



MASTER IN INTERNATIONAL MANAGEMENT AND BUSINESS TRANSFORMATION

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PROJECT MANAGEMENT AND FINANCIAL PERFORMANCE'S DYNAMICS "CHALLENGE FRENCHBEE"

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Introduction

When we analyse the management's organization of a project, the comparison between its working and structure with the framework of a firm as a whole is extremely realistic.

Despite that, we can recognise some International Accounting standards which are completely related to project management and in particular, dedicated to a correct measurement of project's performance.

Moreover, during the working of a project, one of the most complicated issues may be correlated to a right understanding of the presence of indirect costs which constitute a fundamental measure influencing performances.

In addition, as Mr. Jacek Kalinowski has confirmed, several accounting elements are left to the free interpretation of management.

According to project management, we may notice how it is usually shaped by taking in consideration the complexity of the project.

Understanding the constraints that a firm has, may be considered as one of the most articulated phases and the availability of resources plays a fundamental role in it.

However, all the operations made by a firm during project's planning and operations, constantly receive an oversight by other management's divisions, such as risk management.

Therefore, as management is compounded by people, a relevant phase is the selection and recruiting of the personnel, its constantly monitoring and a motivational approach.

Besides the quantitative methods used to measure the performance of a project, we can have different quantitative strategies such as the use of KPIs.

This qualitative method will be introduced within the context of the "Challenge FrencBee".

This project regarding the punctuality's performances of an Airline Company based at the Airport of Orly constitutes a significant example of how KPIs can variate together with a variation on the general result of a project (85% of punctuality of flight's departures).

In a first moment, the methodology of how the KPIs are calculated will be treated, whereas within the following chapters, the Lean project's strategy will be analysed.

The calculation of KPIs constitute a good prove of the objectivity of the qualitative interpretation of the methodology.

Finally, a qualitative appreciation of the Lean methodology used, will be made through a comparison with another project at Orly's airport ("Corsair Baggage delivery project").

CHAPTER 1: ELEMENTS OF EVALUATION: THEORETICAL INTRODUCTION

1.1 Financial statement (regular and final review), cash flow statement and budgeting

When we consider the development of a company's operative project, we can define the management or more in general the team which is involved in it, as a sub organization creating a "committed company"¹.

In that case, the lower size firm has to record all the information needed through accounting documents under the rules of the so called international accounting principles.

The international accounting principles are a collection of listed rules and directives incorporated within the IAS-IFRS^{2 3}.

In particular, the IAS (International Accounting Standards) are a series of principles already existing before the 2001 and the IFRS (International Financial Reporting Standards) are canons generated and added after the 2001.

Before starting to introduce the financial statement's doctrine, it is important to specify the redaction's regulation that IAS-IFRS have introduced in order to give clear information about the performance of an entity:

- *i. Fair presentation and compliance with IFRS*: events, conditions and transactions have to be fairly represented through a correct description of their effects.
- *ii. Going concern*: all the information have to be recorded through a hypothesis of firm's life continuity.
- *iii. Accrual basis*: revenues are supposed to be recorded when they are earned, whereas costs when they are incurred.

¹ Deepining within the fourth chapter.

² The responsible institution for IAS was initially the IASC (International Accounting Standards Committee) but later on the IASB (International Accounting Standards Board) acquired their rights.

³ The interpretations of IAS are provided by the Standard Industrial Code (SIC) whereas interpretations for IFRIS are dictated by the International Financing Reporting Issues Committee (IFRIC).

- *iv. Materiality and aggregation*: material class of similar items have to be represented separately.
- *v. Offsetting*: assets and liabilities don't have to be algebraically summed up apart from when it's provisioned by international principles.
- *vi. Frequency of reporting*: financial statement has to be presented on an annually frequency as a minimum requirement.
- *vii. Comparative information*: all the information reported have to be comparable with internal and external data.
- *viii. Consistency of presentation*: information have to be collected into the financial statement according to the other principles, with the exception of an eventual consistency defection.

The financial statement offers a faithful communication pattern in order to permit to the shareholders to take vision of the financial and economic situation of the firm.

This document is characterized by the so called balance sheet⁴ that consists in an illustrative framework of the analysis of assets and liabilities through the distinction of current and not current activities.

The first section is dedicated to assets and in particular to the qualification in current assets (assets that can turn in liquidity within one year) and not current assets⁵ (assets that normally turn in liquidity after one year).

The second section is dedicated to liabilities and their distinction between current liabilities (debts that are repaid before the year and issued for trading activities) and not current liabilities (debts that are repaid after the year).

Once we have considered the first document of the financial statement we can pass to analyse the so called Income Statement.

The Income Statement shows to the reader the losses or profits realised within the period considered, by taking into consideration the revenues realised minus all the occurred costs.

During this first phase we can arrive to consider the so called EBIT (Earnings Before Interests and Taxes) and finally we can obtain the result of the period through the difference between this quantity and interests plus taxes.

⁴ Even called Structure of Statement of Financial Position

⁵ Current assets and current liabilities can be even defined as instruments used for trading purposes.

Moreover, if we consider other comprehensive incomes (incomes that add value to the result just from a theoretical point of view) within this algebraic sum, we can obtain the statement of comprehensive income.

The financial statement includes also a statement of change in equity, followed by the so called cash-flow statement illustrated by IAS 7.

The cash flow statement is a framework in which all the variations in cash are registered and it's very useful within the analysis of a project, in order to provide a financial planning and a liquidity analysis.

If we consider the indirect method of recording, we can illustrate its dynamic starting from the net income just analysed, by removing from it all the elements that give value just from a theoretical point of view and as a consequence, they don't move $cash^{6}$.

These elements can be for example depreciation, amortisation and gains or losses on disposals.

This section is followed by the calculation of cash flows from operating activities or in other words, all the transaction deriving from the core business of the firm.

In order to calculate all the variations in cash regarding investments in fixed assets, we have to register the cash in and cash out involved in this kind of operations and summing them up.

Finally, we have to consider the cash flows that take place within the financing activities and by following the same process of the other sections we can arrive to the result of the cash flow from financing activities.

The algebraic sum between these three results consist in the so called net change in cash. However, this proceeding can give us three important information.

First of all, cash flows from operating activities are an important index to understand if the firm has or has not enough liquidity to run every day's business and a positive result for it is essential.

Cash flows from investing activities illustrates if the firm is investing or not and for this reason, a negative result may be well accepted.

Cash flows from financing activities expresses from a numerical point of view, the financial planning of the firm and the result could be positive or negative depending on the life-cycle of the company we are considering.

⁶ The direct method considers the neti income statement as a whole by recording cash received from customers less cash disbursed to suppliers and other economical actors

If a firm is in its first stage⁷, finding a negative result for it could be obvious but on the other hand, arriving at a negative amount may be not recommended for a medium stage company.

A basic and important point for project management planning, is the analysis of estimates costs and budget.

The best way to measure estimates costs, is to consider the framework described by the so called Work Breakdown Structure⁸ that is a clear hierarchy of actions normally used in order to reach a precise goal for the firm.

The WBS is compounded by phases like understanding the work, planning the work, assigning all the responsibilities for it, monitoring costs and controlling changes and each of these stages have a cost associated.

Costs can be estimated by considering the resources needed for the project, their quantity and their respective price.

Starting from this analysis, we can now consider the budgeting theory. We can define the budget as costs estimated approved by management which have to be controlled and verified by the financial management.

The budget can be also defined as the total value of the future project of a firm for this reason, it can be even defined as planned value.

According to that a firm can calculate the value of its project on a precise moment of its life-cycle by considering the formula: *Planned value (by specific date)* = (OD - RD)/OD) * *Planned value (total)*.

Where OD is the original duration, whereas RD is the remaining duration.

1.2 Accounting regulation: IAS 11 - IAS 12 - IAS 18

After the necessary introduction about the important rules dictated by the International Accounting Principles, we can now focus on the axioms illustrated by three important international standards typical of project's analysis.

During a project, an extremely important issue is the allocation of contract revenue and contract costs and IAS 11 can give a solution for it.

According to IAS 11 we can define a construction contract as a specific contract created for an asset.

⁷ E.g. "Start up stage"

⁸ Source: AMA Handbook of Project Management, pp. 339-340

A construction contract contains important features regarding revenues such as:

- i. The amount of revenues agreed during the first stage of bargaining
- ii. Other revenues occurred
- iii. Revenues expected in the future

A construction contract provides important indications for costs' allocation such as:

- i. All the costs directly related to the project
- ii. General costs related to the contractualization's activity
- iii. Costs eventually charged to the customer

All the revenues and costs are recognised starting from a calculation of the percentage of completion of a project, for this reason making an estimation of the outcome of a contract is fundamental.

On the other hand, according to IAS 11, in the case in which no outcome can be estimated, no profit is supposed to be recorded.

If we refer to the theory of income taxes, we have to take in consideration IAS 12. IAS 12 illustrates what the future and current effects of taxes within transactions are.

Its objective is to provide an accounting framework in order to give some precise guidelines regarding taxes' registration⁹.

According to the principle, if a tax is strictly linked to the asset or liability we are considering, it has to be taken in consideration be if we are focusing on the current effects, be if we are considering the future consequences.

When a firm has a current tax it can be considered a liability if that tax has not already been settled, whereas it can be considered an asset if the amount already paid is higher than the amount that is due to be paid.

In addition, when we consider deferred taxes and their calculation we are supposed to take first of all a measurement called temporary difference which is calculated by the difference between the carrying amount and the tax base.

⁹ Source: https://www.iasplus.com/en/standards/ias/ias11

The tax base is defined as the total amount of taxes deriving from an asset or a liability.

Afterwards, we can calculate the deferred tax (asset or liability) by the product between the temporary difference and the tax rate (we would choose the tax rate available when the asset is settled or the liability realised).

Finally, we can say that both current/deferred tax liabilities and current/deferred tax assets are supposed to be offset within the statement of financial position if we are recording them on a net basis.

Whereas all the taxes related to profits or losses are supposed to be inserted within the statement of profits and losses and other comprehensive income.

Concluding, another important part of a project's contract formulation is IAS 18 or in other words the rules regarding revenues' accountability.

According to that, revenues have to be registered just when they are effectively recognisable.

The value that has to be taken in consideration for them is the so called fair value that can be calculated when all the conditions of revenues are respected.

A revenue can be defined as an economical benefit which according to IAS 18, does not arise when there is an exchange of similar goods but just when the company trades goods of different nature.

Usually the fair value is lower than the real amount of money that the seller receives because interest rates can be set under markets' standards.

1.3 Direct and indirect costs definition and identification

One of the most important problems in costs' accountability is their selection related to their nature.

The first fundamental division that has to be done is between direct and indirect costs.

We can define the first category as costs that are immediately related to physical items involved within the production. They take the attribute of "direct" because they are linked to the direct method of valuation that is compounded by precise stages such as the measurement of the quantity of production factors considered, the calculation of their waste during the production process and the choose of a price that is supposed to be immediately linked to the value associated to the final product.

Secondly a firm can have other typologies of cost that cannot be directly related to the final product and they can be defined as costs linked to production factors not directly imputable to it.

The indirect proceeding provides three stage to follow in order to arrive to indirect costs. During the first one, arriving to understand the exact cost aggregate is fundamental in order to set an efficient costs' allocation (second stage) and to determine a coefficient useful to calculate the part of cost that has to be attributed to the final product.

According to the theory we have three different models useful for shaping costs within the units of the final product.

The first one takes in consideration the production factors and it organises indirect costs by listing them in heterogeneous groups of production factors.

Afterwards, through a unique coefficient calculated starting from the imputation of working hours spent for production, costs are assigned to the final product.

The second approach takes in consideration the phases of production and it links indirect costs to each single function within the process.

Every function (commercial function, administrative function etc.) will have its own cost's coefficient of imputation and every function will group within it a range of production factors.

The third method provides a focus on the production processes, and it's a model considerably similar to the other two for its working.

As a matter of fact, it is organised in two stage: the first one shapes indirect costs within all the different categories of phase of production, whereas the second phase will calculate the allocation of costs for each unit of product by using different coefficients.

Regarding the operation of shaping of the production proceeding, the praxis indicates that process of transformation of the product are supposed to be divided in different phases in order to make an efficient division of costs, whereas general services' structures are usually not shaped¹⁰.

If we compare the three methods we can conclude that if the first two utilise a strategy for dividing costs through a process that takes in consideration too wide

¹⁰ Source: Management - Budget e controllo di gestione, Marco Agliati, Il Sole 24 Ore/Università Bocconi Editore, p. 442

categories of factors/functions, the production processes' method uses a more precise and realistic framework.

Another important aspect to analyse is that the formula for planned value that we have analysed within the first chapter of the paragraph (*Planned value (by specific date*) = (OD - RD)/OD) * *Planned value (total*)), takes in consideration the sum of direct and indirect costs.

1.4 Performance project's "dilemmas"

In order to conclude our theoretical introduction, we are going to analyse the so called Projects' "Dilemmas" written by Jacek Kalinowski¹¹.

Kalinowski defines a project "as a set of coordinated activities with fixed execution time, discrete in nature, realized in an integrated and unique way to achieve the strategic and operational objectives using the available (limited) resources, and requiring innovativeness and interdisciplinarity of the persons executing the project".

This definition takes in consideration some of the most important factors of success of a project like the nature of a project, the way an objective is achieved, the resources and the level of skills and the using of them by persons.

On the other hand, he has identified 4 essential "dilemmas" regarding some of the most important aspects of a project like financial costs, costs' presentation, and incomes/retained amounts' accounting.

i. Choice of the way of presenting financial costs of project activity: the author by making a simple example, takes in consideration costs of interest¹² of a firm and he explains how a firm can actually choose to record them directly within the financial costs of the period.

This would happen by registering costs of interest in the profit and loss account. However, Kalinowski indicates that a company could find more convenient putting these costs within a long-term project by considering them as operating costs¹³.

The author concludes this section by saying that there's not a right or wrong answer for it.

¹¹ PhD in Economics and Management; Assistant Professor at the Department of Accounting, Faculty of Management, University of Lodz.

¹² Total amount paid for interests on a loan.

¹³ Costs associated to everyday business of a firm.

However, the general rule he exposes is that if the financial costs are directly related to long term projects, they should be considered as components of the budget, in all the other cases they are supposed to constitute elements of the project costs.

ii. Choice of the way of presenting costs of provisions for warranty repairs: even for this section the author exposes two different approaches.
In the first one he explains how costs of provisions for warranty repairs are supposed to be registered within long-term project costs according to the project life cycle.

On the other hand, he says how this method could actually confuse the estimation of actual costs of the project.

In Kalinowski's opinion, this kind of costs shouldn't be classified as operation costs for long-term projects because it would constitute a wrong interpretation of a business activity by going against the lower emphasis on the principle of prudence recently applied.

