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DOCTORAL SCHOOL OF ENTREPRENEURSHIP, ENGINEERING
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METHODS FOR ONLINE PROMOTION OF COMPANIES IN THE FIELD OF INFORMATION TECHNOLOGY

- DOCTORAL THESIS SUMMARY -

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București 2020

Abstract

Numărul firmelor de tip IMM care activează în domeniul tehnologiei informației a crescut semnificativ în România în ultimii ani, acestea fiind într-o competiție continuă pentru atragerea de potențiali clienți. Dezvoltarea Internetului și a rețelelor de socializare condus la necesitatea existenței firmelor în cadrul mediului online pentru a putea fi localizate cu ușurință. Totuși, crearea unei strategii de marketing digital, precum și a unor profiluri mereu actualizate reprezintă o dificultate în rândul firmelor de dimensiuni mici, principala cauză fiind bugetul limitat de care acestea dispun. Teza de doctorat are ca obiectiv principal proiectarea și dezvoltarea unui produs program software prin care companiile să beneficieze de oferte de campanii publicitare personalizate, în mediul online, pe baza introducerii de detalii semnificative. Cercetarea a avut la bază o cercetare bibliografică prin intermediul căreia a fost stabilit profilul unei organizații care acționează în domeniul IT și principalele metode de promovare online. A fost efectuată o analiză comparativă prin intermediul instrumentului software a principalelor rețele de socializare, rezultând un clasament al acestora și indicatori cheie. A fost elaborat un sondaj la care au participat firme din domeniul IT stabilindu-se gradul de conștientizare și adoptare a metodelor de promovare online. Modelarea proceselor care stau la baza campaniilor de promovare prin diagrame a evidențiat activitățile propuse pentru crearea vizibilității firmelor. În urma cumulului de informații a fost proiectat un produs de tip aplicație mobile pentru promovarea IMM-urilor din domeniul IT. Rezultatele obținute prin utilizarea aplicației au fost prezentate într-un studiu de caz care a constatat în implementarea propriu-zisă asupra unei companii și urmărirea impactului adus de crearea unui profil în cadrul rețelelor de socializare destinate domeniului tehnologiei informației.

Cuvinte cheie: metode de promovare online, firme din domeniul tehnologiei informației, rețele de socializare, produs program software

The number of SMEs (Small and Medium-Sized Enterprise) that operate in the informational technology field has risen significantly, in Romania, in the last year, whilst being in a continued competition between each other to attract potential clients. The enormous technological leap that technology and, specifically, social networks have had, forced business to have a digital fingerprint to remain competitive. Although, building a digital marketing strategy and also up-to-date profiles on the social networks raises some problems, usually on the monetary side, given a limited operation budget. This doctoral thesis has as a primary objective to draft and develop a software solution through which companies could benefit from online personalized public campaigns, based on user input. The research was comprised of a bibliographic search through which several company profiles that operate in the IT department were established and also the main online promotion methods were developed. A comparative analysis was done, using the software application, to conclude the rankings and key performance indicators of all the viable social networks. A survey was established in which several IT firms participated, thus defining the user awareness and adoption rate of the online promoting methods. The process modeling that is the basis of the promoting campaigns, built through diagrams, has shown valid proposed activities used for increasing the firm's online visibility. Using all the information gathered, a mobile application product was created to promote SMEs that operate in the IT sphere. The result obtained from using the software solution was presented inside case study that was created from the implementation of the campaign and also the tracking of impact provided by the social network profiles with the purpose of promoting the company in the IT field.

Keywords: online promotion methods, companies form IT field, social networks, software program

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Introduction

The Internet has improved the way companies and customers interact. Due to its impact on the marketing economy, many of the traditional strategies and structures have become obsolete and the way of doing business becomes unsustainable, Edelman (2010).

Digital marketing is a form of direct marketing that creates a relationship between consumers and sellers in the electronic environment, using interactive technologies such as emails, websites, online forums, newsgroups, interactive television, mobile communications, social networks, etc. (Kotler and Armstrong, 2009). The high level of connectivity of digital marketing leads to the facilitation of communications, being used to promote products or services in a timely, relevant, personal and cost-effective way (Bains, 2011).

Small businesses feel that they have limited resources, preventing them from being competitive online. Many of them prefer one or two basic forms of advertising, starting from the premise that the business will evolve over time. Currently, people want to be able to get information about the companies and the services they offer. Therefore, the way to be informed is to identify the company's presence in the online environment.

The emergence of groups and social networks has increasingly led to the interaction of customers with each other. Building an environment that encourages these interactions to promote the company is a big step towards achieving marketing goals and provides an opportunity to get great ideas about what can be done better.

The general objective of the doctoral thesis is to create a software product model that generates the recommendation of an online promotion strategy. Using the application facilitates for companies the process of building a presence in the online environment. They can receive a personalized offer, in real time, depending on various features.

The secondary objectives that contributed to the achievement of the general objective were:

O1 - Bibliographic research to identify significant issues related to IT and IT organizations

O2 - Bibliographic research on online promotion methods and their degree of use

O3 - Carry out quantitative research on the use of these online promotion methods by small and medium-sized enterprises (SMEs) in the field of IT

O4 - Modelling a promotion campaign for social networks

O5 - Design of a software product developed in the Swift programming language with the purpose of generating a personalized online promotion offer

O6 - Case study: Implementation of the proposed software product

The doctoral thesis was developed based on a research methodology that led to the achievement of the general objective and included:

1. **Bibliographic research** carried out to achieve Objectives 1 and 2.
2. **Comparative analysis** of social networks based on the establishment of a set of indicators proposed to achieve Objective 2.
3. **Structured research** through quantitative research methods to meet Objective 3.
4. **Modeling processes** to meet Objectives 4 and 5.
5. **The case study** that validates the proposal made in the research related to Objective 6.

In the first chapter, based on a bibliographic research, the evolution of the field of information technology was presented. It provides an overview of organizations in general, and then focuses on IT organizations.

