JANO
Passenger-Baggage Reconciliation System

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Daniel Alaguero Rodríguez
Alejandro Calvo Rodríguez
Eulalia Cirés Buey
José Antonio Pérez Martín
Jaime Teus Fernández
Abstract

The idea arises from the continuous delays experienced in take-offs as a consequence of passengers arriving late to the departure gate. Although we cannot prevent passengers from being late, we can mitigate the annoying consequences this has for the rest of passengers who arrived on time, and the associated costs to the airlines.

Current regulations establish that an airplane cannot leave the ground carrying any baggage from a passenger that is not on board, for security reasons.

This results in two options for the crew: Either they wait until the passenger finally boards the aircraft, or they disembark the baggage and leave it at the airport before taking off. This second option takes such a long time that normally the crew will wait for the passenger and only after a reasonable time, will they start looking for the piece of baggage.

The second option entails a cumbersome process, because suitcases are introduced into the aircraft following no predetermined rules, and the suitcase could be anywhere in the baggage hold. This causes many planes to be late and lose their take off time slot, causing yet a bigger delay which could also result in losing connection flights. The airline, being responsible for this, ends up paying for overnight stays and causes passengers to perceive the airline with a particularly bad image.

To face this problem, JANO proposes a system that associates passenger with his piece of baggage and that shall reduce the overall chaos that exist today for the reconciliation.

JANO is the Roman God of beginnings and transitions, thus of gates, endings and time. He had two faces, one looking to the past and the other looking to the future. He presided over the beginning and ending of conflict. It used to be said that the doors of his temple were opened during war and closed during peace. As a god of transitions, his functions had to do with birth, journeys and exchange, and in his association with Portunus, a similar harbor and gateway god, he was concerned with traveling, trading and shipping.

Then, it seems that JANO is the most appropriate name for our system. In our case, it has been conceived to take into consideration passengers with one of the faces, and baggage with the other one in order to manage them in the best way possible during all the phases of the trip: at the beginning when the passengers checks the baggage, then when the passenger arrives at the boarding gate, while the baggage is carried to the aircraft cargo hold, and finally when both passenger and baggage arrive at their destination.

But what exactly is it we are proposing? Depending on the level of implication from the airline, and always taking into account their current processes and the possible impact on performance, we shall offer different levels of service.

For those companies whose processes permit to follow our advice, no baggage will be introduced into the aircraft until its owner has already presented himself in the boarding gate. Following this rule, we will make sure that no time is lost in case a passenger arrives late.

In order to do so, our system includes an RFID (Radio Frequency Identification) tag in the baggage that contains a code associating it to a passenger, the owner. A portable RFID reader carried by the person in charge of loading baggage into the aircraft will scan every piece of baggage, and look up for the passenger’s code in a database that will be continuously updated.
and that will contain only those passengers that are already at the boarding gate. This reader, that resembles a digital watch, shall show a light of a specific color depending on the status of the bag. A green light if the bag can be introduced into the aircraft, a red one if it needs to wait for the passenger to arrive, or a yellow one if the bag has been misplaced and belongs to a different flight and needs to be sent back to the airport.

This is the main idea behind JANO, and it has been refined depending on the kind of customer.

For airlines that may not be willing at first to follow the whole process that prevents baggage from being loaded if the passenger has not shown up, we propose a simplified version.

Every piece of baggage will be RFID scanned once it is uploaded to the baggage hold either in bulk or in containers. Following this approach, a piece of baggage may still need to be downloaded from the aircraft if the passenger does not show at the gate. In order to speed this process up, our system knows exactly in which container the piece of baggage is, or if it has been put in bulk, we know in which order it was introduced, and the search can be refined using the proximity functionality of the RFID reader.

In any case, baggage will be scanned at the end of the airport classifying system, before being transported to the aircraft. This will make sure that only pieces of baggage for that flight will be introduced and missing baggage will be early detected, starting at an earlier phase the processes to track and recover it as soon as possible.

Also, other features are offered such as the option to take a picture of the bag at checking. This makes sure that if the need to recover that bag from the cargo hold or to look for it if it has been mishandled arises, the workers will be able to do this faster than it is currently done, not depending on passenger’s description of the bag, that is normally not very accurate.
Mission

JANO is born to bring airlines today’s most innovative solution in passenger-baggage reconciliation systems. JANO guarantees a more reliable way of tracking baggage before take-off for all kinds of flights, including connection flights where the system offers its greatest advantages, being based on RFID tags, monitoring baggage status and loading it into the aircraft depending on the passengers boarding the aircraft or not.

The complete JANO system includes both the software suite to handle this functionality and the necessary hardware infrastructure to allow airlines to establish the system in a fast and easy way with little investment and with immediate returns on investment.

The product consists on a basic package Simply JANO offering the basic functionality of the system plus several other optional packages.

This product is marketed towards commercial airlines and through them towards handling companies.

Vision

To establish JANO as the reference company in Europe developing passenger-baggage reconciliation systems, offering an extremely reliable system that allows airlines minimize costs due to baggage mishandling independently of the airport baggage management system.

To be indirectly perceived by first customers, airlines and baggage handling cos. and by the last customers, flights passengers, as a tool that allows increasing the customer satisfaction level assuring a differentiation over the rest of companies without Jano system.

Values

JANO firmly believes in developing environmentally friendly solutions making use of the latest technologies giving the people the same importance as immediate economic profits. It shall defend the following values:

- Responsibility
- Exemplariness
- Integrity
- Respect for the stakeholders

Figure 1: JANO logo
Chapter 1

PEST Analysis
During the first chapter of this business plan, the main environmental factors that can influence the development of the idea will be analyzed. The chapter will focus on political, legal, economical, technological, social and cultural factors. The scope of the analysis is mainly Spain, since it is the country where JANO will be launched, before setting new goals in Europe and beyond.

1.1 Political and Legal Factors

1.1.1 Airline Passenger Rights

Due to the continuously increasing use of airlines nowadays, with a significant raise in the last two decades, the EU (European Union), has worked on a law to ensure basic rights for airline passengers. This law is applicable since 2005 and establishes common rules applied to passengers departing from airports located in a Member State or to those who come to these airports from a country outside the EU, but operated by a company of the EU\[1\].

These rights are aimed at protecting passengers against cancellations, delays, etc. and also give airline operators the possibility to ask for compensation from external entities, when the harm caused to the passenger is not their responsibility. Among the applicable rights, some cases can be highlighted:

- People with disabilities or reduced mobility: in any case they must be granted the same rights when booking or boarding as other passengers. They should also be provided with assistance if necessary, for which it is recommended to report the situation in advance.

- Compensation and assistance in case of denied boarding. The same is applied in case of flight cancellations if not notified well in advance or if there is no prove that it is not the airline's fault.

- Compensation for delays depending on the distance traveled and the difference of time compared with the forecast.

- Relative to baggage, compensation is up to 1,220 € in case of loss, delay or damage, but the airline can be waived if they can prove that all possible measures were adopted to prevent this situation from happening.

- Transparency: the passenger must be completely informed at every moment by the company he is purchasing the service from of the unbundled price of the ticket (including charges and fees) or the travel booked in case of purchase of special packages. Similarly, the passenger must be properly notified of his rights, especially if there is a situation (delay, cancellation, etc.) where he can claim compensation.

In any case, airlines are still able to minimize costs due to this regulation, because justifying a correct procedure or the existence of exterior faults can exempt them from making these trade-offs, so the passenger would be at a disadvantageous position.

In the same wording of this regulation, the periodical review and discussion of these rights was included, in order to try to adjust the rules referred to the current situation of each moment, and to adjust the fixed compensation in case of maximum injury. It is therefore likely that the basics of this legislation do not vary drastically, but certain exemptions or offsets could be hardened in the medium to long term. All airlines must respect these regulations, and in order to offer passengers the best service, and to minimize potential damage costs to them, they must not only apply the necessary measures to comply with the current regulation, but also apply additional ones that will protect them against future harder laws. The sooner this is understood and new systems are implemented, the lesser the cost will be, and the better the image of the company will be in the eyes of the clients.
1.1.2 Ground handling

According to the Spanish law, the provision of airport ground handling services is regulated. This decree adapts and incorporates into Spanish law the Directive 96/67/CE of the European Union on this issue which remarks the vital importance of ground handling for an efficient use of infrastructures and proper functioning of air transport. This directive aims to open these services to the market on a competitive basis, in a progressive and adapted pace according to the needs of the sector[2].

In this decree, the applicable requirements for the exercise of services at airports of general interest are established; the arrangements for the provision of such services are liberalized, with some exceptions; the circumstances in which, because of space, capacity, security and other conditions of an airport, the number of agents or users providing services are limited; and it is entrusted to the public company AENA ("Aeropuertos Españoles y Navegación Aérea") the management of airport facilities whose complexity, cost or economic impact on the environment, must be kept under the responsibility of the airport authority.
1.1. POLITICAL AND LEGAL FACTORS

debt that it currently owns, that comes from the extremely high cost of building the last terminals of the airports of Madrid and Barcelona, the T4 and the T2 respectively, which accounted for more than 9.38 billion €, well above estimated budget. This also reflects the global trend to privatize all airports, that were considered a public service in the old days, and now have turned to be just another business.

1.1.3 AENA Situation

AENA is the leading airport operator in the world, managing 46 airports and 2 heliports in Spain and participating directly and indirectly in the management of 29 more airports around the world. It is the world’s leading airport operator in terms of passenger numbers, handling more than 200 million with revenues of 3.3 billion € in 2012. However, it has suffered big losses in the last years, for example 70 million € loss in 2012. It is a highly sought goal for many mutual funds. This fact, along with the financial needs mentioned or hiring some consultants (Lazard Corporate Finance and N +1) and the refurbishing of airports to increase business and make them more attractive to the private sector are factors that confirm that they are working on the plan to carry out a partial privatization of the company in the short term.

To give the company a higher value, AENA has sharply raised the airport charges in recent years, while putting on sale new licenses and concessions on site. Furthermore, the reduction of 10% of its workforce translates into major cutbacks in operating expenses. In order to optimize their valuation, AENA is also trying to expand its international influence, by taking the control of 2 or 3 airports outside Spain, what would give greater importance to its international operations, rather than the small participation that they have at many airports today.

![Figure 1.3: Aena is the world’s leading airport operator](image)

All these actions are aimed at enhancing EBITDA (Earnings Before Interests, Taxes, Depreciation and Amortization) at the end of the year, a parameter commonly used in the valuation of these companies as it is supposed that the total value of the company is about 8-10 times the EBITDA. Closing the year with an EBITDA of over 1.5 billion €, could suppose obtaining between 6 and 7.5 billion € of private equity for half of the company.

While exact consequences of this possible change cannot be known, some common consequences resulting from some other similar cases of privatization of airports can be extrapolated. Generally:

- The airport privatization entails job losses.
- In many cases, it results in the creation of private monopolies, the establishment of subcontracting chains or the loss of infrastructure investment.
- Increased airport charges: directly affecting airlines, which commonly rebound those increased costs to the price of tickets. At the time, some routes that were encouraged may disappear.
1.1.4 Passenger Baggage Reconciliation

According to the rules of most air transportation authorities, such as the U.S. Federal Aviation Administration and the European Union’s Joint Aviation Authorities, in the event that a passenger flying with checked-in baggage fails to arrive at the departure gate before the flight is closed, that person’s baggage must be retrieved from the aircraft hold before the aircraft is permitted to take off. The security presumption of passenger-baggage reconciliation is that the majority of bombers will not want to kill themselves, and will not board an aircraft if they have caused a bomb to be placed in its hold. Although all baggage is scanned at the airports, this rule is nowadays maintained.

1.1.5 LOPD ("Ley Orgánica de Protección de Datos")

The “Ley Orgánica de Protección de Datos”, known as LOPD, is the rule that, since 2000, regulates in Spain the legal regime applicable to the treatment of the so-called “personal data”, establishing the conditions in which to collect, process and assign this kind of data to avoid prejudicing the fundamental rights and liberties of citizens, especially their right to honor personal and familiar privacy. With the entry into force of LOPD, Spanish laws were finally adapted to the requirements of the directive 95/46/EC for all Member States of the European Union.

The LOPD shall apply to personal data recorded on physical media, rendering amenable to treatment, and to any type of subsequent use of such data by the public and private sectors, in the following cases:

- When the processing is carried out on Spanish territory in the framework of the activities of an establishment of the controller.
- When the controller is not established on Spanish territory, wherever applicable Spanish legislation under public international law standards.
- When the controller is not established in the territory of the European Union and used in the data processing means located in Spanish territory, unless such equipment is used only for transit purposes.

The issues addressed by the Data Protection Act are:

- General Provisions: it sets out the objectives and scope. It defines key concepts used later.
- Principles of data protection: they are the basic rules that should govern any processing of personal data.
- Rights of persons: they are the set of legal tools that allow citizens to control the use made of their personal data and protect your privacy against misuse or damaging.
- Sector provisions: they set what the requirements are for creating files of public and private ownership, and other issues related to the implementation of the Data Protection Act in specific cases.
- International movement of data: in general, only personal data may be transmitted outside the Spanish territory if, in addition to meet the rest of guarantees provided under the law, prior authorization is obtained from the Director of the Agency or if it is some case in the exceptions provided by law.
- Data Protection Agency is the body responsible for ensuring compliance with data protection legislation and monitoring its implementation.
1.2. Economic Factors

1.2.1 Unemployment

After the beginning of the global economic crisis in 2008, the percentage of active population that suffers from unemployment in Spain has been continually growing (except for short periods of time), and it is higher than the average of the European Union countries, as seen in figure 1.4.

The forecasts of the OECD (Organization for Economic Cooperation and Development) say that the unemployment rate will be 27.3% by the end of 2013, and 28% by the end of 2014. The Spanish government is a bit more optimistic, and hopes that by the end of the year the value goes down to 27.1%, and decreases over the next three years (2014, 2015 and 2016) to 26.7%, 25.8% and 24.8% respectively [3]. From these values, it can be seen that unemployment, which has been historically an endemic problem in Spain shall remain very high in the near to medium term, well above European Union average.

Figure 1.4: Spain’s Unemployment rate is well over the OECD average

1.2.2 Gross Domestic Product

The current crisis has marked a turning point in the economic growth records. As it can be seen in figure 1.5, Spain does not leave recession behind until the second quarter of 2010, but goes...
back in by the end of 2011 [4]. The European Commission forecasts a growth in the Spanish GDP of 0.5% in 2014, 0.9% in 2015 and 1.3% in 2016.

Figure 1.5: Variation of GDP in Spain and the European Union from 2008 to 2012

1.2.3 Credit

In the figure 1.6, it is shown the evolution of the credit between 2008 and 2012 for a sample of 37 companies operating in the domestic market, covering over 95% of the stock of private sector credit. Between those years, there has been a widespread credit contraction (it only grows in 6 entities out of 37, and with a maximum increase of 4%) [4].

This contraction is caused by the previous period of expansion of the credits for the private sector, with higher levels than most countries in Europe, which ended with its strong indebtedness. External financing was needed by the banks, and when the crisis showed up, a lot of them suffered serious problems. The credit contraction in Spain responds to both the offer (credit constraints) and the weak demand. Therefore, obtaining a new credit in Spain for a new company has become more difficult nowadays. Although it is not impossible, other sources of financing should be studied as well, such as a bigger company investing in JANO.
1.2. ECONOMIC FACTORS

1.2.4 Inflation and CPI (Consume Price Index)

Inflation is normally considered as the variation of the CPI. At the beginning of the crisis, deflation appeared in the Spanish economy for the first time since historical data is recorded. It has been a decrease of the CPI during last year, with some occasional interruptions. This is mainly due to oil prices stability and to the weakness of the demand [3].

Figure 1.7: Spain’s inflation was negative in 2009 for the first time in its history

1.2.5 Public Debt

The Spanish Risk Premium is the difference between the interests of the Spanish and the German ten year bond. As it can be seen in figure 1.8, the performance of the German public debt has improved, while the Spanish one has worsened. This has resulted in an increasing risk premium until mid 2012, with a partial recovery since then [3]. Experts expect a slight improvement of the Spanish risk premium due to the good performance of Spanish bonds and the rising interest rates of the ten-year German bonds. This shall make it easier for Spain to get financed, and to be able to face its short and long term debts.
CHAPTER 1. PEST ANALYSIS

Figure 1.8: Spanish and German 10 Year Bond evolution

On the one hand, the Spanish economy tends to improve because of the following factors:

1. The confidence of the financial markets in the European monetary union.
2. The strong adjustment of the private sector in Spain.
3. The progress in the restructuring of the banking sector in Spain.

On the other hand, some adverse factors may delay the comeback of the Spanish economy:

1. The high unemployment rate, that also prevents the recovery of the private consumption due to the fear of people of losing their jobs in the future.
2. The incomplete labor market reform of the year 2012.
3. The lack of progress of the plan for the budget deficit reduction.
4. The international economy slowdown in 2013 (reported by the IMF (International Monetary Fund) in the recent world economic outlook) that could damage the Spanish export growth.

1.3 Technological Factors

1.3.1 Obsolescence Level

“Obsolete Qualification Applicable to goods and procedures that are outdated, no longer used or are ineffective against others appeared later.”

An obsolete technology is any that has been replaced by another technology (that can be leading technology or not) and it is not used more.

Reasons for obsolescence:

- Bad performance comparing with new technologies.
- Impossibility to obtain the correct replacements.
- Entrance of new technologies that replace the previous one (substitute technologies).
- Two technologies competing at the same time but finally one overcomes the others.
- Commercial strategies.

RFID is a booming technology, and it has not been fully exploited yet. It is the next generation for tracking objects and keeping inventory for instance, substituting the older bar codes that are still commonplace everywhere. RFID based solutions are the future, and it will be a long time until the development of a new technology which would make it obsolete.
1.3. TECHNOLOGICAL FACTORS

1.3.2 Technology Intensity

Progress towards meeting Europe 2020 R&D (Research & Development) intensity target

Spain’s R&D intensity has grown from 0.91% in 2000 to 1.38% in 2009, which is one of the highest increases of all EU Member States. This positive trend is due to an increase of both government and business enterprise funding to R&D. Spanish GBAORD (Government Budget Appropriations or Outlays on R&D) has increased steadily with an average annual growth rate of 14.1% between 2004 and 2009. Public funding to research and innovation decreased slightly in the 2010 national budget, but in 2011 the country protected R&D investment as compared to the rest of the budgetary expenses. However, R&D investments suffered a big blast in 2013 with the announcement of the new State budget where they were greatly reduced, in spite of the common opinion by scientists and economic experts that R&D should be fostered, even more during crisis times.

For 2020, Spain has set a national R&D intensity target of 3%, which is achievable but will require an increase of the average annual growth rate, mainly of business R&D investment. Given the structure of the Spanish economy, reforms for a structural change would be needed towards a more knowledge-intensive economy. Compared to other countries, Spain has scoped to increase both the R&D intensity in existing high-tech and medium-high-tech sectors (moving closer to the technology frontier) and to increase knowledge intensity in more traditional sectors of the economy. Efforts already made in this direction are reflected in some figures, such as the number of employees in the high and medium-high technology manufacturing sector, where Spain is the sixth country in the EU [6].

![Figure 1.9: R&D Intensity Projection in Spain](image)

Research and Innovation Performance

The main challenge in the Spanish R&I (Research & Innovation) system is to increase business expenditure on R&I, which in 2009 only amounted to 0.72% of GDP, under the EU average of 1.25%, and represented 52% of GERD (Gross Domestic Expenditures on Research and Development), well below the figure of 65-70% of the top performing countries in Europe and the world (Germany, the Nordic countries, Switzerland, Japan and the United States). However, since 2000, business enterprises have increased their expenditure on R&D, which has grown as a share of GDP by almost 45% over the period 2000-2009.

Also venture capital intensity has risen substantially to 0.13% of GDP in 2008. The still low level of business expenditure on R&D has a negative impact on Spain’s technology and innovation...
performance, and its capacity to produce world competitive technologies and new knowledge-intensive products.

Spain is a dynamic country with a growing research and innovation system. Over the period 2000-2008, Spain increased not only its domestic expenditure on R&D but also its international scientific cooperation, the quality of the scientific production, its technological development and the knowledge-intensity of its economy. Although the growth in new doctoral graduates is lower than in the EU, Spain has one of the world’s highest rates in science and engineering degrees as a percentage of all new degrees. Moreover, the number of researchers as % of total employment has been constantly growing since 2000, at an average annual growth rate of 3.60%, more than the EU average. Regarding license and patent revenues from abroad, Spain has grown more than the EU. However, the share of doctoral degrees in the active population is still far below the EU average, and the unemployment rate of researchers is one of the highest in the EU.

1.3.3 R&D&Innovation Support policies.

National Plan 2013-2016

Minister Council approved on February 1st, 2013 the Spanish strategy for Science, Technology and Innovation and the Spanish Scientific and Technical Research and Innovation Plan. Both documents are the pillars that sustain the R&D&Innovation Government Policy Design for the upcoming years. Both the Strategy and the Plan are aligned with the European objectives defined in the European program, “Horizon 2020”.

While the Strategy (2013-2020) contains the objectives, reforms and actions to be applied in the overall R&D&Innovation scope in order to empower its growth and impact, the Plan (2013-2016) focus exclusively on the State General Administration actions, establishing the scientific-techniques priorities and socials and the resources distribution. The State Plan will go along with the Annual Acting Programs that specify the actions foreseen for each year related to the budgetary assignations available.

The State Plan structure answers to the established strategic goals in the Science Technology and Innovation Spanish Strategy. That plan constitutes the frame tool which will establish the general objectives to reach during the 2013-2020 period, linked to development and perform in the improvement of competitiveness and economic growth [7]:

- **SP (STATE PROGRAMS):**
  1. SP Talent and Employability Promotion.
  2. SP on Excellence on Scientific and Technique Research.
  3. SP on R&D&Innovation Business Leadership Empowerment.
  4. SP on R&D&Innovation Oriented to Society Global Challenges.

- **STRATEGIC ACTIONS:**
  1. Strategic Action on Health.
  2. Strategic Action on Economic and Digital Society.

CENIT (National Strategic Consortia for Strategical Research) Program

CENIT Program was an initiative created to empower public-private cooperation on R&D within Spain, through financing big competitive research projects in strategic areas. Their main goals were:[8]

1. To facilitate the accomplishment of big projects that increase the enterprises scientific-technological capacity and also of national research groups.
1.3. TECHNOLOGICAL FACTORS

2. To extend cooperation culture on R&D.

3. To prepare the enterprises for an easier access to international programs (International Framework program).

4. To empower R&D on SMEs (Small & Medium Enterprises).

NEOTEC Initiative. Activities.

NEOTEC Initiative, whose objective is to support the creation and consolidation of enterprises with a technological basis in Spain, owns a sort of tools in order to facilitate technological entrepreneurs to develop a company from the first business idea conception until it turns into a viable company. The initiative is mainly supported through EBT ("Empresa de Base Tecnológica") injections and capital risk contributions managed by two societies: NEOTEC Fund Society Capital Risk Corp., S.C.R. and Co-investment NEOTEC Corp. S.C.R.

Activities of the Center for the Industrial and Technological Development.

The objective of the CDTI ("Centro de Desarrollo Tecnológico Industrial") is to improve the competitiveness of the Spanish companies increasing its technological level, betting on R&D&Innovation. For it, CDTI facilitates to the companies partially reimbursable aid to interest rate zero (normally, the non reimbursable section is 15% of the granted aid), with long term of amortization, for the accomplishment of projects of investigation and technological development carried out of individual way by a company or in partnership between several organizations, aid for the creation and consolidation of basic technological companies (NEOTEC), and subsidy to fund great integrated projects of industrial investigation, betting by the collaboration public-deprived in technological future areas and with strong international projection.

- R&D&Innovation Projects Support.

In 2011 the CDTI jeopardized a total amount of 1,019 million € for the direct financing of 1,786 enterprise activities of R+D and aid NEOTEC through reimbursable, partially reimbursable aid and subsidy.

Besides this own financing to projects of R&D&Innovation, the CDTI facilitates the access to the line of pre-financing, (advance payments up to 75% of the aid granted by the center to a final interest rate for the company of the Euribor to six months except a point, canalized through the bank) for any type of projects of R&D&Innovation.

![CDTI](image)

Figure 1.10: CDTI encourages R&D investments for Spanish companies

7th Framework Program (2007-2013). Participation of Spain

Since 2007, a progressive increase of the Spanish participation in the programs has taken place and 2011 has been an exceptional good year which has to do mainly with the leadership in projects of demonstration in renewable energies. Thus, the accumulated total return in the 7th Framework Program, that provides a global vision and not only the results of a concrete year, supposes 7.9% of the budget calculated on the UE-27, that implies a return of 1.8 billion €. In 2011 they emphasize the following facts:
• According to preliminary data, the Spanish return obtained in 2011 in the set of the subjects co managed by the CDTI (including those of JTI ENIAC, ARTEMIS, Clean Sky and IMI) was of 414.2 million €, equivalent to 10.3% of the returns of the UE-27, and surpassing in this way the objectives raised in the “Euroingenio Plan” (8%).

• In the subjects co managed by the CDTI registers a 9.4% of projects led by Spanish organizations.

• Thematic Areas: the biggest returns in 2011 in absolute value are in ICT (Information and Communication Technologies) (105.8 million €), NMP (“Nanociencia y Tecnología, Materiales y Producción”) (66.2 million €), Health (61.2 million €), Energy (38.5 million €), Transport (37.6 million €) and activities to the benefit of the SMEs (27.8 million €). In relative terms, they emphasize especially Energy with 18.1%, Activities to the benefit of the SMEs with 14.6%, NMP with 10.5% and Feeding, agriculture and fishing, and biotechnology, with 10.3%. All of them related to the UE-27.

FP7 (7th Framework Program) Key Facts and figures.

• Applications.
  As of March 16th 2011, a total of 15,512 eligible proposals were submitted in response to 248 FP7 calls for proposals [9]
  – involving 25,257 applicants from Spain (9.48% of EU-27).
  – requesting 7.46 billion € of EC contribution (8.45% of EU-27).

  Among the EU-27 Spain (SP) ranks:
  – 4th in terms of number of applicants.
  – 5th in terms of requested EC contribution.

• Success rates:
  – The SP applicant success rate of 20.3% is lower than the EU-27 applicant success rate of 21.6%.
  – The SP EC financial contribution success rate of 18.0% is lower than the EU-27 rate of 20.7%.

Specifically, following evaluation and selection, a total of:

  – 3,152 proposals were retained for funding (20.3%).
  – Involving 5,118 (20.3%) successful applicants from Spain.
  – Requesting 342.32 million € (18.0%) of EC financial contribution.

Among the EU-27, Spain (SP) ranks:

  – 15th in terms of applicants success rate.
  – 11th in terms of EC financial contribution success rate.

• Signed grant agreements

  As of March 16th, 2011 Spain (SP) participates in:
  – 2,646 signed grant agreements.
  – Involving 28,295 participants of which 4,282 (15.13%) are from Spain.
  – Benefiting from a total of 7.91 billion € of EC financial contribution of which 1.2 billion € (15.15%) is dedicated to participants from Spain.
Among the EU-27 in all FP7 signed grant agreements, Spain (SP) ranks:
- 5th in number of participations.
- 6th in budget share.

- **SME performance and participation**
  - The SP SME applicant success rate of 17.65% is lower than the EU-27 SME applicant success rate of 19.33%.
  - The SP SME EC financial contribution success rate of 16.47% is lower than the corresponding EU-27 rate of 18.26%.

Specifically,
- 7,987 SP SME applicants requesting 1.97 billion €.
- 1,410 (17.65%) successful SMEs requesting 323.66 million € (16.47%).

In signed grant agreements, as of March 16th, 2011.
- 854 SP SME grant holders, i.e., 19.94% of total SP participation.
- 184.07 million €, i.e., 15.36% of total SP budget share.

- **Top 3 collaborative links with:**
  - DE - Germany (3,487).
  - UK - United Kingdom (2,923).
  - FR - France (2,654).

![Figure 1.11: Most active FP7 research priority areas by number of applications for research projects](image)
1.3.4 RFID

Introduction

RFID stands for Radio Frequency Identification, and was developed in 1973 by Mario Cardullo as a passive radio transponder with memory, powered by the interrogating signal. However, the first patent to be associated with the abbreviation RFID was granted to Charles Walton in 1983. Its key feature is the wireless non-contact use of radio-frequency electromagnetic fields to transfer data, for the purposes of automatically identifying and tracking tags attached to objects. The tags contain electronically stored information. Some tags are powered by and read at short ranges (a few meters) via magnetic fields (electromagnetic induction), and then act as a passive transponder to emit microwaves or UHF (Ultra-High Frequency) radio waves (i.e., electromagnetic radiation at high frequencies). Others use a local power source such as a battery, and may operate at hundreds of meters. Using RFID represents an improvement over bar codes in terms of non-optical proximity communication, information density, and two-way communication ability [10].

Applications

RFID is used for a wide variety of applications, ranging from the familiar building access, control proximity cards to supply chain tracking, toll collection, vehicle parking access control, retail stock management, tracking library books, theft prevention and airport baggage management, a field that has not been deeply explored in Spain and where JANO comes into action.

Different types of RFID

An RFID system will typically comprise:

- An RFID device or tag.
- An RFID reader.
- A connection to an enterprise system.

![RFID System Components](image)

There are two main categories of RFID devices:

1. Active devices that have power supply, and usually have read/write capabilities. Their range extends up to tens of meters. They are larger and more expensive than passive tags.

2. Passive devices, also called “tags” that are not powered and usually have only read capability. This kind of devices have an unlimited life, they are lighter, smaller and cheaper. In general, low frequency passive tags have an effective range of 30cm, high frequency passive tags around one meter, and UHF passive tags from 3 to 5 meters. If a greater range is needed, active tags can boost the signal to a range of 100 meters.
1.4 Social and cultural Factors in Spain

1.4.1 Evolution of demography during 20th Century

During the 20th century, the growth of Spanish population was always a positive value. The number of inhabitants in Spain moved from 18.6 million in 1900 to 40.5 million in 2000[5]. This twofold increase is related to two fundamental concepts: natural growth and immigration flows.

Natural growth

The natural growth of a country is measured by the difference between births and deaths during an established period, i.e. the relation between nativity and mortality. The evolution of these factors without taking into account exceptional situations (civil war and Spanish flu) experienced a change after the 1970s decade. The natural growth evolved from a model based on high mortality and high fecundity to a model with lower and more stabilized numbers in both factors.

<table>
<thead>
<tr>
<th>Life expectancy</th>
<th>1900</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>33.8</td>
<td>75.3</td>
</tr>
<tr>
<td>Woman</td>
<td>35.1</td>
<td>82.5</td>
</tr>
</tbody>
</table>

Table 1.1: Evolution of life expectancy in Europe

The decrease of the mortality is well exemplified by the growth of life expectancy both in men and women, shown in table 1.1. The current values of life expectancy are among the highest of the European Union.

<table>
<thead>
<tr>
<th>Nativity</th>
<th>1900</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average children per woman</td>
<td>4.7</td>
<td>1.16</td>
</tr>
</tbody>
</table>

Table 1.2: Evolution of nativity rate in Europe

The nativity has also experienced a reduction during the first part of the century. This reduction stopped in the 1970s with the baby boom, when nativity levels went up after the end of the dictatorial regime. After those years, the drop of births was very dramatic, reaching values over 30% during the first years after the boom. This decrease is shown in table 1.2. The overall natural growth during the 20th century was more influenced by the increase of life expectancy than by the descent of the nativity, resulting in a positive number every year of the 20th century.
CHAPTER 1. PEST ANALYSIS

Migration flows

The migration flows during the past century were of course influenced by the economic and political situation of Spain. During the first part of the XX century, the balance was favorable to emigration, standing out the first decade of the century and the period between 1950 and 1970. After the second half of the 1970s, immigration mainly due to the return of Spanish people started to set a positive factor in the balance. During the last decades of the century, international immigration boosted by the economic situation started. This became an important phenomenon during the first decade of the 21st century and it is analysed throughout the next section.

1.4.2 Immigration and demography during past years

The population of Spain has experienced a big growth during the last decade. The number of inhabitants increased in 6 million in those years. The contribution of foreign population increase (3 million) was very important in that growth. Nevertheless during the last part of 2012 a drop in population was registered[11].

![Figure 1.13: The percentage of foreign population in Spain has grown steadily over the last decade](image)

*Figure 1.13: The percentage of foreign population in Spain has grown steadily over the last decade*

The previous figure reflects how during the last decade the percentage of foreign population increased. Nevertheless a stabilization of this growth in the last years of the decade can be seen
1.4. SOCIAL AND CULTURAL FACTORS IN SPAIN

Figure 1.14: For the first time in many years more people are emigrating than immigrating in Spain.

As previously stated, migration flows had a special influence in the demography of the last decade. Figure 1.14 shows how immigration values started to moderate and even decrease after 2009, as a consequence of the economic situation and unemployment.

Figure 1.15: Composition of foreign population by ages in Spain.

The concentration of the foreign population was more important between 16 and 44 years, while national population concentrated between 30 and 64 years. The overall composition of foreign population by ages is shown in Figure 1.15. This distribution, quite stable in the last years, represents the impact that migration flows have had over labor market, because of the concentration of immigrant population around work age.
Composition of foreign population by origin is shown in figure 1.16. As it can be seen, the biggest part of foreign population comes from European Union. It is important to highlight the increase of the share of people coming from Romania as a consequence of its incorporation to the European Union in 2007. If origin countries were considered, the biggest portion would be represented by Romania, followed by Morocco. Population originating from South America has gradually lost weight over the total.

1.4.3 Composition of society

Every ten years, a census, i.e. a studio about the composition of society, is done by the INE ("Instituto Nacional de Estadística"). The results of the 2011 census, the last one published so far, show a total population of 46,815,916 and the most interesting results are shown in the next two figures[12].

Figure 1.16: Foreign population by origin in Spain (2011)
1.4. SOCIAL AND CULTURAL FACTORS IN SPAIN

Figure 1.17: Spanish population pyramid

<table>
<thead>
<tr>
<th>Total Population</th>
<th>46,815,916</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>23,104,303</td>
<td>49%</td>
</tr>
<tr>
<td>Women</td>
<td>23,711,613</td>
<td>51%</td>
</tr>
</tbody>
</table>

Table 1.3: Total population

1.4.4 Cultural Issues

Education

Spain is one of the countries with the highest rate of early school desertion, although for the last five years this rate has been improving[13]. The composition of the non-university education by type of center is shown in the figure below, with a clear predominance of public school.
The access to university studies is usually controlled through an exam called PAU (“Prueba de Acceso a la Universidad”), which in 2012 was taken by 278,818 students. The number of university students in the 2010-2011 course, by length of degree is shown below.

<table>
<thead>
<tr>
<th>Total</th>
<th>1,455,885</th>
</tr>
</thead>
<tbody>
<tr>
<td>First grade</td>
<td>331,452</td>
</tr>
<tr>
<td>Second grade</td>
<td>556,448</td>
</tr>
<tr>
<td>Double</td>
<td>17,329</td>
</tr>
<tr>
<td>European</td>
<td>550,656</td>
</tr>
</tbody>
</table>

Table 1.4: Number of students by length of degrees in Spain in 2010-2011

In 2011, 40.6% of Spanish population between 30 and 34 years had university studies, 6 points over the average of the European Union.