Moreover, the author suggests that this method would not catch out the real profitability of a project and the relationship between costs and revenues.

iii. Choice of the way of accounting for subsidiary income: within this dilemma,
 Kalinowski simply explains how subsidiary incomes are an exception of the rule
 of prohibition of offsetting between costs and revenues.

For example, subsidiary revenues can actually be offset with their related costs and this for the author constitutes a risk for a correct interpretation of the financial statement made by the user.

Choice of the way of accounting for retained amounts: retained amounts are defined as receivables the contractor is supposed to obtain after he reaches precise provisions of the contract.

In this case, the dilemma focuses on the eventuality these amounts should flow or not within the company after a transaction.

According to Kalinowski's paper, retained amounts like a guaranty deposit should be excluded from long-term revenues of a project and the reason would be that usually this deposit is of the same amount of the expected future profits of the firm and at the end of the day, the financial result would be zero.

The solution the author proposes, is to reduce revenues by the quantity of the retained amount and increasing the costs of the project of the same quantity.

However, if the company involved has within its historical background a praxis of recovering all the amounts set as deposit, this quantity shouldn't be registered as a retained amount.

CHAPTER 2: PROJECT MANAGEMENT'S ANALYSIS

2.1 Constraints/results' analysis

When a firm considers the accomplishment of an objective has to analyse, within its operating activities, the relationship among different kinds of constraints and limitations.

According to AMA (American Management Association), constraints' analysis is an important measure also according to risk identification.

Constraints group all the limitations a company can have related to technological limitations, financial ceiling and imminent deadlines for a project's schedule.

One of the most important constraints is the budget amount which depends on the total costs a firm has to afford.

Apart from costs' imputation methods treated in the first chapter, firms usually use in order to create a precise financial ceiling, another important model called activity based costing.

This model takes in consideration the activities which generate costs instead of direct costs sources like all the other methods described.

The core concept of this method is that products consume activities and all the activities generate costs.

The activity based costing can be divided into four important stages that provides the creation of an activities' sample.

Each activity indicated has to be linked to a relative cost and managers are supposed to explain all their amount by using the factors provided.

Finally, the operators will indicate a coefficient in order to allocate costs to the product unit.

Once the firm has understood the real costs' ceiling, the most used framework is the break-even analysis which sets a relation among volumes of production, costs and results.

The basic relationship put in evidence precise indexes like the quantity produced (Q), the price for unit (p), variable costs (cV) and fixed costs (CF).

All these parameters contribute to calculate the so called firm's economic result, calculated by the formula: RE = p * Q - (Cv * Q + CF).

Moreover, by using a second formula, we can calculate the contribution margin by the equation: (p-Cv).



Graph 3.1 "Break - even point's graphic" (made with Word Microsoft Office)

From the graph we can notice how according to the break-even point model we have an economic result equal to 0 and once we have stated it, we can calculate the quantity by whom the costs are equal to the revenues by the formula: Q=CF/(p-Cv).

From an accounting point of view, the assumption of considering just a sample of data and activities is essential in order not to have influences linked to distortive dynamics that could affect the economic result expected equal to 0.

In order to respect the objectives provided by a firm's project by taking in consideration all the constraints, AMA recommends three important activities for a company.

First of all, a company is supposed to increase the capacity produced relatively to the demand.

This first task requires a good management of resources for a firm related to the elimination of not required or not adding value work, or linked to continuous formation training for all the stakeholders involved.

The second action exposed is to reduce demand relatively to capacity which means reducing the amount of project in which the firm is involved during excessive demand period.

The third task considered is the implementation of an appropriate management associated with an efficient control system.

These two efficient firm's department are supposed to establish a feasible project plan even related to casual changes that could happen in the future.

Moreover, an important instrument that can be applied during the coordinative activity, is the creation of a common set of guidelines and templates which can be used in different sections of a firm and that could help in the integration of resources for a project.

2.2 Cost estimation and Project's management evaluation

As we have already said within the second chapter, the start point for understanding the feasibility of a firm's project is succeeding in calculating its budget cost.

However, cost management is defined by an important operation which takes in consideration all the resources needed for each activity.

This process is called *resource estimating*¹⁴.

Normally, resources needed are calculated by taking in consideration each activity and by understanding the actual quantity of necessary resources.

In order to do that, there are two kinds of approaches the first one is called *early resource aggregation* and in this case the firm will start to use resources as soon as a first activities' framework is available.

The second one is called *late resource aggregation* and it uses resources the latest is allowed by the activities' plan.

However, the firm can arrive to a right approach after the simulation of several alternatives feasible with the plan supposed to be applied.

Regarding project's management, cost estimating is a fundamental analysis useful to make a first shape of the firm's planning.

¹⁴ Source: AMA Handbook of Project Management, p. 89

One of the most difficult parts of cost estimation is understanding the presence of indirect costs but in the best case having reliable information may be possible.

In that case, if we consider a competitive tender, the firm would see its likelihood to be successful increasing and moreover there could be a high and positive difference between the bid price and the client's allowed price.

In any case, according to AMA, an estimation in a range between the 5% and the 10% can be considered an accurate one.

The steps for a correct cost estimation can be summarized by the following stages:

- *i.* Order of magnitude stage: in this stage the firm estimates costs by making a computation with other firms' similar projects.
- *ii. Conceptual stage*: during this phase, the firm has the possibility to manage more concreate information and to evaluate different alternatives for the project.
- *iii. Preliminary stage*: this is the stage in which the company is able to define more precise specifications and clear documentation for the project.
- *iv. Definitive stage*: once the firm has accomplished this phase, general and definitive conditions about the contract could be officially signed by a hypothetical bidder.
- *v. Control stage*: this final stage groups all the possible bids from all the external participants of the project like for example suppliers of materials and equipment. This analysis is extremely important when we talk about measuring the *value of project management*¹⁵.

We can extrapolate from this theory six important steps which are dependent among each other.

Looking backwards to the concept of cost estimation, we can talk about the first step called *Measurement Readiness Planning* which includes a part of evaluation of organizational and project management's goals and objectives like improving quality, productivity or most of all, reduction of costs.

Anyway, when we consider project management the main goal of it is the production of value for the firm and the company will start to consider it from the second phase called *initiative planning*.

In this step there is a first projection of a schedule for the firm with the consequent implementation of a strategy.

Moreover, these metrics can record statistics useful to highlight the positive or negative results reached by a team work.

¹⁵ According to AMA, this analysis is extremely important for senior management in order to collect measures useful to implement more efficient project management methods.

The third step is the *measures development* and it is fundamental to build some priorities among all the parts which compound the definitive schedule.

Once the management has obtained a clear scorecard¹⁶, the fourth phase consists in its development.

It is progressed by using six concise requirements which are linked to a clear identification of data considered, a justification to explain why they have been collected, by considering its objective and an explanation about the method used to capture the measures involved.

In addition, this phase requires to calculate the timing required to collect data, the location of this operation and the responsible for the protection of the measures. Once the firm has accomplished the previous steps, the firm can build a planning for the implementation of the program, which concludes the cycle of evaluation of project management.



Table 3.1 The PM value measurement program initiative process - Source: AMA Handbook of Project Management (p. 303)

2.3 Risk management's dynamics

Risk management has a clear fundamental role in the structure of a company due to the risky nature of a firm's project.

¹⁶ The scorecard is supposed to list measures that need to respect some criteria such as providing meaningful information, they have to be supported by valid data, they are expected to be acceptable by stakeholders, repeatable and actionable and finally aligned to organizational objectives. Source: AMA Handbook of Project Management, pp. 305-306.

All the features of a project's plan can be linked to the concept of riskiness; in fact we can assume that its properties of uniqueness, complexity, change and dependency with people reflect this characteristic¹⁷.

However, considering the risk just as a threat of the company may be wrong as a firm can relate it to a positive opportunity.

Within this framework we can notice how risk management is extremely important due to the optimization of the weight of threats and opportunities.

In other words, its role is minimising negative consequences and maximizing the probabilities of positive effects.

According to the literature, we can summarize the essential phases for a correct proceeding in six essential steps which include the reasoning behind risk management's dynamics¹⁸.

The first phase is not related to risk's identification as common sense's reasoning could lead to, but it is related to a planning phase in which risky objectives and not risky objectives are shaped.

In addition, risk management planning includes operations like defining the quantity of risk that is acceptable and all the potential sources which may create risk through a Risk Breakdown Structure¹⁹.

The second phase is indeed risk identification and it includes general kinds of analysis by using typical tools like the SWOT analysis.²⁰

Moreover, during this second section, we can individuate a focus on the identification of the riskiest project's constraints and a round of consultation with the so called "key stakeholders".

The core project starts with the qualitative risk analysis which has the role to understand the weight that the worst threat can have and the benefit of the best opportunity considered.

In order to have a clear qualitative picture of the project, the firm has to calculate the impact which all the possible risks considered can generate²¹.

¹⁷ Source: AMA Handbook of Project Management, p. 184.

¹⁸ Source: A Guide to the Project Management Body of Knowledge. Third Edition.

¹⁹ A risk breakdown structure can be defined as a framework divided in two or more level whose function is to justify the origin of the risk (E.g. technical risk, management risk, commercial risk, external risk, etc.). Source: AMA Handbook of Project Management, p. 187

²⁰ Analysis of strengths, weaknesses, opportunities and threats of a project.

²¹ When risk management calculates the impact of a threat, it will consider factors such as lost time or extra cost, whereas for an opportunity saved time or reduced costs.

Moreover, a Risk Breakdown Structure may be fundamental even during this phase in order to understand if common causes of risk are actually present within a project.

Obviously, within an efficient risk management the firm has to take in consideration a quantitative analysis too.

One of the most used method is Monte Carlo's quantitative risk analysis²² which is defined as a too simplistic analysis.

Monte Carlo is supported by particular kinds of software which use basic statistics and project plans as a way to calculate the risk.

However, Monte Carlo analysis doesn't take into account fundamental aspects of risk calculation such as the correlation among the data considered in order to reduce variability.

The following stage, called *risk response planning*, tries to give a strategic dimension in order to develop the risk impact.

During this stage risk management is supposed to make different actions depending on the presence of a threat or an opportunity.

For example, a threat will be avoided as much as possible, on the contrary an opportunity will be exploited.

Moreover, the management will try to transfer a threat and to share the positive effect of an opportunity.

Finally, the project will have threats and opportunities impossible to be avoided or exploited as they wouldn't be cost-effective; in this case they will be just accepted by the company.

The final step consists in the monitoring and control of the risk management's process; in other words, the management will verify if the impact that was expected actually correspond to the real response.

Moreover, this phase is essential even for the share of information with the so called key stakeholders.

²² Monte Carlo quantitative analysis works by using different kinds of values for each factor that is linked to uncertainty by using a probability distribution and by repeating the calculation over and over. Source: http://www.palisade.com/risk/monte_carlo_simulation.asp.

CHAPTER 3: PROJECT'S PERFORMANCE MEASUREMENT

3.1 Committed company's dynamics

One of the most important aspects of planning and developing a project is the structure that the team involved within the firm has to assume.

In other words, the selection of human and material resources are similar to the process that we can usually find into a standard company.

According to the American Management Association the structure that a "committed firm" is supposed to assume within a project, has to be structured in different phases, by specifying three important features.

They consist in the description of the inputs needed, the output that the firm should obtain after each stage and the tools used.

First of all, we have to specify that the identification of the team's member depends on the resources needed and this operation may be executed through a process of outsourcing²³.

The first step is human resource $planning^{24}$.

This is the moment of team's building in which all the resources needed and the environment have to be understand in order to find the right profile for a project's execution.

Environment and resources constitute the inputs of this phase which have to produce as a result a clear framework about how project's members will interact with each other.

In addition, the committed company will prepare plans about training, formation and rewarding systems for the new work team.

The tools and techniques used during this stage, consist in frameworks and charts useful for assigning fair responsibilities to each member of the team.

Once the committed firm has prepared a clear and precise framework on project's needs, acquiring a team will be the following step.

²³ In this case we are referring to the seek for external management for the planning and developing of a specific project

²⁴ Source: AMA Handbook of Project Management, p. 137

In this case, we can easily understand how the outputs of human resources planning will correspond to the inputs for the team acquisition's phase.

At the end of this step, the committed firm will obtain a clear selection of members with a precise combination among their tasks and availabilities within the project.

As we can intuit, the tools used during this phase consist in different types of recruiting section, especially when specific and individual tasks are not provided.

One of the most used method for recruiting is organizing virtual teams in which members from different areas around the world, can interact by an online platform and simulating a work project's section²⁵.

The third passage consist in the development of the team and as inputs a clear list of all the profiles selected, that will be used for combining them with the training sessions provided within the human resource planning.

The output that will be produced correspond to an evaluation scale which records the performances of the new team and it could help team managers in order to understand if some aspect of the planning should be modified.

In this case, the tools used refer to human relationships and all the members that during the previous stages were just "virtual team's mates" will have the possibility to stimulate a real group's behaviour.

The last step consists in the real manging of the team which is supposed to combine all the aspects already planned and all those features that could actually be forwarded.

In other words, the inputs in this case will consist in all the roles and responsibilities already planned, with all those features that are expected but not already happened such as financial and team's performances.

In this case, the output will be the consequence of the comparison between all the performances of the firm and the previous expected results.

If the committed firm performance's measurement will be negative, the consequences provided may be additional training or disciplinary actions.

Finally, the tools needed in this case will consist in conversation sessions or conflict managements' oversights that committed firm's managers are supposed to analyse in order to group a pattern of helpful feedback to improve project's performances.

²⁵ Source: Bloomberg: "How Virtual Teams Can Succeed"

3.2 Financial needs and operations

When we talk about financial needs for a company's project, we should split this thematic in two macro areas²⁶.

The two principal areas concern a division based on the time of the investment and as a consequence, of the financial operation treated.

For instance, long term investments may be compared to a financing process typical of a new committed firm according to their modalities²⁷.

An example could be the realization of Roma Metropolitane S.r.l. by the local authority "Roma Capitale".

According to Roma Metropolitane's code of conduct, we can see how one of the financing modalities that the new committed company uses is the Initial Public Offering (IPO).

The most common sources for long term funding are the so called Angel Investors who are commonly diffused within the start-up's dimension.

They can be defined as individual investors willing to make investments in young firms by acquiring parts of their equity.

Venture Capital Firms could be defined as a similar phenomenon. However, in this case the investors involved are not individuals but companies which purchase a part of the equity from infant firms.

On the other hand, we have the so called Private Equity Firm which constitute an investment source for firms that are privately held by it.

Usually this operation is defined as leverage buyout (LBO) and it happens when a big company acquires the entire amount of outstanding equity of the other firm²⁸.

A considerable amount of long term financing comes from foundations or pension funds and they are listed within the category of Institutional Investors.

However, in most of the cases there are situations in which investing for financing a project of a firm can be not profitable and usually it could be the consequence of a complicated exit strategy.

In other words, we are talking about the strategy used for returning from an investment; public offering is one of the most diffused practises.