In the second chapter, a bibliographic research on the specialized literature was carried out, which aimed to define the main concepts regarding marketing. The most detailed methods and channels of promotion were also detailed in the chapter.

The third chapter aimed to identify and define a set of indicators common to social networks. These indicators were established through a secondary research, using Similarweb as an online tool. Based on the indicators, it was possible to project the interest of users around the world on different social networks. Thus, a comparative analysis of them was prepared, for each indicator. These indicators reveal to what extent and for what purpose the social media channel is used and to what extent it helps companies to increase their notoriety and improve their performance.

In the fourth chapter, a primary research was elaborated, using the survey as a tool with which it indicates, specifically for Bucharest, in what proportion SMEs use information marketing methods in the field of information technology.

In the fifth chapter were outlined the process diagrams for the most used methods of online promotion and socialization channels, which contribute to the systematic organization of activities undertaken to create a positive impact of the company's presence in the online environment.

Chapter six aimed at proposing a software product that realizes the offer of a promotion campaign. The chaining and correlation between the actions that are part of the software application is presented and a user manual has been prepared. Based on the options indicated by the information technology company that wants to have a presence in the online environment, the software product automatically generates in real time the promotion campaign and a price offer.

Chapter seven presents a validation of the proposed software product, using determined common indicators of social networks and digital marketing methods. It was used by an information technology SME who wants to carry out its online promotion campaign and find out in real time the corresponding price of the desired requirements, in order to make its presence visible in the virtual environment.

The research within this doctoral thesis brought as an element of novelty the highlighting of the importance of online promotion for an SME company and the way in which it can reach the construction of a notoriety. Currently there are companies that deal with the promotion campaigns, but the connection between them and the company that wants to be promoted is made by email / phone / physical presence. At the same time, these small companies do not include all the channels and methods related to digital marketing. This market need has led to the design of a software product to meet their requirements.

The thesis brings through its contributions both a scientific value and a practical one through the models of online promotion campaigns and the proposed software solution. The information presented can be used by both scientific researchers and practitioners.

The logical scheme of the doctoral thesis is presented in Figure I.1.

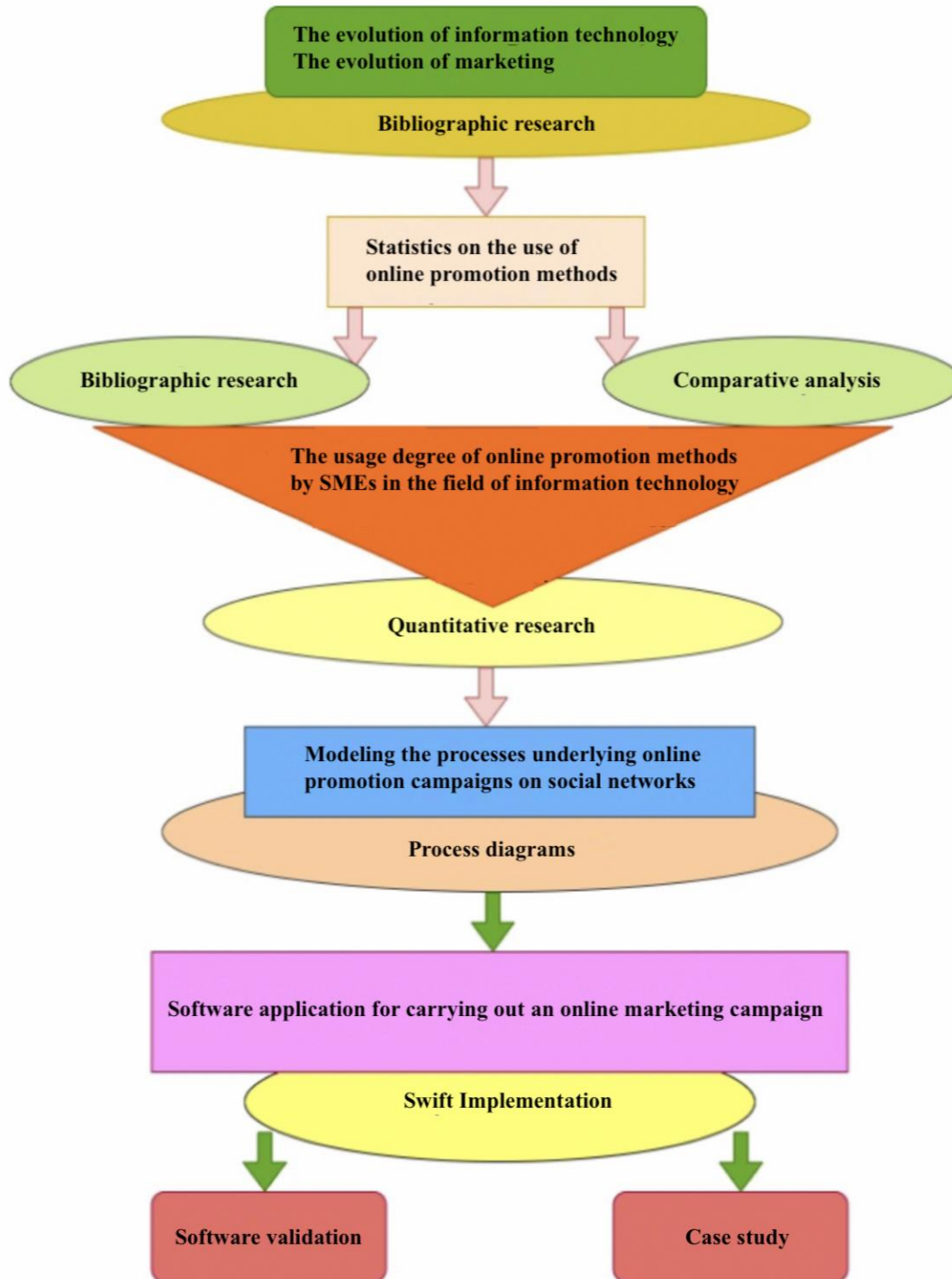


Figure I. 1 Logical scheme of the doctoral thesis

CHAPTER 1.