Culture attached to leisure

According to a survey done between 2010 and 2011, 58.7% of the population read at least one book each year [13].
1.4. SOCIAL AND CULTURAL FACTORS IN SPAIN

The main cultural activities attached to leisure in Spain are music, books and cinema, with rates around 80%, 60% and 50% respectively. This means that 8 out of 10 Spaniards listened to music very often during 2010. The average consumption in leisure services, spectacles and culture is decreasing since 2008, reaching in 2011 1,876 € per year and house.

Transport

In 2012, 2.8 million passengers used urban transport and 1.3 million passengers used interurban transport. Spain is the third country in the European Union by passengers transported by plane. The composition of those passengers by destination is shown in the next figure.


1.4.5 Advocacy groups

There are several types of advocacy groups influencing the political and economic environment of Spain.

Lobbies

In order to increase the transparency of the system, National Authorities are cracking down on lobbies. To do this, a National Register of lobbies is intended to be created. Politicians will have to report about their meetings with the representatives of these registered groups.

Nevertheless, there is a transparency register at European level where groups with domicile in Spain can be consulted. A simple search is enough to verify that there are all kinds of groups registered in Spain from associations to companies or even universities. This allows us to have a big picture of the situation.

The objective of these lobbies is to keep in touch with political parties forming Congress in order to obtain certain benefits. A legal improvement is not always pursued, but simple information about the changing laws. While this practice is commonplace in the USA, Spanish lobbies are low key, and not many people know about their existence.

Unions

There are many unions in Spain representing interests of different sectors of workers. Among them the most known and widespread are UGT ("Unión General de Trabajadores") and CCOO ("Comisiones Obreras"), each one with more than one million affiliates. These unions are important in the politics of Spain since they are taken into account within the negotiations of labor conditions, not only at a national level but also in the particular cases of many companies. In the aerospace sector, unions come together and sign "convenios", or agreements with the company management that regulate labor conditions. A very famous union is SEPLA, ("Sindicato Español de Pilotos de Líneas Aéreas"), formed by the pilots working for Spanish airlines which has a great strength defending pilots' rights.

Religion

Along the history of Spain, the main religion in the country has been the Roman Catholic Christianity. Even though for the last 60 years the Catholic Church has lost weight in the institutional life of the country, still the percentage of people that declare themselves as catholic is very important (73.1% in 2013 according to CIS ("Centro de Investigaciones Sociológicas")) [14]. In this context, Catholic Church can be seen as an influence in the public opinion and therefore an advocate group.

1.4.6 Environmental Conscience

The environmental conscience of the citizens of Spain is still weak according to a report presented by the CIS in the year 2010 ("Ciudadanía y conciencia medioambiental en España"). It is stated that even if the environmental awareness has increased, Spanish people are not well informed about environmental matters. Citizens express their compromise (moral adhesion) but take little actions into practice [15].
Chapter 2

Sector analysis
2.1 Airline Industry Trends

Continuous traffic growth and increases in ticket prices make the air transport industry a good environment for new investments. However, ever increasing oil prices, a global financial crisis, especially in the Eurozone and political instability in Northern Africa and the Middle East have lately had a negative impact in the air transport industry.

Airlines’ profitability has been very low in the last years, especially after the arrival of the so called low cost airlines which have had a huge impact in the sector with shockingly low ticket prices that have forced traditional air carriers to lower their prices and to modify their processes, causing many of them to collapse and disappear.

Figure 2.1: Cents per seat-mile showing global air transportation profitability trend since 1970

Aircraft orders, and hence airline transportation continue to rise year by year. However, mature markets such as North America and Europe have seen their global market share diminish in favor of rising areas such as Asia-Pacific, Latin America, Middle East and Russia.

Air travel demand greatly depends on the strength of the economy, meaning that in the future, the biggest increase in air transportation will happen in developing areas. On the bright side, mature markets will still need a great number of new aircraft in order to rejuvenate their fleet.

Figure 2.2: World real GDP growth, in 2011

Economies from countries not pertaining to North America and Europe will lead the world in
CHAPTER 2. SECTOR ANALYSIS

terms of GDP increase over the next 20 years. The overall compound annual growth rate is expected to be 3.26%, with non North American or European countries accounting for 61% of the growth [16].

As a country’s GDP increases, so does its resident’s desire for travel [17].

IATA (International Air Transport Association) reports state that total demand for air transportation increased 5.9% in 2011, and 4.8% in 2012. IATA data covering the first four months of 2012 showed a 7.1% increase in passenger traffic, while capacity measured in ASK(Available Seat Kilometers) increased 4.9% [18].

Figure 2.3: Relation between aircraft orders and GDP Growth

<table>
<thead>
<tr>
<th>Airplanes in service 2012 and 2032</th>
<th>Demand by size 2013 to 2032</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Size</strong></td>
<td><strong>2012</strong></td>
</tr>
<tr>
<td>Large widebody</td>
<td>780</td>
</tr>
<tr>
<td>Medium widebody</td>
<td>1,520</td>
</tr>
<tr>
<td>Small widebody</td>
<td>2,310</td>
</tr>
<tr>
<td>Single aisle</td>
<td>13,040</td>
</tr>
<tr>
<td>Regional jets</td>
<td>2,660</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>20,310</td>
</tr>
</tbody>
</table>

Figure 2.4: Global aircraft fleet and forecast by number of seats
2.2 Rationale for a Baggage Reconciliation System

Due to the fact that profitability has greatly diminished over the last 40 years, airline carriers are focusing on improving their operations performance. Baggage management is one of airline’s main concerns, costing them millions of euros every year [19].

When baggage is mishandled, it is the airline who ends up paying for it. The airline will have to pay the passenger an economical compensation. Besides this cost factor, it causes the passenger such a big annoyance for not being able to recover his luggage, that the passenger may end up not wanting to travel with that particular company ever again, and advising his friends and family not to travel with that company in the future. All of this results in a tremendous damage to the company’s image. It is estimated that every lost or mishandled bag costs the responsible airline from 80$ to 120$. This figure includes labor and transportation costs (such as for taxis and trains) in order to recover and deliver the bag to the owner, or replacement costs to reimburse him for the lost luggage and contents.

However, most of the times the airline is not responsible for losing baggage. The airline cannot choose the way baggage is handled at a particular airport, and does not control how the extremely complex systems of transport belts and optical sensors that read the bar codes in baggage are set up.

It is with this in mind that JANO has been designed. JANO includes the best features of complex baggage reconciliation systems: RFID bag tagging which greatly reduces the probability of misreading tags, and updated databases that continuously monitor passenger and baggage reconciliation, making sure baggage does not go anywhere without its owner.

JANO can be single-handedly introduced by an airline, without having to suffer huge investments in infrastructure. Since a single airline cannot change the baggage management system in all the airports where it operates (which may be in different countries, under government or the competition control), there is not much it can do to improve the way its passenger’s baggage is handled. However, companies wanting to maintain an extremely high standard in quality with their passengers must rely on JANO in the future.
2.3 JANO Infrastructure

JANO has an extremely easy hardware infrastructure that consists in introducing easy wearable watch-like RFID readers, that workers from the handling company will wear when loading baggage from the baggage belt into the baggage lorry, and when loading them into the aircraft.

In order to be able to print RFID tags, an RFID printer will have to be available at every check-in counter, and in order to identify each piece of baggage in case it is mishandled and needs to be found, a camera that will take a picture of the piece will be also available at the counters and offered in one of our packages at an extra cost for the customer. The reader at the gate is activated as soon as the boarding process begins, and depending on the airline preferences, SLA and processes compatibility, either the passenger can scan his ticket or a worker from the airline can start scanning tickets. The sooner this process of including passengers in the database starts, the sooner baggage can be uploaded to the aircraft, and the lesser the possibility of baggage with no associated passenger being uploaded.

Scanning baggage before uploading it to the aircraft makes the process more secure and effective, and also guarantees delays due to passengers arriving late at the gate are reduced and if the passenger does not arrive to the gate and the baggage needs to be recovered, it shall be possible to do it in a faster way than nowadays.

2.4 Main JANO Applications and Functionalities

Our system can be applied for every kind of aircraft and airport. Depending on the type of aircraft, whether it is a small one being loaded in bulk or a bigger one with containers, available options differ and will depend on the airline’s choice. If the current way of loading baggage wants to be kept, what we offer is to scan all baggage as they are introduced into the container or taken to the aircraft, so that all baggage that is going to be introduced is stored and comparing with the baggage that was checked, it shall be possible to find out which pieces of baggage are missing at this time. Since this baggage transportation is typically performed with minutes in advance to the departure of the aircraft, there is a certain buffer of time to be able to find missing baggage. If the airline is willing to alter its processes, we offer full control over the baggage that is loaded into the cargo hold, making sure before the piece of baggage is uploaded to the aircraft that it belongs to a passenger that has already been registered at the gate.

People managing baggage are often hurt, suffering from back problems from carrying heavy bags very quickly, and in small spaces where it is difficult to move. We cannot change the fact that heavy bags will still need to be loaded, but what we can do is inform the person picking it up of its weight so that he can prepare himself for it. During check-in, every bag is always weighted. However, this information today is just used to decide whether the passenger needs to pay an extra fee if it exceeds a certain threshold. What JANO proposes is to make use of this information, adding it to the data associated to a particular piece of baggage apart from its picture. Then, when a person scans it, the weight shall be shown as well. These kind of measures are the ones expected from a responsible company that takes as much care of its employees as it does of its customers. The final decision about including this functionality is on the airline’s side.
2.4. MAIN JANO APPLICATIONS AND FUNCTIONALITIES

JANO offers as well an extremely innovative service to keep passengers informed on their baggage status. Normally, current airlines only control their baggage at two places and times. First, when the baggage is checked in by passenger at the airport of origin. Second, when the baggage is received and destined for the baggage recovering belt at the airport of destination. This leaves all the time between those intervals with no control over the baggage for the airline. What JANO offers is the service to send passengers an SMS informing them that the baggage has been correctly stored in the aircraft baggage hold. If a passenger boards and its baggage has not made it to the aircraft, JANO will detect this immediately and notify the airline’s operators in order to try to locate it as soon as possible. All the processes needed to locate and recover the baggage are started, then by the time the passenger arrives to the airport of destination he may already be informed about where his baggage is and when he could receive it.

At the check-in, our system will also take a picture of the piece of baggage, and measure its weight. This information will be stored in the RFID tag directly put on the piece of baggage. Then, if it gets lost, we will be able to access the baggage database and see what it looks like, easing and speeding up the recovery process, instead of having to rely on the passenger’s ability
to remember and describe correctly how it looks like, which may not be so easy, especially if he is in a foreign country and is not able to speak the local language fluently.

Current systems rely on bar codes which are often misread, around 20% of the scans [20]. This means that a piece of baggage from a particular flight might end up being uploaded into a different flight. Our system, which relies on a much more trustworthy system such as RFID, makes sure that only baggage for Flight A gets loaded into Flight A. The main problem behind bar codes and the way they are attached to bags nowadays is that they can be easily detached and lost, which means that the bag will be unidentified and it will be almost impossible to recover. The way RFID tags are manufactured, they can be easily glued to the bag, meaning they will not be so easily detached. Eventually, an RFID tag does not need to be put outside the bag, but it could be placed inside, thus making it almost impossible to lose it.

<table>
<thead>
<tr>
<th>Features</th>
<th>Bar codes</th>
<th>RFID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line of Sight</td>
<td>✗ Necessary</td>
<td>✓ Not needed</td>
</tr>
<tr>
<td>Reading Accuracy</td>
<td>0.8</td>
<td>99%</td>
</tr>
<tr>
<td>Reading Speed</td>
<td>✗ Slow</td>
<td>✓ Fast</td>
</tr>
<tr>
<td>Read-Write</td>
<td>✗ Read Only</td>
<td>✓ Read and Write</td>
</tr>
<tr>
<td>Location</td>
<td>✗ Top of bags</td>
<td>✓ Everywhere</td>
</tr>
<tr>
<td>Removable</td>
<td>✗ Easy</td>
<td>✓ Hard</td>
</tr>
<tr>
<td>Configuration</td>
<td>✗ Long paper</td>
<td>✓ Embedded in everything</td>
</tr>
<tr>
<td>Price</td>
<td>1 cent</td>
<td>7 - 15 cents (passive) 25-100$ (active)</td>
</tr>
</tbody>
</table>

Table 2.1: Advantages of RFID over bar codes

2.5 What makes JANO unique

Although full RFID based baggage management systems may offer a better reliability and control over baggage, they also have a series of disadvantages that we understand make them not very appropriate to implement in today’s economical situation, based on the previous PEST study.

These systems need a complete redesign of the airport’s system, and years of testing and tuning-up before they can be implemented. They require a huge investment in new infrastructure; an infrastructure that is often managed by a public company, which do not have budget to allocate in this kind of projects in this situation. Also, should a system like this be implemented, it will be standard for all the airlines operating at the airport, and only for that airport in particular. This means that if the system is not implemented using similar processes and configuration of RFID tags at all the other airports where the airlines operates, it will be less effective. Our system requires no major investment in new infrastructure. Since it can be implemented by a single airline, it will differentiate this airline from the others, improving customer service and making it more attractive to the passengers. Also, since it is under airline’s responsibility, the implementation does not depend on external entities (apart from its related handling company, which will not oppose to it because it will surely be profitable for it too).

2.6 Competitors

In this part, similar solutions that could come in conflict with our proposed solution to JANO shall be explored and studied. JANO is first going to be introduced in Spain, but in less than 3
years we shall extend our operations to other European airports, and later on to other airports outside Europe. That is the reason why we shall look for competitors internationally. We selected some of them, and collected information about their systems.

2.6.1 UNISYS: BRS (Baggage Reconciliation System)

Unisys is a worldwide IT company based in Blue Bell, Pennsylvania, USA with sales of 3.7 billion $ in 2012 and approximately 23000 employees, serving commercial organizations and government agencies throughout the world. Some of their specializations are outsourcing services, systems integration and infrastructure services.

![Unisys](image)

**Figure 2.8:** Unysis is a multinational IT company offering a similar system to JANO

How the system works:

When the bags are checked, they are given a barcode, which is then scanned and reconciled with a passenger. RFID bag tags are processed in the same way.

**Benefits:**

- With a mobile app, passengers can have live updates on where and when to collect their bags.
- Ground handlers know the number of bags to be loaded or unloaded then they can schedule the appropriate number of people to process the bags on arrival.
- Airlines have a record of the baggage loading order. If a passenger fails to board, his bag can be quickly identified and recovered. Real-time information also allows proactive response if extra staff are required to meet the SLA (for example time taken to load all the bags into an airplane).

Unisys and the BARA (Board of Airline Representatives Australia) have been working together since 2004 to provide the Baggage Reconciliation System that links passengers with their bags and tracking as they move through the system. The Unisys BRS is currently used by 17 airports and 38 airlines across Asia Pacific.

2.6.2 SITA: Baggage Management

SITA is a multinational IT company based in Geneva, Switzerland, with revenues of 1.6 billion $ providing services for the air transport industry. Some of their services are: airport, baggage, cargo and passenger operations. They have 4500 employees and 95% of all international destinations are covered by SITA’s extensive network.

![SITA](image)

**Figure 2.9:** SITA baggage system is well known all over the world
CHAPTER 2. SECTOR ANALYSIS

How the system works:

SITA Baggage Management uses barcoding and RFID tagging to manage the flow of baggage between airlines and also between airports.

Benefits:

- Amadeus, a leading travel technology partner and transaction processor for the global travel and tourism industry, is working with SITA to offer real-time baggage tracking information and worldwide baggage reconciliation to passengers, whilst reducing the costs associated to mishandled baggage.
- SITA’s baggage technology eliminates flight delays caused by loading issues and ensures that the ground handler knows where all bags are on an aircraft so they can be quickly removed if a passenger fails to board.
- On-time departures are increased and operational costs are lowered, so the airlines increase profitability. Security also improves.

More than 125 airports and 450 airlines worldwide use SITA’s Baggage Management solution

2.6.3 SMART Airport BRS

SEETEK S.A., based in Switzerland, is a system supplier and integrator in the air transport industry. It supports its customers from consulting and solution development to operating IT infrastructures and business process.

![Seetek Logo]

Figure 2.10: Seetek is a small Swiss company

How the system works:

The SMART BRS directs baggage from check-in counters to airplanes, between airplanes and from airplanes to baggage carousels. Bag tags with bar codes are issued at check-in. PDA (Personal Digital Assistant) workstations enable baggage handlers to scan bar-coded tags and determine the current position of a particular bag in real-time. The system provides baggage sorting systems with the bag identification data required for baggage sorting to minimize miss-sorts. It monitors load and unload of baggage, enabling ground handlers and management to monitor the progress. It is possible to identify potential problems and bottlenecks and take corrective actions as needed.

Benefits:

- It shows mismatches between passengers and luggage to identify bags that need to be unloaded if a passenger does not board into the plane.
- Reduction of operating costs by optimizing the utilization of baggage handling resources.
- Reduction of the number of bags that is directed incorrectly and reduces departure delays and baggage claims from airlines.
- It is possible to identify potential problems and bottlenecks and take corrective actions as needed.
2.6. COMPETITORS

2.6.4 PSI BRS

PSI Logistics is an independent, innovative software producer whose product development reflects several decades of logistics industry experience. The company is based in Berlin, and has many branches in Germany, one in Great Britain and another one in Russia.

How the system works:

On check-in desk, the passenger’s luggage will be tagged with a bar-coded tag generated by the system, the counterpart tag will be stuck onto the boarding card. The BRS system receives loading permission from the check-in desk with certain information about each piece of luggage. It is then possible to scan each item on loading. Using a hand scanner it is possible to record where each piece of luggage is located, into which container and into which position in the hold. The time of loading is also recorded. At the departure gate, the system checks each passenger as he/she boards. If there is a piece of luggage without a corresponding passenger on board, a message to unload it is sent to the BRS, which can locate the luggage precisely using the data collected while loading. If the baggage was not loaded, the BRS internally adjusts the scanned data, and instructs that the loading permission for that bag is now denied.

Benefits:

- It shows mismatches between passengers and baggage to identify bags that need to be unloaded if a passenger does not board into the plane.
- Reduction of operating costs by optimizing the utilization of baggage handling resources.
- Reduction of the number of bags that is directed incorrectly and reduces departure delays and baggage claims.

2.6.5 BROCK Solutions: SmartBag

BROCK Solutions is an automation engineering solutions company created in 1992, specialized in industrial automation for projects requiring automation engineering, manufacturing execution system solutions and project management. It is a privately held, employee owned organization with registered companies in Canada (Headquarters), United States and Puerto Rico.

How the system works:

SmartBag performs reconciliation by matching passengers with checked bags, and then provides real-time information alerting operators of any discrepancy that may appear. Notifications are sent to hand-held terminals to notify operators of status changes, transfer bags awaiting pickup, etc. If a bag needs to be offloaded, SmartBag provides detailed location information to the baggage handler.
CHAPTER 2. SECTOR ANALYSIS

Benefits:

• Notifications are sent to the operators enabling them to proactively resolve issues.
• Provides end-to-end tracking of baggage.
• Automatic processing of delayed or unknown bags significantly reduces airline expenses.
• This system can be implemented as a standalone system or integrated with other modules of the company, providing a more complete solution.

There is no information about where this system is implemented, but the company mainly operates in the North-American country.

2.6.6 IKUSI Airport BRS

Ikusi is a Spanish company of around 1,000 employees offering solutions for the management needs of infrastructures and security, information and entertainment, communications and operations of such varied markets as airports, public administrations, companies, traffic, railways and health. Its headquarters are in San Sebastián, and it is present in other nine countries through subsidiaries (Germany, Australia, Brazil, Chile, Colombia, United Arab Emirates, France, India and Mexico).

![Ikusi logo]

Figure 2.13: Ikusi logo

How the system works:

Starting at the check-in desks, passing through the transport system to the baggage reclaim zone, Ikusi’s automatic baggage handling system is implemented with the most advanced materials and concepts on the market, and provides a transparent system to the operation, with low maintenance costs and high reliability.

Benefits:

• Guarantees the correct distribution of baggage to its destination.
• Control over the elements placed in the aircraft before takeoff, facilitating their rapid offloading in the event that the passenger does not arrive at the boarding gate and avoiding the airline losing its slot.

2.6.7 Other competitors

There are other important companies dedicated to install the whole baggage management system, such as Siemens and Vanderlande. Other minor competitors offering innovative approaches that may not be based on the same concepts also exist, and they could make JANO useless, such as bag2go. For the time being, this is not very likely to happen.

Having some information about our potential competitors, it is now possible to analyze different aspects of the sector.
2.6.8 Threat of new entrants

When we only talk about the Spanish market, there are not many competitors. But there is a non-negligible threat of new entrants, because as seen in the previous examples, there are many companies offering similar products and services internationally. They could try to enter the Spanish market by adapting their product to its airports and way of managing baggage, in case that they saw in it a good investment.

In this sector, as well as in many others, companies that have been operating for a long time have a better knowledge of the market and technology, and may be in a better position towards the clients. The first company that we found related to a baggage reconciliation system with RFID is Symbol Technologies, which implemented this system at McCarran International Airport in Las Vegas in 2005.

Another barrier of entry is the reduction of costs related to the purchase of high volume RFID batches. Big companies operating in many airports will benefit from a better price from their suppliers, and will then be able to offer the service with a more competitive price.

Airlines and handling companies are not very numerous and not very complicated to reach, so the access to distribution channels is not restrictive.

2.6.9 Intensity of competitive rivalry

The existing similar services to the one we propose are not very differentiated, because all of them try to reach the same objectives (reduce flight delays and operational costs), using the same technology (RFIDs and bar-codes), and this will lead to a higher competitive rivalry intensity.

The system we are offering has a high growth in the Spanish market, because nothing similar has been found in our research, but the number of clients within the market is limited. This is why there could be a high competitive rivalry when conquering it.

Exit barriers are not too high, because there is no need of stocking too many RFID tags and RFID readers in order to put in place a company of this kind. It is not needed too much money to optimize and test the product, and the rest of costs can be rebound to the client.

Despite all of this, we did not find any system completely implemented and operational in Spain, and this is why it is easier to enter our first targeted market right now. Being a national company could also be a competitive advantage for JANO.

2.7 Ground handling sector in Spain

The assistance to an airplane when it is on ground comprises several services known as handling. In Spain this assistance is regulated by a Royal Decree, already described in the PEST analysis. JANO would be affecting loading and unloading of planes which is one particular case of ramp services: runway operations assistance [2].

These kind of services are currently provided by companies offering several assistance services and operating within the airports. The licenses to operate handling services are given by AENA, and they are nowadays in process of being reassigned.
2.7.1 Current situation

The following image shows the current distribution of handling operators in airports managed by AENA.

As it can be seen in figure 2.14, there are several companies dedicated to handling services in Spain. Some of these companies belong to bigger groups in which air transport companies are included. This is the case of Iberia handling, related to Iberia Company or Groundforce, belonging to Globalia and therefore directly connected to Air Europa. Having said that, it is observed that the two main air transport companies in Spain have their own handling company, both of them offering load-unload services. After some changes in the sector in the past two years, there also are some independent handling companies such as Acciona Airport Services, Swissport, Lesma Handling, Binter and Clece Servicios Aeroportuarios. Former is split in clever and MA, each of them specialized in different types of ground assistance, corresponding to clever the runway operations assistance services.

Since handling services is a wide concept that involves many services and not only those provided in the parking area, a deeper study is necessary. Different companies offer information about what type of service is offered in each airport. In the scope of this project, the most interesting handling service is ramp service. Next table and figures show in which airports companies offer that kind of service (airports are organized by number of passengers in 2012).
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Table 2.2: Handling companies offering ramp services in Spanish airports
CHAPTER 2. SECTOR ANALYSIS

Figure 2.15: Number of airports where ramp services are offered by company. Figure 2.15 shows a comparative graph of the presence of companies in ramp services. The total number of airports where each company offers these kind of services is presented, considering the data of table 2.2. The same conclusion is reached taking a quick look at the table: the hegemony of Iberia Handling is evident. Groundforce is the second company within this evaluation, far behind the leader. As it will be seen throughout the next section, a restructuring process of the handling sector in Spain started at the end of the year 2013. It will be interesting to compare actual situation to the one after those changes are made.

Figure 2.16: Number of airports within the top 5 in Spain where ramp service are offered by company

Having in mind the restructuring in process, figure 2.16 is considered very interesting. Ramp services in the airports of Madrid, Barcelona, Palma de Mallorca, Málaga and Alicante will be offered to three handling companies each. These airports are 5 out of the 6 most important in Spain by number of passengers in 2012. The figure shows a more balanced presence than if only the total number of airports were considered.

Regarding market share, the hegemony of Iberia is also a fact. Market share of main ground
handling operators in Spain is shown in the figure 2.17.

Figure 2.17: Market share of ground handling companies in Spain

Looking at figure 2.15, the presence of Iberia and Groundforce above the total can be easily calculated: 57% and 18% respectively. Comparing these results with the ones stated in figure 2.17, it can be seen how the superiority of Iberia regarding number of airports is slightly reduced by the fact that Groundforce is concentrated in big airports (see table 2.2 and figure 2.16).

### 2.7.2 Change in process

The handling sector is immersed in a restructuring process promoted by AENA. On May 30th, 2013 a press release was published by AENA announcing the future renewal of the handling licenses for ramp handling in the airports. The total number of licenses to be assigned is 51, to provide services in 43 airports and 2 heliports. The tender will begin in the second semester of the year, in two phases (first one for airports with less than one million passengers per year and second one for airports over one million passengers). According to AENA, the main key points of this restructuring are:

- Increase competition in the sector.
- Improve quality of services.
- Reduce prices.

The process is opened for two months for consultations and proposals from handling companies. After this period, proposals will be evaluated and licenses assigned. The expected result is a more competitive environment, that contributes to better service and quality and less companies practicing auto-handling, but rather subcontracting it from a handling company at a predictably lower price. In order to establish the conditions of the tender, safety and environmental factors have been taken into account; as well as market situation and changes produced in air transport industry in the last years.

As we saw in previous sections, Iberia and Air Europa provide handling services, although the numbers of airports where Iberia offers services is much wider. Therefore the conclusion is that the result of this process will be a more balanced situation with less weight of Iberia in the handling sector.

At this point, it is also appropriate to consider how the licenses are going to be structured. Without entering in detail, licenses are distributed in individual airports or packages of several airports (for the smaller ones). Regarding this, it can be highlighted that some airports (bigger ones) offer several licenses to operate; two or three depending on the case. With this structure,
direct competition is promoted in big airports; while in small airports, the competition would be more oriented to a market share fight. The most obvious case of direct competition in big airports is that in 5 out of the 6 biggest airports (considering passengers in 2012), 3 licenses are assigned for each one (Gran Canaria is not included in this situation). Therefore 15 licenses are in tender in the following airports:

- Madrid-Barajas.
- Barcelona-El Prat.
- Málaga-Costa del Sol.
- Alicante.
- Palma de Mallorca.

As it is shown in figure 2.14, these airports already have several handling operators even if the structure is different to the one presented in that map because of the merges or extinction of companies. When licenses are assigned, it will be interesting to analyze how figures 2.15 and 2.16 have evolved. This will allow to complete this analysis and see if the competition has effectively increased as expected.

2.7.3 Bargaining power of customers

After this overview of the handling sector, we are in better conditions to evaluate some of the aspects that influence the bargaining power of customers. First, we have to repeat that our customer can be defined in two ways: the air transport company that will be the one benefiting from our proposal (final customer) and the handling service company that will be the one purchasing the system (direct customer). For the analysis of this concept, the direct customer is going to be considered. As it is stated along the section, the number of customers is not big and one of them is the clear leader in the current situation.

Along the chapter some products that could offer similar services have been described. Most of these products have a small scope or do not offer exactly the same proposal of added value as our system. The idea of JANO is something that has not been performed in Spain, but we have to consider that since the system is not complicated, substitute products could appear, boosting the power of the customer.

The backwards integration is not very probable in this case, since the production or integration of the system would be quite a different business than the handling one.

The restructuring of the sector is also an important point to consider. If AENA objectives are reached, companies in the handling sector will probably be more concerned about budget allocation. This will make new systems such as JANO an extra investment that may not be considered necessary. But at the same time, these companies will be more receptive to acquire differentiating services to beat their competitors when operating in the same airport.

In general, big groups owning both a handling company and an airline could be more receptive to JANO. But, as it has been seen, these companies are the two biggest Spanish companies so their bargaining power would be enormous.

2.8 Context: airlines, airports and passengers

The context involving JANO shall depend largely on domestic and international air traffic, as well as on the evolution of baggage handling or exchange of information between airports, airlines and customers. All these are factors related to the industry that can influence or even determine the needs, objectives and results of the project.
2.8. CONTEXT: AIRLINES, AIRPORTS AND PASSENGERS

2.8.1 Passengers Evolution

Despite the global economic situation and its influence on the air transport both now and in the immediate future, the prospects for air transport are positive in the short to medium term. Because of the crisis, the increase in the number of passengers has been slightly slowed down in recent years, but always maintaining a positive trend, largely offset by emerging economies. Globally, the aviation industry consensus is that the number of passengers will grow by an average of 5.3% annually until 2016. This translates into an increase of over 800 million passengers, distributed for domestic routes around 500 million and over 300 million for international routes.

![Figure 2.18: Short and long term trends for passengers and mishandled bags](image)

Locally, Spanish statistics have made more visible the crisis and its effect on the aircraft industry. From 2007 to 2010, the drop-off was constant, with an apparent shift in 2010 which was reversed again last year. Passenger levels have not recovered yet and in all these years have been below those recorded in 2007.

The variation of the number of operations or passengers involved in them is a key factor for the JANO project, since the benefits of the service are directly proportional to the operations that can be applied and the number of passengers who are involved in each operation. Therefore, the optimistic outlook for the future is a positive factor for its development.

2.8.2 Baggage Transportation Evolution

In contrast, as a result of increasing rates and the rise of low cost companies with their harsh policies on the matter, the trend is reversed when speaking about checked bags. In 2007, 82% of passengers checked in some luggage, a figure that was reduced to 70.7% in 2010. Similarly, the number of pieces of baggage for each passenger who billed has also decreased from a number close to 1.5 in 2005 to 1.37 in 2010. Assuming that the trend in these fields will be maintained with the consolidation of low-cost companies, or that the number of checked bags might decrease even further, these data can be extrapolated forward, reaching an estimated percentage of about 65% of passengers checking today, with an average of 1.3 bags each one. Of course, these data depend on travel conditions (country, airline, route, etc.). If we focused only on low cost companies, these factors could be reduced to 25% of passengers and simplified to only one checked package for each passenger, so it is especially important to study the evolution of this type of traffic.
2.8.3 Situation in Spain

If the context is reduced to Spain, the steady decline in recent years in the number of operations and passengers carried is evident. The effect of the economic crisis has also been noted, even more so than in other sectors, in the aviation environment. Now, the traffic data in 2012 is going to be disintegrated by airports, airlines and airplane models in Spain, with the aim of analyzing the current situation and trends, and draw conclusions about the different sectors that can be addressed in the project.

In Spain there are 49 airports, a very big number considering the population in the country. Recently a number of small airports have been created, more due to political reasons than to economic studies, and these tend to have a very small number of passengers transported. Therefore, there are extremely large differences in air traffic between them. Based on data from 2012, there were 194 million passengers transported in Spain. Around 41% were processed in the two major airports (Madrid Barajas and Barcelona El Prat), while the other traffic was developed mainly around tourist areas. Especially noteworthy is passenger traffic at airports at the islands (almost 33%), while the 16 airports with less traffic moved just 296,000 passengers (0.15%) [21].

![Passengers in Spanish airports in 2012](image.png)

Figure 2.19: Passengers in Spanish airports in 2012

If traffic is analyzed by airlines, we can see that over 52% of air traffic in Spain in 2012 was carried out by low-cost airlines, whose influence has risen exponentially over the last decade, due to their extremely competitive prices and reinforced by the economic crisis situation. Among them, Ryanair and Vueling are included as the first two operators, while Easyjet and Air Berlin also appear in the top 6 where only Iberia and Air Europa are representing the traditional companies.
Regarding the JANO project, these low-cost airlines represent both an opportunity and a threat: a threat in the sense that they are operators not representing a great amount of checked-in and transported luggage, what would make them less dependent to a system as the one JANO offers. But they also are a business opportunity, as these airlines are devoted to speeding up their ground operations, therefore time is crucial for them, and delays due to luggage can compromise their scheduled operations and directly impact their business model.

Finally, when analyzing the type of aircraft that flew over Spain from or to any of its airports, those belonging to the companies Airbus and Boeing are highlighted, followed very far by Embraer, ATR and Bombardier. From the data, it can be estimated that 45% of passengers traveled on aircraft which made use of containers for transporting luggage, while the remaining 55% were flying in airplanes where the luggage was uploaded in bulk.
2.8.4 Mishandled baggage

Another situation that can positively influence JANO is its applicability to reducing the rate of mishandled baggage, so it is useful to know where this factor stands today.

The reality is that the amount of mishandled luggage (as a percentage over the number of passengers) has been reduced by more than a half in the last five years globally, and the is forecast to continue declining in the future if some efforts are made.

Regarding the reasons for baggage mishandling, the main cause are the connections between flights, as it is common that the delay in the arrival of a first flight endangers the movement of the involved baggage in time. While the passengers normally have enough time to make it to the next flight, their baggage does not, and remains there, not being able to reach the next flight. Also, for international flights, in which passengers need to pass a new security screening and potentially customs, they are he ones that do not make it to the next flight, while their baggage does, and then it needs to be retrieved and extracted from the aircraft. However, statistics indicate some reduction in the luggage affected during flight connections, while problems related to failing to load baggage in the cargo hold have increased. This field is precisely in which this project and RFID tags can develop their potential and provide an additional benefit for airlines to quickly identify luggage that is not in the correct flight, and register it in a database for its proper return.

![Figure 2.22: Reasons for delayed bags](image)

It should also be noted that mishandled luggage statistics strongly depend on the area considered for the study, being Asian average lower than European one.

A common and logical trend is the proportionality between the size of airports and the mishandled luggage they manage. The larger the airport, the more likely passengers shall find their luggage missing or delayed. Even more if the airport is a hub, where connection flights are commonplace. In the case of the airport where JANO shall be first incorporated, Madrid Barajas, the rate of
mishandled baggage has decreased after the addition of Terminal 4 which includes a state of the art baggage management system that has reduced mishandled baggage in the last few years. However, baggage lost during connection flights has increased, due to the fact that terminals T4, normally used for national or European flights and T4S, used for International flights to America are far away, and baggage is transported between them through a high speed tunnel that can get clogged at times. Also, if the passenger needs to catch a flight at the older terminals T1-T2-T3, the distance is even higher and the chances of either the bag or the passenger not arriving on time increase.

2.8.5 Passenger management

Innovations and improvements in every field of technology make possible the continuing evolution in all sectors, including air transportation. In this sense, the availability of the latest technology in hands of the users allows the existence of a range of services closer to them and, in turn, the possibility to reach a much larger audience more quickly.