²⁶ Source: Corporate Finance - Third edition - Jonathan Berk - Peter Demarzo - Stanford University

²⁷ Source: Roma servizi per la mobilita' srl - codice etico p.11

²⁸ Source: "Silver Lake's highly leveraged buyout of Dell" – http://www.mergersandinquisitions.com/leveraged-buyout-lbo-model-overview-capital-structure/.

When the company involved takes this decision, it will be guided by an investment banking, which it is defined as the underwriter of the operation and it will be manage all the offering's procedures.

Public investors have the opportunity to purchase new shares in order to raise new capital (primary offering), or already existing shares held by companies' shareholders (secondary offering).

All the information related to a common investment within a public offering are contained within a registration statement that will be submitted to the Securities and Exchange Commission (SEC).

As we have introduced at the begin of the paragraph, the most important distinction in financing operations is based on the time considered.

Usually when managers evaluate a project, if that project will have some permanent losses, it will influence long term decisions but, in all the other cases, short term investments decisions are involved.

According to short term investments' theory, an important axiom is defined by the so called matching principle which states that short term needs are supposed to be financed with short term debt²⁹.

A fundamental role is played by the permanent working capital which is a mandatory amount that a firm should maintain in order to run its everyday business. In this case we are talking about another typology of long term investments because this particular amount is supposed to remain in the company domain for all its business' life.

As a result, according to the matching principle, this kind of operation will need a long term financing plan.

On the contrary, the temporary working capital will be financed by a short-term financing as it represents a short-term need.

Moreover, it can be defined as the difference between all the amount of investments in short term assets and the permanent working capital.

In particular, managers can decide to finance permanent working capital with short term debt and in this case we are talking about an aggressive financing policy.

²⁹ Source: Corporate Finance - Third edition - Jonathan Berk - Peter Demarzo - Stanford University p. 914

In most of the cases it is preferred to a financing plan with the use of long term debt because short term operations can be considered having a lower probability of being affected by market pathologies such as asymmetric information³⁰.

Short term plans could provide a plan which includes loans' operations.

In this case, the firm usually will receive a loan by paying a periodical interest rate plus a lump sum at the end of the period considered.

The interest rate usually offered is the so called prime rate however, the company could negotiate this rate and arriving to a lower periodical amount to pay³¹.

Finally, additional ways for financing a short term investments are the so called line of credit and the bridge loan.

The line of credit constitutes the limit of the amount a bank can permit to finance and sometimes it is independent from the financial conditions of the firm.

On the other hand, the bridge loan can be defined as an amount of financial resources, that the bank can provide in the short run in order to fill the economical gap, which wouldn't allow the firm to sustain a long-term financing plan.

3.3 Cash flows' creation

When we talk about cash flows, we are considering the final result of the firm's project and their theory is used in order to understand if our project is profitable or not.

First of all, earnings and cash flows cannot be defined as identical measures, but they are correlated in their calculation.

In other words, the calculation of cash flows has as a first step the measuring of incremental earnings which can be defined as the amount firm's earnings should change after an investment decision.

The first element that a firm has to consider are capital expenditures and in particular their depreciation.

³⁰ Transaction pathology even defined as a cause of a possible market failure. E.g. one of the two sides of the transaction (buyer or client) has a greater knowledge about the transaction

³¹ LIBOR (London Inter-Bank Offered Rate) is usually considered as a benchmark rate for this kind of operations – Source: Corporate Finance - Third edition - Jonathan Berk - Peter Demarzo - Stanford University p.916

In accordance with that, capital expenditures are not supposed to be considered as a whole during incremental earning's calculation, but it's going to be gradually subtracted from the initial earnings year by year as depreciation 32 .

After considering depreciation, the firm will obtain the amount of earnings before interests and taxes (EBIT).

As the firm will consider the evaluation of the project without considering the financial activities, interests' expenses won't be included and the result obtained will be defined as unlevered net income.

If this result is positive, the firm will pay taxes according to a marginal corporate tax rate, which constitutes an incremental quantity that the firm has to pay related with the incomes matured.

We may explicit it by the formula:

Unlevered Net Income=EBIT * $(1 - tc) = (Revenues - Costs - Depreciation) * (1 - tc)^{33}$ Where *tc* is the marginal corporate tax rate.

Moreover, all the expenses related to the project such as opportunity costs, project externalities are supposed to be included in the calculation.

Opportunity costs can be defined as the cost of renouncing to the best alternative to the project considered, whereas an example of project externalities is cannibalization.

Cannibalization is a phaenomenon typical of projects where the launching of a final product can actually reduce the revenues from other activities of the firm and it is included as a cost influencing earnings³⁴.

However, there are costs that are independent from the project and they are not supposed to be included in the incremental earnings situation.

They are defined as sunk costs and they take in consideration fixed overhead expenses (fixed costs independent from the project) or development expenditures.

Once the firm is arrived to the calculation of the right amount of incremental earnings, financial analysts will compute cash flows.

The first operation is to add again depreciation.

³² The two method used are the straight-line depreciation method and the reducing balance method. In the first method the firm will equally divided the amount of the expenditure for its estimated useful life. In the reducing method, expenditures will be reduced with a constant rate each year ³³ Source: Corporate Finance - Third edition - Jonathan Berk - Peter Demarzo - Stanford University p. 237

³⁴ E.g. "Cabela's Massive Superstores Are Cannibalizing Each Other" Source: Bloomberg

This action can be justified by explaining how depreciation reduce the value of capital just from a theoretical point of view but there's not a real reduction of cash for the company.

The second step is the calculation of the net working capital by the difference between current assets and current liabilities.

This calculation is better described by the formula:

*Net Working Capital (NWC) = Current Assets - Current Liabilities = Cash + Inventory + Receivables – Payables*³⁵.

In particular, the difference between receivables and payables correspond to the trade credit.

According to cash flows' calculation, an extremely important element is the increment of expenses in working capital in respect to the previous year.

Once we have obtained this last element, free cash flow's formula will be:

Free Cash Flow = (Revenues - Costs) *(1 - tc) - CapEx - NWC + tc * Depreciation. With tc * Depreciation defined as depreciation tax shield which corresponds to tax savings from depreciation previously deducted.

In order to verify if the firm's project is profitable, the financial analyst will actualize all the cash flows by using an appropriate cost of capital with the right maturity which reflect the period of the project.

³⁵ Source: Corporate Finance - Third edition - Jonathan Berk - Peter Demarzo - Stanford University p. 242

CHAPTER 4: Key Performance Indicator's approach

4.1 KPI and Critical to Success factors' definition

According to the theory of the literature and to management's practices within firms, KPI ("Key Performance Indicators") are a useful technique for performance's measurement and animation.

They could be used as a concrete representation of the so called Critical to Success Factors (CSFs).

The CSFs give a qualitative overview regarding the performances of a critical area of a project. They could be a limited number and as we'll see within the next paragraph, they constitute an essential base for building the respective KPI.

The KPIs represent the tools useful to measure the performance of a project from a qualitative point of view.

In the next paragraph we are going to explain the conceptual reasoning, useful to build an efficient KPI and some analytical tools that will help to understand how these indicators could be used in order to have a clear comprehension of the performance of a project.

4.2 How to develop a KPI indicator

According to the paper "Key performance indicators for successful simulation projects"³⁶ the creation of KPIs strictly depends on the the set of CSFs which are supposed to reflect the fundamental features useful for having a clear resume of performances.

For this reason, before to set a CFS, a good comprehension of the problem is essential in order to have a clear framework of the context and of the areas on whom the management needs to focus.

³⁶ Key performance indicators for successful simulation projects - Mohsen Jahangirian - Simon JE Taylor - Terry Young - Stewart Robinson

The method that we are going to explain refer to a top-down approach as it starts from the general objectives of a project and it finally arrives to the implementation of KPIs.



Picture 4.1 Proposed top-down CSF/KPI framework - Source: "Key performance indicators for successful simulation projects" (p. 748)

The example exposed partially refers to the "Challenge Punctuality – FenchBee", as the objective indicated is the 85% on punctuality with 16' of tolerance for the Airline Company.

The subject regarding the Challenge will be better analysed within the last chapter of the thesis.



Figure 4.1 Proposed example of KPIs' calculation (made with Microsoft Office Excel)

The Figure 4.1 explains how the general objective of reaching a punctuality of 85% of the flights of the company is the first factor to consider in order to arrive to create the first CSF called "efficiency of communication".

Afterwards, the project's team will discuss about several statements³⁷ that will be used in order to understand which are the most recurrent problematics and features that need to be taken in consideration.

Within some of the statements there will be common features to consider and this will be a point of reference in order to know which aspect will be more influencing compared to the others.

According to our example, the common feature "Frequency of communication" have two citations within the statements, whereas, the feature "Number of information to share" have 4.

For this reason, we'll consider the feature "Number of information" as an extremely influencing aspect and as a consequence, a base of a potential KPI.

Finally, the consequent KPI, we'll be the concreate and measurable representation of the CSF deployed at the begin.

As a good practice, observing if the CSFs regard the client (in this case the Airline Company) or the provider (in this case ADP) is suggested in order to know the sphere of competence that a project team is evaluating.

According to the other analytical measurements, we can take as an example two important tools which can give two different views according to our interpretation. The first one is called *Project's Success Measure (PSM)* and it gives to us information regarding the relative weight of a KPI compared to the total number of KPIs.

$$PSM = \frac{w_i \sum_i \sum_j KPI_{ij}}{Total \ no. of \ KPIs} \times 100$$

Picture 4.2 Project's Success Measure Formula - Source: "Key performance indicators for successful simulation projects" (p.750)

The formula builds a relation between the KPI taken as point of reference and the relative number of citations associated to the relative CSF.

The relative number citations can be calculated by observing the statements explained above and we can measure them by counting how many times a common feature is contained within them.

³⁷ According to the paper "Key performance indicators for successful simulation projects", an example of statement regarding the communication can be "The customer will be constantly informed about progress on the project"

$$w_i = \frac{c_i}{\sum_{i=1}^5 c_i}$$

Picture 4.3 Project's Success Measure Formula - Source: "Key performance indicators for successful simulation projects" (p.750)

We can understand the relation explained through the formula by noticing how the quotations of the common feature is compared to the total number of citations of all the others common feature witch refer to the relative CSF.

Another important indicator is the "Success Factor Measure".

Compared to the Project's Success Measure, it gives to us a measure more focalised on the weight of the KPI, related to the CSF where it derives.

In other words, the result will be a reflection of the influence that the implemented KPI has within its own range of competence (for example, according to the figure 4.1, "Frequency of Communication").

$$SFM_i = \frac{\sum_j KPI_{ij}}{No.of KPIs associated with CSF_i^*5} \times 100$$

Picture 4.4 Project's Success Measure Formula - Source: "Key performance indicators for successful simulation projects" (p.750)

The formula shows on the numerator the selected KPI and on the denominator the sum of the KPIs associated with the respective CSF multiplied for 5 (where 5 is the maximum evaluation that can be given to the KPI).

4.3 Analytics indicators and performance's correlation

The analysis explained above will give three important indicators which constitute the basis for the following diagnosis part.

This phase is useful in order to observe eventual correlations between the performances and the indicators and to understand where the project has the necessity to improve.

In order to make a recapitulation about what has been explained in the precedent paragraph, we propose here the three indicators that will be used for the analysis of the case "Challenge Punctuality" of the paragraph 6.

i. *KPIs*: They give indications regarding the performance of a single common feature which compose a CSF.

- ii. *PSM*: It gives indications regarding the success of the project, and the weight of the KPI taken in consideration, compared to the total number of KPI.
- iii. *SFM*: It gives numerical information about the success of a factor compared to the performances of the KPI associated with a specific CSF.

The first correlation that can be made through the study of these factors is how an increase or a decrease of the PSM or SFM can influence the total performance of the project.

As a first supposition, we can imagine that a variation in the PSM will be more influencing than a change in the SFM as the first indicator takes in consideration the entire performances of the project, whereas the second one just a particular field. Another important correlation could be observed between the general performances of a project³⁸.

A project is normally divided in different phases and an analysis regarding the tendencies of the indicators in each step of the entire plan can be an interesting point of reference in order to analyse the progresses made and all the possible weaknesses.

Finally, other suppositions could be made by analysis the KPIs by taking them individually.

In this case some remarks regarding the tendencies of a limited aspect of the entire project can be made.

As it could be easily noticed, the risk in this case is of trying to improve a single and restricted KPI, without considering the relative weight of the indicator taken in consideration.

³⁸ In the example which will be proposed in the chapter 6 the indicator of performance will be the 85% regarding the punctuality of the Airline Company.

Chapter 5: ADP (Aéroports de Paris): Company's introduction

5.1 Company's story and features

ADP is a French global leader in airport design, construction and operations, both in Paris and abroad. It was created in 1945 under the name of Aéroports de Paris (ADP) and was a government- owned corporation. It became a public company in 2005 meaning that other shareholders own and invest in the group. Consequently, the company has obtained the financial capacity to adapt and develop existing infrastructures, which allow them to respond to global air transportation transformations.

165 airlines and 119 countries served from Paris-Charles de Gaulle and Paris-Orly 97.2 millions of welcomed passengers in 2016, 23 airports worldwide, €2 947 millions revenue, 1st system in Europe in terms of cargo traffic and 2nd system in Europe in terms of commercial passenger traffic.

ADP consists of the parent company, Aéroports de Paris SA, and its various subsidiaries are divided into five segments: aeronautical activities, shops and services, real estate, airport investment and other activities.

More than half of the group's revenue is coming from its aeronautical activities. Indeed, ADP owns and manages different platforms including three Parisian³⁹ airports for passengers' circulation and freight, all gathered under the brand *Paris Airport* since 2016. At each one of these airports, ADP offers best-in-class aeronautical infrastructure.

- i. Paris-Charles de Gaulle Airport: suitable for long-haul traffics and/or correspondences.
- Paris-Orly Airport: "human-sized" airport and easy to use for companies and particularly efficient for point-to-point traffic to metropolitan destinations as well as Europe, North Africa and overseas.