CURRENT STATE OF RESEARCH ON ORGANIZATIONS THAT OPERATE IN THE IT FIELD

This chapter presents the evolution of the field of information technology and provides an overview of organizations in general, and then the research is centered around IT organizations. Information technology is important for organizations due to the automation of processes, operations, data processing and the systems they use. Maintaining a standard level of services, security and connectivity is a priority task, as more and more companies want to implement more intuitive and complex solutions.

In Romania, the IT industry (software and IT services) has higher growth rates than the economy, which is why it is considered one of the most dynamic industries in the country (Purcărea, 2018). The total revenue generated by this industry is expected to reach almost 6.9 billion euros in 2021 (Figure 1.1).



Figure 1.1 IT industry in Romania

Source: Anis, 2020

An organization is an entity that includes several people, such as an institution or association, for a specific purpose. The approach in the IT field depends first and foremost on the number of employees the company has. There are 3 types of businesses: small, medium and large.

With a small number of employees, in small organizations there is no need for dedicated applications for communication, being enough an email account to communicate with customers and a tele-communication application (Skype, Teams, etc.). Development tools are usually those that are offered for free. For an IT organization that makes web software products, the following tools can be used: a utility with which to write code; versioning tools (GIT); Database; ERP. The main methodologies used by these organizations are the agile ones, which are open to changing requirements over time and encourage constant reviews from end users. The IT field is evolving day by day, thus the needs of employees are also evolving. This flexibility has created 3 new concepts. BYOD (bring your own device) - the ability to use your own equipment, CYOD (choose your own device) - the company will provide a suite of software and hardware solutions from which the employee can choose what he does best and COPE (Corporate-Owned, Personally-Enabled) - uses a single solution that will be offered to all employees.

The IT system has allowed most organizations to reorganize their structure and have a flattened structure that is characterized by open channels of communication, flexibility and decentralization of authority and a smooth flow of information. Their operational styles vary freely, and decision-making is based on individual expertise. The form of control practiced is free and informal, based on cooperation. Participation and group consensus are highly encouraged. Moreover, it gives employees more control over the workplace and less supervision and management is needed.

CHAPTER 2.

ONLINE PROMOTION OF IT ORGANIZATIONS PROMOVAREA ONLINE A ORGANIZAȚIILOR DIN DOMENIUL IT

Modern marketing (Business, 2019) means more than creating a good product, setting a price that makes it attractive and making it available to the market.

Firms need to communicate with existing and potential stakeholders as well as the general public. The companies' concern is no longer related to the communication itself, but to the information transmitted, the channel through which it should be disseminated, the target audience and the frequency of the message. However, communication is becoming increasingly difficult to achieve, as the number of companies raising their voices increases, in order to attract the divided attention of consumers. In order to reach the target markets and to consolidate the market capital of brands, marketers creatively use multiple forms of communication (Purcărea, 2017), being presented in Figure 2.1.

SEO (search engine optimization). Search engines are unique in that they deliver targeted traffic, directing people looking for a product / service to it. The most important search engines are Google, Bing and Yahoo!, and it is the main method used by most users to browse the Internet, generating the source of traffic for a website.

The main engines are constantly working to improve their technology in order to provide optimal results to users. In addition to making content available to search engines, SEO also helps to increase rankings so that content is placed where researchers can find it more easily. The Internet is becoming more and more competitive, and companies that use SEO will have a decisive advantage for visitors and customers. The links allow search engine crawlers, called "crawlers", to reach billions of interconnected documents on the web.

- Google accounts for 96% of smartphone search traffic and 94% of total organic traffic.
- Medium-sized businesses rely more on the technical development of SEO and content to grow and maintain a search presence.

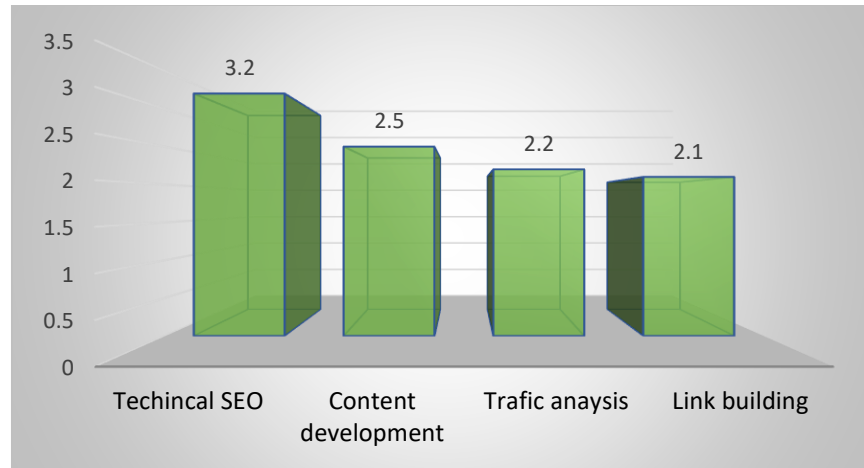


Figure 2.1 Priority of resources for activities, in order of importance in a small business 1-100

Adapted from source: Omnicoreagency, 2018

Social Media. Social media is a computer-based technology that facilitates the exchange of ideas and information and the construction of networks and virtual communities. The role of social networks in supporting business is significant (Figure 2.2). They facilitate communication with customers, allowing the combination of social interactions on e-commerce sites. The ability of social media to collect information helps to focus marketing efforts and market research.