It is estimated that 70% of the current passengers boarding on a plane own a Smartphone [19]. On the other hand, 90% of airports plan to provide information services to passengers through these devices in the next two years. This confirms the concern of airports to improve the customers’ experience, as a way to increase their passengers’ loyalty and ultimately their business. Statistically, 60% of the airports listed providing better experiences for their passengers as their top priority in which to invest in the coming years.

In this sense, a great business opportunity that directly impacts on the JANO project is the ability to develop an application that indicates in real time the location of a piece of luggage. Such an application is claimed by more than 65% of travelers nowadays.

On the other hand, technology may also have a major role in the exchange of information between airlines, airports and the end customers, passengers, through what is known as “business intelligence”. It is quite possible that in the coming years, airlines and airports will try to stimulate the participation of all those parts to get statistics for common use, but it seems more difficult to involve passengers, since up to 55% currently refuse to share their data for these media.

2.9 Bargaining power of suppliers

2.9.1 RFID world on Baggage Handling

The utilization of RFID (Radio Frequency Identification) in commercial airports is recent, since the first full implementation was at Las Vegas Airport in 2005, by Verderlande Industries. The system is now working for around 10,000 outbound bags per day (rfidjournal.com). Experts say that the most targetable airports to implement this tool are those with more than 65,000 pieces of baggage handled every day. The busiest airports according to 2012 statistics are shown in the table 2.3.
In this moment, Las Vegas Airport, Hong Kong Airport and San Francisco Airport have already implemented a high-tech baggage tagging system that expects to reduce mishandled baggage. In the summer of 2013, the board of governors of IATA, which set standards for airlines, voted on whether to mandate a phase-in of Radio Frequency ID baggage tags.

The economical factor is also spurring the potential adoption of RFID. Airlines have been studying the technology for years, but the idea has always been grounded because of the cost of the tags, with a price of over one dollar per piece. Just for comparison, the current bar-code printed tags cost about 4 cents each. The price of RFID tags has come down considerably, reaching values of 5 cents per tag. Price should not be the main reason to reject the implementation of RFIDs anymore, considering the inherent advantages of RFID tags over bar codes.

New technology could yield a quick improvement in airline baggage woes. In 2012, more than 4 million of the 700 million bags checked for domestic U.S. travels were mishandled, and the rate for lost baggage has been increasing for the past four years. RFID has the potential to reverse the trend and ultimately save money for airlines. Last year U.S. airlines spent an estimated 400 million dollars on luggage-money that went to reimburse passengers and deliver late bags to hotels and homes.

IATA has already set a worldwide technology standard for RFID so every airline in every country can read the others’ tags, and secure a unique UHF (Ultra-High Frequency) radio frequency for baggage tags worldwide. IATA has successfully fostered technology upgrades in the industry.
before: the group required airlines to implement electronic ticketing, as an example.

Las Vegas handles more than 70,000 outbound bags per day, so 7,000 bags or more were manually sorted when bar-coded tags were used. RFID has reduced that to only about 700 bags a day. If the tag price gets down to 10 cents apiece, IATA projects that airlines worldwide would save 76 million dollars annually by reducing lost luggage.

2.9.2 Suppliers market

The global RFID market reached in 2012 7.67 billion $, up from 6.51 reached in 2011 registering an increase of 17%. This includes tags, readers and software/services for RFID technology.

<table>
<thead>
<tr>
<th>Type</th>
<th>Cumulative global sales (million of tags)</th>
<th>Percentage of sales</th>
<th>Highlight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>722</td>
<td>7%</td>
<td>Car clickers, military</td>
</tr>
<tr>
<td>Passive</td>
<td>9185</td>
<td>93%</td>
<td>Labels, cards</td>
</tr>
<tr>
<td>Total</td>
<td>9907</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2.4: World tags sales

This increase is primarily due to growth of passive UHF systems for tagging apparel and many closed loop applications.

In retail, RFID is seeing rapid growth for apparel tagging. This application alone demanded one billion RFID labels in 2012, with 1.35 billion tags forecast for 2013. IDTechEX finds that the RFID market will grow steadily over the next decade, rising four-fold in that period to 26.19 billion $ in 2022.

In total, around 4 billion tags have been sold in 2012 versus 2.93 billion in 2011. Most of that growth is from passive UHF RFID labels, the same that are being used in recent high-tech baggage handling systems implemented in civil airports.

The RFID tags in use at San Francisco’s International Terminal are provided by SCS Corporation, a manufacturer of RFID tags and scanners. SFO (San Francisco Airport) is using the 2 per 2 inches self adhesive Dura-label, attached to the standard baggage tag at the check-in counter and scanners operate at 2.45 GHz frequency with a 99.9% read rate. The RFID tags cost around
20 cents a tag.

As a result of this, it is expected that the number of companies inside the RFID market will be enormous. Assuming huge increase in the market with lots of new companies entering each year, it is reasonable to say that all these suppliers will barely have negotiation power.

![Diagram showing Suppliers Negotiation Power](image)

Figure 2.24: Suppliers Negotiation Power

Even if there is a huge number of companies related to RFID technology, some of them are presented in the scope of this project, just to have a glimpse of their scope:

- **AidA RFID & Tracking Solutions**: AidA is a dynamic company dedicated to developing products and solutions in the field of Identification and Tracking by using RFID technology. AidA was founded in 2004 as a pioneer in its field and has ever since been involved in the largest and most exciting international RFID projects, with a presence in over 50 countries. Aida is owned by several investors, including ACCIONA.

![Aida RFID logo](image)

Figure 2.25: Aida RFID logo

- **Intermec Inc.**: Intermec began as Interface Mechanisms in 1966. The Intermec name was adopted in 1982. It took place in the NYSE (New York Stock Exchange) under the denomination of IN, employing around 2,300 people around the world. It gives support in the following industries:

1. AIDC (Automatic Information Data Capture) including bar coding and radio frequency identification.
2. Mobile computing and rugged computing.
3. Printer/media systems.
5. Consulting and services.
2.9. BARGAINING POWER OF SUPPLIERS

- **NetPoint Solutions**: it is a Spanish company specialized in RFID solutions with a huge range of supporting solutions customized for each project. The company is based in Valencia and it has been growing incredibly fast in the last few years.

- **Daily RFID Co. Limited**: it belongs to PAN Group Co., Ltd. It is the leading company focusing on research and development of RFID technology in China. It was founded in 2007 and last annual turnover was around 75 million $.

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2.9.3 Our technology needs

The main difference between JANO and most of the competitor’s systems lies in the different use of tags. While most implementations are based in having zero reading errors in the classification system inside the terminal, our biggest advantage appears in the last moment of the handling process, when the baggage is about to enter the cargo hold, because it is the last moment to avoid an error putting the wrong bag inside an airplane. This last check permits to have the certainty that every bag loaded in the hold is placed correctly.

In order to successfully develop JANO, the technology requirements are:

- Passive RFID tags to be attached to the baggage.

- RFID readers that indicate ground support workers if a specific bag can be loaded or not, through a different set of colors. This reader shall be extremely manageable and easy to handle so the loading process will not be slowed down. As a result of our studies, the best solution is a watch-like reader that will keep both hands of the worker free.

- A database, updated in real time, with information of a bag, its owner and the flight.

JANO shall use passive tags. These are the tags that are being used nowadays in other airports, and should it become mandatory to use RFID technology in the future, these are the kind of tags that would be used. Passive tags are much cheaper than active tags. Their main disadvantage is that they have a shorter range (of around a meter) if compared to active tags (tens of meters’
range). However, in our case, this is not a problem, since bags will not be scanned at such long distances. The main concern for JANO is the development of the reader that shall be tailor made to our requirements and expectations.

Figure 2.29: Active vs. passive tags
Chapter 3

SWOT Analysis and General Strategic Aim
3.1 SWOT (Strengths, Weaknesses, Opportunities & Threats) Analysis

In this section, conclusions about the environmental and sector analysis are drawn. After analysing that information, strong and weak points within the business idea can be highlighted, as well as opportunities and threats coming from the environment.

Strengths

- JANO is easy to implement, and also easy to use.
- RFID Technology used in JANO processes is fully developed.
- There is no need of huge investments in fixed assets, then financial needs are not high.
- JANO is a Spanish company, and this is an advantage while starting in Spain.
- The system increases the quality of service of the airlines, as passengers receive an SMS with information of their baggage.
- The recovery of mishandled baggage is much easier by looking at the picture stored in the database.
- The system can be easily deployed in any airport without depending on local infrastructure. Good for emerging countries.
- JANO can be used during flight transfers, which is the main cause for baggage mishandling.

Opportunities

- The use of RFID technology can be mandatory for baggage handling processes in the mid-term.
- The number of suppliers of RFID technology is increasing, and this should end up in more competitive prices.
- RFID technology for baggage management has not been widely implemented yet.
- Private companies need to invest to compensate low investments coming from public institutions managing airports such as AENA.
- Traditional air carriers need to offer superior customer service to stand out against low cost airlines.
- RFID technology is maturing and prices are diminishing dramatically.
- Baggage mishandling rate remains very high even with automatic baggage managing systems.
- Airlines are more concerned than ever about reducing costs due to lost baggage (100$/bag).

Weaknesses

- The company has no previous experience in the ground handling industry.
- JANO will not benefit from big discounts at the beginning, as it will not be possible to place very large orders to suppliers.
CHAPTER 3. SWOT ANALYSIS AND GENERAL STRATEGIC AIM

- No major changes are implemented in the airport’s baggage management system, which is the main responsible of baggage mishandling.
- JANO is a partial solution until a complete automatized RFID system is established in the whole airport.
- JANO will only decrease the number of baggage that is mishandled in the load process.
- Baggage loading and unloading processes need to be slightly modified.

Threats
- The implementation of baggage management systems based on RFID technology may diminish baggage mishandling rate and decrease the competitive advantage of JANO.
- If there is an extension of RFID control until the loading of the plane, JANO can become useless.
- Competitors offering similar solutions in other countries can enter the market.
- Nowadays, passengers check less baggage, making easier the recovery of bags from the cargo hold.
- Companies with proven RFID bag management systems already exist and are expanding.
- Airlines have a very limited budget allocated for new investments.
- Future innovative solutions such as Airbus’ Bag2Go could make JANO useless. It needs to be deployed immediately.
- JANO will have to negotiate with both the airline and its related ground handling company, showing advantages for both of them.

Some of the above mentioned points can be gathered since they are related to similar topics. A summary of strengths, weaknesses, opportunities and threats can be seen in table 3.1.

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Differentiating services needed by airlines</td>
<td>Easy to implement: 0</td>
<td>No major fixed assets: 2</td>
</tr>
<tr>
<td>Mature RFID technology</td>
<td>No big discounts at the beginning: -1</td>
<td>Used for flight connections: 1</td>
</tr>
<tr>
<td>Airlines concerns about lost baggage</td>
<td>Limited scope on mishandled baggage rate: -1</td>
<td>Spanish company: 0</td>
</tr>
<tr>
<td>RFID compulsory use in the future</td>
<td>Limited modification of Airlines’ processes: 1</td>
<td></td>
</tr>
<tr>
<td>New baggage management systems</td>
<td>Non-global solutions: -1</td>
<td></td>
</tr>
<tr>
<td>Similar solutions found abroad</td>
<td>Diminishing number of checked bags: -3</td>
<td></td>
</tr>
<tr>
<td>Convincing both Airlines &amp; Handling Comp.</td>
<td>Convincing both Airlines &amp; Handling Comp.: 0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weaknesses</th>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>No big discounts at the beginning</td>
<td>Easy to implement: 0</td>
<td>No major fixed assets: 2</td>
</tr>
<tr>
<td>Limited scope on mishandled baggage rate</td>
<td>No big discounts at the beginning: -1</td>
<td>Used for flight connections: 1</td>
</tr>
<tr>
<td>Limited modification of Airlines’ processes</td>
<td>Limited scope on mishandled baggage rate: -1</td>
<td>Spanish company: 0</td>
</tr>
<tr>
<td>Non-global solutions</td>
<td>Limited modification of Airlines’ processes: 1</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 3.1: SWOT matrix**

In the figure 3.1, it has been represented the interaction of every considered factor with the others. Those interactions have been given a score between 0 and 3, depending on how much
3.1. SWOT (STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS) ANALYSIS

they are related. The signs (+ and -) are given depending on if they are affected positively or negatively. With this numerical SWOT analysis, the most important factors of the project JANO are highlighted.

3.1.1 Strengths vs Opportunities

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy to implement</td>
<td>0</td>
</tr>
<tr>
<td>No major fixed assets</td>
<td>2</td>
</tr>
<tr>
<td>Used for flight connections</td>
<td>1</td>
</tr>
<tr>
<td>Spanish company</td>
<td>0</td>
</tr>
</tbody>
</table>

Figure 3.2: Partial SWOT matrix strengths vs opportunities

As we can see in figure 3.2, there are three strong points serving to take advantage of the opportunities: the easiness of implementation of JANO, the maturity of RFID technology and the ability to be used in flight transfers are the focal points that provide us advantages within the environment.

The fact that JANO is a Spanish company does not seem to help so much to take advantage of the environment.

In contrary, analyzing the opportunities we realize that the concern of the airlines about reducing mishandled baggage is the environmental issue that better fits with our strengths, and this should be taken into account while developing JANO.

Conclusions

The second opportunity (growing number of RFIDs suppliers) is not very reinforced, but this is because this opportunity is basically independent of the strengths. Looking at the overall SWOT, we realize that the best way to empower this opportunity is to increment business size.

The third opportunity (concern about mishandled baggage) is a great point to be taken into account in the marketing strategy. JANO has to focus not only on avoiding loading of inappropriate baggage, but also on helping to search and recover lost baggage as soon as possible.
### 3.1.2 Strengths v.s. Threats

![Partial SWOT matrix strengths vs threats](image)

According to figure 3.3, the strong point that counters the most current threats is the ability to use the system in flight transfers. On the other hand, the maturity of the RFID sector represents a great exposure to the threat of having a huge range of different alternatives of systems.

If threats are then compared to strong points, it can be observed that the extension of RFID control until the plane and the dependency of airlines on handling companies for the implementation of those systems are the less dangerous ones affecting our project.

On the other hand, international experienced competitors that already have a developed RFID technology based solution are the worst threat that JANO will have to face.

**Conclusions**

Future competitors are clearly the main threat. The strategy to implement to counter this point is based on speed. There are no competitor in Spain implementing this kind of solution, then being quick and establishing JANO as the first solution in Spain is the way ahead to be kept in mind. If the system works in Spain, then the strategy would not be defensive anymore, and JANO will have to conquer new markets internationally.
3.1.3 Weaknesses vs Opportunities

Figure 3.4: Partial SWOT matrix weaknesses vs opportunities

Comparing weaknesses against opportunities presented in figure 3.4, it can be noticed that what was thought to be a weakness (slight modifications of ramp services and airlines processes) is mitigated by the opportunities present in the environment, turning it into a positive aspect. On the other side, no major changes in the main baggage management system is the weakest point that prevents JANO to take advantage of the opportunities.

With a vertical analysis, we observe that if RFID technology became mandatory for baggage management systems in a near future, week points would not let JANO to take advantage of it. Considering the other ones (maturity of RFID technology and the traditional need to differentiation through investment of airlines), our weaknesses prevent us from taking advantage of those opportunities.

Conclusions

The main weakness of JANO in relation with the opportunities of the market is the limited scope of reducing the amount of mishandled baggage. For that, it is important to improve and optimize the project by offering additional services that could lower this number in the near future.

On the other hand, the implementation of JANO brings some slight changes in baggage management processes, but it is not a big issue, as companies want to invest and apply some modifications if needed.

Regarding opportunities, the high number of providers and the need of investment are not completely exploited due to the size of the business, while the mandatory use of RFID technology for baggage management is the less damaged factor because JANO could be easily adapted.
3.1.4 Weaknesses vs Threats

Every weakness of JANO is exposed to the threats mentioned here. The most important one, as seen in figure 3.5, is the one related to the fact that JANO can be seen as a non-global solution, which will useless once a completely automatized RFID baggage management system is established in the whole airport.

Logically, no threat is beneficial for the company. The one that affects JANO the most is the fact that the implementation of RFID classification systems until the plane hold may turn JANO into an useless system.

Conclusions

The most dangerous threat is actually not very likely to happen. It will be extremely complicated, even impossible to extend the classification system until the aircraft cargo hold.

To minimize the effect of being seen as a partial solution, the idea that JANO works on the final phase of baggage management has to be reinforced. There currently are classification systems based on RFID technology, which do no work any better than traditional ones. If a complete RFID management system is installed, baggage will have to be identified with RFID tags. In this case, JANO could be useful, as the tags are already there.

JANO could be presented as a second phase of the implementation of a RFID baggage management system, and not as a direct competitor to it.
Chapter 4

Operations Plan
4.1 Development of the technology and product design

The main applications of the system have already been described in the section 2.4; nevertheless for better understanding of the system and its needs, a detailed explanation is given in the next paragraphs.

JANO system has an extremely easy hardware infrastructure that combine innovative RFID tags with current bar code tags which are used in the airports. Portable wearable RFID readers are worn by baggage loaders and used before loading the baggage into the aircraft.

In order to print the RFID tags, an RFID printer has to be available at every check-in counter, where there will also be a camera in order to take pictures of every piece of baggage for retrieval purposes. The images will support the identification of any mishandled piece of baggage in case it needs to be found or in case it needs to be downloaded from the aircraft.

As the boarding process begins, the checked passengers are registered in the database and this information shall be used to decide how to manage their baggage. Depending on the airline, JANO offers two different possibilities:

1. Load baggage for all passengers in the flight regardless of whether they have pre-boarded or not, performing RFID scans of all baggage before transporting it to the aircraft. Once the loading process is done, the RFID reader might be used for quickly finding a particular bag in case of a late passenger.

2. If there is a time margin between the boarding of passengers and the loading of baggage, as shown in figure 4.1, it creates an opportunity for implementing an additional methodology: a passenger’s bag would not be loaded into the cargo hold until he had pre-boarded. For the optimization of this methodology, pre-boarding process should be slightly adapted, trying to get a high percentage of passengers checked in advance.

![Figure 4.1: Typical service sequence of a Boeing 737-300 of around 150 passengers](image-url)
The JANO reader shall include some different colored lights and a small screen that can display certain information contained in the database, as shown in the figure 4.2. The characteristics (shape, weight...) of this element are the key to be perfectly manageable, at the time that the usual charging process is performed as it is done today.

Figure 4.2: Design of JANO’s RFID reader

The technology to build the system is fully developed. Tags and printers can be easily obtained from several suppliers as explained in the following procurement section. Cameras do not present a problem either. Even if readers are also very developed and can be obtained in different shapes and from different suppliers; this is the only technology that may need an extra attention from the design point of view. The process of loading baggage is extremely tedious and hard, so our reader shall be the least intrusive as possible with the current technology in order not to slow down the loading process with the scanning.

4.2 JANO solution

The following diagrams explain the solution proposed by JANO to the current situation, analysed in the previous chapters.
The diagram 4.3 explains the different steps followed by both the passenger and the baggage, starting at the arrival to the check-in kiosk.

The passenger is almost inherent to JANO. He will take the plane as always, but will receive an SMS when he turns back on his mobile phone at the destination airport. If the airline decided to begin baggage loading process before boarding begins, just one additional step shall be followed by the passenger: his plane ticket has to be scanned at his arrival to the boarding gate.

The baggage is weighted and pictured, and an RFID tag is placed on it. If the plane uses containers, the piece of baggage can be recovered if its owner fails to board, as the database has all the information about which container it is in. If the plane does not use containers, baggage will only be loaded into the cargo hold once the passenger has boarded, or once he arrives to the boarding gate. This depends on the airline’s decision and in its processes adaptability and suitability to JANO; if there is a sufficient time margin between loading of baggage and boarding of passengers, airlines may want to be sure that only baggage from passenger’s already inside the plane is loaded into it. If the baggage does not pertain to the flight, it is sent back to the terminal.
CHAPTER 4. OPERATIONS PLAN

Figure 4.4: Checkup for missing baggage & passenger

The diagram 4.4 shows the processes performed when boarding ends, to check if either a baggage or a passenger is missing. If a passenger that failed to board has checked baggage into the cargo hold, the ground handler will be warned and will retrieve it. If he does not have checked baggage, the aircraft will be ready for takeoff from JANO’s point of view. On the other hand, if a baggage has not made it to the plane, the baggage search & recovery process will start, and the database will be updated, in order to be able to send an SMS to the corresponding passenger.

Figure 4.5: JANO’s flight transfers processes diagram

As shown in the diagram 4.5, if the plane is not using containers, each baggage is RFID scanned while unloading the cargo hold. If it has not reached its final destination and has to go into another plane leaving in a short time (time to be defined with the airline), it will be directly transported to the next plane, whereas it will directed to the terminal in every other situation.
4.3 Interactions between key processes

JANO will be divided in some standard processes defined below:

- **Development**: comprising the design and test of a standard system that will be adapted to each customer’s needs afterwards.

- **Integration**: regarding customization and installation of the system.

- **Procurement**: taking care of purchases of elements related to the purchase of elements needed for the development of hardware, and the associated contracts with suppliers.

- **Logistics**: comprising transport of components and tags and customer’s inventory monitoring.

- **Marketing and sales**: comprising marketing strategy implementation and relations with the customer until contract signature.

- **After-sales**: comprising service to the customer and monitoring of the system performance.

The figure 4.6 shows the main interactions between the activities described above, and information interchanged from one to another. Along the chapter, each one of the concepts will be explained in detail.
Figure 4.6: Interaction between key activities
4.4 Procurement of components

In this section, we shall define JANO’s policy to organize the procurement division of components, tools and materials to obtain the final operational system offered.

What it is offered is a software package and a hardware infrastructure. This hardware infrastructure is composed of several elements integrated within a full database that interconnects everything controlled through the specifically developed software.

Our core business is the creation of this software, implementing the logic that keeps track of passengers ready to embark on a plane, along with the baggage status and its readiness to be uploaded, both of them always in close correlation. This software must also be able to store information such as pictures for each piece of baggage for all the managed flights, baggage loaded on lorries to the plane, and location of the baggage in one container or another. All this information must be accessible as soon as a mishandled piece of baggage is detected.

The figure 4.7 shows the big picture of the procurement process, which is detailed in further pages.
CHAPTER 4. OPERATIONS PLAN

Figure 4.7: Procurement process

73
4.4. PROCUREMENT OF COMPONENTS

4.4.1 Initial inputs

Company make or buy strategy

Based on the product that we are going to implement, our Make or Buy strategy will depend on how specialized our components shall be. The next table shows our initial strategy.

<table>
<thead>
<tr>
<th>Component</th>
<th>Make</th>
<th>Buy</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>RFID reader</td>
<td>✔</td>
<td></td>
<td>It is the business model differentiating idea. There is nothing similar</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>in the market and it will be necessary to develop it from the beginning.</td>
</tr>
<tr>
<td>RFID tags</td>
<td>✔</td>
<td>✔</td>
<td>Lots of tags providers. Closely linked with the RFID Printer.</td>
</tr>
<tr>
<td>RFID printer</td>
<td>✔</td>
<td>✔</td>
<td>Huge amount of suppliers with standardized models within the market.</td>
</tr>
<tr>
<td>Cameras</td>
<td>✔</td>
<td>✔</td>
<td>Standard product that is not a differentiating feature of the business</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>model.</td>
</tr>
<tr>
<td>Database HW</td>
<td>✔</td>
<td>✔</td>
<td>Not demanding any special requirement over market offer to us.</td>
</tr>
<tr>
<td>Database SW</td>
<td>✔</td>
<td>✔</td>
<td>Database specially developed in order to satisfy our customer needs.</td>
</tr>
<tr>
<td>Connection service</td>
<td>✔</td>
<td>✔</td>
<td>It will be provided by any telecommunications supplier.</td>
</tr>
<tr>
<td>Logistics</td>
<td>✔</td>
<td>✔</td>
<td>We will be responsible for supplying our customer with the necessary</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>hardware.</td>
</tr>
</tbody>
</table>

Table 4.1: Make or Buy strategy

Business specific factors and requirements

As seen before, JANO does not any have special requirements apart from the development of a personalized database software for each customer and integrating the RFID components (reader, tags, printer and camera) according to the customers’ way of work with the minimum possible disruption.

Our RFID Reader should be tailor made by an engineer developer with some key features that shall be described in the following sections.

Our Software Database should be adapted to each customer’s needs. In order to do this, a customer needs analysis must be performed before the system is installed.

4.4.2 Procurement Policy Definition

This section shows the process required to obtain the way to manage our procurement function.
CHAPTER 4. OPERATIONS PLAN

Figure 4.8: Procurement Policy definition process

Inputs:

- Business specific factors and requirements: defined above.
- Company make or buy strategy: defined previously.

Outputs:

- Procurement strategy: all the different sections mentioned below will define our Procurement Strategy within the JANO project.
- Operating plan: this document itself.

4.4.3 Control Supplier

Figure 4.9: Control and suppliers support steering process

Output:

- Approved potential supplier’s requirements.

The following requirements will have to be followed by all of our suppliers:

- Be in possession of a valid ISO (International Organization for Standardization) 9001 certificate.
- Be in a healthy financial situation, not having a creditors contest for instance.
- Have a profitability in 2012 of at least 4%.
- Have had a growing rate in the last two years of, at least, 2%.
4.4.4 Potential Supplier Identification

The supplier’s evaluation will take into account the following process diagram.

![Figure 4.10: Identification of demand process](image)

**Input:**
- Business specific factors and requirements.

**Output:**
- Potential suppliers list.

Analyzing the requirements previously shown and the Make or Buy strategy, the potential suppliers for each of our needs are identified in the figure 4.11.

![Figure 4.11: Potential suppliers for the system’s components](image)
CHAPTER 4. OPERATIONS PLAN

Figure 4.12: Suppliers evaluation process

Input
- Approved potential supplier’s requirements.

Output
- Potential supplier’s evaluation.

From the potential suppliers list the Potential Supplier’s Evaluation is made to classify them in order to be able to decide which is going to be our first option.

The evaluation of each of our suppliers is done by component.

<table>
<thead>
<tr>
<th>Suppliers</th>
<th>ISO 9001</th>
<th>Financial Health</th>
<th>2012 Profit &gt; 4%</th>
<th>Growth Rate &gt; 2%</th>
</tr>
</thead>
<tbody>
<tr>
<td>RFID Solutions</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>NextPoint Solutions</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Texas Instruments</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✗</td>
</tr>
<tr>
<td>Toshiba TEC</td>
<td>✔</td>
<td>✔</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Intermec</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Printronix</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Sony</td>
<td>✔</td>
<td>✗</td>
<td>✔</td>
<td>✗</td>
</tr>
<tr>
<td>Canon</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✗</td>
</tr>
<tr>
<td>Pentax</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✗</td>
</tr>
<tr>
<td>Intel</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>IBM</td>
<td>✔</td>
<td>✔</td>
<td>✗</td>
<td>✔</td>
</tr>
<tr>
<td>HP</td>
<td>✔</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Telefónica</td>
<td>✔</td>
<td>✔</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Orange</td>
<td>✔</td>
<td>✔</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Vodafone</td>
<td>✔</td>
<td>✔</td>
<td>✗</td>
<td>✗</td>
</tr>
</tbody>
</table>

Table 4.2: Suppliers accomplishment of requirements
4.4.5 Select Suppliers and Contract

Input:
- Potential supplier’s evaluation.

Output:
- Signed contract.

The contract is signed after the negotiation between the supplier and JANO Procurement Department in the terms shown by the first proposal.

The suppliers selected for each category as a preliminary option and the prices and economic conditions we have agreed on are:
CHAPTER 4. OPERATIONS PLAN

RFID Reader: NEXTPOINT SOLUTIONS

- A portable RFID reader, specifically a watch that will allow the person responsible for uploading the baggage to read RFID tags in a very quick manner. Since we do not have the necessary knowledge to develop such a gadget, we propose to outsource the creation of this gadget. We estimate the price of the development of the tool will be provided by NEXTPOINT SOLUTIONS after having set the physical and technological specifications such as:
  - Wrist wearable.
  - Scope not bigger than 50 cm. (not to provide wrong readings of the incorrect piece of luggage).
  - No more than 100 grams of weight.
  - A screen capable of displaying 3 different colors and text information at the same time.
  - The ability to emit a sound when the reading is incorrect.
  - Fast readings (in less than 0.4 seconds).
  - 3G/4G connection to the database in real time to permit continuous update.

- The cost of this development should be around 50,000 €.
- The cost of each device is estimated in roughly 500 €.

RFID Tags and Printer: INTERMEC (A HONEYWELL COMPANY)

- RFID printer: In order to cover the need of attaching both the RFID tag and the current information label that goes with every checked-in piece of baggage, we demand an RFID printer that follows the current security standards that airlines and handling companies have. The printer shall also be able to encode the tag with the relevant information such as the flight and passenger information. The printer that complies with all those requirements is the following model:
  - Intermec PF2i printer provided by INTERMEC being able to print RFID inlets.
  - Price: 1,500 €.
  - RFID Smart Labels. Characteristics:
    * Support ISO 18000 6B and 18000 6C /EPC Generation 2.
    * Operating frequency between 865-928MHz radio configured to comply with local UHF RFID regulations including FCC (Federal Communication Commission) and ETSI (European Telecommunications Standard Institute).
    * Thickness between 2.4 to 10 millimeters.
    * Between the four types of inlets available: ShortDipole (SPRINT TM), DogBone, Frog and Web, the one that best fits our requirements is ShortDipole provided by SPRINT in 1,000 units packs.
    - The price of one roll of 1,000 tags is about 60 € but buying more than 30, the cost reduces to 45€ per roll.

- Needs: Our needs will be from the beginning of our activity, and based in our market forecasting, of 10,000 RFID tags for testing the system and changes, and dependent on clients from then on. Assuming Iberia in Madrid-Barajas as the first customer, an initial package of 1.2 million RFID tags would be required and recurrent one-million orders every two months from then on for the daily operations of all our customers.
4.4. PROCUREMENT OF COMPONENTS

Server Database: INTEL

- Servers + database, that will store the information about passengers and baggage. They will be placed at JANQ premises, with a secure access so that only our employees can have access to them. Based on the number of passengers that our system will be dealing with, it should be a fairly powerful server.
  - Our option for this need is the Intel SC5592WS
  - The price for the Database is around 500 € for each of them

Camera: PENTAX

- A webcam at the check-in counter. As a possible component, we have chosen the following:
  - A digital camera able to take photos for each piece of luggage and connected to the server to include the photo linked to the previous information belonging to that particular piece of baggage. That camera will be provided by Pentax.
  - The cost will be around 200 € each one.

Connectivity service: MOVISTAR EMPRESAS

- A 3G/4G connection for every reader to contact with the database. That service will be provided by a telecommunications provider, Movistar Empresas.
  - We estimate this cost in 100 € per year and reader.

4.4.6 Monitoring Suppliers and Contract Management

![Diagram of contract implantation process]

Figure 4.14: Contract implantation process
CHAPTER 4. OPERATIONS PLAN

Input:
- Contract signed.

Output:
- Kick-off.

The kick-off document sets, after evaluating the Implantation Plan (shown in a later chapter), the time, conditions, quantity and other important aspects of the first order and followings. It is performed once for each supplier.

![Diagram of Suppliers monitoring process]

Figure 4.15: Suppliers monitoring process

Output:
- Supplier review report.

This document sets some of the KPIs (Key Performance Index) that will evaluate supplier’s performance. Among different aspects, it takes into account the number of orders. The constants K1, K2 and K3 will be accorded with each supplier and written in the contract. This list of KPIs is:

- Delay (measured in hours) over the number of orders made.
  - KPI \( \leq \) K1: Correct.
  - KPI > K1: Incorrect.

- Number of non-conformities over the total amount of items ordered.
  - KPI \( \leq \) K2: Correct.
  - KPI > K2: Incorrect.

- Time (in hours) to solve these non-conformities over the total number of non-conformities.
  - KPI \( \leq \) K3: Correct.
  - KPI > K3: Incorrect.

These KPIs will allow us to perform a monthly review report for each of our selected suppliers and have to be agreed upon with each one of them.
4.4.7 Order & Receive Products

Figure 4.16: Products ordering process

Input:

- Request for Purchase Order.

This is a standardized electronic form that is received from the logistic department, indicating the order point has been reached according to the inventory monitoring in both JANO’s office and the client facilities.
4.5 JANO Development Process

Before being able to offer a first version of the system, a development process has to be performed. During this process, design and evaluation of alternative processes will be performed and decisions will be taken in order to establish a basic configuration. Then, the system will be easily customized in order to fulfill each customer’s specific requirements and specifications.

Those different steps are explained here under, with their appropriate budget allocation. It has to be said that in this part, the salaries of the employees will not be considered, because they will be specified later on.

The total estimated cost of this step will be 24,531 €.
Figure 4.17: Development process
4.5.1 Concept phase

a) First contact with handling companies

Description:

In this step, we are going to contact different handling companies and analyze their partnership and processes. Those companies operating in Barajas are:

- Iberia Handling: it is the first airport services operator in Spain. Among many services, they have ticket issuing and ramp services. The contact would be through its webpage handling.iberia.es at the very first time, then we would set up meetings and visits to their installations.

- Swissport Handling: they offer airport ticketing sales desk services, baggage services, check-in services, baggage sorting services... The contact would be through emails (Operations and Ramp Manager: Alejandro Florido, alejandro.florido@swissport.com; Commercial Director: Juan Luis Viton, jlviton@swissport.com). The process would also include meetings and visits to their installations.

The issue of this step is to focus on the main problems related to baggage handling, the handling process itself, interaction between companies and loading times. The different types of contracts linking handling companies to airlines will be deeply analyzed, because JANO will be a matter of the two of them.

Duration:

The estimated duration of this step is 4 weeks.

Cost:

Based on a policy of the company, similar to the PG-122E (Policy Gate) of EADS where costs for some criteria are defined, we can estimate the total cost of the step:

<table>
<thead>
<tr>
<th>Description</th>
<th>Daily price</th>
<th>Quantity</th>
<th>Total price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car rental</td>
<td>8.00 €</td>
<td>30</td>
<td>240.00 €</td>
</tr>
<tr>
<td>Parking</td>
<td>10.00 €</td>
<td>30</td>
<td>300.00 €</td>
</tr>
<tr>
<td>Fuel</td>
<td>4.20 €</td>
<td>30</td>
<td>126.00 €</td>
</tr>
<tr>
<td>Meals</td>
<td>24.00 €</td>
<td>30</td>
<td>720.00 €</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Daily price</th>
<th>Quantity</th>
<th>Total price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office --&gt; Airport: 10 km</td>
<td>12€/100km</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other locations (max. once</td>
<td>4.20 €</td>
<td>30</td>
<td>126.00 €</td>
</tr>
<tr>
<td>every 2 days): 30 km</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily km: 10+10+30/2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel: 12€/100km</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two employees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>1,386.00 €</td>
</tr>
</tbody>
</table>

Table 4.3: Cost of first contact with handling companies without taking into account human resources
b) Customer’s interest analysis

Description:

In this step we will analyze customer’s interest in different JANO applications. As it has been shown along this project, JANO has several applications and the decision of developing one idea or another can only be made considering customer’s opinions about them. Gathering information on which applications are more interesting and which gaps can be fulfilled is key before developing a product in any direction.

As we already collected valuable information about the processes during previous contacts with the handling companies (Step 4.4.1-a)), this step consists in discussing and analyzing the data and it is done in the office most of the time.

