

POLITECNICO DI MILANO
Department of Management, Economics and Industrial
Engineering



DIGITAL DEVELOPMENT IN AMT

Thesis Supervisor: Prof. Giovanni Toletti

Graduation Report of:
Federico Renzo Sgoifo Matr. 897619

Academic year 2018/2019

Thanks

Thanks to the people of AMT SRL who collaborated on the report work and gave me the opportunity to learn valuable new things from them. Also, to my supervisor that allowed me to participate in this project. Lastly, I would like to thank my parents that always support me and friends who helped me when I needed.

Executive summary

This work is based on the experience during the development of the empirical activity in the internship with the company AMT SRL. As a management engineering student in the Digital Business & Market Innovation stream, I focused this project on the digital field.

AMT SRL is a company dedicated to the commercialization of customized sizes tubes, develops its activities in a traditional B2B (Business to Business) market in which there is low innovation and players have a low digital inclusion.

This company is directed by its manager, Claudio Cesare Fornengo, who has a broad vision of the market and is convinced that to maintain or increase market share, it is necessary to advance in the new technologies and digital communication channels that are now widely adopted in B2C (Business to Customer) markets. Motivated by his vision, I made the company's website, replacing the previous one which was based on obsolete technologies and was not optimized to obtain traffic through search engines, Search Engine Optimization (SEO).

In this new site, I focused on improving communication about the core activity of the company, using current technology and improving the user experience when navigating through it.

In addition to this, the company is using an ERP (Enterprise resource planning), which is also based on old technologies, that did not allow easy integration with software for the creation of KPI (Key Performance Indicators).

This report is also trying to explain its importance and how to overcome these barriers.

Content index

DIGITAL DEVELOPMENT IN AMT	I
THANKS.....	I
EXECUTIVE SUMMARY.....	III
CONTENT INDEX.....	V
INDEX OF FIGURES	VII
TABLE INDEX	VIII
CHAPTER 1 INTRODUCTION	9
1.1 INTRODUCTION.....	9
1.2 ABOUT THE COMPANY	9
1.3 PROBLEM DESCRIPTION	11
1.4 KEY SUCCESS FACTORS OF A B2B WEBSITE.....	12
1.4.1 <i>Web usability</i>	12
1.5 POTENTIAL BENEFITS OF THE WEBSITE	13
1.5.1 <i>Position the company as an authority in the market</i>	13
1.5.2 <i>Training for customers about the purchase process</i>	13
1.5.3 <i>Obtaining data from potential customers</i>	14
1.5.4 <i>Automation of tasks</i>	15
1.5.5 <i>Improve the effectiveness of advertising</i>	16
1.5.6 <i>Improve availability</i>	16
1.5.7 <i>Expand the market</i>	16
CHAPTER 2 CONCEPTS REVIEW	17
2.1 INTRODUCTION.....	17
2.2 THE DEFINITION OF B2B BUSINESS	17
2.2.1 <i>Characteristics of B2B compared with B2C</i>	18

2.3 USER EXPERIENCE	18
2.4 PRIVACY	18
2.4.1 Cookies.....	18
2.5 PERSONALIZATION	19
2.6 DEFINITION AND IMPORTANCE OF KPI	19
2.7 DEFINITION OF CMS.....	20
2.8 DEFINITION OF SEO	21
2.8.1 Importance of SEO	22
2.9 TRACKING PIXEL	23
2.9.1 Pixels vs cookies.....	23
CHAPTER 3 METHODOLOGY	25
3.1 INTRODUCTION.....	25
3.2 TECHNOLOGIES SELECTION	25
3.2.1 Content Management System.....	25
3.2.2 Page builder.....	26
3.2.3 Cloud provider	27
3.3 PROGRAMMING LANGUAGES AND STACK.....	28
3.4 SEARCH ENGINE OPTIMIZATION	29
3.5 INTEGRATING THE ERP TO CREATE KPIS	34
3.5.1 Introduction to the problem	34
3.5.2 Proposed solution	35
CONCLUSIONS	37
4.1 INTRODUCTION.....	37
4.2 MAIN COMPETENCES GAINED	37
4.3 MAIN ESTABLISHED RESULTS	38
4.4 PERSONAL REFLECTIONS	43
BIBLIOGRAPHY REFERENCES	45

Index of figures

Figure 1 Example of an IP lookup using the IP address of a Politecnico di Milano residence.	15
Figure 2 CTR VS position in Google search result page	23
Figure 3 Page speed Google insights Desktop raking before optimization	31
Figure 4 Page speed Google insights Desktop raking after optimization	31
Figure 5 Google Trends results for keyword "tubi"	33
Figure 6 Picture on how Google displays the business added in Google My Business on the search page	34
Figure 7 Screenshot of the old website (Desktop version)	38
Figure 8 Screenshot of the old website (Mobile version)	39
Figure 9 Screenshot of the new website (Desktop version)	41
Figure 10 Screenshot of the new website (Mobile version)	42

Table index

Table 1 CMS usage

21

CHAPTER 1

INTRODUCTION

1.1 Introduction

In this chapter, I will present the company and its activity, the situation before starting the empirical activity and the problems to be solved, main success factors in a B2B website and the potential benefits that could be obtained for the company.

1.2 About the company

AMT SRL is an Italian company that was founded in 1980 and since then has been supplying precision tubes in special steels and superalloys that are custom designed and manufactured by the main European tube manufacturers, to meet the application needs of the customers who use them.

It guarantees just-in-time delivery services by supplying the quantities of product requested by the customer.

It has technical/commercial skills and experience, such as to be able to ensure its customers product and service choices that represent the best solution at the most competitive conditions.