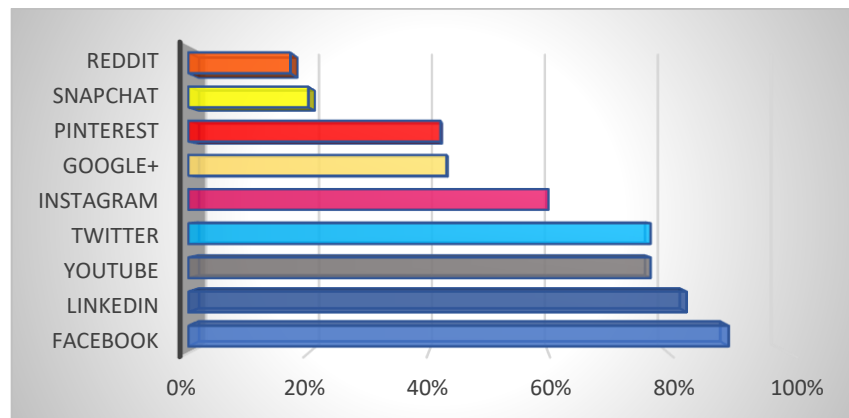


Figure 2.2 The importance of social media platforms for a company

Adapted from source: Omnicoreagency, 2018

Mobile Marketing. Mobile marketing consists of ads that appear on mobile smartphones, tablets, or other mobile devices. Ad formats, personalization, and mobile ad styles may vary, as many social platforms, websites, and mobile applications offer their own personalized mobile ad options. Mobile marketing is an indispensable tool for large and small companies, as mobile devices are becoming ubiquitous.

- In 2018, people spent an average of 3 hours and 23 minutes on mobile devices.
- People access 69% of the media on their smartphones.
- 55% of companies build applications primarily to drive sales, while 50% build them to improve the online customer experience.
- Apple users spend an average of 114\$ when it comes to orders from their smartphones. Android users spend an average of 89\$.

Content marketing. Content marketing is a type of marketing focused on creating, publishing and distributing content to a target audience in the online environment. Most businesses use it to attract attention and expand their customer base, generate or increase online sales, brand awareness or credibility, and involve an online user community.

Content needs to be constantly updated and added to influence customer behavior. When it comes to providing content and ensuring public involvement, LinkedIn is the most effective social media platform at 82%.

Email marketing. Email marketing is a type of digital marketing, which is done through websites, social networks, blogs, etc.

Best practices for promoting this type of marketing include developing your own email list, rather than buying an email list. Email should also be optimized for mobile use, with statistics showing more than half of email messages are open on mobile devices.

- Only 17% of B2B shoppers try to use an online chat feature (real-time messaging). They prefer to use an email to contact distributors.
- 72% of consumers say that email is their number one method of communication when it comes to business transactions. This number remains constant even for the younger population.

Blogging. Blog marketing is the process of reaching a target market of a business by using a blog. Social media platforms should constantly pull content from the company's blog to drive traffic back to its site. Social media posts should include the correct links of websites to blog posts, along

with attractive and creative visuals, so that consumers can click on that site. Blogs create and strengthen the link between the consumer and the brand. The public can learn about a particular brand from the comfort of their desktop computer or mobile device. This can help increase consumer confidence, as companies become an accessible and adequate source of information.

- 73% of B2B companies have case study blogs.
- 81% of internet users agree that blog posts are a reliable source of information or advice.
- B2B companies use 94% of LinkedIn time
- 60% of B2B marketers claim that it is difficult to own content through which to engage their audience.

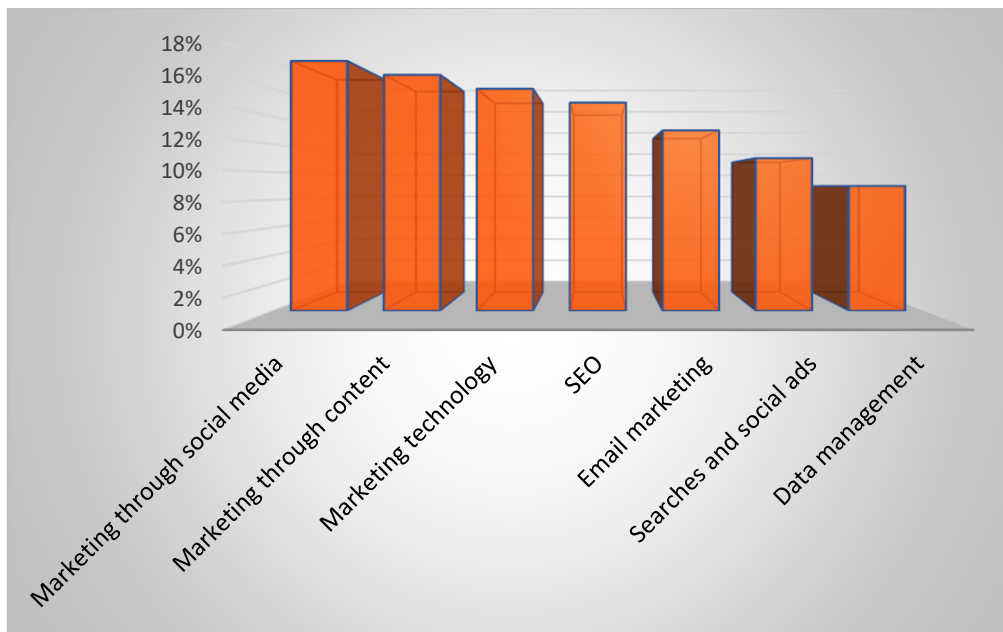


Figure 2.3 The most effective digital marketing techniques in 2018

Adapted from source: Omnicoreagency, 2018

CHAPTER 3.

COMPARATIVE ANALYSIS OF SOCIAL NETWORKS

Small and medium-sized information technology companies tend to build their promotion campaigns and visibility, especially in the online environment. Thus, they can be easily identified and contacted by consumers or other companies, undertaking B2C / B2B relationships. With a limited budget, social networks, as well as online promotion methods, involve lower costs, but with a significant impact among the desired target market.

Several social networks were identified on a market: Facebook, Instagram, Pinterest, Twitter, LinkedIn, Youtube, Google+, which were subjected to a comparative analysis, taking into account a set of criteria defined by the author (Popescu, 2019). They describe different elements of social networks. Thus, there was a need to determine common key performance indicators (KPIs). For a better delimitation and understanding of them, Table 3.1 was compiled, being divided into groups, depending on the category they represent.

