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"CRM AND SENTIMENT ANALYSIS, THE SUPPORTING ROLE OF LEADING-EDGE TECHNOLOGIES"

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Firma della studentessa

Michela Chiarato

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Ai miei genitori

I N D E X

INTRODUCTION

Why should companies use CRM? Why should companies use Sentiment Analysis?

To answer these two questions, it is important to consider the current context in which the two considerations are involved. Nowadays, *Big Data is becoming the new Black Gold*: it is a "treasure" that companies must know how to manage and to achieve the right advantage.

Sentiment Analysis, thanks to the help of some algorithms and bots, is able to intercept a huge amount of Big Data and to scan digital contents, and to assess genuine customers opinions, feedbacks and emotions toward brands, companies, products, services and market sectors. Sentiment Analysis may be conducted via a number of available tools and platforms. Once Sentiment Analysis is completed, the interested company is able to develop more specific selling strategies, tailoring the offer to their emotions.

Another related possibility is that of companies being able to *intercept the customers' attention, something which is becoming increasingly challenging* for them. This is because of ruthless competition, and customers being bombarded by a constant and numbing flow of advertising. This causes increased scepticism, criticism, and lack of faith towards companies.

Customer Relationship Management is a term that encompasses the whole sphere of the *Customer-Centric* vision in which it is important to concentrate and to enhance the customer knowledge, customizing the customers' interactions and maintaining all in the long-term. Indeed, the CRM aim is to acquire and maintain profitable customers giving them a special attention. Nowadays, it is getting harder for companies can manage a well-informed and self-conscious customer. It is no longer possible to play with his ingenuity. Indeed, the test bench for the prospect's loyalty will be in difficult situations. The more a company is able to assist customers and to manage in flexible and efficient way their problems and the more the customer will be satisfied of the service and the company itself, thus increasing loyalty. Therefore, effective customers management and focused attention to customers' opinions and sentiments are two winning strategies for companies, that want to earn and to survive in the current context.

The thesis composition is composed of four chapters: from a broad theoretical basis, concentrated in the first three chapters, it moves to the fourth and last chapter, highlighting a practical case, where all the theoretical notions previously explored are put together and proved.

The *first chapter* presents the first theoretical base: the *Customer Relationship Management (CRM)*. In this chapter, the introduction of what it is CRM and what kind of function it has inside companies, is proposed. The focus of CRM is the attention given to customers in order to understand their desires and needs. A well-defined CRM system can lead to evident benefits for companies which decide to use it. Therefore, the value creation generated by the CRM technology together with the technical skills of a responsible management, can lead to a stronger business and a more satisfied customer. The CRM technology comprises four separate levels, which everyone has a specific function. The structure is the result of decades of implementation and refinement, a process which started in the '80s and is still ongoing. The current Advanced CRM is inserted in the context of the Digital Transformation Era. This Digital CRM is divided in the Social CRM, employed in the monitoring and engagement within popular Social Media platforms, and Cloud-Based CRM, a fast and flexible system which it is accessible via Internet but at the same time it is riskier. Therefore, many CRM trends are developing, tailored to fit any company's size.

The *second chapter* is referred to the actual development context: *Marketing 4.0*.
This chapter is focused on the topic of Social Media and its psychological aspects. Social Media dates back to about ten years ago, and with their rapid evolution of its characteristics have changed, including the same intern functionalities and devices used by people. This chapter's opening section retraces the story of Social Media from the earliest to the most recent. The Social Media evolution was made possible thanks to the development of the technological and sociological sphere.
When we talk about the development of the technological sphere, we refer to the Web evolution that brings with it the Marketing evolution: the current context in which the Social Media are developing is Marketing 4.0, articulated within the Web 4.0.
When we talk about the sociological sphere, we refer to the consideration of Social Media as a sort of theatrical stage where people's tendency is to show every little aspect of their own identity and personal story. This issue is also linked to the "Democratisation" of Social Media, in which everyone can freely express themselves. Social Media are not just a personal tool but also a business one, which can increase contacts, to find potential customers and then to sell them products or services: this technique is called *Social Selling*. We must remember that every Social Media channel has specific functions in terms of objective contents, a specific reference target and specific language: mastering them is key to successful Social Selling.

The *third chapter* is the conclusive theoretical part relative to *Sentiment Analysis*.

With the Web innovation, many modern companies are adopting new *leading-edge technologies:* among them, *Sentiment Analysis* platforms stand out. These kinds of platforms are able to intercept, to monitor and to discover, all customers' needs and trends, allowing for an improved company-customer relationship. It is all started with the *Semantic Web* development, whose aim is to convert unstructured data into meaningful representations, and with the use of *Natural Processing Language (NLP)* technologies, which they allow the texts connection, the semantic research and the final interception of user behaviour in the online contents. Therefore, listening to what users say and understanding it, through the elaboration of online conversations, given by innovative algorithms and bots, together with the additional manual human work, is precisely the aim of Sentiment Analysis.

The *fourth chapter* explores the development of a *concrete case of Sentiment Analysis*.
Before the business case introduction, it is proper lingered on the Big Data issue, now considered it as a sort of new Black Gold. Indeed, Big Data derives from a strong multimedia use by people, which is leading to an exponential growth of available data. All this data, originating from a wide variety of online sources, is a huge "treasure" for companies who can analyse it to discover and foresee future patterns. This scenario is favouring the birth of many Social Media Analytics platforms and many professional profiles, capable of managing them.
Indeed, the practical case has been developed with NetBase, an American platform leader in Social Analytics: it is the leading-edge technology able to intercept all Web contents in the complex phase of *"Sound Buzz"* of the Customer Journey. This unique opportunity derives from a trimester spent in the only one "NetBase Global Channel Partner" in Europe: *Estilos*, a Strategic and Information Technology consultancy company placed near Venice, Italy.
The business case concerns a category analysis on the topic of *Electric Vehicles.* The Sentiment Analysis done on behalf of an Estilos' customer, an electric materials supplier. The practical case is divided into four phases of analysis, in which many aspects of the Electric Vehicles Topic are identified: the Social Media Analytics approach is similar to the Investigative approach, where the patience and the attention to details is fundamental for a good analysis and resolution of the case.
The *first phase* of the practical case involved the creation of the Topic followed by the insertion of all the indispensable parameters to circumscribe the analysis perimeter: it responds to the necessity to quantify the conversation volumes about Electric Vehicles.
The *second phase* involves the data cleaning. This is the longest phase of the analysis process and it requires a lot of patience and accuracy in the filtering the data. It is really a meticulous and laborious work.

The *third phase* involves the analysis of the basic components of the chosen topic. This phase responds to the need to identify the brands, the social channels, the key conversations and issues revolving around Electric Vehicles.
The *fourth phase* goes to intercept people's emotions, opinions and sentiment polarity regarding Electric Vehicles, as available online. The focus of the business case is exactly the Sentiment Analysis, identifying and classifying: Positive, Negative and Neutral options.

Therefore, with Social Media Analytics practice is possible to gather, to analyse, to interpret, and to monitor sensible data from the digital environment. After that, with the help of specific tools such as NetBase, it is possible to support all marketing and customer relationship management activities. The deriving results can impact on business decisions, thanks to the discovery of new market opportunities. Therefore, the Social Media Analytics, as NetBase, really become a winning weapon for the company which decides to use it.

CHAPTER 1
THE THEORETICAL BASE OF SENTIMENT ANALYSIS: CUSTOMER RELATIONSHIP MANAGEMENT (CRM)

1.1. What is the CRM?

A very important concept in the Modern Marketing is the Customer Relationship Management (CRM), a strategic and technologic process applied to a *software* that allows the best way to manage every kind of customers' information and interaction with the company business. It's surprising how many streams of company's data come directly into a simple and customizable dashboard[1].

Inside this one it is possible to see, in chronological order, all the customers' movements with the firm itself, the status of their orders and any customer service issue (like for example the company social media activity). The CRM system allows to always get the needed information in *real time*, in an organized overview, in which it is possible to do every kind of customers research through all the company personnel from everywhere, with every device (mobile, pc, iPad). In particular this determines the possibility to better understand what are the customers' needs to then provide them with improved support and service, absolutely personalized.

The great effort is putting the **customer's relationship** in the centre, both current and potential one. Indeed, in the CRM system it is very important to acquire new customers and understand who they are, what their problems and desires are, how to solve eventual difficulties and after this maintain them, maximizing their loyalty in time towards company offers.

Therefore, the *"Customer-centric"* is the real and the most important issue in the CRM strategy in which a business company should invest a lot because "*Customer is the King*"[2] and he is able to advise other people to buy a certain product or service because he was very satisfied with it. This process is the old and dear *word-of-mouth* that is very useful for companies that want to keep customers because they know that "it's twenty-five times more expensive to gain a new customer rather than keeping an existing one"[3].

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[1] Forbes Magazine, *Why is Customer Relationship Management so important?* : <https://www.forbes.com/sites/forbesagencycouncil/2017/10/24/why-is-customer-relationship-management-so-important/#684700177dac>

[2] Harvard Business Review: Erin Anderson and Vincent Onyemah, *How right should the customers be?* <https://hbr.org/2006/07/how-right-should-the-customer-be>

[3] Harvard Business Review: Amy Gallo, *The value to keeping the right customers*, < https://hbr.org/2014/10/the-value-of-

The customer's happiness is a fundamental element that brings to an increase of customer retention rates and the latter if it is considered and improved can lead, as a consequence, to a major company's profits[4].

Indeed, the *retention rate* is a crucial issue in a company because it determines many considerations about the company's work. When there are retention problems it's important to understand if there are acquisition problems at the base, in particular in the acquisition of right and valuable customers for the business itself. This means that it's important to attract very interested and involved customers that can be loyal and profitable in the short and long term, not simple *high-churning* customers that are attracted only by heavy and limited promotions.

Therefore (in the opposite way) the *churn rate*[5] is influenced in particular by the *customer relationship management* of a company and by the improvement performance in this area (when and how interact with customers) that certainty considers many aspects of the customers' behaviour. Many marketers but also investors use the metric of the churn rate to evaluate the health of the company itself and in some cases, it is considered also to understand the possible customers' prediction rather than known what is happened in the last period.

1.1.1. The Purpose of a CRM system

The final **purpose of a CRM system** is to maximize the so called "**Customers Equity**" that is the hypothetical total value of potential and current customers of a company for the entire life cycle, at net acquisition costs. Customer Equity presents a positive proportion: a higher Customer Equity corresponds to a higher sustainable and well-developed company's competitive advantage.

The latter, because the Customer Equity is composed by three important components according to the researchers Rust, Zeithaml, and Lemon[6]: the Value Equity, the Brand Equity and the Relationship Equity. All these are explained in detail below.

1) *Value Equity* (VE) is the "Value for Money" (VFM) which is very important in Industrial markets mainly because B2B customers. The VE represents the right

keeping-the-right-customers>

[4] Harvard Business Review: *The value to keeping the right customers*, < https://hbr.org/2014/10/the-value-of-keeping-the-right-customers>

[5] The *churn rate:* is the total number of customers who left a company during a specific period divided by total customers at the beginning of this period.

[6] Institutional Knowledge at Singapore Management University: *Linking Brand Equity to Customer Equity* https://ink.library.smu.edu.sg/cgi/viewcontent.cgi?article=4519&context=lkcsb_research>

combination for the customers taking in consideration the offer, price and convenience of a product or service.

2) *Brand Equity* is a very important component in the consumer market. It represents the subjective perception of the customers toward a specific product or service because there is an intrinsic trust beyond it that determines a higher willingness to pay.

The instruments that help the development of Brand Equity include: the advertising, the public relations and the *Holistic Marketing approac*h[7].

According to Philip Kotler the *Holistic Marketing approach* has a leading role in the business strategy and represent the strength that promise a consistent brand. This theory is an orientation shift from product to customer and from sold product to the customer satisfaction. There are four components in this approach:

1. The presence of a broad vision about the needs and the life-styles of customers. It is important to discover more complete and actual ways to assist customers.
2. Understand which sector satisfies customers more. Customer orientation of all company offer is fundamental.
3. Measure the effect of the company actions toward all stakeholders with the main goal to offer a better solution to the target customers.
4. The need to consider in a broader prospective the sector in which the company works, monitoring its evolution, determining the opportunities and identifying the treats.

The Brand Equity's *driving forces* are: the Brand Awareness, the Brand Ethics, the customer's Brand Attitude and the Brand assessment.

- the *Brand Awareness*: the ability of customers to recognize a specific company brand. According to the famous American professor David Allen Aaker, a brand is a set of activities linked to a distinctive sign (trademark, name, packaging design or logo) that adds value to products or services.[8]

  A strong brand awareness can be a good predictor of a brand's market performance and brand success. This also includes a good balance and a positive measure in customer satisfaction and brand loyalty.

  To better understand the real presence of a brand, the researchers developed the so-called *Aaker's Pyramid* in which are presented four levels regarding the Brand Knowledge.

[7] P. Kotler and K. Keller, *Marketing Management*, Ed. 15, Boston, Pearson, 2016

[8] D. Akeer: *Managing Brand Equity: Capitalizing on the Value of a Brand Name, N.Y.,* 1991

From the bottom (more superficial awareness) to the top (strong awareness) of the pyramid:

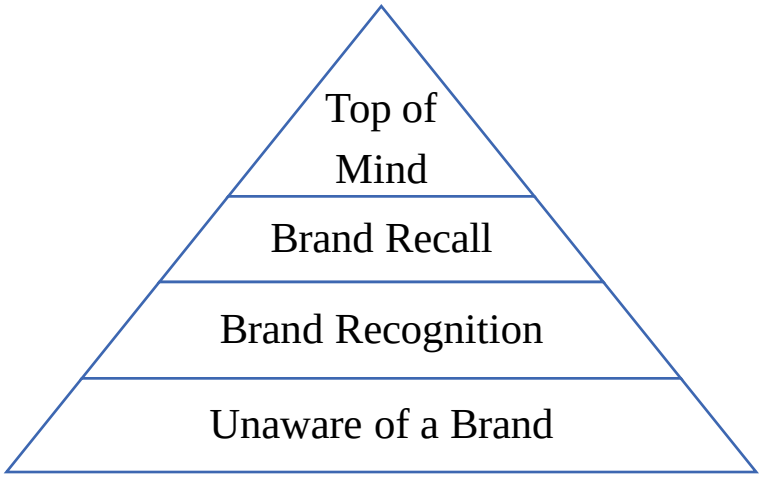


Figure 1 Framework of own elaboration: *Aaker's Pyramid*

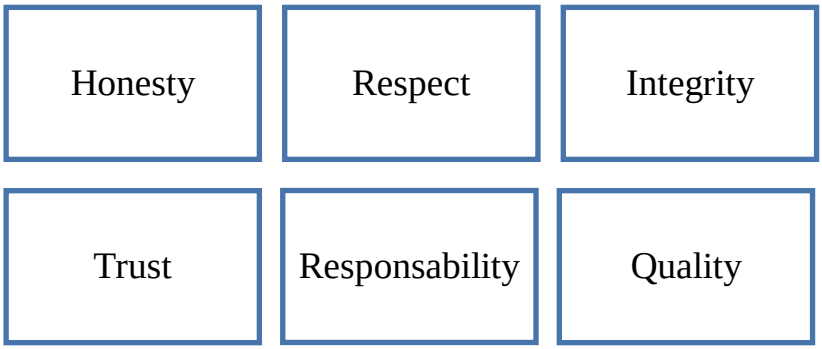
- *Unaware of a Brand:* in which the consumer has no knowledge or recognisability of the brand.
- *Brand Recognition:* is the initial identification phase about the trademark, but it is possible only with questions that link the answers to the brand in the customer's memory.
- *Brand Recall:* is the phase of spontaneous association of the brand to a category of goods or services, without any external incentives.
- *Top of Mind:* this last level is reached when the customer thinks the brand and has an immediate connection with its precise characteristics. This result happens when knowledge and awareness fuse together and influence the customer's choices. This level is the dream position and therefore represents the main goal for most marketing communications.

- the *Brand Ethics* refers to the moral rules or principles that a company defines for itself and therefore for its image and brand as a consequence. Indeed, there is a close connection between Ethical Brand and Brand Reputation.

  "Ethics does not sell"[9] and the same concept of Brand Ethics embodies some attributes, fundamental to maintain the consistency of the brand in its

9 Ying Fan, *Ethical branding and corporate reputation,* Corporate Communications: an International Journal, Vol. 10, Number 4, 2005, pp. 341-350

referred market and they could be also transformed in strong elements of competitive advantage:



In the customer's mind the Brand Ethics is highly considered and reflect the behaviour adopted by company. The customers' decisions nowadays are more sophisticated and careful than before. Usually there are higher expectations in ethical behavior of the brand when the brand is more high-profile.

- the *customer's Brand Attitude and the Brand assessment.*

  The Brand Attitude is referred to an overall consumers' evaluation of the brand in particular around three main pillars: Brand Value, Brand Quality and the Trust that customers perceive by the brand. From an analytical consideration the Brand Attitude is composed by the strength of positive or negative associations, ideas and beliefs deriving from the customer experience, with the conviction that these valuations are accurate.

  The study of the Brand Attitude is helpful in planning the advertising campaigns because it allows the owner of company brand to analyse the customer's point of view regarding the perception of the brand itself.

3) *Relationship Equity* is a positive element because it links the customer to the brand with the tendency of the latter to stick with the brand also when the price is higher and usually this happen when customers prefer a brand rather than other ones.

There are some key drivers, identified as "glue"[10], able to intensify the relationship

[10] K. A. Richards and E. Jones, *Customer relationship management: Finding value drivers,* Industrial Marketing Management, Amsterdam, 2008, pages 120–130

between the brand and its customers, enhancing the customers' awareness to have special treatments such as: *Loyalty Programs* and *Special Recognition Programs*. These latter are designed on the habits and preferences of customers offering them additional incentive to increase their brand retention.

A good practice of many companies is the **customers' classification** because customers are very different, and they have a diversity potential business profitability. It's very important in such way to create an entrepreneurial culture oriented to the customers together with CRM investments.

The customers classification used by companies around the world, is the well-known model of *four customer' types* by the famous professors **Werner Reinartz** and **V. Kumar**, in which are listed a series of characteristic information about the four types.

"Knowing that about half of the company's loyal customers are profitable is useless if it doesn't know which ones to court with what level of service."[11]

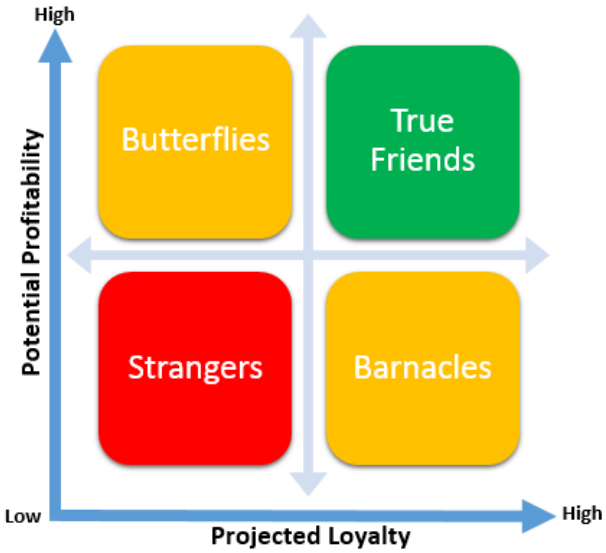


Figure 2 *Customer Loyalty Matrix* *W.* Reinartz, V. Kumar, 2002

1) ***"The Stranger Customer"*** presents a very low level both of Profitability and Loyalty with a very scarce correspondence between the company's offer and the customer's needs.

[11] W. Reinartz and V. Kumar, 2002

The beat solution for the company is to make profit on every transaction but it' s fundamental not to make investments in this category.

2) ***"The Butterfly Customer"*** generates profit but at the same time it is instable and so disloyal. There is an elevated correspondence between the company offer and the customer's needs but this type of customer buys for a short period of time.
   The best solution for the company is organizing promotional campaigns focused on the attraction of this customers also called "Movers" taking advantage of their temporary loyalty. But it's important to avoid continuous investments in this category after their leave.
3) ***"The True-Friend Customer"*** is the most loyal and profitable customers for a company. There is a very elevated correspondence between the company's offer and the customer's needs, determining them as the most valuable customers of all. They are steady and regular purchasers, however not in an intense purchasing way.
   The best solution for the company to maintain this type of relationship with the customer is to avoid every form of excessive customer service contact.
4) ***"The Barnacles Customer"*** is a very loyal customer but with limited profit's generation because of low correspondence between the company's offer and the customer's needs. This customer is a weight for the company because of his problematic way of being.
   The better solution for the company is not to invest so much but to, however, consider their devotion and exactly for this reason it should be interesting for the company to understand their difficulties in the moment of purchase.
   In particular if the problem is the restriction of the wallet's share, the company can focus on *up-selling*[12] and *cross-selling*[13] marketing techniques.

The two researchers W. Reinartz and V. Kumar reported that there is a little correlation between the *customer longevity* and the *companies' profits*[14]. It's very important that a company first of all measures the customers' profitability and the projected duration of their relationship, labelling inside the matrix *"Choosing a Loyalty Strategy"* and only after that starting to manage them in their own way according to the customers' group identity.
However, the only way to reinforce the connection between loyalty and profit is to manage both

[12] The *"up-selling"* sell technique has the scope to offer to customer something with major value respect the initial purchase.

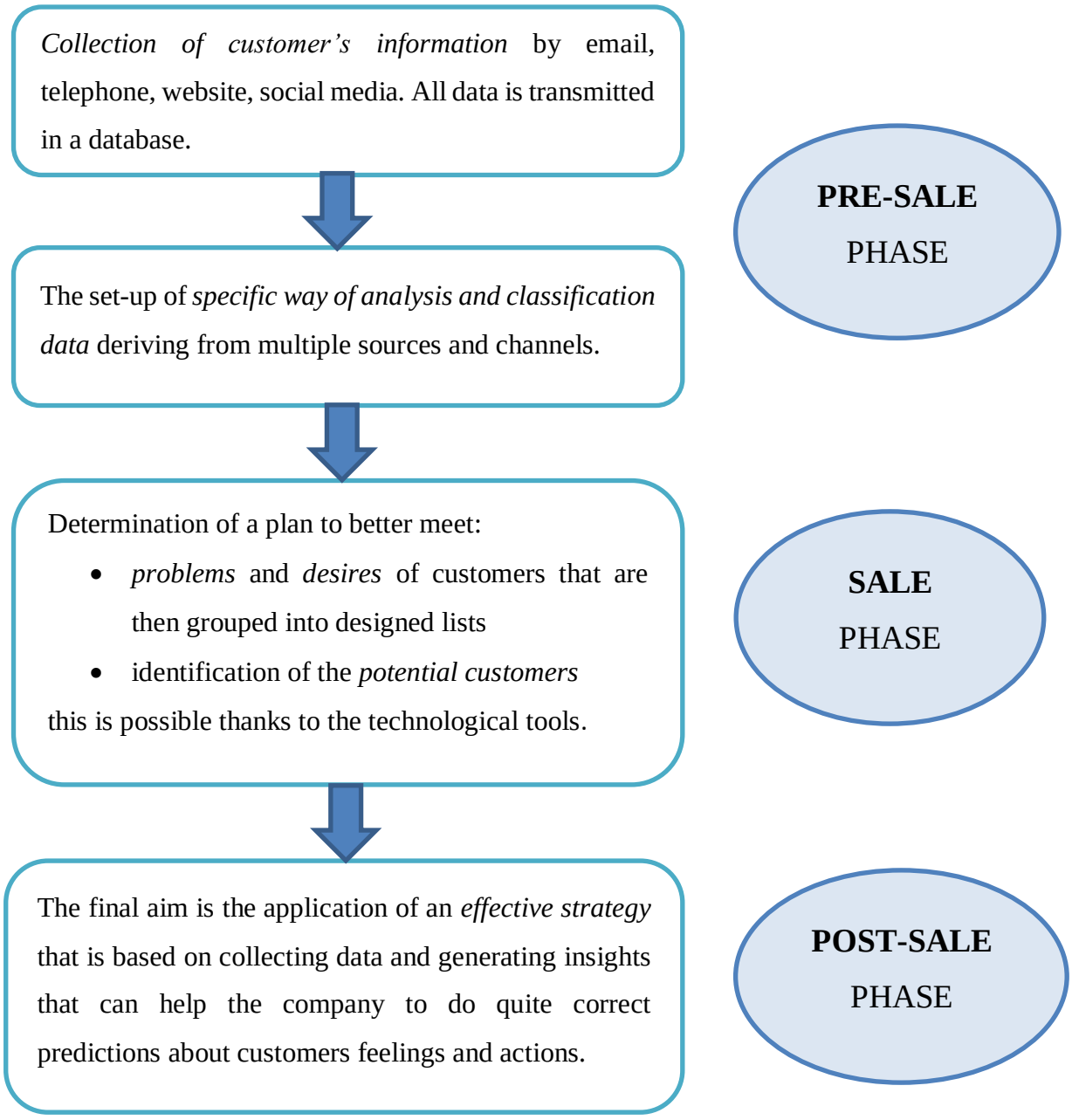
[13] The *"cross-selling"* technique consists in the increment value exchange of products or services that are linked with the initial purchase, making this latter more complete.

[14] Harvard Business School: W. Reinartz and V. Kumar, *The mismanagement of customer loyalty - not all customers are created equal*, <https://hbswk.hbs.edu/archive/the-mismanagement-of-customer-loyalty-not-all-customers-are-created-equal>

simultaneously that it's possible for the companies thanks to the actual technology that is able to monitor and then analyse the complex behaviour of customers.

1.2. The CRM process and the involvement of Corporate Organization

The Customer Relationship Management *process* presents very specific building blocks such as:



In the first step some information about customers is collected and in the second step this information is organized in some specific fields. Therefore, to better understand, with the table below it's possible to see what are the questions that can help a business company, user of CRM system, to implement its customers database.

Type of Information	Questions
Customer profile	• Who are they? • Are they a business or a person? • Where are they located? • If they are a business, how big are they? • If they are a business, what do they do? • Why do they need your product? • How do they communicate with you? • Do they have an account? • How long have they been a customer?
Customer buying profile	• How often do they buy? • When do they buy? • Is there a pattern to their buying habits (e.g., seasonal)? • How much do they buy at one time? Over time?
Customer buying preferences	• What do they buy? • Do they always buy the same thing? • Why do they buy it?
Customer service profile	• What kinds of problems/issues do they encounter? • What is the current status of their issues? • How many open tickets are there? • How many cases have been resolved?

Table 1 *An example about the CRM collected information*

Source: https://www.ontario.ca/page/customer-relationship-management

The CRM System can support the increment of the *share customer base,* which means the purchases percentage of customers regarding a certain product or service which, from an analytical point of view, is the ratio between *benefits* and *costs*[15] of a single offer in respect to the competitor's one.

Usually the CRM improves products knowledge and value perceived by customers and the latter that takes part in the purchase decision of a buyer.

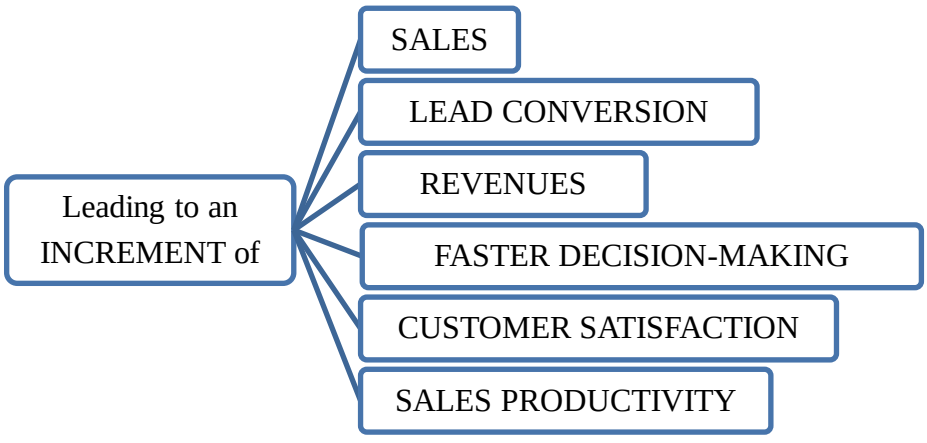
The CRM process presents an upstream strategy that should be as transparent and correct as possible toward the customers and an essential factor for a good result is the collaboration and coordination of all **corporate organization**. All functional areas of business need to be engaged and it's very important that all company's personnel understand the entire process required.

1.3. The positive aspects of CRM adoption

CRM system is a powerful tool that permits companies that use it, to enter in the business life or in the personal life of its customers, according to which they are companies (B2B) or private customers (B2C), making credible a very close relationship with them.

This consideration reinforced the possibility for the business company, that use CRM system, to show that:

- It knows its customers
- It understands its customers
- It cares about needs and interests of its customers
- It wants to satisfy as a consequence all necessities
- It appreciates the business of its customers (in case of B2B).



[15] L. Hou and X. Tang, *Analysis of Costs, Benefits and ROI of CRM Implementation*, The Fourth International Conference on Electronic Business, Beijing, 2004, pages 261-265

The principal business company benefits deriving from the adoption of a CRM system are given by:

- Improvements to company's bottom line thanks to a better knowledge about who are the customers and how it is possible to serve them in a better way. There are real results:
  - Quickly and easy identification and categorization of right leads that can also permit an anticipation of their future needs.
  - Increment of the customer base given by better customer' s treatments and new ways of engagement. This is at the base of a customer return.
  - Identification and prize-giving to loyal customers with special promotions determining higher profits.
  - Increase of personal referrals from existing customers permit to identity possible *cross-selling* and *up-selling* opportunities. As a consequence, customers will spend more and will share and suggest their experience to others.
  - Offering a personalised customer support also thanks to prompt resolution of every problem. With a better customers service, customers are happy and more inclined to spend.
  - Efficient improvement of products and/or services based on historical data and service trends. Very important consideration is given to customers' feedbacks.
  - Research and involvement of potential customers everywhere is possible thanks to social network use and more than half of companies are already doing this.

The real company's utility, deriving from the CRM system use, is the *saving time* spent to manage the inquiries and assistance across many channels used by customers (including calls, e-mails, online chat, and social media), leading an increase of speed and satisfaction responses. The knowledge of more information about customers should help the company to reach:

- an increase of sales due to better and advantageous contracts with the use of customized customers offers.
- an increase of profit with a faster business growth based on the identification and stimulation of the best consumers.
- an increase of customers satisfaction due to simplification and interest with the consequent difficulties resolutions making them happy and loyal with the customer' s service.
- an increase of company results with the monitoring and optimization of actions and campaigns.

Therefore, the CRM strategy is an investment of time and money but with high benefits in the long term.

1.4. The CRM technology: CRM levels and technological functionalities

The CRM is a technological model and also an innovative philosophy in the operative customers management in which the customer is the special cornerstone. All this is guided by clear and well-defined objectives that lead to a *value creation* for the users' company, in which converges in an integrated platform: a synchronized information flow of all customers data, coordinated transactions and facilitated customers' requests.

The technological developments affect the company and as a consequence the diverse methods to collect customers data. More technology is used, and more data should be clean, reliable, timely and significant for a proper analysis[16]. An actual problem nowadays is however the customers' resistance to give own data to companies due to *privacy* issue.

The CRM technology can be considered one of the most important company's resources used to improve its performance, based on attraction and retention of current and potential customers. One of the main contribution of CRM technology is given by the improvement in the planning of all marketing strategies due to advanced skills and corporate knowledge that permits a better knowledge of customers.

However, essential elements for the *CRM success* are a right combination between the technological environment and the managerial one and the consistency among the technological choices. Fundamentals are the technical skills that managers should have in order to use CRM technological system. These abilities allow to understand and to use the complex operational and analytical CRM functions, improving the *customer-oriented business process*[17].

Beyond loyalty programs and customers management there are specific *levels* of technology that permit the integration of *front office* and *back office* systems. This diversity in the types of CRM is a consequence of changes in customers portfolios, speed, handling and need of information and resources. Therefore, as it's possible to see in the graph below, the CRM levels are divided in: Strategic CRM, Operative CRM, Analytical CRM and Collaborative CRM.

[16] M. Viljoen, J. Bennett, A. Berndt and C. Van Zyl, *The Use of Technology in Customer Relationship Management (CRM),* University of Johannesburg South Africa, 2005, pages 106-116

[17] S. Dong, *Value Creation from CRM Systems: Resources and Processes,* The 2010 International Conference on E-Business Intelligence, Atlantis Press, 2010, pages 128- 137

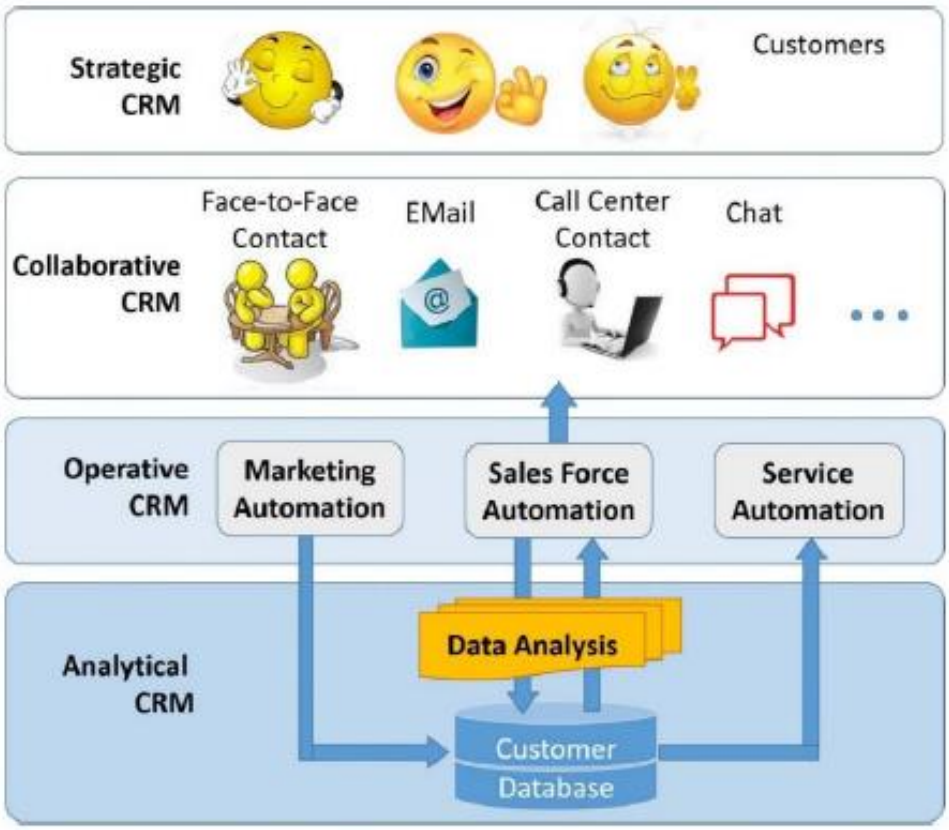


Figure 3 *The CRM levels*

Source: https://www.tutorialspoint.com/customer_relationship_management/crm_quick_guide.htm

"A business absolutely devoted to Customers Service Excellence will have only one worry about profits. They will be embarrassingly large."[18]

1. *Strategic CRM is* based on *Customer-Centric* vision in which it is important to concentrate and enhance the customer knowledge, customizing the customers' interactions and maintaining all in the long-term. Therefore, the Strategic CRM level has the main aim to acquire and maintain profitable customers, having the right information about market trends and special attention is given to customers voice.

2. *Operative CRM* is based on *Customer-Oriented* vision in which are present: the selling process, the use of tools that permit to make focused marketing campaigns and the customer service process. All these processes permit a direct contact with customers both *in-bond* than *out-bound* and they are automated to help to manage a high level of complexity and it is possible only with the *digital transformation* presence in the

[18] Henry Ford quote, 1908

referred company.