The company organization is simple and streamlined and the staff is constantly updated.

The computer system is designed specifically to provide the necessary data for the control of all company activities in real time, including the strict monitoring of the maintenance of the quality promise, the deliveries of the suppliers and the adequacy of the quantitative level of the ready materials, to assure customers of the punctual availability.

The company invests in the search for new services, new products and new technical solutions to be always prepared / adapted to the variations of the markets in which it operates.

AMT owes its success, in equal measure, to the correct solutions provided to customers, to the organization and competence of the personnel, as well as to the valid purchase conditions that it obtains from the suppliers.

The custom made precision steel tubes are used in the manufacturing of plain and spline hollow shafts, diesel engine rocker shafts, plain and splined sleeves, and couplings, threaded rings, gears, power take-offs, cylinder body and piston rod for shock absorbers and hydraulic cylinders, trucks, tractors, and motorcycles and go-kart, motorcycle chassis and more.

The main income for this company comes from the Go Karts sector since it is one of the main suppliers in the world and keeps a stock of these tubes in its warehouse.

The main competences of this company are its ability to provide good consulting based on its experience in this market.

1.3 Problem description

The former website was developed more than 10 years ago, using a CMS (Content Management System) called Joomla which was not updated so it contained several vulnerabilities that were fixed on the subsequent updates.

The site was built in a way that decreased the search engine positioning, some of these factors were due to the use of images instead of text in multiple places, which prevented the algorithm of the search engines could interpreting the content, did not have responsive design which today is severely penalized by the ranking algorithm used by Google (the main search engine of the world), and many other factors that were deficient in the SEO logic.

The web usability was very low since it was not mobile responsive, it was difficult to understand the design and the main parts were in ambiguous places.

This website affected the web positioning in these search engines, which provide a global exposure of the company's offer at a relatively low cost but also did not inspire confidence and transmitted a wrong image of the company's values and competences.

In addition to everything mentioned above, the company has difficulties in generating Key Performance Indicators (KPIs) since the ERP that is currently in use was built to perform some customized activities several years ago and does not allow to create KPIs easily. This software uses 32-bit architecture, this

hinders the integration of several external software to create the KPIs that use an exclusive architecture of 64-bit.

1.4 Key success factors of a B2B website

1.4.1 Web usability

Web usability could be defined as the presentation of information and methods in a clear manner, avoiding confusion and the position of important elements in the appropriate areas, as well as ensuring that the content works in different browser and devices (responsive design).

Jakob Nielsen "the guru of Web page usability" (The New York Times) [\[1\]](#), discussed 5 main components for usability: Learnability, Efficiency, Memorability, Errors and Satisfaction [\[2\]](#).

Learnability is related to the time that the users take to learn how to use the website, the shorter the learning curve the more web usability.

Efficiency is related to the time that the users take to finish a task once they have learned the design of the website.

Memorability is related to the time needed for a user that has been some time away from the website to recover the proficiency in using it.

Errors is related to the number of errors that the users make and the gravity of these errors.

Satisfaction is related to the pleasure of the user while navigating through the website.

1.5 Potential benefits of the website

The potential benefits of a company of these characteristics to develop this point of communication could be several if it is used correctly. Some strategies to maximize the benefits obtained with this investment are:

1.5.1 Position the company as an authority in the market

Being a market with relatively few players and very technical nature, it is possible to share technical knowledge through the website. This useful information, which would be frequently shared, helps to solve problems that customers might have in their processes. This is a marketing strategy that tries to position the company as a leader in its field and reduce the barrier of trust between the client and the company.

1.5.2 Training for customers about the purchase process

The purchase process in this company involves the synchronization of several activities that can be complex for an inexperienced customer. Resolving doubts about logistics, insurance, dates of payments, amount to pay and signings for the contract can save the company the use of human resources to amend communication errors and at the same time influence the client highlighting the reasons why they should buy from the company instead of competitors.

1.5.3 Obtaining data from potential customers

In this market, it is difficult to find potential customers since there are not many sources to obtain data on companies that might need a custom tube that is not easily found in the market.

One way to obtain this information can be publishing the entire range of tubes that can be produced, by the production partners, if the customer makes an order. This table combined with a call to action (CTA) that makes the users interested in getting a budget to fill out a form with their data to obtain more information. With this method, the company can start to create a database of potential customers and focus marketing efforts towards this group.

Another way to obtain data about potential clients using the website is to register the public IP address of the visitors to the site. With this IP is possible to do an IP lookup, which can give us a lot of information about the location and the domain related to this IP address that visited the website, making it easy to determine if this search was made from the internet connection of a certain company. These data can then be stored to be used the results as a target for a subsequent marketing campaign.

As an example, in the figure bellow, you can see the search of the IP address 131.175.147.206 (public IP address of residence Vilfredo Pareto, Politecnico di Milano) made on the website <http://whois.domaintools.com>

IP Information for 131.175.147.206

— Quick Stats

IP Location	 Italy Milan Cineca Consorzio Interuniversitario
ASN	 AS137 ASGARR Consortium GARR, IT (registered Sep 01, 1993)
Resolve Host	global-pareto.dot1x.polimi.it
Whois Server	whois.ripe.net
IP Address	131.175.147.206

```
% Abuse contact for '131.175.0.0 - 131.175.255.255' is 'cert@garr.it'

inetnum:        131.175.0.0 - 131.175.255.255
netname:        CILEA-NET
descr:          CINECA Consorzio Interuniversitario
org:            ORG-CCI3-RIPE
country:        IT
admin-c:        PT5132-RIPE
tech-c:         EC6024-RIPE
tech-c:         RG8920-RIPE
status:         LEGACY
remarks:        This prefix is statically assigned
remarks:        To notify abuse mailto: cert@garr.it
remarks:        GARR - Italian academic and research network
mnt-irt:        IRT-GARR-CERT
mnt-by:         GARR-LIR
mnt-by:         CINECA-MNT
mnt-routes:     CINECA-MNT
created:        1970-01-01T00:00:00Z
last-modified: 2016-12-06T09:59:27Z
source:        RIPE
```

Figure 1 Example of an IP lookup using the IP address of a Politecnico di Milano residence.

