POLITECNICO DI TORINO

Master of Science in Engineering and Management

**IT Audit Consulting in Deloitte Risk Advisory S.r.l.
The relevance of advertising revenues in a Media
Company.**

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A mia nonna Margherita e mio nonno Franco

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Introduction

Deloitte is one of the top four consulting and auditing services companies in the world. The criteria for this kind of classification are revenues and number of employer. It is a multinational company founded in the 1800s by William Welch Deloitte, George Touche and NobuzoTohmatsu.

It has over 244,400 employees allocated in more than 150s states over the various operating sectors: Audit, Tax, Consulting, Financial Advisory e Risk Advisory.

Deloitte network is a world leader in offering services in the area of Corporate Governance, Internal Control Systems, Corporate Risk Management, Security and Privacy.

During the internship experience in Deloitte Risk Advisory S.r.l., it was possible to analyze how the rigorous target are implement and how to mediate and cooperate with Audit activity.

The aim of the thesis aims to describe how consultancy activity can supports specific needs of customers, offering a personalized service and making use of professional and soft skills.

In this way the aim of the consultants, is to analyze and understand the source of data in order to guarantee the Audit activity.

Moreover the managing of the data are object of analysis in order to obtain a compete view of the value generation.

In the upstream of this kind of consideration, the team of consultant has to certify also the technical skills of IT department of the client, regardless the size of it.

At the end of this consideration, it is possible to define the common goal: the security and the correct managing of the Audit data form the first input to the generation of the accounting value.

Indeed one the roles of IT professionals is facilitate the communication and collaboration between the parties.

The annually consultants activity imply the formalization of a set of documents, thanks to which critical points are often encountered or simply note the changes in the accounting IT applications used.

After this analysis, the consultants suggest a range of possible optimal solutions and it will be up to the customer to decide which path to take, after a feasibility analysis.

The current situation will be analyzed first, i.e. how the customer is inclined to change the IT structure in order to guarantee Audit support in an efficient and effective way.

At the end of the process will be suggested a set of technical solutions to ensure greater data or obtain better result.

In conclusion, thanks to this service the end client obtain a better knowledge of their IT structure though an accurate analysis of critical point and an exploitation of their competence.

Moreover, in order to give a technical evaluation of the above describe sentence, will be evaluate the case study of the principal project of the internship experience.

In detail will be analyzed the IT structure of a company of media and communication in the Italian panorama. Furthermore will be described the IT process related to the first source of income: advertising revenue. Will be also descript the controls related to this business cycles in details, from the spot recording to accounting voice generation.

At the end of the work will be illustrate the solution that allows the post-end end live monitoring of advertising revenue.

Chapter 1. The Big Four

1.1 The consulting giants

Through the big four terminology, the four consultancy and auditing companies are defined that share the reference market. PricewaterhouseCoopers, Ernst & Young, Deloitte Touche Tohmatsu and KPMG are the consultancy giants in Italy.

Initially there was also the multinational Arthur Andersen (the current "Accenture"), for a total of 5 companies, but after the scandal of the Enron trial, company came out of this "elite", they become a public company. The latter was charged as auditor of the financial statements of the company protagonist of one of the largest financial cracks in the USA.

The legal structure of the four companies constitute a single legal entity. Each one is part of a network of independently owned and managed companies, which have concluded agreements with other companies, but share the same name, brand and quality standards. Each Network coordinates the activities of the companies present. The Figure 1 below shows the revenue of Big Four accounting / audit firms worldwide in 2017.
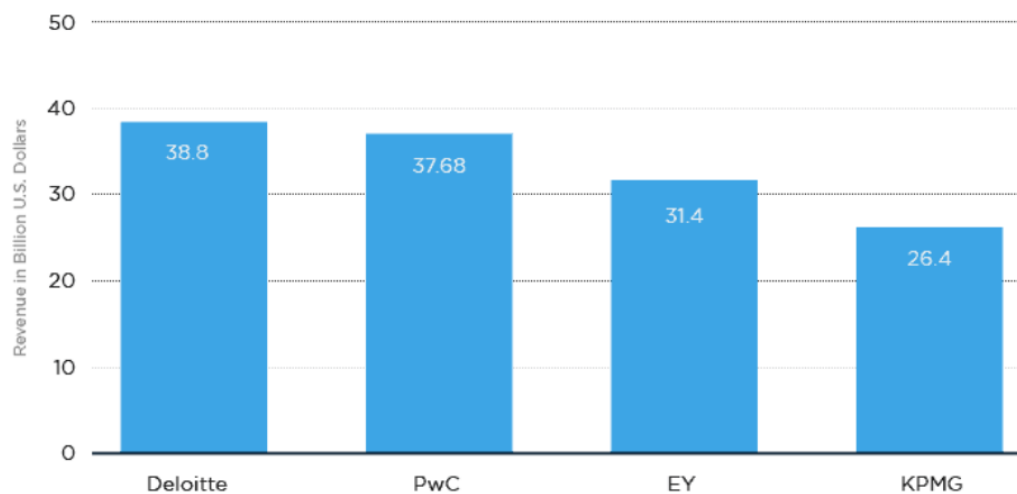
Figure 1 - Big Four's Revenue

"Most of the companies listed on the stock exchange in Great Britain and the United States is a client of the Big Four. The four big auditing companies KPMG, EY, Deloitte or PwC control the books of no less than 98 percent of the companies that make up the Ftse 350 index (the most important in the UK market). The FTSE MIB (acronym for Financial Times Stock Exchange Milan Stock Exchange Index) is the most significant stock index of the Italian Stock Exchange. In the United States, they account for no less than 99 percent of those in the S&P 500 index. "

1.2 Deloitte Touche Tohmatsu Services, Inc.

In the mid-1800s, William Welch Deloitte founded the Deloitte Company and since 1854, he was recognized as an esteemed auditor. He carried out an intense professional activity, which led him to establish important management and accounting systems. Together with the professional George Touche, another founder of Scottish origin, he start his activity generating a significant growth of investment financial companies. In 1968 took over a third Partner, Nobuzo Tohmatsu, who bring a new general view of the market and achieve the ability to anticipate emerging trends. By shifting the focus on Deloitte, the image shows the growth rate of the company value across the recent years, measuring the FTE over the financial years.

FTEs at end of period

(# of FTEs)

10	25	48	55	73	92
Start-up FY13	FY13	FY14	FY15	FY16	FY17
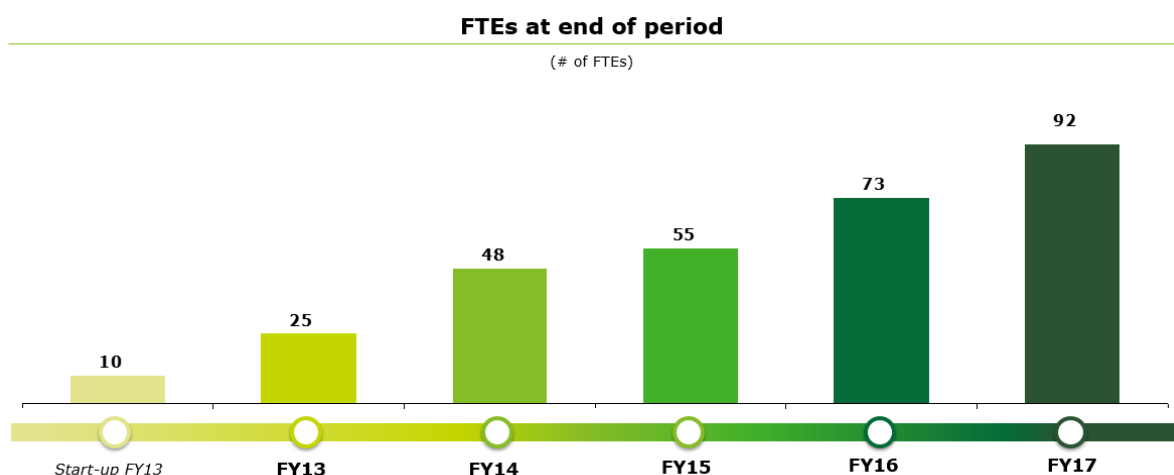
Figure 2 - The annual growth of Deloitte Touche Tohmatsu.

In Italy, Deloitte has been one of the largest companies since 1923 as regards professional business services, with the purpose of combining the tradition of quality with innovative methodological technologies.

As mentioned above the legal structure of Deloitte is composed by several legal entity: Audit & Assurance, Tax, Consulting, Financial Advisory and Risk Advisory are the services offered by various companies, they compose the Deloitte network.

The division and the portion of income generated is illustrate in the Figure 3 and Figure 4 (data referred to FY2017).

Figure 3 - Service offered by Deloitte

Figure 4 - Income division in Deloitte network

"Deloitte today has around 3,600 employees, who support customers to achieve their goals, thanks to their trust in the high quality of the service and their presence
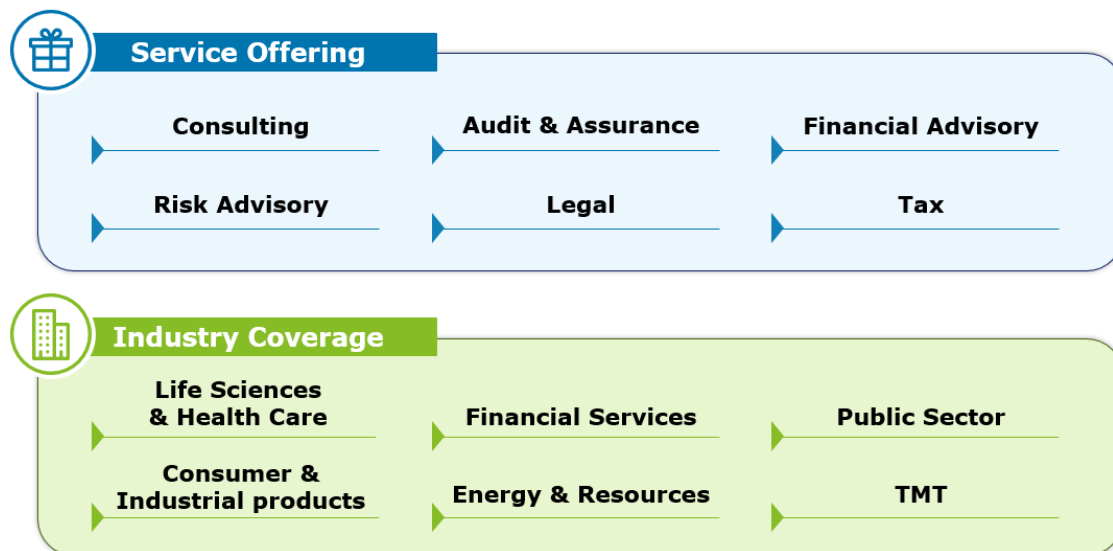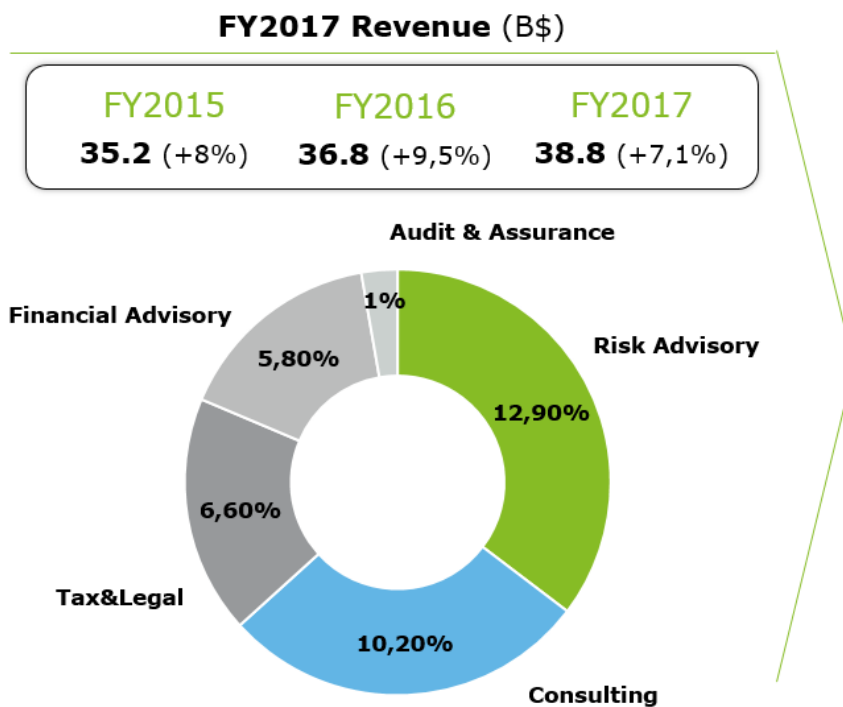
throughout the country. The company stands out for its high propensity for IT consultancy, in addition to auditing.