> *"The first rule of any technology used in a business is that automation applied to an efficient operation will magnify the efficiency. The second is that, the automation applied to an inefficient operation will magnify inefficiency."*[19]

- *Sales Force Automation (SFA)* is the technology application in selling activities for what regards the collection, storing, modification, analysis and transportation of sales data.
  The software functionalities include: Product Configuration (in which it's possible to design and customize the product and price); the Quotation and Proposal Management; and the Management of: Accounts, Lead, Contact, Document, Contract, Event, Incentives, Order and Opportunity.
  The use and the implementation of SFA permits as a consequence, an improvement in: customer relationship, personnel productivity, salesforce productivity and business profitability.

- *Marketing Automation (MA)* is a really good help instrument to increase and improve: marketing process, marketing knowledge, customers experience, instant response and audience reachability.
  The software functionalities include: Customers Segmentation (in this way it is possible to propose customized offers), Reporting and the Management of: Asset, Campaign (the plan, design, test and communication), Direct Mail Campaign, Marketing Performance (eventual churn-rate, migration and customer satisfaction) Marketing Resource and Event Marketing (customised offers to retain customers)

- *Service Automation (SA)* is the process focalized in supporting the system with the use of Data, Devices and Software which benefits included the increasing and improvement of: speed service processes, customer experience and satisfaction and company productivity.
  The five areas of interest are: The *Contact Centre* in which it is possible the first customers approach via Email and Chat for the problems resolution; the

[19] Bill Gates quote, 1999

Call-Centres in which there is the *in-bound* and *out-bound* calls handling, fundamentals are patience and listening skills; the *Help Desks* for the supporting business personnel the *Field Service* and the *Web-based Self Service*.

The software functionalities include: The Scheduling of service technical work, Customer self-service and the Management of: Activity, Agent, Job, Case, Email Response, Communication (*In-bound* and *Out-bound*).

"To give real service, you must add something which cannot be bought or measured with money, and that is sincerity and integrity."[20]

3. *Analytical CRM* is based on data analysis in which every kind of customer is included in a related segment, with its own characteristics, in which the final aim is to understand the customer profile and therefore the *customer knowledge base*. All treated data (about Sales, Finance and Marketing) come from internal and external company system in which a data-warehouse receive, collect and elaborate all information.

The analytical process is also called *Business Intelligence* in which data, reports and simulations are useful to motivate the final decisions and therefore determine the future strategies. An insight on customer behaviour is given by customer related *data-warehouse* in which are applied software with different kinds of data that must be sharable, relevant, secured, transportable, up-to-date and accurate.

Data process and tools used are:

- *Data Mining* is a process that permits the identification of relevant information in a huge amount of data, in the shortest possible time.
  This typology of data is the application of predictive analytics to support sales, marketing and services.
  To better understand, the *predictive analytics* is a subset of data mining that permits to identify new insights or new information from existing ones that are used to predict future consumers activities and trends. All this to increase the effectiveness of the company's strategy.[21]
- *On-line Analytical Processing (OLAP)* is a multi-dimensional analysis of

[20] Douglas Adams quote

[21] M. Viljoen, J. Bennett, A. Berndt and C. Van Zyl, *The Use of Technology in Customer Relationship Management (CRM),* University of Johannesburg South Africa, 2005, pages 106-116

data that allowed the study of data from different points of view and support decisional processes. A typical OLAP combination structure is the cube that considers three dimensions of a single parameter.

- *Dashboards* consider the trend analysis and so the dynamic tracts, objects of investigation.
- *Database Queries* are the tools to access and modify the database.
- *Reports* are helpful instrument to assess the company performance given an accurate analysis of data activities. OLAP technology is a great support.

4. *Collaborative CRM* is based on traditional and new technologies[22] able to support the direct interaction with the final customer such as: mail, calls, fax and chat, web forum, Voice over Internet Protocol (VOIP)[23].

Great attention is given to the most profitable customers and to attract them is useful to align of resources and strategies. Focused action in this sense is given by the co-design solutions that help in the increment of value proposition and loyalty of customer's base.

[22] New technologies also called *"Enterprise 2.0"*. Source : https://www.francoangeli.it/Recensioni/1059p21_RX.pdf

[23] *VOIP*: indicates a new technology that permits to have a phone conversation exploiting an Internet connection with the IP protocol.

1.5. The Advanced approach

In the course of time, the CRM approach saw a lot of changes leading a constant and coherent evolution of the system. According to the graph below it's possible to view it in a graphical way all the main process that characterized the CRM system, from the beginning to the last step.

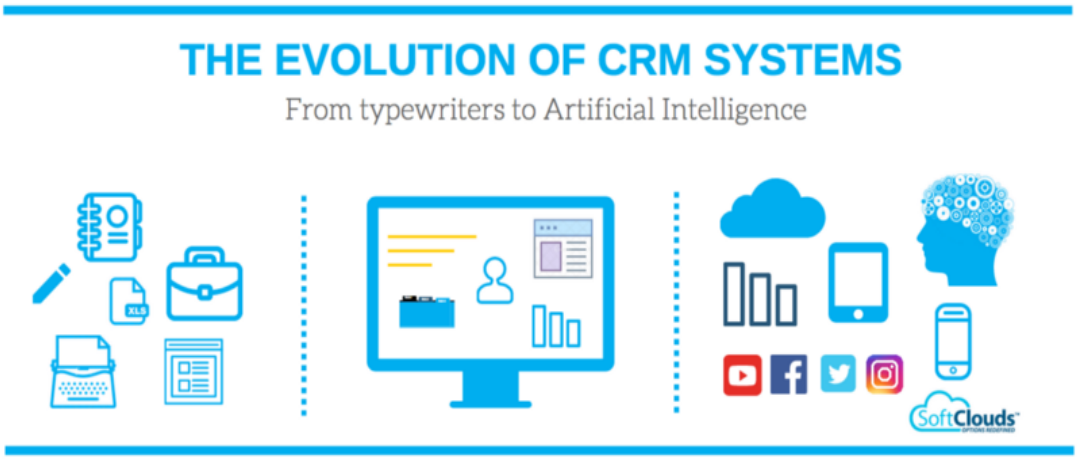


Figure 4 *The Evolution of CRM system*

Source : https://medium.com/@SoftClouds/4-trends-for-crm-in-2018-be3163af4ef8

- The *beginning phase* dates back to the '80s with a basic approach to customers, in which business companies used papers, pens and notebooks to gather information and track basic data about customers.

  After some years, in late '80s other small steps were acquired:

  - the birth of the first contact management *database* due to the PCs innovation in the market, in which business companies started the *front-office* applications giving the possibility to make a better storing and organization of all customers' contacts, in a bigger number.
  - the possibility to analysed, for the first time, a *customization communication process* for a more precise customers' offer.

- The *intermediate phase* date back to '90s – 2000s in which was coined the "CRM" term and was born also the first Mobile CRM: is the age of Innovation.

  This modern CRM with the first automating business processes was helped also by the introduction of *loyalty programs* based on points collections, discount sales, awards and so on, to analyse the purchasing habits of customers more strictly then before. In these years CRM started to be a system designed to data storage, to trigger mechanisms able to create and to maintain a satisfactory relationship with customers, also after sale. Therefore, CRM started to become a tool used to optimize all the business processes, thanks to involvement all the organization: from marketing, sale, logistics,

administration, human resources, to production[24].

- The *latest phase* coincides with the recent years to now, characterized by the development of Social Media and the explosion of technologic devices. As a consequence, an ocean of personal data availability, not only linked to purchases, but also referred to tastes, preferences and opinions in general issues. Nowadays the CRM is *customer-centric*, based on:
  - *Artificial Intelligence Technologies*
  - *Machine Learning* and *Predictive Analytics:* personalized targeting products and customers journey.
  - *Internet of Things (IoT):* given by billions of devices connected together and always.
  - *Big Data and Cloud development:* drive trends.

Now the *Social Network Era* is exponentially influencing every relationship among companies and customers, moreover the companies are also starting to ask *more precise and quality data*. The CRM advanced approach is opening new perspectives in the Digital Marketing field in which it seen the CRM evolution from simple tool to register customers to fundamental resource of integration with the Social World.

The CRM essentiality in the digital marketing process derives from the business company utility to determine what type of customers relationship and interaction must be prioritized at a certain level in order to maximize any possible sale.

[24] Estilos materials: < http://www.estilos.it/>

1.6. The Digital Transformation in CRM

In these last years of deep changes, the new technologies and the new media lead all the world toward an innovative and so unpublished scenario. Everyday life is full of technology devices and they have changed forever every kind of easy habits: from the simple relationship with people around, to the method of reception and distribution of information.

The *Digital Transformation* is a very discussed issue and today it is a great challenge that involves humanity and therefore as a consequence, the companies' world.

The company digitalization is lived through schemes and digital interfaces in which the consumer is in the centre of all the offered experience.

The Digital Transformation is changing:

- Specific and established *Processes* inside the company business (from the marketing area to sale, to administrative, to customer care area and so on), with the ambitious aim to offer a new proposal in line with time, in order to reach a new business market position and more important to reach all the customers in the new channels. This adaptation process leads to a company gain in efficiency.
- *People* who could be considered the drivers by which the digital transformation is being realized and very important. Regarding that, there is the *Human Resource Manager* inside the company that plays a crucial role as a guarantee and enabler of all collaborative process that involved all the company's organization.

  A peculiar characteristic of the digital transformation is based on sharing ideas amongst a network of people to make them operative in fast times.
- The *Technology* itself that required ongoing updates because of the complexity and its constant evolution that required a certain degree of business organization adaptability. Moreover, these changed technologies guarantee now more than ever innovative opportunities through the Web, the Cloud, the Business Intelligence (BI), the Internet of Things (IoT), the Virtual Reality, the Augmented Reality, the Block-chain, and other systems.

The Digital Transformation in the *Business sphere* is a process that includes huge management changes: a well-defined vision and strategy should guide from the starting to the final transformation goal.

Being the Digital Transformation an ongoing phenomenon that includes a series of processes, all these should be very automatic in the course of the time, to then become an integral part of the business organization. Therefore, the presence of a guide figure is very important, that helps the company in this delicate phase, people responsible for the monitoring commitment and

others for the control and optimisation of interventions.

The Digital Transformation in the companies often start from the introduction of new methodologies and tools that regard specific area. One of these important areas from which all the innovation process originate, is the Customer Relationship Management (CRM). Nowadays the CRM system is considered as a sustainable and productive management procedure, with a well-defined maturity: companies are now able to control all changes produced by CRM implementation, and market penetration.

A great difference from the past is given by the consideration of CRM application as a pure and absolute technological factor without the important consideration to define first of all the main marketing goals of the company and then the relative marketing strategy to reach them, before CRM implementation. The application of CRM system is a simplified new way to work inside the company and to tender towards customers and in general to market, and this is possible thanks to the possibility to realize focused business activities on current and potential customers.

Therefore, the Digital Transformation in CRM system considers the possibility to make an evolution from a traditional to an innovative system, in which the communication activities are bidirectional, in multiple channels on the Web and the most important consideration is the simple listening of customers voice and feedbacks.

The *Digital CRM* enhances the typical CRM data together with those digital ones, joining objects such as:

- acquisition of new customers
- the develop of the value of new customers
- the capacity of retention of new customers.

The Digital CRM, the innovative and Advanced Approach, is divided in **Social CRM** and in **Cloud-base CRM**. We see in the following two subparagraphs.

1.6.1. Social CRM

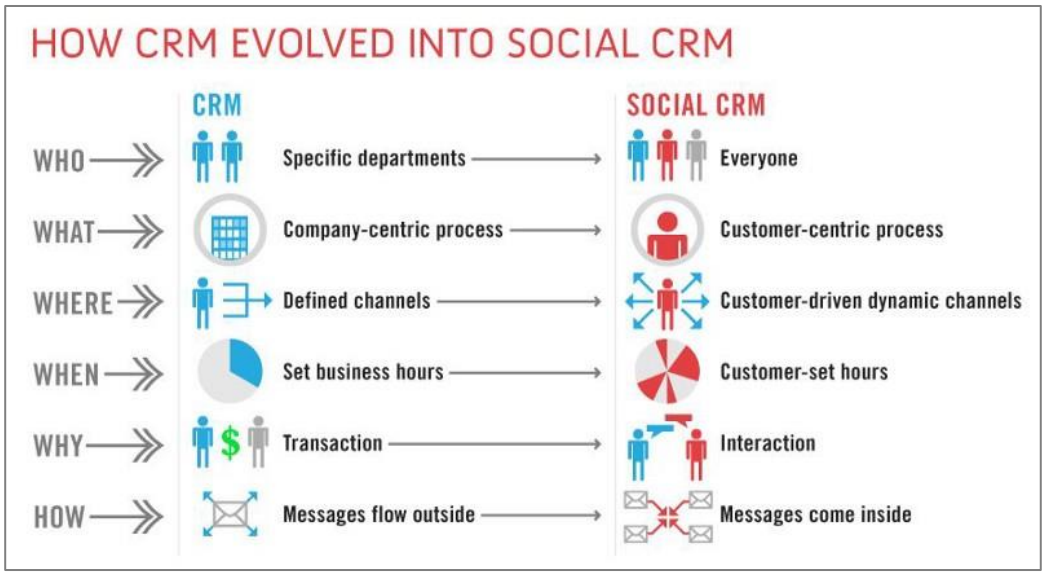


Figure 5 *How CRM evolved into Social CRM*
Source : https://medium.com/@SoftClouds/4-trends-for-crm-in-2018-be3163af4ef8

Social CRM is a new frontier in Customer Relationship Management and this type of system considered *Social Media* tools and service to attract, monitor, engage and replay to customers respect a product or service offered by companies. Very important is the perception given to customers about an individual relationship with the referred company. The evidence of the social world is given by this "extra" customers knowledge and so the possibility to have a more reliable *Predictive Analytics* about future trends.

An important factor that determines the success of a good predictive analytics is given by the ability of a business company to deploy all data obtained in its day-to-day activities and incorporate them in its actions. The future of CRM is exploiting predictive data to become a proactive system and with the pass of time there will be more robots able to collect and to assist customers.

The *Social media* diffusion is a really unstoppable phenomenon in these years and for this motive that companies must be all connected in the virtual world in which is present a lot of multimedia, discussions and comments regarding every kind of goods or services presented in the world market. All these social "Big data" are a real treasure for the business companies to understand the real interest and feedback of all customers, indeed, often customers recommend brands to familiar persons after interacting with them on social media.[25] Therefore it has become

[25] *Internet Advertising Bureau UK (IAB UK):* IAB is one of the most important association in the field of digital advertising, it is known worldwide. It is created to promote a deeper understanding of the opportunities and mechanisms of new media.

essential for the business companies to reach customers engagement through the online brand interactions and building long term relationships with customers themselves.

According to the Philip Kotler school of thought, the Social CRM is the main and natural movement from the Traditional CRM, due to a series of temporal changes that include technological and cultural aspects[26].

As it's possible to see in the graph below, there have been a lot of changes and the most evident is given by the centricity of guide in which in the Traditional CRM is *Company-driven* while in the Social CRM is *Customer-driven*. Briefly:

- in the *Traditional CRM* the company communicates through *out-bound* channels preferring call-centres and e-mails. All the communication with customers is led by the business company with a periodic and distant approach.
- in the *Social CRM* the company communicates through *in-bound* channels like social media, preferring direct contact and quick answers to many questions and doubts of customers. The Social CRM involves an ongoing dialogue between the brand and the customers and also amongst customers themselves giving the possibility to originate real communities around the brand.

  This give to potential customers the possibility to understand the spirit and the ethics of the business company through the answers management given in the virtual space, especially in merit to negative situations or critics.

There are three main points important that in the Social CRM is respects for a well-defined strategy:

1. The *customers' voice* is fundamental and must be listened because it determines a real feedback and can influence also other perceptions, especially in Social Media.
2. The *involvement of the Brand* in customers' conversations, so giving the idea to customers that the company is very interested and close to them in case of necessity.
3. The *controlled conduction* of company in the *conversations* in order to obtain positive outcomes, usually it is implemented to cope with situations of brand crisis and negative feedbacks before the problems go viral.

It is important at this point to underline a light difference of concept between what is the Social CRM and the Social Media Marketing, because they tend to have almost similar scope, giving

The association is managed by the main owners and agencies of media in the UK digital sector.

[26] P. Kotler, H. Kartajaya, I. Setiawan, *Marketing 4.0: Moving from Traditional to Digital*, Wiley, New Jersey, 2017

the coexistence, but these two are not exactly the same.

- The *Social CRM* is a more stable platform for ongoing resolution of customers' matters and difficulties with also the sustainability of a good marketing campaign.
- The *Social Media Marketing* is instead a dynamic platform, more popular and utilized in business company. This account is involved in the diffusion of messages and contents of the brand through the Social Media that for nature are always in change and follow the new trend of the moment.

Some brands tend to unify and others to separate these two managements.

To unify is however a risky action in case of problems because it can infect the other customers' management section, blocking all the process.

In the Social CRM it is necessary to follow three steps:[27] Build Sense, Empower Social CRM Agent and Give power to the created Brand Community.

I. *Build Sense:* in Social Media a lot of people speak around a product or service, also without a direct contact with the brand company, generating flow of sentiments and emotions sharing them with close persons.

The Social CRM has a *Social Listening Algorithm* to monitor, filter, prioritize the conversations in which many times brand companies introduce itself inside to bring a positive and encouraging sentiments.

The main creation of this algorithm is to identify and then to propel to mitigate every kind of contrast and pre-crisis.

II. *Empower Social CRM Agent:* in Social Media nothing is automated just because is a tool that wants an instant and reasonable action that only a human person is able to do well.

The Social CRM Agent is a figure who embodies the empathy of the company's brand and who is an expert in all regards company brand.

[27] P. Koltler, H. Kartajaya, I. Setiawan, *Marketing 4.0: Moving from Traditional to Digital*, Wiley, New Jersey, 2017

The Social CRM Agent could be part of two groups:[28] the monitoring and capturing agent and the analytical agent.

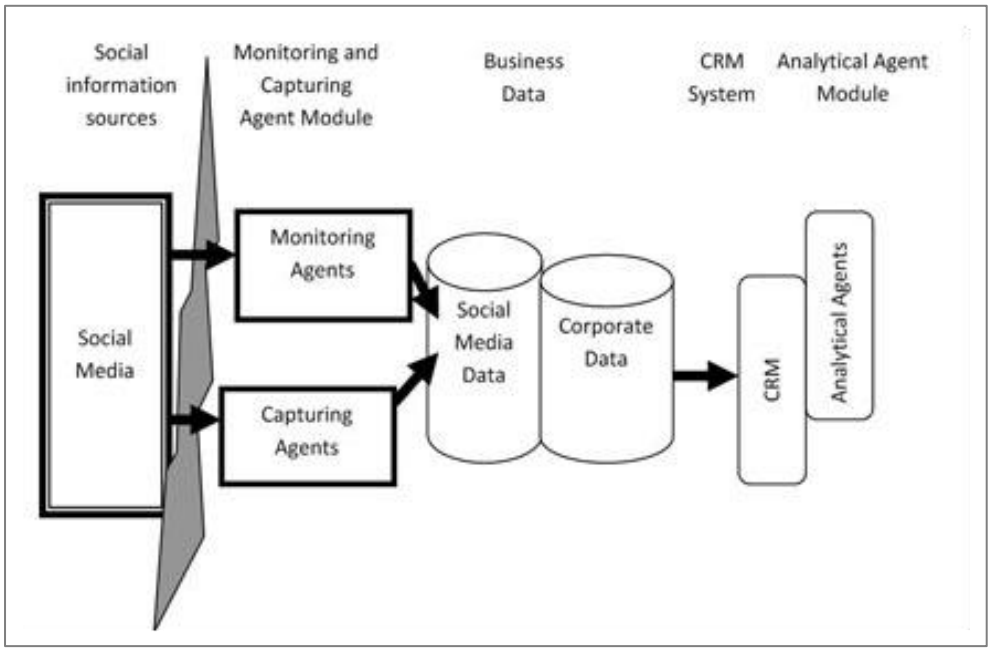


Figure 6: *Relations between agents and other elements of information infrastructure*
Source: C. Olszak and T. Bartuś, Multi-Agent Framework for Social Customer Relationship Management Systems, Issues in Informing Science and Information Technology, Vol. 10, Katowice (Poland), 2013, pages 367-387

- the *monitoring* and *capturing* agent: has a role of reliability due to his interfacing position between Social Media and the company structure itself. He is responsible of collection and supervision of all users' data and contents both of customers and competitors, and this happens under the user's identification by login, the delineation of all the activities relating to a specific content, the tracking date and time of all actions and so on. The captured and monitored big-data derived by the keywords, phrases, files, images and numbers from social networks, forum, blogs and sites.
- the *analytical* agent: has many responsibilities regarding all the analysis part that concern: the segmentation, the customers purchase behaviour, the sales, the customers loyalty, the forecasting position of the brand in the market and the marketing activities and offers.

The agents however do not work alone but are extremely connected with a very dense,

[28] C. Olszak and T. Bartuś, *Multi-Agent Framework for Social Customer Relationship Management Systems*, Issues in Informing Science and Information Technology, Vol. 10, Katowice (Poland), 2013, pages 367-387

flexible and qualified system.

III. *Give power to the created Brand Community:* brand companies are aware that is not possible responding to all requests and comments in Social Media in the long-run, and so, they allow virtual Communities to support indirectly all the Social CRM system. Indeed, many times many users in these created communities autonomously management all the observed problems of the fellow members, becoming a free support system for the company itself.

1.6.2. Cloud-Base CRM

Cloud-based CRM is the new fast and flexible system that is very different compared to the traditional one, because it is giving a significant revolution in the way of working.
Indeed, making a speed comparison:

The *Traditional CRM system* can offer two types of solutions:

- "*On-premise CRM"*: with this type of solution is possible to specialize the system to reach certain needs; the CRM software is installed on a physical server; the hardware for the execution can be very expensive and it is a system that requires very specialized technicians for it: the installation, configuration, testing, protection and updating.
- *"Hosted CRM"*: with this type of solution there is not a software to download but there is a web-based application with a monthly payment for the service.

The *Cloud-based system* offers the software access via Internet through a secure online environment, it is not install and it can be executed by every kind of device, from computer to mobile and others and the updates are all automatics.
There are some *benefits* in the use of Cloud-based system such as:

- *Reduction of costs*: no cost for system installation therefore no initial huge investment to pay, no cost for maintenance and the payment is for the real required use. It is a *cost-effective* way for business to gather information about customers.
- *Work from everywhere*: every user has the same information and thanks to the online environment is possible work anywhere with every mobile device in presence of Internet Network.
- *Fast development*: no requirements for installation and fast updates.
- *Increment of personnel collaboration in the customer management:* two or more employees can work together in the same document at the same time.

"The Cloud computing market is growing at a compound annual growth rate of 22.8% from 2014 to 2018 and will reach $127.5 by 2018."[29]

The Cloud-based system use can have some *disadvantages*, such as:

- *The Internet dependence:* people are completely dependent, for working reason, to remain connected to Internet, eventual disconnection can cause the blackout of many activities.
- *It is not possible have the full control of data*: a provider of Cloud-based system (Google, Oracle, Microsoft, AWS, Alibaba) is in charge of the storage of corporate information.
- *Potential Informatics Security and Privacy Violation:* there is a high risk of information manipulation for market researches and industrial spying. The risk increases in case of wireless networks that are more exposed to hacking.
- *Risk of data loss:* the causes could be the hardware break or problematics relative to software extraction.
- *Standard infrastructure*: it is not possible requested customized options.

1.7. The current and future CRM trends in the SMEs

The CRM system is a strategic change in the business structure due to the different prospective to see the external dynamics. The CRM system works well when:

- there is an optimal communication between the director and the all management team,
- the information is accessible and easy for all
- there is analysis of customers, the objectives understanding of objectives, the planning sales and the customers loyalty.

Currently, the market dynamics are imposing a new approach for the Small Medium Enterprises (SMEs) progressively moving from management modality guided by the offered product with a passive customer, to management modality guided by partner-customer.

The SMEs should invest in technologic processes, which they required a high company adaptation speed. It is a different kind of investment respect the past: the focus was the production plants implementation.

[29] Forbes quote: <https://www.forbes.com/sites/louiscolumbus/2015/06/20/by-2018-62-of-crm-will-be-cloud-based-and-the-cloud-computing-market-will-reach-127-5b/#3aaa2a9a2091>

There are different CRM approaches and implementations between the big/medium companies and the small ones:

- in the *big/medium companies* the CRM implementation is very complex, due to the size of the company itself, and very expensive because there is an involvement of the whole organization. The *cloud-based* CRM system is the appropriate solution to manage in the most efficient and flexible way all this complexity.
- in the *small companies* the CRM implementation is more limited, and the processes are less invasive for the organization but always efficient because they need to be fast and effective at the same time to remain competitive in the market.

The real success of a company, beyond the dimension, in a competitive market is given by streamlined procedures, time reductions, no errors and of course good investments in technology like Customers Relationship Management system.

Indeed, the CRM technology permits to file all the information without errors, management all in autonomy, permitting to improve the relationship with the customers and to increase the company profits in an evident way. The results in SMEs, deriving from the CRM use and all the relative automations, are in the short and medium term.

Instead for what concerns the **future CRM trends**[30], beyond the *cloud-based system* and *social CRM* that we have already talked about, it's possible to find:

- The *Electronic Customers Relationship Management (ECRM)* exploits the huge power of Internet, developing all CRM functions with the use of *Digital Communication* tools such as: E-mail and instant Messaging.
- Personalized automation platforms through *Artificial Intelligence (AI)* that sustain the reduction of labour cost and increase of the answer speed with the automation systems. The new trends in the AI technology that have already influenced the new CRM developments are the use of Chat-bots and Block-chain that determine a transparent relationship eliminating many built barriers.
- The *Chat-bots*, real-time chats that help simplify the customer relationships, permitting to reach a huge number of people in the more customizable way possible
- The *Block-chains* that increase the CRM performance, decrease the data redundancy, permit to recognize the real and pure information about habits, digital behaviours and purchases of customers.
- Integrating data from *multiple channels* and handling *Big Data* characterized by high

[30] Tutorial Point : *CRM quick guide*,
<https://www.tutorialspoint.com/customer_relationship_management/crm_quick_guide.htm>

volume, velocity and variety of data. All this can improve the predictions and decisions.

- The *mobile CRM* is expected to be powerful due to an increment of mobile CRM applications.
- Using *CRM data effectively* in simpler and easier way, without spending more time in entering the same data in the systems.
- CRM Software systems with *Wearables*, that are computing devices worn by many customers to have information in real time.
- Creation of *best customers experiences* in the mind of customer making feel good and putting the company in the top priority list.
- CRM to *XRM* that means *Extreme Relationship Management* in which X replaced any value a business can manage within itself and presents different and larger scope than CRM.

CHAPTER 2

THE ACTUAL DEVELOPMENT CONTEXT: MARKETING 4.0

2.1. The Social Media journey in the course of time

The Social Networks, for some years now, are the most visited sites from the majority of the world population. Every day, every second, in every place a lot of people with their own devices connect to the internet and access to one of many Social Media Platforms.

It's very complex to define a precise and well-developed definition of Social Media and this is due to the presence of distinctive typologies, characterized by a multiplicity of functionalities that are changing in the course of time. Indeed, the Social Media story is made by a very curious sequence of events that was hard to imagine some decades ago. Anyway, we can define the Social Media as net technologies which the individuals use to share textual contents, images, videos and audios, with *many-to-many* relationship orientations. This kind of social relationship, however, is combined by a group of individuals connected to each other by different social bonds of a weak type.

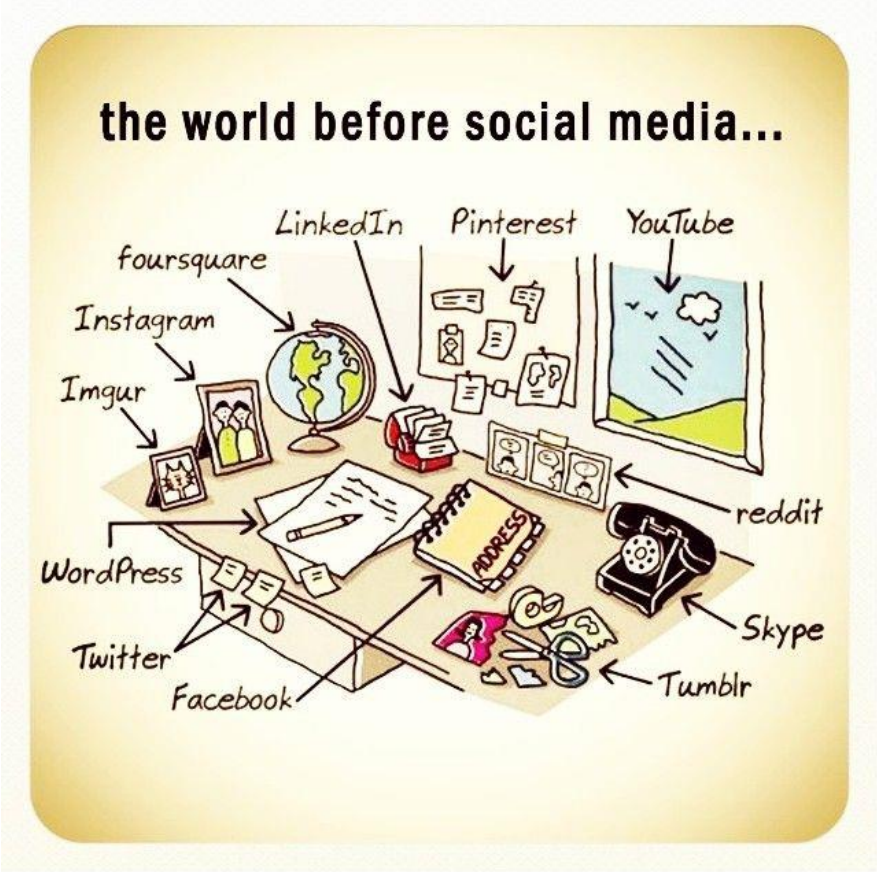


Figure 7: *The world before social media*

Sorce: https://www.methodshop.com/2014/05/world-before-social.shtml

The curious fact is that many simple and common human habits are changed with the continuous development of social media platforms. Indeed, any social media has adopted a specific function, linked with daily actions. As it's possible to see in the picture above, for example:

- *LinkedIn* has taken the place of business cards from which it is possible to contact business people and create new work relationships.
- *Facebook* has taken the place of the address book from which it is possible to remain in contact with old friendships or acquaintances.
- *Instagram* has taken the place of photos album from which it is possible to communicate instantly in a graphic way.
- *YouTube* has taken the place of camera that films video and permits also to watch the streaming TV.
- *Twitter* has taken the place of the post-it, fast and immediate communication tool.

Let's go to recall the entire history of social media, from the beginning to the current years, underling the main characteristics of the most important ones.

All start[31] in 1971 when the engineer Ray Tomlinson[32] invented the *E-mail*. He initially was able to send a message between two nearby machines with the only connection available for the time and then he tried also with some informatics programs adaptation. This event signed the beginning toward the social media phenomenon that embodies the conversation of what happen online.

Then there was the birth of the first sites *BBS (Black Board System)* in which it was possible for users to enter and interact with their own login.

Some years after, in 1979 two American scientists of the Duke University, Tom Truscott and Jim Ellis, developed *Usenet*, the first global net that was able to connect a lot of servers around

[31] Sajithra K, R. Patil: *Social Media - History and Components*, Journal of Business and Management, online publication, Vol.7, 2013, pages 69-74

[32] Ray Tomlinson was hired by United States Defence Department as engineer to build the first Internet in the 1968

the world giving the possibility to transfer articles, information, messages. Usenet didn't have a centralized server, or a dedicated administrator and its scope was that to replace the existing BBS already obsolete.

About ten years after, in 1988, the Finnish IT specialist Jarkko Oikarinen developed the *IRC (Internet Relay Chat)*, a service that offered the possibility to share file, link and to remotely communicate between people via private messages. The IRC is considered the precursor of the instant messaging.

At the beginning of the 90s after the success of IRC, started the launches of the first discussion groups, websites and chat group even if the Internet provider was not accessible to the majority of public but it was a rare commodity. Only in the 1994 the ISPs (Internet Service Providers) began to start operation in the USA, giving then to millions of people the possibility to use it.

In 1995 Randy Conrads created *Classmates.com*[33] a first important software project of social net support that many specialists consider it as the first Social Network. The principal aim of *Classmates.com* was to help people find all the old schoolmates: from the kindergarten to the University. At the beginning, the site was free only for basis functionalities while the interesting part related to the real research and interaction with the old friends was upon monthly payment. Nowadays *Classmates.com* is already existing thanks to a great influence and despite a lot of difficulties due to competitors' platforms.

In 1996 thanks the contribution of Mirabilis, an Israel company, was born *ICQ*, the first program of instant messaging that gave the basis for the abbreviations and emoticons. This vertical[34] network site was not able to work as a modern one, yet.

[33] F. Tissoni: *Social Network - Comunicazione e Marketing*, Prima Edizione, Milano, Apogeo Education, 2014

[34] *Vertical Application:* it refers to software that can answers to specific needs in a market strictly defined about a particular sector.

In 1997, thanks the ongoing development of the Web, the lawyer Andrew Weinreich launched *SixDegrees*, the first to be recognised unanimously as part of the modern Social Network sites. The name "SixDegrees" derived from the idea of the entrepreneur about the theory of "the six degrees of separation"[35] according to which every individual in the planet is linked to anybody else through at maximum a sequence of six persons. This platform allowed users to create an own profile with which they can get in contact with other people: friends, relatives, unknown people. The site reached a million of users and then it was sold in 2000 but, only a year after it was closed due to a bad management.

From 1997 to the 2000s came in succession many sites and potential social networks due also to the fact that the Internet began its huge diffusion, so allowing millions of people the access to the virtual reality. The most known old social networks that nowadays are still existing and are surviving to the innovation changes are *AsianAvenue*, *Migente* and *Blackplanet*, all dedicated to particular communities characterized by ethnic and religious point of view.

In 1999 the American programmer Brad Fitzpatrick launched *LiveJournal* with the main scope to keep the high school friends updated on own activities. Some years after the software was implemented for a blogging activity and after that LiveJournal was sold to a Russian media company. Actually, this social holds few millions of diaries worldwide and many arguments are treated inside but there is a great component of policy with particular reference to the Russian reality.

In 2002 the Canadian programmer Jonathan Abrams founded *Friendster* one of the first social networks that was able to reach and exceed three millions of users in the first two months of life and to enjoy an international popularity from the beginning. The base idea was to be easy

[35] The theory of "*the six degrees of separation*" was formulated in 1929 by the writer Frigyes Karinthy and then in 1967 the theory was applied with a successful social experiment by the American psychologist Stanley Milgram.

in order to create a safety and valid social platform: considering the dating sites in which people meet other unknown persons, Abrams believed that maybe trying to get together "friends of friends" with similar affinities would have been easier. A particular characteristic of Friendster was the excellent technologies in contradiction with the important gap in the technician structure of the site so determining many disservices. After some years the platform was sold to a big Internet Asian company reaching a huge Asian audience. In 2015 the platform closed.

In 2003 was launched *LinkedIn*[36], the first professional social network founded by Reid Hoffmann with a match between free part and fee-paying part for the advanced options. Nowadays it is still growing, and it is one of the more visited sites and more powerful social networks at the moment. LinkedIn presents a more sober and serious approach reserved to business people who want to connect with other professionals, in order to find jobs and socialize. Moreover, LinkedIn presents a huge database very detailed from professional side to scholastic one of a person, indeed all this led to a new evolution in the job market and in all the recruitment processes. The LinkedIn maxim is *"Relationships matter"*.