In the image, you can easily associate the IP address to an entity of the Politecnico di Milano using the field “Resolve Host”, and more specifically, to a university residence.

1.5.4 Automation of tasks

In the website it can be built a system that allows buyers to make orders and be managed automatically, provide a virtual place where customers can see the status and details of their orders without having to call the office, allow the customer to perform modifications of certain parts of the order, create orders cloned from previous orders (useful if the client frequently makes the same order). This will save human resources costs that can be used in other parts of the process.

1.5.5 Improve the effectiveness of advertising.

Taking advantage of the digital marketing tools, the business can improve the segmentation of the market, furthermore, improve the chances that a client that is looking for a service such as the one provided by the company can find it. Also, create brand awareness in the sector and increase conversion rate.

It can be also used several tools, such as pixel tracking, that inserts a very small image in the website that is very difficult to see (usually the size is 1 pixel by 1 pixel). This is to identify the users and target them for marketing campaigns through various online channels.

1.5.6 Improve availability

The website will be available 24 hours a day, 365 days a year. This availability combined with an order system and a Customer Relationship Management system (CRM) can make the customer make the order as soon as he needs it. Availability is very important in this market because, according to the experience of the company, the customer will make the order with the supplier that responds faster.

This is also important since the company maintains some transactions with clients with different time zones, which cannot communicate or request service through the telephone at time that are out of the business hours.

1.5.7 Expand the market

A good management of the website will lead to the reduction of geographical barriers and the company will be accessible from anywhere in the world.

CHAPTER 2

CONCEPTS REVIEW

2.1 Introduction

In this chapter I will present concepts, definitions and theories that are relevant to this report.

2.2 The definition of B2B business

Business-to-Business business refers to the businesses that performs their activities providing services or products to other businesses. Unlike B2C (Business to Customer) businesses, whose clients are the final consumers of the product or service, B2B businesses are part of the global value chain and their customers are another business that contributes adding value to the product or service.

Business brokers are a particular kind of Business-to-Business Business that focuses on assisting and providing consultancy to buyers and sellers in the buying and selling process. Normally they estimate the sale price of the product and advertise it revealing or not the identity of the producer.

2.2.1 Characteristics of B2B compared with B2C

For B2B business, the relationship with its customers is very important, since these are generally maintained over time and, unlike B2C business, the amount of transactions is greater. The decisions made by clients of B2B businesses are more logical and rational and the relationship is based on mutual trust.

2.3 User experience

The user experience (UX) refers to the concept of a design focused on the efficiency of its use by the end-user. Many times, the designs are based on the ease of implementation or development, on the process behind the design or on the efficiency in the use of resources but not in the experience of the end-user.

2.4 Privacy

The privacy can be explained as the control exercised by a user over their information to limit the number of people authorized to obtain it. This includes personal data, photographs, files, etc.

2.4.1 Cookies

Cookies are files that the website and many of its external components save in the Internet browser of the person who is browsing. These files have multiple uses, for example, to store a private key and thus be able to keep a session even if the browser is closed, store information from previous visits to the website to personalize the content and improve the user experience, to store information such as items from a shopping cart so they do not get lost, encryption data to increase security, etc.

Many websites began to store user information through several pages and to record the movements of purchase or sale and search in e-commerce. All this without the authorization of the user.

For this reason, in the European Union, a rule was created that obliges the website to obtain your consent before installing a cookie and also to explain how these cookies will be used.

Not all cookies require consent, cookies used for technical purposes to maintain communication, for data protection by means of private keys or other diverse purposes different from store user data may be used without this consent.

2.5 Personalization

Web personalization is the creation of a personalized experience based on user behavior, location, profile, and other attributes. This is the way in which web personalization is a tool that allows us to modify the contents in the base of the user preferences.

2.6 Definition and importance of KPI

Key Performance Indicators are important indicators based on the performance of the business that allows us to measure the success of our actions. It can be expressed in monetary terms, units or percentages.

They must offer points of view that allow us to make better decisions and enhance the use of data in real-time, these indicators can be viewed from any place and allow us to take advantage of certain opportunities that have a broad and instantaneous vision of the business.

These indicators are diverse depending on the type of company, the market in which they operate and the activity they perform. But also, within the same company, these indicators are diverse depending on the sector of the company. The main objective of these indicators in the different sectors of a business is to show the result or performance obtained by the sector in order to improve it.

They also are useful to find the strengths and weaknesses of the company and be aware of them.

2.7 Definition of CMS

A CMS is a software developed to facilitate the administration and management of the contents of a website with relative ease, but above all, without knowledge of Web programming. A web programmer can create a web site and leave the administration to the users in a simple and intuitive way to use.

These CMS can be open source or purchased with a license, usually, you can include third-party plugins which can also be both payments and open source.

This feature that allows adding additional components developed by third parties generates very large advantages if there are generic needed features to add to the website. This, at the same time, reduces the development costs and it will only be necessary to develop functions that are specific and not very generic.