Some additional meetings/contact with the previous handling companies and with some airlines may be needed in order to know their point of view of our potential applications.

Duration:

The estimated duration of this step is 2 weeks.

Cost:

Related costs to this step are summarized in the next table, considering that the activities will be performed outside the office half of the time.

<table>
<thead>
<tr>
<th>Description</th>
<th>Daily price</th>
<th>Quantity</th>
<th>Total price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car rental</td>
<td>8.00 €</td>
<td>5</td>
<td>40.00 €</td>
</tr>
<tr>
<td>Parking</td>
<td>10.00 €</td>
<td>5</td>
<td>50.00 €</td>
</tr>
<tr>
<td>Fuel</td>
<td>4.20 €</td>
<td>5</td>
<td>21.00 €</td>
</tr>
<tr>
<td>Meals</td>
<td>24.00 €</td>
<td>5</td>
<td>120.00 €</td>
</tr>
</tbody>
</table>

**TOTAL 231.00 €**

Table 4.4: Cost of customer’s interest analysis without taking into account human resources

4.5.2 Solution definition

a) First contact with suppliers

Description:

First contact with RFID technology suppliers and hardware manufacturers to know more about their products, characteristics, prices, volumes they can serve, etc. In this step we will not choose our suppliers (afterwards, procurement will be in charge of this), but we will have up to date information about existing RFID technology and hardware components that will be very valuable in the following steps.
CHAPTER 4. OPERATIONS PLAN

Duration:
The estimated duration of this step is 2 weeks.

Cost:
The contact will be via Internet, and no additional budget is needed.

b) Technical and functional design
Description:
The end of this phase will be the definition of the requirements, both hardware and softwarewise, for the basic configuration based on all the information gathered in previous points. The different suppliers will not be chosen yet; this step basically consists on converting all requirements into detailed specifications of the solution.

Duration:
The estimated duration of this step is 4 weeks.

Cost:
Since this step is completely performed in the office, no additional budget is required.

4.5.3 Solution development
a) Detailed design
Description:
With all the information collected during the previous steps, a detailed design of the following shall be performed for:

- Application components (Software).
- Infrastructure components (Hardware).
- Application installation package.

Duration:
The estimated duration of this step is 4 weeks.

Cost:
No additional budget is required.

b) Software development
Description:
Knowing the kind of tags, hardware systems, applications and requirements suitable for JANO, software development can start. Software design should not be very complicated, but the importance in this step lies in the robustness and speed of the code developed. The internal steps are:
4.5. JANO DEVELOPMENT PROCESS

- Implement the development environment.
- Code, customize and define test application components.
- Assemble application components and verify assembly.
- Finalize application installation package.

When the development of the software finishes, the installation of the integration environment begins.

**Duration:**

The estimated duration of this step is 8 weeks.

**Cost:**

We will use a free version of Microsoft .net framework, and no connection to a database is still needed: there will be then no related costs to this step.

c) Integration of Hardware and Software

**Description:**

When the first version of the software is available, integration with the hardware can start. A problem solving will be performed, and it could be necessary to go back to coding several times (continuous interrelation between those two steps).

**Duration:**

The estimated duration of this step is 8 weeks.

**Cost:**

An initial provisioning of the components needed to build up JANO will have a cost detailed below. All those components could be re-utilized in the near future.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Quantity</th>
<th>Unit price</th>
<th>Total price</th>
</tr>
</thead>
<tbody>
<tr>
<td>RFID readers</td>
<td>15</td>
<td>500.00 €</td>
<td>7,500.00 €</td>
</tr>
<tr>
<td>RFID tags</td>
<td>30,000</td>
<td>0.045 €</td>
<td>1,350.00 €</td>
</tr>
<tr>
<td>RFID printers</td>
<td>5</td>
<td>1,500.00 €</td>
<td>7,500.00 €</td>
</tr>
<tr>
<td>Cameras</td>
<td>5</td>
<td>200.00 €</td>
<td>1,000.00 €</td>
</tr>
<tr>
<td>3G/4G connex (per year)</td>
<td>15</td>
<td>100.00 €</td>
<td>1,500.00 €</td>
</tr>
<tr>
<td>Others (cables,…)</td>
<td>200</td>
<td>1.00 €</td>
<td>200.00 €</td>
</tr>
</tbody>
</table>

| TOTAL                        |          |            | 19,050.00 € |

Table 4.5: Cost of integrating hardware and software without taking into account human resources

Additionally, some servers should be purchased to storage all the information. Those would be considered as part of the company’s equipment.
d) **Technical and functional acceptance**

**Description:**

In this step, solution verification will be performed:

- Operation services: monitoring, scheduling, backup and restore.
- System and network: performance, availability, security.

**Duration:**

The estimated duration of this step is 4 weeks.

**Cost:**

No additional budget is required.

e) **Functional tests in a real environment**

**Description:**

Perform functional tests in a real environment such as a small airport or a big facility will show the good and bad performances of the system when operating. Bad points will have to be corrected. This test will also provide the experience needed to define a basic but fully operative configuration to offer to our customers.

**Duration:**

The estimated duration of this step is 3 weeks.

**Cost:**

Apart from the costs of the components (already considered in the integration of the hardware and software), the other costs related to this step are summarized below:

<table>
<thead>
<tr>
<th>Description</th>
<th>Daily price</th>
<th>Quantity</th>
<th>Total price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car rental</td>
<td>30.00 €</td>
<td>21</td>
<td>630.00 €</td>
</tr>
<tr>
<td>Fuel</td>
<td>6.00 €</td>
<td>21</td>
<td>126.00 €</td>
</tr>
<tr>
<td>Office Facility &amp; other locations: 50km/day</td>
<td>48.00 €</td>
<td>21</td>
<td>1,008.00 €</td>
</tr>
<tr>
<td>Four employees</td>
<td>100.00 €</td>
<td>21</td>
<td>2,100.00 €</td>
</tr>
<tr>
<td>Rent of a facility of 1,040 m² during 3 weeks</td>
<td>2,100.00 €</td>
<td>21</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL** 3,864.00 €

*Table 4.6: Cost of performing functional tests in a real environment without taking into account human resources*
4.6 JANO Implantation Process

The integration and installation process is performed right after the development process. Once a default system has been developed and tested, at the time we receive an offer from a customer that wants our system to be installed, we shall proceed to adapt our system to its specific needs, and to tune it to perfection in a process that takes approximately 11 weeks of continuous work. We shall have different interactions with other departments within our company. For example, the contract itself will be provided by the sales people, which are advised by some external legal consulting.

After the customer’s needs have been identified, the procurement department shall be contacted, and shall be the one responsible for getting the equipment needed. In the end, once everything has been set up, people shall be needed on site for a week in order to be able to follow up how everything is going, providing support. This shall be arranged by the after-sales department.

Regarding costs, we will concur in expenses due to integration engineers and blue collars having to go to the customer facilities to install and test our system, which means transportation, meals, hosting.

The integration and installation process itself is divided in several steps that are described as follows:
Figure 4.18: Implantation process
4.6.1 Receive Customer Application

Description:

A customer is interested in our system and wants it to be installed. We receive the contract to install our system from the sales department.

Duration:

Receiving the contract itself is automatic.

Cost:

No costs associated to this step

4.6.2 Analyze current status of customer’s handling process

Description:

We shall ask for data regarding our customers handling process. This means until what time before departure can a passenger check a bag, whether it operates connection flights in a hub like manner with other flights from the same company or different companies, such as a traditional airline (Iberia), where planes have a longer turn time, or if it is a point to point company with shorter turn times such as low cost carriers (Vueling).

Other information we shall need from them is the average number of checked bags per kind of flight (regional/international), whether his planes carry other kind of cargo apart from passenger’s bags, whether they load baggage in bulk or in standardized containers, whether they have fixed gates where they operate their flights or not, whether their planes are served directly through a terminal finger or there is a need to take a shuttle for passengers to reach the plane, time before departure that boarding starts and ends, their policies about lost luggage, information about their slot times, average number of mishandled baggage per flight.

Duration:

The estimated duration is 3 weeks.

Cost:

Estimated cost depends on the client’s location.

<table>
<thead>
<tr>
<th>Zone</th>
<th>Flights</th>
<th>Accommodation</th>
<th>Meals</th>
<th>Other transport</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madrid</td>
<td>-</td>
<td>-</td>
<td>96 €</td>
<td>57 €</td>
<td>153 €</td>
</tr>
<tr>
<td>Spain</td>
<td>1,800 €</td>
<td>1,500 €</td>
<td>750 €</td>
<td>600 €</td>
<td>4,650 €</td>
</tr>
<tr>
<td>Europe</td>
<td>4,500 €</td>
<td>1,800 €</td>
<td>900 €</td>
<td>750 €</td>
<td>7,950 €</td>
</tr>
<tr>
<td>Worldwide</td>
<td>15,000 €</td>
<td>2,400 €</td>
<td>1,200</td>
<td>1,200 €</td>
<td>19,800 €</td>
</tr>
</tbody>
</table>

Table 4.7: Estimated cost of analyzing customer handling process without taking into account human resources
4.6.3 Define with the customer expected improvements

Description:

Based on our analysis of their current process, we shall propose a series of improvements in service that we can provide. This means reducing the chances of loading baggage for other flights incorrectly and having to unload it because a passenger does not show up at the gate or reducing the time to find a bag from a late passenger. We must guarantee that our system will not delay any flight.

Duration:

It will take one week.

Cost:

Estimated cost depends on the client’s location.

<table>
<thead>
<tr>
<th>Zone</th>
<th>Flights</th>
<th>Accommodation</th>
<th>Meals</th>
<th>Other transport</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madrid</td>
<td>-</td>
<td>-</td>
<td>120 €</td>
<td>71 €</td>
<td>191 €</td>
</tr>
<tr>
<td>Spain</td>
<td>600 €</td>
<td>500 €</td>
<td>250 €</td>
<td>200 €</td>
<td>1,550 €</td>
</tr>
<tr>
<td>Europe</td>
<td>1,500 €</td>
<td>600 €</td>
<td>300 €</td>
<td>250 €</td>
<td>2,650 €</td>
</tr>
<tr>
<td>Worldwide</td>
<td>5,000 €</td>
<td>800 €</td>
<td>400 €</td>
<td>400 €</td>
<td>6,600 €</td>
</tr>
</tbody>
</table>

Table 4.8: Estimated cost of defining expected improvements without taking into account human resources

4.6.4 Purchase of hardware components

Description:

At this point, after we have analyzed the current status of our customer’s processes, its installations and the level of performance that is expected from us, we shall proceed to purchase the needed hardware. The lead times and costs will be provided by the procurement department.

Duration:

The estimated duration is one week. The component which limits this time is the RFID reader that could take almost a week to be received.

Cost:

We are considering two cases, one for a larger client (Iberia in Madrid-Barajas) and another one for a smaller customer. Based on 2013 Iberia departures data, July was the busiest month with more than 3400 flights. Assuming a constant distribution during the whole month and during the day (15 active hours out of 24), it results an average of 8 flights per hour. As the distribution is not constant, a factor of 1.5 is used to estimate the peak (12 flights per hour). Two readers are being used for each flight, and applying a safety factor of 1.2, for a big customer like Iberia, we would need to deliver about 30 readers. All other components are calculated in relation to this estimation.
4.6. JANO IMPLANTATION PROCESS

case 1

<table>
<thead>
<tr>
<th>Unit</th>
<th>Quantity</th>
<th>Unit price</th>
<th>Total price</th>
</tr>
</thead>
<tbody>
<tr>
<td>RFID readers</td>
<td>30</td>
<td>500.00 €</td>
<td>15,000.00 €</td>
</tr>
<tr>
<td>RFID tags</td>
<td>1,250,000</td>
<td>0.045 €</td>
<td>56,250.00 €</td>
</tr>
<tr>
<td>RFID printers</td>
<td>10</td>
<td>1,500.000 €</td>
<td>15,000.00 €</td>
</tr>
<tr>
<td>3G/4G connex (per year)</td>
<td>30</td>
<td>100.00 €</td>
<td>3,000.00 €</td>
</tr>
<tr>
<td>Others (cables,...)</td>
<td>1,000</td>
<td>1.00 €</td>
<td>1,000.00 €</td>
</tr>
</tbody>
</table>

**TOTAL** 90,250.00 €

Table 4.9: Estimated cost of components for Iberia in Madrid-Barajas

case 2

<table>
<thead>
<tr>
<th>Unit</th>
<th>Quantity</th>
<th>Unit price</th>
<th>Total price</th>
</tr>
</thead>
<tbody>
<tr>
<td>RFID readers</td>
<td>8</td>
<td>500.00 €</td>
<td>4,000.00 €</td>
</tr>
<tr>
<td>RFID tags</td>
<td>125,000</td>
<td>0.045 €</td>
<td>5,625.00 €</td>
</tr>
<tr>
<td>RFID printers</td>
<td>2</td>
<td>1,500.000 €</td>
<td>3,000.00 €</td>
</tr>
<tr>
<td>3G/4G connex (per year)</td>
<td>8</td>
<td>100.00 €</td>
<td>800.00 €</td>
</tr>
<tr>
<td>Others (cables,...)</td>
<td>100</td>
<td>1.00 €</td>
<td>100.00 €</td>
</tr>
</tbody>
</table>

**TOTAL** 13,525.00 €

Table 4.10: Estimated cost of components for a smaller client

4.6.5 Customize software

**Description:**

In this step, we shall adapt our software to meet the specific needs of the company. We shall tune up the system with the data we collected on the first step in order to improve the handling process as specified in step 3. This step will be done in parallel with the process of acquiring the hardware.

**Duration:**

4 weeks.

**Cost:**

No cost associated to this step.

4.6.6 Test and Configuration of Hardware

**Description:**

Before proceeding to install the system on site, we will proceed to test it, verifying that it is according to the specifications and that it has the quality that is expected.
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**Duration:**
3 days.

**Cost:**
No cost associated to this step.

### 4.6.7 Installation of the System

**Description:**
Once everything has been tested, we will proceed to install it at our customer’s facilities. The customer shall provide us a space for the cameras at the check in counters if needed. For the installation of the system, 2 integration engineers and two blue collars will be there for a week.

**Duration:**
1 week.

**Cost:**
Estimated cost depends on the client’s location.

<table>
<thead>
<tr>
<th>Zone</th>
<th>Flights</th>
<th>Accommodation</th>
<th>Meals</th>
<th>Other transport</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madrid</td>
<td>-</td>
<td>-</td>
<td>240 €</td>
<td>71 €</td>
<td>311 €</td>
</tr>
<tr>
<td>Spain</td>
<td>1,200 €</td>
<td>1,000 €</td>
<td>500 €</td>
<td>300 €</td>
<td>3,000 €</td>
</tr>
<tr>
<td>Europe</td>
<td>3,000 €</td>
<td>1,200 €</td>
<td>600 €</td>
<td>400 €</td>
<td>5,200 €</td>
</tr>
<tr>
<td>Worldwide</td>
<td>10,000 €</td>
<td>1,800 €</td>
<td>800 €</td>
<td>800 €</td>
<td>13,400 €</td>
</tr>
</tbody>
</table>

Table 4.11: Estimated cost of installing the system without taking into account human resources

### 4.6.8 Perform functional tests

**Description:**
After the system has been installed, we shall verify that everything is working correctly, that the connections between pieces of hardware, and the software are performing as expected. For this, we shall have an IAT (Industry Acceptance Test) with a series of tests with steps and expected results. If the system works fine, it will pass this IAT, and the customer will sign it acknowledging that everything is working fine.

**Duration:**
3 days.

**Cost:**
Estimated cost depends on the client’s location.
4.6. JANO IMPLANTATION PROCESS

<table>
<thead>
<tr>
<th>Zone</th>
<th>Flights</th>
<th>Accommodation</th>
<th>Meals</th>
<th>Other transport</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madrid</td>
<td>-</td>
<td>-</td>
<td>72 €</td>
<td>43 €</td>
<td>115 €</td>
</tr>
<tr>
<td>Spain</td>
<td>1,200 €</td>
<td>500 €</td>
<td>250 €</td>
<td>150 €</td>
<td>2,100 €</td>
</tr>
<tr>
<td>Europe</td>
<td>3,000 €</td>
<td>600 €</td>
<td>300 €</td>
<td>200 €</td>
<td>4,100 €</td>
</tr>
<tr>
<td>Worldwide</td>
<td>10,000 €</td>
<td>900 €</td>
<td>400 €</td>
<td>400 €</td>
<td>11,700 €</td>
</tr>
</tbody>
</table>

Table 4.12: Estimated cost of performing functional tests without taking into account human resources

4.6.9 On site support

Description:

For a week after installation, we shall have a team of experts directly on site in order to solve any potential issues with our system as fast as possible.

Duration:

1 week.

Cost:

Estimated cost depends on the client’s location.

<table>
<thead>
<tr>
<th>Zone</th>
<th>Flights</th>
<th>Accommodation</th>
<th>Meals</th>
<th>Other transport</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madrid</td>
<td>-</td>
<td>-</td>
<td>240 €</td>
<td>71 €</td>
<td>311 €</td>
</tr>
<tr>
<td>Spain</td>
<td>1,200 €</td>
<td>1,500 €</td>
<td>750 €</td>
<td>450 €</td>
<td>3,900 €</td>
</tr>
<tr>
<td>Europe</td>
<td>3,000 €</td>
<td>1,800 €</td>
<td>900 €</td>
<td>600 €</td>
<td>6,300 €</td>
</tr>
<tr>
<td>Worldwide</td>
<td>10,000 €</td>
<td>2,700 €</td>
<td>1,100 €</td>
<td>1,100 €</td>
<td>14,900 €</td>
</tr>
</tbody>
</table>

Table 4.13: Estimated cost of on site support without taking into account human resources
4.7 Logistics

The logistic process is going to be alive along with the business and it is divided in several steps:

Figure 4.19: Logistics process
4.7. LOGISTICS

4.7.1 Procurement contracts sign:
Description:
The logistics section of a company begins from the moment that contracts with suppliers or potential customers are dealt and they establish the detailed definition or at least a basis to define the system and the conditions of acceptance of the supplies in the first case, or delivery of the final product in the second.

(This is performed within the procurement process).

4.7.2 Order to suppliers:
Description:
For JANO, some suppliers for each item are explored in the preliminary phase, always keeping in mind the establishment of agreements with more than one especially in the case of RFID tags in order to ensure the supply and not to rely exclusively on a source, thus maintaining a relative competition among our suppliers that shall reduce prices.

The case of tags is crucial. This supply occurs especially after deployment, once the system is in operation and it is a continuous process, while the other elements may be required depending on the maintenance or complications that happened but never massively except for an initial order to implement the system.

(This is performed within the procurement process).

4.7.3 Transport to JANO facilities:
Description:
The supplier is responsible of the correct delivery of the order on time, on quality and on cost; following the terms and conditions stated in the contracts.

Duration:
According to contracts agreements. It should not be over 48 hours with the exception of the readers that could take up to 7 days.

4.7.4 JANO’s inventory monitoring:
Description:
Supplies will be stored at a dedicated space in the office. This inventory will be continuously monitored to ensure that we are able to fulfill customers’ requirements. For cameras, readers and most of the components, a minimum quantity of replacements will be needed. For the tags, it will be necessary to forecast in advance the customers’ demand based on statistics from previous years, the data in the servers and scheduled flights. It is directly related to the control of the inventory of the clients.

For this process, we will need careful monitoring of deliveries made by both providers of RFID tags and by JANO to final customers. Initially, it is going to be controlled in a semi manual way, with no use of any specialized tool. A future company growth could lead to changes in this operation, introducing the use of SAP or any similar tool.
CHAPTER 4. OPERATIONS PLAN

Enough Stock?

In case inventory is enough to fulfill customers’ requirements, different orders shall be answered and we will go ahead to the next step of transportation. In the opposite case, some orders will be done to suppliers.

The inventory of RFID tags will be considered sufficient if the existing inventory could meet the needs of all customers for a week (enough before the time that would elapse from the completion of the order to the final delivery to our office). The inventory of other elements is estimated to cover potential malfunctions. It shall be 3% of the operating elements at any moment (in case of 200 RFID readers for all the clients, 6 auxiliary elements will be stored in our offices).

Duration:

Continuous process

4.7.5 Transport to client facilities:

Description:

Once we have detected a need for components by a client, and tested that we can meet those needs with inventory stored in the offices of JANO, we proceed to transport those components to the customer’s premises. For this purpose, an agreement with DHL will be established.

Duration:

Depending on the client’s location

Cost:

Depending on the client’s location

4.7.6 Maintenance and incidents (not for tags):

Description:

In case of any problems with the delivered components once they are operating, the client will be able to contact us to ask for a replacement to get to the right working process. For that purpose, the webpage of JANO (www.rfidjano.com) will include a section where the clients will be able to register these kind of problems, so the components would be fixed or changed as soon as possible (according to the available inventory, that would be controlled to face this situations).

Duration:

Depending on the client’s location

4.7.7 Customers’ inventory monitoring:

Description:

Similar to the process of monitoring JANO’s inventory, the customers’ tags would also be managed by our company with the logical limitations derived from the fact that we would not have direct access to them.
All deliveries are registered so we could know the total amount of tags received by each client, and we will also have the checked baggage data including RFID. Additionally we should consider the forecast for the following weeks or months, based on data from previous years, on the client schedule for flights or on the moment of the year (the demand is not constant, with important peaks during Easter, Christmas and Summer). Finally, we shall consider the possibility of lost or mishandled tags applying a safety factor.

With all these considerations, JANO shall estimate the inventory of tags for each customer and the needs of them for the next months. In case that the current inventory volume of a client is not enough to service the following two weeks, JANO would prepare a delivery for the client. Those deliveries would consist of a package of one million tags for largest airports while for smaller ones the package would include the forecasted number of tags for a year (because of obsolence issues).

Duration:
Continuous process

4.8 Facility Management

In the beginning, we propose to establish our business in the region of Madrid, in the Barajas area. This way we will be close to the biggest airport in Spain and our initial target. The industrial complex of San Fernando de Henares seems a reasonable location as they are just 7 km away from the airport installations and offer reasonable rental prices. Our offices do not need to be huge since there will neither be a large staff nor a large volume of stored components. We shall perform quality checks on the RFID tags and readers in the office.

The prices in this area are slightly over $6 per square meter and month and we can find some small offices over $200/m^2 for less than $1,300/m/month. The final choice is an office of $207/m^2 for $1,242/m/month, including safety systems. It is a second floor with no elevator but it is not a big problem as we are usually not transporting big volumes. A bigger office shall be needed when the number of employees increases. By that time, the idea is to buy the office as an investment instead of renting it.

Additionally, we should consider some initial costs for the conditioning of the office (furniture, office . . . ) and some fixed cost because of the ordinary services such as water, electricity, Internet, cleaning, etc (around $800/m/month).

Also, in this office we will proceed to implement our software solution, so we shall need the typical equipment, including computers, screens, keyboards, laptops, printers . . . Due to the small amount of workers, it can be purchased directly, with very few replacement parts stored for any emergence. Additionally, some professional software licenses would be purchased for some basic applications for the right development of the work and the safety of it.

About half of the surface will be used for the storage of both system components (cameras, tags, readers . . . ) and auxiliary furniture and office equipment as well as the allocation of the servers which are needed to store and manage the information related to the use of JANO.

When storing servers and information of great importance to our customers in our facilities, it will be necessary to ensure maximum security of such information, for which we will make use of security available in the office complex. In any case, due to the confidentiality of these data, contracts establish certain clauses which, in case of the dissemination of these data because of insecurity, subtraction, or any other reason, shall force JANO to provide financial compensation to the affected customers.
In order to be covered against this possibility, we will contract some insurance against possible attacks on the physical facilities and the possible loss or damage thereof, and against all virtual attack which can be responsible for the violation of security and confidentiality agreements with clients. This insurance is dealt with Mapfre, with a final agreement of 3,000 €/year. For this purpose, the role of the IT manager appears, along with some other tasks.

For the transport of the components from the office in San Fernando to the location of each client, a vehicle is needed at first. The objective is to find out one which is smart enough to be used for the attendance to meetings but also practical to transport material. The final vehicle chosen is a Ford Fiesta, similar to the one used in the development phase, with a cost of 400 €/month that will be rented just after the first implementation processes. This renting system allows us to buy finally the car if we want for the residual value of the vehicle. For other customers, DHL will be the responsible for this task.

Finally, for the development process, it shall be necessary to use some installations to perform some functional tests for checking that all components and processes are working as predicted. As there is no customer defined yet, those installations have to be hired. The estimated duration of these tests is under three weeks, so that time is enough for that.

The location for those tests will be very close to the offices, in San Fernando de Henares too, in a 1,040 m$^2$ facility located in less than one km. area. It would be rented for three weeks by a cost of 2,100 €.

### 4.9 Marketing and Sales

The Marketing Plan will be developed in further chapters; therefore neither the process nor the costs will be developed here. Anyway, it will be taken into account in the detailed financial plan, as well as in the human resources plan.

Even if sales can be considered to have a very close relation to the marketing activities, there are important outputs generated throughout the sales process that are strictly needed for the development of other activities. Negotiation of the contract, product definition and pricing will hopefully end in a signed contract. The relevant information included in it is needed to perform the following tasks:

- **Procurement:** the size of the order is needed to start with the procurement activities in order to supply the implementation process. This information may be necessary even before the signing of the contract since the procurement plan and the material resources available in the warehouse may affect the length of implementation and therefore, the contract clauses. Also the prices of the material resources can affect the financial terms of the contract.
- **Implementation:** requirements established in the contract will be a key to develop a tailor-made system which fulfills customer expectations. Time to develop and install the system will affect the working process.
- **After-sales service:** all the relevant data obtained during the marketing and sales process of a particular customer can be relevant in the after sales process. Administrative and contact data, the order size which will affect the previsions for spare needs, etc.
- **Management:** within management there are several activities included that will depend on the contract. Financing activities, payment management, HR (Human Resources) needs.
4.10 After-sales process

After-sales activity starts as soon as the contract with the client is signed. It comprises several processes from the proper support during first days after the system implementation until the maintenance of the system. Those processes and its main interactions are shown in the following graph and explained in detail along the next pages.

Figure 4.20: After sales process
4.10.1 Customer services data files

In order to track all the relevant data of the customer, a customer database has to be created and continuously updated. For this purpose we believe that a common Microsoft office package will be enough for tracking all the relevant data.

When the contract is signed, a folder identifying customer name will be created at the “Customer services data file” and immediately filled with the relevant information regarding the customer, such as:

- Administrative data: name of the customer (company), address, identification, bank data, contact person data.
- Contract data: contract number identification, date of signature, sales figure, terms affecting guarantee and maintenance.
- The contract itself.
- Characteristics of the installation agreed: material resources to be installed, size of the installation, and other information that will help to predict possible spare needs or reparation needed on site.

Through the installation of the system any relevant information will have to be communicated to the after-sales department, and compliance with the contract has to be monitored. In particular:

- Final components installed: model, and possible failures detected during installation. If there is any need for new components, the procurement and logistics departments will be asked to provide them. If the failure is caused by a defect attributable to the supplier, proper claims must be managed.
- Main milestones reached: motorization of the installation is not responsibility of after-sales office but implementation management. However, the progress of the project will be an indicator of the time left to have an autonomously working system.

When the system is fully installed, the after-sales process will be the only contact point with the customer. Updating information contained in previous files will allow to offer a good service and to increase customer satisfaction.

Customers will contact after-sales through different tools and every claim or contact will be registered in a file containing mainly the following information:

- Customer: the customer shall be identified in the file, which must be located in the customer folder.
- Date of claim.
- Number of the claim: a code will be assigned to each communication received in order to control it throughout the solution process.
- Motive of the claim: a description of the problem or need will be necessary to evaluate and solve it.
- Main actions to take: evaluating the motives, following actions can be established, and proper responsible to act it can be alerted.
- Internal actions taken: communications between different departments, actions taken, visits or repairs carried out, spares provided... All this information is needed to control the state of the claim.
- State of the claim: received, in process, solved.
• Contacts with the customer: needs or claims are supposed to bring communications between JANO team and the customer and all this communications (data, content...) must be registered and described within the same file.

• Date when claim is considered solved.

A control file of the state of the claims will be important to follow the customer support process. Not only claims, problems or needs have to be collected from the customer, but also other data indicating the performance of JANO and how it affects customer numbers.

• Statistics and numbers: number of flights, RFID tags used per day, situation of its warehouses, improvements on their mishandled luggage, lost slots or costs savings.

• Maintenance visits: date of the visit and conclusions report will be stored in this file. All the problems detected in a maintenance visit must be managed and stored in the same way that those detected from claims or communications.

Finally an important technical requirement to contemplate is that a backup of every customer files is created every two days to ensure accessibility and avoid problems.

We are not accumulating a large amount of backup files as this fact induces serious troubles of management and lack of space in the drives in a long term, so we are just keeping the information of the last two weeks; that means, only the last 6 files for each client are saved and they are deleted as new files are generated.

A chart of the main files regarding after-sales services is shown below.
4.10.2 Web page and customer portal

The main point of after-sales service is direct contact with the customer, therefore it is necessary to describe how JANO is going to ensure and facilitate that contact.

There will be several points of interaction with the customer:

- Telephone.
- Mail.
- Corporate webpage.

The website provider selected is a Spanish company called Publicis Webformance with more than 15 years of experience in the development of tailor made websites. The requirements to this supplier for our webpage will be:
4.10. AFTER-SALES PROCESS

- An attractive presentation for our company with our logo, name and description of our core business in the main page.
- Navigation menu with different options: Home (to return to our main page), Where do we come from? (Our history, mission, vision and culture), What do we have to offer? (Products and services provided by us), Contact (address, company phone number and email address) and Customer Area.
- This website will contain around 15 different pages.
- 20 domain email addresses.
- Our URL: www.rfidjano.com which is on sale now.
- Unlimited email forwarding and auto-responding.
- Advanced submission to search engines.

The cost of this service agreed with Publicis Webformance, including webhosting, is **599 € per year**. The following years it shall be **399 €** since the only services that shall needed are the webpage maintenance and update. If we would want to do a fully website redesign, the price would be **599 €**.

Even if the webpage of the company will exceed the after-sales services, showing also a vision of the company and the activities; it will include the customer portal. That portal will permit our customer to enter in a restricted area using their own login and password to perform the following activities:

- Check his private information.
- Make a consultation (with automatic auto-responding).
- Send any incidence, doubt, suggestion or problem about the performance of the system.
- Submit statistics.

4.10.3 Maintenance Visits

Maintenance terms of the system are agreed in the contract and a periodical revision of the system will be implemented in consequence. During these revisions an expert on the system will examine the performance of the implementation on site looking for possible mistakes both in hardware or software. Maintenance visits are a great source of the real performance data of the system, and its conclusions both for the particular customer and the general system have to be gathered in a report and filed in the customer services data files described above.

Maintenance visits can be programmed not only periodically but also if an unexpected behavior has been observed in the statistics sent by the customer. This means that these activities can be programmed as a result of a proactive process.

Maintenance visits will often lead to spare requests or need for a further inquire in order to solve detected problems.

As it has been said, maintenance visits will be agreed in the contract, nevertheless an initial value must be estimated to be able to analyze the costs related to them during the first years. It is estimated that during the first two years of operation, when projects are concentrated mainly in Spain, maintenance visits shall be performed by two people once a month. After these first years, due to the learning curve, the system is expected to need less surveillance, visits will take
place only once every six months.

During the first years, JANO engineers and the after-sales department will arrange and perform these visits. In the future, the need of subcontracting this service in some locations will be studied to save costs.

4.10.4 Problems solution

Claims from the customer or problems detected during maintenance visits are not always obvious to solve. Sometimes a problem can be identified after a few communications, and others will lead to inspections or evaluations.

Problems with hardware often will lead to repairs or total change of the hardware. In order to establish which kind of actions will solve the problem and which materials will be needed, all the relevant data gathered during communications with customer will be carefully studied. If any doubts remain, customer will be contacted until the problem is, as much as possible, identified. Of course most of the times contact will not be enough to determine the cause of the problem, not to mention that some problems will not be solved by JANO but by our suppliers.

When reparation is needed, the hardware will be collected to send it to the proper supplier through a logistics process. Sometimes a backup element will have to be provided to the customer, this will depend on the terms of maintenance agreed on the contract. The claim will not be considered solved until the customer has its machine back and working properly.

When a problem seems to be affecting the software, analysis of customer statistics may help to determine the problem, when it started and where it can be located. This type of issues will be more difficult to deal with, because it can affect the work of the system until they are solved, and it is not possible to solve them temporarily.

It is very soon to identify the main problems that JANO can have during its performance, but as soon as problems start to appear they have to be tracked. Customer files will be updated with problems identified in claims, as it has been already said, and with problems identified from JANO.

A general file of common incidences will be created and filled with problem signs, causes and main repair actions taken. This will speed up the process of identifying and solving problems, creating a common database of troubleshooting knowledge.

4.10.5 Spare service

As a result of a claim (directly or through an evaluation) or a maintenance revision, a need of a spare can be detected. These needs of course are related to hardware components of the system (camera, printer, readers...), and can be temporary (while reparation is performed) or definitive.

When a need of a spare is detected, the first task to perform is to check the warehouse to find whether we have the amount of resources available or not. Procurement and logistics will ensure the availability and the proper update of the warehouse situation, or the purchase and transport of the elements if needed.

Since spare supply to the customer will be performed jointly with the installation, logistics process will provide transport means, both to the worker and the spares.

The spare must be installed and its correct performance evaluated before the claim is closed.
4.10.6 Statistics handling

Customer shall commit to deliver statistics affecting JANNO performance when signing the contract. These statistics shall be submitted periodically through the web portal, phone or mail. Following data are considered interesting:

- RFID printed per week.
- Luggage checked-in per week: both numbers are not necessarily equal because there may be occasional problems when printing the tags.
- Flights of the company.
- Flights where JANNO system has performed any task.
- Number of hardware elements of each kind working: some elements, not many, are expected to be a back-up so if any is broken it can be replaced immediately.
- Number of hardware elements as a back up.
- Number of mishandled luggage (optional).
- Number of slots lost as a consequence of a late passenger (optional).

These data will be evaluated after every submission and the evolution will be tracked to identify possible problems. Also, this information is important to confirm that the system’s dimension is enough for the customer size and if there is any need of expansion.

This will also allow estimating the number of RFID tags that we have to provide to the customer so the printers are always well supplied. That process is described in the logistics section.

Statistics handling is addressed in two ways.

- **Improving JANNO’s functionality**: this means that customer’s data and its analysis are a key source of information for evaluating the performance of the system, developing it and adapting it to new customers.
- **As a service**: as a service offered to our customers, aimed to identify the main costs due to baggage mishandling and their sources and ways to decrease them.

4.10.7 Other claims management

Besides claims or problem reports, other kind of consultations can be done through the tools allowing customer contact. After-sales office must be always prepared to answer them properly and in the shortest time. This will be facilitated by all the information gathered and stored as described through this chapter. A perfect knowledge of the JANNO system will also be a requirement for the person in charge of this kind of claims. New business opportunities must be identified if present.