In the same year was born *My Space* was born thanks to the brilliant Tom Anderson and Chris DeWolfe. My Space was founded as a popular place in which one can create an own profile and make friends. An important function of this social network was the possibility to considerer it as a sort of showcase for musical groups, where they promote their own music and where they can be heard by record producers and other artists. Over the years, the numbers of users declined quickly and now the platform is more of a social network targeted to bands and musicians. The same artist Mika became famous in the international community of My Space before the diffusion in the music market with his records.

In 2004, one of the most famous and successful social network to date: *Facebook.* The platform was created in the rooms of the Harvard University by the brilliant Mark Zuckerberg and his little team of colleagues, originally properly for an internal academic function. The same name of "Facebook" take inspiration by the academic students' album.

Soon after, Facebook, due to its incredible application, was diffused to other American

[36] Digital Trends: <https://www.digitaltrends.com/features/the-history-of-social-networking/>

universities and schools and after that started its success ascent worldwide. This social network has permanently changed every aspect linked to the socialization and interaction between people both in the private sphere and in the business one. Now the social network is translating (about 100 languages) and it is classified as the first social service for number of active users. The user's registration is free, and the user's profile can be completed with all personal data, images. The platform is designed for people but also for companies that, thanks to their publicity payments, the site can gain income to cover the big fixed costs of management.
Now it's essential for a competitive company to take part in the Facebook platform because it permits a higher visibility in the online world and permits to communication with the referred audience. All this is very important in order to have a clearer vision and transparent feedback of own services or products in the market.

In the same year of the birth of Facebook, *YouTube* was born, a web platform created by Chad Hurley together with other two friends, with the scope of video sharing and viewing.
The innovative platform leaves people to vote and comment on videos, to see video clips, trailers, news and permits the incorporation of personal videos inside other web sites. From the beginning YouTube is growing with a constant rhythm and in 2006 the company was acquired by Google. Nowadays, according to Alexa[37], YouTube is in the second position of the most visited sites in the world.

In 2006 *Twitter* was created by the American company - Obvious Corporation, providing users a personal page upgradable with a short text message of maximum 140 characters and only the last year, in 2017, the length of text message was increased about 280 characters. The Twitter name derived from the English verb "to tweet" and it would like to recall to a short expression. Indeed, this social media offers a rapid and efficient communication in real time, very easy for anyone, designed for communication of short news, both personal and more interesting and public ones. From a technical point of view[38] Twitter is a tool that puts together the social network characteristics and the micro-blogging platform functionalities, becoming one of the main instruments for the unconventional speeches. There are some powerful writings such as the *hashtag "#"* rather than the "@" that permit to the public to research a determined argument

[37] Alexa is an American company, subsidiary of *Amazon.com*, that was born in 1996 with the main scope to analyse the web traffic, classifying the sites in rank relying on the visits of users. Alexa is also a search engine with a service of web directory.
[38] F. Tissoni: *Social Network - Comunicazione e Marketing*, Prima Edizione, Milano, Apogeo Education, 2014

and then entering in the conversation flow. The success of this social media is also linked to the fact that many stars of cinema and sport started to use Twitter, attracting millions of people in the course of last years.

In 2010 the two American entrepreneurs Kevin Systrom and Mike Krieger created *Instagram*, a web and mobile application in which it is possible to upload images and videos with a series of filters, featuring the same app, with the ultimate purpose to share all with the own circle of followers, people interested in the profile's daily activities. The initial idea wanted to remember the *Polaroid* format but in a modern version, so much so that the Instagram Logo recalls the real shape of a polaroid camera. Instagram is a social media mainly utilized by young people and woman, properly for the tendency towards the aesthetics and the current tendencies. The last version available is Instagram 9.0 that permits a major involvement of users with the videos with a lifetime of one day. This social media[39] is directed to people that communicate through photography best and to this ensure a good space to make business.

Google, wanting to compete with Facebook, in 2011 created *Google+* a free social net.
At the beginning high expectations were created thanks to a great and well-developed communication. The idea was to open the software to a little circle of people, a privileged few, with a special and customized invitation, for a time of three months. After that the platform was opened to the public but some considered Google + more similar to Facebook.
At the first sight Google+ seems to be the less attractive social network but presents a lot of potential in the marketing and communication area. Companies or brands have a good reason to stay in this platform because it offers a more quicker and more evident advantages in terms of connection with the search engine, with the Adwords system and with the insertions.

FOURSQUARE

In 2013 *Foursquare* is a social net based on the geolocation created by the two Americans entrepreneurs Dennis Crowley and Naveen Selvadurai. In particular Foursquare[40] is a mobile and web application that allows the registered users to share their exact position (called "*Check-*

[39] History Cooperative: <http://historycooperative.org/the-history-of-social-media/>

[40] F. Tissoni: *Social Network - Comunicazione e Marketing*, Prima Edizione, Milano, Apogeo Education, 2014

in" that occurs in a "*Venue*" that is the specific place) with all own contacts also via Facebook and Twitter profiles. The attractive prospective of this social network is linked to the ludic aspect in which a weekly classification determines a set of points. The small coloured icons called the "*Badge*" represent the interests and activities of the users.

Besides the development of every kind of social media, in 2012 it was coined the term *"Dark Social"* by the American journalist Alexis Madrigal, to refer to the social traffic that is missing of specific sources or however invisible to the majority of the analysis systems, able to intercept the visits on the sites. The dark social indicates the place on the net in which people privately share materials through the chat use, that can be via emails or applications of Instant messaging. The massive use of the Messaging Apps is related to the fact that they are free and simple to use; the data consumption is very reduced; the messages are private, a necessary condition for the increment of use due to the private nature of materials being shared; the advertising is absent; it's possible to share everything, from videos, to images, to links and audios, offering a communication always confidential and very fast. Every content (links, banners, tags that are linked with other external pages) is send by a private message without being visible to others if not only to the specific addressee person, and usually the sharing is made by the copy-paste procedure. The data relative to the dark social cannot be well isolated, interpreted and analysed, and this could be very useful for marketers to better understand the authentic and truthful people's interests, reflection of needs and then could built a true target of audience. The next objective will be able to interpret the majority of the dark social volume of data, without disturbing the private sphere of people's lives, keeping intact the delicate issue of the users' privacy who decided to adopt it.
However, there are already some platforms and specific tools that have the adequate capability to monitor, to identify and analyse the origin of hidden data share.

Between the most famous Instant Messaging apps there are: *WhatsApp, Telegram, WeChat* and *Facebook Messenger*. These dark socials present quite similar characteristics, permitting an easy information exchange between two persons or more thanks to the possibility to create restricted interest groups. Given the easiness of some innovative platforms to intercept the contents in the instant messages, an important step forward has been done in this direction, and an evident recent example is WhatsApp, the more used chat in world. The news is the

introduction of *encrypted messaging*[41] called "*end-to-end cryptography"* in order to protect the messages contents (images, videos, documents, calls) send via chat by wrong hands. Anything is registered or listened and this permits to have the certainty that the communication, via messages or calls, remains reserved only between the interested persons. The encryption is equivalent to safety and in absolute it is an undisputed advantage for the users.

From all the social media and dark social cited, it's intuitive that a myriad of these ones continues to be born incessantly, while the existing ones present themselves as more and more innovative and with more effective functions. An evident fact are the different typologies, reference's users and intended use of all of them. The social media in the next years could open new scenarios, considered impossible until now.

2.2. The actual development context: Marketing 4.0

The social media diffusion was possible thanks to two specific phenomena that concern:

the *technological* sphere, as the introduction of broadband connection between the users, and the *socio-cultural* sphere, as the increment and improvement of IT knowledge among population.

The resulting element of these two events is the evolution of the Web, from "Web 1.0" to "Web 4.0", which is the current one.

Starting from the beginning of the Web evolution (that is also called *"Web 0.0"),* in 1989 the British IT engineer Tim Berners-Lee created the *"World Wide Web"* also called "W.W.W.", a system that allowed users the collective consultation via Web about pages reachable with hyperlink.[42] In 1991, Tim Berners-Lee published the first website in the world at CERN[43] after that he developed the first browser named "*Nexus"*, able to read *htlm* code and *http* protocols. From this moment was born the progress of the Web that until now has reached the Web 4.0 level.

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[41] Sicurezza WhatsApp: <https://www.whatsapp.com/security/?l=it>

[42] *Hyperlink:* in computing is a link that is able to send an information unit (images, documents etc.) on digital support, to another unit. Usually a hyperlink to be notable by the user is distinct for some graphic peculiarity such as the underlining. The click on this linked to a visualization of the connected content.

[43] CERN: the "European Organization for Nuclear Research" is the biggest centre of Research instituted in 1954. The famous international centre is near Ginevra with inside around 6500 scientists arrived from all over the world.

The period from 1990 to 2000 is considered as the time of the Web 1.0: in which the main aim was to inform people. Therefore, Tim himself called the Web 1.0 as *"the only read web"*. It's possible categorized the Web 1.0 as a *Company-centric* oriented with a *one-way communication*. In those years the computers were a rare instrument yet and, as consequence, the Web was a privilege for few. It was the Internet of *contents* characterized by many static websites, realized in *htlm* with very limited updates. In that period only, the specialized technicians were able to install new programs or simply made IT revisions. The users could not interact yet but could only consult the online pages. It was the period of Google and Yahoo develop.

The period from 2000 to 2006 is considered as the time of the Web 2.0. Tim O'Reilly called it *"the read-write web":* the user approach changed. It was possible a free use of the Web and a production of information in a virtual space. It's possible categorized the Web 2.0 as a *Community-centric* orientation with a *multi-way communication.*

In particular, these years are characterized by the dynamic programming languages, in which the developers allowed common people to interact with the contents on websites.

It was the first time that users had an active participation in term of usability, building, sharing, classification, distribution of all the contents. It was the period of births of Blogs, Modern Social Networks and Forums, such as Wikipedia, MySpace, Facebook and others.

The period from 2006 to 2010 is as the time of considered the Web 3.0, called *"the read-write-execute web".* These years are characterized by data and semantics, the study of linguistic meaning, in which was present a communication approach based on "m*achine-to-machine*". In particular is important underline some concepts that were developed in the period, such as:

- the "*Data Web*": the consideration of web as a huge database in which the data are available for all.
- the *"Semantic Web"* in which the contents are linked to specific key words that permit an analysed research of information.
- the *"Adaptable Web"* is the so called *"Responsive Web Design"* that is the graphic adaptation of the Web contents on different devices.

- the "*Potential Web"* is the discovery of the period. It's perceivable as the presence of digital communication devices, as social media, are even now changing the real perception and interaction with the reality. A lot of information are exchanged.
- the *"Three-dimensional Web"* or *"Web 3D"* is a concept that indicates the real possibility to replay the reality in digital format with the 3D interaction in a *htlm* page.
- "*Artificial Intelligences*" (AI) that are software able to interact with users and some examples can be:
  - the *algorithms of Google* that analyse the web net to better understand how can be a right position of the contents according to the relative quality. It is feasible thanks to the use also of key words.
  - the *algorithms of Facebook* that regulates the anti-spam software and filters the artificial messages created specifically by software.

The period from 2010 to now (and it is believed to continue until 2020) is considered as the time of Web 4.0, called *"the read-write-execute-concurrency web"*[44]. The Web 4.0 is referred to an open, smart and hyper-connected web, characterized by the concept of *symbiotic* interaction between the human and machine, whose communication approach is the "*machine-to-human".*

The web 4.0 evolution is connected to the concept *"The internet of Things"* (IOT).

"The Internet of Things" is a term that is referred to the extension of Internet to the "things" and so objects and places in the world. These objects acquire IT intelligence, with the collaboration of data, so resulting very smart devices, systems or machineries.

The aim of the Internet of Things is tracking in digital way the real world, with its things and places, in an alleged electronic map.

The Web 4.0, with the connection of "Internet of Things", underlines the idea of "*space*" and "*big data*" and the innovative concepts that are developing are the following:

- The *augmented reality (AR)* is in ongoing development and it increases the surrounding natural environment of the user across multiple sensory modalities, including visual, auditory and haptic. The AR is an advanced technology with a fast interface that permits to interact in real time with the web, overlaying the surround world with the digital one. The augmented reality has a lot of potentiality in gathering and sharing tacit knowledge. Interesting examples are the wearable technologies as: the eyeglasses or the

[44] Hube Pages Technology: < https://hubpages.com/technology/The-Internet-of-Things-Web-40 >

smartwatches.

- The *concept of "digital alter ego"* is referred to the interaction in real time between the real and the digital identity of a person.
- The *new interfaces* are applied to electronic and innovative devices thanks to Internet, permitting the exchange data relative to the real world.
- *More control of information* could lead to modify some aspects of reality.

The Web evolution is strictly linked to the **marketing** progress that is increasingly interactive thanks to many changes of technological and cultural nature.

The categorization of marketing, according to different historical periods, is given by four typologies: Marketing 1.0, Marketing 2.0, Marketing 3.0 and Marketing 4.0.

These last denominations are attributable to "the father of the modern marketing" Philip Kotler[45], one of the most important American marketing strategists.

According to Kotler, "M*arketing"* presents some definitions that in the course of time have been mentioned many times by a lot of other scientists[46].

The aim of marketing for a company is not only linked to incrementing the turnover, to do advertising, to build public relations, to make merchandising, to exploiting the marketing levers. But, the real aim of marketing is creating value around the company itself.[47] Marketing is bearer of needs, solutions and values.

Below are reported some Kotler quote about Marketing[48].

"Marketing is an administrative and social process through which individuals and groups obtain what they need and desire by the generation, offering and exchange of ***valuable*** *products with their equals."*

[45] Philip Kotler (Chicago, 1931) is an American marketing author, consultant and a very important International Marketing professor. He has many merits: he is defined as the "Guru of the Management" by the Financial Times; he is applauded as "the more expert in the world of marketing strategies" by the Management Central Europe and he is also considered as the social marketing pioneer by many marketing specialists.

[46] Postcron: < https://postcron.com/en/blog/philip-kotler-advice-for-online-marketing/>

[47] C. Ameri Molzer, *Corso di Marketing*, Milano, De Vecchi Editore, 2007

[48] P. Kotler and K. Keller, *Marketing Management*, Ed. 15, Boston, Pearson, 2016

"Marketing is not the art of finding clever ways to dispose of what you make.
Marketing is the art of creating genuine ***customer value****.*
It is the art of helping your customer become better off.
The marketer's watchwords are quality, service, and value."

"Marketing management is the art and science of choosing target markets
and getting, keeping and growing customers through creating, delivering,
and communicating superior ***customer value****."*

Marketing 1.0 or **Traditional Marketing** refers especially to the period of production technology development during the Industrial Revolution, from the '50s to the '60s.
Traditional marketing is characterized by a *product-centric marketing* approach in which a *vertical marketing* is expressed: the companies must sell all products to customers and the actions are very controlled, starting from the top and revealing itself in the form of public campaigns. The interaction with customers is one-to-many transaction.
The context of Marketing 1.0 is composed by mature markets that use the strategical segmentation to intercept a specific target with the use of the *Marketing Mix,* theory of Jerome McCarthy and successively reclaimed by Kotler, also called the *4Ps*: product, price, placement and promotion.
The *product* is the good or service offered in a market to satisfy determined customers' needs. According to the policy of brand management there are three kinds of products: the essential (it determines the competitive advantages: the function, the quality, the competitive plus), the tangible (it is referred to the expected satisfaction of customers: packaging, design, brand name), and the extended (it indicates the combination of all the installations and services: range of products and the accessorises services).
The *price* is the economic compensation that the consumer is willing to pay to receive specific goods or services. This variable is able to generate costs and earnings: the price is easy to manoeuvre but difficult to manage. According to different pricing policies there are: skimming pricing, penetration pricing and segment pricing.
The *placement* is the place where the product is distributed and where there is a close connection between the merchandising activities and the customers.
The *promotion* is the collection of activities aiming to promote, advertise and make a specific product or service known to the referred market. The aim of promotion is to reach the customers' loyalty, the increment of sales, the push to greater use.

Therefore, the marketing mix is an important base theory which puts together all the relevant elements of an analysed product or service, inserting them in a specific and coherent market context, with prefixed business objectives[49].

"Marketing 1.0 is noted for reaching customers' minds
in which companies do a good job, offer good quality
products to people and generate earnings" (Kotler, 2012)

Marketing 2.0 refers to the period from the '70s to the '90s and the marketing *approach* is *horizontal,* oriented to know better the *customers*, not only focalized on the offered product or service. This period is called the "Information Age" due to the Internet diffusion, in which the consumers become increasingly conscious of their position and necessities, realizing a great but specific consumption. The companies began to differentiate the messages in function of a specific target, creating needs and dreams, with an interaction *one-to-one* relationship with customers. Indeed, the companies, following the change of their position toward the consumers and the products, start to listen to requests and comments modifying the offer accordingly. The emotions and experiences took the place of the simple mass sale and marketing started to take the form of *storytelling.*

"The golden rule of "customer is the king" work well for most companies.
Customers are better off because their needs and wants are well addressed.
They can choose from a wide range of functional characteristics and alternatives.
Marketers try to touch the customers' mind and heart.
(...) This is the view in marketing 2.0."[50]

Marketing 3.0 refers to the period from the '90s to the year 2010 in which the approach is focused on the *sharing of values* to touch the customers' conscience and soul. This marketing is more sensible and careful than before: the attention is not only addressed to the description of a product or service with the creation of emotions in themselves, but it is a marketing which furnishes solutions to problematics in the social and ethical fields.

[49] C. Ameri Molzer, *Corso di Marketing,* Milano, De Vecchi Editore, 2007

[50] P. Koltler, H. Kartajaya, I. Setiawan, *From Products to Customers to Human Spirit: Marketing 3.0,* Wiley, New Jersey, 2010

Philipp Kotler defined the Marketing 3.0 as the "*Humanistic Marketing*"[51] a concept based on the centrality of human beings and oriented to the social responsibility, in which the consideration and the respect of human capacities is important: the customers are human beings to serve not to condition, who have values and emotions. The customers start to buy products or services and not only because of needs but also, and sometimes in particular, because they generate a specific value, measurable and concrete. Here, the companies profit is considered a sort of "award" that the human-customer offers, demonstrating his loyalty. Therefore, according to the Phillip Kotler's thought, it's possible for companies to be both profitable and based on human values.

"Thereby, Marketing 3.0 doesn't only aim to sell products
in the best way possible but to also to make the world a better place.
Marketing 3.0 is providing: product, service and value." (Kotler, 2010)

Marketing 4.0: refers to the period from 2010 to nowadays, in which the approach is focused on the online and offline interaction between the customers and the companies, and the combination between two typologies of connection: *"machine-to-machine",* useful to improve the marketing productivity, and *"human-to-human",* useful to strengthen consumer engagement[52].

In this marketing period there is a coexistence between the *Digital Marketing* and the *Traditional Marketing*, the existence of one alone is difficult. The *Digital Economy*[53], where we find ourselves, is a dynamic world that required flexibility and adaptability due to technological trends and to the ongoing research of transparent and authentic values. The distinction between the Traditional Marketing and the Digital Marketing will be in the next paragraph. Marketing 4.0 tries to adapt itself and to accompany the customers' journey in the digital economy.

The flow of innovation, as well as the customers trust, from a vertical approach has become a *horizontal* one, more than ever: now it is not so easy to influence customers through the

[51] P. Koltler, H. Kartajaya, I. Setiawan, *From Products to Customers to Human Spirit: Marketing 3.0*, Wiley, New Jersey, 2010

[52] P. Koltler, H. Kartajaya, I. Setiawan, *Marketing 4.0: Moving from Traditional to Digital*, Wiley, New Jersey, 2017

[53] The "*Digital Economy"* is a term coined by the Canadian business strategist Don Tapscott in 1995, and then the term was revisited by other scientists, as Thomas Mesenbourg. The Digital Economy is a concept referred to an economy in which are present innovative businesses and in which the computing technologies are at the base of it.

In the Digital Economy the networking and communication is digital, and people and companies are still adapting to this approach. The advantages for the companies, in this type of economy, are multiple: an increment of customers experience, reduction of costs and generation of new revenues, satisfaction of employees and increment of customers.

marketing campaigns of companies, customers believe more in the so-called *"f-factor"*[54]: friends, families, followers. This situation derived from a substantial use of the Web together with the *social media* diffusion, which it allows people to have a greater awareness as customers, determining a *digital word of mouth* among them. The purchasing decisions of customers once were individual, while now have been revolutionized by social conformity. In this scenario companies must reckon with the sincere feedback and reviews of all customers, not passive any longer but extremely active and updated.

The period of marketing 1.0 is characterized by the use of the "Marketing Mix" tool, which is defined in the *"4Ps",* to help plan what to offer and how to offer to customers.

Philip Kotler, in the marketing 4.0, considers and studies the evolution of marketing mix tool. The model evolved from the "4Ps" to the "4Cs": co-creation, currency, communal activation and conversation. This change is strictly linked to the innovative context of the Digital Economy.

The *co-creation* is the evolution of the product. It indicates the opportunity for the customer to develop and to personalize the products or services according to his own preferences, creating more value.

The *currency* is the evolution of the price from the standard to the digital one.

In the Digital Economy the collection of big data is important and useful to perform analytics and so to offer a unique pricing to customers. The pricing strategies are not fixed anymore but are very dynamic and flexible based, on market demand fluctuation.

The *communal activation* is the evolution of the place. The distribution centre in no longer the physical store, but the channel is becoming a peer-to-peer distribution. In a typical sharing economy, very connected, the demand of customers is instantaneous, and the request can be fulfilled by the near peers. The service of Uber or Airbnb are two typical examples.

C*onversation* is the evolution of the promotion. Before the digital hyper-connected technologies, the advertising of products or services was effectuated as a one-sides affair: the business company action was limited to sending messages to its customers. Now, with all the technological developments and the great use of the social media in particular, customers are no longer passive to messages but are extremely active in the possible conversations about offers. Business companies are starting to know better than ever the customers thanks to this interaction. A characteristic example is TripAdvisor[55].

[54] P. Koltler, H. Kartajaya, I. Setiawan, *Marketing 4.0: Moving from Traditional to Digital,* Wiley, New Jersey, 2017

[55] P. Koltler, H. Kartajaya, I. Setiawan, *Marketing 4.0: Moving from Traditional to Digital,* Wiley, New Jersey, 2017

Marketing 4.0 is the also the era of the new tools of *digital analysis*, in which it is possible to define and study the customers databases, so realizing almost certain statistics about the customers' expectations which will be useful to shape a new offer.

"The companies can define and analyse their customers databases
in order to know them better. Through these, companies study
consumer behaviours and preferences
in order to give them the best service possible."

2.3. The Social Media Revolution

One of the greatest changes of the present era is referred to the already inexistent distinction in the business world between the real and the virtual sphere. Every day through the Web a lot of people connect with each other to communicate, to conclude economical transactions, to purchase, to work. The social networks are every formal or informal structures including a set of people or organizations with their relationships, from relatives to acquaintances, and they can be offline or online and also one the Web.

We can say that the new media systems are the product of ongoing combination between existent technologies and the innovative technical and institutional networks.

The *Social Media,* in all this, plays a great role in which we are connected all the time, in every place. The social media represent virtual platforms in which it is possible to create, publish and share contents generated by its users, and it's exactly this latter feature to define the novelty: the *horizontality* that is the discretion to could publish content without the need of a journalist or an editor.

By now, the virtual connection is part of daily life in an exponential way, it is a real habit for the majority of persons in this historic moment: the confirmation arrived from people around with all types of connecting devices in hand.

The Social Media diffusion is a real interesting and fascinating phenomenon to study in this last years because it is a tool that is able to collect a huge number of data, every day and in every moment, and it's able to reduce every distance, permitting:

- an *ongoing communication* without any cost, apart from the connection expense that however, is limited
- an instant access to *personal information* with a facility never seen before
- a broad space for *discussions with an extended audience*, so that someone considered

this as a step toward "the democratization of public speaking"[56]

- the possibility *to motivate, involved and persuade people* incentivizing the connection each other
- the possibility to *know a lot of people* with the same interests and goals, encouraging collective actions.

The *Social Media Revolution* takes, maybe, a more sociological aspect and underlines the big and fast change of the World determining an acceleration of every cultural process.

All this involved every single daily life possibility can express oneself freely, communicating the own authenticity with really few barriers. The real transformation is also given by the possibility to could tell your own story with all the emotions and sentiments both positive and negative ones, and own opinions to all those who surround us.

But with the ongoing diffusion of social media are also starting some problems. Some present facts are considered among the great *paradoxes* of Social Media:

- the fact that it is as much easy know online stranger people and chat with them as don't know the closest people, from neighbour to work colleague.
- the fact that as much easy communicate via Social Media o in an online blog all own problems and daily emotions as don't be agree with the privacy right.
- the fact that matters that should be very personal or secret become very shared and popular with the own circle, such as the choice of an electoral vote, or the result of a medical visit.

Then the Web with all its innovative tools becomes an infinite container of data that if properly collected and analysed, allow us to understand, explain and also forecast many social phenomena and future trends in every kind of matter.

With the Social Media the communication is able to influence choices and behaviours of all its users. A clear increasingly growing process is the tendency of people to research and trust to online news substituting the professional filters as newscasts or daily newspapers. An interesting aspect is given by the fact that social media many times are the main source of information while the traditional channels follow the social, looking for exclusive news to diffuse. In a more general way it's possible to distinguish two types of news diffusion:

- *Exogenous*: the news is produced before in the traditional mass media and only after is launched online, in which the social media act as a sort of a sound board of voices.
- *Endogenous*: news is produced on Social Media that act as new-media, moving up the traditional ones.

[56] H. Farell: *the consequences of the Internet for Politics*, Annual review for political science, online publication, 2012, pages 35-52

However, despite of the dangerous diffusion of *fake news*, a very discussed issue in these times, the social media are often at the top of the ranking for the news updates. It's possible to indicate the social media as the modern version of the so called worth-of-mouth that in technological term is "eWOM"[57] namely *electronic words-of-mouth.*

2.4. The sociological aspects behind the Social Media phenomenon

The social media development led to other evolutions both from the customers' side and business companies' ones also thanks to the fact that Social media constitutes a low-cost communication channel very precious to acquire a good size of customers profile.

There are two types of perspectives developed: the bottom-up and top-down.

In the first case the customers adopt a *bottom-up* prospective in which they used the social media tool as a sort of *"Virtual Agorà"* where a lot of people express their own opinions about external occurrence improving the Big Data. In this prospective it's created the possibility to produce:

- The "now-casting": the possibility to create forecasts on present, identifying dynamics that are realizing in real time.
- The "forecasting": is referred to the intentional creation of forecasts about future events considering the "diffused wisdom" in social media. These latter can work as a sort of *collective brain* able to aggregate individual expectations.

As consequence of these tendencies are arising many programs financed directly by governments with the main aims can gather significant data about big issues such as: economy, society, seismology, marketing, politics, psychology, epidemiology and others.

Two of the most popular programs:

- The *Open Source Indicators* program (OSI)[58]: is an American program that gathers the ongoing circulation of data in the Web and Social Media. The program aims to monitor and to analyse in real time the ideas, people actions, merchandise in order to make forecasts about social events and conditions.
- The *Recorded Future* project: is a program that is developed by CIA in collaboration with Google, aimed to analyse data in websites, blogs, networks accounts to identify

[57] A. Ceron, L. Curini, S. Iacus: *Social Media Sentiment Analysis, l'evoluzione dei fenomeni sociali attraverso la rete,* Volume 9, Milano, Springer, 2014

[58] T. Berry, K. Belvin, M. Hickman, F. Mendoza, A. Phelps and K. Reisler: *Open Source Indicators Program Handbook*, Mitre technical report, 2017, online publication, pages 1-89

the relationship between people, organizations, actions and events to then make forecasts about the human evolution in terms of society.

In the second case the business companies adopt a *top-down* prospective in which they have the possibility to influence the life choices of customers. The most common applications are:

- *Community*[59]: is a social aggregation of people, not necessary bound by place or country, that are interested in a specific argument, connected to a network. This set of actors generates a great interaction amongst them and strong bonds that determine a consolidated identification in the belonging group, driven by passion around the same interest, mutual sustain, effort and knowledge exchange.

  The community could be also the creation managed by companies around products or brands, in which information is shared about news and relevant facts. The community is a good channel to consolidate and transmit brand values and business philosophy to customers, allowing to become conscious of brand credibility.

  The important fact is linked to the opportunity for business companies to directly contact customers for immediate and timely clarification.
- *Micro-targeting*: is the use of data mining techniques for the market segmentation together with marketing strategies direct to transmit customized messages or offers to customers. Through social media it's possible to influence the theme and the mood of every conversation if the companies have a great leverage.

Another important sociological reflection is the consideration of social media as a sort of theatrical stage in which one shows every little aspect of its own intimacy and identity, that promotes an ongoing effort of users in term of redefinition of their own virtual profile. Here with time, the eventual masks or filters will tend to be evident and will begin to crumble more quickly than in the real world due to an extra-exposition. The social media become the tools thanks to which the *re-elaboration of the self* is continuous and implies a higher identity value. This digital mediation, in which it is possible to have different relational experiences, permits also a major protection in terms of embarrassment and timidity while by other side it permits an ongoing negotiation of approaches or creation of distance with other near people.

A social media particularity is given by the possibility for users to decide *what to show* and to *who to show* the personal contents and information. Many times, a lot of information and contents are not exhibited with awareness to a huge public, originating many problems also

[59] E. Davenport, H. Hall, *Organizational knowledge and communities of practice,* Annual Review of Information Science and Technology, online publication, 2005

hitting the personal sphere of the *reputation and privacy* issue. If we talk about the contents in the social media, it' evident as they are more public but also more synthetic and fragmented than ever. The communication between people is always more instantaneous, emotional and it often moves towards closed environments such as chats.

On the other hand, if used well, the social media could be a very helpful instrument that increases the reputation itself with a coherent share and valuable themes: "*likes*" and in some cases particular *algorithms* can measure it, increasing the personal reliability about that specific virtual environment. And so, the importance that everyone gives to the interaction with a determined public is fundamental for the construction of a personal virtual identity.

The *privacy issue* is very delicate and when people report in networks a lot of information, often they render public what normally is considered private, confusing the relation between two spheres.

At the moment people should be review the limits between the public and the private world because the tendency right now is determined by an ongoing process of what to hide and what to reveal about oneself. There is a remarkable tension between exhibition practise and intimacy, entailing a mixed twist between the online and offline. Therefore, it would be preferable a better *self-branding management* redefining a *digital intimacy*[60]*:* a state in which is possible to relive strong shared emotions with the ability to give a deeper meaning to relationships.

2.5. The so called "Democratisation" in the Social Media

The New technologies in communication and information, for many aspects reduce the knowledge gap that people have from the social and cultural point of view. Many scientists define the Digital Media as the *Technologies of Freedom* due to the possibility to access the global information society that is lacking spatial barriers and is able to annul the traditional constraints about own interests and objectives.

The Digital Revolution regards the banal possibility, potentially for everyone, to connect any devices to the Internet, developing the "Network Society" of those who have the material and effective availability to connection. But in practice, not all people in the world have the possibility to connect themselves due to the obsolescence, the irregular distribution, the lack of infrastructure development and construction that are not able to reach everyone in specific geographical area or urban contests, determining an important social inequality.

[60] R. Stella, C. Riva, C. M. Scarcelli, M. Drusian: *Sociologia dei New Media*, Prima Edizione, Utet, Torino, 2014

The digital gap depends by the exploitation of multiple offered opportunities by the new media for the users, that can be linked with:

- *The frequency of use*: the more the new medias are used in the course of the time, with a daily regularity use, more familiar they will be with it.
- *The modality of use*: can be classified in categories of hobby, study and work in which are visible the socio-cultural and demographic variables in the addressing the online resources used. Young people are those who have a ludic and relational use of the new social, respect the adults who prefer a network use more focused on problems resolution of daily life.
- *The performed activities* with the digital media: when the latter are many, it indicates a consequent high level of cultural capital and a higher level of possessed instruction.
- *The digital education:* is based on many types of competences that determine a well-defined education:
    - the *operational competences* are the basic and necessary knowledges that are essential to employ the more common technologic devices.
    - the *informational competences* are linked with the ability to research, to select and to processes a mass of information that requires enough complex and articulated management capacities.
    - the *strategic competences* regard the capacity to use the more suitable communication technology according to the specific goals to pursue.
    - the *critic competences* are a set of capacities necessary to select and assess the available resources.

Therefore, the extension of the networks and new forms of distribution and accessibility to the new media give the possibility to the users to construct unprecedented actions of participation, democracy, freedom and revolution, rendering available a higher quality and major quantity of personal data.

An important concept to underline is the *"democratisation"* of the new media, that is an exceptional power deriving from the evolution of network diffusion.

This democratic potential is allowing people to freely express their emotions and opinions, giving them the possibility to become producers and diffusors of content, ideas, proposals, thanks to the speed of messages and the facility of sharing, all based on a huge degree of interactivity between users.

The Web nowadays is the place in which there is an ongoing creation and cancellation of every kind of people groups with the same interests, ideas and passions; in which there are many opportunities offered by the new technologies and in which the concept of *"Digital*

Citizenship"[61] is touchable and the users themselves want a closer and incremented participation in the political dynamics of their own countries. It's always more present the awareness that the new media could lead to the resolution of many problems thanks to the use of the Internet. On the other side, some sector critics consider the web and the new media to the contrary, a tool that moves away the users' freedom, increases the power of control over the users, increases the existent disparities and create other ones, supports the violent and rancorous tones.

The possibilities to participate in the decision processes, due to the internet, the diffusion of new media, the expression of freedom, the spectacularity of the contents and themes, have given people the possibility to create also so-called *e-democracy*. The latter indicates the possibility for the citizens to directly intervene in a public debate, formulate online opinions, access information and public services and discuss and negotiate together for the stipulation or modification of some rules. The topics covered, range from the politics[62] to social movements[63]. Therefore, in the e-democracy the new media permit a wide potential for the communication that is always more horizontal, the strengthening and the broadening of the consensus, the proposal and discussion about the news, the realization of initiatives and manifestations. All this is possible because the new technologies are suitable for all and are more effective because people are extremely free to express and share their opinions in addition to a very low cost.

Another important consideration is linked to the fact that thanks to the new media everyone can easily access to huge and well diversified sources of information that are also independent and alternative from the traditional ones that are more easily controllable by state authorities or by the big communication companies.

In the e-democracy process, some typologies of *technologies* could be identified:

- *typically informative:* powered by processes and flow *top-down* (from the public administration to citizens) and *bottom-up* (from the citizens to public administration). The equal and bi-univocal relation constitute a first approach between the parties and it is easily possible through the online walls, the newsletters of institutional sites, the

[61] R. Stella, C. Riva, C. M. Scarcelli, M. Drusian: *Sociologia dei New Media*, Prima Edizione, Utet, Torino, 2014

[62] In the *politics issues* is observable as thanks to the internet diffusion with all its technological instruments, more and more people are interested and involved in all the political dynamics that before are left to the attention of the institutions or of few interested.

[63] For *social movements* we mean the collective actions in defence of specific rights such as: socials, culturals, ethnics and sexual. These social movements aim to change the society and they use: the protest as a pressure tool on the institutions, the informal nets that link a plurality of groups and people joined by the same purpose.

autonomous administration of formative instruments.

- *for the dialogue:* is the main instrument for every form of confrontation and collaboration between parties due to the intentionality and the will. From the technological point of view there are some tools that enable all this, such as: the mailing list, the online discussion forum, the e-mail and the social media.
- *for the consultation:* in which people are called to express a choice through a vote and the information and communication technologies strongly help in the formulation of this one.

2.6. The Social Media jump: from friendship networks to business networks

Social Media[64], in a technical way, are a group of web applications built on a computer. Social Media are a technological paradigm which results are determinate by a transition from a monologue to a dialogue: people are *users* but also *editors*. In these online spaces it is possible to socialize, to share information and contents, and they are a space in which sociology and technology are mixed together.

