
</table>

* The price of an additional operator if required is 90 € per day **Prices do not include: Taxes, transport expenses for trips longer than 50 km, image processing or cartography projects, video edition, data backup and so on. For trips longer than 50 km, the company will charge 1 € / km.

Sales plan

Taking into account the study carried out by Frost & Sullivan about the services with greater growth in the following years, the following percentages of sales have assigned according to the kind of service.

Considering also the capability of the company of providing services (due to the number of multicopters and the number of operators), and assuming a very small demand in the beginning, but also quick growth, the number of daily services forecasted per year are the following:

<table>
<thead>
<tr>
<th>Service / Mission</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerial Photography</td>
<td>12</td>
<td>50</td>
<td>85</td>
<td>187.5</td>
<td>275</td>
</tr>
<tr>
<td>(High Definition)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aerial Video</td>
<td>12.96</td>
<td>54</td>
<td>91.8</td>
<td>202.5</td>
<td>297</td>
</tr>
<tr>
<td>(Standard Definition)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infra-red / Thermal</td>
<td>23.04</td>
<td>96</td>
<td>163.2</td>
<td>360</td>
<td>528</td>
</tr>
<tr>
<td>Inspection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL SERVICES</td>
<td>48</td>
<td>200</td>
<td>340</td>
<td>750</td>
<td>1 100</td>
</tr>
</tbody>
</table>
Promotion

Promotion is a key value in the marketing strategy, especially for businesses which are not very known and widespread as it is the case of multicopters services. It is likely that having prospect clients, they are not aware about the existence of these kinds of solutions for their business.

Therefore, Imaginaeri’s strategic objective for the first years of operations in terms of promotion is to boost awareness among people, especially prospect clients, about the availability of these services, being placed at the same time as leader of this market in Spain.

The main communication strategy followed by Imaginaeri is to address directly to its potential customers and offer on site demonstrations.

Besides that, Imaginaeri has its own website, where prospect clients can browse the services portfolio and easily contact with the company. Search engine optimization and presence in social networks are also carried out to increase the visibility on internet.

Regarding the promotion at media, Imaginaeri is setting some Internet banners in some online places carefully elected (prospect customers’ suppliers, high tech web pages, top sites and so on).

There are also some specialized magazines that can help Imaginaeri to promote successfully its services among its principal customer target group.

Imaginaeri will promote itself at different events. This is a technology based enterprise with a young team as founders, what makes it a perfect match and potential winner of start-up contests. There are several competitions in Spain that can provide finance to start-ups such as the following:

Technological Events and Fairs are also an adequate way to get in touch with enterprises, look for corporate contacts and promote new technologies such as multicopters to satisfy human needs.
Financial structure

Imaginaeri has decided to fund its costs heavily with own capital, this means that an important part of funding comes from capital investment in equity both by the five founders and a prospective Business Angel (BA). The amount to be financed in the starting years ascends to 350000€. The funds will be raised with a non-convertible participative loan (145000 €) and a long term debt (30000 €) plus the equity (175000 €). The BA accounts for 97500 € over the 145000 € corresponding to the participative loan, thus his ownership is 30% instead of 14%.

P & L

Imaginaeri expects to have negative results for the first and second year, although from the third onwards benefits will be generated.

It is noticeable that although the total amount of benefits at the fifth year is bigger than at the fourth, the percentage of net profit over total sales is slightly smaller. This is due to the fiscal shield that compensates losses in the payment of taxes. Indeed, on the fifth year the impact of taxes is higher.

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TOTAL SALES (EXPECTED INCOME)</strong></td>
<td>43343€</td>
<td>100%</td>
<td>182680€</td>
<td>100%</td>
<td>310556€</td>
</tr>
<tr>
<td><strong>COST OF GOODS SOLD (COGS) / DIRECT COSTS</strong></td>
<td>124055€</td>
<td>283%</td>
<td>162248€</td>
<td>69%</td>
<td>211177€</td>
</tr>
<tr>
<td>= <strong>GROSS MARGIN</strong></td>
<td>-80212€</td>
<td>-183%</td>
<td>20432€</td>
<td>11%</td>
<td>99379€</td>
</tr>
<tr>
<td>- INDIRECT COSTS</td>
<td>50630€</td>
<td>115%</td>
<td>28402€</td>
<td>10%</td>
<td>32229€</td>
</tr>
<tr>
<td><strong>OPERATING INCOME (EBITDA)</strong></td>
<td>-159842€</td>
<td>-298%</td>
<td>-17707€</td>
<td>-4%</td>
<td>37150€</td>
</tr>
<tr>
<td>- DEPRECIATION AND AMORTIZATION (D&amp;A)</td>
<td>19760€</td>
<td>45%</td>
<td>19760€</td>
<td>11%</td>
<td>32705€</td>
</tr>
<tr>
<td><strong>OPERATING PROFIT (EBIT)</strong></td>
<td>-159002€</td>
<td>-344%</td>
<td>-27731€</td>
<td>-15%</td>
<td>34444€</td>
</tr>
<tr>
<td>- INTERESTS (FINANCIAL RESULT)</td>
<td>2700€</td>
<td>6%</td>
<td>15302€</td>
<td>35%</td>
<td>11550€</td>
</tr>
<tr>
<td><strong>NET PROFIT (EAT)</strong></td>
<td>-155302€</td>
<td>-350%</td>
<td>-43033€</td>
<td>-24%</td>
<td>22894€</td>
</tr>
</tbody>
</table>