4.10.8 Resources needed in After-sales service

After-sale service estimated resources will be based on the different activities to perform. Some resources (both human resources and material ones such as transports or warehouses) will be shared with other processes, however after-sales process shall be independent from those other activities and so it has been considered.
• **Management activities**: these are answering and tracking the claims, and organizing resources for visits and reparations. During the first years of operation it is believed that one person will be enough to manage after-sales activities. About the material resources needed, those will be the usual ones regarding a management activity such as a computer (with Microsoft office license) and office supplies.

• **Maintenance visits and repairs**: the human resources for this part of after-sales service have been estimated in further chapters taking into account the planning, expected number of customers, its size and location. Visits are estimated to be performed monthly at the beginning. People already working in JANO for other processes (blue-collars and engineers) will perform these maintenance visits and the reparations needed. Main costs attached to these activities will be transport and expenses, the wages of the workers and the cost of the spares.

• **Statistics analysis**: Engineers shall perform the analysis of the statistics submitted by the customer in order to extract conclusions about the performance of the system and suggest improvements. For this, the main cost will be the same that for the managerial activities: computer, office supplies and Microsoft office licenses.

• **Web page**: main costs have already been described as 599 € for the creation of the page and 399 € per year for maintenance and update.

4.11 **Time planning for operations**

In this Gantt diagram, the duration of each process for the first client is shown:

• The development for 10 months.

• 15 weeks before ending the development phase, sales process can be started looking for that first client.

• The integration phase would start as soon as the development one is finished, and it would take 11 weeks to complete it.

• From the moment a client signs a contract, it could get its system integrated and starting to work after a period comprising the time needed to end the development plus 11 weeks for the implantation.

• Procurement phase starts in the development phase when performing the functional tests, and it is a continuous process since then.

• After-sales starts in the moment the integration is finished and it makes use of the logistics and procurement processes.
Figure 4.22: Gantt diagram for operating plan
Chapter 5

Marketing Plan
5.1 Marketing Process

The marketing process is composed of several steps which will be detailed below:

1. **Searching for opportunities**: This search and identification of opportunities is performed through a market research trying to find:
   - Needs
   - Problems
   - Desires
   - Changes
   - Trends

   Different problems can be identified within the scope of this project, such as the delay of flights because of passengers arriving late and the high rate of mishandled baggage. There is a need of a system to control both things, and the desire of passengers to be informed on real time about their baggage’s status.

2. **Segmentation and choice of markets**: Based on the previous research, it is easy to find the target market segment among the global market: We shall focus on offering our product to airlines, which will be the companies obtaining profits with the implantation of JANO. In the case of Iberia, it is both an airline and a handling company. We shall offer them our product and convincing the handling company will not be any problem, as it obtains its own profits too. Although they are not direct customers, passengers also need to be taken into account because their opinion and desires are very important, and they will benefit from JANO.

3. **Market analysis**: Once the segmentation has been decided, the actors performing in this scenario need to be studied in order to define the marketing strategy which could lead to better results. The main elements are the competitors and the customers. In this step, other companies using RFID technology for baggage management outside Spain and the airlines’ and handling companies’ needs will be studied.

4. **Marketing strategies formulation**: The four elements of marketing mix are analyzed: product, price, place and promotion. The objective is to define strategies that can satisfy the preferences, desires or needs of customers, taking into account their characteristics, at the time they enforce the competition in the market.

5. **Designing action plans**: This phase refers to the planning of tasks to be done, how to assign resources for these tasks, who is responsible for them and what budget is required in order to be able to accomplish all these processes.

6. **Implementation**: After designing the action plans, the next step is the implementation of the planned strategy.

7. **Monitoring and evaluation**: In the final stage, the whole process is controlled and evaluated to find whether the strategy is being implemented according to the action plans or not, and the performance of the staff responsible for it. Finally, the objectives and results are evaluated to be able to take some corrective measures or to improve current processes.
Figure 5.1: Marketing process
5.2 Definition of strategic and operative marketing: Product, Price, Place and Promotion

We can define the basic lines of our marketing process according to the marketing mix analysis, by using the 4 P’s:

5.2.1 Product

The idea was conceived considering the problems and deficiencies airlines have when it comes to handling baggage. The main characteristics are the following ones:

- Because of the passenger-baggage reconciliation norm and the delays caused by this reason, JANO offers airlines the possibility of loading baggage only when the owner has boarded.

- To reduce mishandled baggage, JANO RFID scans all of them before their load into the cargo hold, to be able to identify any missing piece of baggage and to quickly begin its recovery process.

- One step ahead, most mishandled baggage occurs when transferring. If a company acquires JANO additional functionality for transfers for its flights, then those incidences will be reduced.

- As the final users (passengers) would like to know if their baggage has reached the airplane, JANO includes a special package that will send an SMS with this status.

- Additionally, a picture is taken to be able to easily recognize a suitcase in the problematic cases when it has been mishandled.

- Bearing in mind that baggage handlers tend to suffer from back problems and injuries when uploading baggage, especially heavy ones, JANO stores the weight of every piece of baggage. When proceeding to upload a particular item, the reader will inform the handler of its weight, and a warning will be provided when it is a heavy one. Usually, companies allow every passenger to carry bags up to 23 kg with no extra fare, and 30 kg paying an extra fee. So, a warning will be displayed for bags over those standard 23 kg.

- The system should interfere as little as possible with the customer’s current activities (e.g. the way baggage is managed before getting to the airplane, the schedule of loading/unloading of the ground handling companies once an airplane lands...) so JANO is adapted to those current processes instead of greatly modifying the processes to reach our solution. If the client wants to maximize product’s functionalities, its current processes could be slightly modified to maximize JANO’s benefits.

- To be able to reach the maximum number of potential clients, the product is customizable and portable.

- JANO services do not end with the installation at customer’s facilities. An after-sales service is provided afterwards, managing the logistics for all the consumables needed for the daily operations of JANO, as well as offering added-value services such as statistics about passenger flows, average number of baggage for passenger, average weight per bag,... with analysis that shall be offered at a certain price. This will guarantee a constant source of income for the company, and will allow it to be continuously improving.

5.2.2 Price

This is a very complex step within the marketing plan, because once a price is defined, some other things will be implicitly determined, such as:
• **Competitiveness of the product**: This would be the attractiveness of the price of our product in comparison with competitors’ similar products price (if any).

• **Market acceptance**: The price of the product will have a good acceptance by the market and will be interesting for our clients only if it is lower than the amount of savings that it is responsible for. That makes sense, because if airlines do not see an economic profit from using our product, they will never buy it.

• **Profit margin**: The product that is being commercialized should be done at a price that brings economic benefits to our company.

Considering all this, and taking into account that there is no direct competitor at this time in the Spanish market, we can then provide an upper and a lower limit for our price:

\[
\text{Cost of JANO} < \text{Price of JANO} < \text{Losses of a company due to lack of JANO}
\]

When deciding the price, several conditions should be taken into account: the costs involved to create the solution for the airline, the savings that it is going to bring and the handling company-airline binomial. Once JANO’s price is agreed upon, there shall be a certain margin between this price and the savings of the airline so that the handling company and the final user can negotiate a price which satisfies both of them.

The price for every JANO product (Simply JANO, or other packages including extra features) can be divided into several steps:

- An initial price, set after the customization and implementation of the solution for the final client.
- A recurrent price in the following years while JANO is in service.
- A semi-recurrent price due to the procurement of components (especially RFID tags but also readers/cameras/servers) applying a margin over the procurement price.

In that way we are analyzing the price of Simply JANO package if we were to start with the duo Iberia/Iberia Handling in Madrid-Barajas airport: Table 5.1 includes the annual losses due to delays distinguishing by origin, and the savings that JANO brings. The calculation of all the costs are explicitly detailed in Appendix A: “Cost of delays affecting airlines, and savings that JANO can bring.”

<table>
<thead>
<tr>
<th>Cost origin</th>
<th>Annual losses</th>
<th>Annual losses avoided by JANO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic</td>
<td>2,007,349 €</td>
<td>1,143,821 €</td>
</tr>
<tr>
<td>Tactical</td>
<td>367,668 €</td>
<td>212,209 €</td>
</tr>
<tr>
<td>Mishandled baggage (loading)</td>
<td>1,367,950 €</td>
<td>547,180 €</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>3,742,967 €</strong></td>
<td><strong>1,903,210 €</strong></td>
</tr>
</tbody>
</table>

Table 5.1: Annual losses caused by delays and the ones avoided using JANO for Iberia in Barajas, in Euros

Now we are able to construct the following table (Table 5.2) with the price of Simply JANO by year, and compare it to the annual losses that are saved thanks to its use. They are estimated based on the forecast for the first year and considering the effect of the learning curve:
5.2. DEFINITION OF STRATEGIC AND OPERATIVE MARKETING: PRODUCT, PRICE, PLACE AND PROMOTION

### Table 5.2: Price of Simply JANO package and its estimated savings by year for Iberia Handling / Iberia in Barajas, in Euros

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simply JANO</td>
<td>400,000 €</td>
<td>206,000 €</td>
<td>212,180 €</td>
<td>218,545 €</td>
<td>…</td>
</tr>
<tr>
<td>Procurement</td>
<td>324,030 €</td>
<td>333,720 €</td>
<td>343,732 €</td>
<td>354,044 €</td>
<td>…</td>
</tr>
<tr>
<td>Maintenance</td>
<td>100,000 €</td>
<td>103,000 €</td>
<td>106,090 €</td>
<td>109,273 €</td>
<td>…</td>
</tr>
<tr>
<td>TOTAL PRICE</td>
<td>824,030 €</td>
<td>642,720 €</td>
<td>662,002 €</td>
<td>681,862 €</td>
<td>…</td>
</tr>
<tr>
<td>Potential cost savings</td>
<td>1,903,210 €</td>
<td>2,093,531 €</td>
<td>2,240,079 €</td>
<td>2,352,083 €</td>
<td>…</td>
</tr>
</tbody>
</table>

There is an important difference between the price of Simply JANO and the cost savings that it is bringing. In this example it is about 1 million €. Simply JANO is going to be sold to ground handling companies, and they must be able to add their margin before selling it, and keep the price still attractive compared to the costs for the airlines.

Prices for all the products and services are not given at this point. They can be found in the section “Product portfolio analysis” because it is where they are defined.

### 5.2.3. Place

JANO will be marketed through commercial people who will contact potential customers, in order to explain the features and benefits of the offered product. The commercial manager and commercial employees will be part of the internal staff while there will be a cost intended for advertising campaigns management and other commercial tasks. The commercial manager must have a very deep understanding of the product, so it has been decided to make him part of the company’s staff instead of outsourcing the function.

An important role will be played by the website, where there will be information about the system, as well as statistics about their use and savings in real cases.

### 5.2.4. Promotion

The best promotion we could have is the recognition of a big client as well as the statistics in a real case of the effectiveness of JANO. This will surely cause a chain of events in which competitors will also want to have this product to give a better service to passengers. But this obviously is a second step; the first one would be the achievement of getting that first big client and once he is satisfied with our performance, he will be the best ambassador for our product, implementing it in all the airports in the airline’s network.

JANO is not aimed at a wide audience as it is found in a very specific sector with special conditions, so the promotion should be directed to people involved in this sector.

For that, firstly in the national market, JANO’s promotion is focused on specialized magazines that will make our brand name well known and will catch our clients’ attention.

The most important magazine for us is the new official magazine for the airport of Madrid Barajas, which is going to be published soon, and where all the companies operating at the airport will want to have a share. This will make our product known by all the airlines in the airport. Apart from this one, there are other magazines that can be found in kiosks regarding air transport services, and handling in particular where lots of companies offering their solutions are advertising. These include:
CHAPTER 5. MARKETING PLAN

- Ground Handling International
- Avion Revue
- Hispaviacion.es

Ground Handling International is the main magazine regarding handling in the world, and organizes annual meetings for the main actors in the sector. In order to gain further knowledge of the handling industry, we have considered attending one of their meetings once JANO development starts. One of them took place in Madrid on October 20th 2013. Some JANO’s representatives could attend periodically to improve the knowledge on the sector and to be able to establish contact with important people in this business.

Since RFID is the technology used in our business, the company will also be present in the site of RFID Journal (http://www.rfidjournal.com/), which talks about all kind of news concerning RFID technology. There is a special section dedicated to the RFID technology in aerospace industry, and this may help us spread an image of JANO as being an innovative product.

During the second phase, the international expansion, we shall go onto specialized aeronautics conventions and aerospace exhibitions such as Le Bourget in Paris, AirExpo in Toulouse or Farnborough in the UK.

5.3 Product Portfolio Analysis

JANO is a complete solution to several problems that our potential customers need to face. It has already been mentioned along this project that the different features of the system are customizable and some of them are optional. That is why the basic product Simply JANO is offered, then several products/services are given as additional packages. This can be easily seen hereunder.

5.3.1 Simply JANO Package

This is the basic product that is offered to the potential clients, and consists of:

- RFID printer: Printers provide the RFID tags to be attached to every piece of baggage with the coded information about the passenger ID, the bag (picture and weight) and the flight.

- RFID reader: Readers inform the baggage handler via a set of colors of whether a bag can be loaded or not, of its weight and the corresponding flight.

- JANO software for boarding: This software manages all the information. Its main functionality is to update the status of each bag (loadable/not loadable) when a passenger has pre-boarded, depending on the airline’s preferences.

- RFID tags: The tags contain the information about a specific passenger/baggage/flight. This Basic JANO is the standard version of our system, offering our main ideas and with a full functionality that can be offered to a customer. However, the following additional products give a broader functionality and many of the advantages of JANO can only be understood if they are implemented. These will be offered in packages, and starting from the Simply JANO product, an airline will be able to choose among the available packages, each of them offering a special feature.
5.3.2 Additional products and services

- **Connection Package**: This package includes the software needed to manage baggage transfers between flights connection. Once JANO is established in more than one airport, RFID tags will be available for connection flights. As baggage is downloaded from an aircraft, it shall be RFID scanned through our portable reader, and bags for connection flights can be easily separated speeding up the process when compared to bar codes. This package will mainly be offered to airlines operating in hubs, with lots of connections flights where bags need to be quickly ID’d and transported from one plane to another.

- **Vision Package**: This package adds a camera at the check in counters or kiosks. Adding a camera at the counter will permit to take a picture of the piece of baggage and add it to the database. With this option, should a bag get lost, the operator shall be able to access the database, find the corresponding picture and look for it. By doing it this way, we will not need to rely on passenger’s description of the bag.

- **Stats Package**: This package will include analysis of the data obtained by JANO that will be provided monthly to the airline in order to improve its passenger flows, boarding operations and baggage loading processes. Apart from the hardware and the functionality it provides, one of the main interests of JANO for an airline is to provide them with some key statistics that will include:
  - Passenger Flow. What time do passengers arrive in advance to the gate. Can we shorten the boarding time? What kind of passengers tend to get there earlier?
  - Number of baggage that are mishandled
  - Bags per passenger. Average number of checked bags per passenger.

- **Message Me Package**: For passengers that ask for this functionality, this service shall inform them of whether their bag has been successfully uploaded to the aircraft, and if it has made it to the next plane for flight transfers.

According to this portfolio of different products, and based on the previous operations plan, the content in this marketing plan itself and some information from the next HR and financial plans, a matrix can be built to study the costs of each kind of product, distributed in some different cost criteria. As it is not possible to define a standard price for each product because it heavily depends on the client, its volume, processes and potential savings, this analysis is performed for a whole year once the company is stable with all the products. That means that the costs that are included are referred to every existing client at that specific moment.

Based on that information and the price assumed for Iberia in Madrid-Barajas for the initial implementation (just the simply JANO package), the estimation for each product’s price could be done but always keeping in mind that it is just a rough calculation, and each client should be studied in detail to give an accurate price which could satisfy both parts. The prices for the first year are higher because of the costs for the implementation of the solutions. Those prices would be:
# Chapter 5. Marketing Plan

<table>
<thead>
<tr>
<th>Product</th>
<th>Price installation</th>
<th>Price each year (€/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simply JANO package</td>
<td>200,000 €</td>
<td>200,000 €</td>
</tr>
<tr>
<td>Vision package</td>
<td>25,000 €</td>
<td>0 €</td>
</tr>
<tr>
<td>Connection package</td>
<td>100,000 €</td>
<td>100,000 €</td>
</tr>
<tr>
<td>Stats package</td>
<td>0 €</td>
<td>35,000 €</td>
</tr>
<tr>
<td>Message me package</td>
<td>0 €</td>
<td>10,000 €</td>
</tr>
<tr>
<td>Support &amp; maintenance</td>
<td>100,000 € for simply JANO, depends on the packages purchased</td>
<td>100,000 € for simply JANO, depends on the packages purchased</td>
</tr>
<tr>
<td>RFID tags supply</td>
<td>Margin over supplier's price</td>
<td>Margin over supplier's price</td>
</tr>
</tbody>
</table>

Table 5.3: Prices of JANO packages
### Different products/Services

<table>
<thead>
<tr>
<th>Cost factors</th>
<th>Core JANO</th>
<th>Camera</th>
<th>JANO S/W for transfers</th>
<th>JANO Handling statistics Analysis</th>
<th>SMS Service for passengers</th>
<th>Support &amp; Maintenance</th>
<th>RFID tags supply</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office &amp; Company</td>
<td>83,881.02 €</td>
<td>10,179.89 €</td>
<td>53,533.34 €</td>
<td>29,923.07 €</td>
<td>18,724.32 €</td>
<td>40,043.18 €</td>
<td>92,021.09 €</td>
<td>328,305.91 €</td>
</tr>
<tr>
<td>Marketing</td>
<td>133,175.03 €</td>
<td>12,914.96 €</td>
<td>29,884.40 €</td>
<td>29,255.77 €</td>
<td>12,718.02 €</td>
<td>28,999.61 €</td>
<td>28,604.84 €</td>
<td>275,552.62 €</td>
</tr>
<tr>
<td>Procurement</td>
<td>415,307.24 €</td>
<td>92,783.69 €</td>
<td>126,381.63 €</td>
<td>22,024.12 €</td>
<td>3,822.97 €</td>
<td>408,277.60 €</td>
<td>2,626,088.90 €</td>
<td>3,694,606.16 €</td>
</tr>
<tr>
<td>Implementation</td>
<td>533,462.67 €</td>
<td>85,638.34 €</td>
<td>333,615.55 €</td>
<td>80,886.19 €</td>
<td>20,475.76 €</td>
<td>132,542.37 €</td>
<td>25,740.17 €</td>
<td>1,124,361.05 €</td>
</tr>
<tr>
<td>Personnel</td>
<td>484,433.99 €</td>
<td>44,589.08 €</td>
<td>280,549.42 €</td>
<td>176,301.65 €</td>
<td>33,614.87 €</td>
<td>344,236.64 €</td>
<td>170,679.93 €</td>
<td>1,535,005.57 €</td>
</tr>
<tr>
<td>After Sales</td>
<td>156,678.82 €</td>
<td>18,388.03 €</td>
<td>109,811.15 €</td>
<td>45,053.50 €</td>
<td>2,909.77 €</td>
<td>287,275.67 €</td>
<td>18,081.23 €</td>
<td>638,198.16 €</td>
</tr>
<tr>
<td>TOTAL COST</td>
<td>1,806,938.76 €</td>
<td>264,493.99 €</td>
<td>933,775.49 €</td>
<td>384,044.29 €</td>
<td>92,265.71 €</td>
<td>1,241,375.07 €</td>
<td>2,626,008.90 €</td>
<td>7,684,029.47 €</td>
</tr>
</tbody>
</table>

### Margins

<table>
<thead>
<tr>
<th>Margin (%)</th>
<th>75%</th>
<th>25%</th>
<th>65%</th>
<th>25%</th>
<th>25%</th>
<th>25%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Margin (€)</td>
<td>1,355,204.07 €</td>
<td>66,123.50 €</td>
<td>606,954.07 €</td>
<td>96,011.07 €</td>
<td>23,066.43 €</td>
<td>310,343.77 €</td>
</tr>
<tr>
<td>PRICE</td>
<td>3,162,342.84 €</td>
<td>330,617.49 €</td>
<td>1,540,729.57 €</td>
<td>480,055.37 €</td>
<td>1,511,718.84 €</td>
<td>3,701,420.19 €</td>
</tr>
</tbody>
</table>

**Figure 5.2: Product - Cost matrix.**

- **Cost criterion 1:** Percentage of costs from cost criterion 1 dedicated to product 1
- **Annual cost for the product 1 due to that cost criterion 1:** 83,881.02 € 26%
- **Percentage of costs for getting product 1 coming from the cost criterion 1:** 5%
The combination of different packages leads to a customized solution. In that case, a price analysis will be done, considering not only the economic benefit, but also the intangible improvements that JANO provides regarding passenger’s awareness (SMS, less baggage due delays, less mishandled baggage . . .).

5.4 Development, evolution and selection of corporate strategies and market-product strategies

In order to develop the strategy represented in Figure 5.3, the first step is to find a big customer in Spain. This is the market that we know the best and we want to start developing our product at our offices in San Fernando. JANO, being a Spanish company, shall target another Spanish company first, before trying to find other clients abroad. Once JANO has matured and has been installed in several airports in Spain, international expansion begins.
5.4. DEVELOPMENT, EVOLUTION AND SELECTION OF CORPORATE STRATEGIES
AND MARKET-PRODUCT STRATEGIES

In order to sell JANO two companies have to be convinced. The airline and the associated ground handling company. Our services are aimed at improving airlines’ processes and giving them a crucial advantage over the competition in today’s extremely tight and low margin air transportation market. However, dealing with baggage management as we are, this is not done directly by the airline, but subcontracted to a ground handling company. If we get to convince an airline of using JANO, it will press the handling company to use our services.

Figure 5.4: IAG logo

If the airline and the handling company are all part of the same group, this makes everything so much easier. This is the case for Iberia, and therefore the targeted company shall be the newly formed IAG in which Iberia takes part.

Despite the crisis, Spain is the fourth country in the world with the highest number of passengers transported by air, and the second in Europe, with 194.2 million passengers transported in 2012. Table 5.4 shows a table with the main airlines operating in Spain in 2012. This can be a good reason to encourage the expansion nationally.

<table>
<thead>
<tr>
<th>Company</th>
<th>Million passengers transported</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryanair</td>
<td>28.9</td>
<td>2%</td>
</tr>
<tr>
<td>Iberia</td>
<td>15.3</td>
<td>-15%</td>
</tr>
<tr>
<td>Vueling</td>
<td>13.7</td>
<td>20%</td>
</tr>
<tr>
<td>EasyJet</td>
<td>13.2</td>
<td>4%</td>
</tr>
<tr>
<td>Air Berlin</td>
<td>9.7</td>
<td>19%</td>
</tr>
<tr>
<td>Air Europa</td>
<td>8.1</td>
<td>-7%</td>
</tr>
<tr>
<td>Air Nostrum</td>
<td>4.5</td>
<td>-9%</td>
</tr>
<tr>
<td>Thomson</td>
<td>4.3</td>
<td>-1%</td>
</tr>
<tr>
<td>TUIFly</td>
<td>4.1</td>
<td>-3%</td>
</tr>
<tr>
<td>Thomas Cook</td>
<td>4</td>
<td>-3%</td>
</tr>
<tr>
<td>Lufthansa</td>
<td>3.3</td>
<td>7%</td>
</tr>
<tr>
<td>Monarch</td>
<td>3.3</td>
<td>-3%</td>
</tr>
<tr>
<td>Condor</td>
<td>2.8</td>
<td>2%</td>
</tr>
<tr>
<td>Transavia</td>
<td>2.6</td>
<td>7%</td>
</tr>
<tr>
<td>Jet2.com</td>
<td>2.5</td>
<td>18%</td>
</tr>
<tr>
<td>Others</td>
<td>39.6</td>
<td>-15%</td>
</tr>
</tbody>
</table>

Table 5.4: Ranking of airlines operating in Spain by number of passenger moved

IAG (International Airlines Group) is a newly formed group created on April 8th 2012 from the fusion of Iberia and BA (British Airways), each of them owning other airlines. Since we want to focus in the Spanish market during the first three years of operation, let us look at the main airlines within IAG operating in Spain.

These shall include:

- **Iberia**, a traditional airline, with over 15.3 million passengers transported in 2012, and
which uses Madrid - Barajas as a hub for connecting their short and mind range flights to their long range flights destined for the Americas.

- **Vueling**, 90.5% of which is owned by IAG. It is a hybrid company. While it offers low prices comparable to other low cost companies, it also offers their clients a better flying experience, comparable to traditional companies, such as a fidelity program or business class seats for selected flights. In 2012, it transported 13.7 million passengers in Spain. Its main hub is in Barcelona El Prat. It is one of the fastest growing companies in Europe right now opening more routes and acquiring more aircraft every year.

- **Air Nostrum**, 100% subsidiary of Iberia, it operates regional and European flights through their regional jets and counted 4.5 million passengers last year. They have an excellent service and a reputation for always being on time.

- **Iberia Express**, Low cost company created by Iberia for the short range routes minimizing costs. They are slowly acquiring all Iberia’s short and medium range routes, offering tickets at a lower price.

- **British Airways**, United Kingdom’s Flagship company, although with a relatively low market share in Spain. Their hub is in London- Heathrow, where it operates flights to most of the world.

- **BA City Flyer**, Subsidiary of British Airways. It operates regional and European flights in a similar way to Air Nostrum for Iberia. Its main presence in Spain is in the Islas Baleares, where lots of Brits tend to spend their holidays.

![Figure 5.5: Target airlines](image)

Adding up all the different airlines composing IAG, it is clearly the biggest cluster of airlines operating in Spain, with some 35 million passengers transported in 2012.

JANO aims at being implanted in hubs and there are only 2 hubs in Spain: Madrid Barajas and Barcelona El Prat. In both of them, the main airline is part of IAG. Iberia, in the case of Madrid, and Vueling, in the case of Barcelona. This means that if JANO is sold to IAG, it shall work with the main airlines at the 2 hubs in Spain.

The offered system can be adapted to both traditional and low cost companies. Targeting IAG, we can approach different types of airlines, all under the same group, operated by the same handling company, which will make the process of introducing JANO smoother than approaching other airlines with several handling companies depending on the airports where they operate, which might have different strategies.

Our second option regarding traditional airlines would be the Air Europa group. They also operate in a hub and spoke like mode and could benefit from our solution for connection flights.

Lastly, we cannot forget other low cost companies. Although they have greatly reduced their number of flights in the last couple of years because of the crisis, and because of Vueling increasing
5.4. DEVELOPMENT, EVOLUTION AND SELECTION OF CORPORATE STRATEGIES
AND MARKET-PRODUCT STRATEGIES

heavily their flights offer in Spain, they are still among the main airlines in Spain.

These include Ryanair, Easyjet and Air Berlin.

Summarizing:

JANO will target IAG in Spain first, in several steps or stages. The reason for proceeding in
several steps, one after another over a relatively large lapse of time, around a year, is to gradually
increase the workforce and give workers enough time to gain experience from an early stage to
put it into practice in the latter stages of the implantation. This will also make sure that we
do not need to face a huge investment at the beginning of our project, but it is more homogeneous.

The different expansion stages that have been identified are:

2014

**Stage 1. Madrid Barajas airport**

After the development of JANO has taken place, we will start installing our system at Madrid
Barajas airport only. Since it is the biggest airport and we have not installed a similar system
so far, we want to approach it slowly and once any potential problems have been solved and
everything is working fine, we shall proceed to Stage 2 in order to increase our target population.
The integration of JANO in Barajas will finish by the end of 2014.

2015

**Stage 2. Barcelona Málaga - Sevilla**

Once everything has been settled in Barajas, we shall expand our business to Barcelona, Málaga
and Sevilla. All of them have a high number of IAG flights.

Barcelona will give us the chance to reach Vueling’s hub, and it shall be an important challenge
for setting up the system, since in Barajas our main client was Iberia, a traditional company,
whereas now it shall be Vueling, more of a low cost carrier, which means the tune-up shall need
to be different. That is the reason why we do not wish to do it at the same time. We shall also
install JANO in Málaga and Sevilla which are also part of the main airports served by IAG in
Spain and are relatively close to each other, which will ease the logistics process, moving work
teams from one to the other in little time if necessary.

**Stage 3. Palma Mallorca Menorca - Ibiza**

Lastly, we shall extend JANO to the Islas Baleares. This is an strategic decision that will give
us visibility in a very fragmented market where competition is fierce and lots of companies are
fighting for increasing their market share. We believe that a company using JANO here could
offer a differentiated service that would increase customer satisfaction and could move other
customers to use our partner airline to travel to the islands.

With these, we will have reached all of Spain’s main airports operated by IAG by the end of 2015.

2016 and forward

Starting in 2016, our vision is clear. We have identified 3 lines of expansion.
1. Continuous increase of JANO Network in Spain. We shall cover all remaining airports where IAG serves.

2. European Expansion. We shall expand to other main airports in Europe for IAG, i.e. London Heathrow and start working on capturing other clients from One World Alliance all around Europe. In European routes, the most important destinations are Madrid, London and Madrid Paris. Bearing in mind that British Airways, part of IAG as well as Iberia, operates from London, London Heathrow should be the first international airport where we should expand. Other busy routes for IAG are Barcelona, Paris and Barcelona, London.

3. Global Expansion. Reach global destinations for IAG and One World airlines. Going out of the European Union, the busiest routes are Madrid-Moscow, Barcelona-Moscow, Madrid-New York, Madrid-Buenos Aires, Madrid-Geneva and Madrid-Lima. However the benefits and margins analysis has to be carefully done to compare the increasing of logistics cost in front of the benefit for both parties.

![One World airlines](image)

Figure 5.6: One World airlines

5.5 Environmental threats and opportunities

As we have analyzed in previous sections our business is not implemented at this moment at least in Spain so we are not considering any potential competitor threat on our environment. No RFID based solution is used nowadays in Spain, so we will be the first company offering this technology at a reasonable cost in a way that will allow us to install this system at any airport without needing to change current costly infrastructures.

5.5.1 Opportunities

- The biggest opportunity is the fact that the handling market in Spain is very concentrated in a few big companies. Therefore as soon as one company installs JANO, it shall give us a rather important market share.

- Synergies can be created, by expanding our network to the airports in which our client operates, where it is sure our client would be interested. That also will allow us to get new clients in the new destinations unifying logistics and warehouse costs.

- Economies of scale: as a result of our client managing lots of flights, its tags needs shall be enormous, allowing us to enjoy discount fees from suppliers in all the different international
airports. These economies of scale affect also at the implementation and the procurement of components to start the activity at the client (that is to say that Iberia Handling is not going to buy only one RFID reader but a lot of them to provide all his employees with the appropriated tools).

- Further synergies: As we will be concentrated in several very important airports and our main clients will permit us to have the biggest part of the market, JANO will be able to immediately solve any baggage loss or incorrect destiny definition by having information in the database about the most part of the flights that airport is managing in real time.

### 5.5.2 Threats

- The biggest threat is that JANO’s proposal is not perceived as an interesting approach by our launch customer. To mitigate that threat or risk, we shall assume a lower launch price with this client that makes JANO more attractive. It will also be critical to show and justify the cost savings in loss of slots, penalties for baggage mishandling and customer image that JANO will give. Also it is important to remark that the implementation and normal development of activity will not impact the current established processes of the client to get the customer’s confidence.

- Another threat is to have to fight with a potential competitor that develops the same business model than us regarding our results and get another big client. The processes of implementation and tuning- up are time-consuming, and it is not easy to change providers once everything has been established.

### 5.6 Market, environment, segmentation and positioning

At this point, we shall emphasize that currently there is no baggage management solution in Spain using RFID tags. While the T4 in Barajas has studied this technology and already counts with a system that could rely on RFID tags, so far no airline has shown interest in utilizing it, and everything is relying just on traditional bar codes. The main reason for this is the added cost of using these tags. However, we shall explain to them the added benefits of using RFID tags, and with our detailed case study we believe the added cost will be worth it. With the price of tags continuously going down, price cannot longer be a drawback when taking into account the benefits of this technology.

A study about the main airports where IAG operates in Spain has been conducted as is shown as follows:

For each airport, we shall identify the number of passengers transported in the previous year and the main companies operating there.

#### Madrid Barajas

With 45.2 million passengers transported in 2012, it is the main airport in Spain. Its traffic has been hit by the crisis, diminishing heavily over the last two years. However, it remains the main airport in the country, and it should maintain this position, as more routes to Asia are going to be fostered.
The main operator is Iberia, which uses Barajas as their hub for their flights to the Americas. The rest of IAG companies have an important position in Madrid Barajas, with 4 companies in the Top 10. The total number of passengers transported by IAG in 2012 stood at 21,900,567.

<table>
<thead>
<tr>
<th>Airline</th>
<th>Passengers</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iberia (IAG)</td>
<td>15,141,514</td>
<td>1</td>
</tr>
<tr>
<td>Air Europa</td>
<td>5,148,592</td>
<td>2</td>
</tr>
<tr>
<td>Ryanair</td>
<td>5,136,264</td>
<td>3</td>
</tr>
<tr>
<td>EasyJet</td>
<td>3,015,109</td>
<td>4</td>
</tr>
<tr>
<td>Air Nostrum (IAG)</td>
<td>2,793,068</td>
<td>5</td>
</tr>
<tr>
<td>Iberia Express (IAG)</td>
<td>2,200,326</td>
<td>6</td>
</tr>
<tr>
<td>Vueling Airlines (IAG)</td>
<td>1,273,838</td>
<td>7</td>
</tr>
<tr>
<td>British Airways (IAG)</td>
<td>424,482</td>
<td>12</td>
</tr>
<tr>
<td>BA City Flyer (IAG)</td>
<td>67,339</td>
<td>48</td>
</tr>
<tr>
<td><strong>TOTAL IAG</strong></td>
<td><strong>21,900,567</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 5.5: Passengers from IAG airlines in 2012 in Madrid-Barajas. Source: AENA

**Barcelona-El Prat**

The second biggest airport in Spain, but growing very rapidly, and potentially surpassing Madrid Barajas in total traffic in the near future.
5.6. MARKET, ENVIRONMENT, SEGMENTATION AND POSITIONING

The main operator here is Vueling, which uses El Prat as a hub for their Spanish and European operations and has seen its traffic growing strongly over the last years, especially after Spanair collapsed. Adding all the IAG companies, we obtain that for 2012 the total traffic for IAG was 12,966,563 passengers.

<table>
<thead>
<tr>
<th>Airline</th>
<th>Passengers</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vueling Airlines (IAG)</td>
<td>10,478,838</td>
<td>1</td>
</tr>
<tr>
<td>Ryanair</td>
<td>5,185,369</td>
<td>2</td>
</tr>
<tr>
<td>Easyjet</td>
<td>2,601,829</td>
<td>3</td>
</tr>
<tr>
<td>Iberia (IAG)</td>
<td>1,401,423</td>
<td>4</td>
</tr>
<tr>
<td>Lufthansa</td>
<td>1,322,895</td>
<td>5</td>
</tr>
<tr>
<td>British Airways (IAG)</td>
<td>737,336</td>
<td>8</td>
</tr>
<tr>
<td>Air Nostrum (IAG)</td>
<td>313,282</td>
<td>18</td>
</tr>
<tr>
<td>BA City Flyer (IAG)</td>
<td>35,684</td>
<td>69</td>
</tr>
<tr>
<td><strong>TOTAL IAG</strong></td>
<td><strong>12,966,563</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 5.6: Passengers from IAG airlines in 2012 in Barcelona-El Prat. Source:AENA

**Palma de Mallorca**

Palma’s airport is currently dominated by low cost companies, most of them offering flights for tourists coming to the island from Germany and the United Kingdom. The main operator in 2012 was low cost company Air Berlin, owned by Lufthansa. In the case of IAG the total traffic is more discrete with 1,767,061 passengers transported in 2012.
Table 5.7: Passengers from IAG airlines in 2012 in Palma de Mallorca. Source:AENA

Málaga

Málaga’s airport is also dominated by low cost companies, Ryanair being number one.