In fact, compared to the other big four, part of the main business is given for example by the provision of services, such as the supply of IT applications, the development of management software and the management of Cyber Risk Security Standards. "

1.3 Services offered by Deloitte Risk Advisory S.r.l.

Deloitte Risk Advisory S.r.l. specifically deals with the provision of these services:

- Corporate Governance;
- Internal Control Systems;
- Corporate Risk Management;
- Regulatory Compliance;
- Security and Privacy.

There are 300 professionals in eight offices across the nation, and the company boasts specialist and multidisciplinary skills, many of which are attested by internationally recognized qualifications and certifications.

The customer requests the identification and management of risks from the company Deloitte, both in the strategic and operational fields. The implementation of internal control systems, the definition of governance models, regulatory compliance, IT security, the quality of corporate data, are issues connected to each other and the company seeks a correct ad hoc solution for each. This is possible only through a personalized collaboration with each specific customer.

The projects on which Deloitte operates are at national and international level and concern the areas of "Internal Audit", "Corporate Governance", "Security," Regulatory Compliance "and" Control Assurance ".

The company is a leader in the field of Risk Management. Thanks to a "business oriented" perspective, combined with technological knowledge it is universally recognized by the national and international Boards and Top Management.

The added value offered by Deloitte to the Customer consists in responding to problems in an innovative and proactive way, thanks to the adoption of a "best practices" methodology, that is, the company has global tools, which interface with an international network. The risks to which companies are subject relate to technological evolution, the complexity of regulations, globalization. Management takes place on different levels: business processes, technologies, business units, regulations and data.

Figure 5 - Deloitte leadership cycle

Chapter 2.

Approach to consultancy and IT Audit

Historical background on consultancy

The consultancy was born in the late 1800s with Taylor, who with the "Scientific Management" expressed an external point of view with respect to the entrepreneur; this anticipate the "Management Engineers", in which several management engineers contributed to the drafting merging knowledge related to both how a company works and the times and methods of processing. The main purpose is to improve economic efficiency and labor cost.

After the war, was published the Marshall financial plan, known as "European Recovery Program" in which there was the reconstruction of the economy and the development of large multinationals including those related to consultancy.

In 1980, five companies had more than 1000 employees, while in 1990, thirty companies had more than 1000 employees.

During the mid-1980s, IT consulting was born and shortly thereafter, the trend of company processes came by replacing functions. At the end of the processes was added *SAP*, management software to which the companies had to adapt.

In 2000, the ERP wave began to disappear due to the effect of market saturation and subsequently the transition to the monetary system from lire in euros took place.

2.1 Description of the advice

According to Francesco Ciampi author of the book "*La consulenza direzionale: interpretazione scientifica in chiave cognitiva*" give a definition consultancy activity. *"Service activity, carried out by subjects external to the company, independent of it and equipped with adequate scientific-professional skills, which consists in assisting the entrepreneurial top of the client company in identifying and in the corrective-evolutionary-creative solution, of strategic, organizational, managerial problems, contributing to the creation of new business knowledge ".*

In order design a model of act, we can affirm that all consultancy firms generally follow the process described below.

Customer relationship set – up → Diagnosis of the business problem → Action plan design → Solution practice → Conclusion

Figure 6 - Project phases

The first phase is the relationship set-up, a moment of mutual learning.

The customer tends to have two difficulties: one linked to the management of the problem object of the request and the other linked to the management of the purchase process.

Subsequently, the diagnosis of the business problem and the definition of the scope of the problem: the organizational location, the ownership, the intensity and the timing.

During the final phase, a diagnostic plan is drawn up, which defines the location of the problem through interaction with the customer.

During the "therapeutic plan" phase or simply the "action plan design", the consultant formulates a range of innovative solutions to offer to the customer.

The optimal solution cannot be immediate, are necessary creative skills, in order to find the insight.

At the end, the costumer elaborate a feasibility analysis in order to reach with the correct choice. Only the customer has the power to decide which solution to adopt.

Participation and motivation to change by the customer during each phase can generate a cooperative generation of new ideas.

Finally, the implementation of reached solution ends the relationship. During this crucial phase are analyzed the results and the multiple effects, which occurred in long periods. Moreover, the qualitative effects and the knowledge that the consultant has shown are valuate.

Different type of consultancy activity

There are different types of consultancy and each company will have to adapt accordingly to the different types of customers.

The *quasi-consultancy* occurs when the customer knows the problem and the solution. Implementation requires specific knowledge not available. The consultant plays the role of developer.

The classic model of consultancy model, on the other hand, highlights how the client perceives the symptoms, but is unable to diagnose or treat. The consultant makes diagnoses and therapies in order to implement the solution.

Finally, the *meta-consultancy* model shows how the client has dysfunctional symptoms. It does not have self-cognitive abilities, but they would like to develop them.

The consultant helps the client to evaluate himself.

The types of customers

"The final judge of your work; if you do not clarify who the customer is, they might think that the consultancy was not carried out successfully ". This is the definition of "client" from Richard Newton's book "*Il consulente aziendale*".

It is necessary to know role of customer within the organization. The consultancy activity can involve a wide range of people with different interests and cause internal conflicts regarding business needs and objectives.

The presence of various stakeholder can generate confusion within the organization since they usually pursue different ideas: the client's opinion and stakeholders' one can be conflicting, so a distinction between them is necessary.

The consultant is part of the organization, acting as a mediator between the two parties.

Delegating other employees, who are not directly involved in the project, within the organization, often causes misunderstandings and problems.

In general, a customer is define as a natural person, with whom he can talk and analyze together what the needs, desires and interests are to achieve.

The interests and objectives of an organization, on the other hand, are determine only in an indirect way.

The misalignment of the individual's interests of the organization with those of the organization itself occurs an information-asymmetry, consequently the uncertainty of the consultancy result increases.

To solve the problem, the consultant needs to know who the customer is and should interface with him, to have a detailed version of what the interests of the organization are. In reality this is not always the case, in fact the consultant in these cases can make the problem explicit and ask for support from those who have hired him to arrive at a situation of balance between the parties. He will try to mediate the needs of the two and identify which need is most urgent, relevant and sensible.

The manager, an implicit client, generally instructs the senior manager, a real client, to collaborate with the consultant. Both are two important customers to consider, because they will eventually evaluate the service provided.

Also, before starting the project, the client must approve the consultant's rates from the corporate budget managers, so the person who is responsible for paying the bills is the financial client. Finally, there is the customer staff, made up of people who take care of reviewing the work done by the consultant and influences the real customer in approving the work or not.

The group of customer stakeholders of the organization are people with control functions, shareholders and owners depending on the type of contract. They can express a positive or negative opinion on the work of the consultant.

Why use the consultancy service?

Consulting is an economic sector like many others, based on the offer of a specific service, which aims to satisfy certain consumer needs, in which the common marketing and sales rules come into play.

One of the essential requirements is the ability to sell a service.

The ability of a consultant is not to have a wide range of theoretical knowledge, but consists in knowing how to close a contract with the customer.

According to the book "*Come la consulenza direzionale crea conoscenza: Prospettive di convergenza tra scienza e consulenza*" by Francesco Ciampi. *"It doesn't matter how extraordinary, unique or precious your skills are; no one uses a consultancy service just because he is fascinated by your talent. Clients are looking for a consultant because they have a need or a desire, which, in their opinion, can be satisfy by this professional figure."*

It is often difficult to identify what the client's needs are, so the consultant, through his ability to sell services and complete projects, will have to try to guess them in order to conclude an agreement.

An essential part of the purchase derives from need, but there are other prerequisites that affect an individual wants and can appear the service offered, even if it meets his needs.

According to the Francesco Ciampi's book: *"The most difficult thing in the initial stages with a new potential customer is about the establishment of mutual trust. From the personal experience, I learned that adopting completely transparent behaviors at the first stage could generate some insecurity. In the long term, it certainly pays more: I have always received the maximum collaboration of the customer that I have acquired in the last ten years and in one case, it has blamed me for the failure to achieve the objectives of the project (and in our profession reaching 100% of the objectives on schedule is an exception ".*

Often it happens that we do not know the real reason why the client turned to the consultant, since he lacks the courage to disclose everything, or they prefer that some details are confidential. This problem is inevitable, but it is not a difficult issue to manage, it is only necessary to coordinate the work with more efficiency and effectiveness in order to identify the client's hidden motivations. The consultant only by spending time within the organization can help him better understand the internal

dynamics. Based on this motivation, it is useful to start a large project with a phase of exploration of the problem and the nature of the organization.

Consultant activity can imply also some relational activity as well as the usual ones:

- Understanding the critical points of the project.
  Before have an external consult, the client often tries to face it by himself;

- Having an impartial opinion from an external body that is not involved in the project. An external advisor can meet the required skill to make judgments based on knowledge and work experience. The client asks the consultant for advice, but in reality he only wants to confirm his point of view and have an approval before taking the decisive step;

- Helping to convince the stakeholders of your company to accept its new decision, as a more competent external support that can have a greater influence on employees.

The prerequisites for the sale of a consultancy service

Before describing what the success factors of a consulting firm are in order to sell its services, we have analyzed which are the key winning aspects that a company must have.

According to Francesco Ciampi ": *"In an enterprise it is necessary to adequately report the knowledge to be memorized, since the process of preserving and disseminating knowledge requires the use of time and resources. In fact, it is necessary to adequately choose the knowledge that is worth keeping. The company should govern the sharing processes, making sure that what individual members learn becomes common heritage of the entire organization. The company, while maintaining a flexible and change-oriented attitude, draws on organizational memory when it is appropriate to recover and reapply practices already tested positively in the past."*

There are generally eight basic requirements to be met in order to sell a consultancy service:

1. There is a customer.
   If there is no customer, there will be no form of gain. First, we should check the possibility of having some form of clientele and then take the time to analyze and improve a line of services.

2. The customer has needs that he has not yet been able to satisfy.

3. The client is aware that he needs help to achieve his goal.

   The necessary condition for the sale to take place is that the customer is unable to solve the problem on his own and asks the consultant for help.

4. The client knows the consultancy company, how many and which projects he has completed.

   He knows the methodology adopted by the consultant to solve some problem cases, in what he is specialized, since in this way he is more aware of the type of good and service he can buy.

5. The customer knows that the consultant has the appropriate skills to perform the service.

   The consultant must evaluate himself, based on his vertical / transversal skills. He has the ability to know how to sell projects and the ability to know how to build a network of contacts.

6. The consultant evaluates his resources before accepting the assignment assigned to him.

   They use the word "availability" to define the time during which they can work on a certain job, that is, when they are not engaged in other activities. It is difficult to estimate the end date of the project, since there are different timelines.

   To accept a consultancy agreement, it is not necessary to give immediate availability; it is possible to sign the contract before having the necessary time to work on it.

7. The consultant has a budget available to pay for the services.

   The last two prerequisites analyze the economic aspect, that is, we focus on the problem, only if the customer is willing to pay what the consultant has proposed to him.

   It is appropriate to clarify immediately if the potential customer has a sufficient budget and is allowed to use it freely.

   In the event that the customer does not have this resource, it would be advisable to avoid these types of customers; otherwise, there is a risk of being excluded from the market. In addition, it may happen that you collaborate with a customer who can guarantee financial availability, but the manager of

reference does not have the opportunity to dispose of the money, nor to convince other people to spend it.

8. The customer can take advantage of this budget.

Moreover, the prerequisite for selling a project is the client's willingness to provide the consultant with everything he needs to work for him and with him.

In fact, the customer often carries out projects through collaboration.

Obstacles to consider before selling a consultancy service

Therefore, the existence of a sales opportunity does not always imply the signing of the contract. Customers have the opportunity to choose from multiple consulting firms. For every opportunity, there are many obstacles to selling.

The company does not automatically choose the consultant; the first phase of the selection process is overcoming skepticism. Customers can doubt the purchase if the reputation that the consulting firm has built up over the years is not excellent.