Balance sheet

The capital has a great importance in the balance. In the first three years the company throws negative cash flow, but the level of leverage is not excessive.

The percentages belonging to Current Assets (CA) and Non Current Assets (NCA) vary pretty much in function of the year, due mainly to the quick amortization of the multicopters and the regular investment in NCA.

In the last year this difference is especially high since both, the factory and the multicopters, are almost amortized and a new investment would be required for the next year. NCA does not exceed 50%, which is good for the liquidity of the company.

The NCL are higher than CL up to the fifth year, when the debt has been paid back and the equity is very high. This high equity will decrease with the planned sixth year investment.
Cash Flow

Attending to the transference of money into or out of the business, the Cash Flow is calculated for the 5 years of the program. Cash & Cash Equivalents are obtained as the sum of three terms: Operational Cash Flow, Investment Cash Flow and Financial Cash Flow.

Representing costs versus sales, it can be observed that the break-even is expected to happen during the fourth year, in the early 2017.

Cash & Cash Equivalents suffer a minimum during the second year of operation, developing a excellent growth during the following years.

**Ratios**

<table>
<thead>
<tr>
<th>Interest Rate</th>
<th>NPV</th>
<th>IRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>15%</td>
<td>70 115 €</td>
<td>22%</td>
</tr>
</tbody>
</table>

Comparing Imagineri’s IRR with the spanish bond, it can be concluded that it is a company really worthy to invest on.

Besides, both the economic profitability and the shareholders profitability are very good

<table>
<thead>
<tr>
<th>Year</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>84.34%</td>
</tr>
<tr>
<td>ROE</td>
<td>192.84%</td>
</tr>
</tbody>
</table>

In addition, due to the character of the business, the accounts payable period will be shorter than the accounts collection period. Imagineri is expected to gain power once the business is established and clients and suppliers know the company.

**Contingency Plan**

Adverse scenarios and mitigation along with contingency measures for the main risks identified are defined in the table.

In spite of these measures, if all risks became reality, it would be needed to increase funding in 40000 € that would be allocated among the third and fourth years of operations. However, this situation is very unlikely to happen.

It is worth to mention that besides of the conservative way of forecasting the financial scenario, even if all the risks identified eventually impacted Imagineri business, the results would be quite good (IRR 12%).
Conclusions

1. **New solutions for old problems**: Nowadays, there are lots of activities that can be performed by using UAVs technology in substitution of conventional methods. Through the use of this technology, Imaginaeri offers solutions that reduce time, cost and effort; increasing safety, effectiveness and efficiency.

2. **Multicopters**: Imaginaeri’s multicopters present affordable prices, high versatility in their performances, leading technology and readyness to use.

3. **Legislation, the starting flag**: In this increasingly highly technological environment, the evolution of the technology and legislation never goes in parallel, usually going the second behind the first one. Imaginaeri is taking a step-forward position in multicopters’ civil market that guarantees great advantages.

4. **Emerging market**: Imaginaeri will use an effective marketing and sales strategy in order to get a good and strong impact on customers’ mindset and to gain visibility, with the objective to be positioned as the main reference inside the industry.

5. **Complete solutions**: Imaginaeri solutions comprise the customized product, the service and the after-sales support. This fact represent an important differentiation against possible competitors.

6. **Customer focused**: Imaginaeri is a client oriented organization that provides tailored services, being the most important goal to get the higher customer satisfaction as possible. This point defines its communication strategy: To address the customers directly and to use a web page as catalogue and possible contact channel.

7. **Benefits**: Imaginaeri offers an Internal Rate of Return (IRR) of 22% in spite of the conservative way of forecasting its financial figures. In addition, the way of providing dividends to shareholders and employees, as well as the amount kept to reinvest in the company makes from Imaginaeri a complete reliable business to invest on.

8. **Risks**: To be prepared just in case difficulties arise, Imaginaeri has developed both, mitigation and a contingency plan designed to guarantee the survival, and even the profitability of the business, which would represent an IRR of 12% if an adverse scenario takes place.