All these characteristics generate a network effect that is defined as:

The network effect is a phenomenon whereby increased numbers of people or participants improve the value of a good or service. (Investopedia, 2019)

For this reason, some of these CMS after reaching the critical mass of users increased their use exponentially and as this platform has more users at the same time is more attractive to software developers, who develop a greater number of applications, making it more attractive to users. This generates an effect that maximizes the value of a few players in the market, for this reason, the CMSs that currently exist and are used in a considerable way are few, clearly dominated by a market leader.

In the table below we can see the result of the research recently performed by W2techs (Web Technology Surveys). WordPress is used by 34.1% of all the websites, surpassing by a very wide margin Joomla that barely has 2.8% of use.

Table 1 CMS usage. Source W3techs

CMS	% of use compared with all the websites
WordPress	34.1%
Joomla	2.8%
Drupal	1.8%
Shopify	1.6%
Squarespace	1.6%
Wix	1.1%
Magento	0.9%

Note: The table shows only the first 7 CMSs

2.8 Definition of SEO

The search engine optimization is the discipline of optimizing a website to improve its positioning in search engines. It can be defined as an optimization

process that is applied to maximize the organic visibility of a website before certain search terms.

2.8.1 Importance of SEO

This process is very important since it allows us to obtain organic traffic (without advertising cost) and thus increasing the revenues of the company if the conversion rate is maintained.

In a B2B market, this is very important since the traffic obtained from social networks and word of mouth is lower than in a B2C market and the traffic coming from the search engines becomes a key element of success.

Today, the main search engine is Google, which has a website ranking algorithm to position them in a specific place depending on each search. This algorithm is called PageRank and is constantly changed and optimized to avoid any kind of cheating.

This algorithm favors certain criteria over others, the main objective of this algorithm is to show the websites of higher quality and closer to what the user was looking for. For this reason, it is key to focus all content and SEO tools on obtaining high ranking in certain types of searches and keywords, but also, it is always necessary to have a website built with all quality standards and user experience to ensure that the score obtained is not diminished by this fact.

A study carried out by the "Advance web raking (2019)" shows how most of the visits are taken by the sites listed in positions from first to third on the google page and have the highest CTR (Click Through Rate).

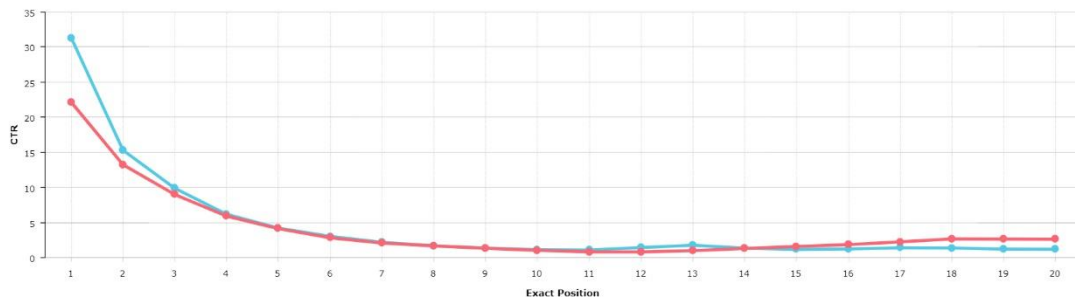


Figure 2 CTR VS position in Google search result page

2.9 Tracking pixel

A tracking pixel or conversion pixel is an image that is displayed in the HTML of the website. Normally this image is very small (the usual dimensions of this image is one pixel base per one pixel high), with transparency and gif format. This makes the image practically invisible in the eyes of the users.

The goal of this invisible image is to track and record a user's visits. When opening this image that is hosted on an external server, this records the visit of the IP and with the help of other algorithms that run in the browser as JavaScript can register extra information on the interactions of this user with the website.

This information is stored for later re-target this audience in advertising campaigns in various digital channels.

2.9.1 Pixels vs cookies

Cookies can also be used to do this work, but with the current regulations, it is more difficult because we store the user's data on their own devices. But with the pixels, the regulations do not apply, since it is the user who places the request to load the pixel image. This is controversial because the user is not

aware that he is doing this, but the mechanisms used to obtain this information are the same used to record site visits and will be difficult to regulate.

CHAPTER 3

METHODOLOGY

3.1 Introduction

In this chapter, I will present all the empirical activities, tools, technologies and procedures I followed during the development of the internship.

3.2 Technologies selection

To select the technologies to use, I obtained information about the most used technologies and I also focus on other aspects such as the ease of maintenance of these technologies for a company that does not have an IT department, open-source technologies, price of license and number of developers and users using technology.

3.2.1 Content Management System

At the moment of selecting the platform, according to the characteristics of the company and the use that they would give to it, it was evident to me that I had to choose a CMS option instead of some other option based on some framework or built from scratch.

When doing an analysis of all the Content Management Systems that were in the market, it also became clear to me that the ideal system for this case is WordPress. Since 34.1% of all websites are made with this system. This is a great advantage as mentioned above due to the fact that a great variety of third-party plugins and tools are available to be easily integrated. But in addition to this, it is very easy to find a developer that is specialized in this system and can add a custom feature.

This system is based on a technology widely used in websites, its backend language is PHP integrated with a MySQL database and many other libraries and frontend languages integrated. WordPress also has its own functions and a system of hooks that allows easy customization by developers.

In the administrator interface, WordPress uses a system that is quite intuitive for the user. It has a panel in which you can add notes and pages, manage users and add third-party plugins.

3.2.2 Page builder

At the time of developing each page of the website, I found several options to do so. The first was getting a theme installed on the site to create a child theme, doing this you can modify the theme without interfering with future updates of the theme, and customize the pages using the programming language of the backend, PHP, and design the frontend using HTML with CSS styles. When analyzing this option, I realized that it was not very efficient since to design the frontend and comply with all the SEO standards of responsive design and other requirements, I must have experience in this field to achieve a good result.