Furthermore, the world of consultancy is a very competitive market and every credible competitor represents an obstacle. The selection criteria used by the organizations are the tariffs applied, the competence and experience in the field, and finally personal compatibility. Often the needs on both sides may not match, the client may need to purchase the service, but the consultant must show obstinacy in selling his project. If an opportunity does not correspond to the consultant's expectations, it can represent an obstacle to the sale.

"It may happen, for example, that a customer is not willing to pay the rate you offer, or that the project implies physical or geographical conditions to which he does not intend to subject you (such as working at night or thousands of kilometers from home)."

There is another obstacle to the sale, for example, the customer meets all the prerequisites for the sale, but suddenly he changes his mind. In fact, it may happen that the customer's economic situation changes rapidly over the course of the time analyzed (interim) and the resources available must be recalculated.

The services offered by a consultancy company

The consultancy mainly deals with personalized services provided by independent subjects aimed at identifying and analyzing managerial problems or business opportunities. It is a broad vision compared to the standard one that is, focused on reducing times and generating profits with your product. The consultant does not have the power to make decisions; at most, he can express his preference, which will however remain regardless of the consultant's advice. Its main goal is to help implement the suggested actions.

There are three types of service:

1. Consultation: brief intervention during which the consultant, starting from the customer's description of the problem, identifies alternative solutions. The process usually lasts two months;
2. Project: longer intervention, in which an analysis of the situation is carried out directly by the consultancy company. Basically, the duration is 6 months;
3. Continuous assistance: longer-term support intervention downstream of a project, alongside management.

2.1.1 Types of Project and continuous growth

A service with a long-term support and well structure intervention.

The project may have the function of providing the customer with an additive knowledge and an opportunity for improvement (in terms of business management or redesign of the corporate strategy).

Otherwise, the aim of the project can be transmit some specifically knowledge about a model to diagnose a situation or solve a problem and carry out a specific change process.

From a general point of view, the transmission of knowledge can be deeper the simple commission, because if it is the consultant who "gets to know", it means that this has not been internalized within the company.

As well as some other sector, the consulting activity can be classified by the relative area of interest.

The areas of intervention are part of the sector; these can concern the various functional areas such as strategy, staff organization, marketing, logistics, information systems, administration and finance.

Therefore, the type of service offered can be wide broad, including more the one areas at the same time (e.g. corporate, reorganization, monitoring, etc.), or narrow and focused to a specific business area (e.g. market study for launching a new product or implementation of new tool).

Another kind of classification can be oriented by the size of the company that can belong to SMEs (small to medium enterprises), large, private, public, manufacturing, banks, financial institutions, pharmaceuticals.

This imply that will be required different skills between large and small businesses and between different sectors.

The professional must generally converge on two roles, he must be an expert and relational, he was born as a competent person, that is, bearer of a specific competence and has a well-defined and specialized role.

Types of project

The consulting firm does not create products, but creates information for customers, who must be constantly trained in order to find a way to balance organizational structure and revenues.

According to the theory, there are three types of consultancy projects. This division is made up by considering the required effort, the expertise needed and the degree of customization:

- Brains project: more senior staff than junior are needed; they are complexes denoted by creativity and innovation.
  The consultants are highly qualified and therefore consequently well paid in fact there is no well-defined procedure.
- Gray-hair project: both senior and junior staff are required at the same, this kind of project needed high customization of the customer's work; in fact, there is limited creativity. The problem to be analyzed is not new; less prior knowledge of the problem is sold.

Knowledge of this reflects on the possibility of delegating part of the work. This is the type of consultancy project carried out during the internship period in Deloitte Risk Advisory S.r.l. described in the Chapter 3.

- Procedural project: more juniors staff than seniors required; a well-known problem is analyzed.
  Consultancy activity imply known task and that can be efficiently finalized.

Continuous growth and lever effect

A consulting firm is forced to grow steadily, because growth is promised upon entry and then doubled every 4 years. If this does not happen, employees are no longer motivated to stay in the company. This does not allow the company to generate new revenues. How do consulting firms increase earnings?

The leverage effect, in this sense, can be defined as the transfer of knowledge form the senior to the junior, consequently the margin that advances from the middle salary to the junior is acquired by the partner.

By changing and adapting the shape of the pyramid to projects, you earn more.

2.1.2 The Consulting offer

The goal of the proposal that the consultant makes to the customer is the sale.

Usually in the offering stage, there is already a part of the solution or at least a guideline. The offer already tells about what will be done so is hard to create a customized offer.

The contents of the offer listed below:

1. Executive Summary: a summary, which finalized at the end of the consultancy, contains what is in the subsequent chapters. It is the summary of the proposal, the content is limited and generally must not exceed the page.

2. Description of the problem: the result of the interactions that occurred in the pre-sale phase; it describes the client's need.
   In order to avoid subsequent misalignments must be clearly specified (both desired and unintended).

About that, there is a difference between change request and issue. Change requests is a change of parameters, while an issue is something to be defined, because it has not been addressed previously.

3. The resolution methodology: represents the way in which the problem will be solved; it represents the previous experience consolidated in a methodology that can be reapplied to any context with appropriate adaptations.

4. The expected benefits: benefits that required by the customer. It clearly defines what the client will get from the project. These can be of two categories, both tangible and intangible. The more vague the proposal, the less tangible the service will be.

5. The experience of both consultants and the company in the field is necessary to convince the customer that the company has the ability to solve the customer's problem by describing the track record, i.e. an appendix with the CVs of the team consultants that will be assigned to the customer. Experience in the field is a necessary and sufficient condition to guarantee the customer greater confidence and serenity.

6. Economic conditions: price and anchoring are the two success variables. The risk of the consultancy is that the customer can be intimidated by creating an anchor to the number, or an underestimation of the planned work.

7. The "Terms & Conditions" that is together the percentage of advance is decided, which will be low at the beginning of the analysis and the remaining part will be requested at the mid / end of the project.

In detail, the type of consultancy treated in the case study below will be IT – Consulting (Information Technology).

"In this type of consultancy, the client company is assisted in the profound evaluation of IT strategies (overall or in part of the company) with the aim of aligning technology with the business process. IT consultancy projects are often long, even more than the operational consultancy projects, even reaching 18 or 24 months. A functional analysis is generally carried out for the development of a software for the customer, or a risk mapping work is carried out. "

2.2 The Audit of Information Systems

The information systems audit is the *"systematic process by which a competent and independent person evaluates objectively evidence relating to certain areas in order to create an opinion and issue a report on the degree of compliance, with respect to a whole default of standards, of these areas."*
The main task of the Information System Audit is to ensure that information systems are capable of adequately protecting corporate assets.
The latter are elements present within an environment that must be protected and analyzed. This is the matter of risk management.
In addition, IS (Information System) Audit protects the integrity, confidentiality and availability of data to guarantee the security principles present in company policies.

Based on the company's objectives, safety requirements take on importance. We must also take into consideration the aspect of data processing or privacy and responsibility understood as an "accountability" obligation.

IS Audit achieves the organization's objectives efficiently and effectively, safeguarding the interests of stakeholders.

The analysis of the risk

The risk analysis is targeted to prevent the disclosure or loss of data.
The possibility of something happening that could damage, destroy, or disclose data is known as risk. ISO / IEC 13335-1 defines risk.
The possibility that a given threat materializes by breaching the vulnerability points of an asset or group of assets, with damage to the organization".
Risk management reduces it to a level defined acceptable by company policies, dependent on the value of the assets, the business objectives and the available budget.
Once the critical and/or sensitive IT resources have been identified, a risk assessment is carried out, also determining the probability of occurrence, the influence and additional protective actions that would decrease the effect to a defined level acceptable to management.

Controls

To limit or eliminate the identified risks, controls are prepared/integrated. Policies are a set of practices and procedures put in place to reduce risks and confirm that business objectives are achieved. They are defined to confirm that the business objectives will be achieved and that harmful events will be avoided or, at least, identified and subsequently corrected.

The mitigation of risk works at all levels of the organization in order to achieve business objectives. The controls are mainly used to safeguard assets and encourage company policies (compliance) and applicable laws (compliance), ensuring that authorizations for access to information systems are suitable and consistent with the authorizations present (Segregation of Duties). To produce efficiency and cost-effectiveness for the year, the accuracy and reliability of the processing and backups are verified.

The check can be of the type:

- Directive: aimed at encouraging the actions and events necessary to achieve the set goal. These are for example the policies, procedures, standards, laws and regulations;

- Preventive: aimed at preventing the detection of errors, inefficiencies or irregularities, the lack of correctness in authorizations and use of assets. These are, for example, access controls;

- Investigative or detection: aimed at correcting irregularities or errors. It is carried out only after a product has been dispensed, therefore it does not guarantee complete efficacy. These are for example log analysis, antivirus, CCTV cameras;

- Corrective: aimed at defining the guidelines used to intervene on actions that have occurred, but are not desired, such as attacks on the system and errors. For example login, fire prevention system;

- Recovery: attempts to recover the state of a system following an accident. These are for example operating system restore points.

Testing

The conformity test consists in the collection of evidence in order to verify the adequacy of the organization with the control procedures. It establishes whether the

controls are carried out in a way that complies with the management's policies and procedures. The aim is to give the IT auditor a sufficient guarantee on a given control. Greater importance is placed or relied on, both as prefigured in the initial assessment.

Communication of result

The final interview, carried out at the end of the work, allows the IT auditor to comment on the findings and recommendations with the management. It is possible to present at this stage what the objectives and coverage of the audit are and give explanations on the audit process.

The IT Auditor ensures that the facts mentioned in the audit report can be corrected and that the recommendations are feasible and economically viable.

Finally, the results are shared and for the most critical areas, a "remediation" plan is carried out in order to mitigate the risk.

2.2.1 IT Audit in Deloitte Risk Advisory S.r.l

With the expression IT Audit are generally defined the audit procedures dependent on the Customer's IT systems.

Audit team and IT Specialist, two distinct souls of the same engagement who must coordinate to achieve the common goal of a quality Audit.

The aim is to encourage the exchange of knowledge between the Audit team and the IT Specialist team, in order to ensure the analyzed information systems structure.

By analyzing the contents of the IT Audit in support of the audit, it is possible to divide the IT Audit procedures into several phases:

1. Planning phase: IT Understanding and Audit Planning procedures;
2. Testing phase: General IT Controls (GITCs), ITAC (IT Automated Controls), etc.
3. Concluding and Evaluation phase: Engagement Quality Control reviewer.

Only after this careful analysis can Deloitte certify the financial statements of each company.

IT Specialists must take into consideration the size of the work that depends on the particularities of the customer and how "autonomous" the Audit team is, i.e. the availability of resources with the necessary IT skills.

A first estimation of the required effort is made in order to quantify the necessary resources for carrying out the IT Audit activities; which are evidence of the new walkthroughs conducted, evidence of previous walkthrough updates, automated controls Testing templates, User visible controls and validation parameters and tables.

An important component of the overall IT Audit effort comes from banking clients and IT-dependent clients. Including credit and debit card management companies, outsourcers of online services (cloud services), online booking services, utilities (for online services) and finally media (radio newspapers -tv for online services).

The IT Specialists deal with the verification of the Automatic Controls, the evidences called "IPE" (Information produced by the Entity) and the general controls.

Their technical contribution is essential to avoid underestimating the risks and to remedy the inappropriate extension of the checks.

It is necessary to quantify the use of IT resources, evaluate the nature of the assignment, the dimensional factor.

The quantification of the commitment of IT Specialist resources therefore consists first of a careful analysis relating to the nature of the assignment, for example it distinguishes whether the company is listed on the stock exchange or not. Subsequently, the Audit hours foreseen for the assignment are defined, the number of relevant "new" applications and the number of "recurring" applications. The latter, together with the IPEs (the evidence), are necessary for the conduct of the above mentioned procedures.

 Finally, is evaluated the IT risk factor that determines the degree of IT dependency of the customer. In fact, the number of applications is defined, the presence of a "family" of integrated applications (ERP) and the presence of one or more new and relevant applications simultaneously with a series of recurring applications.