As for IAG, it is Vueling that has an important number of passengers in this airport, being the third most important operator. The rest of IAG companies have a more discrete position. The total traffic for IAG is 1,885,275 passengers.
5.6. MARKET, ENVIRONMENT, SEGMENTATION AND POSITIONING

### Málaga total traffic

<table>
<thead>
<tr>
<th>Airline</th>
<th>Passengers</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryanair</td>
<td>2,916,380</td>
<td>1</td>
</tr>
<tr>
<td>Easyjet</td>
<td>1,676,808</td>
<td>2</td>
</tr>
<tr>
<td>Vueling Airlines (IAG)</td>
<td>996,266</td>
<td>3</td>
</tr>
<tr>
<td>Monarch Airlines</td>
<td>619,867</td>
<td>4</td>
</tr>
<tr>
<td>Air Berlin</td>
<td>586,001</td>
<td>5</td>
</tr>
<tr>
<td>Iberia Express (IAG)</td>
<td>301,981</td>
<td>11</td>
</tr>
<tr>
<td>British Airways (IAG)</td>
<td>255,316</td>
<td>13</td>
</tr>
<tr>
<td>Air Nostrum (IAG)</td>
<td>253,157</td>
<td>14</td>
</tr>
<tr>
<td>BA City Flyer (IAG)</td>
<td>44,567</td>
<td>31</td>
</tr>
<tr>
<td>Iberia (IAG)</td>
<td>33,988</td>
<td>34</td>
</tr>
<tr>
<td>TOTAL IAG</td>
<td>1,885,275</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.8: Passengers from IAG airlines in 2012 in Málaga. Source:AENA

### Sevilla total traffic

<table>
<thead>
<tr>
<th>Airline</th>
<th>Passengers</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryanair</td>
<td>1,841,458</td>
<td>1</td>
</tr>
<tr>
<td>Vueling Airlines (IAG)</td>
<td>1,208,428</td>
<td>2</td>
</tr>
<tr>
<td>Iberia Express (IAG)</td>
<td>253,694</td>
<td>3</td>
</tr>
<tr>
<td>Air Nostrum (IAG)</td>
<td>239,480</td>
<td>4</td>
</tr>
<tr>
<td>Air Europa</td>
<td>229,040</td>
<td>5</td>
</tr>
<tr>
<td>Iberia (IAG)</td>
<td>54,126</td>
<td>9</td>
</tr>
<tr>
<td>TOTAL IAG</td>
<td>1,755,728</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.9: Passengers from IAG airlines in 2012 in Sevilla. Source:AENA

Sevilla

In Sevilla, although the main operator is still Ryanair, up to three IAG companies are in the top 5, which makes it an excellent choice to implant our system. The total traffic for IAG in 2012 was 1,755,728.

![Sevilla airport](image-url)
CHAPTER 5. MARKETING PLAN

Menorca

When it comes to Menorca, again Vueling is the main operator by far, and Air Nostrum is also a key actor in this airport. Iberia has a limited number of passengers since it substituted its routes by Iberia Express routes in the first months of the year 2012. Total IAG traffic stands at 864,532.

![Figure 5.12: Menorca airport](image)

<table>
<thead>
<tr>
<th>Airline</th>
<th>Passengers</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vueling Airlines (IAG)</td>
<td>575,619</td>
<td>1</td>
</tr>
<tr>
<td>Thomson Airways</td>
<td>322,686</td>
<td>2</td>
</tr>
<tr>
<td>Air Nostrum (IAG)</td>
<td>255,902</td>
<td>3</td>
</tr>
<tr>
<td>Ryanair</td>
<td>219,915</td>
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</tr>
<tr>
<td>Monarch Airlines</td>
<td>169,225</td>
<td>5</td>
</tr>
<tr>
<td>Iberia Express(IAG)</td>
<td>26,114</td>
<td>14</td>
</tr>
<tr>
<td>BA City Flyer (IAG)</td>
<td>6,196</td>
<td>34</td>
</tr>
<tr>
<td>Iberia (IAG)</td>
<td>701</td>
<td>47</td>
</tr>
<tr>
<td><strong>TOTAL IAG</strong></td>
<td><strong>864,532</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 5.10: Passengers from IAG airlines in 2012 in Menorca. Source:AENA

Ibiza

In Ibiza, IAG also has an importance presence, mainly due to Vueling. The total IAG traffic is 1,424,079 passengers for 2012.

![Figure 5.13: Ibiza airport](image)
5.6. MARKET, ENVIRONMENT, SEGMENTATION AND POSITIONING

<table>
<thead>
<tr>
<th>Airline</th>
<th>Passengers</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryanair</td>
<td>1,324,497</td>
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</tr>
<tr>
<td>Vueling Airlines (IAG)</td>
<td>937,708</td>
<td>2</td>
</tr>
<tr>
<td>Easyjet</td>
<td>465,457</td>
<td>3</td>
</tr>
<tr>
<td>Air Berlin</td>
<td>411,679</td>
<td>4</td>
</tr>
<tr>
<td>Thomson Airways</td>
<td>347,406</td>
<td>5</td>
</tr>
<tr>
<td>Air Nostrum (IAG)</td>
<td>341,534</td>
<td>6</td>
</tr>
<tr>
<td>Iberia Express (IAG)</td>
<td>66,714</td>
<td>14</td>
</tr>
<tr>
<td>BA City Flyer (IAG)</td>
<td>43,444</td>
<td>18</td>
</tr>
<tr>
<td>British Airways (IAG)</td>
<td>34,679</td>
<td>20</td>
</tr>
<tr>
<td><strong>TOTAL IAG</strong></td>
<td><strong>1,424,079</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 5.11: Passengers from IAG airlines in 2012 in Ibiza. Source: AENA

5.6.1 Targeted market segments

As already mentioned, different market segments are going to be targeted for different reasons:

- Ground handling companies (such as Iberia Handling, Groundforce...): these are the ones that will actually be buying JANO products, and will incorporate its advantages to the ground handling services they offer for a better performance.

- Airlines (such as Iberia (IAG), AirEuropa...): they are the ones that will be taking advantage of JANO. They will witness a decrease in the number of lost baggage and in the delay of its planes among others, and they will decrease their respective operational costs. As the benefits of JANO are huge, they will request it to their ground handling companies (that will then have to contact JANO). Regarding target segment, airlines can be divided in traditional ones and low cost companies. This division will be important when identifying which products of JANO portfolio they are interested in.

- Airline alliances: they are not a customer itself, but as they are a common business strategy among traditional airlines, they have to be considered as a segment.

- Passengers: they will also benefit from JANO features, but the problem is that they might not be really aware of what JANO is, or might not know if JANO is being used in a specific travel. As passengers will surely not pay more money for their plane tickets just because JANO is being used (at least at the beginning), and they do not have the sufficient power to “oblige” an airline to use JANO services, a little budget is going to be focused on them.

As a result of this segmentation, a product-market analysis has been performed. For the analysis only direct interests have been taken into account. This means that target segments may be indirectly benefited of several JANO functionalities, but only those which produce a direct benefit have been considered as interesting for each segment. The outcome of that analysis is the following product-market matrix.
CHAPTER 5. MARKETING PLAN

Figure 5.14: Product market matrix

The introduction should be through the handling company that offers its services to different airlines. The collaboration of those airlines to take part in the JANO processes is required because they will have to print and attach the RFID tags to the baggage at the check-in desk. They should not find big obstacles with those small modifications in their way of working because of three main reasons:

- Most important airlines have their own handling company or have some synergies with handling companies at least.
- There is not a big diversity of ground handling companies where to choose from by the airlines. It does not make sense to risk to suffer the impact of changing the handling company of most of the airports that maybe will not be prepared to give support instantly to that increase of demand.
- Our process is also focused on improving profitability, processes quality and customer image of the airline. Then if the airline’s profits are higher with JANO than they were before, it would be obvious to be eager to collaborate in order to install this new product.

5.7 Marketing Objectives

At this stage of the business, when the company is starting up, the main objectives of the marketing plan are the following:

- Getting recognition among handling companies and airlines.
- Spreading the idea that JANO is a solution to an existing problem.
- Reaching the targeted customer, which will be the starting point of an expansion phase. Getting them to request it to their ground handling services providers.

5.8 Information marketing management system

An effective marketing information system must allow continuous monitoring of the effect of every action of our marketing plan in the targeted audience of each of those actions (that most of the
times are the potential customers) defined along the strategy. Since the defined strategy has a short term approach (reaching the first big customer) and a medium term approach (expanding with an actual partner and increasing JANO recognition), impact on both approaches has to be estimated.

To estimate the direct impact of the marketing actions on the first big customer, the best way is to obtain reports of meetings and commercial visits performed by the sales manager and by subcontracted commercial agents. Contacts with the customer and its interest status must be tracked and compared along the first contacts, because this will be really helpful in order to have an idea of its wish to buy JANO.

Several time lapses will be measured and analyzed:

- As the point of contact of a ground handling company or an airline will surely be the commercial department, it will be interesting to measure the time lapse between the first contact with the customer until the “specialized” department (such as the one in charge of operations, logistics…) is reached.

- The time lapse between the first contact with the customer and the moment the contract is signed will also be a very useful information to estimate how long future negotiations could last.

- Apart from this information, all the duration of the different phases will be compared to the ones estimated in the operations plan and in this marketing plan.

Regarding the second approach of the strategy, the impact of the advertising campaign will be measured in different ways:

- Contacts established by new potential customers, taking also into account the way of contact (phone, web page, mail…)

- Continuous tracking of the questions asked about JANO (in the different ways of contact specified before), in order to be able to answer to the main issues in the next marketing actions.

- Recognition of JANO when a new potential customer is contacted by the company. The percentage of customers that already know what the system does, or the name of the company should increase as a result of the advertising campaign in the specialized means previously defined.

5.9 Budget and time for different elements

Marketing plan and strategy is focused mainly on the first year and the acquisition of one big customer. Nevertheless further efforts have to be made to give JANO a known image within the handling sector. As it has been considered in the marketing mix, different means such as magazines and subcontracted commercials will be used to promote JANO.

An estimation of the cost of these actions mainly linked to the place and promotion of the marketing mix is shown in next table. There, it has been considered that the web page cost, also linked with place and promotion, is considered in the operations plan budget.

Taking into account previous considerations, the total marketing plan cost will be around 75,000 €.

It has been considered that the sales process begins at the middle of the first year, when the project is still in the development phase. During this first year, the marketing actions will be
mainly focused on a direct approach through commercials and the sales manager. It will be along the second phase when advertising efforts will reinforce and promote JANO’s image.

<table>
<thead>
<tr>
<th>Advertising campaign</th>
<th>Ground handling magazine 6 full page insertions</th>
<th>38,100 €</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ground handling website banner 1 year</td>
<td>2,596 €</td>
</tr>
<tr>
<td></td>
<td>Avion revue 3 monthly insertion</td>
<td>9,000 €</td>
</tr>
<tr>
<td></td>
<td>hispaaviation 4 monthly insertions</td>
<td>12,000 €</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.rfidjournal.com">www.rfidjournal.com</a> 50000 impressions banner</td>
<td>1,500 €</td>
</tr>
<tr>
<td>Advertising cost</td>
<td></td>
<td>63,196 €</td>
</tr>
<tr>
<td>Subcontracted tasks</td>
<td>External commercial tasks (end of year 1) 100 hours estimated</td>
<td>7,000 €</td>
</tr>
<tr>
<td></td>
<td>Subcontracted tasks cost</td>
<td>7,000 €</td>
</tr>
<tr>
<td>Networking activities</td>
<td>Attendance to annual handling conference 2 members</td>
<td>4,000 €</td>
</tr>
<tr>
<td></td>
<td>Networking cost</td>
<td>4,000 €</td>
</tr>
<tr>
<td>Total marketing plan cost</td>
<td></td>
<td>74,196 €</td>
</tr>
</tbody>
</table>

Table 5.12: Marketing Plan budget
Chapter 6

Human Resources Plan
6.1 Legal Structure

Once we know how JANO is going to be like, we have to think about what type of company fits better to our needs. Analyzing and looking for differences between all of the different kinds, we decided to incorporate a Limited Liability Company (L.L.C. or S.L. in Spanish) because of the following aspects:

- **Easiness**: the easiness of incorporation of a L.L.C. is preferred, mostly because they do not have the strict filing requirements needed in other type of companies. It also allows an easy entrance and exit of partners.

- **Quickness**: compared to other type of companies, a L.L.C. is quickly incorporated.

- **Low initial investment**: the minimum share capital needed for incorporating a L.L.C. is 3,000 €. This is a low amount compared with the 60,000 € needed in a Spanish S.A.

- **Limited Liability of the partners**: the partners of a L.L.C. are liable for the debts of the company only up to the amount that they contributed to it. No personal assets can be reached by L.L.C.s creditors, with very few exceptions.

- **Closeness**: the L.L.C. is the typical type of company for family business. Being six partners and having a close trustworthy relationship, the management and control of the company will be easier.

6.2 JANO Organization

The human resources plan will establish the personnel needed to achieve the company’s objectives. It will deal with the number of employees, the organization structure, the economic terms and other working conditions.

JANO is an SME, and it shall be organized as such. Personnel needs are not very big, and therefore the organization scheme will not be complicated. In a small company such as JANO, it would be desirable that employees have a multi-task profile; this will create synergies within the Human Resources structure. This fact will be accentuated at the beginning, and as long as JANO remains a start-up, there will be some tasks that will not require a dedicated position. Based on those needs, profiles for vacancies will be defined along this chapter.

6.3 Organization Chart

As the company grows throughout the years, personnel needs will vary. Nevertheless, the upper levels of the organization will remain structured in a similar way, since they are those which manage the main areas in which the company will develop its business activity. All those structural departments will be managed by the CEO (Chief Executive Officer).

Those structural areas will be:

- **Development and integration**: containing the people working on the operating part of the business, development and customization of the software, hardware testing, installation and integration. This area will be mainly composed by blue-collars, software developers and engineers. Those engineers will also perform the analysis of the statistics of the system, when required by the after-sales department.

- **Commercial**: this department will contact customers, find out their needs and perform all the negotiation process. Also, this will be the department in charge of the marketing strategy implementation, subcontracting the design of advertisement campaigns and contracting the advertisement support.
- **Procurement**: this will be the department in charge of supplying hardware components and tags when needed, both during the installation and the after-sales process.

- **After-sales**: the after-sales department will manage complaints and requests from customers. As this is a managing department and not an operating one, the needs of personnel will be among the smallest of the company.

- **Facility and HR**: administrative tasks, purchase of goods for the office, subcontracting the cleaning and security services will be the main tasks for this department. Also, IT security, servers protection... will be among their tasks.

As the marketing strategy is developed and new customers and projects arise, personnel needs will increase. Analyzing the marketing strategy of the previous chapter, the headcount of each department along the following years has been estimated. The detailed analysis can be seen in Appendix 1, containing the projects that are being developed according to the marketing plan, and the estimation and timing of the new hiring. As a summary, the next figure contains the evolution of the number of persons of each profile within the company.

![Figure 6.1: Evolution of the headcount of each profile during the first five years](image)

Figure 6.1: Evolution of the headcount of each profile during the first five years
Figure 6.2: Headcount at the beginning of 2016 stands at 34 associates

Figure 6.2 shows the estimated number of persons of each profile that will be part of the organization by 2016. At this time, the first three stages identified in the Appendix 1 diagram shall be completed. This means the international expansion is about to begin.

The allocation of that workforce according to the structural departments previously defined is shown in Figure 6.3.
At this point it is important to be aware of the possible changes in the organizational chart when international projects start to be developed. The structure beyond level 2 will have to be multiplied and divided by countries or geographical areas. The analysis of such a structure at this point is not possible since it will highly depend on the projects’ location and size.

6.4 Vacancies, profiles and functions

At the beginning, the manager of each department will have to perform the functions described in the following table. When the number of employees that depend on him grows, he will be more dedicated to managing and organizing the department tasks. He will also be in charge of giving general training to the new employees that are being contracted, informing them of the company’s mission, vision and values, as well as how things are organized within it.

The different functions, profiles and retributions are explained hereunder. The number of positions reflects the headcount of figures 6.2 and 6.3.
## Table 6.1: Blue-collar profile, functions and salaries

<table>
<thead>
<tr>
<th>Profile</th>
<th>Number of employees</th>
</tr>
</thead>
</table>
| - High degree of technical education in systems integration  
- At least three years experience in the domain of RFID applied in control, tracking or management process  
- English: Conversation level (another language will be a plus)  
- IT skills in MS Office, including Outlook and Internet | 9 |

<table>
<thead>
<tr>
<th>Functions</th>
<th>Salary</th>
</tr>
</thead>
</table>
| - Transport all components needed to perform system installation  
- Integrate hardware and software elements at customers location  
- Perform scheduled maintenance of installed products (directly at customer’s location if needed)  
- Carry out quality tests of supplied components and write performance reports for the suppliers *(Shared task with Procurement)* | Worker |
| | 28,000 € |

## Table 6.2: Software programmer profile, functions and salaries

<table>
<thead>
<tr>
<th>Profile:</th>
<th>Number of employees</th>
</tr>
</thead>
</table>
| - At least a BS in computer science, with demonstrable skills in the following programming languages: C++, JAVA and Python  
- At least 3 years experience in the domain of software development  
- Good communication skills  
- English: Fluent in reading, writing and speaking | 3 |

<table>
<thead>
<tr>
<th>Functions</th>
<th>Salary</th>
</tr>
</thead>
</table>
| - Provide software customized solutions depending on customer’s requirements *(Shared task with Engineer)*  
- Test and refine JANO software  
- Perform hardware and software integration  
- Carry out software maintenance and updates | Worker |
| | 30,000 € |
### Profile
- A BS in electronic/electric industrial engineering with wide knowledge in RFID
- At least 3 years experience on any position related to RFID systems, development and implantation
- Excellent communication skills
- Ability to manage groups of people
- Assertiveness
- English: Negotiation level, and another language, French or German will be a plus
- Previous knowledge about aeronautic and airports process is a nice to have

### Functions
- Meet clients and advise them taking into account their needs *(Shared task with commercial employee)*
- Provide software customized solutions depending on customer’s requirements *(Shared task with software programmer)*
- Provide hardware customized solutions depending on customer’s requirements *(Shared task with procurement employees)*
- Create documentation: User’s manual and FAQ
- Perform acceptance tests of the products during implementation phase
- Perform basic training courses for customer at the end of implementation phase
- Analyze JANO statistics *(Shared task with after-sales employee)*
- Provide information to the software programmer related to improvement directions based on product performance
- Carry out unscheduled maintenance of installed products if it can’t be performed by blue-collar (directly at customer’s location if needed)

### Number of employees
<table>
<thead>
<tr>
<th>Number of employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
</tr>
</tbody>
</table>

### Salary

<table>
<thead>
<tr>
<th>Worker</th>
<th>Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>35,000 €</td>
<td>45,000 €</td>
</tr>
</tbody>
</table>

Table 6.3: Engineer profile, functions and salaries
**Commercial employee**

- High degree of technical education on commercial activities or international commerce
- At least three years experience in commercial activities related to aeronautics and RFID management and control processes
- English: Negotiation level (another language will be strongly desirable)
- Excellent customer focus
- National and international mobility

**Functions:**
- Carry out initial research of client’s situation
- Meet clients and advise them taking into account their needs (*Shared task with engineer*)
- Negotiate with customers and define contracts and clauses
- Perform marketing campaigns of JANO (*Shared task with advertising agency*)

<table>
<thead>
<tr>
<th>Number of employees</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salary</td>
<td>32,000 € 40,000 €</td>
</tr>
<tr>
<td>Worker</td>
<td>Manager</td>
</tr>
</tbody>
</table>

**Table 6.4: Commercial employee profile, functions and salaries**

**After-sales employee**

- High degree of technical education in commercial activities or international commerce
- At least 3 year experience in after sales domain in aeronautics sector managing big clients
- English: Negotiation level (another language is a nice to have)
- Proactive behaviour
- Completely customer oriented

**Functions**
- Analyze JANO statistics (*Shared task with engineer*)
- Manage incidents: Analyze clients’ incidents, turn them into specific tasks, and transfer them to appropriate worker (blue-collar, engineer or procurement employee)

<table>
<thead>
<tr>
<th>Number of employees</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salary</td>
<td>32,000 € 40,000 €</td>
</tr>
<tr>
<td>Worker</td>
<td>Manager</td>
</tr>
</tbody>
</table>

**Table 6.5: After-sales employee profile, functions and salaries**
### Facility & HR employee

<table>
<thead>
<tr>
<th>Profile</th>
<th>Number of employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Business Administration degree or similar. MBA for engineers</td>
<td>2</td>
</tr>
<tr>
<td>- At least 3 year experience in human resources department managing and empowering human factor or in facility management department</td>
<td></td>
</tr>
<tr>
<td>- Communication skills</td>
<td></td>
</tr>
<tr>
<td>- Motivated about the aeronautical sector</td>
<td></td>
</tr>
<tr>
<td>- English: Negotiation level</td>
<td></td>
</tr>
<tr>
<td>- Assertiveness</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Functions</th>
<th>Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Perform facility management</td>
<td>Worker</td>
</tr>
<tr>
<td>- Manage and control outsourced services</td>
<td>Manager</td>
</tr>
<tr>
<td>- Recruit new personnel</td>
<td>32,000 €</td>
</tr>
<tr>
<td>- Carry out general administration tasks: Invoices, wages payments...</td>
<td>40,000 €</td>
</tr>
<tr>
<td>- Arrange travels and meeting calls</td>
<td></td>
</tr>
</tbody>
</table>

Table 6.6: Facility and HR employee profile, functions and salaries

### Externalised services

<table>
<thead>
<tr>
<th>Profile</th>
<th>Number of employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Facility &amp; HR department shall control every outsourced service. The best alternatives will be chosen in function of proposals received and requirements established</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Functions</th>
<th>Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Cleaning services</td>
<td>Worker</td>
</tr>
<tr>
<td>- Office security and surveillance of the office</td>
<td>Manager</td>
</tr>
<tr>
<td>- Legal &amp; Financial management and consulting</td>
<td>-</td>
</tr>
<tr>
<td>- Translating services</td>
<td>-</td>
</tr>
<tr>
<td>- External training</td>
<td>-</td>
</tr>
<tr>
<td>- Shipping services</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 6.7: Externalized profile and functions
### 6.4. VACANCIES, PROFILES AND FUNCTIONS

#### Procurement Employee

<table>
<thead>
<tr>
<th>Profile</th>
<th>Number of employees</th>
</tr>
</thead>
</table>
| - BS in management/Industrial engineering with demonstrable knowledge of supply chain management  
- 3 year experience in similar positions  
- Excellent communication and negotiation skills  
- English: Negotiation level. Another language will be a plus  
- Assertiveness  
- Regional and national mobility | 4 |

<table>
<thead>
<tr>
<th>Functions</th>
<th>Salary</th>
</tr>
</thead>
</table>
| - Provide hardware customized solutions depending on customer’s requirements *(Shared task with engineer)*  
- Negotiation with suppliers and definition of the contracts and clauses  
- Order new components to suppliers and track shipping  
- Monitor and control warehouse  
- Perform quality tests of supplied components and reports for suppliers *(Shared task with blue-collar)* | Worker 32,000 €  
Manager 40,000 € |

#### IT Employee

<table>
<thead>
<tr>
<th>Profile</th>
<th>Number of employees</th>
</tr>
</thead>
</table>
| - BS in Informatics with strong knowledge in IT security systems and databases protection  
- At least 3 year experience in security systems or IT maintenance  
- Proactivity  
- English: Basic level(demonstrable) | 2 |

<table>
<thead>
<tr>
<th>Functions</th>
<th>Salary</th>
</tr>
</thead>
</table>
| - Manage company’s IT (including servers) security  
- Perform IT maintenance (webpage, e-mail, ...) | Worker 30,000 € |

Table 6.8: Procurement employee profile, functions and salaries

Table 6.9: IT employee profile, functions and salaries
CHAPTER 6. HUMAN RESOURCES PLAN

<table>
<thead>
<tr>
<th>Position</th>
<th>Profile</th>
<th>Number of employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO</td>
<td>- MS in Management/Industrial engineering with an MBA</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>- 5 year experience as a general manager</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Excellent communication and negotiation skills</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Knowledge of languages</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Functions</th>
<th>Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Manage employees taking deeply into account the company’s mission, vision and culture</td>
<td>Manager</td>
</tr>
<tr>
<td>- Choose the best strategy according to the situation and company’s profile</td>
<td></td>
</tr>
<tr>
<td>- Lead the company throughout its expansion</td>
<td>55,000 €</td>
</tr>
</tbody>
</table>

Table 6.10: CEO profile, functions and salaries

6.5 Contracting Policy

Personnel needs along the first years of the organization have been estimated. Nevertheless, that estimation depends on the projects and therefore, it can vary. The first step to establish a contracting policy is stating when and how new positions are going to be opened. This unleashes a whole contracting process that ends when the vacancy is filled.

JANO is not a very large organization and the manager’s visibility of the different departments’ workload should be good. When Level 2 managers (HO (Head Officer) development and installation, HO commercial, HO procurement, HO after-sales and HO facility and HR) perceive that there is going to be a need of an increase in personnel, the CEO has to be informed. After analyzing the needs jointly with the proper manager, the CEO can authorize the new position and inform HO facility and HR about the situation.

The profile of each position has been defined along this HR Plan. After the CEO confirmation of the position, HR employees meet with the HO of the pertinent department to agree on the characteristics of the profile and adequate them to the exact needs. HR department selects candidates and presents at least 3 of them to the manager who has asked for a new employee. The manager is the one who has the final decision about the selection. Whenever it is needed, a technical interview (performed by the manager or an employee selected by him) can be added to the process.

As general guidelines to add to the profiles previously defined, the following characteristics will be valued in every candidate before entering into the HR selection process:

- Medium English level at least.
- Three years of experience.
- Willingness to travel.

All those three characteristics are valuable to ensure that workers are prepared to fulfill company’s needs when international expansion begins.

Contracting policy establishes a strong rule that no candidate will be promoted or hindered, along the selection process, because of their gender. As for the disabled people, the policy establishes the same rule. Nevertheless, the contracting will be previously examined with the legal advisor (outsourced) to maximize the possible economic benefits for the company.
6.6 Professional development

While the company remains small, development paths, regarding positions, are not very variable. Position assignment highly depends on the profile of the employee, giving not as much importance as it will given in the future, to his career path inside the company. Nevertheless, this kind of organization gives every employee a wide vision of the business in all the areas. This means that when JANO starts growing, the first employees can easily become team leaders, related to their previous experience.

Development paths will be divided in managerial positions and operating positions.

Among managerial positions, those of the second level, the best chance of creating development opportunities among the employees, is allowing mobility from one position to another. This will keep the learning process going, and will increase the amount of employees knowing the tasks of each position. When international expansion begins, this will be a key strategic factor of the company since, as it has been said before, departments will be divided in geographical areas, and each one of them will need a prepared manager.

Also, employees devoted to administrative tasks, such as after-sales, procurement or facility management could be suitable for a managerial position if their profile is adequate. With time, the development path described in the previous paragraph could also be a possibility for them.

Within the operating profiles; software developers, engineers and blue-collars, the development path cannot be based on mobility. Technical work requires specific features that are not suitable for other positions within the company. For those workers, the development opportunities within the company would be becoming responsible for a team of workers with similar characteristics.

6.7 Training

Training courses will be offered and provided to the employees following the next process:

1. First of all, weak areas within the company must be identified.
2. Define short and long-term goals to be reached after the training is performed.
3. Search and/or develop training modules taking into account the employee or group of employees’ profiles.
4. Receive and analyze feedback from both the trainer and the trainee.

The number of hours dedicated to external training activities (managers’ internal training is not considered here) and its budget will be defined each year by the HR department. The definition and selection of the training activities will take into account the budget of the company and the needs of each department, examined in the previous process. Managers will request training activities based on the profile, position, salary and tasks of the employee.

The following course titles are just examples of what different employees may need during their career at the enterprise:

- CEO: Leadership, Administration . . .
- Blue-Collars: Approach to Madrid-Barajas Baggage Classification system, Workplace safety, Baggage handling approach . . .
- SW Developers: programming languages.
• Procurement & Commercial manager: How to deal with suppliers, Finding of suppliers through internet, RFID Technology market evolution, RFID technology and its applications...

6.8 Labor conditions

The definition of labor conditions must take into account the company’s particularities. At this moment JANO is a start-up which, along its first years of operations, expects to grow first nationally and then internationally. Through these stages, the workload will probably not be equally distributed, as it corresponds to a project-driven company. Contracts allowed in the Spanish labor law have been analyzed to find the best ones fitting these characteristics.

A combination of “Fixed contract” and “work and service contract” will fulfill the engagement needed to drive the company to success with the flexibility needed in the first years.

Even if every worker must be committed to the company, it is believed that a strongly engaged management team is needed during the first two years. Also, leaders of the department are expected to stay in the company for a large period of time to share the know-how they acquired from the beginning. Therefore, managers defined as HO each department will be contracted under a fixed contract after a test period. Also, the team manager position, if created, will be offered a fixed contract.

Even if a continuous growth has been planned both in projects and workload, flexibility on the costs must be ensured, especially during the first years of the company. To manage this requirement, it has been decided that employees (blue-collars, engineers...) with no-managerial or team leader position will be contracted under a “service and work contract”. To provide flexibility, contracts will be revised overtime in every case.

As a legal and administrative advisor will be subcontracted during the first days of JANO operations, he will give his advice to the company and provide the proper knowledge about the legal details concerning contracts.
Chapter 7

Financial Plan
7.1 Initial investment plan

Like every start-up, JANO needs an initial investment that makes it possible to begin the operations of the company and the development of the products until income exceeds costs. As it has been showed along this business plan; at first, there are no major purchases to be made during the first years of operation. The main investment of the company will be to be able to afford the development process of the reader and the system itself. On the other hand, the operation of the company is going to be managed primarily through rentals. The amount to invest will be determined taking into account the financial needs of the company, the number of shareholders and possible investors. Therefore, the information presented in this section is much related to the financing plan presented in the whole chapter and it is a summary focused on estimating the financing needs.

In order to establish which will be the overall initial amount needed in the first years, all estimated costs have been taken into account, always in accordance with the information given in the operations, marketing and human resources plans. Therefore, this calculation gathers information from the entire document.

Initial costs for the first few months will consist of:

- Salaries for the personnel and their associated training costs: it shall increase during the first three years, since the personnel needs are increasing greatly.

- Solution development costs: they shall only appear during the first year. Afterwards, starting from year 4, a share of the profits of the company shall be devoted to R&D aiming at developing new products and solutions in order to keep generating more business and gain more customers.

- Costs related to the office (rental, maintenance, security, equipment) and to updating and maintaining the website, the servers or the software licenses: these costs increase until 2015, plateauing from then on, without taking into account the purchase of fixed assets.

- Costs due to setting up the company and the legal and financial counseling services. These costs tend to remain constant in the following years. Once a contract is signed with the first client, new costs shall appear related to the operations such as procurement, integration, after-sales . . .

As a summary, the following tables show an estimation of these costs during the first five years of the company.

<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>Development</td>
<td>74,531</td>
<td>-</td>
<td>-</td>
<td>300,000</td>
<td>600,000</td>
</tr>
<tr>
<td>Car rental</td>
<td>910</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Parking</td>
<td>350</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fuel</td>
<td>273</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Meals</td>
<td>1,848</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Office rental for testing</td>
<td>2,100</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Procurement</td>
<td>19,050</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Other investments</td>
<td>-</td>
<td>-</td>
<td>300,000</td>
<td>600,000</td>
<td></td>
</tr>
<tr>
<td>Reader development</td>
<td>50,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 7.1: Cost associated to development
### Table 7.2: Costs associated to human resources (personnel)

<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>Personnel</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CEO</td>
<td>71,500 €</td>
<td>73,645 €</td>
<td>75,854 €</td>
<td>78,130 €</td>
<td>80,474 €</td>
</tr>
<tr>
<td>IT Manager</td>
<td>39,000 €</td>
<td>46,865 €</td>
<td>82,750 €</td>
<td>85,233 €</td>
<td>87,790 €</td>
</tr>
<tr>
<td>Procurement manager</td>
<td>52,000 €</td>
<td>53,560 €</td>
<td>55,167 €</td>
<td>56,822 €</td>
<td>58,526 €</td>
</tr>
<tr>
<td>Procurement worker</td>
<td>- €</td>
<td>49,989 €</td>
<td>132,400 €</td>
<td>159,101 €</td>
<td>187,285 €</td>
</tr>
<tr>
<td>Facility &amp; HR manager</td>
<td>52,000 €</td>
<td>53,560 €</td>
<td>55,167 €</td>
<td>56,822 €</td>
<td>58,526 €</td>
</tr>
<tr>
<td>Facility &amp; HR worker</td>
<td>- €</td>
<td>7,141 €</td>
<td>51,489 €</td>
<td>90,915 €</td>
<td>93,642 €</td>
</tr>
<tr>
<td>After sales manager</td>
<td>13,000 €</td>
<td>53,560 €</td>
<td>55,167 €</td>
<td>56,822 €</td>
<td>58,526 €</td>
</tr>
<tr>
<td>After sales worker</td>
<td>- €</td>
<td>7,141 €</td>
<td>44,133 €</td>
<td>68,186 €</td>
<td>93,642 €</td>
</tr>
<tr>
<td>Commercial manager</td>
<td>52,000 €</td>
<td>53,560 €</td>
<td>55,167 €</td>
<td>56,822 €</td>
<td>58,526 €</td>
</tr>
<tr>
<td>Commercial worker</td>
<td>- €</td>
<td>78,555 €</td>
<td>132,400 €</td>
<td>159,101 €</td>
<td>187,285 €</td>
</tr>
<tr>
<td>Engineer manager</td>
<td>58,500 €</td>
<td>60,255 €</td>
<td>62,067 €</td>
<td>63,925 €</td>
<td>65,842 €</td>
</tr>
<tr>
<td>Engineer worker</td>
<td>34,125 €</td>
<td>199,176 €</td>
<td>317,784 €</td>
<td>422,612 €</td>
<td>460,896 €</td>
</tr>
<tr>
<td>SW Developer worker</td>
<td>58,500 €</td>
<td>113,815 €</td>
<td>131,021 €</td>
<td>191,774 €</td>
<td>219,474 €</td>
</tr>
<tr>
<td>Blue-collar worker</td>
<td>36,400 €</td>
<td>234,325 €</td>
<td>395,822 €</td>
<td>517,078 €</td>
<td>573,559 €</td>
</tr>
</tbody>
</table>

These operating and development costs have been calculated taking into account the forecast explained in the next points of this chapter. Also, taking into account that information, integration, procurement and post-sales costs have been estimated:
### Initial Investment Plan

<table>
<thead>
<tr>
<th>Year</th>
<th>Procurement</th>
<th>Integration</th>
<th>After Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>90,250 €</td>
<td>344 €</td>
<td>- €</td>
</tr>
<tr>
<td>2015</td>
<td>1,130,037 €</td>
<td>95,808 €</td>
<td>28,671 €</td>
</tr>
<tr>
<td>2016</td>
<td>1,938,755 €</td>
<td>108,424 €</td>
<td>98,790 €</td>
</tr>
<tr>
<td>2017</td>
<td>2,337,391 €</td>
<td>276,241 €</td>
<td>42,564 €</td>
</tr>
<tr>
<td>2018</td>
<td>2,556,966 €</td>
<td>461,991 €</td>
<td>104,093 €</td>
</tr>
</tbody>
</table>

**Table 7.4: Summary of the costs associated to procurement, integration and after-sales**

At first sight, the procurement direct costs seem extremely high compared to costs related to integration and after sales. The reason for that is that here only direct costs are considered and are bigger for the procurement part that deals with a huge number of tags. Other costs such as personnel and other expenses will add up to the integration and after sales costs, increasing them to similar levels to procurement.