Social media are born to respond to a precise relationship goal that it must be considered both in case of simple use of the tool and also in case the channel is aimed to make business, (trend increasingly growing, that it will be explained soon).

Therefore, as it's possible to see in the table below, every social media (six are chosen in the table below) is concentrated on:

- Specific social *object* around which are generate rumours, conversations, network engagement, such as: post, images and videos.
- Specific *languages* of reference that permit the message sharing in the modality and with appropriate timing, allowing the viral diffusion. The language can be formal and informal which signs are generally: @ and #.
- Specific social *goal* is referred to the target chosen and indicated for the specific social network. The final purpose is the sharing of the object between friends' sphere, job circle and so on.

[64] Social Media is a term that presents a Latin connotation: "Medium" means instrument.

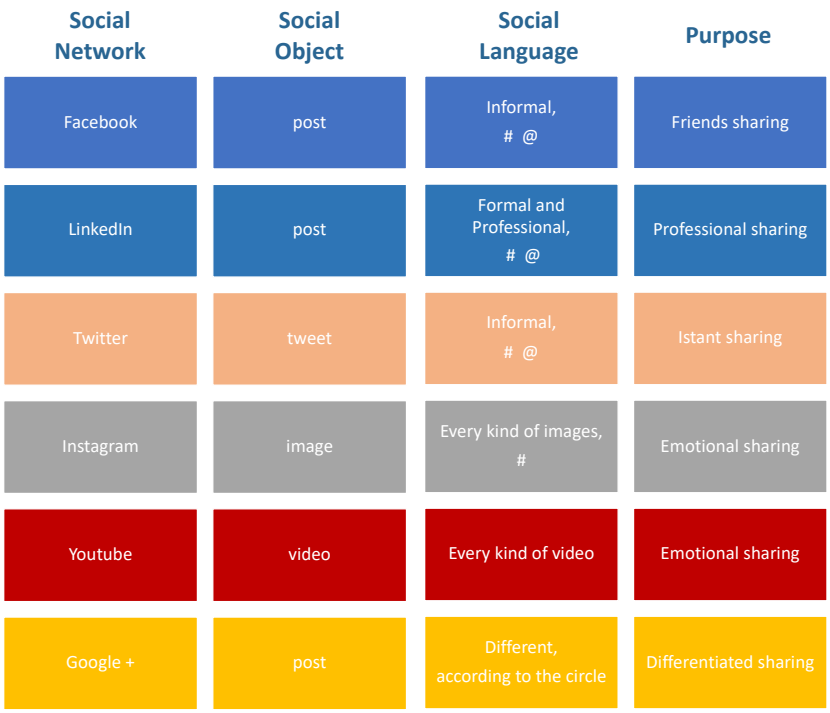

Figure 8: *Social Network, Object, Language and Purpose*
Source: Estilos materials

To complete the clarification, it's possible to differentiate the social media according to their specific addresses:

- *Content Based social network*: the focus in this type of social network is the content and its sharing. One of the famous social network here is *Twitter*.
- *Profile Based social network:* the focus in this type of social network is the profile, public or private, is the access point. One of the famous social here are *Facebook* and *LinkedIn*.
- *Mobile Based social network:* the focus in this type of social network is the exclusive mobile usability both by smartphone and tablet, moreover the use of geolocation services. An example of social network here is *Foursquare*.

There is an additional and very important classification of Media in the Social Networks. According to it, is possible to understand the nature and eventual development of internal and external conversations:

- The Media (such as web site or blog) can be managed directly by the company, generating prospects.
- The Media (such as Google Adwords) can be paid to have more visibility reaching customers in a vast way.
- The Media can be gain on communication channels thanks to the word-of-mouth, generating fans-customers.

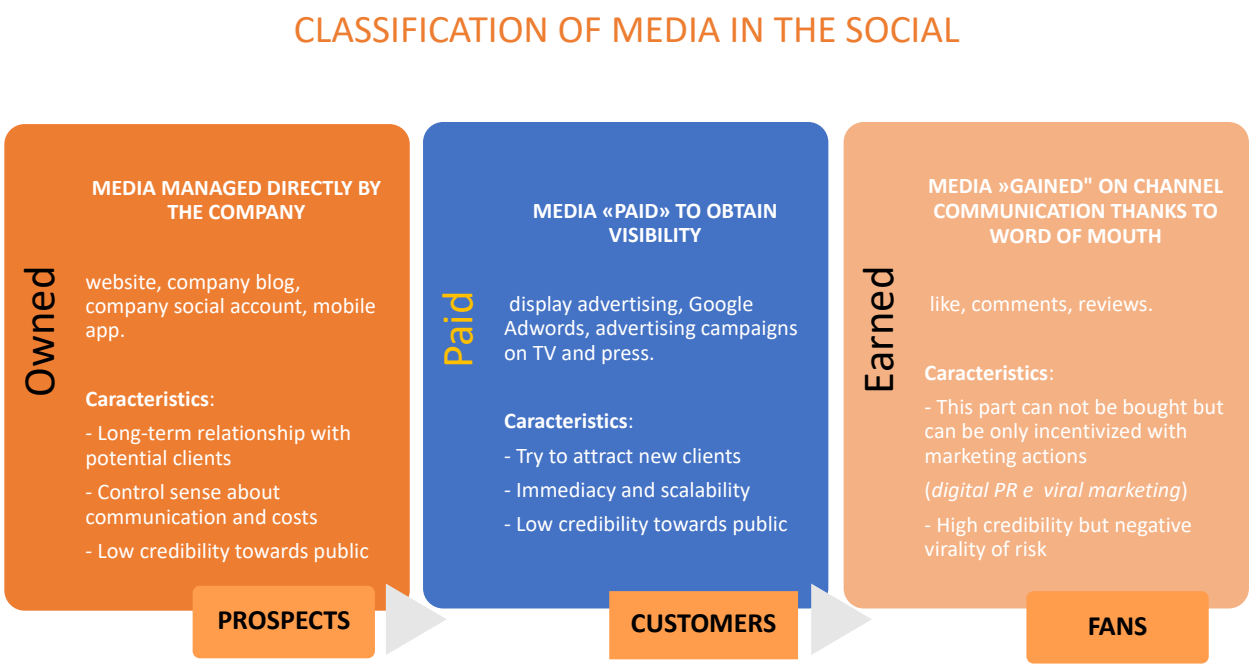

Figure 9: *Classification of Media in Social Networks*
Source: Estilos materials

Social Media today consists of thousands of social media platforms and they have a huge part of the life of millions of people and companies worldwide. The introduction of some paid instruments has ratified the official social media passage from pure *entertainment* tool to a *promotional* one for the companies, that at the moment they have started to choose the more suitable channels to own business goals.

Make business using social media to promote products or services today is a normality, while some years ago seemed a very inconceivable and inappropriate concept.

The technical term ***Social Selling*** is precisely referred to an innovative trade process that considered the social media use and the network power to increase own contacts and find new potential customers with the ultimate aim of loyalty and to directly sell to these customers.

Thanks to the Social Selling, the company can strengthen and improve its *Brand Reputation*, thus enhancing the *positive sentiment* around the company rather than products or services of the case (this topic will be discussed in the final chapter about the Sentiment Analysis). A positive sentiment makes possible an increment of favourable recommendations aside the customers themselves, that are able to influence then their own circle regarding the purchase decisions.

The brand reputation management considers many behaviours such as:

- the necessity to be transparent and to share towards customers;
- to be unique and truthful;

- very important then is the monitoring of all the actions online and offline, in order to gather representative information and so to avoid errors in the future;
- create valuable, engaging and interesting contents to share in the communication.

The brand reputation built with the social media that are not traditional, increment of the *perceived value* of customers respecting the marketing activities with traditional media.

An additional clarification: when we talk about traditional media we refer to different characteristics in respect the social media ones. Below, a clear graph is shown for better understanding.

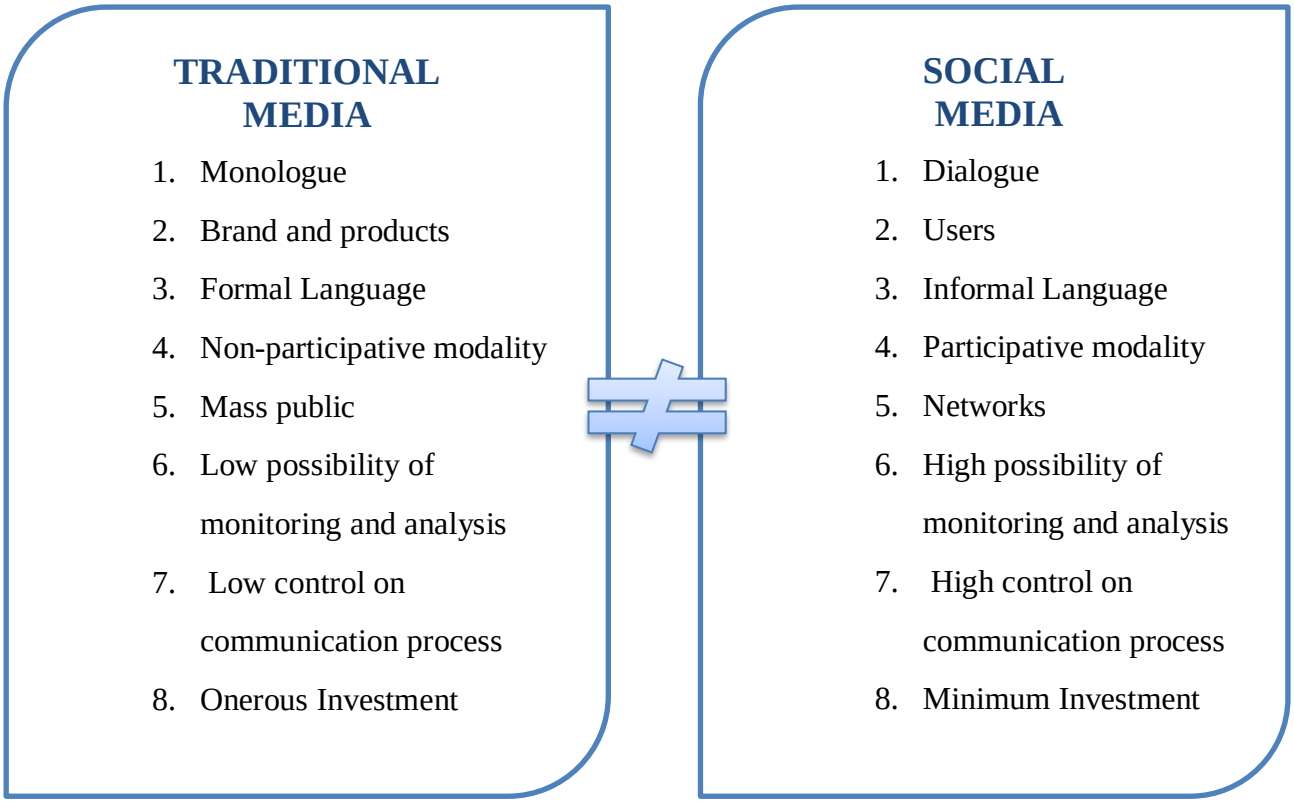

Figure 10: *Traditional Media vs Social Media*

Framework of own elaboration on consultation: Estilos materials

The social media are more effective compared to the traditional ones, because they are able to intercept the ideal buyers, giving to the company an opportunity to invest money and effort in the right promotional channels (such as Facebook, Instagram and others) with a limited waste. At the same time, thanks to the digital marketing that has a more strategic, efficient, clear and less expensive approach, it is possible to identify or create durable *communities* of loyal customers that appreciate the product or service, reinforcing the brand reputation of the company. Usually these groups are able to guarantee always a very sincere *feedback* regarding the product or service, useful both for other customers than for the same business company,

that is able to monitor this. The traditional media (radio, television, phone) communication must not disappear but must collaborate together with the social media communication in order to reach really the great communicative potentiality.

The Social Selling is used by the modern business companies that are in line with the innovative opportunities and which understood how to reach in a better way all the prefixed sale objectives. An important consideration that derived from the adoption of the social selling, in respect with the traditional method, is giving by the increment of ROI[65] (Return on Investment). Usually when there is a high ROI it means that the investment's gains compare favourably to its cost. It's important to remember that the ROI is a business metric which, to be measurable, must be always correlated to a precise objective of business. Usually there is a process, made by some steps[66], that is necessary to respect in order to reach the social media economic performance: the costs and the benefits must be weighted and also every investment must be balanced.

i. The first step is the choice of the right *strategy*, where is fundamental the right determination of the core objectives and their support activities.
ii. The second step concerns the *metrics* choices necessary to measure the economic results.
iii. The third step is linked to the *organization* in which is done a valuation about the possession of tools and competences to measure the social media performance.
iv. The fourth step concerns the *technologic* choice, right to support all the operations that can be intern or extern

The more used channels to apply the social selling in which are conveyed relevant contents are the principal ones: LinkedIn, Twitter, Facebook and Instagram.

The social selling[67] is one of the effects produced by the Digital Transformation in the sales field that has changed the action modality for the companies interested in optimized communication with the use of social media. All this has sanctioned the transition from the so called "Old sales Model" into the "New Sales Model".

[65] ROI (Return on Investment) is a financial index that expresses the ratio between the net profit and the cost of investment resulting from an investment. This metric is used to evaluate the efficiency and so the rate of return on money of the investment.

[66] Altimer Prophet is a well-known American research and consulting company. It is actives in providing innovative technologies to companies, in order to increase and improve their businesses.

Report : <http://www.web-strategist.com/blog/2010/04/22/altimeter-report-social-marketing-analytics-with-web-analytics-demystified/>

[67] LinkedIn, What is Social Selling ? :< https://www.linkedin.com/pulse/what-social-selling-eva-sachse/>

The *Old Sales Model*[68] is the classical sales approach that considers some actions of Marketing, Qualification, Canvas Model writing and Meeting necessity.

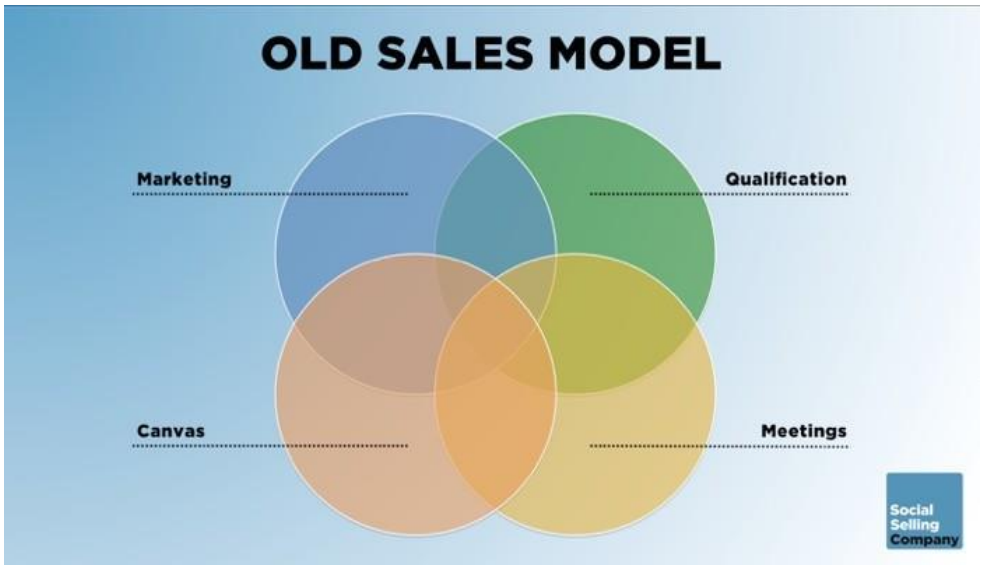

Figure 11: *Old Sales Model*
Source: https://www.linkedin.com/pulse/what-social-selling-eva-sachse

The old model is colder, aloof and already obsolete in respect to the new one. The process is full of inefficiencies mainly because it is *one-directional* from marketing to sales, the communication is in the hands of a single professional sales clerk figure. The sales representatives must qualify the potential customers according to some characteristics that qualify him based on: the ability, authority, the inclination to purchase, the economic size.

[68] SimpliLearn : < https://www.simplilearn.com/reasons-digital-selling-beats-the-old-sales-model-hands-down-article>

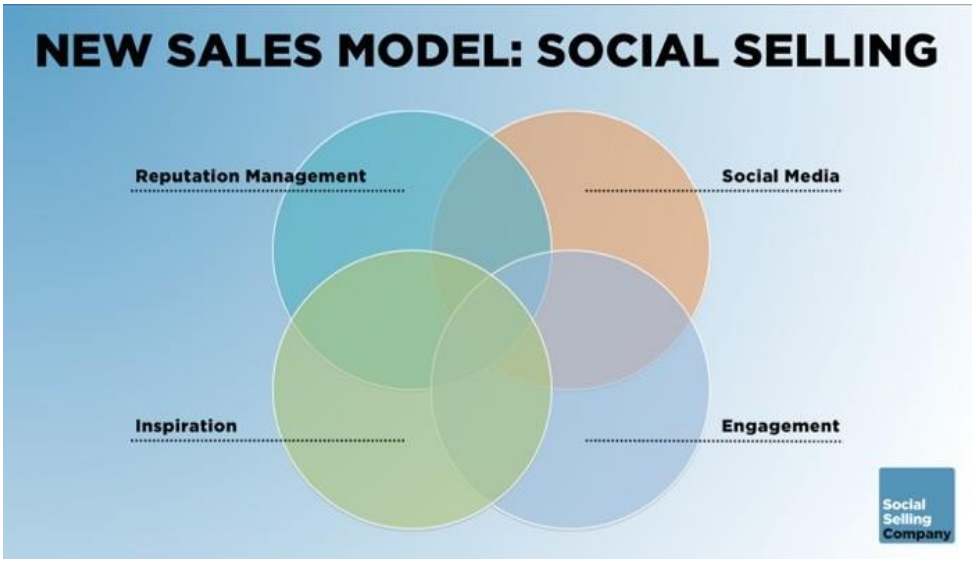

Figure 12: *New Sales Model: Social Selling*

Source: https://www.linkedin.com/pulse/what-social-selling-eva-sachse

The use of the *New Sales Model*[69] has realized a significant impact on selling roles and processes rendering them more dynamics, also thanks more collaboration of the sales team. With this model change the customers base engagement and the reputation management that is the strategy related the perception of the company, brand, product or service. Social media are the tools used by the social selling process, that help to put in contact the customers world with the business world. Thanks to this ongoing interaction the customers are inspired to make the right choice in the purchase procedure. On the social media the customers are receiving constant updates on the new functionalities, characteristics and trends of the moment regarding specific sectors, all this increase the knowledge, interest and awareness of customers. All the functionalities deriving from the new model, such as the collection of customers' feedbacks, the social and CRM metrics, make the marketing team able to have almost completely correct predictive analysis and data science techniques. The more the business companies know their current and potential customers, the more they will sell. The digital selling is nowadays very powerful because it is able to exploit all data available from the online world.

[69] SimpliLearn: < https://www.simplilearn.com/reasons-digital-selling-beats-the-old-sales-model-hands-down-article>

CHAPTER 3

THE SENTIMENT ANALYSIS

In the last years, the Web innovation is guiding many modern business companies to adopt new *leading-edge technologies*, able to intercept, to monitor, to discover, to improve, in the best way possible, all needs, trends, relationships and also thoughts of all customers. This is possible thanks to specialized platforms of *Sentiment Analysis*. But, to better understand what is Sentiment Analysis and which are all its specific usefulness, it is fundamental to retrace the path of study done, to intercept customers data and make sense of them. All started with the development of the *Semantic Web*, whose aim is to convert unstructured data into meaningful representations, and with the use of *Natural Processing Language (NLP)* technologies allowing the connection of texts to each other, semantic searching, information visualization, and modelling of user behaviour in online networks.

3.1. The Semantic Web and Natural Language Processing (NLP)

The technology is making available advanced applications that analyse information flows on the Web, to rebuild the interpretative schema and to confer a sense of the collected data.

The word "*Semantics"* derives from the root of "seed", which discipline studies the meaning of words, called *Lexical Semantics*, from the single letters to a whole sentence. Thanks to the semantics it is possible to establish a linguistic nexus of what it is written.

The term ***Semantic Web*** (or Web 3.0) was coined in 2011 by Tim Berners-Lee, as already stated in the previous chapter, to indicate the web transformation called World Wide Web.

The Semantic Web is oriented to the creation of a technological and smart Web, in which information is precisely examined and the decision-making processes are automated, on the base of defined parameters decided by users. In this new virtual place, it was beginning to publish documents associated to big data, linked to a specific semantic nature, capable of responding to automatic requests of search engines[70]. The advanced research, based on the automatic elaboration, is possible thanks to the use of keywords or hyperlinks connections in *htlm* documents.

[70] F. Tissoni: *Social Network - Comunicazione e Marketing*, Prima Edizione, Milano, Apogeo Education, 2014

This advanced method that allows to analyse and to extrapolate the semantic information from online contents automatically thanks to sophisticated algorithms, is called ***Natural Language Processing*** *(NLP).*

"NLP is not magic, but the results you can get
sometimes seem almost magical."
(Wei Li, Chief Scientist NetBase, 2015)

Upon a quick analysis is made, the Natural Language Processing (NLP) is composed of two expressions.

- The first one is the *"Natural Language"* that refers to the everyday language. The "natural language" is a synonym of "human language" and it can present complexity and ambiguousness. The interpretative difficulty is due to eventual colloquialism, idioms and sarcasm.
- The second one is *"(Computer) Processing"* that refers to the IT treatment, characterized by a formal language.

Initially, the natural language was a study strictly linked to linguistic, psychological and sociological competences and only after the 1950s the concept has been studied also in statistics and informatics. This strong attention led to the development of the "Computational Linguistics".

According to Wei Li, Chief Scientist in NetBase Solutions Inc.[71], the Natural Language Processing (NLP) is a term almost equivalent to *Computational Linguistics* (CL), but with some differences:

- The CL is an interdisciplinary matter which puts together the informatics and the linguistics and it has a theoretical and scientific focus.
- Instead, the NLP is problem-oriented, and it has a centred nature in practical focus.

It is possible to say that Computational Linguistics is the scientific base on which Natural Language Processing rests on and from which it develops.

There are other terms, which are often used in parallel to NLP:

- *The Machine Learning (ML):* is an automatic learning approach which uses specific algorithms to elaborate languages, with the aim to solve some problems of *Artificial*

[71] *NetBase Solutions Inc.* is an American platform based on the NLP technology, founded in 2004 by Jonathan Spier and Michael Osofsky, two engineers of SAP Ariba (also the latter is an American software of information technology services). NetBase defined itself as a "fast, accurate and deep social analytics platform", used by the greatest existing companies, to monitor and to act in the Web.

Intelligence (AI) nature. Machine learning requires a huge quantity of data and it is efficient in automatic classification or clustering. Today the more sophisticated methods of natural language processing are positioned exactly between NLP and ML.

- *The Hand-crafted Rules:* is the more traditional approach to NLP. The linguistics rules are generated and implemented by linguists and engineers and they are efficient in linguistic analysis and syntactic analysis. The systems rules are a good solution for the accuracy and precision.
- *The Natural Language Understanding (NLU):* is almost the same concept of the NLP. In particular, the NLU foresees a deepened parsing, based on Artificial Intelligence prospective. Indeed, the NLP foresees a superficial language processing, based on machine learning prospective.

Therefore, the NLP is composed by a range of methods and computational techniques, together with theoretical fundaments. The language analysis, used to elaborate texts, is still an open challenge in many fields due to its complexity.

For this very reason, the elaboration of the Natural Language Processing is divided in *five levels*, that interact with each other.

Figure 13 *NLP levels,* Framework of own elaboration

The *Phonologic level:* identifies and interprets the *sound* of words pronunciation. There are three rules of phonologic level:

i. the *phonetic* rules for the sound of words;
ii. the *phonemic* rules for the variation of pronunciation when words are pronounced together;
iii. the *prosodic* rules for the accent oscillation and intonation.

Indeed, the natural language has two forms: spoken and written. In the oral languages, there are two additional elaborations: *speech recognition* allows computers to understand the human language and *speech synthesis* allows computers to speak together with human beings.

The *Morphological level:* regards the fact that words are composed by *morphemes*, the smallest units of meaning, and these partitions allow to understand the significance. The NLP is able to recognise every significance from every morpheme.

The *Lexical level:* allows the NLP system to interpret the *meaning* of every single word, to whom a "tag" is assigned.

The *Syntactic level:* whose focus is on the analysis of words, with greater attention to *grammar*. The syntax leads to the meaning of many languages thanks to order and dependence. The useful technique to identify the relationships between words, based on grammar, is called "*parsing*".

The *Semantic level:* determines the total elaboration of significance in a specific context. The semantic elaboration is concentrated on interaction between the words meaning. This development can bring to *semantic disambiguation* of words with multiple meaning, thus trying to solve problems linked to both meaning and grammar ambiguity.

Therefore, every application which uses a text is a candidate for NLP application.
The most famous and used NLP applications include:

- *Information Retrieval:* is a set of techniques used for focused recovery of information in electronic format[72]. "Information" means documents, metadata, files inside databases or the world wide web on which is based the use of keywords. Therefore, Information Retrieval supplies a list of documents potentially relevant answering to users' queries. In this typology are also included stemming, part-of-speech tagging, the recognition of composed words, decomposition, and word sense disambiguation.
- *Information Extraction:* given a document, it is trying to extract specific information. These are based on occurrences of terms and phrases. The Information Extraction technique is focused on recognition, tagging and extraction of some key elements

[72] A. Ceron, L. Curini, S. Iacus: *Social Media Sentiment Analysis, l'evoluzione dei fenomeni sociali attraverso la rete,* Volume 9, Milano, Springer, 2014

(people, organizations) from wide texts collection. The final aim is to classify or to attribute these texts, not to extract opinions.

- *Question-Answering:* is a technique which supplies to users only a text of the answer or the steps necessary to obtain the answer.
- *Synthesis: "taller"* level of language elaboration, which it allows to reduce a long text to a smaller one, giving it a narrative abbreviated significant representation of the original document. Therefore, this type of language elaboration level is focused on text managed by regularity[73], and not by rules as in the "lower" level of NLP.
- *Dialogue Systems*: use levels of lexical and phonetic languages, also with the collaboration of all the four NLP applications above.

3.2. WordNet and Text Analysis

WordNet[74] is a well-known **lexical-semantic database** for the English language, elaborated by the linguist George A. Miller[75] at the American Princeton University and his team. This database is based in psycholinguistics theories of human lexical memory, making it a good and useful tool for computational linguistics and natural language processing (NLP).

The centre of the specific study on lexicon, for the Italian language, was developed in Pisa by the *Institute of Computational Linguistic of CRM*[76], but it is still not free to consult.

While the classic dictionaries are organized in alphabetical order, WordNet, which is a sort of dictionary, organizes, defines and describes vocabularies on a *conceptual basis* and on *affinity of mining*. Indeed, inside the database, nouns, verbs, adjectives and adverbs are ordered in the so called *"syntactic categories"*, and each of them is then subdivided in a set of synonyms

[73] The "*lower"* level of NLP elaboration has units of analysis governed by rules. These types of units could be: morphemes, words, aphorisms. Generally, the NLP systems tends to implement modules to realized lower level of elaboration, more accurate studied and implemented than higher level of NLP.

[74] Princeton University, WordNet: < https://wordnet.princeton.edu/>

[75] George A. Miller (1920-2012) was an American psychologist, one of the founders and maximum exponent of cognitive psychology and psycholinguistic. Very well know are many of his works about the study of word and languages, beyond the study about development of WordNet, the online word-linkage database, usable by computer programs.

[76] *Institute for Computational Linguistics (ILC) "A. Zampolli"* (http://www.ilc.cnr.it/en/content/welcome) is a centre of reference to national and international level for what regard the field of Computational Linguistics, and it is part of the National Research Council of Italy (CNR). The activities are managed inside a well-established network of collaborations, in the setting of numerous research projects on science, editorials activities and technologic formations.

called *"synset",* a lexical concept shared by all terms associated to it. In WordNet, a term can have a multiplicity of meanings and therefore be in many syntactic categories.
Beyond the "synset" (a set of synonyms described in the same definition), there are other technical terms part of *lexical fundamentals* and *relations*.

- *"Lexical matrix"* derives from the association between form and meaning:
    - *Word-form:* sequence of letters that define the word expression. When there is more than one, the Word-form is called *"Polysemous".*
    - *Word-meaning:* is the sense of expressed word. When there is more than one, the Word-meaning is called *"Synonym".*
- *"Gloss"* is a short definition linked to "synset", often combined with an example. The "glosses" are added later to increase the entirety of information.
- *"Synonymy"* is when two Word-form (synonyms) can be replaced by one another, while the meaning and value of veracity remains the same.
- *"Antinomy"* is when two Word-form if substitute one with the other one, change the meaning in opposite way.

Instead, the *semantic relations* are between Word-meaning, and they are:

- *"hyponymy/ hypernymy"* is a relation which generates a hierarchic structure similar to the specialization criterion. "Hyponymy" indicates the connection between a specific concept and a more general one[77]. "Hypernymy" indicates the connection between a general concept and a more specific one[78].
- *"meronymy/ holonymy"* is a relationship applied to syntactic category of nouns. *"Meronymy"* is when, given two concepts, the first one is a component of the second one[79]. "*Holonymy"* is when, given two concepts, the second one is a component of the first one[80].
- *"Implication"* is a relation applied to syntactic category of verbs. Giving two verbs, the first one entails the second one, and the first verb does not occur if the second one does not happen[81].

[77] *"Hyponymy"* example: flower => field

[78] "*Hypernymy"* example: colour => red

[79] *"Meronymy"* example: handlebars => bike

[80] "*Holonymy"* example: smartphone => display

[81] *"Implication"* example: get wet => raining

In the last years, there has been growing attention of companies towards extraction of significant data from a large quantity of textual materials and, thanks to specific software frameworks, companies are now able to classify and to interpret value data, available in online environment.

The automatic analysis of texts has crossed a strong evolution from the 60s - 70s to now, due to the strict connection together with informatics evolution.

In the **40s**[82] with the main precursors of the modern *quantitative analysis* in linguistic field, G.K. Zipf and G.U. Yule.

Around the **50s**, C. Muller and P. Lafon started to measure and to develop indexes of *linguistic statistics*, with strong attention to lexemes and morphemes. A **Lexeme** is the minimum unit of lexical meaning of a language and each lexeme of a language corresponds to its record in a dictionary. A **Morpheme** is the smallest element of a word having meaning, which is not possible to subdivide further.

Around the **70s**, they also developed *lexical statistics*, where the language analysis was based on the study of lemmas. A **Lemma,** or lexical voice, is composed by one or more graphic words and it usually is the word quote in a dictionary, with all its declinations.

In the same years in Italy, the linguists A. Zampolli and T. De Mauro put the basis for the *quantitative linguistics*, so developing the first linguistics- statistics resources.

From the **80's** onwards, the study on artificial data and data expressed in natural language began with surveys and analysis of fragments of texts. The reduced part of text, generally, is inserted in a collection of documents constituted by "corpus of textual data". The **corpus** is the collection of selected and organized texts which can be whole or fragmented. In linguistics, the corpus aim is to develop a model of human language functioning which can be translated in computer programs.

At the end of 80s, L. Lebart and A. Salem defined the *textual statistics* based no longer on lemmas, but on *graphical forms analysis*, together with the development of *software* for the analysis of textual data. Only in the second half of the **90s**, a new statistics address, based on textual data analysis and called *Text Mining* was developed.

The **Text Analysis**[83] (also called *Text Mining* or *Text Data Mining*) is the automatic extraction of information from texts, through computer support, indispensable in case of huge information quantity, with the aim to intercept relevant data for the research.

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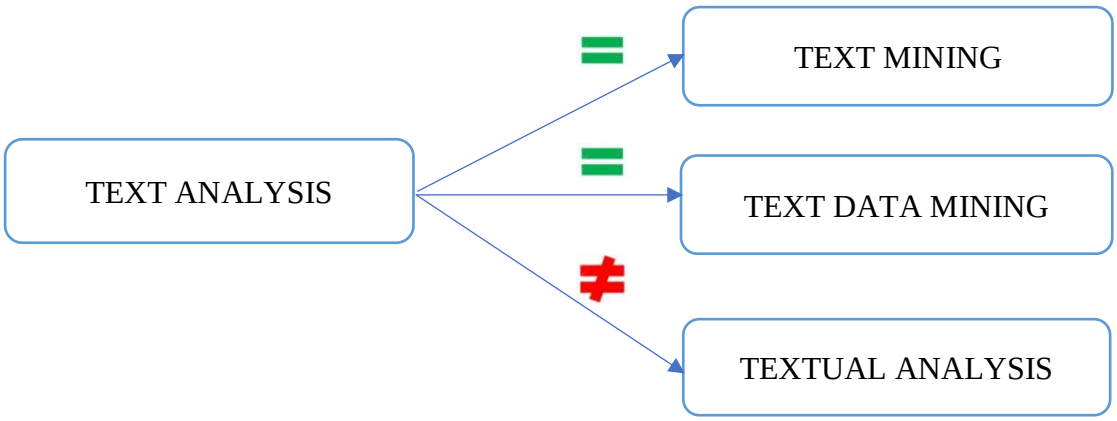
[82] S. Bolasco, *Statistica testuale e text mining: alcuni paradigmi applicativi*, Quaderni di Statistica, Vol. 7, Napoli, 2005, pag. 1-3

[83] S. Bolasco, *Statistica testuale e text mining: alcuni paradigmi applicativi*, Quaderni di Statistica, Vol. 7, Napoli, 2005, pag. 1-37

Text Analysis concept is different respect *Textual Analysis* concept. Textual Analysis is linked to the research field but without automatic analysis. Indeed, Textual Analysis is based on texts reading in which information is categorized, in order to give a semiotic interpretation of it.



According to Bolasco[84] and his team of researchers, the automatic analysis is based on terms called *"Words",* which are linguistics objects, units of text analysis and they can be recognized in: graphic forms, lemmas or mixed units. They are all able to intercept the content in the text. The so called **graphic forms**, which have a formal approach and they are independent from language, are able to recognize the sense (set of meanings) of documents. The graphic forms are the sign and the sense.

The *"Sign"* is composed by two parts:

- A part distinguished from the phonic (spoken) and graphic (written) point of view. This part of sign is called "significant".
- A part distinguished from the point of view of form and substance. This part of sign is called "significance".

The "*Sense"* of a word is formed thanks to the help given by those particles that surround it. Indeed, these particles ascertain the general meaning of a text, based on a set of **co-occurrences**, which are a frequent combination of one or more words.

Text Analysis allows to study in depth the meaning of a large quantity of information. With the digital evolution, the dimensions of information sources are exponentially growing the size on which work. In terms of time and costs *human work* alone is not possible: computer work is able to develop the same operations in a considerable shorter time, also allowing extraction of a determined specific typology of information, on the basis of pre-set inputs given to computer.

[84] S. Bolasco, *Statistica testuale e text mining: alcuni paradigmi applicativi*, Quaderni di Statistica, Vol. 7, Napoli, 2005, pag. 1-37

A good Text analysis is provided by a set of integrated steps[85]:

I. *Text preparation:* is an essential step done with the help of a software able to manage, in transparent way, meta-data in texts, respect the automatic lecture of text.

In this step some activities must be done, such as: *cleaning data*, *normalizing texts* and *text annotation*.

- The *data cleaning* is a technique used to filter data, so ensuring a sort of reliability, precision, interpretability and accuracy of information. The quality of data starts from this step.
- The t*ext normalization* renders the text more standard, adjusting spaces, apostrophes, accents, dates, numbers, expressions and so on. It is important to maintain a sort of "stability" in terms of univocal meaning. the aim of the text normalization is to highlight elements of particular interest like names, typical expressions and so on.
- The *text annotation* consists in associating meta-information to words: grammatical category, relative lemmas, sematic labels, tagging, co-occurrences in the corpus, morphologic characteristics and so on.