³⁹ www.parisaeroport.fr 4 Xerfi France, Nicolas Le Corre et Alexandre Boulègue, (2017), "Les aéroports et services aéroportuaires"
- Le Bourget Airport: specialized in business aviation traffic, which allows Paris-Charles de Gaulle and Paris-Orly airport to focus on commercial aviation traffic (1st system in Europe in terms of business aviation traffic).
- iv. ADP also owns and manages one heliport and 10 general aviation airfields in France. ADP manages as well as business activities such as shops (all paying activities: shops, restaurants, car parks, banks, etc.), customers services, passengers information (website, mobile application, Wi-Fi and internet areas, Paris Worldwide magazine, etc.), passengers comfort (information desk, games areas, etc.), joint venture activities for commercial distribution in airports (ex: Duty Free Paris) and advertising (ADP's Media). Retail activities hold significant potential for development of the group, because of the growth in traffic, the attractiveness of the positioning of Paris, and areas that are especially designed to maximize the shopping experience and sales. The third activity consists of real estate trade. Besides retail activity, this business is also a strategic development axis for the group and a major growth component. It covers airport property (aircraft maintenance hangars or industrial areas) and real estate diversification (offices, hotels, shops and logistic locations) in order to form true "Airport Cities". Moreover, ADP invests and manages shareholding in foreign airports (Schiphol, TAV Airports and 13 other airports in the Middle East). The company aims at becoming a synergistic network of airports across the globe and at conquering new markets that are opening up internationally. Then, ADP's concern is to invest in strategic airports in developing markets. Finally, ADP offers also services across the rest of the airport value chain to its customers, in such areas as security services, industrial services (energy, etc.) and engineering, as well as in the telecommunications and mobility sectors. Thus, this unrivalled positioning across the airport value chain gives robustness to the company's economic model. ADP is convinced that the expertise combination will be the source of distinct operational and competitive advantages, creating value for the customers, employees and shareholders, as well as for the regions in which the airports are located.

Airports are two-sided platforms as they provide, on one hand, infrastructures and services to air transportation professionals (airlines and freight companies) and, on the other hand, commercial services to the passengers. In this economic model, their interest is to capture the value of both sides of the market: airports need to attract air carriers in order to attract passengers inside the retailers. In this case, ADP is the entity that owns the vision behind the platform and the market opportunities. The company ensures that the platform exists, evolves and provides value through its different offers, suppliers and partnerships.

The Platform Ecosystem Canvas tool can give a description of ADP's environment and stakeholders (ANNEXE 1: ADP's ecosystem canvas).

a) External Stakeholders

There are several external stakeholders that have a specific interest in the ADP platform success or failure. First, air transportation regulations are made by different entities: the European Union and the different states where the airlines operate. Regulations, acting like laws, contain specific guidelines like definitions, licensing requirements, performance specifications, environmental norms, exemptions, forms, etc. but also details about security and customs. ADP needs to conform to these different regulations (environmental, security, etc.) in its activities and infrastructures.

Secondly, ADP is influenced by its different shareholders, and especially the French State. The French State acts as a specific shareholder as it can influence regulations and help the company by different means.

b) Peer Consumers

ADP possesses three main consumers who are consuming and accessing the value created by the airport:

- i. Passengers: They come to the airport in order to access the service provided by the airlines. ADP appears as an intermediary platform: the company makes the passengers pay for its aeronautical services through airport taxes and offers extraservices through its retailers, restaurants, parking, hotels, partnerships with, for instance, RATP, STIF, Château de Versailles, etc. Customers purchase ADP's services on-the-spot but can book some of them in advance as well (for instance, parking slots).
- ii. Airlines: They come to the airport in order to provide their service to the passengers. ADP is allowing them to reach their customers as well as providing them infrastructures and air transportation services to operate flights and offer the best experience to the passengers. Indeed, ADP provides the necessary

facilities for their activity (runways, premises, maintenance, depot and warehouses, reception of the passengers, etc.). For that reason, airlines pay licence-fee to the airport.

iii. Freight companies: Those companies are a complete different business for ADP, as they do not concern the passengers. Freight companies pay licence-fee to the airport for its infrastructure and air transportation services.

As a biface market, ADP's goals are to attract at the same time passengers and strategic airlines for those passengers: for example, Orly and Paris CDG do not necessarily attract the same profile as passengers, therefore contracts with relevant airline companies need to be made. From that, ADP needs to provide to airlines the opportunity to offer the best travel experience.

From another side, freight market is not based on the same logic: ADP needs to provide high-end infrastructure and air transportation services⁴⁰.

c) Peer producers

ADP does business with several entities that are interested in providing value on the supply side of the ecosystem. These companies complete ADP offers and services.

Air transportation service providers: every air transportation activity is outsourced in the airports (luggage, tarmac circulation, parking slots, security, etc.). ADP pays those crucial suppliers for their services in order to improve passengers' experience and companies' efficiency. For instance, the security checkpoint before entering the safe area allows one major point for the passengers: it ensures their security in the airport and during the flight. In case of emergency or extraordinary situations (breakdown...), ADP can step in to work with its operators.

Retailers and food services provide additional services for the passengers. Those companies pay rent (plus give a part of their revenue) to ADP for the location. Consequently, ADP's goal is to create long-term relationships with its suppliers in order to improve mutual efficiency and practices throughout the time.

Indeed, retail and extra-services represent 28.8% of ADP's global revenue.

d) Peer partners

⁴⁰ Group ADP, "Connect 2020: strategic plan for the 2016-2020 period".

Finally, Group ADP is also collaborating with entities that create additional value for the different stakeholders.

In addition to airport transportation and retail services, Group ADP provides extraservices to the passengers. For example, through hotels, car slots, partnerships with touristic places, etc., the airport is trying to improve each aspect of passengers' travel experiences.

Secondly, the different booking platforms are considered as partners as they allow passengers the opportunity to visit airports. Besides, Group ADP is working with the platform "MisterFly" to provide online tickets purchase on its own website.

Finally, Group ADP provides also infrastructures for companies who wish to rent locals (AirFrance for instance, as well as trade unions, etc.). For this category, Group ADP needs to attract those partners in order to improve passengers' experience and increase its revenue through extra activities.

5.2 Lean Management's department

The already quoted "Challenge Punctuality" has been developed in one of the youngest department of ADP: the *Lean Department*.

The Department has been launched during the summer of 2017 within the group⁴¹ and it's now considered as a pilot division for the firm.

According to that, the Lean methodology will be launched at Charles De Gaulle's Airport on the basis of projects' performances.

The Department plays an important role within the Operational Direction of Orly's Airport.

Its scope is the creation of a conception where the client is positioned on the centre of the internal processes of the firm, by eliminating all the possible forms of functioning that don't add value for an enterprise's service or operation (the so called "Mudas"⁴²).

The need of obtaining a Lean Department was born after organisation's reconfiguration, started from the construction project of a strategical structure, which will be supposed to create a connection of the Terminal South and the Terminal West of Orly's Airport.

⁴¹ Interview with Madame Agnès Nicolas, Lean Department's responsible

⁴² "The Toyota 3M model: Muda, Mura, Muri"

As a result, all the internal work units of the two different Terminals will be merged and Orly will pass from an organisation divided through operational units, to an organisation organised by process.

This will implicate a more transversal kind of management, where the Lean plays the role of facilitator.

The so called CRE (the "Economic Regulation Contract") impose certain constraints and among them we can find the goal of increasing the firm's competiveness in order to make ADP the leader in the French transportation sector. Through that, the company will be supposed to obtain more and more optimised by make the charge of work more manageable for the entire environment⁴³.

Each department has de possibility to demand the support of the Lean Department with the scope of having the maximum of efficacy is possible to obtain, even after the merger and reduction of the resources.

Moreover, we can define the type of management proposed by Lean's philosophy as a transversal one, with the scope of not having just an internal department's coordination, but a shared one among all the different actors which work in other domains of the enterprise.

Another important activity of the Department is the so called performance's animation through an important selection of KPI which are normally exposed and illustrated during weekly Visual Management's sessions.

During these meetings all the responsible of the principal areas where the Lean Management is involved, are reunited in order to explain through pictures and schemas the result of each week.

The presentations are made by using a standard nomenclature used by all the participants of each operative unit involved and they are set within a room dedicated to the visual management.

Currently the two project managed by the Lean Department are the optimisation of the crisis processes of the Handled Baggage System and the Challenge Punctuality.

⁴³ Aèroports de Paris – Dossier public de consultation – "CRE 2016-2020".

5.3 Company's future projects and developments

In 2015, Augustin de Romanet - the group's CEO - has announced ADP's strategic project named *Connect 2020*, after two phases of infrastructure modernization and quality of service improvement.

ADP's transformation project describes the strategic development of the company through three main pillars: optimization, attractiveness and international development. ADP invested 4,6 billions euros⁴⁴ in its five years plan which has as important goals, the improvement of airport's operational systems and of customer's experience.

The "transformation ID Card" constitutes a way to analyse the complete transformation plan and its process (ANNEXE 2: ADP's ID CARD).

The transformation nature and initiative are based on the long-term objective of becoming a leader on the international market, as ADP has to deal with a strong competition. According to that, Group ADP is setting up a development strategy for the whole airport value chain (retail, property, infrastructure, etc.). Besides, it even includes a financial, strategic and HR's reconstruction. According to the plan, a rationalisation of all activities and a grouping of operational units will be provided in order to reach efficiency. On the financial side, reductions of wastes in terms of salaries and an optimisation of additional investments will be an important pillar, together with reductions in tariffs and fees for the business area.

According to the concept of *transformation ecology*, in this case we are talking about a company with a huge activities' portfolio, integrated within several airports around the world, and with a large workforce and many stakeholders. One of the most challenging aspect is that ADP has to deal with the operational and social restructuration: units' optimization will conduct to layoffs and a strong change resistance could be encountered.

To sum up, Group ADP aims at enhancing its competitiveness and at developing its activities internationally. The project will be completed once ADP's operational efficiency becomes a guarantee of attractiveness not for passengers only, but even for flight companies and young talents. As a consequence, Paris will be promoted as one of the most important economical and touristic destinations around the world.

⁴⁴ Groupe ADP, "Strategic plan for 2016-2020 period", p. 4

Chapter 6: "Punctuality's Challenge -FrenchBee": project's introduction

6.1 Initiative, motivations and objectives

As reminded within the paragraph 5.2, the lean's methodology includes as one of the most important concepts, the participative collaboration of all the actors involved within a project.

In particular, within airports' environment different kinds of firms act at the same time in order to guarantee the performance of a service.

These firms could constitute either direct or indirect providers for the airport.

In other words, the airport could represent either the direct or indirect client if we take into consideration enterprises which offer a service to an airline company or to one of its providers.

According to that, the first motivation linked to the Challenge, is the accomplishment of a common participation for the unique goal of increasing the punctuality of the airline company.

The perimeter of the project was very clear since the begin and it took form from the initiative of the future sponsor of the project.

It included all the procedures of the *departure process* in which the Airport of Orly is responsible regarding the infrastructures offered and to the performances linked to that.

We can resume it through the following steps:

a) Passenger process

i. Passenger's registration: it's the first part of the process in which the passenger takes its access within the platform in order to record all its identity information and of its luggage.

In this first phase, the passenger can have the choice of utilising the touch screens hardware (BLS), or heading to the desk served by an employee of the service provider⁴⁵.

The service offered at the desk could represent just the approval and delivery of the luggage or even the registration of the personal identities in the case of passengers not registered online, at the BLS on in the other particular cases explained by the note (45).

According to Orly time procedures' nomenclature, the registration operations made by the assistants start at H-3h30 and they finish at H-60min⁴⁶.

- ii. PIF ("*Poste d'inspection filtrage*"): once the passenger has passed the first phase and it has received its CAB (the bar code providing the information of the passenger, of the luggage, and of the destination), the second steps are the securities' checks. For the passengers the suggested hour of presentation at the PIF is at H 1h30, whereas the airplane's equipage is obliged by the company to be there at the same limit hour.
- iii. PAF (Police aux frontières): for all the "not Schengen" destination, the passengers are obliged to pass a control of passport's verification made by the police⁴⁷.
- iv. Boarding: the last part where the passenger is included is the boarding process. It includes a second verification of the identity and of the CAB of the passengers, made by the same assistants of the registration According to the timing rules, this process must begin at H 60mn and finish at H 10mn⁴⁸.
 During this part, an important distinction has to be made.

⁴⁵ For the Airlines Company "FrenchBee" the service provider for this part of the process is GEH ("Groupe Europe Handling"). On the base of the so called *desk planning*, the passengers could have the possibility of using the automatic registration, the automatic luggage deposit or the manual one made by an assistant.

The reasons of possible changes are associated to the periodical availability of the registration desks or to a considerable presence of premium passengers or passengers with particular needs such as passengers with animals, PHMR (passengers with disability) or UM (unattended minors).

⁴⁶ The timing limits are taken by considering the scheduled hour of the first movement of the airplane. For example, if we take H – 3h30 (begin of the registration procedure), it means that the operations will start three hours and thirty minutes before the first movement. All the limit hours are furnished by the company to its providers. ⁴⁷ We want to be a superior of the second start the second start three hours are furnished by the company to its providers.

⁴⁷ We won't explain details about this process, as the Challenge doesn't include PAF verification.

 $^{^{48}}$ Generally, the process is supposed to finish at H – 20. Despite that, in case of missing passenger (passenger lost in the airport, refused passenger by the company etc.) who has already delivered its luggage, the procedures provide another dynamic. According to a security rule, the luggage already charged in the airplane cannot be accepted if the passenger doesn't join to the flight. For this reason, at H – 15, a luggage research could be launched and it is supposed to have an end at H – 10.

The boarding can be a contact one or an offshore one. In the first case the passengers directly enter within the airplane by using a temporary tunnel. In the second case, multiple bus will transport the passengers to the airplane. The limit hour for the begin of this kind of operation is the same as the limit hour of boarding's start (H – 60mn).

b) Airside's processes

Within this category of procedures, we can find all the operations and the actors involved directly on the runway. In other words, we are talking about all the processes lead to get the airplane ready to leave.

Here resumed all the operations involved with their relative limit hours:

- i. Cleaning procedures (Start: H 3h30; Finish: H 2h40)
- ii. Luggage's delivery (Start: H 3h30; Finish: H 30mn)
- iii. Catering procedures (Start: H 2h30; Finish: H 1h40)
- iv. Freights' delivery (Start: H 2h30; Finish: H 1h30)
- v. Fuelling operations (Start: H 1h30; Finish: H 10mn)
- vi. Luggage's charge (Start: H 1h25; Finish: H 20mn)
- vii. Freights' charge (Start: H 1h25; Finish: H 1h20)⁴⁹

We can notice how this complicated chain of operations constitutes an extremely difficult mosaic to manage.

As reminded previously the main purpose is supposed to be reaching the 85% of punctuality within 16 minutes of tolerance.

According to that, the goal vision of all the actors listed before would be for the first time the performances on punctuality.

The role of facilitator of the lean department was surely extremely important especially during the preliminary phases of the Challenge, where the efficiency of communication among all the actors was fundamental.

In other words, communication had the role of convincing all the providers of services within the platform about the concrete advantages they would have found through accepting a Lean methodology in order to optimise their processes.

⁴⁹ Here the most influencing operations regarding punctuality are indicated. All the others details can be found within the Annexe 3 "Limit hours approved by providers"

Here some example of advantages divided among the three most important Lean's concepts⁵⁰:

- i. Simplification and optimisation of processes: all the providers will beneficiate of more simplified processes by eliminating all the useless procedures that don't add value for their service.
- ii. Teams' well-being: the reduction of "Mudas" will generate a satisfaction in the output of the service and less charged tasks for operators.

iii. Economic performance: just the processes which will generate value will be maintained and in addition, the value which they generate, will be maximised.
Finally, we confirm that despite the main goal of the Challenge is obtaining the 85% of the airplanes punctual, the indirect (and not less important) objectives are linked to a transmission of a model that even other flights' companies can utilise.
As we'll see within the next chapter the choice of FrenchBee as airline company relies on this important expectation.