Another alternative, which ended up being the best, was to use third-party software to build these pages and not have to worry about many of these good practices that are already generated automatically by the software.

This type of software is called page builders, there are many in the market for WordPress but one that is relatively new caught my attention. This page builder is Elementor (<https://elementor.com/>) that despite being relatively new contained many more functions than other page builders in the market and went from 0 to 10000 users in less than 3 months when it was created having now about 2 million of users and several developers who contribute to this project.

This software is open source, but also has many own and third-party add-ons that can be added at a certain price. In my case, I used the pro version of this system that allows greater customization and some extra features.

Another advantage of this page builder is that it makes the user's task very intuitive if you want to edit or create a page, you no longer need to depend on the company that developed this website to do it. In addition to being intuitive, you have a lot of information documented on the internet and several active communities where you can get information.

3.2.3 Cloud provider

When having to select the infrastructure to host all the software. There were many options since the prices in general for this are quite low. The first option was a shared hosting which is the most economical and for a site of these characteristics it could work. Shared hosting is a server that is divided among several users and the cost of the server is shared among all. But it also shares the resources of this and usually, the problem arises of "noisy neighbors" that are other users using much of the resources of the server in an abusive manner. Also, this option limits in a big way the use of many features that could only be used if we had the server for ourselves.

Another alternative was to use a dedicated server, only available to us and with the freedom to do what you want with it. The disadvantage of this is that the prices are already higher and for the use that this company was going to give a dedicated server had many resources that were not going to be used.

As a last alternative, which turned out to be better than the previous ones, it was a Virtual Private Server. The VPS simulates a virtually a dedicated server but at the same time shares the infrastructure as the shared hosts, so they are also economical. This option has begun to be used to a large extent thanks to its low cost, its scalability, and its security.

As a provider of this product, I chose Amazon Web Services because it is the world leader in this market and its prices are proficient, offering many resources for scalability and additions of add-ons such as efficient databases or other VPS and all within the same network. The negative point of AWS is that I must configure everything, and it is a very complex system to install it. But once this is done it needs very little maintenance and the costs are far lower than any other provider.

3.3 Programming languages and Stack

Having selected WordPress as a CMS to develop anything within this system it is necessary to use PHP as a backend language, native WordPress functions, and other external plugins functions are also available.

To personalize the design CCS and HTML are used together with JavaScript that allows to create dynamic content (without refreshing the page).

As mentioned earlier, the site is hosted on an AWS VPS. The operating system is Linux (Ubuntu) using an Apache web server that comes preconfigured with

PHP and MySQL database. This technology stack is called LAMP, which is the acronym for Linux, Apache, MySQL, and PHP.

3.4 Search Engine Optimization

Because the google algorithm changes constantly I had to look for solutions in recent sites that provide these SEO services. There is no information on this in academic articles since it seems that the industry is so fast that it advances much faster than the academic sector.

For SEO optimization I followed a list of good practices and methods that I will list below:

1- Improve the security and accessibility of the website:

Installing the SSL certificate to encrypt communications and that the information that the user sends cannot be read if it is intercepted. This is a practice that is not necessary for a website like this since it does not exchange user information, but it is a key requirement to not be penalized by the Google algorithm.

Then with the help of a third-party plugin installed in WordPress (Yoast SEO) create a sitemap that helps google spiders (they are software called spider because they browse the web and visit the sites applying the algorithm on them) to know which pages they have to index and which ones do not.

2- Improve the speed of the website:

This is very important because an optimization in the loading speed implies a better user experience. This speed is influenced by many factors, but normally with this CMS, the problem is that it uses many JavaScript and CSS files that

are loaded with external plugins and with the same WordPress for the operation and design of the site.

This problem can be solved by doing what is called code minification, which means compacting the CSS, JavaScript and HTML code so that they occupy less size and load faster. What is also done is to join these multiple files in one of each type, which in these cases significantly improves the loading speed.

Also, another of these problems is the loading of images, because if they are loaded without compressing them, they will take a considerable time to load. The loss of quality when compressing the images is negligible; however, the load speed gain is very high. Another tool that exists is called "Lazy load" that loads images as the user moves through the screen and not all at the same time, this improves the overall user experience.

Apart from this a highly important factor is the Cache of the page, this is a process that saves the final result of the page (the HTML already processed) and instead of executing the files of the server to generate this HTML the cache software uses the previously saved result saving processing time and increase loading speed.

All this process was done using a software called WP Rocket.

A tool to verify the speed of loading and many other factors regarding efficiency in the programming of the website is "Google Insights" (<https://developers.google.com/speed/pagespeed/insights/>) that examines the website and summarizes all the problems and gives you a score of 1 to 100.

Below you can see a screenshot of the website analysis before carrying out this optimization process:

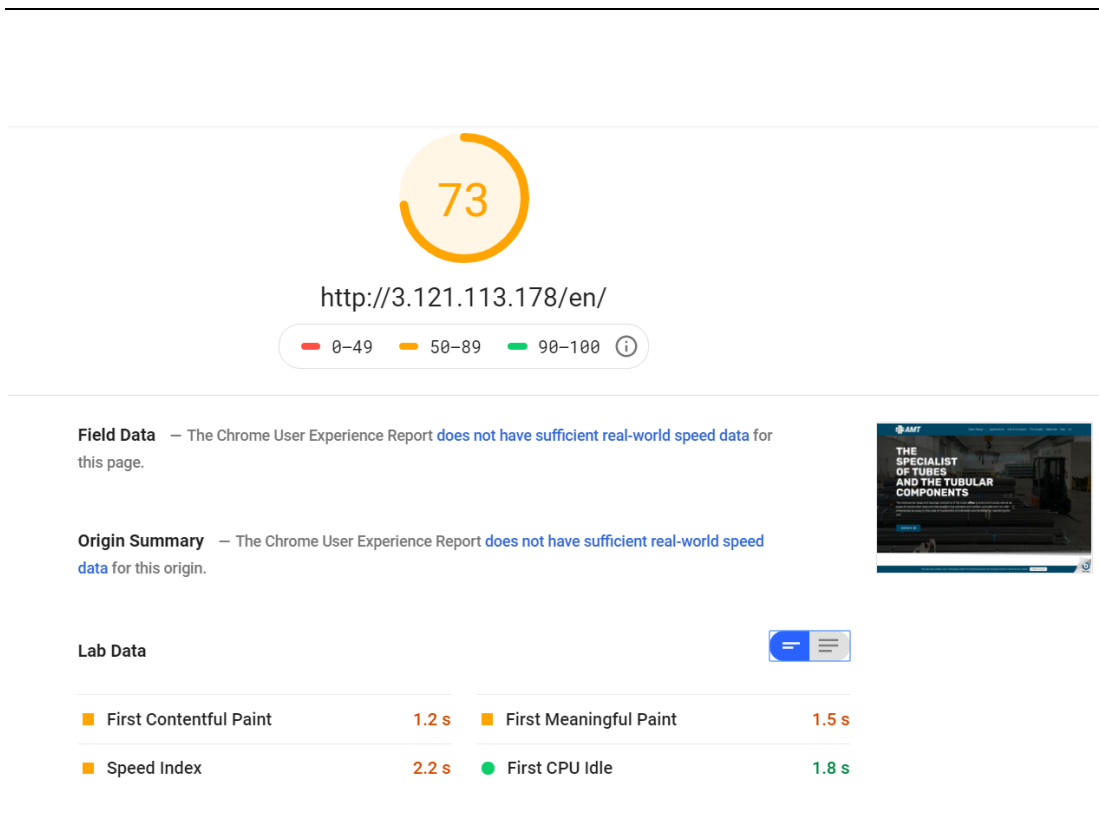


Figure 3 Page speed Google insights Desktop raking before optimization

This is a screenshot of the website analysis after performing the aforementioned optimization:

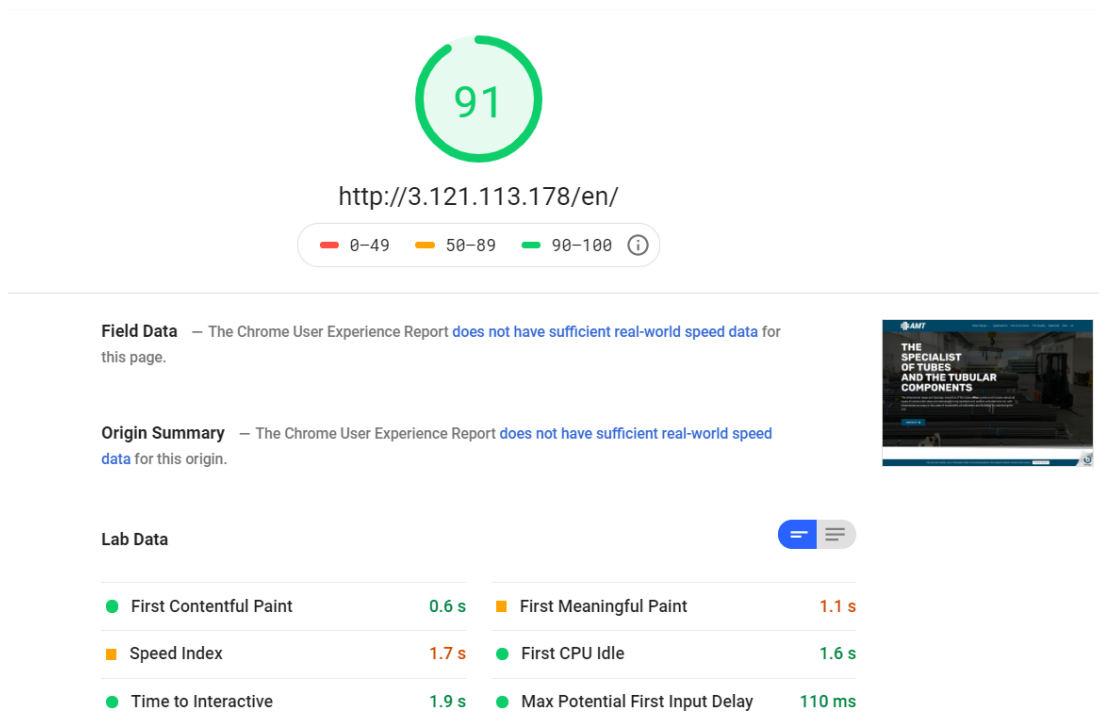


Figure 4 Page speed Google insights Desktop raking after optimization

3- Responsive design:

Nowadays a lot of people use more mobile devices than desktop devices to perform searches. For this reason, it is also a very important factor in SEO ranking the optimization of the design so that it adapts to the various mobile devices. Most of the mobile design is automatically done by the page builder used, Elementor, but there are several small details that must be fixed using a style code (CSS) so that the design adapts to the different dimensions of the screen.

4- Domain age and current URLs:

The study "How long does it take to classify in Google?" [17] shows that most websites with good positions in search results are more than 2 years old. To take advantage of the fact that the domain of the company has existed for more than a decade, we will use the same URL for the pages. So, we will not lose the positioning that these pages have already won.