Based on the above considerations there is a general classification of IT risk, described below:

- Moderate level of IT risk: IT system characterized by some recurring applications (4 -6 applications) of significant impact for the purposes of the financial statements with marginal or non-influential web services on the accounting systems;

- High level of IT risk: IT system that presents a new relevant application to be subjected to walkthrough in the current period; 8-10 recurring applications (already subjected to walkthrough in previous audit periods and without significant changes), with relevant "web" services with respect to accounting systems (e.g. "order collection", "active invoicing" etc.).

- Significant level of IT risk: this conditions adds to the previous one considerations related to the use of applications and services with cloud mode, the reliability of IT procedures or the reliability of the control system as they have been exposed to unresolved deficiencies exercise or exposed to unsatisfactory procedures to monitor the risk of fraud.

Planning Phase

The first phase concerns the *IT Understanding and Audit Planning Procedures*. The main topics of the analysis that will be carried out by the customer are defined.

During this phase are defined the purpose and an appropriate planning of the IT Specialist intervention in order to obtain a good outcome of the Audit activities. The described interim activities concern the client's applications relevant for the audit, the infrastructures of the applications detected and, if applicable, the assessment of the organization's controls.

Finally, the emerged deficiencies will be listed and prevention measures to mitigate the risk will be suggested.

Testing Phase

The controls can be manual or automatic.

Often the customer relies on the application system to carry out automatic checks.

From a revision point of view, the automated functions mentioned above are: automatic input, processing and output controls (Basic controls - BC), automated calculations (Computational controls - CC) and automated accesses (Automated regulation) to applications (Authorizations controls - AC).

Once the applications have been tested, the customer is asked for a list of all the information prepared by the customer in a word file called IPE (Information produced by the Entity) in order to ensure correct completeness and accuracy of the information extracted from the applications usually by predefined query.

Both the IPE file, the Excel GITC (General IT control) will be uploaded to a corporate file sharing platform, since they are usually archived.

Conclusion Phase

The analysis ends through a *Summary Memo* that traces the procedures by policy and confirms whether or not the execution has been carried out, reporting the results.

The documents deriving from the conclusion phase of an IT Audit are:

- Summary of deficiencies;
- Discussion of any deficiencies detected;
- IT Specialist Summary Memo.

Chapter 3.
The Case Study

3.1 Description of AS – IS project

During the internship, were implemented all the phases that characterize the IT Audit consultancy process. This involves identifying relevant controls and evaluating the design of the controls identified and determining whether they have been implemented.

The following process flow illustrates the steps undertaken to understand the internal control relevant to the audit, including evaluating the design and determining the implementation for relevant controls. The evaluation of design and determination of implementation is applied to each of the relevant controls identified.

Figure 7 - Process flow for understanding internal control

The first step is the formalization of "Understanding the IT Environment", as part of obtaining an understanding of the entity and its environment, the applications in use

relevant for the Audit analysis, the staff dedicated to it, but also the technological infrastructures to support it.

The evaluation of the AS-IS phase continues with the formalization of an Excel file called GITC (General IT Controls) in which the applications, the Windows Active Directory system and the database are tested.

The analysis consists of the general evaluation of the IT documents held by the customer. The controls concern the users created, ceased, the admin users, the minimum-security requirements relating to the password, the evidence of the list of administrators of the IT department and the list of those responsible for the correct execution of the backup plan.

The last phase is dedicated to "ITAC" controls (IT Automated Controls) and to the analysis of the interaction between the application systems (Interface Controls).

A correct interaction process imply the correct implementation the business cycle at all. The applications are evaluated according to the various areas, of which the entire process is made up.

Automated controls depend upon the effectiveness of general IT controls, and if such general IT controls are determined to be ineffective, the risk associated with the automated controls may be higher.

This kind of control are related to different automated process, such as:

- Automated input, processing, and output controls: This includes the automation of controls related to financial reporting (e.g., a three-way match of the purchase order, shipping document, and invoice prior to payment; the automated approval of payment following an approved delegation of authority; or the automation of the interface between two systems).

- Automated calculations: This includes the automation of financial calculations underlying amounts that support or are related to classes of transactions, account balances, or disclosures in the financial statements (e.g., the extension of sales price times quantity to generate sales invoices; the calculation of outstanding balance on a loan portfolio; or the calculation of depreciation expense).

- Automated application access: This includes the automation of access to financial reporting transactions, including logical segregation of duties (e.g., access restrictions to updates to inventory quantities or the

systematic segregation of duties between front-office and back-office transactions for derivatives processing).

In particular, this chapter will concern the analysis of advertising revenues of one of the main media and entertainment companies in the Italian panorama.

Starting from the IT mechanism that generates the descriptions, it is described how the actual functioning of the inherent business cycles is confirmed and in the end of the motorization of them.

3.2 The media-communication sector and advertising revenues.

The global growth of the Media & Entertainment sector.

According to PwC forecasts published in the "Global Entertainment & Media Outlook 2015–2019", the global revenue of the Entertainment & Media sector will grow in the next five years and a CAGR (compounded annual growth rate) of 5.1%, from US $ 1,740 billion in 2014 to 2,230 billion in 2019.

The entire sector will grow at a differentiated pace in the different markets. It is clear that when consumers all over the world are connected to the network their behavior tends to get closer, less than two specific aspects. The first is related to the quality of the infrastructure available to use the content. The second concerns instead the preferences and the specific consumption habits of each country, whose importance remains fundamental also in today's globalized world. This report shows how the experience of the contents is relevant with respect to the communication platform. This underlines the importance of the role of end consumers. The report collects the forecasts for 2019 on the performance in 54 countries of all the main traits involved: internet access, online advertising, TV, television advertising, films, video games, music, recordings, periodicals, radio, out of home advertising, books and specialized publishing.

The technological development related to the channel of distribution has been absorbed; therefore, end consumers are learning to have full flexibility and freedom in choosing when and how to use the contents. In general, consumers regard any distinction between "digital" and "non-digital" as irrelevant.

Consequently, the selection process will tend to assign an ever-increasing weight towards personalization against the type of platform and technology.

Total digital media revenues will continue to show sustained growth, non-digital media will retain their relevance, contributing well over 80% to the global revenue of 2019. It can also be seen that the percentage relative to some typical aspects of

traditional media, such as live programs, ensure a steady income that is not destined to decrease.

Advertising growth is mainly digital, driven by mobile and video.

Regarding the advertising market, overall global revenues will grow to a CAGR of 4.7% between 2014 and 2019. In addition, in this case the markets will move at different speeds according to the geographical areas. In this regard, two cases are reported at the antipodes: Indonesia will be the advertising market with the highest growth rate with a CAGR of 12.9%; Greece will be the only country to show a decline, with a CAGR of -0.3%.

The trend in advertising revenues shows how there will be an increase in digital and a substantial confirmation of non-digital: while the global revenue of digital advertising will grow to a CAGR of 12.2% compared to 1.2% of non-digital, the latter will continue to represent more than 60% of global advertising expenditure in 2019. Therefore, it can be said that this represents a solid foundation in an extremely dynamic context. At the same time, the road to growth is clearly that of digital, as evidenced also by the fact that Internet advertising will be the fastest growing segment until 2019, well above global advertising on television channels. For that year, digital advertising as a whole will account for 38.7% of world advertising revenue, compared to 16.6% in 2010. The highest growth will be recorded in the mobile and video advertising segments.

Spending on video advertising will increase overall to a CAGR of 19.5%. In this there are a lot of data to support this trend, one of the most interesting is an increase of about 100% in the number of connections from smartphones (3.85 billion in 2019).

Another concrete proof of the continuous positive trend is the analysis of the relationship between revenues and investments. In fact, it can be highlighted how the forecast of a turning point is concrete. Considering all segments and geographic areas up to 2019, global advertising revenues (up to a 4.7% CAGR) will exceed consumer spending (up to a 2.9% CAGR). This implies an increase in dependence on advertising revenues.

Significantly, the growth differential varies widely between countries, with a tendency to be narrower in mature markets and wider in expanding economies. For example, US consumer and advertising revenues will increase by 2.9% and 3.5% at CAGR

respectively, while in Indonesia by 5.2% and 12.9%. In any case, from a global point of view, this divergence in revenue flows should be closely monitored.

The business will reach 41 billion in 2022.

The TV market and a focus on the Italian context

TV represented the largest share of the Italian E&M advertising market in 2018, with revenues of € 3.2 billion.

In the 1970s, TV antennas dominated city horizons, and may soon return: in 2020, around 450 million families are expected to watch "traditional" TV.

In 2020, "traditional" TV, that is all types of television with the exception of the so-called "SVOD" (Subscription Video On Demand - Netflix, Amazon Prime and similar), will support the growth of the global television industry, even if is present a drop of the recorded minutes related to this media.

The estimates have been calculated on the basis of 83 countries and, among them, Indonesia, India and Nigeria are on the podium of the biggest traditional TV viewers. Italy is in tenth place, with over 42 million users. (16)

The overall advertising market in Italy in 2018 is € 8.2 billion. It increase of 4% compared to 2017 and returning to 2009 levels.

Internet advertising represents 36% of the total with a higher growth rate of this market, equal to 11%. TV continues to be the solid base of the entire advertising planning in the country (+ 1%, for a share of 47% of the market).

Although an increase of 8% between 2018 and 2024 in terms of subscriptions to pay-TV services is expected globally, the sector as a whole is not returning the expected numbers: in 2023 the revenues of the entire TV market overall they will drop by 11%. In this scenario, traditional TV will be able to make a positive contribution thanks to advertising investments, for which an additional 4 billion dollars are expected in 2020, reaching a turnover of 185 billion dollars in 2021.

Among the main drivers of the billions of dollars in advertising investments are the tens of millions of viewers who stay tuned on the channel when the commercials are aired, and the news in the "addressable TV advertising" field, that is, the possibility of showing personalized advertisements to several families watching the same program.

Customizable advertisements are estimated to generate approximately $ 3.4 billion in revenues in the US in 2020, a third more than in the previous year and 4.5 times more than in 2016. Although this type of advertising investment representing a limited portion of the entire US television advertising sector ($ 70 billion a year), these announcements allow functions that have hitherto been exclusive to digital channels, such as message customization and display measurement.

"TV doesn't record the same growth rates as it did twenty years ago, but around 2 billion viewers around the world will watch commercials in exchange for free TV shows. For others, with the integration of AVODs (Video - Demand advertising based e.g. Youtube), we expect that in 2020 hundreds of millions of viewers will accept the same compromise on these transactions, a turnover of 32 billion dollars per level global "comments Andrea Laurenza. "TV is still a fundamental point of contact to create an emotional relationship between the brand and consumers, and therefore is an important part of the integrated communication plans of companies" concludes Andrea Laurenza (Deloitte Digital & Technology Leader).

3.3 The Company *Alfa*

The company *Alfa* is an Italian company active in the media and communication sector. It specializes primarily in the production and distribution of free-to-air and pay TV on multiple platforms, as well as in the production and distribution of cinema, multimedia and advertising sales. It can be considered one of the first groups, also at European level, of the sector under analysis.

Alfa report the 2018's economic financial results. The Group ended the year in question with revenues of more than 3 billion euros, down on that reported on in 2017, as a consequence of the reduction in turnover business in Italy. While net profit jumped from around 90.5 million to more than 400 million euros.

For the current year, *Alfa* management expects that the trend in advertising revenues will remain in line with that of the market, consolidating the market shares already achieved at the end of 2018. In Italy, where instead the advertising market in 2018 has closed down to -0.2% (drop in addition to -1.9% recorded in 2017), *Alfa*'s gross television advertising revenues grew against the trend from around 2 million euros in 2017 to more than 2,1 million of Euro.

In this context, the *Alfa* Group has developed an integrated free/pay television model that ensures sustenance and growth in revenues from this front.

3.3.1 *Alfa* IT environment

During the formalization of the "Understanding the IT Enviroment" document for the *Alfa* company, it was noted that all business cycles are grouped within three different domains, each of which refers to a cycle. In particular, the applications system relevant for the audit work are divided as follows into the three domains (the application name will be encrypted for privacy reason):

- Enterprise: all cross-company and staff applications:
  - *SAP*: general accounting
  - *SAP HR*: human resources management
  - *Tagetik*: corporate financial statements and explanatory notes
  - *Star*.: management of artistic resources and management of related contracts

- o *Amm. Dir*.: administrative management of rights
- o *Syn.*: management of the procurement process.
- Business: business applications that can affect accounting. In particular, all the applications necessary for the business cycle inherent to advertising revenues reside in this domain (as later described); therefore, it will be analyzed in more detail. The business applications system are:
  - o *AdS.*: the *AdS.* system is used for contractual management and billing of the active cycle relating to *Alfa* advertising rights.
  - o *OnA.*: used for the management of program schedules, personal data and the right for the use of editorial content.
  - o *Val. Em.*: post-clearance verification of what was broadcast on *Alfa* broadcasts.
  - o *Star.*: The *Star.* system is used for contractual management and invoicing for artistic resources.
  - o *Lum.*: Management of contacts with the majors and accounting in *SAP*. The *Lum.* system is used to keep track of contacts with the majors and for accounting in *SAP*.
- P-Domain: application system related to model of pay-tv.