If only these costs were considered to establish JANO’s financial needs, the estimation would be much higher than real, since at a certain point JANO will start producing income and compensating those costs. The income estimation is done in the sales forecast section.

![Accumulated cost, accumulated income and accumulated cash flow during the first five years](image)

**Figure 7.1: Accumulated cost, accumulated income and accumulated cash flow during the first five years**

The previous image shows the accumulated cost and the accumulated income during the first two years. The difference is what is called the “accumulated cash flow”, shown as a light blue area which reflects the liquidity needs of the company and, therefore, the financing needs. As it can be seen in the image the “accumulated cash flow” is negative at the beginning. The most negative point are the real financial needs for the company. This happens in February, 2015 and the estimated value for the financing need is around 670,000 €. Based on that amount and considering the additional financial cost due to the repayment of the debt, the financial needs account for roughly **725,000 €** to cover the needs for the first two years. The initial financial plan is designed and shall be explained in the next section of this chapter.

According to that forecast and bearing in mind that any company wishing to keep its market share with innovative products must devote resources for this, it is decided to invest a great deal
of JANO’s profits in R&D, especially once the company has a stable income, starting in 2016. Also, a very important share of the company profits will be given as dividends for the investors that believed in the project, maintaining our initial equity and always enticing new investors for the project given our high dividends and potential.

Conditioned by the increasing personnel, due to the exponential increase in business of the company in the first years, and coinciding in time with the international expansion of the business with the signature of a contract with an airline in a big European airport, forecast for 2016, it is decided to acquire a property in which to establish our new bigger offices where our daily work shall take place, as well as a vehicle. Both the new office and vehicle shall be substituting the rental ones that have been used so far.

In order to afford this big investment, an additional investment of around 250,000 € is needed. Besides, the profits for the last years of the forecast shall be used for investments inside the company, searching for new cutting-edge products (smart suitcase, virtual reality applications,...) as well as for dividends and financial investments outside the company.

These financial investments shall offer a certain return that will counter the financial obligations from the debt during the last years of the forecast.

### 7.2 Financial Plan

As it has been stated in the previous point, financing needs are approximately 725,000 € during the first two years. Accumulated investments and accumulated profit generate a profile of debt where the most negative points is produced in July 2015. The value of the accumulated amount to cover is very similar in both points. The financing needs will be divided in current liabilities and noncurrent liabilities.

The noncurrent liabilities will be those assumed by the shareholders at the constitution of the company. These shareholders will be divided in two groups: JANO Founding Members and an interested partner company. JANO team is constituted by 6 members who will contribute with 20,000 € each in the moment of the foundation of the company. In parallel, a partner company with interests in the handling industry shall be contacted for support, contributing with 100,000 €. In conclusion, the structure of the noncurrent liabilities, which will form the initial equity of the company, will remain as follows:

<table>
<thead>
<tr>
<th>Owner</th>
<th>Amount</th>
<th>Percentage of the equity</th>
</tr>
</thead>
<tbody>
<tr>
<td>JANO Founding Members</td>
<td>120,000 €</td>
<td>54.5%</td>
</tr>
<tr>
<td>Partner company</td>
<td>100,000 €</td>
<td>45.5%</td>
</tr>
</tbody>
</table>

Table 7.5: Composition of the equity

As it is shown in table 7.5, this structure will ensure the control of the company by the founding members of JANO.

When analysing the possibility of getting external support from a partner company, several considerations have been done in order to identify the potential interested partners:

1. Big companies with interests in handling sector, but not their primary activity.
2. Companies with no current big interest in the air transportation market in Spain but with a potential interest in entering this market.
3. Companies that are not part of our initial scope of potential customers developed in the marketing plan. This consideration ensures the independence of the marketing plan from the interest of the shareholders.

Among the companies fulfilling those criteria, Acciona is considered very interesting as a potential partner. With interest in the handling industry outside Spain, they operate mainly in Germany; and it is independent from Iberia Handling and Groundforce, which are the main actors in the handling industry in Spain. Its business in ramp services in Spain is concentrated in the Islas Baleares. Also Swissport could be a possibility, but its direct competition with Iberia Handling both in Madrid and Barcelona made us discard them.

The rest of the financing needs will be fulfilled with a loan, which will be paid in 7 years with a lack of coverage of 1.5 years. The initial liabilities of JANO are composed of that. Considering fees payment in the costs estimated for the first 5 years, financing needs rise slightly and have been reviewed in consequence. After an iterative revision it has been estimated that the total amount of the loan will be 500,000 €.

The loan is estimated to be achieved in the next conditions:

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Loan condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening fee</td>
<td>1.5%</td>
</tr>
<tr>
<td>Study fee</td>
<td>0.5%</td>
</tr>
<tr>
<td>Interest</td>
<td>9.5%</td>
</tr>
<tr>
<td>Lack of coverage</td>
<td>18 months</td>
</tr>
<tr>
<td>Payment period</td>
<td>84 months</td>
</tr>
</tbody>
</table>

Table 7.6: Conditions of the initial loan

According to the previous table, the detailed payments JANO must face in those years are detailed in the next table. The amounts represented in the table shall be paid monthly.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>January</td>
<td>other months</td>
<td>Jan - Jun</td>
<td>Jul - Dec</td>
<td>every month</td>
<td>every month</td>
<td>every month</td>
</tr>
<tr>
<td>2014</td>
<td>13,795.77 €</td>
<td>3,795.77 €</td>
<td>3,795.77 €</td>
<td>9,659.60 €</td>
<td>9,659.60 €</td>
<td>9,659.60 €</td>
<td>9,659.60 €</td>
</tr>
</tbody>
</table>

Table 7.7: Amount to be paid monthly as financial costs of the initial loan
In conclusion, in the first year of operation, JANO’s financial structure will be organised as it is shown in next graphic.

The initial forecast has already been analyzed, and the following conclusion has been obtained:

It is not in the best interest strategically to accumulate all the company’s profits in cash. As a result of this key idea, starting from 2016, a series of important investments shall take place. First buying new fixed assets for the company and investing in R&D to maintain our technological advantage, and secondly carrying out financial investments outside the company.

The increase in personnel make it imperative to invest in a new office. This one should be bigger, able to host our associates, around 40 in the fifth year, and with extra available space, since the company shall not cease to grow in the short to mid term. By buying this new office, we shall be able to get rid of the rental of the older office. A company vehicle, substituting the previous rental car, shall be bought as well, in order to use it for meetings with customers and
to eventually transport material if necessary.

The company shall embark on these investments in September 2016, once the international expansion is a reality adding Heathrow to the airports JANO serves. The rationale for this is that at this time our economic future is guaranteed and we shall have an optimistic outlook, being able to face the remaining initial debt as well as this new debt that we are facing to bring these investments to reality.

The loan is obtained with these conditions according to the current market:

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Loan condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening fee</td>
<td>1.5%</td>
</tr>
<tr>
<td>Study fee</td>
<td>0.5%</td>
</tr>
<tr>
<td>Interest</td>
<td>7.9%</td>
</tr>
<tr>
<td>Lack of coverage</td>
<td>12 months</td>
</tr>
<tr>
<td>Payment period</td>
<td>48 months</td>
</tr>
</tbody>
</table>

Table 7.8: Conditions of the second loan

According to the previous table, the detailed payments that JANO must face in the 4 years are shown in the next table. The amounts represented in the table shall be paid monthly.

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>September</td>
<td>6,589.09 €</td>
<td>1,589.09 €</td>
<td>1,589.09 €</td>
<td>7,791.21 €</td>
</tr>
<tr>
<td>next months</td>
<td></td>
<td>Jan - Aug</td>
<td>Sep - Dec</td>
<td>every month</td>
</tr>
<tr>
<td>Oct - Dec</td>
<td></td>
<td>every month</td>
<td>every month</td>
<td></td>
</tr>
</tbody>
</table>

Table 7.9: Amount to be paid monthly as financial costs of the second loan

Figure 7.4: Payback of the second debt

The evolution of cash in the company is represented in the figure 7.5, only taking into account the received debt, the costs and the revenues already charged to the clients.
The first half of 2015 and the instant when the second loan is obtained are the moments where the cash and cash equivalents in the company fit the most the needs of the company. Anyway, the existence of trade receivables in the short-term guarantees that the company can permanently face the current liabilities.

### 7.3 Operating costs

Operating costs comprise all the costs defined in the first section of this chapter adding some extra costs related to the received debt. Since most of the operating costs have been detailed in the initial investment plan section and the financial costs are detailed in the previous one, only the costs related to the operation of the company are being explained here:

- **Procurement**: It refers to the procurement of RFID tags and other items necessary for the correct operation of JANO. Of course, the bigger the number and size of clients, the bigger the procurement costs. This value only refers to the cost of tags and other items, not taking into account the transportation of these tags to the clients or the integration of these elements. For starters, it is supposed that JANO pays up front for these components, bearing in mind that we are a start-up company with no reputation, but as time goes by, these conditions shall get better, and we shall be able to be given more days to pay.

- **Integration**: It refers to the direct cost of the different solutions’ implantation. They shall increase when the business becomes global, because of the higher cost in travels.

- **After sales**: It refers to the costs related to the maintenance services and the support of the system after integration. As for the other types of costs, they increase as the business becomes global. These costs are higher during the first years of the company (until 2016). The reason for this is that more periodic visits need to be performed in the beginning until the system reaches a more mature state with less problems and things to tune up.
7.4 Sales Forecast

The sales forecast is based on the strategy that was defined in the marketing plan, assuming incomes from national and international customers based on three aspects: integration and service of different products, procurement of RFID tags and other components, and after-sales services.

This estimation is based on the analysis of the pricing strategy explained both in the marketing plan and in appendix A. In that analysis, both the total number of passengers and the annual number of flights related to the airline at every airport are taken into account for establishing the final price. For all the customers reached in the first two years and additionally for Heathrow being the most important additional airport, the detailed sales forecast is shown below. Following with the expansion strategy, after the second year, international customer figures will be added to these sales numbers. As the calculation method for sales has been the same as the one used for national customers, the detailed figures are not shown in this chapter.

The tables show the three aspects mentioned in the previous paragraph and the different packages for sale. These revenues will be charged to the customer within 60 days as it is agreed, except in the cases any other information is explained. JANO would prefer to have shorter payment periods, but 60 days sound more realistic at first bearing in mind that we are dealing with large global companies.

- The procurement for integration section refers to the initial components that are necessary to set up the system in the airport. These revenues are the only ones that are going to be charged to the client when the system is first installed.
zech

### Table 7.10: Revenues coming from procurement for integration

- The recurrent procurement consists of the components (mainly RFID tags) which are given to the client regularly for its use for baggage identification.

### Table 7.11: Revenues coming from recurrent procurement

- The integration of Simply JANO is done according to the schedule assumed in the marketing plan. Initially, 20% of the integration cost is charged in advance, along with another 20% just when the installation is finished. The remaining 60% is charged within the following 60 days.
### Table 7.12: Revenues coming from simply JANO integration

- The payment of the connection package integration has exactly the same structure as Simply JANO. This product shall start being sold in 2018 once a solid network of airports of the same company are being served by JANO. It is only implemented in the largest airports as those are the ones where more transfer movements take place.

<table>
<thead>
<tr>
<th>Simply JANO integration</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barajas (Iberia)</td>
<td>€200,000</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
</tr>
<tr>
<td>Barajas (Others)</td>
<td>€-</td>
<td>€154,500</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
</tr>
<tr>
<td>El Prat</td>
<td>€-</td>
<td>€329,600</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
</tr>
<tr>
<td>Menorca</td>
<td>€-</td>
<td>€35,896</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
</tr>
<tr>
<td>Sevilla</td>
<td>€-</td>
<td>€31,673</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
</tr>
<tr>
<td>Mallorca</td>
<td>€-</td>
<td>€48,565</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
</tr>
<tr>
<td>Málaga</td>
<td>€-</td>
<td>€49,620</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
</tr>
<tr>
<td>Ibiza</td>
<td>€-</td>
<td>€54,899</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
</tr>
<tr>
<td>Heathrow</td>
<td>€-</td>
<td>€652,454</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
</tr>
<tr>
<td>Others</td>
<td>€-</td>
<td>€65,245</td>
<td>€62,012</td>
<td>€50,029</td>
<td>€-</td>
</tr>
</tbody>
</table>

### Table 7.13: Revenues coming from connection package integration

- Both the simply JANO and the connection package are giving revenues every year as a service once the integration has finished.

<table>
<thead>
<tr>
<th>Connection package integration</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barajas (Iberia)</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
<td>€112,551</td>
</tr>
<tr>
<td>Barajas (Others)</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
<td>€84,413</td>
</tr>
<tr>
<td>El Prat</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
<td>€180,081</td>
</tr>
<tr>
<td>Menorca</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
</tr>
<tr>
<td>Sevilla</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
</tr>
<tr>
<td>Mallorca</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
</tr>
<tr>
<td>Málaga</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
</tr>
<tr>
<td>Ibiza</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
</tr>
<tr>
<td>Heathrow</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
<td>€346,094</td>
</tr>
<tr>
<td>Others</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
<td>€-</td>
</tr>
</tbody>
</table>
The integration of the vision package will be done one year after Simply JANO launch as a complement to it. It is estimated to be applied in airports with high traffic (more than 500 flights in the peak month) because those are the ones with the highest amount of mishandled baggage and the need of identifying missing baggage. No additional charges will be applied for this package as it would be really working as a part of Simply JANO.

Table 7.14: Recurrent revenues coming from service of simply JANO

<table>
<thead>
<tr>
<th>Recurrent Simply JANO</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barajas (Iberia)</td>
<td>€206,000</td>
<td>€212,180</td>
<td>€218,545</td>
<td>€225,102</td>
<td></td>
</tr>
<tr>
<td>Barajas (Others)</td>
<td>€128,750</td>
<td>€159,135</td>
<td>€163,909</td>
<td>€168,826</td>
<td></td>
</tr>
<tr>
<td>El Prat</td>
<td>€192,267</td>
<td>€339,488</td>
<td>€349,673</td>
<td>€360,163</td>
<td></td>
</tr>
<tr>
<td>Menorca</td>
<td>€17,948</td>
<td>€36,972</td>
<td>€38,082</td>
<td>€39,224</td>
<td></td>
</tr>
<tr>
<td>Sevilla</td>
<td>€13,197</td>
<td>€32,623</td>
<td>€33,601</td>
<td>€34,609</td>
<td></td>
</tr>
<tr>
<td>Mallorca</td>
<td>€16,188</td>
<td>€50,021</td>
<td>€51,522</td>
<td>€53,068</td>
<td></td>
</tr>
<tr>
<td>Málaga</td>
<td>€12,405</td>
<td>€51,109</td>
<td>€52,642</td>
<td>€54,221</td>
<td></td>
</tr>
<tr>
<td>Ibiza</td>
<td>€9,150</td>
<td>€56,546</td>
<td>€58,242</td>
<td>€59,990</td>
<td></td>
</tr>
<tr>
<td>Heathrow</td>
<td>€163,113</td>
<td>€672,027</td>
<td>€692,188</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
</tr>
</tbody>
</table>

Table 7.15: Recurrent revenues coming from service of connection package

<table>
<thead>
<tr>
<th>Recurrent Connection Package</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barajas (Iberia)</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>€112,551</td>
</tr>
<tr>
<td>Barajas (Others)</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>€84,413</td>
</tr>
<tr>
<td>El Prat</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>€120,054</td>
</tr>
<tr>
<td>Menorca</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
</tr>
<tr>
<td>Sevilla</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
</tr>
<tr>
<td>Mallorca</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
</tr>
<tr>
<td>Málaga</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
</tr>
<tr>
<td>Ibiza</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
</tr>
<tr>
<td>Heathrow</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>€173,047</td>
</tr>
<tr>
<td>Others</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
</tr>
</tbody>
</table>
## 7.4. SALES FORECAST

### Table 7.16: Revenues coming from vision package integration

- Once the integration is finished, an additional payment shall be received annually in the concept of maintenance. In correspondence, JANO takes responsibility for fixing any possible problems with the components or related to the whole system. In this concept, there might also be some future developments of the software, if the changes to apply are not too time-consuming (to discuss in each case).

### Table 7.17: Revenues coming from maintenance of simply JANO
Table 7.18: Revenues coming from maintenance of connection package

- Although they cannot be considered maintenance, some other revenues could be included along with them as they are packages in use after the whole integration is finished. This is the case of the stats package, targeted for high-traffic airports since the service starts.

Table 7.19: Revenues coming from stats package

- It is also the case of the “Message me” package, for all airports because of its high value creation for the final client of the airline (passenger) for a really low price.
### 7.5. PROFIT AND LOSS FORECAST

The forecast of the profit and loss account for the first five years is shown in the next table. A vertical analysis is represented for the results of each year, allowing the comparative of the results from one year to another.

#### Table 7.20: Revenues coming from “message me” package

<table>
<thead>
<tr>
<th>'Message me' Package</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barajas (Iberia)</td>
<td>- €</td>
<td>6,867 €</td>
<td>10,609 €</td>
<td>10,927 €</td>
<td>11,255 €</td>
</tr>
<tr>
<td>Barajas (Others)</td>
<td>- €</td>
<td>5,150 €</td>
<td>7,957 €</td>
<td>8,195 €</td>
<td>8,441 €</td>
</tr>
<tr>
<td>El Prat</td>
<td>- €</td>
<td>9,613 €</td>
<td>16,974 €</td>
<td>17,484 €</td>
<td>18,008 €</td>
</tr>
<tr>
<td>Menorca</td>
<td>- €</td>
<td>876 €</td>
<td>1,804 €</td>
<td>1,858 €</td>
<td>1,913 €</td>
</tr>
<tr>
<td>Sevilla</td>
<td>- €</td>
<td>644 €</td>
<td>1,591 €</td>
<td>1,639 €</td>
<td>1,688 €</td>
</tr>
<tr>
<td>Mallorca</td>
<td>- €</td>
<td>790 €</td>
<td>2,440 €</td>
<td>2,513 €</td>
<td>2,589 €</td>
</tr>
<tr>
<td>Málaga</td>
<td>- €</td>
<td>605 €</td>
<td>2,493 €</td>
<td>2,568 €</td>
<td>2,645 €</td>
</tr>
<tr>
<td>Ibiza</td>
<td>- €</td>
<td>446 €</td>
<td>2,758 €</td>
<td>2,841 €</td>
<td>2,926 €</td>
</tr>
<tr>
<td>Heathrow</td>
<td>- €</td>
<td>- €</td>
<td>7,957 €</td>
<td>32,782 €</td>
<td>33,765 €</td>
</tr>
<tr>
<td>Others</td>
<td>- €</td>
<td>- €</td>
<td>- €</td>
<td>4,803 €</td>
<td>7,621 €</td>
</tr>
</tbody>
</table>

#### Table 7.21: Total sales forecast

<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>Procurement</td>
<td>101,550 €</td>
<td>1,326,873 €</td>
<td>2,305,356 €</td>
<td>2,834,447 €</td>
<td>3,122,025 €</td>
</tr>
<tr>
<td>Integration</td>
<td>200,000 €</td>
<td>1,300,656 €</td>
<td>1,977,064 €</td>
<td>1,887,552 €</td>
<td>3,109,729 €</td>
</tr>
<tr>
<td>After Sales</td>
<td>- €</td>
<td>406,630 €</td>
<td>844,192 €</td>
<td>1,399,801 €</td>
<td>1,725,350 €</td>
</tr>
</tbody>
</table>

The total sales figures, including national and international projects, are shown below:
CHAPTER 7. FINANCIAL PLAN

Revenues

<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>Procurement</td>
<td>101,550 €</td>
<td>1,326,873 €</td>
<td>2,306,356 €</td>
<td>2,834,476 €</td>
<td>3,122,025 €</td>
</tr>
<tr>
<td>After Sales</td>
<td>€ 0%</td>
<td>- € 0%</td>
<td>- € 0%</td>
<td>- € 0%</td>
<td>- € 0%</td>
</tr>
<tr>
<td>Simply JANO</td>
<td>301,550 €</td>
<td>1,021,046 €</td>
<td>1,896,525 €</td>
<td>2,389,534 €</td>
<td>3,034,159 €</td>
</tr>
<tr>
<td>Connection Package</td>
<td>- € 0%</td>
<td>- € 0%</td>
<td>- € 0%</td>
<td>- € 0%</td>
<td>- € 0%</td>
</tr>
<tr>
<td>Vision Package</td>
<td>- € 0%</td>
<td>- € 0%</td>
<td>- € 0%</td>
<td>- € 0%</td>
<td>- € 0%</td>
</tr>
<tr>
<td>SMS package</td>
<td>- € 0%</td>
<td>- € 0%</td>
<td>- € 0%</td>
<td>- € 0%</td>
<td>- € 0%</td>
</tr>
<tr>
<td>Stats Package</td>
<td>- € 0%</td>
<td>117,163 €</td>
<td>288,351 €</td>
<td>414,232 €</td>
<td>56,493 €</td>
</tr>
</tbody>
</table>

Cost of sales

<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>Procurement</td>
<td>140,053 €</td>
<td>1,888,135 €</td>
<td>3,147,431 €</td>
<td>4,572,239 €</td>
<td>5,958,630 €</td>
</tr>
<tr>
<td>Salaries</td>
<td>84,625 €</td>
<td>1,104,987 €</td>
<td>1,909,152 €</td>
<td>2,328,082 €</td>
<td>2,545,016 €</td>
</tr>
<tr>
<td>Others</td>
<td>45,000 €</td>
<td>654,950 €</td>
<td>1,023,046 €</td>
<td>1,297,242 €</td>
<td>1,444,433 €</td>
</tr>
</tbody>
</table>

Gross Profit

<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>Indirect Costs</td>
<td>193,778 €</td>
<td>573,929 €</td>
<td>778,623 €</td>
<td>916,185 €</td>
<td>995,331 €</td>
</tr>
<tr>
<td>Salaries</td>
<td>342,025 €</td>
<td>430,139 €</td>
<td>625,339 €</td>
<td>765,108 €</td>
<td>829,562 €</td>
</tr>
<tr>
<td>Others</td>
<td>51,753 €</td>
<td>141,731 €</td>
<td>153,284 €</td>
<td>150,050 €</td>
<td>155,769 €</td>
</tr>
</tbody>
</table>

EBITDA

<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>Accumulation</td>
<td>52,281 €</td>
<td>154,128 €</td>
<td>302,247 €</td>
<td>359,188 €</td>
<td>409,544 €</td>
</tr>
<tr>
<td>Depreciation</td>
<td>61,056 €</td>
<td>61,056 €</td>
<td>61,056 €</td>
<td>61,056 €</td>
<td>61,056 €</td>
</tr>
<tr>
<td>Others</td>
<td>1,171,046 €</td>
<td>1,311,046 €</td>
<td>1,451,046 €</td>
<td>1,591,046 €</td>
<td>1,731,046 €</td>
</tr>
</tbody>
</table>

EBIT

<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>Net Income</td>
<td>118,938 €</td>
<td>499,536 €</td>
<td>1,072,814 €</td>
<td>1,506,426 €</td>
<td>2,076,760 €</td>
</tr>
<tr>
<td>Income taxes</td>
<td>1,213,205 €</td>
<td>1,056,426 €</td>
<td>1,791,044 €</td>
<td>2,189,534 €</td>
<td>2,689,534 €</td>
</tr>
<tr>
<td>Income taxes to be paid</td>
<td>- € 0%</td>
<td>- € 0%</td>
<td>- € 0%</td>
<td>- € 0%</td>
<td>- € 0%</td>
</tr>
</tbody>
</table>

Table 7.22: Profit and Loss forecast

In the first year the company is expected to have negative profit because of the development of the product, which is the major investment of the company. In this first year as a start-up, sales figures will be small while costs of human resources and other costs will be bigger. Anyway, it is not a representative year.

For the next years, when the company is starting to stabilize, the vertical analysis shows small variations except for some facts that shall be highlighted:

1. Contribution of procurement and after-sales to the figures increases. This means that more profits are obtained from these sources with the corresponding increase in the cost of sales.

2. From the second year complex packages are introduced diminishing the weight of simply JANO in the total sales figures, broadening the portfolio of products that are being sold.

3. Indirect costs gradually decrease, enhancing the efficiency of the human resources of the company.

4. Gross profit, EBITDA, EBIT (Earnings Before Interest and Taxes) and net income constantly in relation to sales, except for the year 2017. It is mainly due to a strategic decision of the company, focused on airports in Europe and all over the world where the traffic of the final clients (IAG group) is not high. This results into higher costs for lower revenues, but it shall be compensated in the following years with the implementation of the connection package.
7.6 Cashflow forecast

The forecast of the cash flow for the first 5 years is shown in the next table:

<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>net income</td>
<td>156,487</td>
<td>-</td>
<td>327,451</td>
<td>651,843</td>
<td>651,011</td>
</tr>
<tr>
<td>depreciation and amortization</td>
<td>66,656</td>
<td>74,559</td>
<td>127,744</td>
<td>190,558</td>
<td>312,774</td>
</tr>
<tr>
<td>change in other operating assets and liabilities</td>
<td>184,675</td>
<td>397,318</td>
<td>372,057</td>
<td>-46,500</td>
<td>232,020</td>
</tr>
<tr>
<td>inventories</td>
<td>24,675</td>
<td>25,050</td>
<td>29,564</td>
<td>9,309</td>
<td>11,950</td>
</tr>
<tr>
<td>trade receivables</td>
<td>160,000</td>
<td>371,749</td>
<td>364,567</td>
<td>57,079</td>
<td>282,327</td>
</tr>
<tr>
<td>trade liabilities</td>
<td>-</td>
<td>-</td>
<td>15,480</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>cash provided by operating activities</td>
<td>274,506</td>
<td>-4,693</td>
<td>407,531</td>
<td>795,069</td>
<td>1,442,369</td>
</tr>
<tr>
<td>payments for investments and long-term financial assets</td>
<td>80,000</td>
<td>80,000</td>
<td>-</td>
<td>250,000</td>
<td>550,000</td>
</tr>
<tr>
<td>proceeds from long-term financial assets</td>
<td>8,000</td>
<td>6,000</td>
<td>-</td>
<td>15,000</td>
<td>50,000</td>
</tr>
<tr>
<td>purchases of intangible assets</td>
<td>305,481</td>
<td>-</td>
<td>-</td>
<td>300,000</td>
<td>600,000</td>
</tr>
<tr>
<td>cash used for investing activities</td>
<td>27,800</td>
<td>80,000</td>
<td>39,514</td>
<td>515,927</td>
<td>123,140</td>
</tr>
<tr>
<td>increase in financing liabilities</td>
<td>500,000</td>
<td>-</td>
<td>250,000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>repayment of financing liabilities</td>
<td>-</td>
<td>35,858</td>
<td>76,766</td>
<td>309,127</td>
<td>171,130</td>
</tr>
<tr>
<td>cash distribution to shareholders (dividends)</td>
<td>-</td>
<td>10,000</td>
<td>50,000</td>
<td>80,000</td>
<td>100,000</td>
</tr>
<tr>
<td>changes in capital and non-controlling interests</td>
<td>220,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>cash provided by financing activities</td>
<td>413,281</td>
<td>40,486</td>
<td>515,927</td>
<td>564,070</td>
<td>1,161,078</td>
</tr>
<tr>
<td>net increase in cash and cash equivalents</td>
<td>32,213</td>
<td>679</td>
<td>14,818</td>
<td>41,873</td>
<td>10,160</td>
</tr>
<tr>
<td>cash and cash equivalents at beginning of period</td>
<td>32,213</td>
<td>32,213</td>
<td>31,534</td>
<td>46,352</td>
<td>88,225</td>
</tr>
<tr>
<td>cash and cash equivalents at end of period</td>
<td>32,213</td>
<td>31,534</td>
<td>46,352</td>
<td>88,225</td>
<td>98,385</td>
</tr>
</tbody>
</table>

Table 7.23: Cashflow forecast

The net income evolutions have been described in the previous section and it is the responsible, along with the mandatory repayments of the assumed debts of the decisions taken for managing the cash of JANO. The cash is controlled to cover around the 30% of the short-term liabilities, being able to cover the whole 100% if needed by using some of the current assets.

Due to the excess of cash in the first year, it is invested in some financial assets, obtaining some finance incomes. These instruments should be sold in 2015 to be able to cover all the liquidity needs of the company before revenues overcome costs.
CHAPTER 7. FINANCIAL PLAN

The great results since 2016 are those which lead the company to purchase some tangible assets (with the help of the second debt) and decide a generous dividends policy which rewards the investors and possibly could attract more capital. From 2017 onward, instead of remaining in cash, the profits are invested in R&D and some financial instruments outside the company, to guarantee a long and successful future.

All those investments result in an increasing amount in the concept of depreciation and amortization.

7.7 Balance sheet forecast

The balance sheet forecast for the first five years is shown in the next table.

<table>
<thead>
<tr>
<th>Assets</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-current Assets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intangible assets</td>
<td>305,481 €</td>
<td>305,481 €</td>
<td>305,481 €</td>
<td>605,481 €</td>
<td>1,205,481 €</td>
</tr>
<tr>
<td>Property, plant and equipment</td>
<td>27,800 €</td>
<td>67,314 €</td>
<td>583,241 €</td>
<td>597,311 €</td>
<td>608,389 €</td>
</tr>
<tr>
<td>Intangible assets amortization</td>
<td>61,096 €</td>
<td>-</td>
<td>122,192 €</td>
<td>-</td>
<td>183,289 €</td>
</tr>
<tr>
<td>PPE depreciation</td>
<td>5,560 €</td>
<td>-</td>
<td>85,671 €</td>
<td>-</td>
<td>155,133 €</td>
</tr>
<tr>
<td>Other investments and other long-term financial assets</td>
<td>80,000 €</td>
<td>-</td>
<td>-</td>
<td>250,000 €</td>
<td>800,000 €</td>
</tr>
<tr>
<td>TOTAL Non Current Assets</td>
<td>346,625 €</td>
<td>231,580 €</td>
<td>619,763 €</td>
<td>993,274 €</td>
<td>1,841,578 €</td>
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<tr>
<td>Current Assets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inventory</td>
<td>24,675 €</td>
<td>49,725 €</td>
<td>79,289 €</td>
<td>88,597 €</td>
<td>100,548 €</td>
</tr>
<tr>
<td>Trade receivables</td>
<td>160,000 €</td>
<td>547,748 €</td>
<td>912,397 €</td>
<td>970,373 €</td>
<td>1,213,710 €</td>
</tr>
<tr>
<td>Cash and cash equivalents</td>
<td>32,213 €</td>
<td>31,534 €</td>
<td>46,352 €</td>
<td>88,225 €</td>
<td>98,385 €</td>
</tr>
<tr>
<td>TOTAL Current Assets</td>
<td>216,888 €</td>
<td>629,007 €</td>
<td>1,038,038 €</td>
<td>1,147,195 €</td>
<td>1,412,643 €</td>
</tr>
<tr>
<td>Total assets</td>
<td>563,513 €</td>
<td>860,587 €</td>
<td>1,657,801 €</td>
<td>2,140,469 €</td>
<td>3,254,221 €</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Equity and Liabilities</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital stock</td>
<td>220,000 €</td>
<td>220,000 €</td>
<td>220,000 €</td>
<td>220,000 €</td>
<td>220,000 €</td>
</tr>
<tr>
<td>Year results</td>
<td>156,487 €</td>
<td>327,451 €</td>
<td>651,843 €</td>
<td>651,011 €</td>
<td>1,361,615 €</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Reserves</td>
<td>-</td>
<td>-</td>
<td>160,965 €</td>
<td>762,808 €</td>
<td>1,333,819 €</td>
</tr>
<tr>
<td>Dividends</td>
<td>-</td>
<td>-</td>
<td>10,000 €</td>
<td>50,000 €</td>
<td>100,000 €</td>
</tr>
<tr>
<td>TOTAL Equity</td>
<td>63,513 €</td>
<td>380,965 €</td>
<td>982,808 €</td>
<td>1,553,819 €</td>
<td>2,815,434 €</td>
</tr>
<tr>
<td>Non-current Liabilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-term financing liabilities</td>
<td>464,142 €</td>
<td>387,356 €</td>
<td>528,230 €</td>
<td>357,099 €</td>
<td>213,907 €</td>
</tr>
<tr>
<td>TOTAL Non-current Liabilities</td>
<td>464,142 €</td>
<td>387,356 €</td>
<td>528,230 €</td>
<td>357,099 €</td>
<td>213,907 €</td>
</tr>
<tr>
<td>Current liabilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short-term financing liabilities</td>
<td>35,858 €</td>
<td>76,786 €</td>
<td>109,127 €</td>
<td>171,130 €</td>
<td>143,192 €</td>
</tr>
<tr>
<td>Trade liabilities</td>
<td>-</td>
<td>15,480 €</td>
<td>37,637 €</td>
<td>58,421 €</td>
<td>81,687 €</td>
</tr>
<tr>
<td>TOTAL Current Liabilities</td>
<td>35,858 €</td>
<td>91,266 €</td>
<td>146,763 €</td>
<td>229,551 €</td>
<td>224,879 €</td>
</tr>
<tr>
<td>TOTAL Liabilities</td>
<td>500,000 €</td>
<td>479,622 €</td>
<td>674,993 €</td>
<td>586,650 €</td>
<td>438,786 €</td>
</tr>
<tr>
<td>Total equity and liabilities</td>
<td>563,513 €</td>
<td>860,587 €</td>
<td>1,657,801 €</td>
<td>2,140,469 €</td>
<td>3,254,221 €</td>
</tr>
</tbody>
</table>

Table 7.24: Balance sheet forecast

From the assets side, fixed assets are composed by equipment on one hand and the developed reader and system on the other hand, considered as intangible assets since they are part of the know-how of the company. The investment in property plants and equipment grows every year because of the needs related to the growth in personnel (an special case is 2016 when the office and the car are bought). The development is important in the first year to have the products ready for commercializing as soon as possible to guarantee the present of JANO, and it is an area that is recovered when profits are enough to think about the future of the company.