Tabel 3.1 Common indicators social networks

1. Website audience
Total visits
Traffic distribution
Monthly visits
Duration of the visit
Pages / visit
Return Rate
2. Visits in time
3. Promotion channels
References
Social
Organic search
Paid search
Display ads
4. Search traffic
5. Display ads
6. Social traffic
Display ad network
Top publishers

Following the processing of the data displayed for each social network, a statistical analysis was performed to provide comparative information of these platforms.

It can be seen that LinkedIn leads this top when it comes to traffic that has the Desktop as its source, ie the web platform (Figure 3.1).

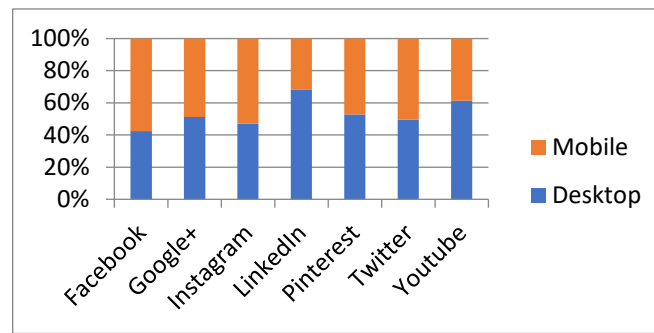


Figure 3.1. Analysis of traffic distribution on social networks

It is noted that most visits are recorded on Youtube and Facebook (Figure 3.2). There is a major difference between their percentage and the rest of the networks. Most monthly visits are also present on Youtube, Facebook, thus resulting in the degree of access by users, as well as the importance given to them.

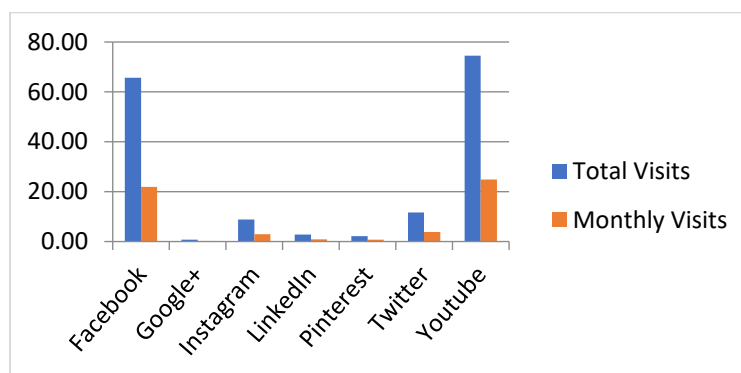


Figure 3.2. Analysis of visits within social networks

Figure 3.3 illustrates the duration of a user's visit on a social network. Following the comparison between them, Youtube is the channel that captures the most interest and to which users give the longest time, followed by Facebook.

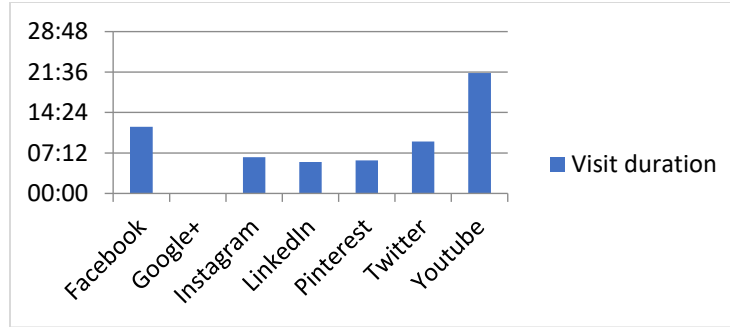


Figure 3.3. Analysis of the duration of a visit within social networks

Most users do not use a social network only once, frequenting it daily, even several times a day. Figure 3.4 illustrates this rate of return for compared social networks.

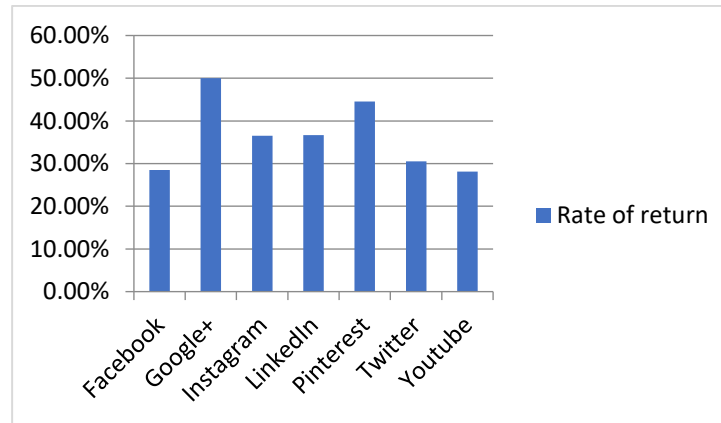


Figure 3.4. Analysis of the rate of return on social networks

Figure 3.5 shows the percentage of traffic received from each promotion channel for all compared social networks. LinkedIn tops the rankings when it comes to paid search.

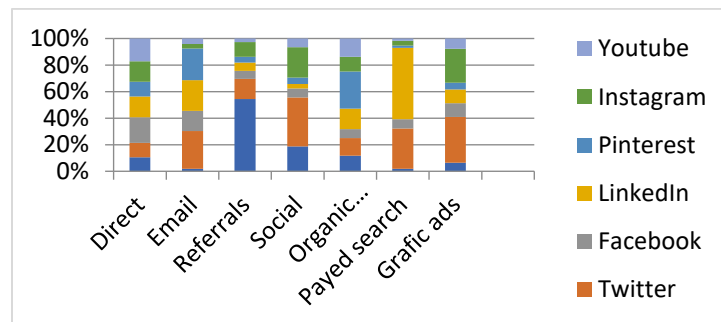


Figure 3.5. Comparative analysis of traffic for social networks

CHAPTER 4.

RESEARCH ON THE DEGREE OF USE OF DIFFERENT ONLINE PROMOTION METHODS BY SMES IN THE IT FIELD

Identifying the most suitable social networks for the online promotion of an information technology company is a challenge. The aim was to determine through a primary research method the main channels used by SMEs in the IT industry to increase their visibility in the online environment. The research diagram is presented in Figure 4.1.