6.2 First part: analysis period

The analysis period (November '17 – December '17) had as a goal the identification of an Airline Company with a high passengers' traffic and low performances of punctuality, within the Terminal South of Orly.

The reasons behind these intentions were that more concrete results would be reached by working with an airline company which doesn't have linear processes and as a result, not optimised ones.

Moreover, an airline company with a high traffic of passenger, implies a higher influence on the performances of the airport and more in particular, of the Terminal South.

For these motivations the first choice was the Airline Company "Air Caraibes"⁵¹. This Airline Company represented the 7th airline company for number of passengers (Annexe 5: Passengers' traffic per Airline Company 2017) with a punctuality within the 16 minutes of the 24,9% of flights.

⁵⁰ We can find more in detail an explanation about the valorisation of the Challenge within the Annexe 4 "Project's mandate". It constitutes one of the principal result of the "Definition Stage" which will be explained in the paragraph 6.3.

⁵¹ Air Caraibes is an Airline Company of the "Dubreuil Group" which has a portfolio of destinations which includes the Caribbean and the Antilles.

The influence on the platform is confirmed by the study effectuated on the statistics regarding airport's punctuality with and without the company.

From the picture 6.1 we can notice how during the months of August, September and October, the punctuality of the all platform decreases in average of a 12%. Moreover, looking just at Orly Terminal South, the punctuality decreases in an average of a 16% because of the bad performances of Air Caraibes.



Picture 6.1 Influence of Air Caraibes (TX) on the punctuality of the platform (Challenge's documents)

The proposition was well accepted by the directional committee.

Despite that, the apparently secondary and indirect objective of delivering a Lean method feasible even for other Airline Companies took a central focus.

According to that, the idea shared within the committee was centred on the importance of the concepts of economic performance, teams' well-being and processes optimisation.

Therefore, a smaller company was proposed and its name is FrenchBee.

FrenchBee can be defined as the "low cost" vector of Air Caraibes and this is one of the reason why the company was finally chosen.

As specified within the Annexe 4 in the section "Valorisation", the project would be a long vision one and one of the justification for that, was the opportunity in the future of using the same Lean model, directly for Air Caraibes or for other concurrent Airline Companies. In other words, the feasibility of a smaller Company would facilitate the delivery of a new method with the possibility of transmitting it to other flights' enterprise in a future.

As a consequence, the analysis moved to consider FrenchBee and its performances about punctuality.

The "influence aspect" of the Airline Company started to be a less important feature to consider (the Airline Company started its activity during June 2017 and it could count just 68000 passengers)⁵².

On the other hand, the performances about 16' punctuality were lower than the average of Orly during the 2017 (Picture 6.2).



Picture 6.2. Influence of FrenchBee (BF) on the punctuality of the platform (Challenge's documents)

Another analysis that has been made take into account the system of delays causes' system called "DL codes method".

This method refers to an important nomenclature system used within the Airport of Orly.

All the possible causes of delay are indicated with a code between 1 and 99.

As we can notice from the Picture 6.3, the most recurrent DLs during 2017, are delays where the Airport can be considered directly involved (in red within the Picture).

⁵² Despite that the Company had a negative influence of 9% on the performances of the Terminal South

For this reason, the choice of the Airline Company resulted to be even more justified by the opportunity to directly intervene without assigning all the responsibilities just to the providers.



Finally, we can say that the negative performances on punctuality and the reasons linked to the delays' causes, gave the last input to start the Challenge with a well-defined perimeter: FrenchBee's flights, departure's process, Réunion's destination⁵³.

6.3 Second part: DMAIC's procedure

The DMAIC's procedure (Annexe 6) constitutes an important strategy for the comprehension of a problematic and the optimisation of processes.

Each one of the letters of this acronym constitutes an important phase of the process, with a completely different scope.

i. *Definition:* During this part, multiple operations are done in order to define the team of work, divided between operational team's members and Directive Committee.

We can define the first ones as the core of the activities in the airport and on the tracks.

⁵³ Réunion is an island and region of France in the Indian Ocean, east of Madagascar and 175 kilometres southwest of Mauritius - (Source: Wikipedia).

According to the "Challenge FrenchBee", a central role has been given to the responsible of the Teams involved in all departure's process. This idea was linked to the choice of transmitting a cultural and strategical influence to all the employees.

The responsible of the Team will participate to formations' sessions during the *Improvement* part and after having visualised the sources of inefficiency on the cartography of the processes (*Analyse*).

The approach used the definition part, had as an important objective, the comprehension of the importance of all the various problematics linked to the operational activities.

The strategy used consisted into a series of individual interviews with each responsible of the teams⁵⁴.

The questions that were asked to each one of the participants have voluntary been let the same ones for each interview.

The first question was about the identification of the interlocutors for each activity of each Team involved.

This first interrogation had as a goal the eventual notification of incoherencies regarding the communication and the possibility of having "interenterprise" problematics.

In other words, this was useful to see if the problematic of an actor involved within the procedure, could have an impact on other participants. The second question was regarding the limit hours of each enterprise involved.

Finally, the last one was about the main problematics of each firm that could have an impact on punctuality's performances.

The result of this first phase has been a general meeting with all the responsible and with the Directional Committee, in order to obtain a validation of all the problematics collected and in order to validate the next phases and the so called "quick-wins".

The quick-wins can be defined as gains feasible to be obtained in the shortrun and that can have an important impact on punctuality.

ii. *Measure*: This second part can be defined as a verification of the information received during the Definition phase.

⁵⁴ This approach was even useful for the composition of the KPI according to the proceeding explained in chapter 4.

The Lean procedure to be followed in this case, is the so called "Gemba". This Japanese word indicates an approach where the involved members of the Lean department observe the procedures on the field, in order to verify if the problematic listed and the limit hours actually correspond to the real situation.

In addition, the observations had the potential of helping to visualise other possible problematics not notified during the previous interviews.

One of the most important goals of this phase, corresponded to the composition of a clear cartography⁵⁵ of all the processes of departure for FrenchBee and for Réunion's destination.

The map will have the scope of focus on the imperfection of the procedures but above all of eliminating all the "Mudas".

Analyse: as already explained, the analyse part is a fundamental phase in order to understand the causes of incoherence within the process.
Once all the imperfections are identified, the Lean approach will act in order to make the process more agile and simplified for assuring the economic efficiency and the well-being of the teams.

In order to make it a real change within the organisation, a clear communication plan is necessary.

In other words, a clear formation plan for the employees involved will be provided and their comprehension will be verified⁵⁶.

iv. *Improvement*: During the Improvement phase the results obtained after the previous operations will be evaluate⁵⁷.

A clear indicator useful to observe the performances of the new tool of the optimised process map will be the principal indicator of 16' punctuality. The Lean approach can be found in this case by the Kaizen⁵⁸ strategy. Despite some results are already achieved, finding some imperfection even within the improvements could be possible according to the logic of "continuous amelioration".

⁵⁵ The cartography has been composed by using the BPMN's technique (Business Process Model and Notation), useful to visualise different actions deployed by different actors at the same time.

⁵⁶ Some methods about the analysis of employees 'understanding will be explained within the chapter regarding the comparison with "Corsair's baggage delivery project" (Paragraph 7.4).

⁵⁷ The begin of this phase is planned for the 18th of June 2018.

⁵⁸ Kaizen (改善), is the Japanese word for "improvement".

During this phase the Lean operators will keep going in playing the role of facilitators among all the actors involved, in order to understand the exigencies and eventually accepting the solutions proposed by the actors.

Control: The last phase put in evidence different principles extremely important for a project and in particular for the Challenge FrenchBee.
 The idea of creating a project to be proposed even to other airline companies, implies that the project has to be performant and with a long run duration.

In order to obtain it, all the new procedures have to be approved, well understood and automatic.

A verification of all these features can be done by using a "Top approach". This approach provides different kind of meetings that can have respectively a verification, proposition and validation scope depending by the level of communication.

The verification scope is usually treated by the actors of the Teams directly involved in the process.

The goal is a careful analysis of the eventual complications of the day for the proceedings and a very rapid share of information among all the employees.

The propositions regarding other possible solution are usually obtained by less frequent meetings between the Lean operators and the responsible of the Teams involved in the project.

Finally, all the new eventual solution, are validate by the Directional Committee with meeting with a monthly frequency.

A fundamental part of the thesis and of the Challenge will be the identification, the measure of the performances, but especially the control of the consequent performances reached.

We will notice how this last aspect will be deployed by a collective participation of all the actors involved and not just by a vertical control operated by the Lean Management Department.

Chapter 7: KPI and Human resource's performances

7.1 KPI evaluation

According to the proceeding explained in Chapter 4, we are now going to explain the real reasoning utilised for the composition and the evaluation of the Key Performance Indicators of the "Challenge FrenchBee".

The goal of the entire project is reaching a 16' punctuality for the departure process for the destination of the Isle of Réunion.

The first critical to success factor (CSF) considered is the "efficiency of communication".

The choice is linked to the important number of providers involved, which give to us an idea of how the communication process could be difficult among them.

Moreover, a confirm about it is arrived from the interviews had with all the actors during the definition phase.

Regarding that, within all the different kinds of statement the issue linked to the share of information during the operations was very frequent.

According to the efficiency of communication, we have considered three common features noticed among all the statements and they respectively correspond to: the frequency of communication, the rapidity of communication and the number of information to share.

As we can notice from the Annexe 7, within all the statements the common feature of the "rapidity of communication" was present.

That means that the correspondent KPI would have a relative high weight and a considerably low grade according to the scale⁵⁹.

Respectively, the subject of the "frequency of communication", "rapidity of communication" and "the number of information to share", were repeated 6, 8 and 1 times.

⁵⁹ The scale which coordinates the evaluation of the KPIs is comprised between 1 (lowest grade) and 5 (highest grade). The scale is linked to the number of quotation within the statement for each common feature. A high number of quotations corresponds to a problematic thematic and to a lower evaluation of the KPI. More precisely: 0 quotations: KPI = 5; 1-2 Q, KPI = 4; 3-4 Q, KPI = 3; 5-6 Q, KPI = 2; 7-8Q, KPI = 1.

The scale has been used as a reformulation of the reasoning contained within the paper "Key performance indicators for successful simulation projects" where the grade between 1 and 5 were assigned by the employees involved through the compilation of questionnaires.

According to the scale, this corresponded to a KPI for the frequency of communication equal to 2, for the rapidity of communication equal to 1 and for the number of information to share equal to 4.

The second critical to success factor considered is the methodology efficiency.

Regarding this factor, we identified three other common features, extremely connected to the Lean notion of process optimisation and elimination of all the incoherent processes.

The three common features respectively are: the "coherence of procedures", "the added value of procedures" and the "regularity of procedures".

By utilising the same reasoning of the first CSF and the same scale, we found out for the first KPI an evaluation of 3, for the second KPI an evaluation of 3 and for the regularity of procedures an evaluation of 2 (Annexe 8).

As we have already explained in chapter 4, these evaluations are useful in order to understand the single performance of a particular aspects of the project, but they are not essential in order to know what's the relative influence for the whole project. According to that, the formulas proposed by the academic article "Key performance indicators for successful simulation projects" can offer an idea about it.

The two principal indicators are the *Project's Success Measure (PSM)* and the *Success Factor Measure (SFM)*.

The first measure can give to us a result regarding the performance of an indicator, compared to the general weight that it has in the whole project.

Whereas, the Success Factor Measure gives an indication regarding the weight of the result within its sphere of competence (its critical to success factor).

0,40		
13%	SFM (KPI1)	13%
0,53		
9%	SFM (KPI2)	7%
0,07		
4%	SFM (KPI3)	27%
0,31		
15%	SFM (KPI4)	20%
0,31		
15%	SFM (KPI5)	20%
0,38		
13%	SFM (KPI6)	13%
	0,40 13% 0,53 9% 0,07 4% 0,31 15% 0,31 15% 0,38 13%	0,40 13% SFM (KPI1) 0,53 9% SFM (KPI2) 0,07 4% SFM (KPI3) 0,31 15% SFM (KPI4) 0,31 15% SFM (KPI5) 0,38 13% SFM (KPI6)

Table 7.1 "Measures' table" (Made with Microsoft Office Excel)

The "*Wi*" measures correspond to the number of statements that contain a quotation regarding a common feature (frequency of communication, rapidity of communication, number of information to share for the CSF: "Efficiency of communication" and "Coherence of procedures", "Added value of procedures" and "Regularity of procedures" for the CSF: "Methodology efficiency").

The more this indicator is high, the more a singular feature can have an important influence on the performance of the its own critical to factor indicator and as a consequence, on the entire project.

Here the analysis of each measure obtained, for each Key Performance Indicator:

- i. KPI1: *Frequency of communication:* the score obtained on the PSM is equal to 13% and it is the same as the score obtained on the SFM. This means that the relatively high influence on punctuality of this indicator is the same regarding the general sphere of the project and the smaller sphere of the efficiency of communication.
- KPI 2: *Rapidity of communication:* The low percentage on PSM (9%) and SFM (7%), depends in this case, not on the level of influence of the factor that is relatively high (wi = 0,53), but on the low score of the KPI "*Rapidity of communication*" (1).

This is the case in which the measures are able to give an indication either of the relative weight of the indicator (the PSM of the entire project and the SFM of the correspondent single critical to success factor) and of the performance.

iii. KPI 3: Number of information to share: in this case the PSM received a percentage score of 4%, whereas the SFM of 27%. These measures offer another emblematic interpretation of this method. The PSM is dramatically low because of the extreme low influence that the factor "number of information shared" can give to the project (despite the very positive performance of the KPI).

In addition, we count in this case a high score for the SFM. This prove that, regarding the performances of the single critical to success factor "efficiency of communication", the number of information to share is proved to be a positive contributor.

- iv. KPI 4: Coherence of procedures: The influence of this factor is relatively high and the KPI scores 3. This is reflected by the PSM and SFM indicators which respectively score 15% and 20%.
- V. KPI 5: Added value of procedures: The same influence level and the same KPI, give to the two measures the same percentages of the *coherence of* procedures' feature.
- vi. KPI 6: *Regularity of procedures:* The same score on the KPI and the almost similar level of influence, compared to KPI 1, give to the respective PSM and SFM, the same percentage score of the *frequency of communication*.

According to the table 7.1, we can conclude that the most important features to consider regarding the possible positive effect on the punctuality are the *frequency of communication* and *the rapidity of communication* for the CSF "Efficiency of communication" and all the three KPIs of the CSF *methodology's efficiency*, as they all have a relatively high potential level of influence.

7.2 Project performances' control

The performances on punctuality can be considered as the first step of the "Challenge FrenchBee".