5- Optimized content:

The previously mentioned Yoast SEO plugin has a ranking to assess the SEO of a page and also provides recommendations after analyzing each one. I used this tool to improve the content of the site.

Also, searched for keywords using the Google Trends tool that provides statistics on the search for certain keywords in a specific region. Unfortunately, the searches in this technical field have very few numbers to obtain accurate statistics.

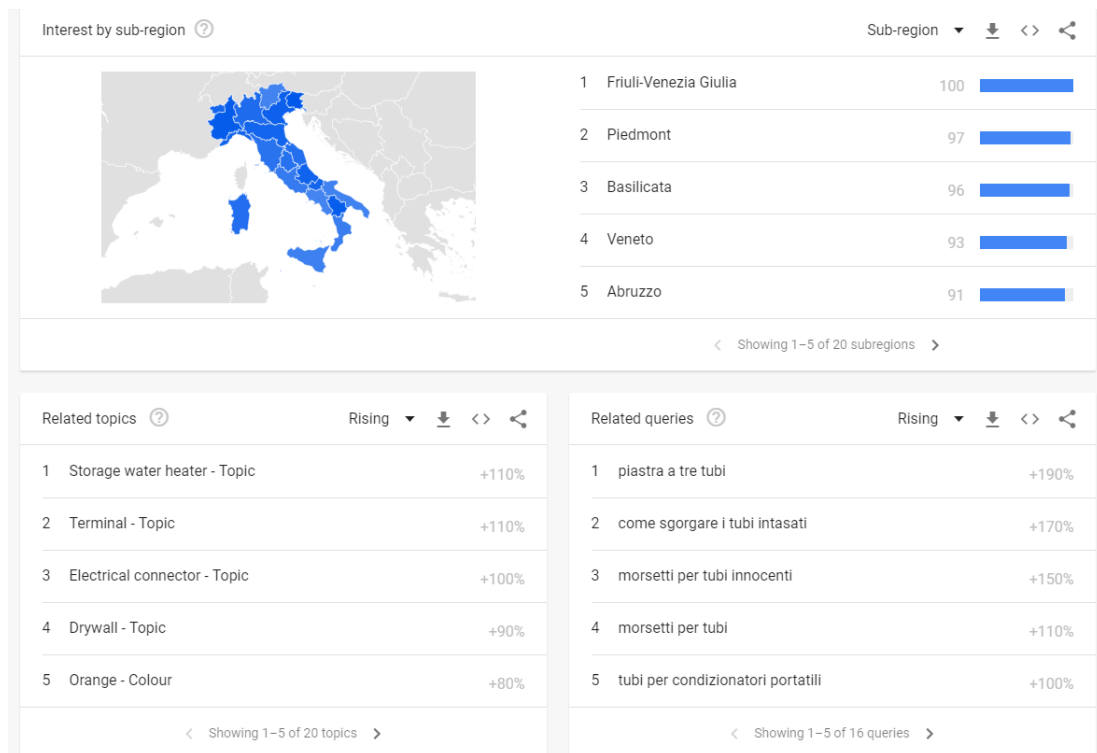


Figure 5 Google Trends results for keyword "tubi"

6- Technical SEO:

This part refers to the use of keywords in the title of the pages or subtitles that are the most important at the time of linking the page with a keyword. Use hierarchic HTML tags for the titleholders (h1, h2, h3, h4) according to the title hierarchy. It is also important to place a description in the images using these keywords to position them in the image search engine.

7- Add information to google my business

It is also important to add the business to "Google my business" which adds the business information to Google map and to the right side of the search page if someone searches for it. We can update all the information and connect the website. In this way our site is more reliable and is a factor that influences SEO.

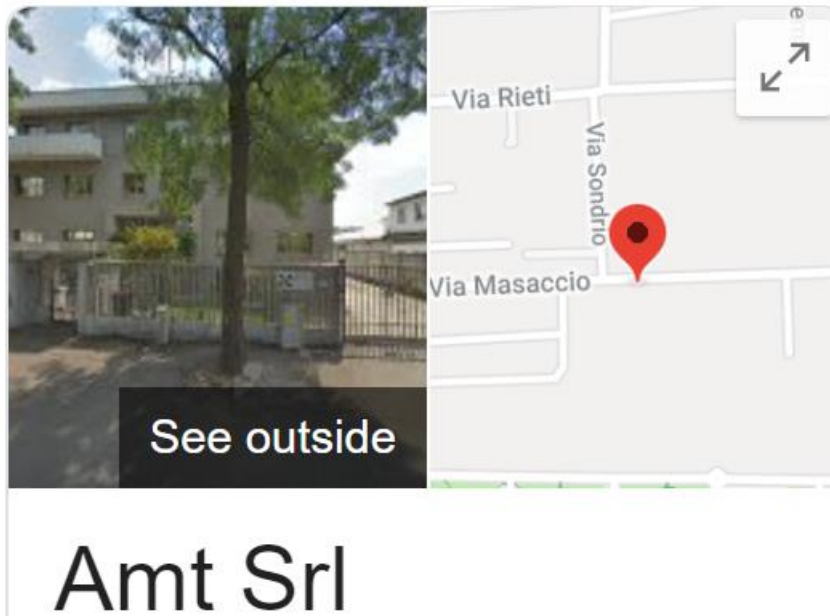


Figure 6 Picture on how Google displays the business added in Google My Business on the search page

3.5 Integrating the ERP to create KPIs

3.5.1 Introduction to the problem

Another of the objectives I was commissioned was to find a solution to the problem of KPIs.

The company has an ERP that was installed many years ago and has a large amount of information that can be used for data analysis and also generate KPIs that help makes decisions in the company.