Given the large amount of data to analyse, many automatic lemmatizer are used. They are tools based on local grammars and electronic dictionaries, with the aim to quickly return to the lemma of a term.

II. *Lexical analysis:* allows a description of some constants of language, in terms of percentage incidence of some words, therefore "imprinting". This step is focused on a "vertical analysis" in which the meaning of words is considered regardless of underlying context. There are two levels of "vertical analysis": the study of "empty words" and the study of "full words".
    - In the first level, the analysis of *"empty words"* (connectives, prepositions, conjunctions, determiners), regards incipit of phrase, punctuation, phrase structure. They are that kind of words without meaning, which function is to connect other ones.
    - In the second level the analysis of *"full words"*, regards words of content, which with their frequency and usefulness, giving sense to the document of reference.

III. *Information extraction:* is an important step in Text Analysis because it focuses the attention in that part of language which is very meaningful. There is a selection of

[85] S. Bolasco, *Statistica testuale e text mining: alcuni paradigmi applicativi*, Quaderni di Statistica, Vol. 7, Napoli, 2005, pag. 1-37

"peculiar language" which is the restricted percentage of lexicon vocabulary, essential to guide the analysis.

IV. *Textual analysis:* regards all the operations oriented directly to the corpus, able to furnish a text representation, both through concurrences and co-occurrences analysis. However, textual analysis without the use of statistic techniques allows to:
    - answer to complex queries about corpus of text of reference
    - visualise the entities of interest researched
    - categorize part of test creating new textual variables which increment a structure database.

The interest towards Text Analysis, or Text Mining, is growing in the last years, thanks to the incessant development of informatics resources. The study of texts meaning, documents and others online materials, is growing, but only a limited number of companies are already applying it. Beyond electronic dictionaries, it is important to build a base knowledge, with *WordNet* for example, or automatic translation with the use of multilingual dictionaries, an example could be *EuroWordNet*[86]. The Text Analysis or Text Mining technologies develop useful procedures for companies, according *Information Retrieval* and *Information Extraction* operations which are then integrated by D*ata Mining (DM)* together with *Artificial Intelligence (AI)*. The Text Analysis procedure provides the individuation, automatic extraction and categorization of significant data from specific texts. This presupposes the existence of documents warehouse as corpus on which to investigate (approach called "corpus base"). Its aim is to transform a set of non-structured texts into a structured data, after being allocated into a database.

In concrete, Text Analysis finds some applicative fields[87] inside business companies, for what regards:

- *Customer Relationship Management (CRM):* classification based on keywords and automatic addressing of e-mails, for example, based on contents comprehension.
- *Customer Opinion Survey:* automatic analysis of warnings or claims done by customers
- *Human Resources Management:* automatic analysis aimed to control the expressed opinions and sentiments of employees, or extraction of specific professional skills from curriculum vitae online or business database.

[86] *EuroWordNet* is a multilingual WordNet database created and defined in 1999, structured in synset terms (set of synonymic words) with, at the base, semantic interrelation. Inside EuroWordNet there is an Inter-Lingual Index able to connect every language in order to go forward from words of a language to similar words of another languages.

[87] S. Bolasco, *Statistica testuale e text mining: alcuni paradigmi applicativi*, Quaderni di Statistica, Vol. 7, Napoli, 2005, pag. 1-37

- *Natural Language Processing (NLP):* construction of linguistic resources or specific knowledge in natural languages.
- *Intelligence Activities:* regarding security problems.

3.3. The customer attention: fundamentals of the Sentiment Analysis

Why is it so important to analyse the online conversations, and so understand what others said?

Nowadays, the digital devices provide access, unprecedented, to a mass of information, products and services, through a variety of digital channels.

In a world always more and more mobile, social and multichannel than ever, needs and behaviours of users are changing and as consequence, there is an adaptation of business companies. The companies' attention towards this evolution is enough present.

The companies' attention towards this evolution is enough present. In this moment customers are constantly assailed by infinite messages and advertisings. The companies have difficulties in capturing their attention. The winning element for companies is the exclusive focus on the **Customers Experience (CX)** and for this purpose, they are developing many innovative platforms able to support them. A well developed and accurate Customer Experience, improves the *perception* of business in the eyes of customers, who often change perception with each interaction. The CX is one of the most valuable and at the same time delicate aspect for a company, so that managing that perception in all its forms should be a top priority and responsibility.

But, what is exactly the meaning of concept "Customer Experience"[88]?

The CX[89] represents the overall experience customers live during the relationship together with the business company: a relation-interaction which includes the customer care and the support. According to Forbes[90] Magazine, the Customer Experience includes many elements, but it can reduce itself to the *perception* customers have about a brand or company[91].

The factors which influence the customers' perception in relation to the business company are:

- *Quality* of products or services must be appropriate and good, is the basis.

[88] J. Pine and J. Gilmore, *L'economia delle esperienze. Oltre il servizio*, Milano, Rizzoli Etas, 2000

[89] M. Ferraresi and B. Schmitt, *Marketing Esperienziale. Come sviluppare l'esperienza di consumo*, Milano, FrancoAngeli, 2005

[90] Forbes is one of the most important global media company, focused on business, investing, technology, entrepreneurship, leadership and lifestyle. It was founded in New York City in 1917 by Bertie Charles Forbes. Forbes is an offline and online magazine.

[91] Forbes Magazine, *What is Customer Experience?* : <https://www.forbes.com/sites/blakemorgan/2017/04/20/what-is-customer-experience-2/#464c7bb670c2>

- The *values* shared by the company and the coherence of image in practical way.
- The *attitude* with which the customers and the potential ones, approach to products or services: every customer has own specific needs, they are not all the same.
- The presence of *Market Trends*, therefore external factors, influence people. Every business company should try to foresee, in the best possible way, these trends in order can interfere in the purchase decisions.
- The attention to *experience* and *personality* of every customers is important and it conditions the customers's experience.
- A general but real concept is linked to the human tendency to prefer and to be attracted by offers that sound *familiar* and are *easy* to understand and remember. This is a winner concept in every field and a satisfied purchase leads to others.

According to one of the most influential conversion rate optimization expert Peep Laja[92], the first factor which induces customers to purchase products or services is the *online reviews reading*. The latter is the answer to the initial question in the paragraph and it is for this reason that business companies should monitor and analyse the online conversations.

Nowadays, people are predisposed to gather many information from *mixed sources*: online and offline. The lack of a clear distinction between these spatial dimensions allows customers to considered information both from *new media* (based on Internet: e-mail, blog, sites, mobile) and from *old or traditional media* (which are not online: word-of-mouth, TV, radio, press). The majority of the online researches of customers start with the big Search Engines (Google for example), for then move ahead on social media (Facebook, Instagram, Twitter and others). After the collection of information, customers compare them, according to their needs. When there is indecision in the customers' mind or when a sincere *feedback* is required, people search *reviews*, to be sure of the final choice, they eventually ask friends and family members.

The scientists, in the last decade, have deepened the issue related to the c*onsciousness of customers' purchase decisions.* A significant study[93] made by the expert Myles Anderson, reveals the growing importance of online reviews in the purchasing decision. In particular, almost the totality of people involved (88%) say they trust online reviews, as much as to entrust themselves personal recommendations, 39% read reviews regularly and only the 12% of those surveyed do not read reviews.

[92] In 2015, Peep Laja was nominated as the most influential conversion rate optimization expert by agency PPC Hero. The year after he was interviewed by Forbes magazine, for the section "Mentoring Moments".

[93] The *"Consumer Review Survey"* made by Anderson, considers a panel of answering more 2000 people from USA (90%) and Canada (10%): <https://searchengineland.com/88-consumers-trust-online-reviews-much-personal-recommendations-195803>

Besides the tendency to consult the online reviews, people, many time, take decisions on the basis of preferences learned and formed by social norms and expectations, making so possible to come to a decision in a *subconscious* way, without understanding the preference of the choice. In the end they choose instinctively, without any rational reason.

Another interesting research, carried out by the Mobile Observatory Strategy of School of Management of Politecnico di Milano, shows that there is growing time spent by online customers from *smartphone* and a good portion of customers use it to finalize transactions.

This users' repositioning, from computer to mobile phone, is carrying an ongoing enhancement of responsive sites from mobile phone and an increment of Mobile Advertising, so changing the strategic and relational approach of business companies towards customers. Thanks also a great amount of personal data, deriving from mobile users, the companies aim, nowadays, is to improve the customer experience and the multichannel communication (both online than offline), with the use of innovative tools such as: apps, chatbot and augmented reality.

Nowadays, the customers have devices, multichannel, information, choice possibility and a concrete and determining decision power: it is very complex to determine the evaluation of *Customer Satisfaction*. The customers' choices are not pushed by needs, but mainly by pleasures and experiences: *Customer Experience* (customized for each customer in terms of offers, contents, products, services), the transparent communication, efficient service and an immediate satisfaction of customers are all strategic elements on which every company should be addressed.

According to Forrester, one of the most influential research and advisory companies in the world, there is a positive correlation between the adoption of Customer Experience strategy and the company incomes: the increment of profitability of companies is 14% higher, respect those companies which neglect the Customer Experience.

Therefore, the online generated and shared contents, with the attention to Customer Experience strategies, are important resources to better understand the users' opinions and to have an overall and accurate vision about the emotive status of the online world: positive sentiments create sales and so profit for companies. The study specialized to understand sentiments and opinions, behind texts, documents and conversations in the online environment, is the Sentiment Analysis.

3.4. The Sentiment Analysis

The need to know reliable information and preferences about customers, is bringing to increasing companies interest towards the online world contents, especially those deriving from social media: according to the report *"Global Digital 2018"* written by Hootsuite, a leader American social media management platform, the Social Media users in the world, calculated in January 2018, correspond to more 3 billion (with an increase of 13% respect the year before) and 9 on 10 of these users access to Social Media via smartphone.

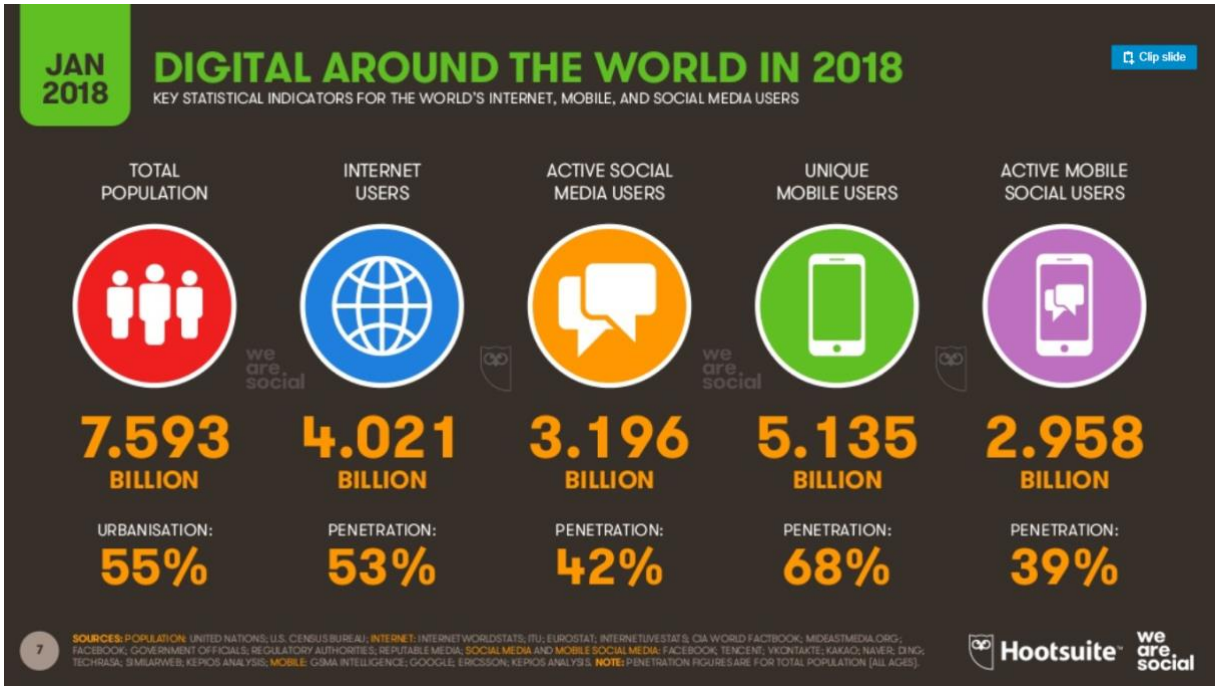


Figure 14 *Digital around the world in 2018*, Hootsuite

Source: https://blog.hootsuite.com/it/report-we-are-social-hootsuite-2018-digital-social/

The listening[94] to understand what users say, through the elaboration of online conversations, given by innovative algorithms and bots, together with the additional manual human work, is precisely the aim of Sentiment Analysis.

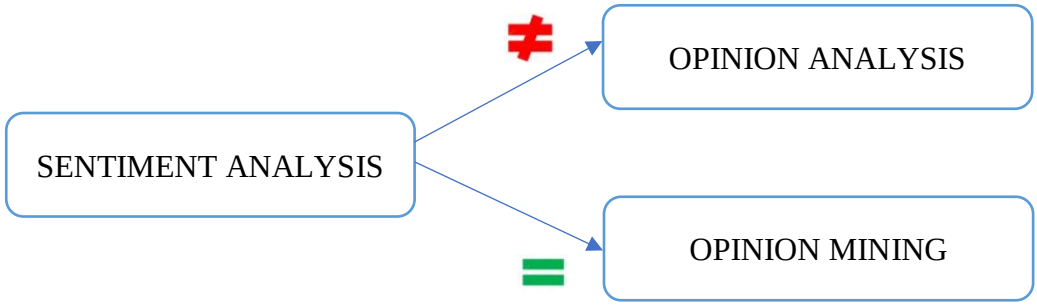
Sentiment Analysis is a term that appeared in reference to automatic analysis of evaluative text, in 2001 papers by Das, Chen and Tong, thanks to their interest in analysing the market sentiment[95]. The Sentiment Analysis can be defined as a set of theories, techniques and instruments which they allow to measure the company *reputation* and *perception* relative to qualitative aspects. These qualitative aspects are connected to *positive*, *negative* or *neutral*

[94] The listening of conversations, supposes the analysis and studio of customers' opinions, but not the solicitation of the latter.

[95] B. Pang and L. Lee, *Opinion Meaning and Sentiment Analysis*, Foundation and Trends in information retrieval, Vol. 2, 2008, pages 1-94

reactions of users and appear from *digital conversations* of users, such as: reviews, articles, chats, emails, likes, shares and comments. Exactly for this application, Sentiment Analysis is often also called *Social Media Analysis* or *Web Sentiment Analysis*.

The Sentiment Analysis is referred to the *intensity* of the online sentiments and it is placed at the end of the web monitoring process. Indeed, this is in line with the thought of Oscar Wilde: *"The sentiment is not the starting point but the arriving one."*



While Sentiment Analysis is the study referred to the *intensity* (high, medium, low) of sentiment and it classifies the text also in base on the *polarity* (positive, negative, neutral) with the aim to extract the relative sentiment, the **Opinion Analysis** is referred to the *motivation* behind the sentiment. These two concepts must remain separate.

Instead, Sentiment Analysis is linked with the concept of **Opinion Mining**, and sometimes the two are used as synonyms. The "Opinion Mining" concept appeared in a paper, published in 2003 by Dave et al., to indicate a technique able to make a research based on *keywords* and then to elaborate for every term some *attributes* (positive, negative, neutral). The aggregate distribution of the terms becomes possible to extract the associate opinions to every keyword[96]. Opinion Mining is based on the recognition of the opinions in the text, connected with specific attributes. When we talk about *"opinions"* in a text, generally we referred to subjective expressions: people point of views and sentiments, in relation to specific situations. People opinions can be express for everything, from products, services, people, events, to various issues. Today, many researches are done on "opinions", this due to the fact that people expose themselves, more than ever, in online environments (social media, blogs, forums, sites, reviews and others), allowing companies to measure their reputation.

[96] A. Ceron, L. Curini, S. Iacus: *Social Media Sentiment Analysis, l'evoluzione dei fenomeni sociali attraverso la rete,* Volume 9, Milano, Springer, 2014

The Web development is radically modifying customers habits. Now, a great portion of customers:

- *consult reviews* before buying, this moment is called *"Zero Moment of Truth"*[97].
- *write reviews* after the product use or the service experience. What drives customers to write a review is the so called "active involvement", the pleasure to feel involved and to give a useful contribution to someone else.

Reviews, opinions and judgments of customers, often involve sectors from hotels and food services, to consumption and services. Today a good words-of-mouth is no longer enough for businesses, but it is important have *good online reviews* because it influences and attracts the choices of the online community, conditioning the companies' profits. It is important for a company to incentivize the release of reviews, also when the latter are *not so good*: listening to the *"voice of customers"* and then act to correct and improve where there were critical observations.

In this competitive scenario for companies, a relevant phenomenon of the last years is the diffusion of *"Opinion Spam"*[98]. The latter are false and misleading opinions, written in posts or comments in social media, blogs, sites or forums, by a multiplicity of people (anonymous for the majority) with the aim to confuse users on specific product or service: promoting or damaging the companies' reputations.

The Opinions Spam are speculative activities, used by anonymous people (called *"Opinion Holder"*), to write wrong reviews: these are possible because there are not adequate tools, restrictions or punishments, able to verify the veracity of what reported by users. There are three typologies[99] of Opinions Spam:

- *untruthful opinions:* people published undeserved reviews or comments. They are both positive and negative, and respectively they are called *"hyper spam"* and *"defaming spam"*.

[97] *"Zero Moment of Truth" (ZMOT)* is a term coined in 2011 by Jim Lecinski, vice President of Customers Solutions in Google. The meaning is linked to the moment in which customer received the incentive to buy something and he goes in the Web to search information and reviews, in order to feel secure about the eventual purchase.

[98] Y. Chen and H. Chen, *Opinion Spam detention in web forum: a real case,* Department of Computer Science and Information Engineering, National Taiwan University, Taipei, 2015, pages 173-183

[99] N. Jindal and B. Liu, *Opinion Spam and Analysis*, Department of Computer Science, University of Illinois, Chicago, 2008, pages 1-11

This typology of opinion is not so easy to individuate because the spammer can create reviews very similar to truthful ones.

- *opinions on brands only:* people publish reviews or comments only about specific products, mentioning the brand without enter in details of characteristics. This typology of opinion is easy to individuate.

- *non-opinions:* people publish advertising messages or with a text of poor interest without to expressing opinions. This typology of opinion is easy to individuate.

Today the "Opinions Spam" are in phase of research, due to the fact that at present there is no functional algorithm able to intercept these contents.

The Sentiment Analysis or Opinion Mining analyzes and classifies texts[100], and this takes place on Documents or on Phrases:

- *Document level:* the analysis is based on a set of documents contained opinions which can express sentiments. Different labels are then assigned to these sentiments if they are positive or negative. The majority of techniques are based on *supervised learning:* machine learning is a system able to solve some tasks in autonomous way, on the basis of ideal examples, determined by desired combinations of inputs and outputs, previously furnished.

The *algorithms* are trained can classify: the polarity of reviews or comments (positive, negative, neutral) and the sentiments of opinion words or opinion phrase, such as: great, excellent, bad, terrible.

The analyzed elements, beyond supervised or not supervised algorithms, in the documents are:

  - *Frequency of words:* are counted the words repetitions with attention to keywords.
  - *Part of speech:* adjectives are very important in the opinions orientation, important in this sense are also verbs and nouns, to understand the sentiments.
  - *Syntactic relations:* considers the relation between the words.

- *Phrase level:* this analysis is more complex than the other one. The phrases in a text can be objective or subjective, but not always it is so evident this phrases distinction.

In case of *objective phrases,* information is "factual" and real, regarding situations, people, objects.

[100] N. Jindal and B. Liu, *Opinion Spam and Analysis*, Department of Computer Science, University of Illinois, Chicago, 2008, pages 1-11

In case of *subjective phrase,* information is based on expressing polarity of sentiments and personal sensations. In addition, it is useful to identify the force of expression of opinions, recognizing their intensity according to the six primary emotions: happiness, surprise, fear, sadness, anger, disgust.

The Sentiment Analysis in phrase level presents studies based on two approaches[101]:

- *The manual method:* is not a flexible approach. It allows people to codify the document text by hand, spending on it a lot of time.

The manual approach is combined with the *automatic method*, in which algorithms help to analyze a large amount of data in speedy way.

- *The corpus or dictionary method:* exploits the occurrence of specific terms and opinion words with the objective to find others inside the corpus. This method considers the context of use of words: words can assume different meanings and polarities, according to the context in which they are inserted.

3.5. Advantages and Disadvantages of the Sentiment Analysis

The Sentiment Analysis application involves every field of interest, from politics, current events, economy, society to brands, companies, social sciences. Therefore, it allows to improve in exponential way marketing strategies, to encourage the business, to take the rightest decisions, but above all, Sentiment Analysis is also a good instrument to acknowledge about problems and eventual weaknesses.

With the proliferation of contents generated by web users, it is becoming indispensable for business companies, to know, to collect and to monitor all the sources.

Therefore, what it leads companies to considered Sentiment Analysis is linked with the possibility to rapidly intervene in case of criticality. Indeed, according to the application of specific analysis filters (we talk about them in the last chapter), it is possible individuates relevant conversations and variety of contents, which could be or useful or potentially dangerous for company itself.

[101] N. Jindal and B. Liu, *Opinion Spam and Analysis*, Department of Computer Science, University of Illinois, Chicago, 2008, pages 1-11

The main **advantages** of Sentiment Analysis for companies, are different respect the traditional instrument of *Web Analytics*[102], based on focus group and market researches, and they are all attributable to a saving of time and money. The Sentiment Analysis:

- Returns a **continuous** and in **real time feedbacks,** on spontaneous opinions of the selected target. There is an immediacy of results. The Sentiment Analysis is fundamental to intercept instantly negative moods or discussions around the products or services of companies. A faster answer to problems brings again to customer satisfaction.
- Gives the possibility to trace a **complete and detailed profile** of all customers. This allows companies to have a precise market segmentation, on which put in place specific **marketing strategies** (also advertising campaigns): the crucial point is always the *customers satisfaction*, but with the advantage for company, of having many useful information regarding the customers propensity toward the company itself.
- Allows to measure and improve the **Return of Investment (ROI)** of every marketing actions, given by the possibility to listen the online customers thoughts, preferences, critics and eventual suggestions. The online conversations are very important to adjust a not so good digital strategy or to foresee some weak points.
- Improves **Customers Relationship Management (CRM)**, usually is not so easy for business companies measure to the customer satisfaction and the collection of useful data about customers. But, thanks to Sentiment Analysis the relationship between companies and customers improves: there is a great attention to what customers say and on how they

act in the online environment. The main interest is that of companies, due to the necessity to monitor their online reputation: the risk is linked to the possibility that a bad posts or mentions could became viral in some way.

- A better customer service (punctual work according to customers' requests, immediate reactivity on business social media, adequate reimbursement in case of errors or defect of companies), increase also the probability of **customer loyalty**, feeding the opportunity to have *influencers,* expert people on products or services, able to condition many others. Therefore, Sentiment Analysis is able to form **leads generation**.
- Improves the **Market Researches** thanks to the knowledge of opinions and sentiments of customers, inserting new elements, characteristics, functionalities.

[102] *Web Analytics* is the measurement, collection, analysis and reporting of web data. The main scope of the Web Analytics is to understand the web usage and to measure the web traffic. The *qualitative market researches* support Web Analytics. Some examples that do this, are: User experience in-depth interviews, In-home usage tests, Crowd-sourcing with experts and Surveys.

- Helps to **manage eventual crisis**, because it is a study that previously supplies instruments to foresee them. The constant monitoring and readiness in complaint answers are the keys to avoid the online communication crisis, before it is too late to manage it.

Some **problems** of Sentiment Analysis easily findable, regarding:

- the *accuracy* of all information found.
- the ability to *correctly* know how to filter information: the risk is to have a too wide or strict range of filter.
- the lack of a good knowledge of the sector of reference, together with the relative trends and possible future develops.
- the lack of a good knowledge of the competitors in the sector of reference.

After a quick view of all advantages and disadvantages of Sentiment Analysis, it is possible also identify some **improvements.** The challenges are in continuous developments, especially in the formulation of algorithms increasingly refined. The algorithms used in the Sentiment Analysis have a limited comprehension, due to:

- *colloquial languages*: the difficulties circumscribe cultural and linguistic expressions, which they are too characteristics. The abbreviations and slang are difficult to catch.
- *orthographic errors:* is very common find them in social media, errors also related to wrong translations.
- *sarcasm and irony:* they are in absolute the most difficult text particles to catch for Sentiment Analysis because they have a very subjective significance, so much so, they are sometime also difficult to understand when you talk directly with people. Many studies are trying to find a right algorithm which will improve the probability not to get the Sentiment Analysis wrong.

Positive aspects of Sentiment Analysis applied to corporate strategies and processes are certainly more beneficial than the initial difficulties of adoption, due to existing cultural resistances. Major attention to customers sentiments and opinions in the referred market with use of Sentiment Analysis finally leads to an **increase of the sales and revenues**. The positive correlation between companies' higher profits and the good and positive customers' sentiment in online conversations shows that Sentiment Analysis is a winning strategy for the companies which adopt it.

CHAPTER 4

THE SENTIMENT ANALYSIS: A PRACTICAL CASE

The Sentiment Analysis was born from a necessary and simple need: can listen and to understand what people think, say and how they behave in relation to some products or services of a specific company or brand, in a referred market. The main focus of Sentiment Analysis is the representation of customer perception, behaviours and opinions.

Therefore, Social Media Analytics, with an appropriate Sentiment Analysis methodology, help companies to make a deep analysis, to catch real and sincere information by customers, in order to elaborate it and to extract significant data, so companies can develop more correct strategies.

After all the previous part inherent to Sentiment Analysis with all its theoretical foundations (from CRM, Social Media, Semantic Web, NLP, WordNet, Text Analysis, to Sentiment Analysis definitions), in this last chapter a practical case will be presented, in order to better understand what is really Sentiment Analysis and what are all the actual applications and potentiality, with one of the most famous Sentiment Analysis platform nowadays, NetBase, used by some of largest and innovative business companies worldwide.

4.1. The Big Data as the new Black Gold and the Privacy issue

For many years the Big Data concept was not so considered and fully comprehended, only recently many companies do are trying to use them for their decision-making strategies.

When we talk about **Big Data** we refer to a set of technologies and methodologies used to make analysis on a huge amount of data. This amount of data has a huge volume of information (the real size is not possible to identify, due to data volume which is in continuous changing) which must be related to the system's ability to acquire information. Big Data Analytics allows to extrapolate, to analyse, to put in relation a lot of data in order to discover and foresee future paths. Therefore, to reach a condition where a system can be defined "big", all the following elements must be detected:

- *Volume* of data, which derived by *structure* sources (databases) and *unstructured* sources (all free data, such as: texts, imagines, emails, social network, events).
- *Variety* of information, is a different typology of generated, collected, used data
- *Speed* of information flow, with which data is generated and then transmitted in real

time, in order to make analysis on it.

- *Veracity* of data, is its accuracy. A reliability index is important to make right decisions.
- *Value* is the ability to transform data in value. Valuable data is fundamental for having and for making investments.
- *Variability* of data is linked to possibility of inconsistency data.
- *Complexity* of management data, giving a huge quantity of them.

Big Data is a treasure of information for companies and thanks to it they can reach costumers.

"Big Data is the new Black Gold". Nothing truer.

Nowadays, a huge debate is in progress and the issue regards all people: **Data Privacy**. The majority of customers do not know the privacy norms and the importance of the sensible data in the Web.

According to the research done by Altroconsumo[103], on a sample[104] (the analysis publication date back to November 2017) of 995 Web users between 18 and 64 years old, almost the totality (91%) declared to not read privacy conditions necessary to use services, this negligence is due to: the length of privacy text and the impossibility to modify privacy conditions. Moreover, always this majority has declared to be available to release its sensible data in exchange of reward: this is a meaningful point. Therefore, what emerge from this sample is a contrast: on one side there is lack of consciousness of the value of personal information and its safeguard, while in the other side there is both a passivity and also a diffidence of some users to release personal information to organizations, for worry of a bad management of it.

Big Data if correctly used can be a precious information source, like for example in medicine, public security, mobility and other public sectors. In the last years many companies have invested billions in technology, financing software development for the management and analysis of data. Big Data knowledge extraction and the following use of it, lead to an improvement of decisional activities subordinated to processes able to management and to transform the volume and variety of dataset.

[103] *Altroconsumo* is an Italian no-profit organization. It is the first and well-known association with the aim to protect customers' rights. This organization counts almost 400.000 members, it was born in 1973 with the name Consumer Protection Committee.

[104] Research "Privacy su Internet" Repubblica.it: <http://www.repubblica.it/tecnologia/sicurezza/2017/11/03/news/privacy_sul_web_gli_italiani_cedono_i_dati_senza_informarsi-180173625/?refresh_ce/>

The value generation, from rough data (social media data, transactions, personal data, public data) to refined data, goes through a process. There is a logic sequence which it allows an organization to memorize and to manage internally all data. The Big Data life cycle process is divided in two areas:

1. *Big Data Management:* is the area which includes the generation and collection of data, the extraction and cleanliness of information, follow by the storage of data.
2. *Big Data Analysis:* is the area which includes the modelling and analysis of data, following the governance of data interpretation.

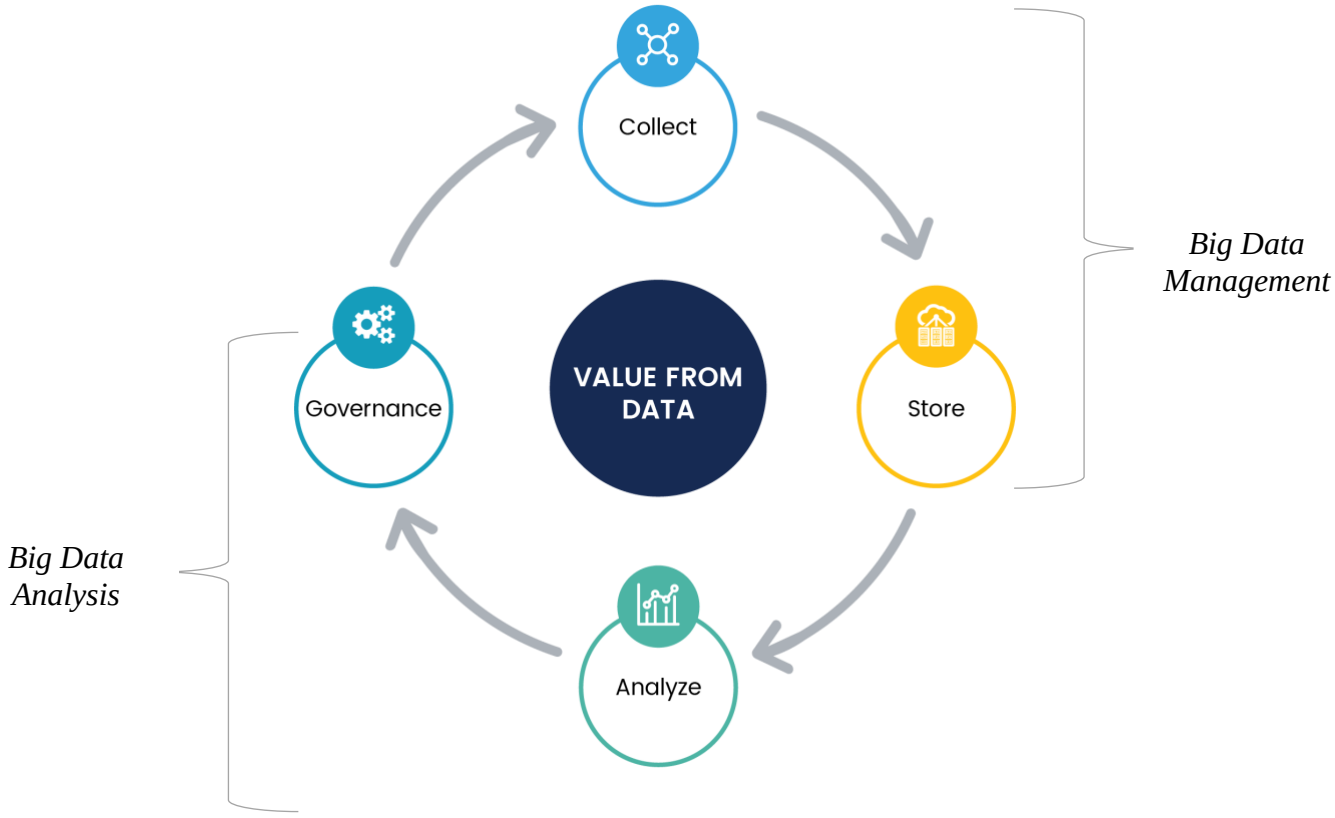


Figure 15 *Big Data life cycle*

Source: <https://www.safaribooksonline.com>

Therefore, Big Data is the main source of the Sentiment Analysis. Thanks to the use of some tools and platforms, it is possible measures and processes opinions and emotions starting from a huge volume of collected and stored information by the Web. The materials found are then subdivided according to the polarity of sentiment: positive, negative, neutral. After that, companies can have a generic panorama about opinions and brand perceptions and in particular on those areas in which margins of business improvement are identifiable.

4.2. The Social Media Analytics

The **Social Media Analytics** (also called *(SNA) Social Network Analytics*) is a recent methodology used in the social sciences, developed in the economic and marketing sector. The Social Media Analytics is the practice of gathering and analysing data from digital media and then with the use of specific tools is possible to understand and to improve possible business decisions. The most common use is to make a Sentiment Analysis in order to support all marketing and customer relationship management activities. In particular, the practice involves sophisticated NLP processing Machine Learning algorithms able to identify and to parse feelings in the selected texts[105].

In *Digital Era*[106], full of Big Data, is fundamental tries to exploit the majority of possible available data, because all companies, nowadays, can learn very much from it about their customers. Every activity made by a person, produces a digital trace, so creating more digital raw material, which it is increase exponentially. The same *Artificial Intelligence (AI)* techniques[107] and *Machine Learning*[108], characteristic of this Era, extract an increasingly value of data thanks to the prediction capability of algorithms.

So, having more available data, the business companies will have more adequate data to improve their offer to do their target. In this new scenario, many **profiles** are developing inside business companies, in order to supply and to satisfy all the requests. Nowadays, According to Monster[109], the most required professional profiles in Digital Marketing by business companies are:

- *Digital Content Management:* is a Web Editor who is appointed to create and to handle all contents for the company.
- *Social Media Manager:* is the responsible Social Media channels, the online community, the

[105]TechTarget global network of tecnologiy-specific websites: <https://searchbusinessanalytics.techtarget.com/definition/social-media-analytics>

[106] *Digital Era* (also called *Information Age, Computer Age,* or *New Media*), is the 21st century period in human history characterized by the existence of digital technology.

[107] *Artificial Intelligence* is a term coined for the first time in the 50s and it involves all the computational machines able to execute specific tasks which they are characteristics of human intelligence: learning, planning, language comprehension, object and sound recognition and problems solving.

[108] *Machine Learning* is a term coined after the AI one. It is a way to reach the artificial intelligence through the automatic learning, giving predefined algorithms. The Machine Learning is a method centred on the capacity of these machines to receive a series of data and to learn alone, without an explicit programming, modifying the algorithms as soon as they received more information about the related analysis. The Machine Learning aim is to adapt and to improve it according to occurrence of situations.