The problem of increasing the brand visibility of an SME company in the Romanian IT industry is correlated with the knowledge of online promotion methods, their use in creating a promotion campaign, awareness of their importance in building notoriety.

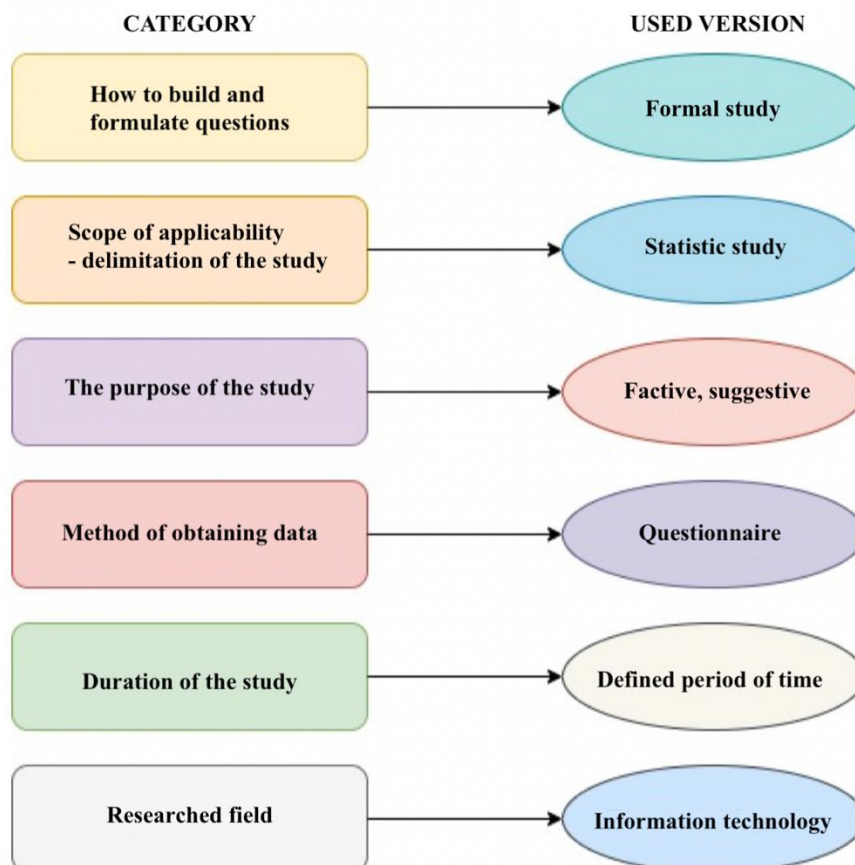


Figure 4.1 Research Diagram

The primary research undertaken was quantitative, being an exploratory one, which aims to observe the current trends of companies in the IT sector. The tool used consisted of the questionnaire-based survey, which had as methods the analysis of questions with simple, multiple answers, as well as questions that used the Likert scale. The survey was conducted online using the Google Docs platform.

The distribution process of the questionnaire was carried out between June and July 2018, being applied to the respondents under the same conditions, namely through a link that redirected them to Google Forms, to view and complete the questions, choosing from predefined options.

We wanted to test several hypotheses formulated below to determine the impact that various methods of online promotion have on organizations.

The data was processed and interpreted in the form of graphs or tables using both Microsoft Excel and the SPSS analysis tool (Negoiță, 2018).

It follows from this interpretation that most respondents are employed in SME-type companies, established in the period 2010-2018, which use means of promotion in the online environment (Figure 4.2).

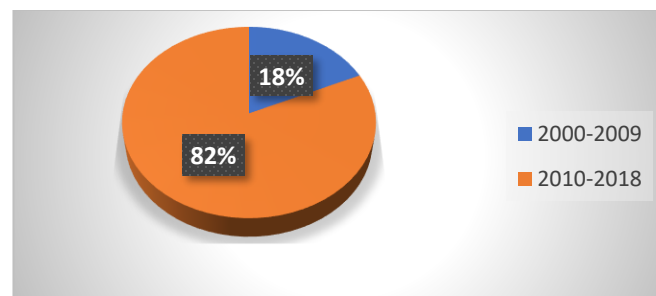


Figure 4.2 Percentage of SMEs set up by time period

Figure 4.3 shows the budget allocation of IT companies for the channels and methods used in online promotion, considering only those in the top of preferences for the promotion strategies of Romanian enterprises.

One reason why it is chosen that the largest amounts to be invested in the website, within SMEs, is the ease of its realization, its ability to strengthen the brand. In addition to this, at present, there

are a multitude of tools, platforms, companies and resources that help to create a structured web page.

Almost 30% of IT companies invest in social media campaigns, due to the tendency of people to have an account on them and also to spend a significant part of their time in the online environment. This frequent use also leads to the use of smart mobile devices, so companies are beginning to become aware that the website must have a responsive layout to fit the different screens and also be fully functional on all resolutions.

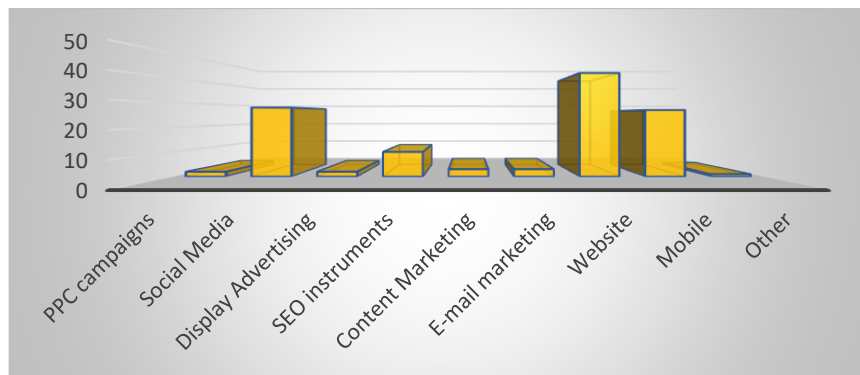


Figure 4.3 The preferences of companies in the IT industry for allocating budget in online promotion methods

The respondents of the questionnaire „Agree” that Social Media plays a significant role in the online environment, which is why they choose to use it in online promotion. According to them, it contributed in large proportions to each of the four proposed statements (Figure 4.4). However, when it comes to turnover and sales, there are neutral opinions about the role of social channels.