Given the impact on the active cycle and on revenues, the number of users to whom access is granted and the amount of data managed, the integrity and accuracy of the controls inherent to the Business domain are relevant for the purposes of the audit.

Furthermore, it is noted that the business cycle relating to advertising revenues represents the majority of operating revenues.

As we will see later, each of the listed applications is assigned a risk level based on the number of users who have access to it, the amount of input/output data and the degree of impact at the business level.

For this classification, the effectiveness of the control of the previous test period is also noted.

Based on the attribution of a "Higher" or "Lower" degree of risk, the degree of approach intensity and detail will be determined.

3.4 Advertaising revenue analysis

As part of the financial reporting activities of the *Alfa* Group, was conducted an analysis of the procedure adopted by the Company for the management of information flows relating to advertising revenues.

As mentioned above, the systems involved are contained within the Business domain. In particular, the application system relate to this specific process are summarized in the following table:

Business cycle	Application system
Relevetion issued spot	*Val. Em.*
Advertising revenue billing	*AdS.*
Group accounting	*SAP*

Table 1 - Busibness cycles and application systems

The objectives of the work carried out were to detect the procedure for the transmission and management of data relating to the spots issued and advertising revenues and to verify the automation process through appropriate controls.

The study was carried out by applying a methodology whose main steps are as follows:
- Survey of the technological landscape to support the operation of the systems affected by the investigation;
- Identification of the feeding techniques of the scope applications;
- Identification and verification of the operational effectiveness of automatic controls.

To detect the effectiveness of the data flow, the whole process was analyzed from the recording of the spot on the air to the generation of the invoice.

In detail, the accounting process for advertising revenues is divided into the following phases:

1. The spots emitted from the control room to the radio link are recorded by the issuing machine through a log file (playout log);
2. The actual spot emission is recorded in a DB via the Digital Video Project application interface;

3. The *Val. Em.* application is powered by the data in the lineup of the commercials programmed on *AdS.*; and secondly, from the spot data actually emitted by the XML file (Digital Video Project output);

4. On the basis of the inputs mentioned above, *Val. Em.* makes a first comparison between what is actually issued and what has been programmed, and sends the results of this reconciliation to *AdS.*;

5. *AdS.* uses the input data sent by *Val. Em.* for the recalculation of invoices relating to advertising revenues.

The high-level architecture relating to the data flows of advertising revenues is represented in the following scheme:
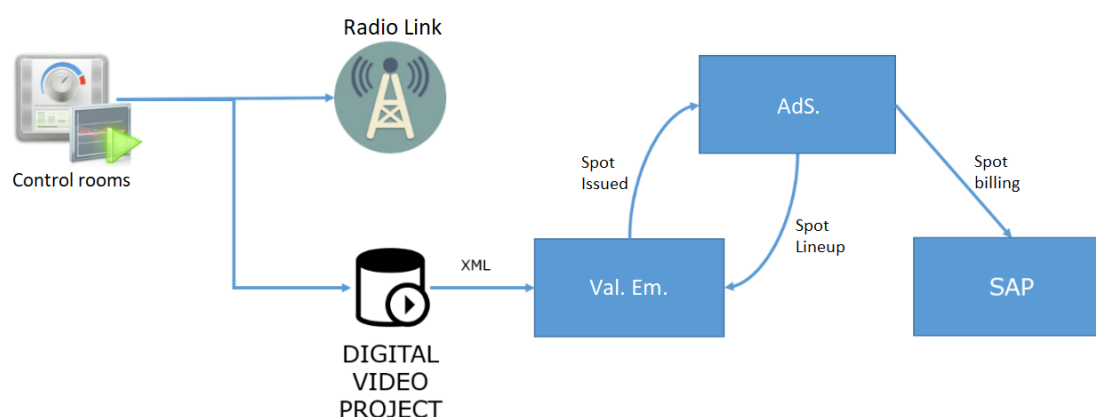

Figure 8 - IT structure related to advertising revenue generation

3.4.1 Design of operational procedure

The general purpose of this stage are related to the understand of how IT affects the relevant flows of transactions and the specific risks to an entity's financial statements arising from IT (that relate to risks of material misstatement from an audit perspective) and how the entity has responded to these risks through implementation of IT controls. The diagram below illustrate the logic followed in the risk identification and mitigation phase.
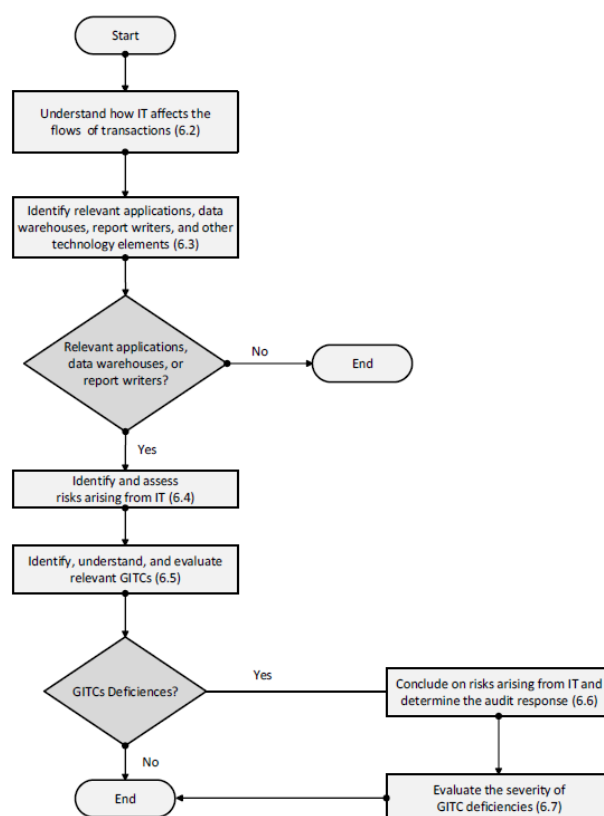
Figure 9 - Risk evaluation process

Once determined the application system that are relevant for the Audit analysis, following a logic order, the first step of controls concern the General IT Controls. They can be defined as the basis of this crucial phase since they assess the correct implementation and management of each single application system. The later stage

of controls concern the correct implementation of automatized process and the interface between them. Application systems may be defined as automated user systems and manual procedures that process information.

From a financial statement audit perspective, the application systems that are typically relevant are those that play a role in initiating, authorizing, processing, recording or reporting financial data. Which may range from complex Enterprise Resource Planning (ERP) systems (e.g., *SAP*, PeopleSoft, JD Edwards, Oracle), to custom software (developed internally by the entity or developed for the entity by a third party), to commercial off-the-shelf (COTS) software requiring little or no customization.

Considerations that may be relevant when considering the entities ERP system include, but are not limited to:

- The number and type of ERP functionalities and/or modules management has implemented.
- How the ERP applications and modules interface (automated vs manual).
- The IT infrastructure supporting the ERP system (database, operating system and network).
- The extent to which management relies on the ERP system to process and maintain data.

For what concern the specific case study, as mentioned above, the advertising revenue process implies three different application system: *Val. Em.*, *AdS.*, *SAP*.

3.4.2 GITC (General IT Conrols)

In order to illustrate how the risks arising from IT at application level are mitigate, will be illustrate one of the GITC: *AdS*..

As described above, the first stage concern the identification of the IT risck, reported in the first column of the picture (). Specifically the second colun is releted to the identification of the control and the suseguent is the formal description.

Risk Arising from IT (RAIT)	RAIT Risk Classification	Control ID	Control Description
Users have access privileges beyond those necessary to perform their assigned duties, which may create improper segregation of duties.	Higher	ADS.01	Management approves the nature and extent of user-access privileges for new and modified user access, including standard application profiles/roles, critical financial reporting transactions, and segregation of duties.
		ADS.02	Access for terminated and/or transferred users is removed or modified in a timely manner.
		ADS.03	User access is periodically reviewed.
		ADS.04	Segregation of duties is monitored and conflicting access is either removed or mapped to mitigating controls, which are documented and tested.
		ADS.06	Privileged-level access (e.g., security administrators) is authorized and appropriately restricted.
Systems are not adequately configured or updated to restrict system access to properly authorized and appropriate users.	Higher	ADS.05	Access is authenticated through unique user IDs and passwords or other methods as a mechanism for validating that users are authorized to gain access to the system. Password parameters meet company and/or industry standards (e.g., password minimum length and complexity, expiration, account lockout).
		ADS.09	The key attributes of the security configuration are appropriately implemented.
Inappropriate changes are made to application systems or programs that contain relevant automated controls (i.e., configurable settings, automated algorithms, automated calculations, and automated data extraction) and/or report logic	Higher	ADS.10	Application changes are appropriately tested and approved before being moved into the production environment.
		ADS.13	Access to implement changes into the application production environment is appropriately restricted and segregated from the development environment.
Production systems, programs, and/or jobs result in inaccurate, incomplete, or unauthorized processing of data.	Higher	ADS.15	Only authorized users have access to update the batch jobs (including interface jobs) in the job scheduling software.
		ADS.16	Critical systems, programs, and/or jobs are monitored, and processing errors are corrected to ensure successful completion.
		ADS.17	Financial data is backed up on a regular basis according to an established schedule and frequency. Backup media are stored in an appropriately secure location.

Figure 10 - Summary of *AdS*. GITC (1)

Ones classificate both the RAIT and RAWC are design the control itself.

In the Figure 11 are reported the operating conclusion of each control.

With the support of the client's IT referent (or control owner) are described the current set-up of setting of parameters.

We assess the risk associated with the control as either "higher" or "not higher" considering the following factors:

- The nature and materiality of misstatements that the control is intended to prevent or detect;
- Whether there have been changes in the volume or nature of transactions that might adversely affect control design or operating effectiveness;
- Whether the account balance, class of transactions, or disclosures has a history of errors;
- The effectiveness of entity-level controls, especially controls that monitor other controls;
- The nature of the control and the frequency with which it operates;
- The degree to which the control relies on the effectiveness of other controls (e.g., the control environment or general IT controls);
- The competence of the personnel who perform the control or monitor its performance and whether there have been changes in key personnel who perform the control or monitor its performance;
- Whether the control relies on performance by an individual or is automated (i.e., an automated control would generally be expected to be a lower risk if relevant general IT controls are effective);
- The complexity of the control.

Control ID	Risk Associated with Control	Design Conclusion	Interim Operating Effectiveness Conclusion	Final Operating Effectiveness Conclusion	Deficiencies Noted?
ADS.01	Not Higher	Effective	Effective	Effective	No
ADS.02	Not Higher	Effective	Effective	Effective	No
ADS.03	Not Higher	Effective	Effective	Effective	No
ADS.04	Higher	Ineffective	Ineffective	Ineffective	Yes
ADS.06	Not Higher	Effective	Effective	Effective	No
ADS.05	Not Higher	Effective	Effective	Effective	No
ADS.09	Not Higher	Effective	Effective	Effective	No
ADS.10	Not Higher	Effective	Effective	Effective	No
ADS.13	Higher	Ineffective	Ineffective	Ineffective	Yes
ADS.15	Not Higher	Effective	Effective	Effective	No
ADS.16	Not Higher	Effective	Effective	Effective	No
ADS.17	Not Higher	Effective	Effective	Effective	No

Figure 11 - Summary of *AdS*. GITC (1)

From an operational point of view, the control is subdivided in two different stages: design and operating procedure. The design procedure is the result of first meeting with the control owner. The first stage has the aim to objectively describe the current setting of the application; the latter has the purpose to demonstrate it. The operating phase can be figure out both operating directly on the system or with the support of evidence. The latter option implies usually more time than the first, but can be considered less expensive.