[109] *Monster* is one of the most knows America-based global employment website: <https://www.monster.it/consigli-di-lavoro/articolo/professioni-digital-marketing>

advertising campaigns, social reputation analysis and digital PR.

- *Community Manager:* is a professional figure specialized in Crisis Management and Social Caring inside the online community.
- *Digital PR:* is a professional figure specialized in the online People Relations with the aim to identify potential ambassadors for a brand or company, to involve them in some particular projects.
- *Web Analyst:* is the responsible the quantitative indexes such as: number of visits in a website, the time spent by visitors inside a website and pages from which users arrived.
- *SEO Specialist:* is the responsible for the optimization of online visibility of a company, his aim is to find strategies a webpage could be identified it by algorithms of the search engines, in order to appear in the first positions of these.
- *E-Commerce Manager:* is the responsible for the online store, together with the offline store management.
- *Data Scientist:* is the responsible for Big Data management in the company. His aim is to transform confused data in well-organized information, in order to give a right sense to business strategy.

The available *data* can have different *nature*: textual data (comments and posts), analysed network data, actions (likes), hyperlinks, SEO (Search Engine Optimization) data. Thanks to this amount of data is possible to know many information on digital channels users such as: the place in which they are located, the sex and age, the most researched and used keywords, the schedule of hours and days in which users is more connected, the user behaviour.

All brand or company Social Media strategies are identified in the researches and activities of Social Media Analytics, generally implemented by a Social Media Specialist, who aim is:

1. to *trace*: the data identification regards the contents types (audio, text, video, imagines), the sources from which data derived, period of time analysed, data property which can belong to private or public user.
2. to *analyse* available data derived from customers' activities. To make a right analysis of data is important the use of some digital tools. The used **tools**, can be specific free or paid platforms, or programs for data analysis already provided in social media, (between the most famous inside tools: Facebook Insight, Instagram Insight, LinkedIn Analytics and Twitter Analytics, for example), which help to understand in qualitative and quantitative terms, the goodness of strategy and weakness of strategy chosen. Tools simplify the social media manager tasks, especially in the management and organization analysis.

3. *to interpret* all information obtained by parameters of analysis. Data interpretation can be useful and efficient for good marketing strategies, new investments and the improvement or development of new operations. It is the phase where human capacity is involved, in order to understand the meaning of the analysis.

   The measurement of **results** should be at immediate comprehension of users' behaviours and interactions in the online space (in social networks or digital channels: blogs, forums, sites). **Feedbacks** will be useful to make immediate decisions of business. An interesting point about the use of these innovative platforms, is the possibility to really **listen the referred network**:

   - *who is speaking*: all the online profile of users (age, sex, interests, geolocation).
   - *what they are talking about*: the referred topic on which the eventual discussion is centred.
   - *how are they speaking*: the relative sentiment (positive, negative, neutral) of the discussed issue, in online environment.

4. to *monitor* the interpreted information. This allows company to have an active *listening* of digital channels, so determining a constant update and increment of analysis effectiveness.

The Social Media Analytics activities, which are divided in these three phases, will be seen in detail, in one of the next paragraphs, with the explanation of an empirical case based on an analysis made with one of the most known Social Analytics platforms: **Netbase[110].**

[110] NetBase: < https://www.netbase.com/>

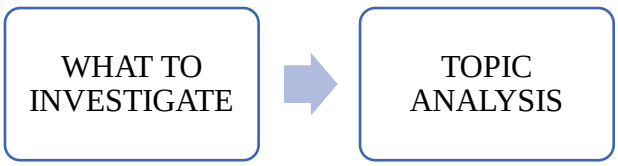
4.3. Investigation Techniques in the Social Media Analysis

The Social Media Analytics is not only an analytic instrument, but also an investigative instrument: listening could eventually lead to discover unexpected solutions[111].

The reason why Social Media Analysis is easily linked to **Investigative Techniques** resides in the same approach of analysis construction. Usually when a company makes an Intelligence Social Media Analysis the aiming better knows its customers in terms of habits, interests, actions, opinions, sentiments in order to improve their interaction, improve its brand awareness, improve the effectiveness of eventual advertising campaigns and to increase leads generation, in an immediate way. Therefore, an Investigative approach in Social Media Analysis helps companies can exactly determine what people wants, how much people desires some goods or services and with which device people purchases what it desires.

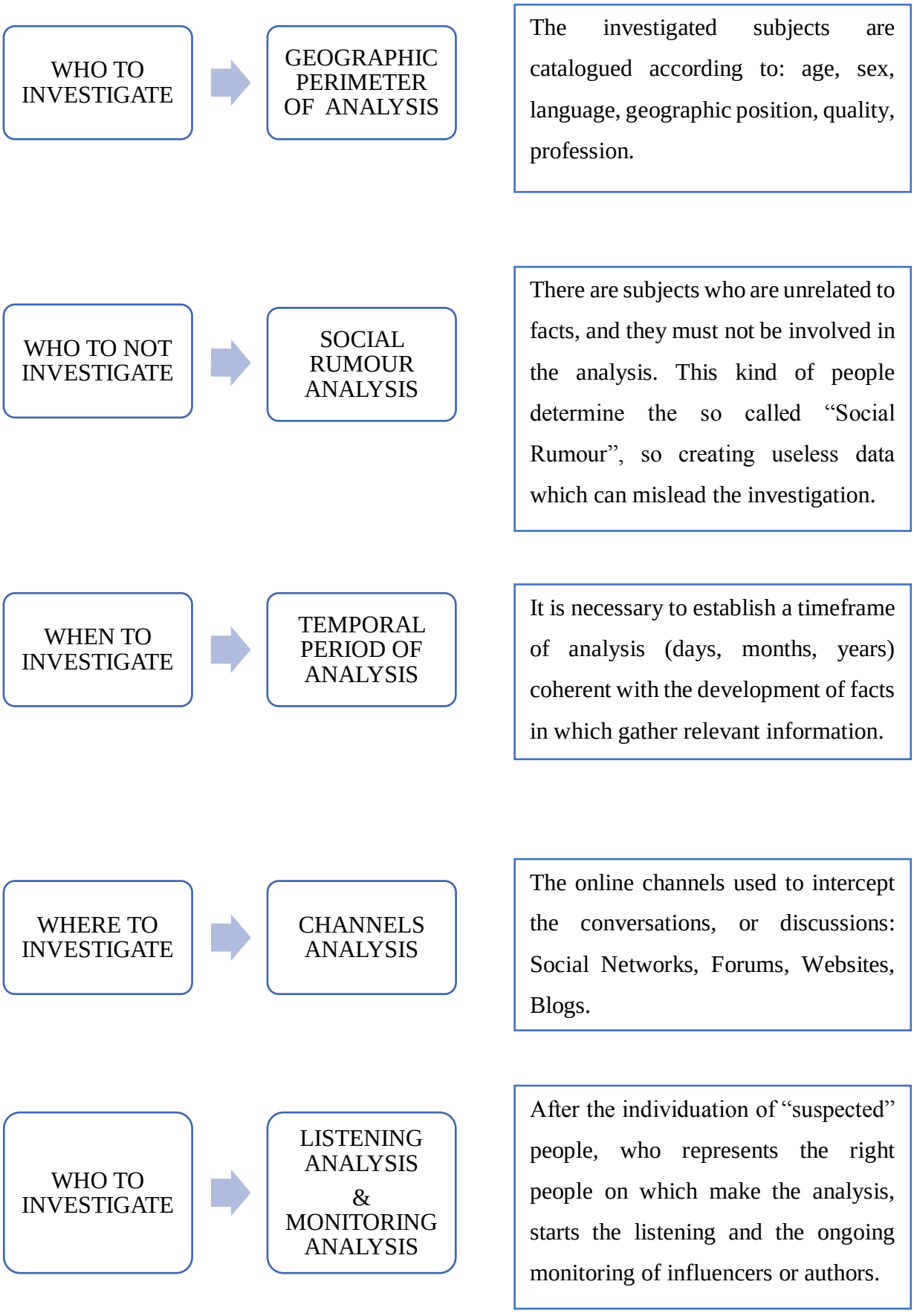
The investigator or detective is the person who is responsible of the analysis: he observes, studies behaviours, analyses reactions and tries to understand emotive involvements of the targeted customers, who are *subjects investigated*. Inside a company the investigator could be the person who is the responsible figure for Social Media Analysis and Sentiment Analysis: Social Media Manager or CRM Specialist or Web Analyst or Data Scientist. Therefore, a good investigator is aware who he is not able to immediately recognize a useful element for the *investigation*, which is the research, but he will have the patience and the curiosity to carefully gather and then to scrupulously analyse every possible *sign*, which is data. A signs collection will help investigator to develop a logic and rational process which should lead to a truthful result.

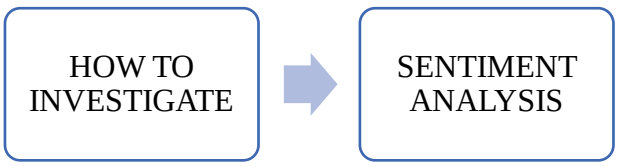
Now, to better understand the investigative approach it is useful to list the **investigative instruments** used by investigator, together with the **relative analysis** to do. This, in order to solve the case and then to reveal the accuracy of research.



It is a sort of exam of "crime scene" in which it is important, to acquire, with the *objective rigor* typical of investigator, relevant elements and places, useful for the success of investigation.

[111] Estilos: < http://www.estilos.it/>


WHO TO INVESTIGATE
GEOGRAPHIC PERIMETER OF ANALYSIS
The investigated subjects are catalogued according to: age, sex, language, geographic position, quality, profession.
WHO TO NOT INVESTIGATE
SOCIAL RUMOUR ANALYSIS
There are subjects who are unrelated to facts, and they must not be involved in the analysis. This kind of people determine the so called "Social Rumour", so creating useless data which can mislead the investigation.
WHEN TO INVESTIGATE
TEMPORAL PERIOD OF ANALYSIS
It is necessary to establish a timeframe of analysis (days, months, years) coherent with the development of facts in which gather relevant information.
WHERE TO INVESTIGATE
CHANNELS ANALYSIS
The online channels used to intercept the conversations, or discussions: Social Networks, Forums, Websites, Blogs.
WHO TO INVESTIGATE
LISTENING ANALYSIS & MONITORING ANALYSIS
After the individuation of "suspected" people, who represents the right people on which make the analysis, starts the listening and the ongoing monitoring of influencers or authors.



The investigated people are under control by the investigator. People are observed, studied, analysed and involved in their behaviours, movements, reactions. Sentiment Analysis becomes essential in order to understand many aspects, especially linked with people emotions.

4.4. The Customers Journey

The *Voice of Customers (VoC)* is a term used in the business and Information technology to describe the needs, expectations and preferences of customers. For companies, it is important to listen the Voice of Customers, which it is dropped off into an online context, with its dynamic interactions, in order to understand what are the contents and sentiments inside digital environment. Companies must know and coordinate their presence on all t*ouch-points* with customers, which set of these defines the *Customer Journey*.

Every traced *Single Customer View* leads to a unique representation of a customer, which it simplifies the same Customer Journey comprehension. An effective business strategy is dependent by the *Customer Data Quality*[112], which the latter traces the data adequacy, according to the comprehension process in which it is inserted. Therefore, thanks to some support technologic tools it is possible to clean, to integrate and to enrich every found data and then to furnish a customized experience to customers.

Therefore, what it is the *Customer Journey*?

Customer Journey, also called *"Story of the bond customers-companies"*, is the itinerary who customers cover, both in the online but also in the offline environment, with a company, so establishing a relationship with it over time. The key elements of the Customer Journey are called *touchpoints*: they are the channels through which customers experiment the brand: the *Customers Experience* of every touchpoint is important and it can change in significant way all the journey.

[112] Estilos: < http://www.estilos.it/>

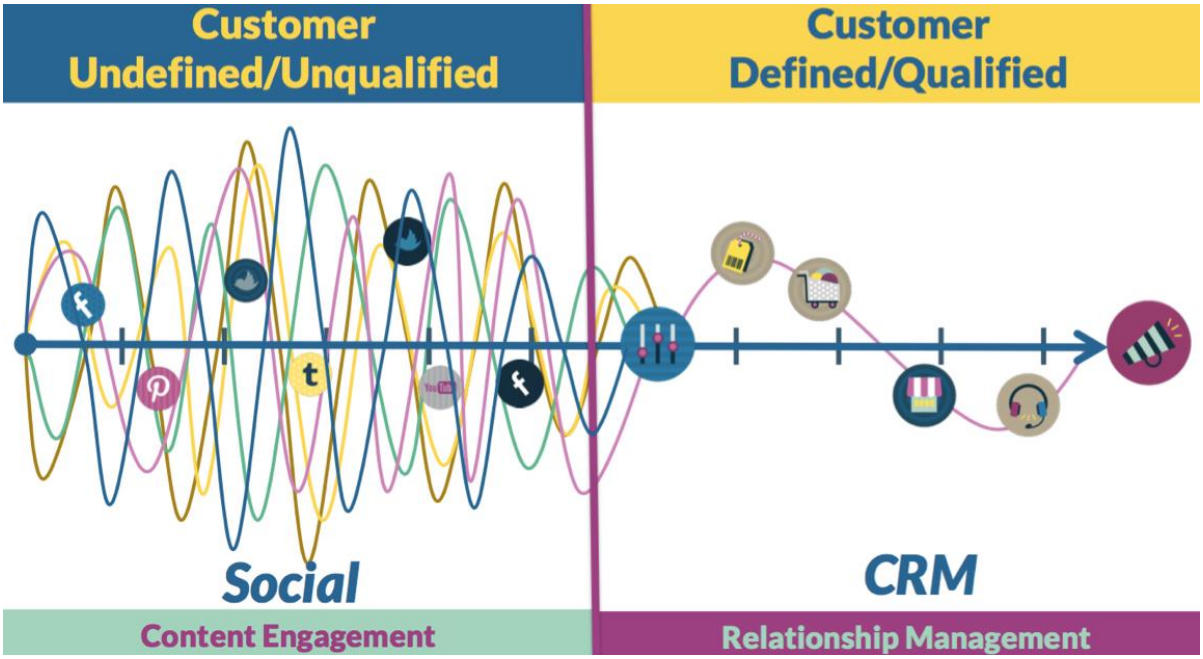


Figure 16 *The Customer Journey* Source: Estilos materials <http://www.estilos.it/>

In order to have a better overview, it is possible splits Customer Journey in two moments[113]:

1. The first is the **Sound Buzz** in which customers are unknown to companies but however they talk about brands, products or the company itself, with other people in digital environment.

   Inside Social Network people usually discuss about many issues: from personal, leisure, to professional. All this amount of undefined data (from here it takes the name of "Sound Buzz") generated in Social Media, it is a constant disturbing factor for a business company. Indeed, Social Rumour makes *difficult* two important actions for business companies:

   - The *Communication* between the company itself and customers, rendering it stressful and less effective. Rumour distracts the customers' mind from the company's massage, so absorbing time, energies and attentions. If companies are not able to get out of that digital noise, they will have problems to be noticed, listened and followed by customers. The solution is to find an attractive digital strategy to catch the customers 'attention.
   - The *Customers Journey* identification, first essential step to recognize customers, to establish customers relationships and to make then a Sentiment Analysis on customers' traces.

[113] Estilos srl : < http://www.estilos.it/>

If a company is predisposed to listen Social Rumour, which it is a set of voices that speak at the same time and in the same environment, it will be difficult find immediate solutions and valuable aspects for a research focused on specific customers.

2. The second moment coincides with the **identification of the Customer**.
   The starting point is when customer has the need to satisfy a desire with a company's product or service. In order to satisfy this impulse, the customer follows a series of steps or actions, so allowing company to potentially have many data about him. The crucial point, called touchpoint, is the purchase of the product or service of company, after more or less long contacts with the company.

The following touchpoints are those used by the **Traditional Marketing**: they still remain valid, but in these last years, with Digital Marketing, they have evolved.
Therefore, the following basics, but still effective, touchpoints in the Customer Journey are:

1. *Awareness:* it is the moment in which the consumer is conscious of his need and he wants to satisfy it with a specific product or service.
2. *Familiarity:* it is that physical characteristic (logo, colours, naming, notoriety) which it allows customer to recognize a specific brand or service inside an environment (online and offline) full of competitors.
3. *Consideration*: it is the moment in which a consumer is oriented toward a defined product or service because it has desired peculiarities (functionalities, design, price). The consumer compares what he is considering with a competitive one.
4. *Purchase:* it is the moment in which that familiar product or service is chosen and hence purchased by consumers.
5. *Loyalty:* it is the main objective for companies. Customers loyalty represents their devotion towards products or services of a company and it persists if cultivate (also with the assistance post sale) unless there is a betrayal of customers' expectations.

Nowadays, beyond these touchpoints (some marketers call this set also *"classical loop"*), there are many others which they compose a longer and a more complex path, but always more natural for the customers.
The reasons of the touchpoints evolution are related to a process which its origin is the technological innovation. The latter allows a growing activity of customers, so leading to a change in their purchase habits. Indeed, the continuous Web connection by means of devices

(the most common: tablet, pc and smartphone) give to customers an additional possibility to always be informed and updated.

The online and offline interactions present different types of touchpoints:

- *Physical Touchpoints:* radio, TV, word-of-mouth, store, call center, public relations and others.
- *Digital Touchpoints:* blogs, websites, forums, social networks, live chats, emails, e-commerce, Search Advertising campaigns and others.

And another distinction regards the typology of management:

- *Managed Touchpoints:* are those realized by the same company, such as: stores, newsletters, and so on.
- *Unmanaged Touchpoints:* are those which are not realized by company but by other subjects voluntarily or not, such as: blogs, websites, word-of-mouth, and so on.

Therefore, the **current touchpoints** lead to development of another Customer Journey in which the border between online and offline is increasingly difficult to distinguish.

1. Research Online and Purchase Offline (ROPO): it is a widespread practice. The customer researches online information on what he desires, making comparisons and reading reviews. After that, he prefers to buy the desired products or services inside a store (offline).

2. Click and Collect: customer researches and buys online but he collects desired goods or services in the store, near home. This choice is done by customers in order to avoid additional costs in money and time, in terms of deliveries, delays and forced domestic waits.

3. *Try and Buy:* in this case, customer tries the product or service in the store to then buy online. Try and Buy is also called *Showrooming* exactly because the store became a sort of showroom of products or services. The practice "Try" is used also in order to touch and to see with own eyes the offer. The practice "Buy" is used in order to saved money because many times the online products or services have a lower cost.

Therefore, this latter Customer Journey is more articulated than the previous one. It is no longer a linear path, but it is dispersed by interruptions and deviations of these elements of contact between the company and the customers.

4.4.1. The Customer Journey Map

Just for the Customer Journey complexity, it is necessary for companies to form strategies based on a *Customer Journey Map*, a tool capable of giving an optimized and wider vision of customers. In particular, the Customer Journey Map will help companies to better focus their investments of company, thus allowing the planning about the interpretation and a prevision of the future customers' needs.

- *Objectives definition* allows to address the aim of this tool: what kind of is the target of the service and what to offer them.
- *Collecting data on Customer Experience* through surveys or interviews and *Monitoring* of the online presence and reputation of the company, and their social media.
- *Drawing a Map* in which the online and offline touchpoints interact with each other, during the decision phase. Gradually it will be implemented and perfected.
- *Map as a guide* in order to address every business action, especially the marketing ones. Moreover, it is important that every person inside the company is aware of this map, in order to make it more effective.

Therefore, the Customer Journey Map is a sort of photography of the customer which helps to understanding the customer's behaviour and regulating processes in order to trace and to manage every kind of activity within the Customer Journey. Furthermore, it is a useful method to maximize the customer satisfaction.

A customer can *abandon*, in every moment, his journey towards a brand and its product or service. The reasons of customer early leave are many: data breach, attraction towards competitive brands with their products or services, personal facts, change of interest, lack of trust, lack of transparency, bad user experience[114], shipping charges, bad customer service pre/post sale, dissatisfaction, difficulty with the payment method.

In order to solve the Customer Journey early leave, some companies are resorting to the implementation of some strategies, in which the analysis and interpretation of data are supported by provisioning systems. For companies it is important to listen to customers and to collect their feedbacks. A personalization of products and services offered and a reduction of time between the touchpoints, will help improving Customer Journey, creating a stronger bond with the customer, for better advocacy to friends and relatives.

4.5. NetBase: leading-edge technology

NetBase is an American platform specialized in Natural Language Processing (NLP) technologies, able to analyse the Social Media and Web contents.

It is defined as a *"fast, accurate and deep Social Analytics to drive a business"*[115].

NetBase Solutions Inc. was created around 2004 in Santa Clara, California by the innovative minds of Jonathan Spier and Michael Osofsky, two engineers of Ariba (now SAP Ariba).

The first company name was *Accelovation*, combination of the two words "acceleration" and "innovation", and after only four years it was changed into the current name.

Many global companies (only to mention some: CocaCola, Yamaha, Polo Ralph Loren, L'Oreal, Visa, CreditSuisse and others) is actually using it in order to manage brand reputation, to create companies and to connect them, in real time, with customers. This platform elaborates millions of Social Media posts and web materials at the same time, then uses the data to make analysis and detailed studies. The fast results deriving from this platform are very accurate and useful for market researches, customer service, sales, public relations and product innovation.

[114] *Bad User Experience* occurs when a consumer has difficulties in term of fluency of *web surfing* during the use of an e-commerce or a website using a device (smartphone, tablet or pc). This difficulty leads to not completing the payment of the product or service chosen online by the customer.

[115] NetBase: <https://www.netbase.com/>

In particular, NetBase is a Social Analytics platform able to offer some solutions[116], such as:

- *Improvement of Crisis Management:* a crisis is the worst nightmare for a company. The speed of Web contents diffusion does not allow distractions in the monitoring: the company readiness is fundamental to control every possible potential damage for its reputation.
- *Supporting of Campaign Performance:* it is necessary to have a deep knowledge of every aspect related to the target customers. because it allows to improve the performance campaigns, the awareness of the company and the involvement of potential customers.
- *Maximization of Product Launches:* companies use Customer Experience information to influence the strategy, the products portfolio administration and the development of new products, in order to increase their market shares and their revenues.
- *Decrement of Customer Care costs:* a company has a competitive advantage over the other ones, when they offer an expected customer service. A quality customer service is when there are right and well instruct collaborators who are able to identify and to solve all the customer's problems.
- *Protection of Brand Health:* thanks to Sentiment Analysis it is possible: to know what customers say, to analyse all sources, to identify any problems and to measure the customers loyalty level.
- *Increment of Customers Acquisition*: the research of customers attention and their engagement is increasingly difficult for companies. A functional option is to understand what and who influences customers. After that the relative segmentation and targeting focalization can lead to a customized Customer Experience.

Nowadays, NetBase is considered a leader platform in Social Media Analytics also because, in the last six years, it has earned almost twenty *certified awards* such as for example:

- *Top rated Social Media Management platform*
- *Forrester ranks NetBase a leader*
- *TrustRadius ranks NetBase at the top in Social Media Monitoring tools*
- *Featured in Reuters news*
- *Best in class: consumer Goods technology*
- *B2B Marketer of the year*
- *Next Generation Customer Experience*
- *Technology visionary Awards*

[116] NetBase: <https://www.netbase.com/>

- *Cool vendor*
- *Innovative information access company*
- …

According to the Chief Scientist Wei Li, NetBase is a very innovative platform able to bring out in a significant way, meaningful customers insights. In the past, it required days to understand some functions, but now, with some advanced options only a handful of minutes are needed. The depth and largeness of NetBase analysis is without equal. Indeed, always according to the Chief Scientist, NetBase is the most accurate, deepest, fastest and more granular text analysis technology of the sector. The customer-centric platform is also translated in more than 40 languages and it really helps every customer to identify his priority and the following steps.

The Social Insight, such as NetBase, can really impact on business decisions, becoming a winning weapon for the company which decides to use it.

The NetBase platform is able to offer some practical applications. In particular, there are three types of NetBase packets, each one focused on a specific study[117]:

NetBase Pro, NetBase Enterprise and NetBase Voice of the Customer.

1. **NetBase Pro:** is focused on ***Social Search and Insights***

It is an application useful to keep track of all variable opinions and behaviours of customers. Social Media are an extremely dynamic reality. This type of NetBase packet offers a powerful Social Analytics solution spending less time in making analysis and leaving more space to strategy formulation.

The great competitive advantage is linked to some key features such as:

- a deep and real time knowledge,
- the use of Natural Language Processing, so allowing to understand the meaning of unstructured texts written in almost 200 languages,

[117] NetBase: <https://www.netbase.com/>

- the use of Historical Data, beyond the actual data, allows to better understand the Customer Journey and all actions followed by companies, brands or industries. All in one analysis.

Voice of the Customer

Customer Experience Analytics

2. **NetBase Enterprise:** is focused on ***Social Listening and Audiences***

Fully understanding customers and their Journeys is a key element to have a good differentiation for companies. This type of analytics, beyond the increment of all revenues, reduces customer assistance costs. This type of NetBase packet offers:

- a single unified view of Customer Experience data from every possible digital source,
- accurate and clear Insights across the widest number of topics and languages,
- timely analysis.

NetBase Enterprise

Social Listening and Audiences

3. **NetBase Voice of the Customer:** is focused on ***Customer Experience Analytics***

The Customer Experience analysis required a huge quantity of data, that it will be transformed in useful data to guide strategic business initiatives. Companies need to a reliable and an innovative tool able to manage this quantity: we talk about millions of data.

4.5.1. NetBase Reviews

TrustRadius[118] is one of the most trusted review site of business technology: the site counts around 135 thousand of reviews made with over 400 words by more 50 thousand verified users. This site helps both the purchase process but also the acquiring process. TrustRadius serves Buyers, in order to help them make them better decisions based on unbiased and in-depth reviews, and Vendors, helping them to better understand their customer's voice thanks to advised platforms or tools. The founding value of TrustRadius is the transparency in order to help the users of technologic solutions to learn by their peers and to create a virtual place in which sharing the best company technologies.

Therefore, according to TrustRadius valuation, NetBase platform is considered a great and well-developed tool, which to obtain really meaningful data. The TrustRadius valuation is high, with a score of 8.6 out of 10.

NetBase is considered one of the most appreciated Social Media Analytics in circulation. Respect many others with similar characteristics, NetBase allows to reach some real results in term of:

- Monitoring and scanning of Web contents, so allowing to identify potential crisis in public relation.
- Identification of sector trends
- Data collection on competitors
- Identification of sale opportunities.

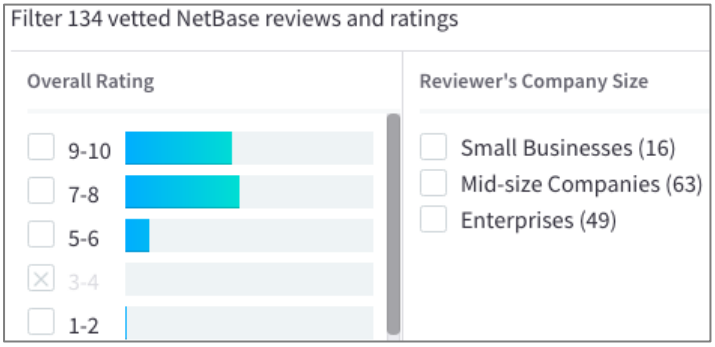


Figure 17 TrustRadius: < https://www.trustradius.com/>

In TrustRadius, the users' reviews are more than one hundred, made by a great sample of mid-size companies, followed by big companies. There is only a little part of small company reviews, this because this kind of advanced platform, such as NetBase, are

[118]TrustRadius: < https://www.trustradius.com/>

expensive and perform better with a lot of data. The typologies of target companies are in line with those which purchase NetBase.

According the users' reviews, dated between 2016 and 2017[119], NetBase has many positive aspects but also some negative ones. In the following tables are reported the most frequent aspects.

POSITIVE ASPECTS	NEGATIVE ASPECTS
- Good graphic interface, the design visualisation is very appreciated - Deep data mining, the platform is able to extract millions of data - Deep segmentation, able to identify in specific way all customers characteristics - Easy to use, it is a real competitive advantage for NetBase. - Ongoing innovation in the available option - Discrete speed in loading data and also in its updating - A great customer service support in case of problems - Good quality of data deriving from analysis.	- The assigned sentiments to posts, mentions sometime are not so precise - The time of loading for some functionalities can be improved - Required specific skills in the platform installation - The private posts are not visible for Netbase analysis, so losing a lot of data - Necessity of some tutorial videos to better understand some functionalities - The NetBase price is very high - Required a lot of time to really learn all the NetBase functions.

[119] TrustRadius: <https://www.trustradius.com/>

4.6. Estilos: the only one Global Channel Partner of NetBase in Europe

NetBase has a broad network of good social platforms, integration and channel partners, which help it to extend its business value to important companies and brands around the world. The NetBase partnerships represent a huge range of leader companies in the sector of technology, solutions and services.[120] The partnerships are founded on collaborations aimed at understanding what customers are saying in social setting in order to help their companies grow with faster and more informed decisions.

NetBase has two types of partnerships:

1. *Integration partners:* NetBase platform integrates the market leading business intelligence with social marketing solutions, offering a complete and a real time business vision to customers. The NetBase aim is to render his partners, and consequently their customers, more aware about decisions and helping them to increase revenues.
2. *Global Channel Partners:* they are fundamental for NetBase to extend the international diffusion of the platform, so bringing the additional value worldwide. In particular the sales and marketing network are present in North America, Latin America, Asia and Europe.

In Europe, currently, the only partner is the Italian company **Estilos**[121].

Estilos is a Strategic and Information Technology consultant company, specialized in Customer Relationship Management and Management Systems. It is founded in Mestre, city near Venice, in May 2005 by four business partners. The company location is not a random choice, but it was well thought: Mestre is in the prosperous territory of the so called North-East Italian locomotive.

At the beginning, Estilos was born as spinoff of a big European project, focused on CRM and it projected by SAP. According to this trace, the starting company aim was based on *front-end processes* (Estilos was one of the first companies in Italy to adopt this kind of approach, indeed at the time, many companies' approaches were only back-office) such as: the management and organization of what regards all the interface operations with the customer and analytic management of data.

[120] NetBase: <https://www.netbase.com/>

[121] Estilos: <http://www.estilos.it/>

With the course of time, Estilos is remained an *innovative and leading-edge company*. Therefore, the current main activities are the following ones[122].

- At the base, Estilos always offers *front-end processes* and solutions to companies, but also it drives companies in their *Digital Transformation* path and it introduces innovative models supporting marketing, sales, service and social processes.
- Estilos helps companies in the management of *structured and unstructured processes* through engagement tools in collaboration with the company (together with its employees, its customers and eventual channel partners). In this way, it is possible to render visible the "Customer Voice" in the Customer Journey.
- In Estilos there are some data scientists, whom aim is to tailor *Algorithms* on *Artificial Intelligence* and *Predictive Analysis*, in order to reach important, concrete, and measurable results helpful for the customer or product multi-channel recommendation systems.
- Estilos supports *B2B and B2C companies*, approaching the consumer market through *e-commerce channel*. This channel is integrated with Social Network and it is implemented with a system in which the communication and collaboration are only in one.
- By means of data visualization tools, Estilos is able to trace and to display *Customer Journeys* through different channels and touchpoints. The interactions, conversations and interests traced, are then transformed in sales and promotion contents. The analyzed commercial targets will be useful in order to identify the new micro-markets with high profitability.

Nowadays, Estilos, thanks to its being more and more a *leading-edge company*, boasts collaborations with big national and international companies, some examples are: Coop, Angelini, Scame, Prodir, Lavazza, ABS and others well-known.

[122] Estilos materials: <http://www.estilos.it/>

4.7. A Sentiment Analysis practical case with the use of NetBase

NetBase is the innovative platform used to make the Sentiment Analysis business case.
It is from here, that the title of thesis was born:

"Crm and Sentiment Analysis, the supporting role of leading-edge technologies"

The business case concerned to make an analysis, on behalf of an Estilos' customer, on three different topics. Some details:

- *Estilos' customer* is an international company, leader in the sector of electrical solutions.
- *NetBase* is the Social Analytics platform used to make the Sentiment Analysis. In particular the version used is: "NetBase Enterprise, Social Listening and Audiences".
- *Estilos* is the only one Global Channel Partner of NetBase in Europe, therefore, Estilos is expert in the NetBase use.
- The commissioned analysis is focused on three topics regarding three sectors in which the Estilos' customer is involved as electric materials *supplier*.
- The *topics* on which to work are: Electrical Vehicles, Electric Materials and Explosion-Proof.
- The *analysis aim* is to trace the interests of people and companies, and to intercept the useful contents related to each topic. In particular, for each one, it is fundamental to understand these general points:
    1. How much it is spoken about the topic
    2. Who talks about the topic
    3. What is the Sentiment involved
    4. Who are the main influencers of the topic
    5. What are the main used channels
    6. What are the main problems and issues
    7. What are the main geographic areas involved
    8. What are the treated brands
    9. What are the main conversation about the topic.

The Sentiment Analysis was required by Estilos' customer on the following three *topics:*

Electric Materials: this topic is the contest of reference for the Estilos' customer market.

Electrical Vehicles: this topic is very important to analyse because Estilos' customer is an electric materials supplier, which they are useful for some Electric Vehicles. Moreover, the analysis of this topic is also done in order to understand many trends and news of the moment, seen the technological innovation of the last years.

Explosion-Proof: Estilos' customer is also an explosion-proof materials supplier for some companies. This kind of material represents a *niche* market.

The analysis on the topic that will be reported below, it is the largest and most detailed analysis among the three topics requested. The topic chosen for the thesis case is *Electrical Vehicles*.

The Sentiment Analysis done with NetBase, the Social Media Listening platform, is composed by different phases and steps.

NetBase allows to intercept all Web contents in the complex phase of *"Sound Buzz"* of the Customer Journey. This stage is very rich of countless customers data before the contact between the customer and the company (with a sale for example). The data found can be considered as customers digital footprints along a path.

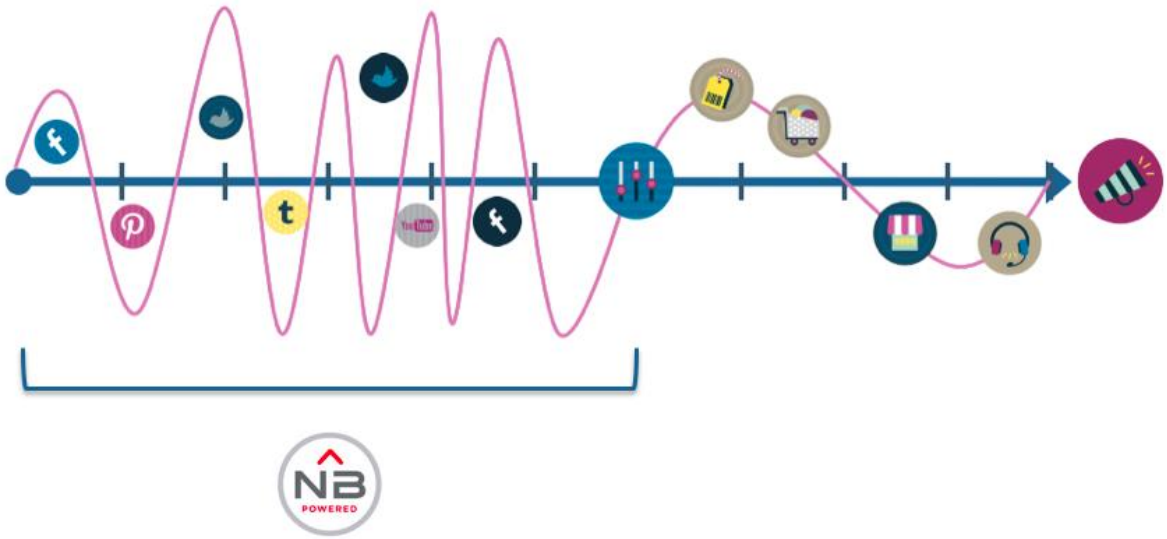


Figure 18 *NetBase Analysis in the Customer Journey*, Source: Estilos materials http://www.estilos.it/>

The following table is a summary of the researched objectives with the relative analysis. In the right side of the table, corresponding Widget of NetBase, in order to better understand the analysis done.