Regarding current assets, it is shown how the inventory of the company rises following the need to attend more and more demand from old and new customers every year, and according to the policy of being able to cover one week for all clients in case of any contingencies with suppliers.
The trade receivables amount is really high from the beginning due to the long period for payment that JANO’s clients are allowed and it rises more and more every year because of the increasing customers and projects.

Cash and cash equivalents concept is controlled to be able to cover liquidity needs in the short-term but refusing to accumulate money making no use for it. The main destinies for cash are re-investing in JANO through intangible assets, investing outside the company in financial instruments and dealing dividends to reward the investors trust.

From the liabilities side it is shown how the financial liabilities change from a predominant long term in the first years to a final balanced scenario. The equity nevertheless increases every year as a consequence of the retained earnings. Trade liabilities increase as a consequence of the bargaining power of JANO with its suppliers, which at the beginning is considered to be small and even non-existing; but rising with the expansion of the company and the confidence of old providers.

### 7.8 Scenarios and Strategies

All information included in the previous sections of this chapter is calculated and analyzed considering a neutral scenario for the revenues and the costs of the company.

![Figure 7.8: Income, costs, monthly and accumulated cashflow for a neutral scenario](image)

In order to be prepared against some possible unexpected situations and deviations from this assumed scenario, some other environments are contemplated and some actions are studied to face the problems of the different situations.

- Any change related to an increase in the revenues because of a higher price or some additional clients or a higher air traffic demand in 2014 (most likely since 2013 statistics are really bad compared to previous years but it is not expected to keep on that trend) would result into a better scenario which could be considered as an optimistic forecast.
Some other variations leading to a better performance could be the achievement of smaller payment periods for clients or the shortening of the development phase, starting the sales sooner. Any of these situations would result into an increase in the revenues and, therefore, in the cash and equity in the following years. The financing needs would be lower and the investments both in property, plant and equipment; and in intangible assets could be assumed in a shorter term.

- An increase in the costs along with a decrease in the revenues would represent a pessimistic scenario.

To face it, JANO should assume a higher amount of debt initially, delay the acquisition of the
expensive equipment, such as the office or the vehicle for the company and also reduce the dividends in the first years of the study. A possible solution, which should be studied accurately, would be an increase in the prices to compensate the mentioned variations, but it should be adjusted very carefully in order not to lose any clients.

- If the development phase is delayed for several months, it would delay (chain effect) the start of the sales and the revenues, resulting into another pessimistic scenario.

Figure 7.11: Income, costs, monthly and accumulated cashflow for a second pessimistic scenario

In this case, accumulated costs increase for a longer period with no revenue to compensate them. Then, similar to the previous scenario, JANO should assume a higher amount of debt initially, delay the acquisition of the equipment, and delay giving out dividends until a more stable situation is reached to avoid a liquidity problem in the short-term. Some solutions for this situation might be the increase of the months of lack of coverage for the debt or the delay in the hiring process of new employees (mainly those related with sales and after sales).

- The expected scenario is based on several customers with different needs and requirements. If JANO did not manage to be installed in Heathrow, one of the most important clients, this would be probably the most critical scenario.
The development phase and the initial sales in Spain would not vary from the standard case, but once the middle of 2016 arrived, the strategy should be modified drastically to fit the new situation. A lower-pace growth should be defined for the company with a new set of objectives (large airports with new airlines with the standard product simply JANO, instead of small airports focused on the future connection package with current airlines). The increase in personnel should be reduced according to these new objectives; obviously the equipment and the second debt would be suppressed and the objective would be to get new contracts with other airlines. Desirable companies inside the same alliance as IAG (oneworld) such as American Airlines in their main hubs Miami or Chicago, Japan Airlines in Tokyo or Air Berlin in Mallorca or Berlin, but also any others such as Air Europa with some airports in Spain. Low-cost airlines could be another target market.

- If air traffic keeps on decreasing in the following years, JANO should be sold at a lower price.
7.9. FINANCIAL RATIOS

Figure 7.13: Income, costs, monthly and accumulated cashflow for a fourth pessimistic scenario

The main effect would be a decrease in the revenues, so prices should be increased compared to the amount of passengers of flights or simply assume less revenues. Anyway, it is a very improbable scenario and it would not represent a problem unless a very large diminution would be produced in a short term. In the long term it would imply a lower income but would never put the company in danger.

7.9 Financial ratios

As a summary of this financial plan, the following ratios are considered below.

<table>
<thead>
<tr>
<th>Profitability</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Margin</td>
<td>46.9%</td>
<td>37.8%</td>
<td>38.6%</td>
<td>35.3%</td>
<td>42.5%</td>
</tr>
<tr>
<td>EBITDA Margin</td>
<td>-17.3%</td>
<td>18.9%</td>
<td>23.4%</td>
<td>20.4%</td>
<td>30.0%</td>
</tr>
<tr>
<td>EBIT Margin</td>
<td>-39.4%</td>
<td>16.5%</td>
<td>20.9%</td>
<td>17.3%</td>
<td>26.1%</td>
</tr>
<tr>
<td>Net Income Margin</td>
<td>-51.9%</td>
<td>10.8%</td>
<td>12.7%</td>
<td>10.6%</td>
<td>17.1%</td>
</tr>
</tbody>
</table>

Table 7.25: Main profitability ratios

Regarding the profitability ratios, the results for the first year are negative (which was more or less expected) but they are not representative as it is the first step of the project when the company starts and the development phase takes place.

Gross margin near to 40% all years seems an optimistic forecast, but it can be explained because of the lack of direct competitors. This fact allows JANO to set a higher price for its packages, being able to recover the direct costs and to apply a generous margin.

The results are improved every year except for the fourth one. In 2017, JANO is mainly focused on small European and American airports for IAG group. Those airports imply a higher cost compared with the profit obtained. This situation is due to a strategic decision: the objective is to reach a large number of airports so that JANO can start selling in 2018 the connection package which would compensate this step back.
Table 7.26: Main ratios affecting payment period

The payment periods are really important when studying the liquidity of a company. In the case of JANO, the most pessimistic scenario (at the same time, the most realistic) has been assumed by considering initially that the payments to suppliers are done at the moment without any delay while the clients are paying within the largest legally accepted delay. It is a logical scenario for a start-up company dealing with very important and large clients such as airlines and suppliers that are leaders in their sectors.

Year by year, debtor days are reduced and creditor days are increased as JANO’s results make it more trustful for both clients and suppliers. Inventory days are stable according to the policies defined for tags (between one and two weeks stocks) and for other components (a larger period). Obviously, the results for the first year are not useful for any analysis because of the late start of the turnover.

Table 7.27: Main liquidity ratios

Both the current ratio and the acid test show that current assets are really exceeding current liabilities. This is because customers are paying within a long period (debtor days) so there is a big amount in the balance with the concept accounts receivable which cannot be moved to the non-current assets.

The results for the first years are conditioned by the initial distribution of the passive account where equity is low compared with liabilities, but the trend is inverted in 5 years as the equity in 2018 is more than 6 times the total liabilities.

Table 7.28: Main leverage ratios

The leverage ratios reflect the same evolution in the relation equity-liabilities stated before. The coverage ratios are negative in the first year as a result of the negative profit (not representative) but they get higher and higher in the following years while the interests are slightly reduced and the revenues are increased. The last year, those coverage ratios are negative as a consequence of the financial result that is positive, because the returns of the financial investments outside the company completely compensate the interests of the pending loans.
7.9. FINANCIAL RATIOS

<table>
<thead>
<tr>
<th>Returns</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROE</td>
<td>-0.41</td>
<td>1.47</td>
<td>0.96</td>
<td>0.51</td>
<td>0.62</td>
</tr>
<tr>
<td>ROA</td>
<td>-0.28</td>
<td>0.38</td>
<td>0.39</td>
<td>0.30</td>
<td>0.42</td>
</tr>
<tr>
<td>ROCE</td>
<td>-0.30</td>
<td>0.43</td>
<td>0.43</td>
<td>0.34</td>
<td>0.45</td>
</tr>
<tr>
<td>Free Cash Flow</td>
<td>35,858 €</td>
<td>86,786 €</td>
<td>90,873 €</td>
<td>-251,130 €</td>
<td>243,192 €</td>
</tr>
</tbody>
</table>

Table 7.29: Main return ratios

Finally, when evaluating the main returns, as said before, the first year is not helpful for this study. It is visible again the evolution in the passive distribution and the increasing revenues year by year. The reason for the continuous decrease in the ROE is the equity rising because of the reserves accumulation. On the other hand, the ROA and ROCE increase slowly: revenues are growing but total assets are growing too. The results in 2017 are different as a result of the strategy followed by the company for a later expansion.

Free cash flow (FCF) is a common measure in corporate finance to see how much cash flow from a company is available for distribution among the security holders without causing any issues to its day to day operations. There are some different ways for calculating this FCF but the most common one makes use of the net income, amortization and depreciation, the changes in working capital and capital expenditures [22].

For JANO, FCF could be increasing year by year, but it is slowed down because of the investments (either in intangible assets, equipment or outside the company).

Free cash flow can also be used to calculate some common parameters to evaluate some inversions; this is the case of the Net Present Value (NPV), the Internal Rate of Return (IRR) or the payback period.

For that, it is also necessary to estimate the WACC (Weighted Average Cost of Capital). It is calculated based on the distribution of the passive into equity or liabilities and based on the expected return from both contributors. For that, expected return from the liability side is valued according to the initial loan (around 10%) which has to be discounted with the applicable tax at the EBIT.

Expected return from private investors is more difficult to evaluate but can be estimated by taking into account similar start-up companies or some other companies working in that sector. Based on the free-risk rate of return, the premium over it and the parameter beta, it can be estimated at 15%.

Then, the final result for the WACC would be estimated around 10%. That would be the discount rate to consider the temporal value of money. In order to be more conservative and pessimistic and positioning in one of the worst cases, the discount rate that is going to be used is 15%.

The free cash flow was calculated for the forecasted years until 2018, but the estimation of the parameters mentioned implies the consideration of the so-called “Terminal Value”. Since cash flows cannot be estimated forever, they are calculated for a “high-growth period” and then the terminal value represents the value of an imaginary sale of the company just at the end of that period. For the calculation of this terminal value, growth is assumed to be already limited and very stable. Mathematically, it is estimated by dividing the FCF of the last period by the difference between the discount rate and the considered growth rate from then on.

As 2018 cannot be considered a stable stage yet, for those calculations, some more years are going to be roughly forecasted. Airports and airlines are limited in the world and after some years of service, if the project succeeded, the appearance of some competitors would be a fact.
so, the fast growth of the first steps is expected to be drastically stopped in the following years, assuming results will stabilize from 2021 on.

According to these premises and subtracting from the year 2014 the initial investment of 720,000 € which has to be compensated, the forecast of FCF used when calculating the IRR or the NPV is:

<table>
<thead>
<tr>
<th>Year</th>
<th>Net income</th>
<th>Amortization/Depreciation</th>
<th>Capital expenditures</th>
<th>Change in working capital</th>
<th>Free Cash Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>156,487 €</td>
<td>66,656 €</td>
<td>413,281 €</td>
<td>538,969 €</td>
<td>35,858 €</td>
</tr>
<tr>
<td>2015</td>
<td>-327,451 €</td>
<td>74,559 €</td>
<td>40,486 €</td>
<td>-355,710 €</td>
<td>86,786 €</td>
</tr>
<tr>
<td>2016</td>
<td>651,843 €</td>
<td>127,744 €</td>
<td>354,534 €</td>
<td>354,534 €</td>
<td>90,873 €</td>
</tr>
<tr>
<td>2017</td>
<td>651,011 €</td>
<td>190,558 €</td>
<td>26,370 €</td>
<td>26,370 €</td>
<td>-251,130 €</td>
</tr>
<tr>
<td>2018</td>
<td>1,361,615 €</td>
<td>312,774 €</td>
<td>1,161,078 €</td>
<td>270,119 €</td>
<td>243,192 €</td>
</tr>
<tr>
<td>2019</td>
<td>1,450,000 €</td>
<td>400,000 €</td>
<td>1,000,000 €</td>
<td>350,000 €</td>
<td>500,000 €</td>
</tr>
<tr>
<td>2020</td>
<td>1,500,000 €</td>
<td>500,000 €</td>
<td>1,050,000 €</td>
<td>400,000 €</td>
<td>550,000 €</td>
</tr>
<tr>
<td>2021</td>
<td>1,525,000 €</td>
<td>550,000 €</td>
<td>1,100,000 €</td>
<td>425,000 €</td>
<td>550,000 €</td>
</tr>
</tbody>
</table>

The payback of the initial investment would be a reality by mid 2019. It would be delayed to 2020 if the discount rate and the temporal value of money were taken into account. Including the consideration of the last terminal value, the NPV calculated for those cash flows is over 1.5 million € exactly 1,745,880.52 €. All this is influenced by the strong continuous re-investment in new facilities or new ideas, reinforcing the conception of a long-term project.

Although its calculation implies some inexactitudes and some assumptions that are not always known, the IRR is a common parameter related to an investment that is analyzed and taken into account when deciding to bid or not to bid in a project. When trying to sell a project to an investor it is common practice to give the reinvestment amounts the same returns in the following years as the main project. However, it is really strange the case when these expected returns actually occur once the project becomes a reality[23].

Anyway, the calculation of the IRR is done based on the previous data with a result of 34.25%. The evolutions of FCF, NPV of the investment and its return (by mean of IRR) are represented in figure 7.14.
Appendices
Appendix A

Cost of delays affecting airlines, and savings that JANQ can bring
The delay of a plane causes costs to the airline, affecting its profitability. Those costs can be classified as tactical costs and strategic costs, dependent one from each other.

- **Tactical costs**: They are encountered on the day of operations. They may be caused by a number of factors, such as technical problems, not proper environmental conditions, or the late arrival of a passenger to the boarding gate.

- **Strategic costs**: They are opportunity costs: They are defined as the possible loss of income due to the reallocation of the non-profitable slots caused by delays. Those costs are more complex to identify and quantify, because they can only be properly revealed by re-optimising the whole airline network in order to increase the utilization of the aircrafts.

For the calculation of those costs, Iberia and Iberia Handling in Barajas are taken as a reference.

First of all, strategic costs are going to be examined. The estimation of these costs is based on the so called buffers. A buffer in this context is the slot of time allocated in specific moments of the daily operations to mitigate the effects of unpredicted delays. The implementation of JANO would result in a reduction of the number of in-gate delays, and subsequently the reduction of the need of these buffers. The airline fleet could then be better used and efficiently distributed to be used more time in operation. Strategic costs are related to the potential profits that an airline is not producing because of the non-utilization of its fleet because of those buffers.

A first rough approach to the calculation of strategic costs, based on the following assumptions can be made:

- In 2010, in USA, the average cost per passenger and mile for an airline and a flight was 0.116$ considering full occupation.
- Constant inflation rate of 3% in the last and following years.
- €/$ exchange rate is set at 1.3567.
- Iberia departures in Madrid - Barajas are around 36,000 in 2013, involving 5.6 million people.
- The percentage of departures affected by delayed passengers whose baggage is in the aircraft is about 2%, resulting in an average takeoff delay of 15 minutes.
- Three categories of flights are considered: the percentage of flights in each category has been adjusted based on Iberia’s offer but also taking into account the forecast of passengers for 2013, which is about 5.6 millions.
- JANO could reduce up to 20% the incidences detailed above for regional and medium categories, and the average time of delay up to 50% for all of them. The incidence on the long range category is a bit lower due to the use of standardized containers in those flights.
- Incidences are supposed to affect in the same way (and proportion) all flights, independently of their type.

As already said, Iberia offer is divided into three different kinds of flights: regional, medium and long range. A standard flight is defined for each sector to be used as a reference. The chosen ones are Barcelona, Kiev and Buenos Aires, all of them departing from Madrid-Barajas. For each one of them certain magnitudes are being defined to be able to calculate the cost and the revenue per minute and then the profit. As a result we can estimate the money that the company is not invoicing because of having the plane on ground.
• Regional: The reference is a flight from Madrid to Barcelona in an A319 or an A320, with an average capacity of 125 passengers and an average ticket price of 80 €. Considering a cost of 0.07 € per passenger and kilometer, one hour and a half to be able to complete the route, occupation around 80% and taking into account that the 55% of the total number of flights of Iberia are included in this category, the final losses due to take-off delays are almost 300,000 €.

• Medium: The reference is a flight from Madrid to Kiev, by using an A320, and A321 or and A330, with an average capacity of 220 passengers and a ticket price of 600 €. Considering a cost of 0.065 € per passenger and kilometer, four hours to be able to complete the route, occupation around 85% and that the 30% of the total flights of Iberia are included in this category; the final losses due to take-off delays are 1 million €.

• Long range: The reference is a flight from Madrid to Buenos Aires in an A340, with an average capacity of 340 passengers and a ticket price of 1,500 €. Considering a cost of 0.06 € per passenger and kilometer, twelve hours to complete the route, occupation around 88% and that the 15% of the total flights of Iberia are included in this category; the final losses due to take-off delays are 600,000 €.

<table>
<thead>
<tr>
<th>Type of flight</th>
<th>Regional</th>
<th>Medium</th>
<th>Long-Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Origin</td>
<td>Madrid</td>
<td>Madrid</td>
<td>Madrid</td>
</tr>
<tr>
<td>Destination</td>
<td>Barcelona</td>
<td>Kiev</td>
<td>Buenos Aires</td>
</tr>
<tr>
<td>Aircraft models</td>
<td>A319/A320</td>
<td>A320/A321/A330</td>
<td>A340</td>
</tr>
<tr>
<td>Cost (€/RPK)</td>
<td>0.07</td>
<td>0.065</td>
<td>0.06</td>
</tr>
<tr>
<td>Average max number of passengers</td>
<td>125</td>
<td>220</td>
<td>340</td>
</tr>
<tr>
<td>Average ticket price (€)</td>
<td>80 €</td>
<td>600 €</td>
<td>1,500 €</td>
</tr>
<tr>
<td>Average distance (km)</td>
<td>500</td>
<td>2,500</td>
<td>10,000</td>
</tr>
<tr>
<td>Average time on route (min)</td>
<td>90</td>
<td>240</td>
<td>720</td>
</tr>
<tr>
<td>Occupation rate</td>
<td>80%</td>
<td>85%</td>
<td>88%</td>
</tr>
<tr>
<td>% Flights</td>
<td>55%</td>
<td>30%</td>
<td>15%</td>
</tr>
<tr>
<td>Average income per flight (€)</td>
<td>8,000 €</td>
<td>112,200 €</td>
<td>448,800 €</td>
</tr>
<tr>
<td>Average cost per flight (€)</td>
<td>3,500 €</td>
<td>30,388 €</td>
<td>179,520 €</td>
</tr>
<tr>
<td>Profit per minute (€/min)</td>
<td>50</td>
<td>341</td>
<td>374</td>
</tr>
<tr>
<td>Losses by incidence (€)</td>
<td>750 €</td>
<td>5,113 €</td>
<td>5,610 €</td>
</tr>
<tr>
<td>Annual losses by incidences (€)</td>
<td>297,000 €</td>
<td>1,104,469 €</td>
<td>605,880 €</td>
</tr>
<tr>
<td>Annual losses avoided by JANO (€)</td>
<td>178,200 €</td>
<td>662,681 €</td>
<td>302,940 €</td>
</tr>
</tbody>
</table>

Table A.1: Total strategic delay cost for Iberia in Barajas in 2014

The estimated losses derived from delayed flights caused by passengers that do not board because they arrive late to the boarding gate and have their baggage checked are a bit higher than 2 million € annually. Assuming the reduction of the incidences that JANO could bring and the lower duration of them, the initial savings in the first year could be near to 1 million €, in strategic costs.

In this second section tactical costs are going to be examined. They are calculated based on studies with data collected from airlines and from airports considered in this project (e.g Easyjet, Iberia, Lufthansa and Madrid Barajas, Málaga, London Heathrow)[24] [25].

Additional assumptions and comments:

• Reactionary costs are considered. Those costs refer to the fact that original delays caused in specific aircrafts cause “knock-on” effects in the rest of the network of subsequent flights.
Delay costs depend on the phase of the flight in which they occur. The reports that have been used distinguish between: At-gate, taxi, cruise extension and arrival management. As JANO will reduce the time caused by the management and removal of the baggage of late or non-arriving passengers, the phase to be considered is At-gate.

Tactical costs calculations took into account: Fuel burn costs, maintenance costs, flight and cabin crew salaries and expenses, handling agent penalties, airport charges and cost of passenger delay to airlines.

The following data is extracted from the reports, distinguishing between three types of planes to see the differences between regional (Airbus A320), medium (Boeing 757-200) and long-range travels (Boeing 767-300), as already done in the first part of this appendix. The following table shows tactical costs due to a 15-minute delay.

<table>
<thead>
<tr>
<th>Type of Plane</th>
<th>2010 Basis</th>
<th>2014 Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airbus A320</td>
<td>380 €</td>
<td>428 €</td>
</tr>
<tr>
<td>Boeing 757 (757-200)</td>
<td>470 €</td>
<td>529 €</td>
</tr>
<tr>
<td>Boeing 767 (767-300)</td>
<td>690 €</td>
<td>777 €</td>
</tr>
</tbody>
</table>

Table A.2: 15 minutes delay tactical costs

Based on the assumptions presented in the strategic cost estimation and on the ones of this second part, the next table, containing the total delay cost of the tactical part for Iberia in Barajas airport is constructed:

<table>
<thead>
<tr>
<th>Type of Flight</th>
<th>Number of Flights</th>
<th>Delayed Flights</th>
<th>15 min Delay Cost</th>
<th>Cost of Delays</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional</td>
<td>19,800</td>
<td>396</td>
<td>428 €</td>
<td>169,488 €</td>
</tr>
<tr>
<td>Medium</td>
<td>10,800</td>
<td>216</td>
<td>529 €</td>
<td>114,264 €</td>
</tr>
<tr>
<td>Long-Range</td>
<td>5,400</td>
<td>108</td>
<td>777 €</td>
<td>83,916 €</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td>367,668 €</td>
</tr>
</tbody>
</table>

Table A.3: Total tactical delay cost for Iberia in Barajas in 2014

Assuming the same reduction of these incidences and the lower duration of them, the initial savings in tactical costs in the first year when using JANO are around 187,000 €.

Finally, some costs savings will be achieved by reducing the amount of incidences related to mishandled baggage. For that, we should take into account some other assumptions:

- The global average mishandled baggage is 8.83 per 1,000 passengers, and this fact results in a cost for the industry of 2.6 billion dollars, 0.88$ per passenger.
- Mishandled baggage of Iberia in Madrid is currently 50% over the average of the industry.
- 25% of the mishandled baggage is not correctly managed because of some problems during the load of the elements to the plane.
- JANO’s effect on mishandled baggage is to reduce 40% these situations when loading and subsequently the costs involved by them.

When looking at the mishandled baggage problem, the cost of this issue for Iberia can be estimated based on the global statistics, applying a correction factor (+50%) because it is known that Madrid-Barajas is over the average (10 vs. 8.83 bags per 1,000 passengers) and additionally it is very dependent on the size of the companies, because most of those bags are affected by the
transfers from one flight to another. As Iberia is the most important traditional (non low-cost) company in Madrid and the one with the most connections, it is assumed to be over that average.

<table>
<thead>
<tr>
<th></th>
<th>Iberia Barajas</th>
<th>Globally</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average mishandled bags per 1000 pax</td>
<td>13.25</td>
<td>8.83</td>
</tr>
<tr>
<td>Average cost per passenger</td>
<td>0.97 €</td>
<td>0.65 €</td>
</tr>
<tr>
<td>Annual passengers</td>
<td>5,615,280</td>
<td>2,950,000,000</td>
</tr>
<tr>
<td>Annual cost mishandled bags</td>
<td>5,471,800 €</td>
<td>1,916,414,830 €</td>
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<tr>
<td>Annual cost mishandled bags (due to load issues)</td>
<td>1,367,950 €</td>
<td>479,103,708 €</td>
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<td>Annual losses avoided by JANO (€)</td>
<td>547,180 €</td>
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Table A.4: Mishandled bags cost savings for Iberia in Barajas in 2014

The estimated cost of mishandled baggage for Iberia in Barajas is almost 5.5 million €. Applying the consideration that JANO only affects loading problems (40% reduction) and this kind of problems is responsible for 25% of the cases, the initial savings when using JANO are 550,000 €.

These results are calculated for the first step of the implantation of the solution, one year after the implementation in Madrid Barajas. It is supposed that the results in the following years would be affected in a positive way because of the learning and the experience achieved. In a further future, if JANO is serving for the same company in a several different airports, the solution for the mishandled baggage in transfers could be applied, with the subsequent costs associated being reduced too.

In this case, the initial prices shall be set at:

- 200,000 € once the customization and implementation of the solution to the final client is accomplished.
- 300,000 €/year while JANO is in service. This price would include maintenance tasks (not including the price of additional components or components working incorrectly once the guarantee cannot be applied).
- Procurement of components with a 20% margin for JANO.

The price for other companies and airports can be estimated by extrapolation of these results based on the amount of passengers. Some other considerations should be taken into account for a more accurate estimation such as some different additional margins for other airports, mainly because of the costs of transport of components or workers.

Additionally, JANO could provide some advantages like the improvement of the image of a company because of its better performance or the SMS service to the final passenger to confirm that his bag is correctly loaded into the aircraft. These advantages are not quantifiable but they will increase the satisfaction of the customers of JANO’s clients and, therefore, their revenues.
Appendix B

Hiring plan
Appendix C

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<td>AENA</td>
<td>Aeropuertos Españoles y Navegación Aérea</td>
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<tr>
<td>AIDC</td>
<td>Automatic Information Data Capture</td>
</tr>
<tr>
<td>BARA</td>
<td>Board of Airline Representatives Australia</td>
</tr>
<tr>
<td>BA</td>
<td>British Airways</td>
</tr>
<tr>
<td>BRS</td>
<td>Baggage Reconciliation System</td>
</tr>
<tr>
<td>BS</td>
<td>Bachelor of Science</td>
</tr>
<tr>
<td>CDTI</td>
<td>Center for the Industrial Technological Development</td>
</tr>
<tr>
<td>CE</td>
<td>Conformité Européenne</td>
</tr>
<tr>
<td>CENIT</td>
<td>National Strategic Consortia for Technical Research</td>
</tr>
<tr>
<td>CEO</td>
<td>Chief Executive Officer</td>
</tr>
<tr>
<td>CIS</td>
<td>Centro de Investigaciones Sociológicas</td>
</tr>
<tr>
<td>CCOO</td>
<td>Comisiones Obreras</td>
</tr>
<tr>
<td>CPI</td>
<td>Consumer Price Index</td>
</tr>
<tr>
<td>DE</td>
<td>Deutschland (Germany)</td>
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<tr>
<td>EBITDA</td>
<td>Earnings Before Interests, Taxes, Depreciation &amp; Amortization</td>
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<tr>
<td>EBIT</td>
<td>Earnings Before Interests &amp; Taxes</td>
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<tr>
<td>EBT</td>
<td>Empresa de Base Tecnológica</td>
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<tr>
<td>EC</td>
<td>European Community</td>
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<tr>
<td>EOI</td>
<td>Escuela de Organización Industrial</td>
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<tr>
<td>ETSI</td>
<td>European Telecommunications Standards Institute</td>
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<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>FAQ</td>
<td>Frequently Asked Questions</td>
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<tr>
<td>FCC</td>
<td>Federal Communication Commission</td>
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<td>FCF</td>
<td>Free Cashflow</td>
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<tr>
<td>FP7</td>
<td>7th Framework Programme</td>
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<tr>
<td>FR</td>
<td>France</td>
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<tr>
<td>GBAORD</td>
<td>Government Budget Appropriations or Outlays on R&amp;D</td>
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<tr>
<td>GERD</td>
<td>Gross Domestic Expenditures on R&amp;D</td>
</tr>
<tr>
<td>GPU</td>
<td>Ground Power Unit</td>
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<tr>
<td>HO</td>
<td>Head Officer</td>
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<tr>
<td>HR</td>
<td>Human Resources</td>
</tr>
<tr>
<td>HW</td>
<td>Hardware</td>
</tr>
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<td>IAG</td>
<td>International Airlines Group</td>
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APPENDIX C. ACRONYMS

IAT  Industrial Acceptance Test
IATA  International Air Transport Association
ICT  Information & Communication Technologies
ID  Identification
IMF  International Monetary Fund
INE  Instituto Nacional de Estadística
IRR  Internal Rate of Return
ISO  International Organization for Standardization
IT  Information Technology
KPI  Key Performance Indicator
LLC  Limited Liability Company
LOPD  Ley Orgánica de Protección de Datos
MBA  Master of Business Administration
NMP  Nanociencia & Tecnología, Materiales y Producción
MS  Microsoft
NPV  Net Present Value
NYSE  New York Stock Exchange
OECD  Organization for Economic Co-operation and Development
PAU  Prueba de Acceso a la Universidad
PEST  Political, Economic, Socio-cultural and Technological
PDA  Personal Digital Assistant
PG  Policy Gate
RFID  Radio Frequency Identification
ROA  Return On Assets
ROCE  Return On Capital Employed
ROE  Return On Equity
RPK  Revenues per passenger kilometer
R+D  Research & Development
R+I  Research & Innovation
SA  Sociedad Anónima
SEPLA  Sindicato Español de Pilotos de Líneas Aéreas
SFO  San Francisco Airport
SGT  Scheduled Ground Time
SL Sociedad Limitada

STA Scheduled Time of Arrival

STD Scheduled Time of Departure

SME Small and Medium Enterprise

SP State Program

SP Spain

SW Software

TEC Technology

IRR Internal Rate of Return

TM Trade Mark

SWOT Strengths, Weaknesses, Opportunities and Threats

UGT Unión General del Trabajadores

UHF Ultra-High Frequency

UK United Kingdom

USA United States of America

VIP Very Important Person

WACC Weighted Average Cost of Capital
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The Air transport sector has been immersed for the last years in a fight between two business models. The so called flag companies have seen how their profit dropped as a result of the pricing strategy of the low cost companies. In this environment all airlines are focusing their endeavors in eliminating wastes and reducing costs. It is in this situation where JANO idea arises, focusing on the continuous delays experienced in take-offs as a consequence of passengers arriving late at the boarding gate and the costs airlines suffer daily due to mishandled baggage.

Despite the current economic crisis, Spain remains the third country in number of airplane passengers in the European Union. The restructuration of the handling sector shall mean that only a few strong companies will remain and those offering the most innovative differentiating solutions will prevail.

How can a baggage handling company offer differentiating solutions when there is a centralized airport baggage management system that is the same for all of them?

The answer is simple, by using JANO.

Taking advantage of RFID, a technology already mature yet unexploited in Spain, our system will be the “Last Step” in the baggage chain. It will be used during the most critical stage, the loading of baggage into the aircraft.

While multi-million euro solutions have been developed to sort thousands of pieces of baggage inside the terminal buildings, not enough research has been carried out in this last step.
RFID advantages over bar codes

✓ No direct line of sight needed between reader and tag
✓ 99% reading accuracy vs 80%
✓ Speeds up the scanning process
✓ Tags can be attached to anything, anywhere

We offer a system that covers this current gap and does not rely on extremely complex solutions. It consists of:

- RFID tags
- An RFID reader
- A Database

Before loading bags into the aircraft, our proposed idea is to scan all of them using a customized light wrist-wearable RFID reader to identify which ones can be immediately loaded and which have to be put aside for different reasons (passenger did not show up, bag belongs to a different flight,...)

But this is not all: Should we need to recover a bag that is already in the cargo hold, our reader can be used as a tracking device that will quickly show the loader where the bag is by knowing in which order it was loaded and showing him an actual picture of the item that will speed up current processes manifold.

What happens today when a bag goes missing? Does the passenger know?

The answer is NO. What image is an airline projecting when it has passengers all over the airports in the world waiting in the baggage belt for a bag that is not coming?

By scanning all items and associating them to the passengers for a specific flight, missing bags will be detected at an earlier stage and retrieving processes will start even before the plane takes off. What other current system can say that?

The passenger shall receive a message as soon as he lands informing him of his baggage status. He will know the process to find it has started and he will not find himself helpless not knowing what to do waiting forever at the destination airport.

But our system should not be installed at just one airport. Its full potential unleashes when it is widely implemented.

Flight transfers. This is where most baggage gets lost. By scanning bags as they are downloaded from the aircraft as well, JANO will quickly identify which ones need to be urgently transported to connection flights, without taking the cumbersome process of going back to the terminal, potentially not getting on time. It is just a matter of making things easy.

“RETRIEVING PROCESS WILL START BEFORE THE PLANE TAKES OFF”
For our study, we have studied the different companies present in Spain and chosen IAG as our ideal partner to bring this idea to life.

IAG is the number 1 airline group in Spain and the United Kingdom, and one of the largest in the world, offering more than 230 destinations in over 70 different countries and carrying a total of 62 million passengers a year.

Struggling against emerging companies with lower structural costs, they are lacking a boost. We shall offer our system to them to help them get back on their feet and be the reference group in Spain and in Europe once again.

“IAG is the ideal partner for JANO”

Following current Service Support trends, we do not only provide our customer with a software and hardware infrastructure, we go one step further.

Our partner will not need to worry about anything. We will handle everything: from the procurement of supplies following a detailed forecast based on previous needs and continuously tracking the available stock, to the maintenance and update of the system, gaining a mutual trust in a solution that has come to stay for good.

All eventuations have been forecast and every task has been identified, having the best team to lead this project to success.

If we want to associate ourselves with the leaders, we need to be leaders too.

For this, the company has been divided in 5 key areas that shall manage processes smoothly and professionally

- Development
- Procurement
- Commercial
- Facilities and HR
- After Sales

The development of our solution is expected to start in January 2014, with an estimated duration of 10 months.

Three months before finishing developing the software, we shall start advertising our solution and looking for clients. Once a client shows interest, the final integration step will begin to customize the solution for that client and will take another 10 weeks.

The company is created by 6 founding members who will have the control of the company, and will find an additional investor to contribute in the initial equity of the company. Our additional financial necessities during the development will be met with a loan of 500,000 €.

Initially, 6 employees will be hired to manage the company, and this number will grow up to 48 employees in 2018, reflecting a more mature structure with several projects in different countries.

Our expansion starts with Iberia in Madrid-Barajas. Afterwards, we shall reach the whole IAG group first in the main airports in Spain, then expanding our network to the main airports in Europe and the world to be able to introduce our Connection package to improve baggage handling during flight transfers. Once this has been accomplished, we shall reach the whole OneWorld alliance in which IAG takes part.

Ours is an innovative differentiated solution that shall allow us generous profits and margins.

Main figures

3.7M€
Annual potential savings using JANO for Iberia in Madrid

170 M
Number of RFID tags provided in the first 5 years

27
Airports reached by Year 5 including Barajas, El Prat and Heathrow
Revenues will increase exponentially during the first years of operation reaching 8M€ by the end of 2018 with an estimated Net Income of 1.4M€. These figures are expected to remain this high in the following years.

In order to maintain our technological advantage, we shall invest heavily in R&D to keep bringing new solutions to the market, but at the same time giving out above-industry-average dividends to attract investors.

JANO is an innovative differentiated solution that shall allow us generous profits and margins.

Our forecast has been obtained based on the current air traffic and economic situation. The future environment may be different from this, but in any case, JANO is based on a solid project that will succeed in time.