Both of the procedures terminates with a professional judgment: "effective" or "not effective". If the final operating conclusion result as ineffective, the control evidence a formal deficiency. Without an opportune mitigating procedure, the deficiency has to be communicated to the Audit team.

The control can be subdivided also from a temporary point of view.

The interim conclusion, for that reason, is related to a conclusion obtained in a span of time different from the fiscal year. It can occur for an activity related to a large company in order to obtain a better result. At the same time, is the projected

scheduled to perform testing as of an interim date, then roll forward procedures need to provide more persuasive evidence as the risk of material misstatement and the risk associated with the control increases.

If the period of the project coincide with the fiscal year, we can assume the interim result as the final one.

For what concern specific case of *AdS.*, during the reference period was highlighted two deficiency:

- ADS.04: During the analysis, does not emerge an internal control relate to Segregation of Duties. This kind of internal control are generally implemented, in such large company also at application level.
  - o Mitigation procedure: however, a control operates in a preventive way, and is integrated into the user creation process. In fact, before the creation of a new user is assigned a specific role.

Therefore, the management of any conflicts takes place in an integrated manner with the application-level profile creation process.

The risks associated with the non-implementation of a real SoD control are therefore mitigated by process of application profiles creation. The new profiles are submitted and agreed with the business representatives. (ADS.01)

In addition, this control is also mitigated by the annual user review process, which guarantees precise control of the roles associated with users by the reference manager (ADS.03).

- ADS.13: There is no clear distinction implemented between users enabled for development in a test environment and users enabled for production release, since the staff of the supplier is also potentially enabled for deployment in production.
  - o Mitigation procedure: In this sense, was examined the evidence for a sample change, to testify to the actual segregation of roles in the implementation of the change.

Specifically, it was analyzed the mail exchange related to deployment and the segregation of roles between the supplier and those of internal staff is evident.

As a conclusion of this step of controls, the deficiencies described are covered to an opportune mitigation procedure.

Consequently, the data produce by them are considerable as guaranteed.

3.4.3 Interface controls

What is an "Interface Control"?

Once the controls regarding the individual applications are completed and the deficiencies are analyzed, the next step involves analyzing the data flow from each application.

The aim is to detect the correct implementation of the business cycle trought the application systems and subsequent items generation take place in a consolidated manner.

The end-to-end understanding of the relevant flows of transactions includes understanding the interfaces between various systems (including both automated and manual interfaces). Depending on how an entity's systems are designed and configured, automated interfaces may or may not require manual intervention. Regardless of whether an interface is automated or manual, an understanding of the "path" by which transactions and other data travel through the entity's systems before ultimately being reported in the entity's financial statements allows to identify where risks to the financial data may exist.

Automated interfaces allow for the electronic transfer and data between systems.

We may determine that an interface is relevant to audit analysis if the data transferred via the interface are.

For example, an entity generates revenue by providing services to customers. Customers are billed a standard rate (based on contracts) per service provided. Services provided are tracked by the service counts system. The entity uses a separate billing system to generate invoices, which are calculated based on contract rates stored in the billing system and "counts" of services provided that are automatically fed into the billing system from the service counts system. The billing system also

tracks client receivables balances and generates revenue and receivables entries that are automatically transferred to the general ledger system for posting.

The data flow: from recorded spot to accounting procedure

The first of the so called "Interface controls" concerns the automatic detection of the spots emitted (from the control room and radio links) in the DigitalVideoProject tool and its output in XML (for greater clarity, refer to the Figure 8 - IT structure related to advertising revenue generation);

As previously reported, the data plot involved in the Interface procedure concerns the recording of the spots issued and the comparison of the latter with what is scheduled in the schedule, for the purposes of invoicing relating to advertising revenues.

For the purposes of certifying the correct transfer of the data transmitted as described in the previous paragraph, an advertising spot issued on a determined channel was sampled and the entire data flow was validated, in order to confirm the correspondence of the information present in the various tools and application.

The spot was selected as the item for the checks. For privacy reasons, the evidence relating to the sampling and, subsequently, the references to live programming, will be omitted.