The participative strategy during the project is implemented even during the control of the performances.

The scope is the understanding of the problematic through the propositions of the employees who directly work in the platform (registration's agents, maintenance's workers, catering agents etc...).

The "Failure mode and effect analyse" gives a clear example of what a participative controlling means.

The first four columns, "Function", "Failure mode", "Potential effects" and "Possible causes" are fill by the employees of different departments (listed on chapter 5).

The fine is to ask to the employees a possible cause of bad functioning, by indicating the function of the operations and the different failure modes according to them.

Moreover, as experts of their own sector, they will indicate the potential effects and as already specified the possible causes.

The role of the Lean manager will be the objective evaluation of what the employees have proposed.

Function	Failure mode	Potential effects	Possible causes	Detection	S (Severity)	O (Occurrence)	D (Detection)	RPN	Comments

Picture 7.1 Failure mode and effect analyse (Challenge's documents)

The scope of the second part of the table is an evaluation of the priority of the problematic.

A numerical score will be given through a note between 1 to 5 under each columns of severity, occurrence and detection.

According to that, the weight of the impact (Severity), the number of times the failure could happen (Occurrence) and the period of its potential duration (Detection).

The result, the RPN will be the product of these three factors: the higher it is, the higher will be the level of prioritisation for a prevention plan for the eventual failure.

We can conclude that this kind of tool, can give to us a perception regarding what a participative problem solving is and how we can have an objective list of possible failures to take care of.

Once we have planned the list of the so called "common causes", we should consider as well the possible "special causes" of failure.

In order to well define this aspect, there is another important tool that can give to us a vision about it: the *Process capability chart*.



Picture 7.2 Process capability chart (Challenge's documents)

If we talk about the punctuality's challenge FrenchBee, everything that is above the Upper Control Limit, could be for example a too high intervention's time for the actors involved.

On the other hand, all the other negative performances such as a low level on 16' punctuality could be positioned under the lower control limit.

In other words, this tool can be an important point of reference in order to follow the performances of a process and for being aware of possible not expected changes in performances.

The third tool that we'll take in consideration during the control phase⁶⁰ is the A3 Model.



Picture 7.3 A3 Model (Challenge's documents)

This tool (Picture 7.3) focus more on the resolution's phase of the problematics put in place within the previous two tools explained.

The title of the A3 model will be the problematic on whom the Lean Department, together with the actors involved will focus and will try to find a solution.

According to that, the employees involved within the problematic will fill the first section "Background", the second one "Current Conditions" and part of "proposed countermeasures" section.

⁶⁰ The Control phase will take place during the last part of July

The scope will be the understanding of the current situation from information directly shared by the respective agents and taking in consideration their propositions about a potential solution.

Normally the Target/Goal is fixed by the Lean Department and the analysis part will give some countermeasures which could correspond or not to the ones proposed by the employees.

Obviously if the countermeasures of the management correspond to the ones of the employees, the following solution will be more sustained by both parts.

During the final two phases, just the Lean Management will be concerned and it will focus on a possible implementation plan for which a continuous monitoring will be made according to its results (Follow up section).

Obviously, an important point regarding the control of performance are the KPIs, which will be presented on an exact sub-phase of the process.

This is actually the dynamic of "Top's logic" (Annexe 9): this kind of communication strategy has the scope of planning different rhythm of communication, for different level of actors involved.

According to that, the "Top 5" meeting, will be a very short and daily reunion with all the actors involved on the field.

The scope is making a focus regarding the forecasted problematic of the day and what the day before has not satisfied the expectations of $performances^{61}$.

On the other hand, the "Top 30" meeting has the strategical point of finding a participative solution to the problematics analysed (E.g. through the Failure mode and effect analysis).

It usually has a weekly rhythm and it can be normally linked to the finding of a potential solution with the shared strategy of the A3 Model.

During this meeting just the teams' agents will join in order to represent all the employees involved.

In addition, we have the "Top 60" meeting where just the Directive Committee's members will participate and it will have the scope of approving the results obtained (through the presentation of the KPIs) and of explaining the next phases of the project.

⁶¹ With "forecasted problematic" we can define the total number of PHMR (passengers with reduced mobility), UM (Unattended minor) etc.

Finally, according to internal communication, the Lean department takes vision of the result obtained on KPIs through weekly visual management's sessions (Chapter 5).

7.3 Benchmark with "Corsair baggage delivery's project"

Corsair baggage delivery's project can be defined as the first challenge of a Lean Team operating at Orly's airport.

The methodology used is the same as the "Punctuality Challenge FrenchBee": the DMAIC.

In this case, the division of the different parts of the project was clear in accordance with the two categories of KPIs used.

In fact, during the phase of definition, just KPIs regarding the quality of the project were given and during the other four phases the KPIs were especially about the quality of the project.

This can be considered as the first big difference between the two projects since performance's animation and the choice of the KPIs in FrenchBee's challenge were addressed just to the measure of the quality of the project.

Before to explain in depth the indicators used, we can pass to describe the DMAIC's stages of the project (Annexe 10).

During the *Definition phase* the attention was focused on the collection of all the contacts of all the actors included within the process.

This sub-phase of the definition part presents an indicator in accordance with the percentage of contacts received on the total of all the participants.

Moreover, the other sub-phase of "Definition", were addressed to the acquisition of all the indicators, resources and the planning useful for the whole project.

The last phase of the definition part, was linked to the programming of all the next phases.

Even these last two sub-phases had their own respective KPI, regarding the availability of all the features listed on the second point and to the finalisation of the programming.

Summarising we can say that the Definition phase of the project was focused especially on internal communication.

In fact, according to the Responsible Manager of the Project, Sir Clement Rattez⁶², one of the main points of the project was the comprehension of the task of each actor, the existing interactions among them and the eventual incoherent features regarding their actions.

In order to do that, all the participants needed to participate to all the introduction meetings and they should have showed a high level of interest in the project.

This extremely subjective measure was analysed through the choice of other indicators such as the number of days of delay for responding to an invitation.

The *Measures phase* focused on the observations made with exactly the same dynamic of the Challenge FrenchBee.

Different percentages for performance were given, regarding the validation of all the participants of the program of the project, the finalisation of the observations and the analysis of the data collected through them.

Afterwards, within the *analysis phase*, an important tool introduced by this project is presented: the *Makigami model*.

The scope of this model is the definition of the perimeter of where the different streams of information come from by listing all the actors involved in the project⁶³. The model is composed by a cartography where several operations are listed, with their own respective communication's supports.

At the end of the model's composition, the result will be a clear list of all the different actions with a visual description about how they are linked among each other.

A second result will be the focus regarding all the anomalies during the processes, with all the respective causes of wasting.

We could say that this second goal of the project puts in evidence the most important concept of Lean Management that is the elimination of processes that don't add value.

The Makigami's model can be defined as a different way for reaching the same scopes of the cartography used during the "Challenge FrenchBee" (chapter 6).

Even the Makigami's model had its own indicator of progression.

The other features of the analysis part of the project, focused on some tools similar to the Punctuality Challenge, such as the list of all the anomalies, the Ishikawa's

⁶² Interview made on the 12th of April

^{63 2}nd Committee's presentation – "Livraison Bagage Corsair"

diagram⁶⁴, the "5W"⁶⁵ and the chronograms with the limit hours of intervention of each participant.

The *improvement part* takes into exam the thematic of the "Quick-Wins" (Chapter 6), of the standardisation of the new procedures optimised and of the formation's program for all the teams involved.

The further difference between the two project can be found within the *controlling phase*.

Here the visual management is deployed into an even more interactive way through the so called *"Obeya" room.*

The Obeya room is usually an open space fully dedicated to the visual management, where anyone is involved within the project, can access and analyse the progressing and the performances of it.

In any moment of a working day, all the KPIs previously listed are exposed, together with the principal indicators strictly related to the performances of the processes.

On the table below, all the features and the common points between the two projects are listed:

	"Punctuality's	"Corsair baggage
	challenge	delivery's
	FrenchBee"	project"
Lean's method	Х	Х
DMAIC's strategy	Х	Х
Processes' KPIs ⁶⁶	Х	Х
Project's KPIs ⁶⁷		Х
Classic visual management	Х	
Obeya room		Х
Processes' cartography	Х	
Makigami		Х

 Table 7.1 "Projects' comparison" (Made with Microsoft Office Word)

⁶⁴ The Ishikawa diagram is an important Lean Management's tool useful to have a clear vision about all the different problematics regarding four principal components: the "measure" methodology used to analyse the performances, the "environment", the "machines" utilised, the "personnel", the "material" used and the "method".

⁶⁵ The "5W" is a very immediate methodology that is used in order to focalise on a problematic by asking for five times the question "Why".

⁶⁶ With "Processes' KPIs" we want to indicate the indicators of the performances strictly related to the operational procedures.

⁶⁷ With "Project's KPIs" we want to indicate the performances related to an efficient project's organisation (E.g. efficiency of internal communication).

Conclusions

We may assume that project management constitute an important tool in order to favourite the growth of a firm.

For this reason, project management is a vital division for a company and according to that, the everyday business of a firm should be a pillar in order to reduce constraints and accelerating the development of this thematic.

Looking for efficient and performative resources is a fundamental operation in order to reduce possible operative limitations, by creating a conspicuous competitive advantage in the market.

In addition, efficiency may be recognised in the minimization of costs involved and in accordance with it, a continuous evaluation of all the processes included is fundamental for this operation.

All the articulated components described connect our mind to the idea of committed firm.

Moreover, this idea is supposed to be linked to a long term or a short term projection, which as we have seen, can completely change the financial planning structure.

A not marginal role is played by human resources.

The formation and training path can be a discriminant component of competitive advantage within the market and we can suppose that the reputation of a company could be a fundamental aspect for it.

In addition, we may sentence that despite a possible positive result for a project, in some cases the firm could consider it as a complex tool to manage.

This statement could be reconnected to one of the phaenomena analysed in the paper such has cannibalisation.

In other words, we can say that even for this reason, risk management and all the evaluation departments involved in a project are extremely responsible of the amount of eventual profits or losses deriving from such an important investment.

Despite that, profits and losses cannot be described as the only way to measure the performance of a project.

During the paper, we have described the KPIs' methodology applied during a typical Lean strategy of project management (DMAIC).

Through this analysis, we have concluded that the Lean project management can be described as a participative strategy of problem resolution, which involves all the directive and operational participants, during different periods.

The shared vision on a single objective has as a result, the improve of punctuality but most of all, the transmission of the Lean methodology as a way to reach organisational and economic efficiency.

We can define these advantages as shared objectives of all the participants of the project and for this reason, the choice of the calculation of the KPIs, resulted from the observation and the understanding of the needs of each part involved.

The higher was the number of firms which showed the same need, the more the score of a KPI could affect the main indicator of 16' punctuality for the Airline Company.

The participative Lean strategy will be held even during the "control part" and the scope will be the finding of a shared solution to all the eventual problematics, that the development of the project will have.

The comparison with "Corsair baggage delivery's project" demonstrates that a single model of project management has different kinds of tools, which can be used depending on the thematic showed by the project itself.

Concluding we can say that "the small firm" which is created during all the organisation of a project, is an entity which has to deal with different kinds of management aspects such as Human Resources, measure of results and performance's controlling.

The paper with the Lean Management and the KPIs' method has tried to explain one of the possible and concreate solution for coping with this difficult subject.



Annexe 1: "ADP's ecosystem canvas"

Annexe 2: "ADP's ID CARD"



Process pax/equipage/bagage	Cible (H-X)
Ouverture banque enregistrement	H - 3:30
Fin operations enregistrement	H - 00h60
Presentation equipage au PIF	H - 1h30
Présentation pax au PIF	H - 1h 30
Début operations bagages en galerie (Traitement 1er bge)	H - 3h30
Livraison premier bagage sous l'avion	H - 1h 30
Fin operations en galérie (prise en main du bge par Samsic)	H - 00h40
Début chargement bagages dans l'avion	H - 1h25
Arrivée dernier bagage sous l'avion	H - 00h30
Fin chargement bagages (dans l'avion)	H - 00h20
Embarquement equipage	H - 1h20
Début Embarquement pax au contact	H - 00h60
Début Embarquement pax au large	H - 00h60
Début operations Bus Pax (Stationnement bus en porte)	H - 00h60
Début operations recherche bagage pax manquant	H - 00h15
Fin recherche Bagage/pax manquant	H - 00h10
Heure limite d'acceptation fret (dans bât fret)	H - 4h00
Fin acceptation fret dangereux	H - 3h00
Validation plan de chargement	H - 3h00
Notification au Capitaine	H - 3h00
Fin Confection fret/transport fret	H - 2h30
Fret sous l'avion	H - 1h30
Heure theorique début chargement fret	H - 1h25
Fin chargement du fret	H - 1h20
Heure de début fouille	
	40 minutes
Fin operations fouille	
Arrivée essencier sous l'avion	H - 00h90
Fuel Order	H - 00h50
Début operations fueling	H - 00h60
Branchement	H - 00h47
Fin operations fueling	H - 00h20
Début operations extering	H - 2530
Fin operations catering	H - 1h50
Début opérations nettovage et armement	H - 2h30
Fin operations nettowage et armement	H - 1b50

Annexe 3: "Limit hours approved by providers"

Annexe 4: "Project's mandate"

Valorisation	Opportunité
 Gain > 40 points de ponctualité pérennes Enjeux de compétitivité et de maitrise opérationnelle Maitrise de procès et de ressources Optimisation du stationnement avions dans un contexte de ressources contraint Augmentation de la satisfaction client (enquête ACI et image de marque) interne/ externe Federer les équipes autours d'un objectif commun; Bien être et montée en compétence des équipes (vision long terme) Cartographie procès Départ (création d'abaques factuelles) 	 Ponctualité 16' French Blue: 42%* (cible 85%) Ponctualité 16' Orly Sud: 51% Ponctualité 0' French Blue: 4% Ponctualité 0' Orly Sud: 13% Satisfaction passagers French Blue * Chiffres Juin-Dec 2017
Indicateurs clés et valeurs cibles	Champ d'application du projet
 Ponctualité 16': Cible 85% TTU enregistrement: 30 sec automatique; 1mn30 manuel HLE: Cible 60 min Temps d'attente PIF: Cible 90% en moins de 10 min Temps d'attente PAF: 45 min passeport 30 min EU TTU embarquement: Cible à définir Temps d'occupation du poste avion: Cible à définir 	 Procès Départs : Faisceau Paris Orly – La réunion Enregistrement Passagers (web checking et autre) Dépose bagages PIF (mesure timing activités) PAF (mesure timing activités) Embarquement équipage, préparation avion, Embarquement (contact et large) Départ bloc avion

Annexe 5: "Passengers' traffic per Airline Company 2017"