RESEARCH	USE CASE	WIDGET NETBASE
How much it is spoken about it	AWARENESS ANALYSIS	Summary Metrics, Word Cloud
What are the treated Brands	BRAND ANALYSIS	StoryScope
What is the Sentiment involved	SENTIMENT ANALYSIS	Sentiment, Sentiment Drivers, Word Cloud, Brand Passion Index
What and Where are the main used channels	DIGITAL ENVIRONMENT	Sources, Domains, Geo Regions, GPS Locations
Who talks about it	INFLUENCER RANKING	Demographic, Authors
What are the main conversations	CONVERSATIONS ANALYSIS	Stream
What are the main issues	CATEGORY ANALYSIS & PRODUCT INNOVATION	Stream, CrossTab

Table 2 *Summary of Practical Case Analysis*, Framework of own elaboration

4.7.1. First phase: the creation and definition of the Topic

The first phase involved the creation of the Topic followed by the insertion of all the indispensable parameters to circumscribe the analysis perimeter: it responds to the necessity to know how much are the conversation volumes about Electric Vehicles.

In NetBase platform in the *Header* (which it is the highest part of a site), there is a *Top Menu*, composed by many functional buttons. The button interested in the definition of the first phase of analysis is *"Topic"*. As the same word implies, it is the NetBase part in which the topic, in this case *Electrical Vehicles*, is set up. The topic definition involved two under-settings: Global Settings and Keywords which they permitted filters application. On this data setting will follow the data cleaning.

The *Global Settings* section is composed by some filters such as:

- *Data range*: it is the sub-section in which there is the time definition, useful for the analysis: in this case the time evaluated has a range of three months. Generally, NetBase allows a continuous monitoring period with a range from the current day to maximum of 27 past months. It is also possible analysed a specific time period.

- *Languages:* it is the sub-section in which are indicated the languages of reference for the analysis. In this case the languages contemplated are Italian and English. The linguistic comprehension is very accurate.

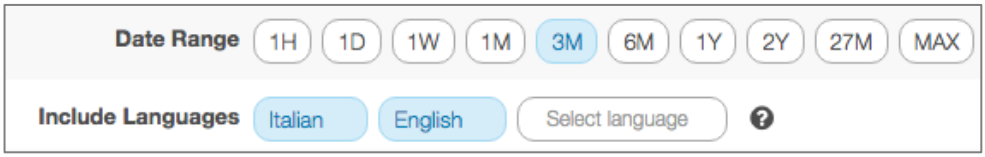


Figure 19 NetBase analysis executed on *Electric Vehicles* topic: *Data Range and Language*

The *Keywords* section is composed by:

- *Primary Terms:* it is the sub-section in which terms, brands name, products category, acronyms, synonyms, common misspellings and hashtags are the keywords that represents the principal and indispensable focus of the analysis. Considering the topic of Electric Vehicles, some primary terms are for example: electric vehicles, wall-box, charge, #ev and so on.

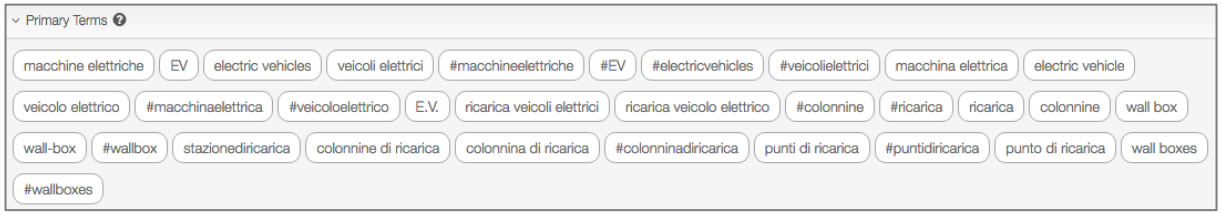


Figure 20 NetBase analysis executed on *Electric Vehicles* topic: *Primary Terms*

4.7.2. Second phase: data cleaning of the Topic

After the definition and setting of all the data parameters necessary for the Sentiment Analysis, the second phase involves the data cleaning. This is the longest phase of all ones the analysis process and it requires a lot of patience and accuracy in the filtering data. It is really a meticulous and laborious work.

Always in the *Keywords* section, there are useful functionalities for data cleaning:

- *Exclude Authors, Exclude Domains* and *Exclude Terms:* these are the sub-sections where it is possible to see all data cleaning. All terms, authors and domains individuated and sectioned, contaminate the results of analysis. It is possible to analyse every single source in order to understand if is the case to exclude or not it from the analysis. Generally, all "dirty" sources are referred to wrong meanings, errors and misleading words, which they have the power to influence the analysis. Therefore, they must be excluded from the analysis: the scope is always to have a more reliable and correct analysis possible.

4.7.3. Third phase: the basic analysis of the Topic

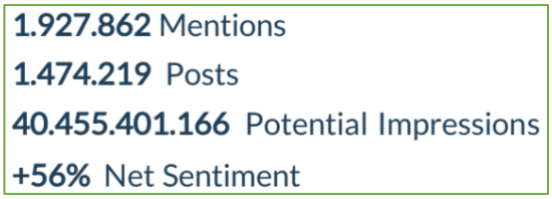
After the long and meticulous work of data cleaning, the third phase involved the analysis of the basic components of the chosen Topic. This phase responds to the necessity to know what are the treated Brands, what and where are the main used channels, what are the main conversations, what are the main issues and who talks about Electric Vehicles.

In NetBase platform, always in the *Top Menu* of the *Header*, the interested button in the definition of the third phase is *"Analyze",* where are present all the useful sections for the topic Analysis.

Therefore, the sections involved in the analysis of Topic "Electric Vehicles" are:

- *Summary metrics:* is the section where are reported, in graphic way, the first results of the research on the Electric Vehicles.

  Therefore, according the results of the research done on Electric Vehicles between the February and April 2018, NetBase has measured millions (as it is reported in the image below) of Mentions, Posts, Potential Impressions and a positive Net Sentiment: the volume and the intensity of the online discussion around Electric Vehicles is very wide and intense.



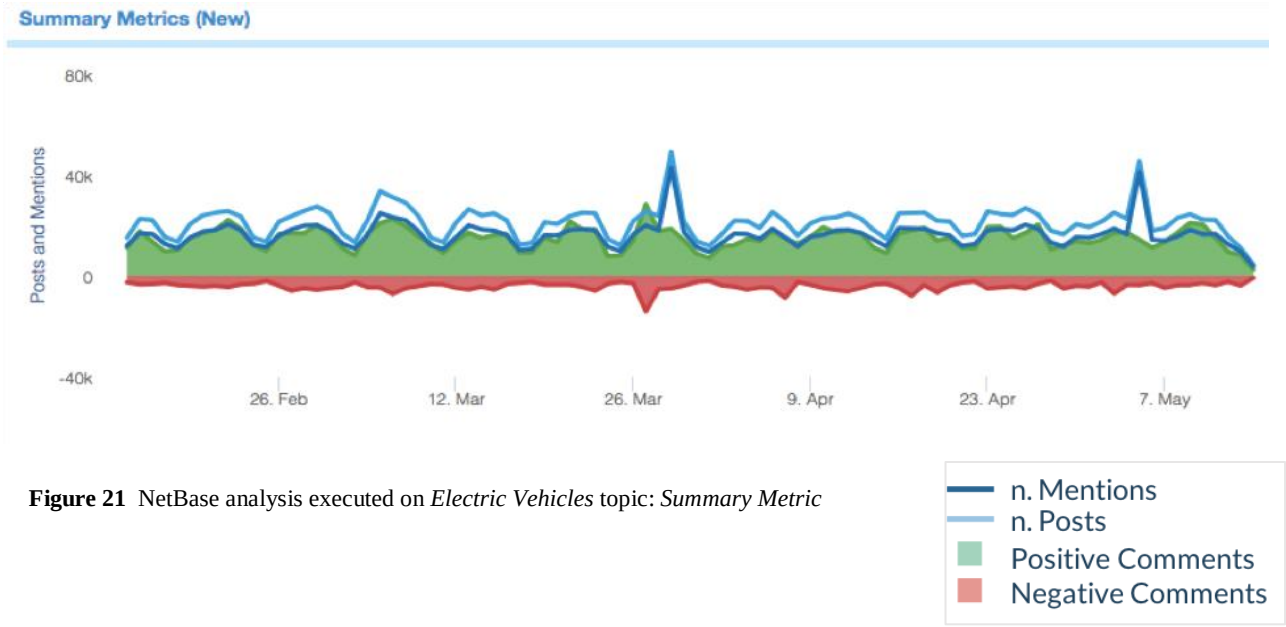


Figure 21 NetBase analysis executed on *Electric Vehicles* topic: *Summary Metric*

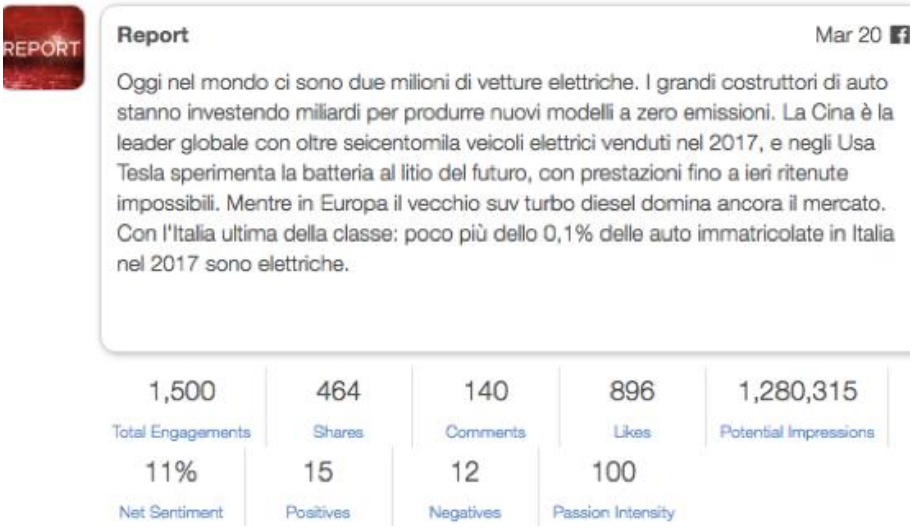


Figure 22 NetBase analysis executed on *Electric Vehicles* topic: *Summary Metric post*

- *World Cloud: Terms and Hashtags:* is the section where cloud-shaped graphs, are found, composed by the most used Terms and Hashtags in the Electric Vehicles topic. Therefore, according to the results of the research done on Electric Vehicles, the resulting Terms and Hashtags are completely in line with the topic. The demonstration arrives by the same charts.

- The *Terms* most used are: Vehicles, Tesla, Ev, Charging, Power.

Figure 23 NetBase analysis executed on *Electric Vehicles* topic: *WordCloud Terms*

- The *Hashtags* most used are: #ev, #electricvehicles, #tesla, #electriccars, #battery.

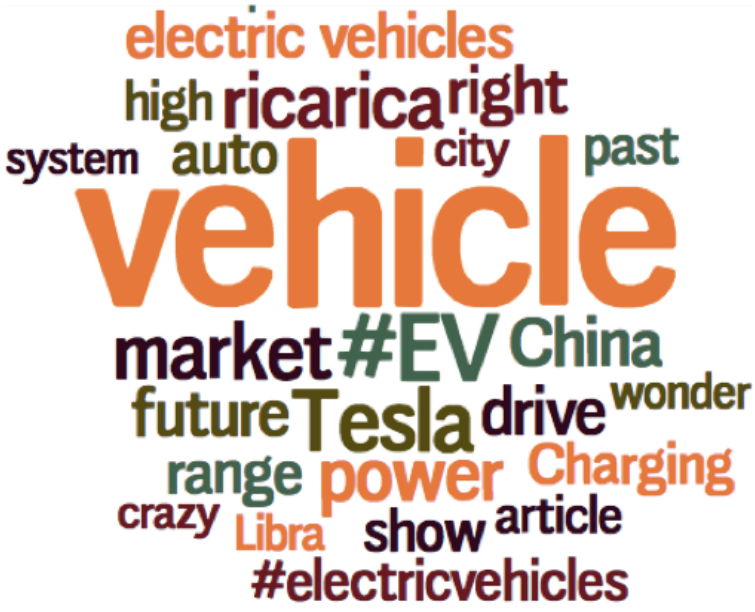


Figure 24 NetBase analysis executed on *Electric Vehicles* topic: *WordCloud Hashtag*

- *StoryScope: Brands treated:* in this NetBase section, the circle chart highlights the most mentioned brands in the Electric Vehicles analysis: wider is the brand section in the chart, more is the number of mentions.

Therefore, in the business case the most mentioned brand is *Tesla* with 65, 000 mentions in only three months.

Between the most mentioned brands there are also: *Nissan, BMW, Honda, Porsche, Volkswagen, Ford, Mercedes-Benz, Toyota* and so on. The huge number of mentions of these car companies is linked with the launch of some new Electric Vehicles.

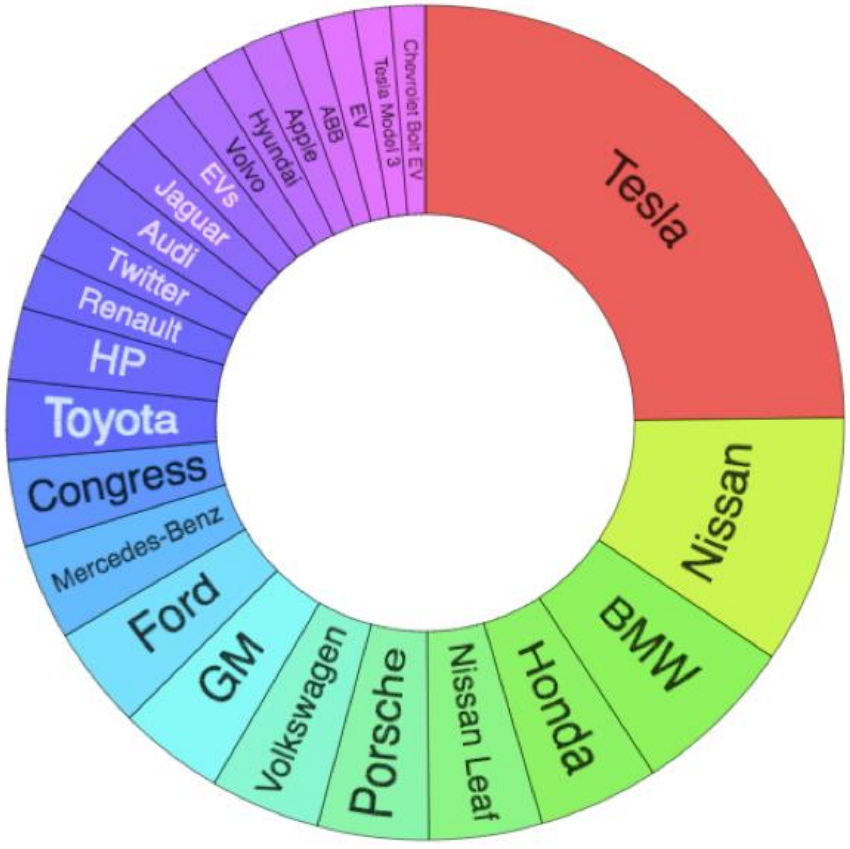
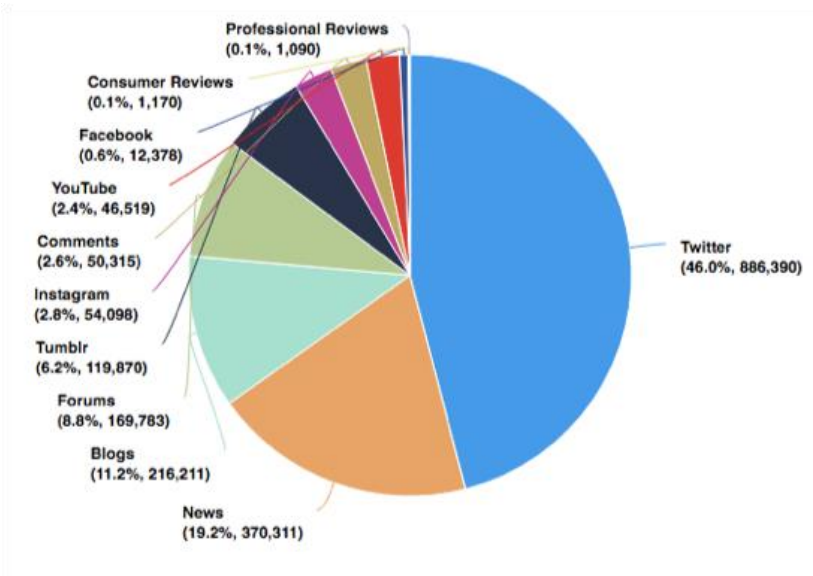


Figure 25 NetBase analysis executed on *Electric Vehicles* topic: *Brands StoryScope*

- *Sources and Domain:* in these two NetBase sections, the focus is addressed towards sources and specific domains from where information and discussions around the topic take origin.

  Therefore, the *digital environments* involved, from which all the information flow on Electric Vehicles derived, are:

- *Twitter* with 46% of mentions
- *News* with 19% of mentions
- *Blogs* with 11% of mentions
- *Forums* with 9% of mentions
- *Tumblr* with 6% of mentions



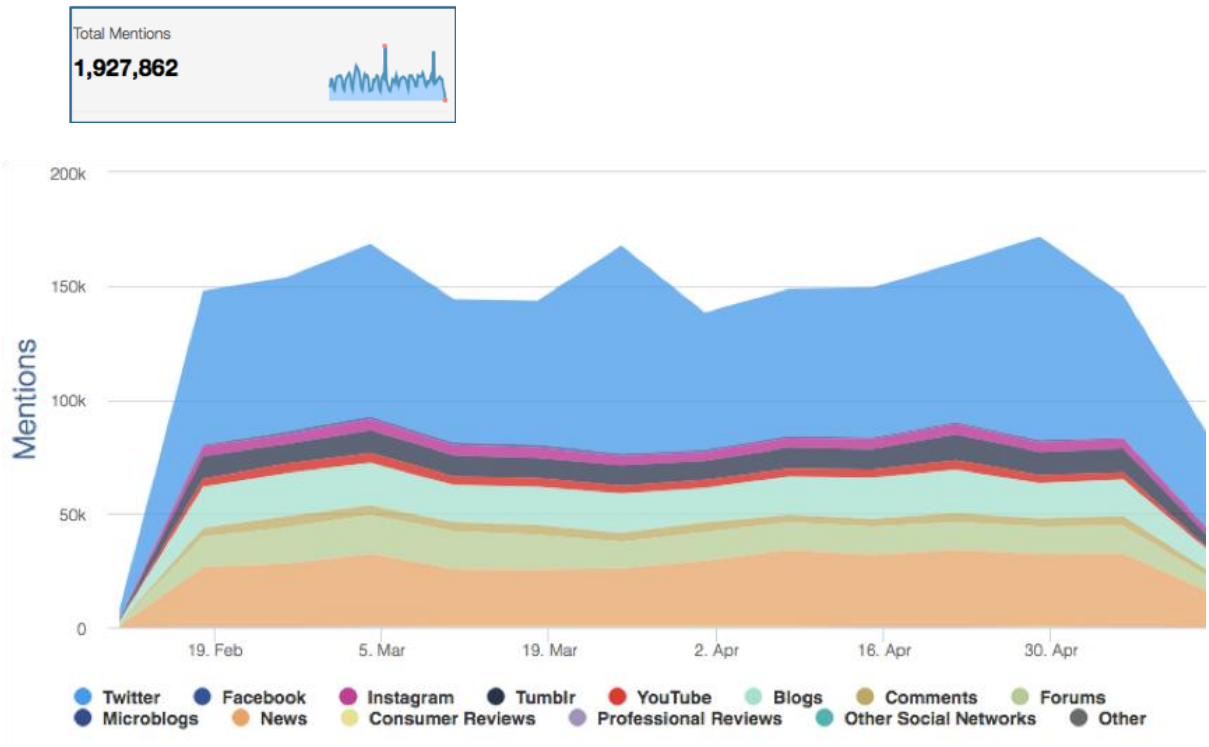


Figure 26 NetBase analysis executed on *Electric Vehicles* topic: *Sources*

The *Domains* in the analysis correspond to all Social Networks, Blogs, News and Forums used by people to talks and to discuss on topic.

Therefore, it is spoken a lot of Electric Vehicles in some specific domains:

- News
- Specialized industry pages
- Inspirational or trendy blogs, such as: *Medium.com*
- Websites Specialized in Finance, such as: *4Traders.com* and *Financialbuzz.com*
- Alternative Social Media, such as: the American *Reddit.com*

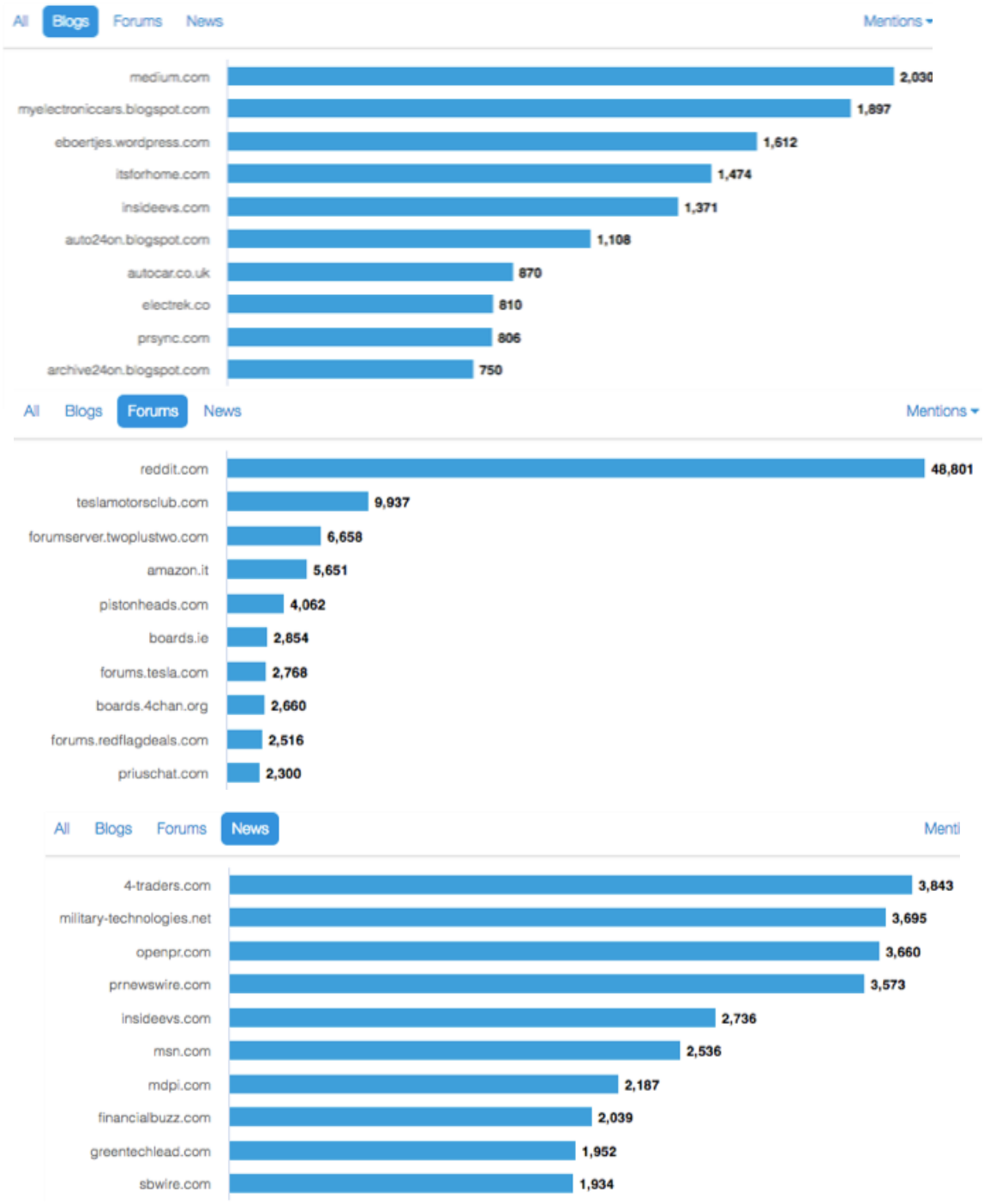


Figure 27 NetBase analysis executed on *Electric Vehicles* topic: *Domains: Blogs, Forums, News*

- *Demographics:* in this NetBase section, the focus is addressed towards who really are people who talk about the topic: their age, sex and professions.
  Therefore, the public who talks about Electric Vehicles has a good *male* presence, around 67%, and it is collocated around two age range: 25-34 years old and 55-64 years old. This adult male population is passionate and very attentive to the Electric Vehicles issues. Their professions are in line with the expectations: Art Creative, Sales and Marketing professionals, technologic professionals, experts of Blog and a large part of professionals in the financial sector.

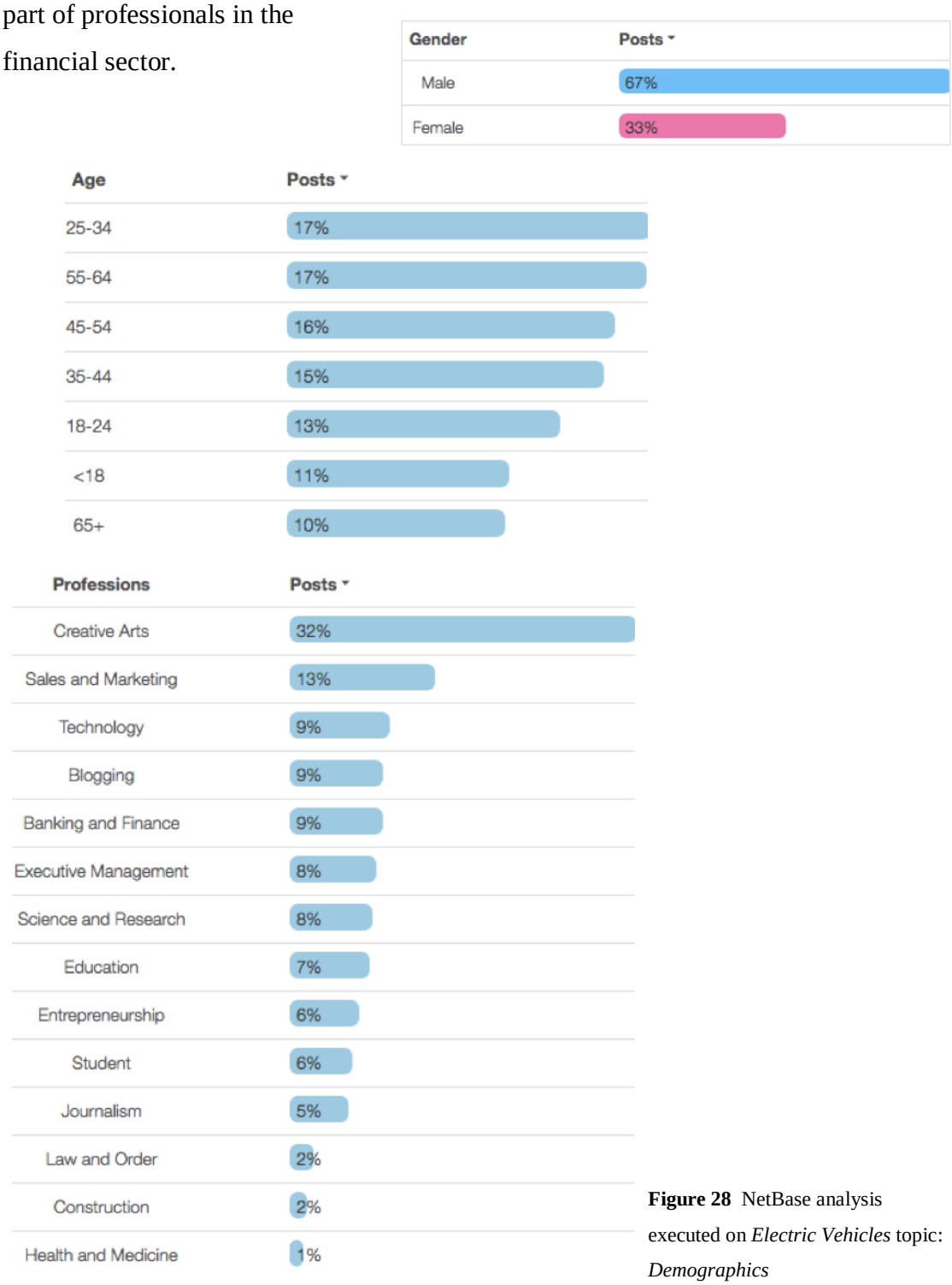


Figure 28 NetBase analysis executed on *Electric Vehicles* topic: *Demographics*

- *Geo Regions and Language:* in these two NetBase sections, the focus is addressed towards the analysis of what are the countries and the languages where conversations happen. Therefore, the two considered languages for the analysis are: *Italian* and *English*.

Language	Posts	Share
English	1,377,761	93%
Italian	96,877	7%

In Europe, the *geographic areas* active in the Electric Vehicles discussions are:

- *United Kingdom* with 44% of mentions
- *Italy* with 27% of mentions
- *Germany* with 7% of mentions
- *France* with 4% of mentions
- *Spain* with 2% of mentions

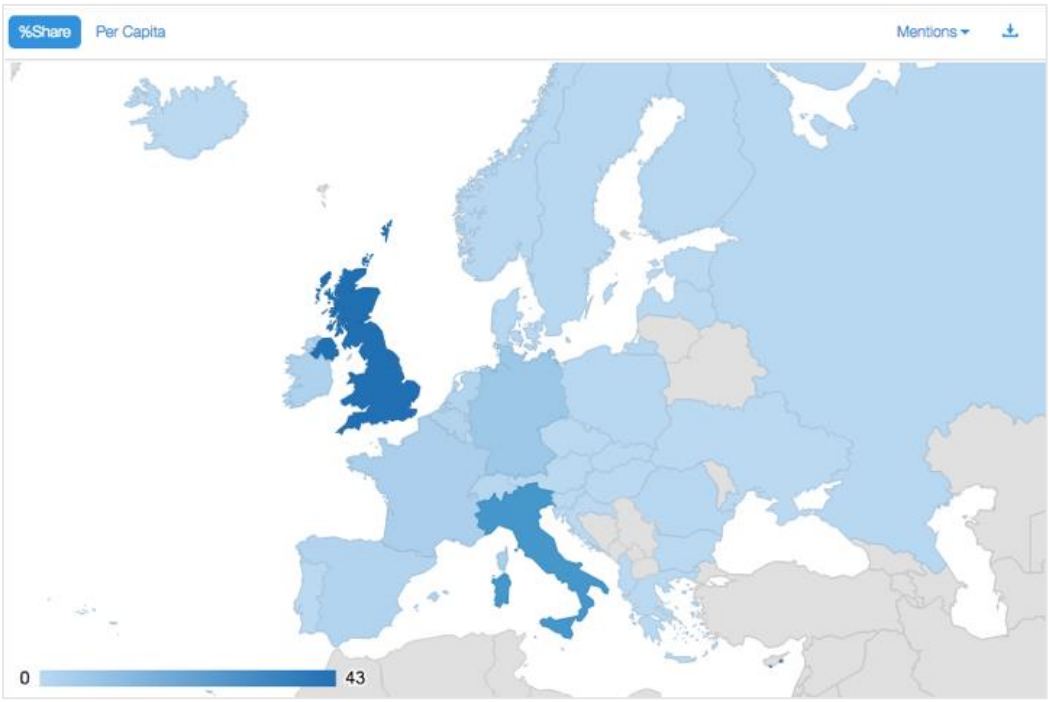


Figure 29 NetBase analysis executed on *Electric Vehicles* topic: *Geo Regions* and *Languages*

A discovered curiosity during the analysis, derived by many posts and mentions of the United Kingdom (44%). The issue regards the new London trend: inside the already existing street lamps researchers are installing charging systems for Electric Vehicles.

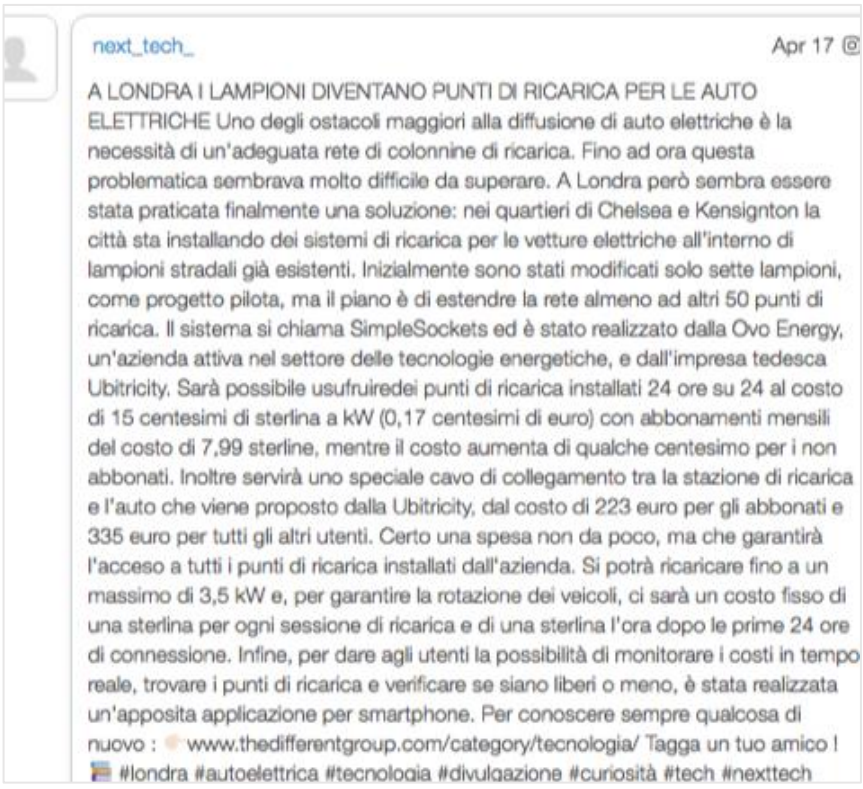


Figure 30 NetBase analysis executed on *Electric Vehicles* topic: *Geo Regions and Languages*

- *Authors:* this NetBase section explains who are the Top Authors who talk about the topic, so generating discussions and engagement around Electric Vehicles topic. Therefore, the most influent authors are News Websites, passioned bloggers and technologic experts in Electric Vehicles. Given the Top Ten Authors in the table below, there is been chosen one influencer between them, who it is constanly updated on the new market trends, followed and considered by virtual population.