Subsequently, evidence was obtained of the emission path of the PlayOut machine for the day in question in XML format (Figure 12). The presence of the sampled spot and the identification code has been verified within the file. It was also found that the date and time of issue corresponded with what was detected in real time.

```
▼<Oggetto>
  <OraInizioEffettiva>19:20:43</OraInizioEffettiva>
  <OraFineEffettiva>19:21:14</OraFineEffettiva>
  <DurataEffettiva>00:00:30</DurataEffettiva>
  <DurataEffettivaLorda>00:00:30</DurataEffettivaLorda>
  <OraPrevistaPalinsesto>19:20:00</OraPrevistaPalinsesto>
  <DurataPrevistaPalinsesto>00:00:00</DurataPrevistaPalinsesto>
  <CodiceProdotto>S5302</CodiceProdotto>
  <CodiceContenitore>1920</CodiceContenitore>
  <TitoloContenitore>BREAK 1920</TitoloContenitore>
  <DurataPrevistaContenitore/>
  <DurataEffettivaContenitore>00:03:27</DurataEffettivaContenitore>
  <OraPrevistaContenitore>19:20:00</OraPrevistaContenitore>
  <CodiceSupporto>S5302SP00</CodiceSupporto>
  <CodiceSegmento/>
  <FlagQualitaConvenienza>Q</FlagQualitaConvenienza>
  <FlagAffogato/>
  <TitoloAssemblaggio          /TitoloAssemblaggio>
  <TipoOggetto>31</TipoOggetto>
  <CodiceTargetProgramma> </CodiceTargetProgramma>
  <DurataSponsorPromo/>
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  <Note          /Note>
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  <ProgressivoSupportoProgramma/>
  <InizioParte/>
  <FineParte/>
  <SequenzaSpotNastro>3</SequenzaSpotNastro>
  <CodiceMaterialeIS/>
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  <OraFineEffettivaAlFrame>19:21:13.14</OraFineEffettivaAlFrame>
  <DurataEffettivaAlFrame>00:00:30.06</DurataEffettivaAlFrame>
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  <IDProgrammazionePubblicita>0087753515</IDProgrammazionePubblicita>
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```

Figure 12 – XLM-file generation

Once the correspondence between what came from the issuing machine and what was actually transmitted on video was validated, the correct transfer of the data passed on the Validation Issued and *AdS*. applications was verified.

For the *Val. Em.*application, the acknowledgment of the spot emission was verified through system print screen.

Downstream of the verification on Issued Validation, we proceeded to analyze the correct transfer of information on the *AdS*. application.

Billing on the *AdS*. side is only possible if the spots are in a "reconciled" state, a status that is associated with the spot following the reconciliation process that takes as input the data sent by the issued validation. The correct assignment of the status to the selected spot was therefore examined.

In the Figure 13 it is possible to view the correct assignment of the reconciled status to the spot sampled for the checks, tracing the serial number of the spot in question:

Figure 13 - Spot recoincilition - *AdS*.

The second check relating to the interfaces between the systeses taken as an example concerns the analysis of the data flow from *AdS*. to *SAP*. During a meeting with the contacts, the process of passing unidirectional data from *AdS*. to *SAP* was retraced.

As previously described, the transfer of invoice data takes place downstream of a validation procedure of the same on *AdS*., to then be transferred to *SAP*.

This process occurs periodically, when the Accounting and Billing Office sends an email with an Excel file attached containing the list of invoice numbers ready to be accounted for, reference dates, document types, etc. The sending of this email acts as an explicit authorization for the billing of what is indicated in the file.

In the case under test, the billing range for two sample days (25/02 and 26/02) was taken into consideration.

A first check is found when *AdS*. does not allow you to choose the invoice number, in fact a search is performed by date in order to obtain confirmation of what is indicated in the email attachment.

The output generated in conclusion by *AdS*. is a report containing an identification number.

By viewing the report content in Excel format, you get evidence of the invoices extracted and deposited in a special folder on the server, from which *SAP* will import. From the generated report, it is possible to carry out different types of extractions; in order to analyze the reports relating to the dates selected in their entirety, no filters were setted during the verification. In Figure 14 an extract of the evidence collected during the test phase, from which the numerical values to be accounted for are excluded.

	A	B	C	D	E	F	G	H
	A1		fx	VERIFICA PASSAGGIO DATI CONTABILITA PER SAP				
1	VERIFICA PASSAGGIO DATI CONTABILITA PER SAP							
2								
3	DATA ELABORAZIONE			27/02/2019 09:50				
4	REG	ANNO	NR. PROGR.	DATA FATT.	TD	IMPORTO DARE	IMPORTO AVERE	IMPORTO DIFF.
5								
6	3	2019	2763	25/02/2019	11			
7	3	2019	2764	25/02/2019	11			
8	3	2019	2765	25/02/2019	11			
9	3	2019	2766	25/02/2019	11			
10	3	2019	2767	25/02/2019	11			
11	3	2019	2768	25/02/2019	11			
12	3	2019	2769	25/02/2019	11			
13	3	2019	2770	25/02/2019	11			
14	3	2019	2771	25/02/2019	11			
15	3	2019	2772	25/02/2019	11			
16	3	2019	2773	25/02/2019	11			
17	3	2019	2774	25/02/2019	11			
18	3	2019	2775	25/02/2019	55			
19	3	2019	2776	25/02/2019	55			
20	3	2019	2777	25/02/2019	55			
21	3	2019	2778	25/02/2019	55			
22	3	2019	2779	25/02/2019	1			
23	3	2019	2780	25/02/2019	1			
24	3	2019	2781	25/02/2019	1			
25	3	2019	2782	25/02/2019	1			
26	3	2019	2783	25/02/2019	25			
27	3	2019	2784	26/02/2019	3			
28	3	2019	2785	26/02/2019	3			
29	3	2019	2786	26/02/2019	3			
30	3	2019	2787	26/02/2019	3			
31	3	2019	2788	26/02/2019	3			
32	3	2019	2789	26/02/2019	3			
33	3	2019	2790	26/02/2019	3			
34	3	2019	2791	26/02/2019	30			
35	3	2019	2792	26/02/2019	30			

Figure 14 - Accounting end summary report

These reports are used for a balance check between *AdS.* and the data presented in the spool of the data to be accounted for *SAP* products, in order to be sure that the data that will be accounted for and recorded in *SAP* are correct.

In *SAP*, it is possible to enter the System - Services - Jobs - Job Summary menu in order to check the outcome of the data import job from *AdS.*. If the outcome of the job is negative, *SAP* does not perform any data recording and / or writing, and the same is canceled and started again.

If the checks carried out end positively, the batch input used for actual accounting is started and the outcome is verified by entering the System - Services - Batch Input - Sessions menu. If, by means of evidence, it is evident that the batch input has correctly completed the operations (one for each invoice) therefore the data has correctly entered *SAP*, has been checked and the related accounting entries have been made on

the accounts. At the end of the invoice accounting procedure in *SAP*, you return to *AdS*. to confirm the accounting has taken place.

Most of the billing is managed with *AdS*., the remaining portion that is present in *SAP* but not passed through by *AdS*. is manually reconciled.

At the IT level, the file that *AdS*. sends to *SAP* is transcoded by *SAP* by means of the rules present in specific *SAP* tables.

If a data sent by *AdS*. was not mapped within these tables, the transfer would end with an error.

During the test case we verified the effectiveness of some of the typical *SAP* standard controls of the accounting phase (closed accounting period and numbering range not available) that have been remedied at the moment, but all the other *SAP* standard controls are also active.

3.4.4 ITAC (IT Automated Controls)

What is an Automated Control?

Automated controls are control activities, mostly or entirely performed through information technology (e.g., automated control functions programmed into computer software).Automated controls may enforce or control a rule-set or validation on one or more conditions within a process. It may include configurable settings, automated algorithms, automated calculations, and automated data extraction.

For example, an order entry screen within an application may contain a field that allows the user to select only from a list of approved suppliers to complete the order. In this case, the automated control is the mechanism that limits the choices of vendors. In addition, an automated control that automatically rejects customer orders beyond the established credit limit occurs at the point of initiation of a transaction.

All ERP systems contain automated controls, but automated controls may also exist within any application, interface, or other IT system. This kind of controls can be classified by the adopted approach as preventive or detective. In addition, these may exist at any stage of the information flow (i.e., initiation, authorization, processing, recording, or reporting of a transaction).

For instance, automated "work flow approval" for journal entries (automatic routing of journal entries to the appropriate reviewers/approvers by the system) is an automated control that exists at the point of authorization of a transaction.

Automated controls that operate at the business process level and apply to the processing of transactions by individual applications are typically referred to as automated application controls. These controls help ensure that transactions occurred, are authorized, and are completely and accurately recorded and processed. From an audit point of view, the existence of automated application controls that the entity relies on is one of the aspect to be considered in order to classify the reliance of that application. The correct response of these controls implies that agreement and setting in business cycles are correctly implemented.

For example, automated application controls may include verification of the arithmetical accuracy of records by the application, automatic generation of customer invoices by the application once delivery is completed, and automatic recording of accounts payable and operating expenses upon matching of the purchase order and receiving document by the application.

In addition to automated controls that are part of the entity's business processes, automated controls may also exist within the entity's general IT control structure. Automated general IT controls may be configured within any of the entity's technology elements — application, database, operating system, and/or network. This is the similar to example reported above, since this kind of controls are intrinsically implemented in the application settings, since the business cycles related to advertising revenue is one of the principals source of income. Usually this set of controls are implemented, these could concern automated general IT controls may include system-enforced password parameters and an automated workflow for approvals related to moving system changes into the production environment.

As an example relating to this type of control, the logic of the anomaly report will be examined below, in particular the relationship between the spot issued / programmed.
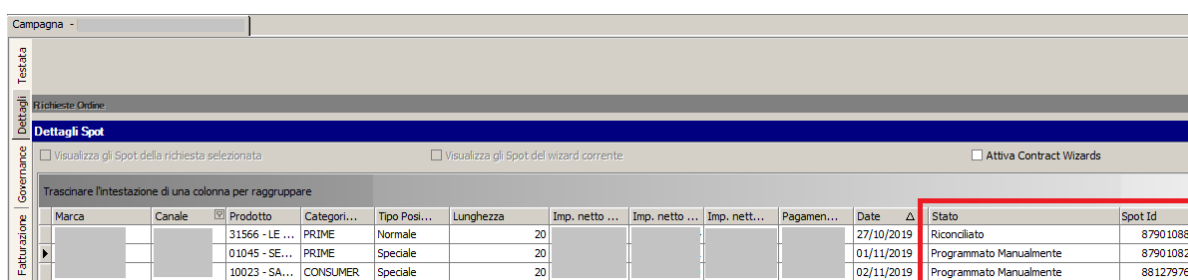
First, it has been verified that the *AdS*. application allows billing only for those spots classified as "reconciled". This status generated by the process described above (see Figure 15 - Spot recoincilition - *AdS*). It is in no way possible to bill commercials with states prior to the reconciled. On the positive outcome of this check, the hypothesis of

proceeding with the issuance of the invoice of a spot not transmitted live, therefore avoiding subsequent problems on the accounting front, but above all certifying the correct functioning of the business cycle related to this type of operating revenue.

To verify this requirement, it was found that in a sample of spots containing all possible states, only the "reconciled" one is correctly invoiced.

The correct spot classification

From a general point of view, the very first stage is the identification and verification of the operational effectiveness of automatic controls.

As mentioned, advertising revenues represent the main source of income for the company *Alfa*; for that reason, the controls above carried out as example concern the verification of this business process.

For the same reason, even during the course of the project, they played an important role.

Specifically, the example below for this type of control tests the logic of the error creation, in particular the relationship between the spot issued / programmed.

First, it has been found that the *AdS*. application allows billing for those points classified as "reconciled", a state that is generated by the process described above (see Figure 16 - Spot recoincilition - *AdS*).

It is in no way possible record commercials with states prior to the "reconciled".

The positive outcome of this check avoids the possibility of proceeding with the issuance of the invoice of a commercial not transmitted live, therefore avoiding subsequent problems on the accounting front, but above all certifying the correct functioning of the business cycle related to this type of operating revenue.

In order to verify this requirement, results that in a sample of spots contains all the possible states displayed in te the column "state" in the Figure 15.

Only the "reconciled" one is verified as turnover (Figure 16).

Figure 17 - Different spot state

Figure 18 - Reconciled / billed

The reconciliation of the spots issued takes place with an automatic certification software that takes the issue from the system out of the Playouts (Validation Issued) and reconciles on a Spot-Id basis with respect to the events scheduled in the lineup by the dealership.

The outcome of the reconciliation is reported in a dedicated section of the *AdS*. system.

The operator cannot act on the correction functions on the spot issued and successfully reconciled (see gray context menu in the printscreen below). The procedure for modifying this spot forces the operator to perform a manual "Disconnection" of the pairing (with change of status tracked in the audit by the system) to proceed with any changes; all other hypotheses are grayed out and cannot be selected. This certifies that the price established downstream of the IT process implementation cannot be altered during the process.

Figure 19 - Non-hypothesis correction

Following this first overview relating to the automatic detection of the spot status, which allows for subsequent invoicing, the operation and the logics underlying the creation of the anomaly report were tested.

In order to validate the correct functioning of the anomaly detection, an anomaly relating to spot S5724 was sampled. Firstly, the spot canceled on reconciliation occurred on *AdS.*.

Subsequently, the correspondence of this information was verified on the *Val. Em.* application: it was found that the spot in question appears only in the left box (scheduled spot list), while is not on the box on the right (spots transmitted) and is therefore replaced from other commercials.

Figure 20 - Spot replacement

Finally, the new entry for the spot was found again on *AdS.*: "canceled".

For all the above considerations, it can therefore be concluded that the automatic control system specifically related to the correct assignment of the spot status can be considered correct. Therefore, the Audit value, relating to the audit of the Alfa

company financial statements, may consider the process of reporting the spots emitted in error valid.

3.5 Post end monitoring

Following the classic IT Audit service activity during the internship activity, for the same case study project, the service continued with a Business Intelligence activity. Generally this service is dedicated to the most important and large companies, since it is still a considerable amount of data.

3.5.1 Business Intelligence service