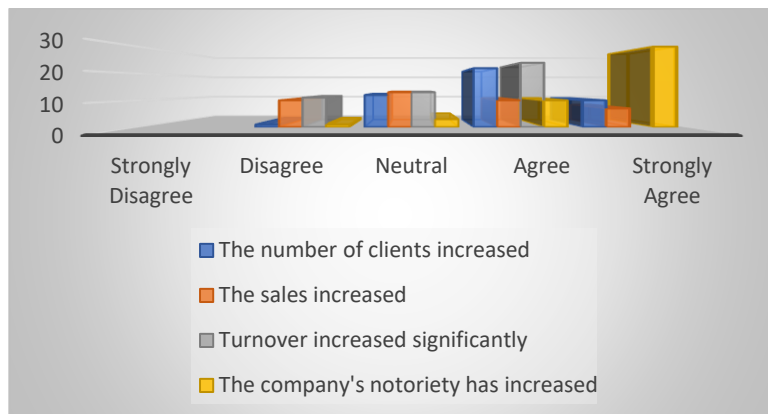


Figure 0.4 Representative diagram for the performances made by Social Media

CHAPTER 5.

PROCESS MODELS THAT ARE THE BASIS OF THE ONLINE PROMOTION CAMPAIGN

Process modeling consists in the graphical representation of them or the workflows of a company, as a means of identifying potential improvements. It is usually done by different graphical methods, such as flowchart, data flowchart, etc.

A process is a series of steps and decisions involved in completing and achieving a goal. In a process, each event can trigger one or more activities, so there is a one-to-many relationship. Next, for each channel and method of online promotion, a series of actions were proposed modeled by process diagrams.

Facebook. Facebook displays your ad differently to your target audience, depending on your chosen goal. The total budget is the amount that is allocated over the entire campaign, which will be divided by the number of days for the ad. If you opt for a daily budget, the amount will be entered for each day and the total number of days will be selected. Facebook Pixel is used to measure conversions. The main activities undertaken to build an online promotion campaign through the social network Facebook and present in the process diagram are represented in Table 5.1.

Tabel 5.1. Process diagram steps - Facebook

A1. Create a Facebook page
A2. Select the Create Ads option
A3. Choosing the purpose of the advertisement
A4. Account creation and choice of settings
A5. Target audience choice
A6. Allocated budget, time slot, campaign duration
A7. Choosing the image and text of the advertisement
A8. Install Facebook Pixel
A9. Set conversion measurement
A10. Post advertising on Facebook

Instagram. Instagram uses the Facebook advertising platform to run all advertising campaigns. So, any setting of ads, goals, budget and creation are done through Facebook Ad Manager. Statistical Significance Calculator: allows you to see if the results are significant enough to be used in the next campaign. Instagram Insights: Used to see statistics on engagement level and user reach. Website Analytics: It is used to track the number of visitors who come to the company's website. The process diagram for Instagram is shown in Table 5.2.

Tabel 5.2. Process diagram steps - Instagram

A1. Creating a Facebook account
A2. Access Facebook Ad Manager
A3. Choosing a campaign goal
A4. Choosing the target audience
A5. Select ad format
A6. Advertising design for Instagram
A7. Setting the budget
A8. Campaign testing
A9. Posting the campaign
A10. Measuring campaign success

Twitter. The main activities undertaken to build an online promotion campaign through the social network Twitter and present in the process diagram are represented in Table 5.3.

Tabel 5.3 Process diagram steps - Twitter

A1. Creating a Twitter Ads account
A2. Accessing Ads Manager
A3. Select create campaign
A4. Select the desired commitment
A5. Select campaign details
A6. Adding audience groups
A7. Setting the auction type
A8. Audience selection
A9. Choosing Tweets for the campaign
A10. Examine your campaign setup
A11. Campaign launch

Tweets that are published organically or that are promoted only to the target audience can be promoted. Payment is only made when the people involved are involved in the published content, but impressions that do not generate a commitment are free.

LinkedIn. During the process of creating an advertisement on the LinkedIn social network, there can be found 3 types of format: sponsored content, text ad and personalized messages sent via email. As sponsored content and text ads are created, the campaign manager will generate previews in different sizes and environments so that the best option is displayed.

To build the process diagram related to the LinkedIn social network, the steps presented in Table 5.4 are required.

Tabel 5.4 Process diagram steps - LinkedIn

A1: Access the LinkedIn platform
A2: Access the Campaign Manager
A3. Creating the campaign
A4. Select sponsored updates
A5. Choosing the promoted product
A6. Choosing the ad format
A7. Targeting the audience
A8. Establishing the budget
A9. LinkedIn campaign publish
A10. Report verification

Google AdWords. The URL displayed must be the same domain as the website. It is recommended to use keywords in the title, the limit being 25 characters. The activities for online promotion through Google AdWords are shown in Table 5.5.

Tabel 5.5 Process diagram steps – Google AdWords

A1. Create an AdWords account
A2. Create an AdWords campaign
A3. Select the campaign type and name
A4. Choosing the geographical location
A5. Establishing the daily budget and bidding strategy
A6. Creating the first group
A7. Advertising writing
A8. Insert keywords
A9. Set cost per click maximum
A10. Review of data entered
A11. Enter billing information
A12. Launch Google AdWords Campaign

SEO. The first step in the process diagram of the SEO promotion campaign is to analyze the website owned by the company. The website needs to be updated both technologically and in terms of its presentation. The diagram of the online SEO promotion process is shown in Table 5.6.

Tabel 5.6 Process diagram steps – SEO

A1. Analysis of the current configuration of the site
A2. Creating themes and researching keywords
A3. Establish a content strategy
A4. Performing an SEO audit
A5. Defining and pursuing the goal
A6. Website optimization
A7. Local SEO improvement
A8. Improved back links
A9. Tracking SEO results

CHAPTER 6.