This system uses a 32-bit architecture that is not very compatible with many modern software that mostly has a 64-bit architecture. At the same time, this ERP offered few options to extract the information and use it and for asking

for something particular should contact the developer and wait 3 months for the development in addition to the cost of it.

Another drawback is that the company needed a solution that could also be used online and not only within the local network. This is because sellers often have to go to the customer's office and many times it been necessary for them to obtain quick information from the customer's account.

3.5.2 Proposed solution

To solve this problem, I concentrated on researching the technology behind the database used by the ERP and also on how to extract the information.

After some research, I discovered that the system installed on a local server used an SAP Sybase database and that I could connect to it using a Windows driver called ODBC (Open Database Connectivity). This driver uses a 32-bit architecture since the ERP system was using 32 bits architecture. To connect it and extract the data, I found the access information (User, Password, Port, and server) in an ERP folder and I was able to connect to this database using Microsoft Excel (32-bits). To get specific information we need to communicate with the database using SQL queries.

In this way, I already solved one of the problems that was obtaining data to generate KPIs. To solve the problem of online access, the manager of the company suggested me a software, Microsoft Power BI, which is used to connect databases, excel files and many other data sources and generate graphics and KPIs. This software also has the ability to synchronize these dashboards to be used in the cloud.

To achieve this I had to use the version 32 Bits of the software and connect the database but when trying to synchronize with the online platform it was necessary to install a separate software that was called Microsoft Power BI

gateway, this software exists only in version 64 Bits so although I was successful connecting the database with the Power BI I could not synchronize it with the online platform.

I found useful at that moment this website of suggestions on the Power BI community in which many other persons explain that have the same problem and it is not possible to overcome with Microsoft Power BI:

Provide full Personal Gateway functionality for those with 32-bit Windows [13]

After evaluating other options such as database bridges and other software without much success, we found a solution using the AWS VPS with a Web Service, this is a software that through HTTP technology act as receptor of data in format XML of JSON (that are standardized data structures) and send this data to the database hosted in the VPS. The local server should send the data from the database every time it is updated, or it is inserted a new record.

We budgeted this solution with the ERP developers and its cost was approximately 2000 euros, which is not an excessive price for a company.

Once the data has synced on the server, a KPI software can be installed on the server or connect to the external application such as Google Data Studio that allows the employees of the company to generate these KPIs and do any analysis with the data when they need it without the inconvenience of paying an extra service for this.

Other options could have been to open a port of the local network to enable any software to connect to the database using the access information, but this solution was discarded due to possible security issues.

CONCLUSIONS

4.1 Introduction

The objective of this chapter is to show the result of the activity carried out in the internship with AMT SRL, as well as the knowledge acquired and some personal reflections.

4.2 Main competences gained

By doing this activity I learned a lot about the operation of the company, the market in which it interacts and thanks to having been working with its ERP and its database, I was also able to learn a lot about the company's administrative activities. The people in the company were always very kind and taught me many things.

With respect to the digital development that I performed in the company, I was able to learn more about the B2B market and how these digital channels are used. I learned computer tools which are very useful for my field of study such as Microsoft Power BI, many software of database management, SQL handling, AWS (Amazon Web Services) use to create VPS (Virtual Private

Server) with an Apache server running on Linux. I learned notions of SEO (Search Engine Optimization). I learned how ERP (Enterprise Resource Planning) works and how is the flow of orders in a company, as well as the flow of products in a commercial company within it.

I researched tools for the company such as CRMs (SalesForce).

4.3 Main established results

From the point of origin, the main result obtained is the improvement of the website of the company which, being a website with low performance in terms of SEO, unattractive and static, is a communication tool in which it can write posts that are added automatically. For the page, it is used for some administrative procedures and to test new types of campaigns that analyze the results of them.

This are screenshots of the original website:



Figure 7 Screenshot of the old website (Desktop version)



Figure 8 Screenshot of the old website (Mobile version)

It can be seen that the site is not adapted to modern desktop computers that have a high resolution and is not adapted to cell phones either.

The buttons and parts of the structure of this site were made in images, which made it impossible for the robots that analyze the page to index it to the browsers to interpret the text that appeared.

On the other hand, it is seen that the site used flash player, a technology that is obsolete and will be removed from the Google Chrome browser in 2020.

Below we can see the screenshot of the final result, after the optimization of files and the process carried out to maximize the factors that influence the SEO. The entire site is mobile responsive, is optimized for fast loading speed with HTML files, CSS and minified Javascript, compressed and loaded images by "slow loading" and with a well-configured caching software with a 91 of ranking on the Google Insights desktop.

Google analytics installed and ready to provide the statistics and KPIs of the website.



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Figure 10 Screenshot of the new website (Mobile version)

Also, the training on its use to the personnel of the company was a very satisfying task since according to them it is an easy tool to use and with a lot of potentials to communicate to the world and to do it in a fast way and without intermediaries.

Another objective achieved was to access data from the database in both Microsoft Power BI and Excel and find a solution to be able to synchronize this data with an online database to produce the necessary information in a fast way for the salespersons when they need it.

Developing this solution was beyond my internship, but a low budget was obtained thanks to the previous research and work in this project.

4.4 Personal reflections

Personally, I think that in the B2B sector of this type of commercial business, the inclusion of digital channels and the development of additional digital services has a lot of potentials to grow and at a relatively low cost.

When doing this work, I had the opportunity to know all the sectors of the company, see how they operated and learn a lot from the people who worked there. I was also able to research technologies and become familiar with the software that is used in companies for different functions. In addition, I had the opportunity to learn about the market and how the company interacts with the customers and the suppliers.

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