The service can be defined as a set of business processes to collect data and analyze information of any type. These processes are associated with the production or monitoring business cycle, but in any case the spectrum of applications can be considerably enlarged.

The business intelligence service offered aims to provide an immediate representation of everyone in a database, which otherwise would be difficult to manage.

Specifically in this case, the tool for Business Intelligence is Qlik Sense, a web tool that allows the analysis of data provided by a database, modeled through a back end in SQL Lite and displayed through graphical representation in a front-end. to which end users have access.

The front end is the graphic part, as well as the last part of the process.

The graphical objects that allow the display of database data are of the most varied (graphs, KPIs, summary etc.).

Qlik Sense provides native graphic objects to which extensions encoded in JAVAscript, HTLM, CSS can be added. This is a detail of this software that is often not found in similar Business Intelligence tools (e.g. Power BI).

The choice of graphic objects must be weighted and aimed at obtaining a clear and immediate visualization of the data.

The function of the front end and display objects cannot be limited to simple representation. Firstly, graphic objects are highly customizable with a first level of

order. For example as regards a graph, this can vary in the number and type of the dimension, in the intervals and the type of plot represented. In addition, there is another possible level of detail: it is possible to insert an additional formula or another level of code that allows a certain type of display. This function is aimed at distributing the complexity of the back-end code in order to make it more manageable.

Once the desired dash border is obtained, the objects present in turn can function as filters, so as to obtain a different overall configuration. For example, in a graph containing all revenues for the year, a specific period can be selected to obtain the display of the type of revenue in that given period through a second graph.

This functionality reflects the basic operation of the Qlik Sense tool.

Qlik uses a dynamic associative model of data through the construction of keys, or similar values within two different tables, in order to create a link between the tables provided by the source database. The keys assigns the connections between the database tables, allow them to "talk" to each other.

The principle is based, as mentioned, on the analysis of the raw data. Each datum has a certain granularity which can be understood as the real number of values it can assume. For example, a data concerning the quarters of a fiscal year has a greater granularity than the number of customers.

The back end is the seat of the code, the part not visible to the end user, but only by the developers. Through this the connection to the database is created and the data are managed through an associative model.

Through the keys, the tables are related according to various models.

Therefore the data analysis work that takes place at the base is crucial to achieve a coherent representative model, optimizing the trade off between efficiency and manageability.

Based on the needs of customers and the data contained in the database, the associative relationship model is created.

In detail, the most flexible and used is the so-called "star" model. From a central table of keys only, all the other fact tables are connected radially and to the linked secondary tables which are only used to aggregate the other so as to expand the detail of the single data by connecting with other data which in turn serve to increase the granularity of the primary data.

Drill down and drill through.

The use of BI tools allows to obtain a precise and dynamic representation of data with different granularity taking advantage from the principal features in business intelligence: *drill down* and *drill through*. The aim is to obtain useful results from the intersection of them that would otherwise be difficult to obtain by analyzing the database in its zero state.

They both give the user the ability to see data and information in more detail–although they do so in different fashions.

Drill down is a capability that takes the user from a more general view of the data to a more specific one at the click of a mouse. For example, a report that shows sales revenue by state can allow the user to select a state, click on it and see sales revenue by county or city within that state. Otherwise, in a graph containing all revenues for the year, a specific period can be selected to obtain the selection of the type of revenue in that given period through a second graph. It is called "drill down" because it is a feature that allows the user to go deeper into more specific layers of the data or information being analyzed. For example, the drill-down can go from country to state to city to zip code to specific location of stores or individual sales reps. Typically, the look and feel of each level of the report is similar–what changes is the granularity of the data and related keys.

Instead of taking the user to a more granular level of the data, drill through takes him to a report that is relevant to the data being analyzed, also at the click of a mouse. For example, a tabular report that shows sales revenue by state can allow the user to click on it and reveal an analysis grid of the same data, or a heat map representing the data in visual form. It is called "drill through" because it is a feature that allows the user to pass from one report to another while still analyzing the same set of data.

The principal benefit can be defined as:

- Gain instant knowledge of different depths of the data – Drill down gives the user a deeper insight of the data by letting him see what makes up the figures he's analyzing. For example, in mere seconds, drill-down answers questions such as: of my National sales figure, which states are performing better? Which states are underperforming? And within each state, which territories are driving revenue?

- See data from different points of view – Drill through allows users to analyze the same data through different reports, analyze it with different features and

even display it through different visualization methods. This greatly
enhances the users' understanding of the data and of the reasons behind the
figures.

- Keep reporting load light and enhance reporting performance – By only
  presenting one layer of data at a time, features like drill down lighten the
  load on the server at query time and greatly enhance reporting performance–
  while offering great value to the end-user.

3.5.2 Advertinsing revenue monitoring

As previously described, in general, a Business Intelligence service is offered to the
client company, so that a consistent and dynamic representation of a huge amount of
data can be obtained.

Business intelligence applications can have different purposes. In fact, with reference
again to the case study, an "Audit Innovation" service was developed during the Alfa
project.

In order to obtain a better balance analysis, an elementary associative model has been
developed to obtain the graphic representation of the data. The model is elementary
in that it is the representation of a single database.

The graphic objects are grouped in the overview section. In particular, the 3 KPIs (Key
Performance index) were obtained through the addition of extensions. These
represent the number of customers, advertising campaigns and the average annual
discount percentage; are located in the center of the screen.

In the left part is the source of revenues is divided into percentages the base to
customers.

While the two linear graphs represent the gross margins. The first on the left
represents the first advertisers in detail, while the second the trend of revenues in the
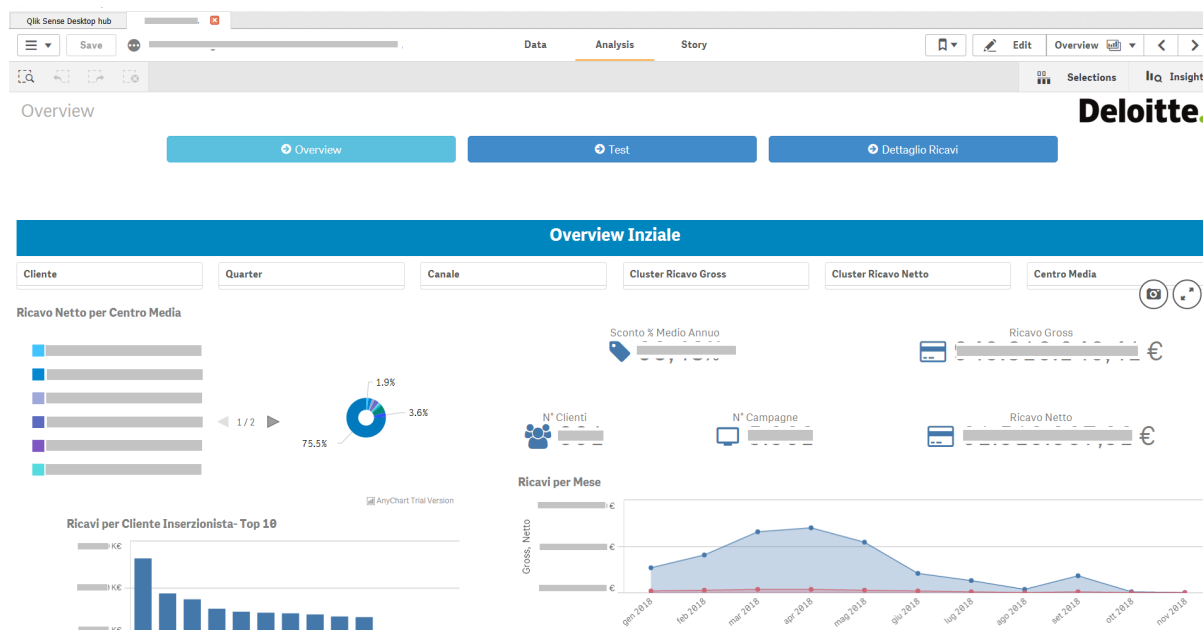selected period.

Figure 21 - Overview

The end user can navigate within the overview, through six main filters. These are highlighted in the "box-text" in the upper zone of the overview.

As previously described, it is possible to obtain a coherent representation using data with different granularity; for example, the "quarter" data, which determines the quarter of the fiscal year under analysis, has a greater granularity than the "channel" or "customer" data.

To navigate within the dashboard, it is also possible to use the plotted data in the graphs as filters to obtain different representations. This is the consequence of the associative dynamical model, for any data set, the ultimate result will still remain faithful.
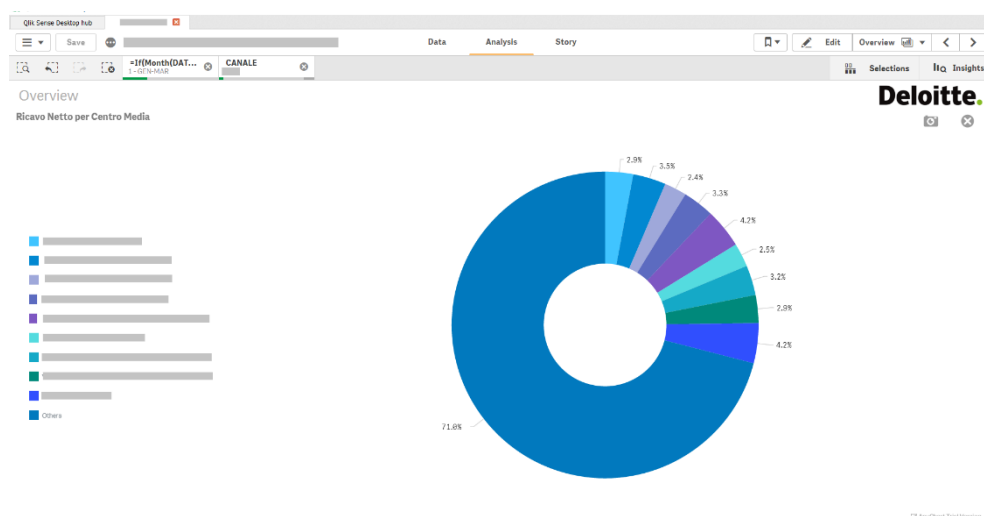
Figure 22 - Data visualization (1)

The Figure 20 shows the graf obtained by filtering one channel and a determined quarter. The graph divides the revenues of the quarter under examination in percentages on the basis of the nine main customers, separating them from the "others".

For example, three different graphs obtained from three different data sets will be shown below.
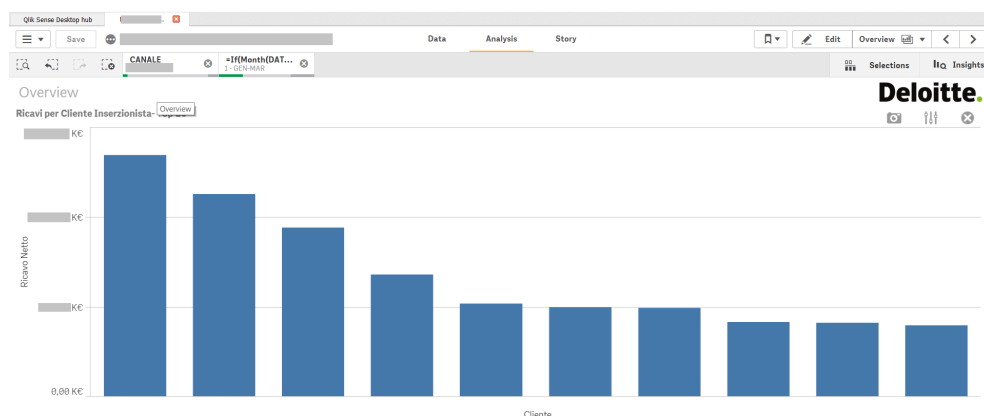

Figure 23 - Data visualization (2)

The graph in the Figure 21 was obtained simply by limiting the analysis to a channel in a given quarter. In particular, net revenues for the ten main customers are highlighted in the period in question. The names are obscured by the abscissa axis for privacy reasons.

Figure 24 - Data visualization (3)

The graph in the Figure 22 represents the gross and net revenues across the time, for a given customer in the first quarter of the period in question.

As mentioned above, this "Audit Innovation" service was determined and requested with the Audit team. There is a section dedicated to tests. From a general point of view, the graphic representation helps in the determination of any anomalies or monitoring activities.

In the case study, the test has the objective of identifying customers with which a percentage of abnormal discounts and gifts are associated throughout the year and for each individual quarter.

All invoices with a zero amount are considered free gifts.

The discount percentage was calculated as the ratio between the discounted amount, i.e. the gross value from which the net amount was subtracted, and the total gross per customer.

For the identification of anomalous customers, a statistical test was applied that allows to identify the observations that deviate excessively from the average. To do this, the standard value was calculated:

$$Standard\ Value = \frac{\%\ Discount\ per\ customer - AVG\%Discount\ per\ customer\ in\ a\ period}{STDEV\%Discount\ per\ customer\ in\ a\ period}$$

All customers with a standard value above 1.96 are considered anomalous. The further the standard value moves away from this threshold, the more anomalous a customer can be because it means that it deviates excessively from the average for the period.

Figure 23 highlights the scatter plot resulting from this test: the value of the standardized deviation is shown in the ordinate axis (where the limit values are detected with a green line), while the value of deviation from the abscissa axis average. Each point identifies a customer, if this falls outside the tolerance range then it will be highlighted in red.

The pie chart only indicates the percentage of points within the tolerance range and that of anomalies.
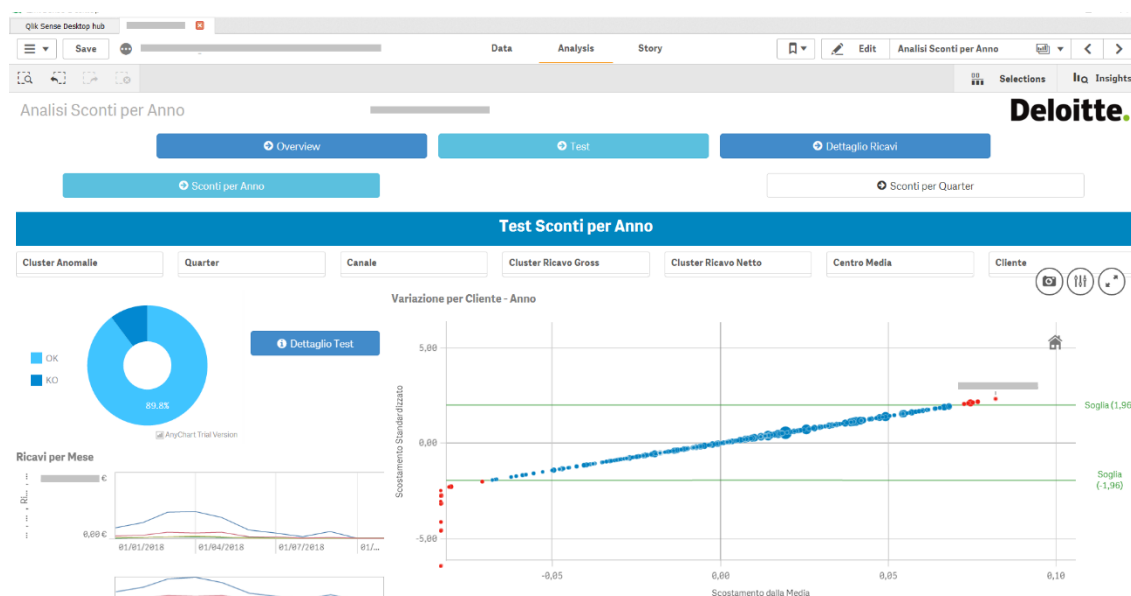

Figure 25 - Discount test

For the case study in question, the client of reference is the Audit team, but in general a further functionality of a web tool such as Qlik Sense is precisely that of being uploaded to a server. Once completed, the application is transmitted and can be reached via a simple web browsing browser. This facilitates dissemination to an unlimited number of users, for example within the same company.

In addition, through the QMC (Qlik Management Console) you can also create a very detailed management of the final tool, dividing end users into groups and, based on this division, select the interface displayed by each group. It is in fact possible, for example, to select a group of admin to which to navigate a different and more detailed home screen, compared to what displayed by all the other users.

Conclusions

The aim of the thesis work is to analyze a project in Deloitte Risk Advisory. Ones inspected the approach to the world of consultancy and the panorama of this sector from a theoretical point of view, the focus has been on IT Audit. It aims to guarantee added value by identifying the risk reduction aspects and appropriate actions that give more value.

During the internship period, I had the opportunity to encounter the targets requirement necessary to a project related to the analysis of a complex IT system.
In particular, as mentioned above, during this type of activity, the Audit team was supported in certifying the balance sheet for the fiscal period under analysis.

All forms of revenues come from a more or less complex IT system, so it is essential to implement a series of controls aimed to guarantee the efficacy and safety of the data processed.
The controls on the individual applications applied can be considered as the basis on which to build the controls relating to the interfaces between the applications and the automatisms.
The analysis of the flow of protected data is the main part of the controls and the most sensitive, because it is the practical implementation at IT level of the business cycles.
The case study retraces this entire path.

From a very articulated and complex IT structure, infrastructure and applications related to advertising revenues were selected as the case study of the thesis.
A global analysis of revenues shows how they constitute the majority of them; therefore, it was interesting to figure out how the business cycle is implemented at IT level.
In detail, the flow of data relating to the commercials was analyzed, as well as the way they are processed and managed from the recording of the spot on air to the

generation of the balance sheet item. To certify the IT process implies to ensure the generation of profit from the source.

The Alfa Company founds its leadership on the Italian panorama thanks to its consolidated sources of profit and, above all, those relating to advertising revenues.
Therefore, it is crucial to mitigate all types of IT risk at the source and to optimize the structure and processes in order to take full advantage of industry leadership.
The entire flow of data was also retraced in order to highlight the malfunctions and their management, in order to approve the correct management of the data.
For this reason, a high level of detail was required for the checks relating to this business cycle.

To obtain a better level of detail, a Business Intelligence application has been developed. It aims to monitor advertising revenues data and to highlighting anomalies through specific statistic tests.
Given the extreme relevance of advertising revenues, any process alteration constitutes a significant fluctuation of results.
Business continuity is strictly linked to the ensuring of the continuity of this source of revenue. This depend primarily on a market analysis and the consecutive choice of advertising campaigns price and customers selection. Secondly, but not less relevant, this business cycle cannot be detached from a solid and effective IT structure.
We can state that the market analysis behind the choice of advertising campaigns is aimed at increasing the operating result and affirming the leadership in the Italian panorama. On the other hand the IT Audit process, certifying the IS structure, aims to assure and optimize the mechanism to generates the operating revenues necessary for business continuity.

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