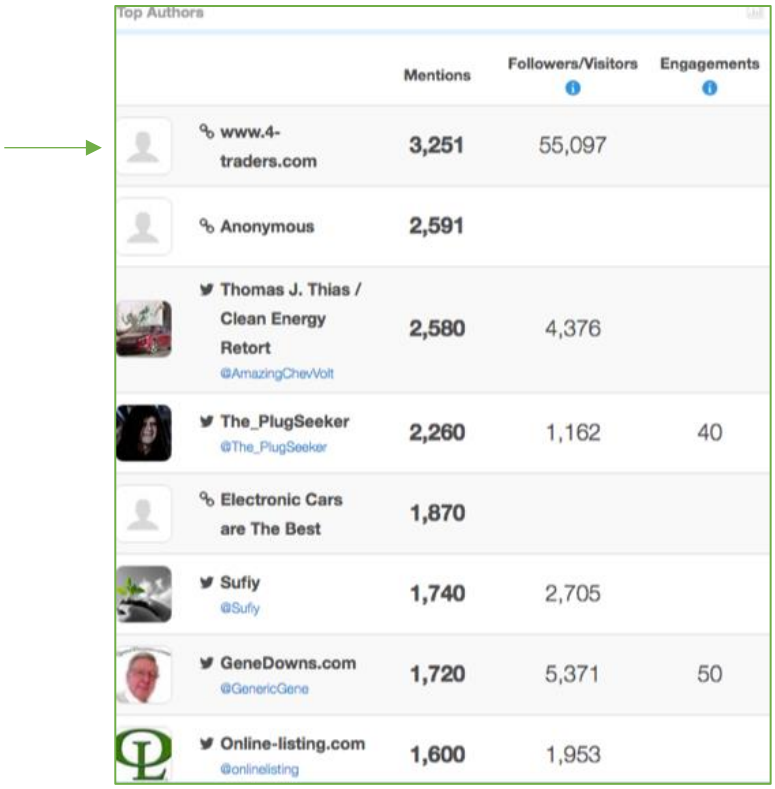
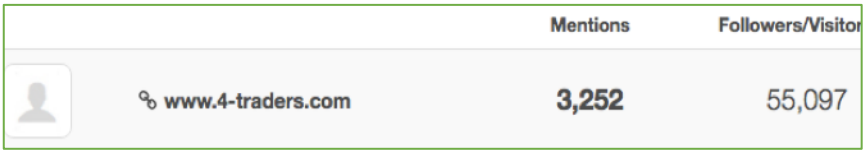


Figure 31 NetBase analysis executed on *Electric Vehicles* topic: *Authors*

The considered influencer is a News website, particularly active in the Electric Vehicles environment: *4TRADERS.COM*. The website is continuously updated, and it presents a strong positive index in terms of public engagement.



Also, the Twitter account of *4-trader.com* is extremely active even counting more of one million of Tweet linked to current news.

Figure 32 NetBase analysis executed on *Electric Vehicles* topic: *Authors*

Going deeper with the analysis, many posts are related both to negative aspects and positive aspects of Electric Vehicles topic:

- The *cost* of Electric Vehicles is higher than the traditional ones.
- The *batteries*, giving their engineering complexity, are very expensive.
- It is expected an exponential increase of Electric Vehicles, in the global market.

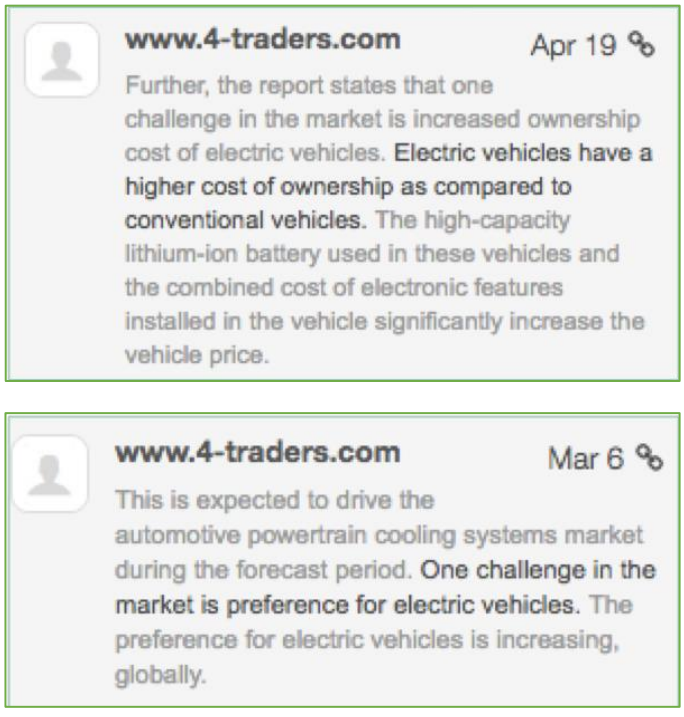


Figure 33 NetBase analysis executed on *Electric Vehicles* topic: *Authors*

- *Stream: Conversation Analysis:* this NetBase section shows all the conversations around the topic, considering every kind of expressed sentiment (positive, negative, neutral). From the analysis are emerged some curiosities and considerations on Electric Vehicles.

  A curiosity:

  A frequent theme in posts and mentions regards an innovative idea of Nissan and its subsidiary 4R Energy Corporation: a Japanese project which should revolution the concept of sustainable public lighting. The latter is a new kind of external lighting called *"The Reborn Light"* allowing its functioning in independent way from sockets and plugs. This can take places thanks to the support of solar panels and old batteries of Electric Vehicles, which they are increasing.

Figure 34 NetBase analysis executed on *Electric Vehicles* topic: *Stream*

Some considerations about Electric Vehicles:

Going deeper into the analysis on Electric Vehicles, some considerations emerged:

- It is a developing market: in Europe the Nordic countries are the biggest users with well-defined charging stations. While Italy is still far behind.

- Currently, China represents the driving nation in Electric Vehicles: it is one of the major EV markets both in terms of production and use. Moreover, China has a large amount of Charging Stations in all its public territory.
- Electric Vehicles are perfect for moving in city, they can go everywhere.
- Electric Vehicles are eco-friendly. And It is very appreciated their silent motor.
- The limited autonomy of batteries requires continuous *pit-stop.*
- The charging time of Electric Vehicles requires many hours before a complete charge.
- The need to have more charging columns scattered throughout the territory.
- The charging columns are very expensive.
- The stations charging require huge connections to electrical grid.

- *CrossTab:* this NetBase section is useful to valuate possible strategies in the field of Electric Vehicles. The CrossTab is an advanced function able to make a cross analysis between data deriving from the Topic and data deriving from chosen themes. The chosen themes are following six:

Figure 35 *Chosen Themes for the CrossTab,* Framework of own elaboration

Inside the Electric Vehicles topic, on a total of almost 558,000 mentions, the most recurrent themes are Green Vehicle, with more than half of mentions, and the theme of "Energy".

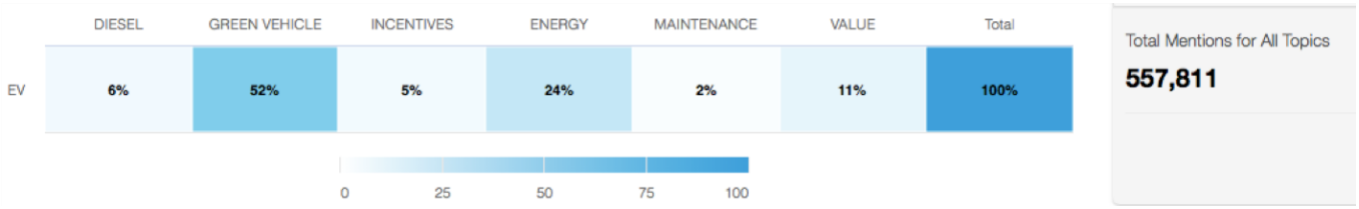


Figure 36 NetBase analysis executed on *Electric Vehicles* topic: *CrossTab*

4.7.4. Fourth phase: the Sentiment Analysis of the Topic

The Social Analytics, after identifying all the basic components of analysis, goes to intercept people's emotions, opinions and sentiment polarity presented in the Web contents. The focus of the business case is the Sentiment Analysis, where three different sentiments are reached.

 Positive  Neutral  Negative

There are many sections in NetBase able to measure the online sentiment of the search topic:

- *Sentiment:* is the section where are located circular charts, which function is to give a graphic overview of sentiment of the involved analysis.

  The first is a pie chart, which it identifies, in clear way, the percentages of positive and negative sentiment expressed in the Web contents, towards the topic of Electric Vehicles.

  - The *positive sentiment,* identified in red, has a higher percentage: 78,2% equivalent to more 134,000 mentions.
  - The *negative sentiment,* identified in green, has a percentage of 21,8%, equivalent to more 34,000 mentions.
  - The *Net Sentiment* is positive, and it reaches 56%. It derives from the difference between the positive and the negative percentages.

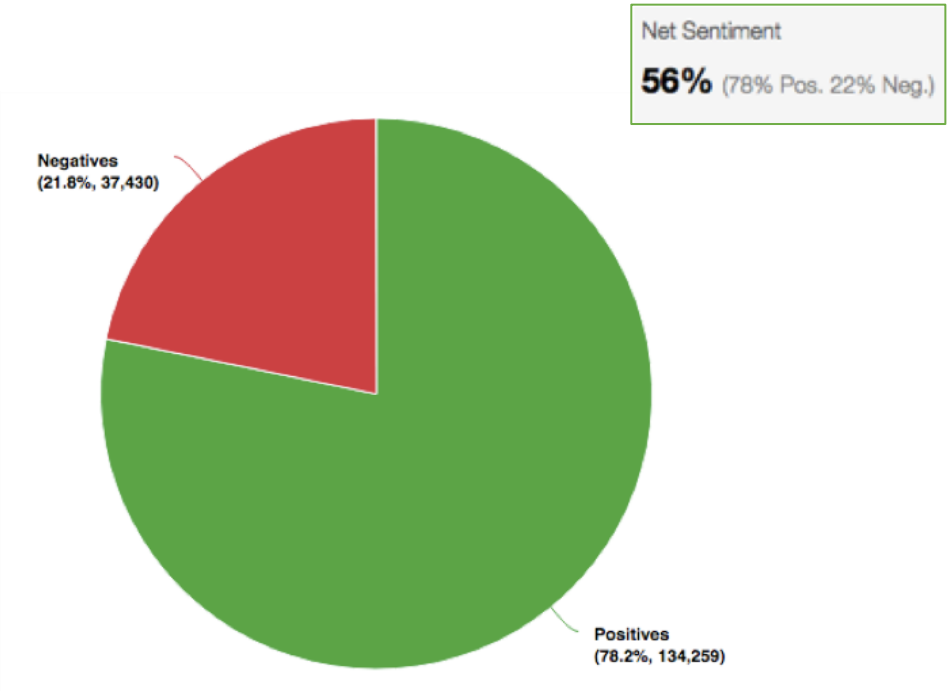


Figure 37 *NetBase* analysis executed on *Electric Vehicles* topic*:*

Positive and Negative Sentiment in Pie Chart

The second chart derives from *StoryScope*, a NetBase function. This typology of chart puts together two kinds of information: the sentiment polarity and the main words used in relation to each sentiment. In this chart, beyond the positive and negative sentiments, is present the neutral one.

😐 Therefore, in the Electric Vehicle topic, when all three types of sentiments are reported, the *neutral* sentiment is present for almost the whole data: 91,1% equivalent to 1,8 million mentions.

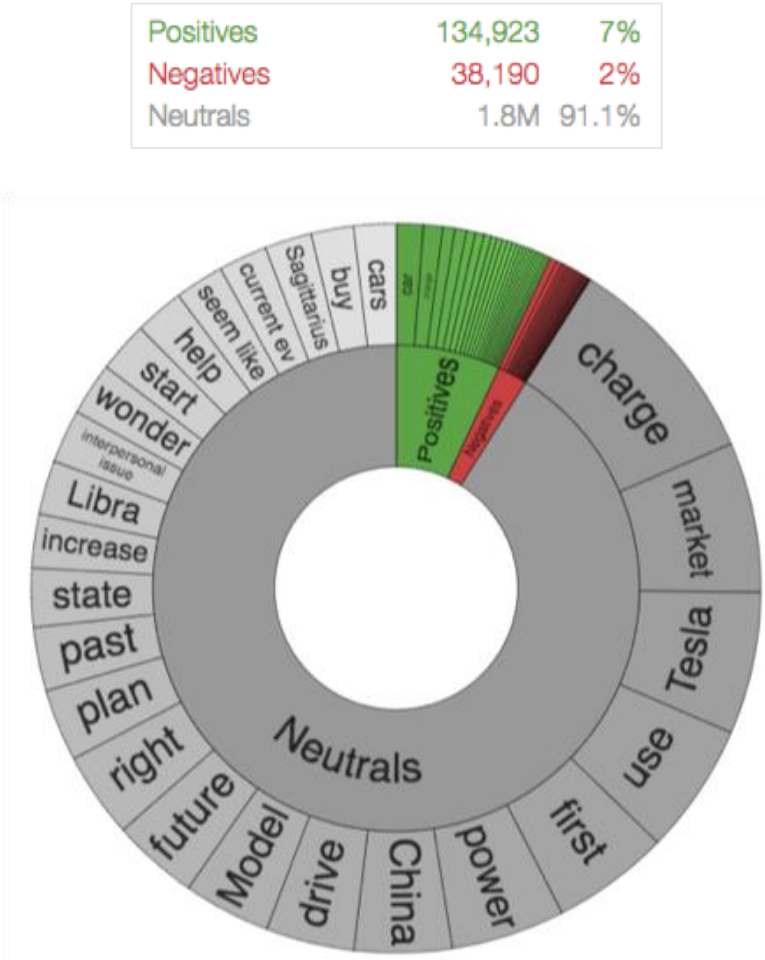


Figure 38 NetBase analysis executed on *Electric Vehicles* topic: *Neutral StoryScope*

Thanks to this kind of chart, it is possible to make a deepened study both on positive but also on negative sentiment, the two feelings that express something precise: customers opinions is really an interesting issue for every company, furthermore listening the Voice of customers could lead to curious market trends.

The *positive* sentiment in the Electric Vehicles topic is identified with emotions like *Happiness* and *Confidence*.

Dropping into the topic of Electric Vehicles, these positive emotions are generated by:

- a greater awareness of people in terms of environment sustainability
- peculiar characteristics of some Electric Vehicles such as: the silent motor, modern lines and reduced consumption.

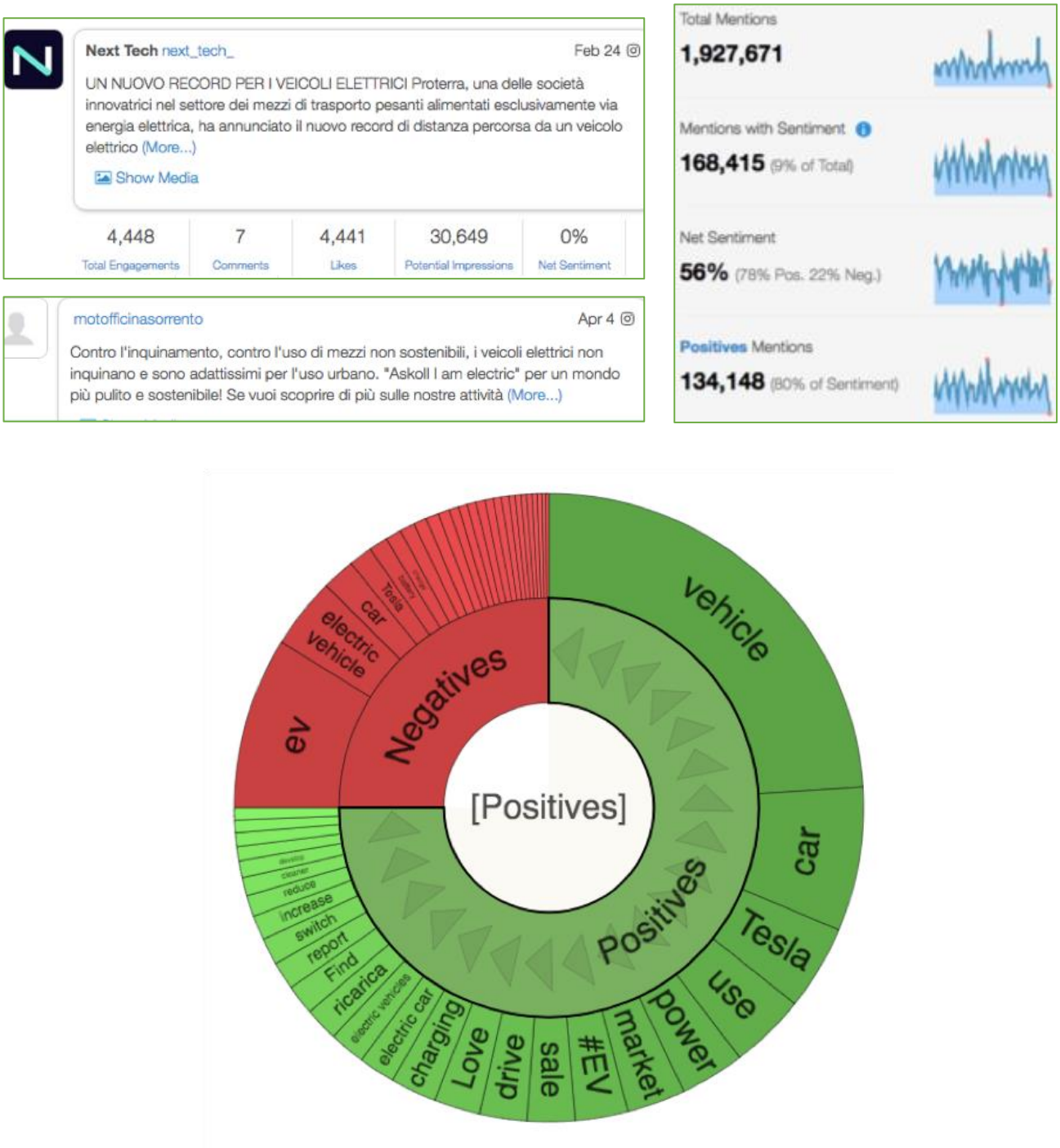
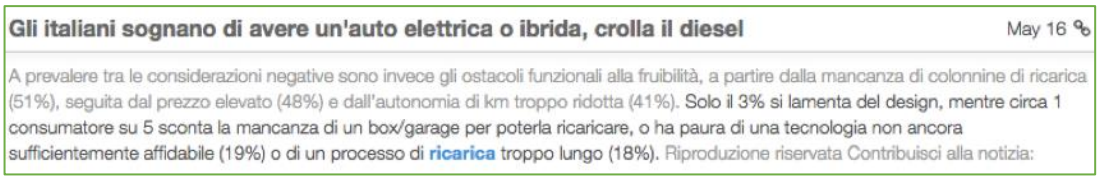


Figure 39 NetBase analysis executed on *Electric Vehicles* topic: *Positive StoryScope*

☹ The *negative* sentiment in the Electric Vehicles topic is identified with emotions like *Sadness* and *Anger*.

Dropping into the topic of Electric Vehicles, these negative emotions are generated by:

- high prices of Electric Vehicles
- problems related to battery charge
- autonomy limitations
- scarcity of refuelling points.


Gli italiani sognano di avere un'auto elettrica o ibrida, crolla il diesel May 16

A prevalere tra le considerazioni negative sono invece gli ostacoli funzionali alla fruibilità, a partire dalla mancanza di colonnine di ricarica (51%), seguita dal prezzo elevato (48%) e dall'autonomia di km troppo ridotta (41%). Solo il 3% si lamenta del design, mentre circa 1 consumatore su 5 sconta la mancanza di un box/garage per poterla ricaricare, o ha paura di una tecnologia non ancora sufficientemente affidabile (19%) o di un processo di **ricarica** troppo lungo (18%). Riproduzione riservata Contribuisci alla notizia:

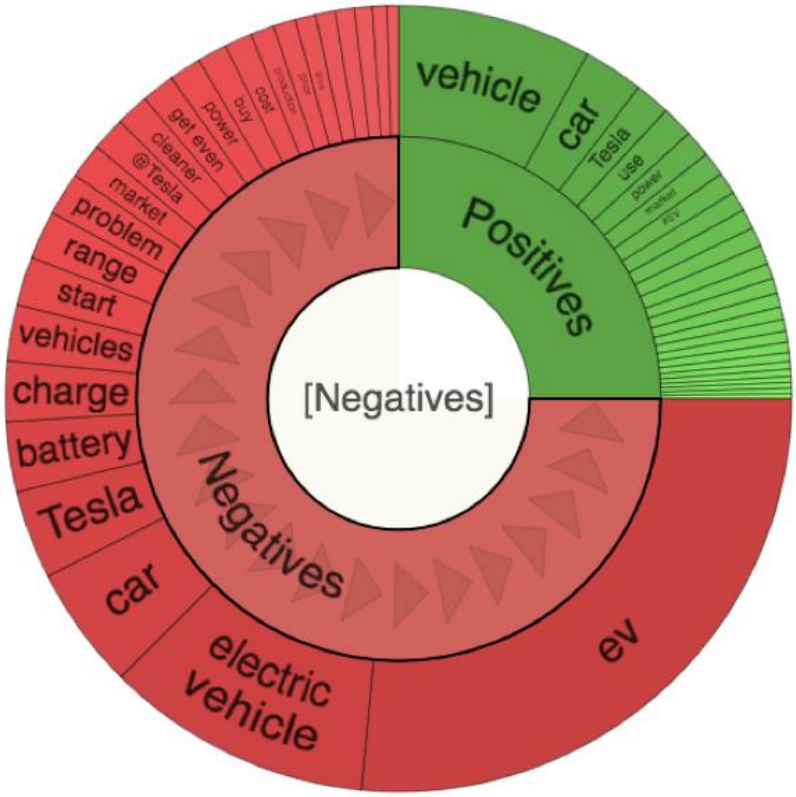


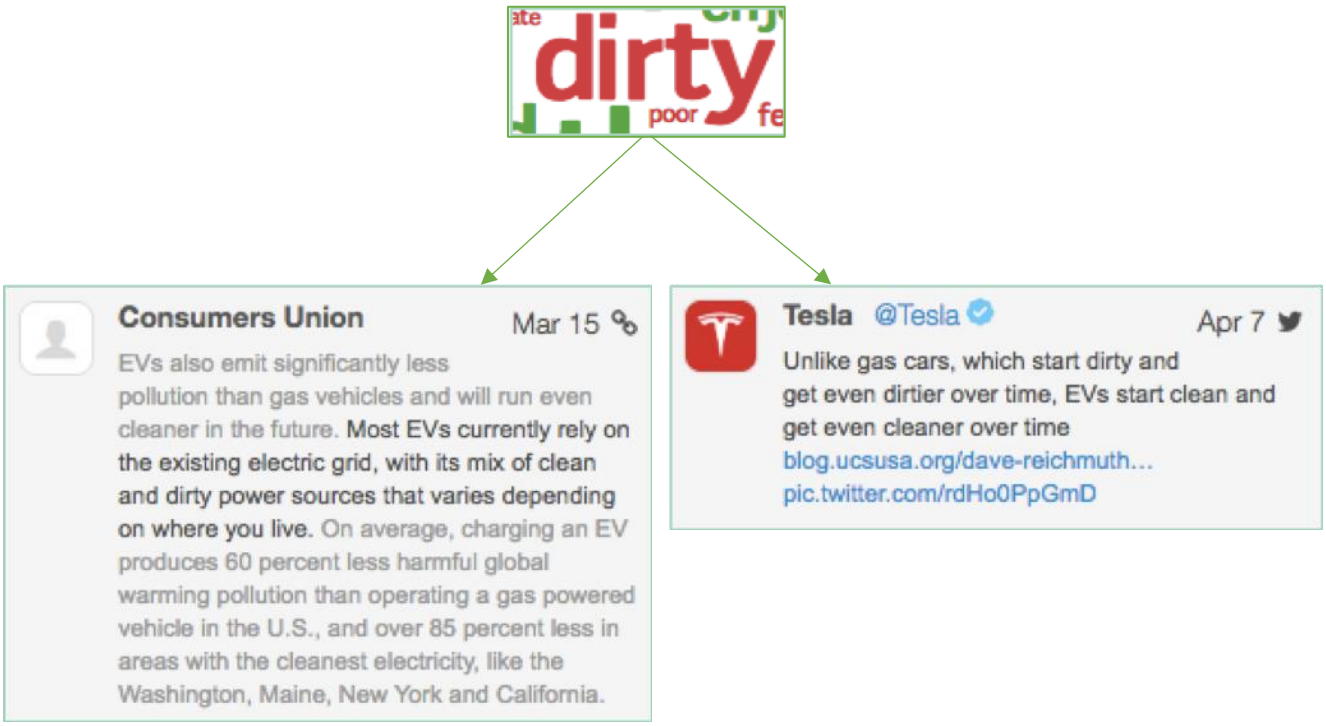
Figure 40 NetBase analysis executed on *Electric Vehicles* topic: *Negative StoryScope*

- *World Cloud: Sentiment Drivers:* is the section where cloud-shaped graphs, are found, composed by the most popular emotions in the web contents. It is a very specific schema of emotional and behavioural situations linked to Electric Vehicles, according to attributes, emotions and behaviours. The colour green or red identify respectively the positive connotation of word, in the first case, and negative connotation of word, in second case. Bigger is the word, more times it has been mentioned.

  Therefore, analysing the topic Electric Vehicles, the appearing sentiments are mainly positive: love, good, best, interested, better, happy, smart. As it is possible to notice, the negative terms are limited, and they are attributable to problematics pertinent to the *battery* and the *cost* of Electric Vehicles. These problems are well-known in the referred market and the specialists are already comparing each other on eventual solutions.

Figure 41 NetBase analysis executed on *Electric Vehicles* topic: *WordCloud Sentiment Drivers*

In the Sentiment Analysis proceeding, it is probable to bump into words that at the first glace them could be considered as negative but, making a deeper analysis, they can reveal themselves as positive or neutral. And vice versa. Thanks to the *"Stream"* functionality it is possible to intercept and to check every single post or mention in the online environment. The following is a typical case.



In this example, filtering the adjective "Dirty", mentioned 1377 times, we discover it is not negative. Considering the two most mentioned posts, "Dirty" is associated to:

- A reduction of (dirty) polluting emissions, which it has a positive connotation, in term of environmental responsibility.
- A mixed power sources of electric grid: clean and dirty. In this case the connotation is neutral.

- *Passion Index:* is the section where the proposed chart aggregates three dimensions in a unique visualisation: the Mentions quantity, the Passion Intensity and Net Sentiment related to the analysed topic. The sphere has variable dimension and position:
  - The circle *dimension* shows the number of mentions.
  - The circle *position* is the result deriving by the intensity of sentiment with its positivity or negativity. More positive is the sentiment and more in the right side is positioned the circle. Vice versa for the negative sentiment.

  To remember is the calculation of Net Sentiment which is the difference between the positive sentiment percentage and the negative sentiment percentage. Therefore, the Passion Index measures how much people like Electric Vehicles.

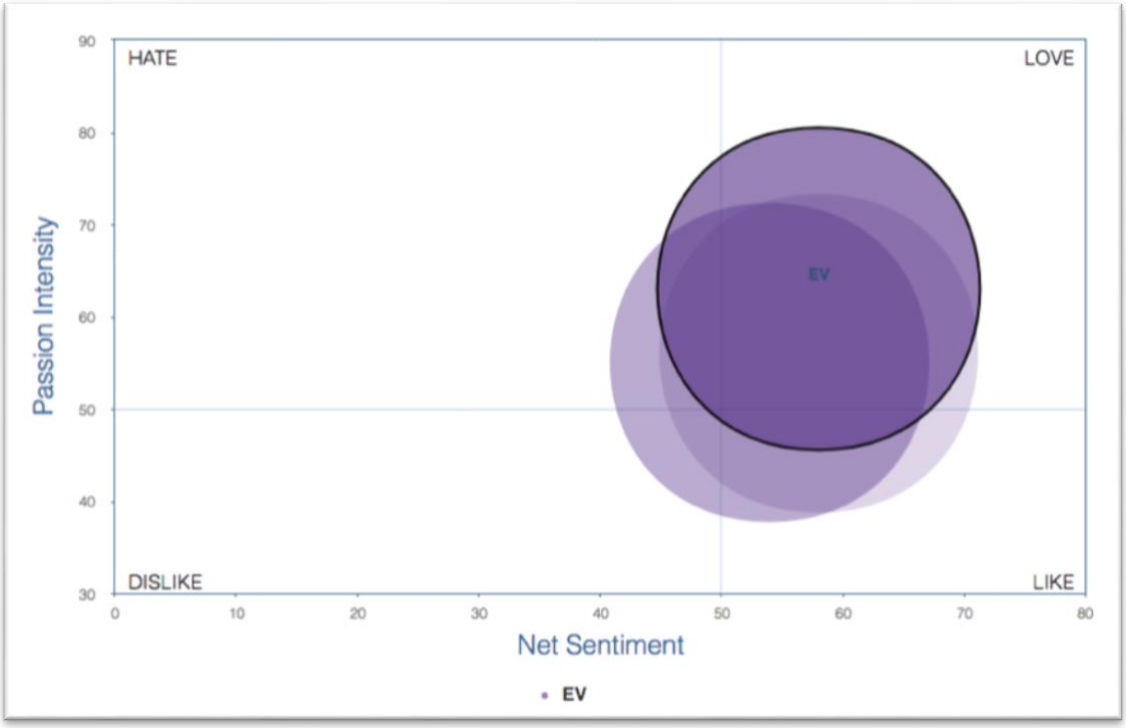
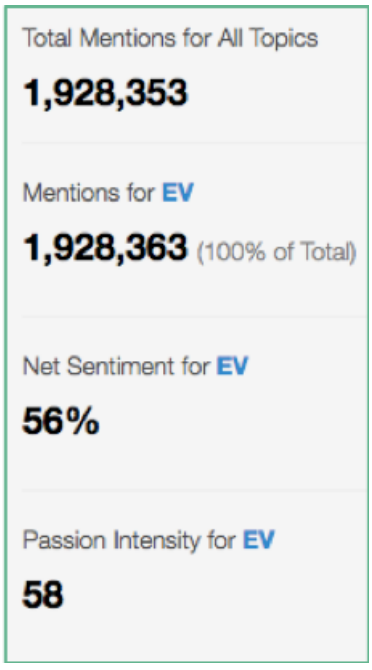


Figure 42 NetBase analysis executed on *Electric Vehicles* topic: *Passion Index*

The business case on Electric Vehicles is based on an analysis measured on three months: February, March and April 2018.

From the graph is possible notice the increasing movement of the violet circle. The movement underlines a great positivity, thus letting the circle to enter in the most positive section: *"Love"*.

Therefore, Electric Vehicles passion index registers a general enthusiasm in the conversations, so pushing the index value to 58 with a Net Sentiment of 56%.



CONCLUSIONS

It is arrived the moment to finally answer, in more detail, to the two initial questions.

Why should companies use CRM?

Why should companies use Sentiment Analysis?

The *Customer Relationship Management (CRM)*, should be used by companies because it is a winning business strategy that it identifies a new method of work and process management, in order to acquire new customers and to understand their problems and desires.

In particular, the CRM system is a strategic and technologic process applied to a software which it allows to manage every kind of customers' information and interaction with the company itself, in the best way possible. Indeed, with a CRM system, a company can see, in chronological order and in an organized overview, all the customers' movements with the company itself and it allows to do every kind of customers research to get the needed information. All this can be done in real time, from everywhere and with every device.

Therefore, the real usefulness for company, deriving from the CRM system use, is the saving time spent to manage the inquiries and assistance across many channels used by customers (including calls, e-mails, online chat, and social media), leading an increase of organizational efficiency and satisfaction responses. So, an increment in customer satisfaction should lead the company to reach a wider number of customers and increment of turnover.

Premising the importance of this customer-centric vision, also the *Sentiment Analysis* follows the same one. Sentiment Analysis should be used by companies because it is the study specialized to understand sentiments and opinions, behind texts, documents and conversations in the online environment. This analysis allows to measure the company reputation and perception relative to their qualitative aspects which they are connected to positive, negative or neutral reactions of customers. Major attention to customers sentiments and opinions in the referred market, with use of Sentiment Analysis, finally leads to an increase of the sales and revenues. The positive correlation between companies' higher profits and the good and positive customers' sentiment in online conversations shows that, Sentiment Analysis is a winning strategy for the companies which adopt.

At the end, we can say that, both Customer Relationship Management and Sentiment Analysis are equally two winning strategies because they present a similar aim: increment the company reputation in order to gather more customers and to reach an increase in turnover.

But to satisfy the Sentiment Analysis aim, companies should use *Social Media Analytics* platforms in order to gather and to reach all the customers' useful data.
The choice to analyse a real business case, with NetBase, a leading-edge Social Media Analytic platform, want to be a concrete demonstration of this winning strategy.

What emerges from the *Sentiment Analysis of the practical case*, are both positive and negative sentiments connected to the topic of Electric Vehicles.
The Electric Vehicles topic is widely discussed in the digital environment. Indeed, Electric vehicles are smart mode of transport both in terms of environmental sustainability and of driver comfort. In the first consideration, Electric Vehicles are smart because they allow for total elimination of harmful emission. In the second consideration, Electric Vehicles are capable of moving freely within cities, also where it is not commonly allowed, exactly because of their eco-friendly technology.
Beyond these positive aspects emerged, there are also many negative ones, mainly linked to the same Electric Vehicles' functionalities.
First of all, the battery's autonomy is very limited, thus limiting travel range, and requiring continuous pit-stops to charge. Another similar and important limitation is linked to the charging time, which may last for many hours before being completed. Around Europe, especially in Italy, the Electric Vehicles are still a developing market and their use is still quite limited. The key linked causes are: a very limited availability of charging columns scattered throughout the territory, what appears in huge way it is their expensive cost, beyond the fact that charging stations require huge connections to the electrical grid. In contraposition to the current Italian scenario, what emerges, according to the International Energy Agency (IEA) in its last report "Nordic EV Outlook 2018", is that only the Northern European countries (Denmark, Finland, Iceland, Norway and Sweden) stand out as leading-edge countries in terms of Electric Vehicles use, accounting for 8% of the overall number of Electric Vehicles in the world. These countries represent the third global market for number of Electric Vehicles sales and use, after China and United States. This is also because these countries offered well-defined charging stations in their public territory.
Therefore, Electric Vehicles is a growing market where wide improvement margins are expected in the coming years, both in terms of electric components and also in necessary public infrastructures. After these Sentiment Analysis conclusions on Electric Vehicles topic, what the Estilos' customer, an electric material supplier, could take the cue from it is: to procure an advanced management system able to product innovative electrical components, developed in the electric vehicle field; to maintain a careful and close relationship with the production houses

of electric vehicles in order to stay up-to-date with future developments in the field of innovative electric components; to focus on the most appreciated products; to address production according to what was discovered in the analysis about the most popular electric components; to address the production or the sales towards the regions or countries more interested in discussing these kind of materials; and to reformulated the strategies used to challenge the competitors.

Therefore, Social Listening platforms are leading-edge technologies which can, with a correct training, attempts and applications, reveal itself as a valuable tool for modern companies: the results could be deep and surprising. Indeed, the Social Analytics platforms are able to suggest, to those companies that decide to use them: new business opportunities or the creation of new lines of product development or possible adjustments of digital strategies, or new co-branding partnerships, or the discovery of new market niches before unthinkable.

To discover or adjust all these aspects, a good social analyst should be able to follow some indispensable actions such as:

- Listening with great patience the customers' voice: every comment, every opinion is key to better understand people's feelings.
- Interpreting the customer language and writing style: this is important to understand their needs and expectations.
- Individuating the reasons for which people becomes loyal to certain products or services, or why not.
- Intercepting a variety of customers reactions, in particular the negative ones, in order to fight misinformation.
- Catching useful signals that can lead to the unfolding of new trends or markets.

It is exceptional to see how these tools could lead to some unexpected results and to the potential rethinking of some business strategies. The unexpected discoveries can be linked to:

- Reputational aspects, both positive and negative
- Unforeseen behaviours and different ways of use relative to the offered product or service
- The discovery of potential reputational crises, thanks to real-time monitoring communication campaigns.

These are some examples of unexpected results, but thanks to the possibility to intercept them at the right time, companies are now able to manage them and to act with unplanned or unconventional marketing actions, coherent with their market of reference.

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"Nulla è facile e nulla è impossibile"

Un meritato e sentito Grazie a:

- *I miei genitori e la mia famiglia* presenza costante e paziente da sempre.
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