Cie	N pay D	N pay A	Ponctualité Départ (14')
	N Dax D		roncioune bepair (ro)
Airfrance &	4 397 807	4 383 880	74.80%
Transavia	2 115 204	2 049 877	A1 80%
Familat	1 202 00/	1 401 751	74.007
EasyJer	1 373 226	1401751	/ 4,00%
Vueling	1 198 400	1 199 098	69,30%
Aigle Azur	530 459	514 129	39,40%
Roval Air			
Maroc	491 674	506 289	56,20%
Air Caraïbes	490 351	509 333	24,90%
Corsair	487 807	504 462	36,80%
TAP	363 988	371 469	68,20%
Air Corsica	307 220	300 843	67,60%
Air Algerie	299 054	307 263	35,60%
Tunisair	253 981	268 731	27,70%
Iberia	226 492	230 329	82,90%
Norwegian	169 839	175 540	44,80%
British Airways	118 105	112 687	78,70%
Alitalia	51 507	52 621	84,70%

Annexe 6: "DMAIC Challenge FrenchBee"



Annexe 7: "Efficiency of communication's table"

		Efficiency of communication	
	Frequency of communication	Rapidity of communication	Number of information to share
Information of TVA is support outland.			
in late (Cleaning Company)	4	4	
Last minute information regarding the positioning of the airplane (Cleaning Company)	4		
Company's contact absence during departure operations (Cleaning Company)			
Coordination problem with airplane's catering firm (Cleaning Company)	d		
TVM's information not updated in time (Bus passengers transport's company)			
Operators not informed regarding airplanes' delays (Bus passengers transport's company)			
Information of TVM's support arrived in late (Fueling Company)			
Late information airplane's charging plane (FrenchBee)		4	
	KPI 1	KPI 2	KPI 3
	2	1	4

	AIIIEAU	5. Methodology efficiency s ta	UIC
		Methodology efficiency	Popularity of po
	contentie of procedures	Added value of procedures	Regularity of ph
Late arrival of cleaning company			J
Freights' late preparation		J	
Late arrival of catering company			e
Late arrival of fueling company			2
Delais due to recherche baggage	7		
Incoherent limit hours of intervention		·	
The charging plan of freights is sent after the begin of freights' delivery		·	
Airplanes' parking plan not shared with all the providers			

Annexe 8: "Methodology efficiency's table"

Annexe 9: "TOP's logic"

KPI 5 3

KPI 4

KPI 6

2



			S47	S48	S49	S50	S51	S52	S01	S02	S03	S04	S05	S06
	DEFINITION DU PROJET	Prise de contact	75	*>>										
ETAPE 1		Définition (Indicateurs, Ressources, Planning)		80%	>									
		Charte Projet		8	0%									
		Validation format		90%	$\mathbf{\Sigma}$									
ETAPE 2	MESURES ET OBSERVATION	Observations		10%	>					\supset				
		Analyse des données historiques		25%	•	\supset								
	ANALYSE	Makigami		90%										
		SOP Flux d'informations					\geq							
ETAPE		SOP Flux d'informations					\geq							
3		SOP Dépose Tapis					\geq							
		Collecte des anomalies								1		\square		
		Ishikawa, 5P, ECRS, Chronogramme												
		Quick Win						\square						
ETAPE 4	MISE EN PLACE DES AMELIORATIONS	Actions priorisées								1	\geq			
		Nouvelles Actions / Formalisation / Formation											\supset	
		Mise en place Obeya												
ETAPE 5	MISE SOUS CONTROLE	Développement Obeya								1			\supset	
		Seuils d'alerte et règles de réaction											\supset	

Annexe 10: "DMAIC Livraison Bagages Corsair"

Annexe 11: "Makigami's model"



Bibliography

- Paul C. Dismore, Jeannette Cabanis Brewin (2010) AMA Handbook of Project Management.
- Management Budget e controllo di gestione (a cura di Marco Agliati) Il Sole 24 Ore/Università Bocconi Editore.
- Jacek Kalinowski (2010) Project management and presentation of information in financial statements – company performance measurement or project performance measurement.
- Project Management Institute (1987) "A Guide to the Project Management Body of Knowledge" - Third Edition.
- Jonathan Berk, Peter Demarzo (2014) Corporate Finance Third edition Stanford University.
- Roma servizi per la mobilita' srl codice etico p.11.
- Key performance indicators for successful simulation projects Mohsen Jahangirian Simon JE Taylor Terry Young Stewart Robinson.
- "Challenge FrenchBee's" documents.
- Nicolas Le Corre et Alexandre Boulègue, (2017), "Les aéroports et services aéroportuaires".
- Group ADP, "Connect 2020: strategic plan for the 2016-2020 period".
- "The Toyota 3M model: Muda, Mura, Muri".
- Aèroports de Paris Dossier public de consultation "CRE 2016-2020".
- 2nd Committee's presentation "Livraison Bagage Corsair".

Sitography:

- <u>https://www.iasplus.com/en/standards/ias/ias11</u>.
- <u>http://www.palisade.com/risk/monte_carlo_simulation.asp</u>.
- "Silver Lake's highly leveraged buyout of Dell" <u>http://www.mergersandinquisitions.com/leveraged-buyout-lbo-model-overview-</u> <u>capital-structure/</u>.
- Bloomberg: "How Virtual Teams Can Succeed".
- Bloomberg: "Cabela's Massive Superstores Are Cannibalizing Each Other".

Interviews

- Responsible Manager of "Corsair's baggage delivery project", Sir Clement Rattez.
- Lean Department's responsible, Madam Agnés Nicolas.
Thesis' summary

Introduction

When we analyse the management's organization of a project, the comparison between its working and structure with the framework of a firm as a whole is extremely realistic.

Moreover, during the working of a project, one of the most complicated issues may be correlated to a right understanding of the presence of indirect costs which constitute a fundamental measure influencing performances.

Therefore, as management is compounded by people, a relevant phase is the selection and recruiting of the personnel, its constantly monitoring and a motivational approach.

Besides the quantitative methods used to measure the performance of a project, we can have different quantitative strategies such as the use of KPIs. This qualitative method will be introduced within the context of the "Challenge FrencBee" at the Lean Department of Orly's Airport.

Finally, a qualitative appreciation of the Lean methodology used, will be made through a comparison with another Lean project.

Chapter 1: elements of evaluation: theoretical introduction

The micro-structure that project's management lead into a company, can be defined as a typical "committed firm's" structure. For this reason, the lower size firm need to respect the typical rules of accounting, listed within the international principles. *Fair presentation and compliance with IFRS; Going concern; Accrual basis; Materiality and aggregation Offsetting; Frequency of reporting; Comparative information; Consistency of presentation.*

The financial statement offers a faithful communication pattern in order to permit to the shareholders to take vision of the financial and economic situation of the firm.

This document is characterized by the so called balance sheet that consists in an illustrative framework of the analysis of assets and liabilities, through the distinction between current and not current activities.

Another fundamental document, is the so called Income Statement. The Income Statement is a representation of the losses or profits realised within the period considered and it takes into consideration the revenues minus all the occurred costs.

The further phase will be the calculation of the EBIT (Earnings Before Interests and Taxes) and through it, we can obtain the result of the period by considering the difference between this quantity and interests plus taxes.

The financial statement includes also a statement of change in equity, followed by the so called cash-flow statement illustrated by IAS 7. The cash flow statement is a framework in which all the variations in cash are registered and it's very useful within the analysis of a project, in order to provide a financial planning and a liquidity analysis.

*Cash flows from operating activit*ies are an important index to understand if the firm has or has not enough liquidity to run every day's business and a positive result for it is essential.

Cash flows from investing activities illustrates if the firm is investing or not and for this reason, a negative result may be well accepted.

Cash flows from financing activities expresses from a numerical point of view, the financial planning of the firm and the result could be positive or negative depending on the life-cycle of the company we are considering.

A basic and important point for project management planning, is the analysis of estimates costs and budget. We can define the budget as costs estimated approved by management, which have to be controlled and verified by the financial management. The budget can be also defined as the total value of the future project of a firm for this reason, it can be even defined as planned value.

According to that a firm can calculate the value of its project on a precise moment of its life-cycle by considering the formula: *Planned value (by specific date)* = (OD - RD)/OD) * *Planned value (total) (*Where OD is the original duration, whereas RD is the remaining duration).

If we consider the International Accounting principles, according to IAS 11 we can define a construction contract as a specific contract created for an asset.

A construction contract provides important indications for costs' allocation such as: all the costs directly related to the project, general costs related to the contractualization's activity and costs eventually charged to the customer.

If we refer to the theory of income taxes, we have to take in consideration IAS 12. IAS 12 illustrates what the future and current effects of taxes within transactions are. Its objective is to provide an accounting framework in order to give some precise guidelines regarding taxes' registration.

One of the most important problems in costs' accountability is their selection related to their nature.

The first fundamental division that has to be done is between direct and indirect costs. We can define the first category as costs that are immediately related to physical items involved within the production.

Secondly a firm can have other typologies of cost that cannot be directly related to the final product and they can be defined as costs linked to production factors not directly imputable to it.

Chapter 2: Project management's analysis

When a firm considers the accomplishment of an objective has to analyse, within its operating activities, the relationship among different kinds of constraints and limitations.

Firms usually use in order to create a precise financial ceiling, another important model called activity based costing. This model takes in consideration the activities which generate costs instead of direct costs sources like all the other methods described.

The core concept of this method is that products consume activities and all the activities generate costs. The basic relationship put in evidence precise indexes like the quantity produced (*Q*), the price for unit (*p*), variable costs (*cV*) and fixed costs (*CF*). All these parameters contribute to calculate the so called firm's economic result, calculated by the formula: RE = p * Q - (Cv * Q + CF).

Moreover, by using a second formula, we can calculate the contribution margin by the equation: (p-Cv). In order to respect the objectives provided by a firm's project by taking in consideration all the constraints, AMA recommends three important activities for a company.

First of all, a company is supposed to increase the capacity produced relatively to the demand. The second action exposed is to reduce demand relatively to capacity which means reducing the amount of project in which the firm is involved during excessive demand period. The third task considered is the implementation of an appropriate management associated with an efficient control system.

Cost management is defined by an important operation which takes in consideration all the resources needed for each activity. This process is called *resource estimating*.

Normally, resources needed are calculated by taking in consideration each activity and by understanding the actual quantity of necessary resources.

In order to do that, there are two kinds of approaches the first one is called *early resource aggregation* and in this case the firm will start to use resources as soon as a first activities' framework is available.

The second one is called *late resource aggregation* and it uses resources the latest is allowed by the activities' plan.

One of the most difficult parts of cost estimation is understanding the presence of indirect costs but in the best case having reliable information may be possible.

The steps for a correct cost estimation can be summarized by the following stages: *Order of magnitude stage*: in this stage the firm estimates costs by making a computation with other firms' similar projects; *Conceptual stage*: during this phase, the firm has the possibility to manage more concreate information and to evaluate different alternatives for the project; *Preliminary stage*: this is the stage in which the company is able to define more precise specifications and clear documentation for the project; *Definitive stage*: once the firm has accomplished this phase, general and definitive conditions about the contract could be officially signed by a hypothetical bidder; *Control stage*: this final stage groups all the possible bids from all the external participants of the project like for example suppliers of materials and equipment. This analysis is extremely important when we talk about measuring the *value of project management*.

Once the firm has accomplished the previous steps, the firm can build a planning for the implementation of the program, which concludes the cycle of evaluation of project management.

Risk management has a clear fundamental role in the structure of a company due to the risky nature of a firm's project.

The first phase for building a risk plan is related to a planning phase, in which risky objectives and not risky objectives are shaped.

The second phase is indeed risk identification and it includes general kinds of analysis by using typical tools like the SWOT analysis.

The core project starts with the qualitative risk analysis which has the role to understand the weight that the worst threat can have and the benefit of the best opportunity considered. The following stage, called *risk response planning*, tries to give a strategic dimension in order to develop the risk impact. During this stage risk management is supposed to make different actions depending on the presence of a threat or an opportunity.

The final step consists in the monitoring and control of the risk management's process; in other words, the management will verify if the impact that was expected actually correspond to the real response.

Chapter 3: Project's performance measurement

One of the most important aspects of planning and developing a project is the structure that the team involved within the firm has to assume. In other words, the selection of human and material resources are similar to the process that we can usually find into a standard company.

First of all, we have to specify that the identification of the team's member depends on the resources needed and this operation may be executed through a process of outsourcing. The first step is *human resource planning*.

This is the moment of team's building in which all the resources needed and the environment have to be understood in order to find the right profile for a project's execution.

At the end of this step, the committed firm will obtain a clear selection of members with a precise combination among their tasks and availabilities within the project. As we can intuit, the tools used during this phase consist in different types of recruiting section, especially when specific and individual tasks are not provided.

The third passage consist in the development of the team and as inputs a clear list of all the profiles selected, that will be used for combining them with the training sessions provided within the human resource planning.

The last step consists in the real manging of the team which is supposed to combine all the aspects already planned and all those features that could actually be forwarded.

In other words, the inputs in this case will consist in all the roles and responsibilities already planned, with all those features that are expected but not already happened such as financial and team's performances.

When we talk about financial needs for a company's project, we should split this thematic in two macro areas. The two principal areas concern a division based on the time of the investment and as a consequence, of the financial operation treated. For instance, long term investments may be compared to a financing process typical of a new committed firm according to their modalities.

The most common sources for long term funding are the so called Angel Investors who are commonly diffused within the start-up's dimension. They can be defined as individual investors willing to make investments in young firms by acquiring parts of their equity.

Venture Capital Firms could be defined as a similar phenomenon. However, in this case the investors involved are not individuals but companies which purchase a part of the equity from infant firms.

On the other hand, we have the so called Private Equity Firm which constitute an investment source for firms that are privately held by it. Usually this operation is defined as leverage buyout (LBO) and it happens when a big company acquires the entire amount of outstanding equity of the other firm.

A fundamental role is played by the permanent working capital which is a mandatory amount that a firm should maintain in order to run its everyday business. In this case we are talking about another typology of long term investments because this particular amount is supposed to remain in the company domain for all its business' life.

As a result, according to the matching principle, this kind of operation will need a long term financing plan. On the contrary, the temporary working capital will be financed by a short-term financing as it represents a short-term need.

In most of the cases it is preferred to a financing plan with the use of long term debt, because short term operations could have a lower probability of being affected by market pathologies, such as asymmetric information.

Finally, additional ways for financing a short term investments are the so called line of credit and the bridge loan.

The line of credit constitutes the limit of the amount a bank can permit to finance and sometimes it is independent from the financial conditions of the firm.

On the other hand, the bridge loan can be defined as an amount of financial resources, that the bank can provide in the short run in order to fill the economical gap, which wouldn't allow the firm to sustain a long-term financing plan.

When we talk about cash flows, we are considering the final result of the firm's project and their theory is used in order to understand if our project is profitable or not.

The calculation of cash flows has as a first step the measuring of incremental earnings which can be defined as the amount firm's earnings should change after an investment decision.

The first element that a firm has to consider are capital expenditures and in particular their depreciation. In accordance with that, capital expenditures are not supposed to be considered as a whole during incremental earning's calculation, but it's going to be gradually subtracted from the initial earnings year by year as depreciation.

After considering depreciation, the firm will obtain the amount of earnings before interests and taxes (EBIT). As the firm will consider the evaluation of the project without considering the financial activities, interests' expenses won't be included and the result obtained will be defined as unlevered net income.

If this result is positive, the firm will pay taxes according to a marginal corporate tax rate, which constitutes an incremental quantity that the firm has to pay related with the incomes matured. We may explicit it by the formula:

Unlevered Net Income=EBIT *(1 - tc) = (Revenues - Costs - Depreciation) *(1 - tc), Where tc is the marginal corporate tax rate.

Once the firm is arrived to the calculation of the right amount of incremental earnings, financial analysts will compute cash flows.

The first operation is to add again depreciation. The second step is the calculation of the net working capital by the difference between current assets and current liabilities.

This calculation is better described by the formula: *Net Working Capital (NWC)* = Current Assets - Current Liabilities = Cash + Inventory + Receivables - Payables.In particular, the difference between receivables and payables correspond to the trade credit.

According to cash flows' calculation, an extremely important element is the increment of expenses in working capital in respect to the previous year.

Once we have obtained this last element, free cash flow's formula will be: *Free* Cash Flow = (Revenues - Costs) * (1 - tc) - CapEx - NWC + tc * Depreciation.

With *tc* * *Depreciation* defined as depreciation tax shield which corresponds to tax savings from depreciation previously deducted.

In order to verify if the firm's project is profitable, the financial analyst will actualize all the cash flows by using an appropriate cost of capital with the right maturity which reflect the period of the project.

4. Key Performance Indicator's approach

According to the theory of the literature and to management's practices within firms, KPI ("Key Performance Indicators") are a useful technique for performance's measurement and animation.

They could be used as a concrete representation of the so called Critical to Success Factors (CSFs).

According to the paper "Key performance indicators for successful simulation projects" the creation of KPIs strictly depends on the the set of CSFs which are supposed to reflect the fundamental features useful for having a clear resume of performances.

For this reason, before to set a CFS, a good comprehension of the problem is essential in order to have a clear framework of the context and of the areas on whom the management needs to focus.

The method that we are going to explain refer to a top-down approach as it starts from the general objectives of a project and it finally arrives to the implementation of KPIs.

After having set a general numerical objective, the project's team will discuss about several statements that will be used in order to understand which are the most recurrent problematics and features that need to be taken in consideration.

Within some of the statements there will be common features to consider and this will be a point of reference in order to know which aspect will be more influencing compared to the others.

Finally, the consequent KPI, we'll be the concreate and measurable representation of the CSF deployed at the begin.

According to the other analytical measurements, we can take as an example two important tools which can give two different views according to our interpretation. The first one is called *Project's Success Measure (PSM)* and it gives to us information regarding the relative weight of a KPI compared to the total number of KPIs.

 $PSM = \frac{w_i \sum_i \sum_j KPI_{ij}}{Total \ no. of \ KPIs} \times 100$

The formula builds a relation between the KPI taken as point of reference and the relative number of citations associated to the relative CSF.

The relative number citations can be calculated by observing the statements explained above and we can measure them by counting how many times a common feature is contained within them.

$$w_i = \frac{c_i}{\sum_{i=1}^5 c_i}$$

Another important indicator is the "Success Factor Measure". Compared to the Project's Success Measure, it gives to us a measure more focalised on the weight of the KPI, related to the CSF where it derives.

$$SFM_i = \frac{\sum_j KPI_{ij}}{No.of \ KPIs \ associated \ with \ CSF_i^*5} \times 100$$

By summarising:

KPIs: they give indications regarding the performance of a single common feature which compose a CSF; *PSM*: it gives indications regarding the success of the project, and the weight of the KPI taken in consideration, compared to the total number of KPI; *SFM*: it gives numerical information about the success of a factor compared to the performances of the KPI associated with a specific CSF.

Chapter 5: ADP (Aéroports de Paris): Company's introduction

ADP is a French global leader in airport design, construction and operations, both in Paris and abroad. It was created in 1945 under the name of Aéroports de Paris (ADP) and was a government- owned corporation. It became a public company in 2005 meaning that other shareholders own and invest in the group. Consequently, the company has obtained the financial capacity to adapt and develop existing infrastructures, which allow them to respond to global air transportation transformations.

165 airlines and 119 countries served from Paris-Charles de Gaulle and Paris-Orly 97.2 millions of welcomed passengers in 2016, 23 airports worldwide, €2 947 millions revenue, 1st system in Europe in terms of cargo traffic and 2nd system in Europe in terms of commercial passenger traffic.

The "Challenge Punctuality" has been developed in one of the youngest department of ADP : the *Lean Department*.

The Department has been launched during the summer of 2017 within the group and it's now considered as a pilot division for the firm. Its scope is the creation of a conception where the client is positioned on the centre of the internal processes of the firm, by eliminating all the possible forms of functioning that don't add value to an enterprise's service or operation (the so called "Mudas").

The need of obtaining a Lean Department was born after organisation's reconfiguration, started from the construction project of a strategical structure, which will be supposed to create a connection of the Terminal South and the Terminal West of Orly's Airport.

Each department has de possibility to demand the support of the Lean Department with the scope of having the maximum of efficacy is possible to obtain, even after the merger and reduction of the resources.

Moreover, we can define the type of management proposed by Lean's philosophy as a transversal one, with the scope of not having just an internal department's coordination, but a shared one among all the different actors which work in other.

Chapter 6: "Punctuality's Challenge - FrenchBee": project's introduction

Within airports' environment different kinds of firm act at the same time in order to guarantee the performance of a service.

The first motivation linked to the Challenge, is the accomplishment of a common participation for the unique goal of increasing the punctuality of the airline company.

The perimeter of the project was very clear since the begin and it took form from the initiative of the future sponsor of the project. It included all the procedures of the *departure process*.

Here resumed all the operations involved with their relative limit hours: Cleaning procedures (Start: H – 3h30; Finish: H – 2h40); Luggage's delivery (Start: H – 3h30; Finish: H – 30mn); Catering procedures (Start: H – 2h30; Finish: H – 1h40); Freights' delivery (Start: H – 2h30; Finish: H – 1h30); Fuelling operations (Start: H – 1h30; Finish: H – 10mn); Luggage's charge (Start: H – 1h25; Finish: H – 20mn); Freights' charge (Start: H – 1h25; Finish: H – 1h20) (Annexe 3).

The role of facilitator of the lean department was surely extremely important especially during the preliminary phases of the Challenge, where the efficiency of communication among all the actors was fundamental.

In other words, communication had the role of convincing all the providers of services within the platform about the concrete advantages they would have found through accepting a Lean methodology, in order to optimise their processes.

The proposition shared within the Directive Committee was centred on the importance of the concepts of economic performance, teams' well-being and processes optimisation.

In order to facilitate the transmission of the Lean methodology, a smaller company was proposed and its name is FrenchBee. This Company can be defined as the "low cost" vector of Air Caraibes and this is one of the reason why the company was finally chosen.

The performances of FrenchBee regarding 16' punctuality were lower than the average of Orly during the 2017. Moreover, in most of the delays' causes of the company, the airport was directly involved. For this reason, the choice of the Airline Company resulted to be even more justified by the opportunity to directly intervene without assigning all the responsibilities just to the providers.

The DMAIC's procedure (Annexe 6) constitutes an important strategy for the comprehension of a problematic and the optimisation of processes. Each one of the letters of this acronym constitutes an important phase of the process, with a completely different scope.

Definition: During this part, multiple operations are done in order to define the team of work, divided between operational team's members and Directive Committee.

The result of this first phase has been a general meeting with all the responsible and with the Directional Committee, in order to obtain a validation of all the problematics collected and in order to validate the next phases and the so called "quick-wins".

The quick-wins can be defined as gains feasible to be obtained in the short-run and that can have an important impact on punctuality.

Measure: This second part can be defined as a verification of the information received during the Definition phase.

The Lean procedure to be followed in this case, is the so called "Gemba". This Japanese word indicates an approach where the involved members of the Lean department observe the procedures on the field, in order to verify if the problematic listed and the limit hours actually correspond to the real situation.

One of the most important goals of this phase, corresponded to the composition of a clear cartography of all the processes of departure for FrenchBee and for Réunion's destination. The map will have the scope of focus on the imperfection of the procedures. *Analyse*: as already explained, the analyse part is a fundamental phase in order to understand the causes of incoherence within the process. Once all the imperfections are identified, the Lean approach will act in order to make the process more agile and simplified for assuring the economic efficiency and the well-being of the teams. *Improvement*: During the Improvement phase the results obtained after the previous operations will be evaluate. A clear indicator useful to observe the performances of the new tool of the optimised process map will be the principal indicator of 16' punctuality.

Control: The last phase put in evidence different principles extremely important for a project and in particular for the Challenge FrenchBee. The idea of creating a project to be proposed even to other airline companies, implies that the project has to be performant and with a long run duration. In order to obtain it, all the new procedures have to be approved, well understood and automatic.

A fundamental part of the thesis and of the Challenge will be the identification, the measure of the performances, but especially the control of the consequent performances reached.

We will notice how this last aspect will be deployed by a collective participation of all the actors involved and not just by a vertical control operated by the Lean Management Department.

7. KPI and Human resource's performances

According to the scale, the scores of the KPIs for the frequency of communication was equal to 2, for the rapidity of communication equal to 1 and for the number of information to share equal to 4.

The second critical to success factor considered is the "methodology efficiency".

The three common features respectively are: the "coherence of procedures", "the added value of procedures" and the "regularity of procedures".

By utilising the same reasoning of the first CSF and the same scale, we found out for the first KPI an evaluation of 3, for the second KPI an evaluation of 3 and for the regularity of procedures an evaluation of 2.

According to that, the formulas proposed by the academic article "Key performance indicators for successful simulation projects" can offer an idea about it.

The two principal indicators are the *Project's Success Measure (PSM)* and the *Success Factor Measure (SFM)*.

The first measure can give to us a result regarding the performance of an indicator, compared to the general weight that it has in the whole project.

Whereas, the Success Factor Measure gives an indication regarding the weight of the result within its sphere of competence (its critical to success factor).

The "*Wi*" measures correspond to the number of statements that contain a quotation regarding a common feature. The more this indicator is high, the more a singular feature can have an important influence on the performance of the its own critical to factor indicator and as a consequence, on the entire project.

According to the Table 7.1, we can conclude that the most important features to consider regarding the possible positive effect on the punctuality are the *frequency of communication* and *the rapidity of communication* for the CSF Efficiency of communication and all the three KPIs for the CSF *methodology's efficiency*, as they all have a relatively high potential level of influence.

The participative Lean strategy during the project is implemented even during the control of the performances. The scope is the understanding of the problematic through the propositions of the employees who directly work in the platform

The "Failure mode and effect analyse" gives a clear example of what a participative controlling means. The first four columns of the table (Picture 7.1), "Function", "Failure mode", "Potential effects" and "Possible causes" are fill by the employees of different departments. The fine is to ask to the employees a possible cause of bad functioning, by indicating the function of the operations and the different failure modes according to them.

The scope of the second part of the table is an evaluation of the priority of the problematic. A numerical score will be given through a note between 1 to 5 under each columns of severity, occurrence and detection.

The result, the RPN will be the product of these three factors: the higher it is, the higher will be the level of prioritisation for a prevention plan for the eventual failure.

Once we have planned the list of the so called "common causes", we should consider as well the possible "special causes" of failure. In order to well define this aspect, there is another important tool that can give to us a vision about it: the *Process capability chart* (Picture 7.2).

If we talk about the punctuality's challenge FrenchBee, everything that is above the Upper Control Limit, could be for example a too high intervention's time for the

actors involved. On the other hand, all the other negative performances such as a low level on 16' punctuality could be positioned under the lower control limit.

The third tool that we'll take in consideration during the control phase is the A3 Model (Picture 7.3). This tool focus more on the resolution's phase of the problematics put in place within the previous two tools explained.

The title given to A3 model's document will be the problematic on whom the Lean Department, together with the actors involved will focus and will try to find a solution. According to that, the employees involved within the problematic will fill the first section "Background", the second one "Current Conditions" and part of "proposed countermeasures" section.

The scope will be the understanding of the current situation from information directly shared by the respective agents and taking in consideration their propositions about a potential solution.

Normally the Target/Goal is fixed by the Lean Department and the analysis part will give some countermeasures which could correspond or not to the ones proposed by the employees.

During the final two phases, just the Lean Management will be concerned and it will focus on a possible implementation plan for which a continuous monitoring will be made according to its result.

Corsair baggage delivery's project can be defined as the first challenge of a Lean Team operating at Orly's airport. The methodology used is the same as the "Punctuality Challenge FrenchBee": the DMAIC.

During the *Definition phase* the attention was focused on the collection of all the contacts of all the actors included within the process. This sub-phase of the definition part presents an indicator in accordance with the percentage of contacts received on the total of all the participants.

Moreover, the other sub-phase of "Definition", were addressed to the acquisition of all the indicators, resources and the planning useful for the whole project.

The *Measures phase* focused on the observations made with exactly the same dynamic of the Challenge FrenchBee. Different percentages for performance were given, regarding the validation of all the participants of the program of the project, the finalisation of the observations and the analysis of the data collected through them.

Afterwards, within the *analysis phase*, an important tool introduced by this project is presented: the *Makigami model* (Annexe 11). The scope of this model is the definition of the perimeter of where the different streams of information come from by listing all the actors involved in the project. The model is composed by a cartography where several operations are listed, with their own respective communication's supports.

The further difference between the two projects can be found in the controlling phase. Here the visual management is deployed into an even more interactive way through the so called *"Obeya" room.* The Obeya room is usually an open space fully dedicated to the visual management, where anyone is involved within the project, can access and analyse the progressing and the performances of it.

Conclusions

Project management is a vital division for a company and according to that, the everyday business of a firm is a key, in order to reduce constraints and accelerating the development of this thematic.

Efficiency may be recognised in the minimization of costs involved and in accordance with it, a continuous evaluation of all the processes included is fundamental for this operation. Despite that, profits and losses cannot be described as the only way to measure the performance of a project.

During the paper, we have described the KPIs' methodology applied during a typical Lean strategy of project management (DMAIC). Through this analysis, we have concluded that the Lean project management can be described as a participative strategy of problem resolution, which involves all the directive and operational participants, during different periods. We can define these advantages as shared objectives of all the participants of the project and for this reason, the choice of the calculation of the KPIs, resulted from the observation and the understanding of the needs of each part involved.

Concluding we can say that "the small firm" which is created during all the organisation of a project, is an entity which has to deal with different kinds of management aspects such as Human Resources, measure of results and performance's controlling. The paper with the Lean Management and the KPIs' method, has tried to explain one of the possible and concreate solution for coping with this difficult subject.