DESIGNING A DESIGN SOFTWARE PROGRAM TO PROMOTE SMES FOUND IN THE IT

Internally, there are several companies that deal with digital marketing, offering their services through websites. Websites could be effective tools for initial awareness and involvement, but they do not fall into the later stages of channels, where applications prove their worth and can stimulate better retention rates.

A mobile device has evolved from a communication tool to an extremely efficient business tool over the years. As technology advanced rapidly, people began to become addicted to mobile phones, tablets, and other smart devices.

Today's consumers need personalized services / products and delivered as soon as possible, preferring to download the mobile application and perform all activities through it. Thus, they have access to information whenever they want. Companies have understood this and are beginning to give importance to applications, as the popularity of their use is growing.

The development of the MyBuddy application used the native programming language supported by Apple, namely Swift. It is a secure, fast and interactive programming language that combines modern language thinking with the wisdom of Apple's broader engineering culture and the diverse contributions of its open source community.

The application contains 4 screens, the first screen allowing the user to choose the company size, field of activity and key indicators. Each of these social networks and digital marketing methods have common but also distinct indicators to capture the target audience.

These indicators have been identified and used in the application logic (Table 6.1). The second screen offers which networks / online promotion methods can be chosen (Facebook, Google, Instagram, LinkedIn, SEO or Twitter). The third screen appears when one of the social networks / methods presented above is selected, each of which has between three and four degrees of implementation based on cost. The last screen appears when the Confirm button on the second page is pressed. This screen contains a summary of all costs incurred based on the selection. Figure 6.1 shows how the application works.

The software product has gone through a testing phase to ensure, when it is launched, that the end user experience is flawless.

Tabel 6.1. Key indicators

Locations	Facebook, LinkedIn, Twitter, Instagram, Google AdWords
Age	Facebook, LinkedIn, Twitter, Instagram, Google AdWords
Sex	Facebook, LinkedIn, Twitter, Instagram, Google AdWords
Known languages	Facebook, Twitter, Instagram
Events	Facebook, Twitter
Company	LinkedIn
Industry	LinkedIn, SEO
Experience	LinkedIn
Education	LinkedIn
Technology	Twitter
Interests	Instagram
Device types	Google AdWords
Keywords, key phrases	Google AdWords, SEO
Similar products / services	Google AdWords
Links	SEO

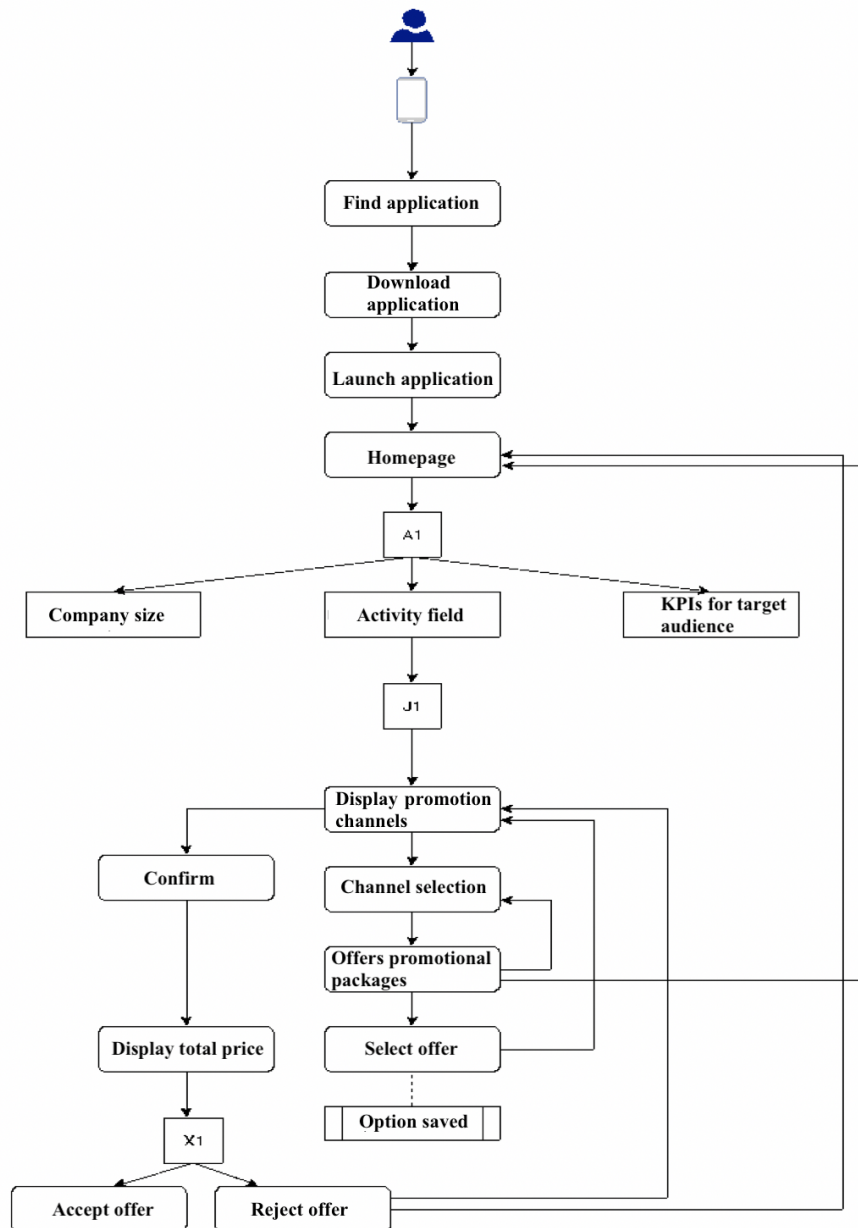
Navigation controller: The selection controller (being the first screen) must be inserted into a navigation controller to allow the Swift language to have a starting point. Without this point, the application cannot be started. A navigation controller manages the back and forth transitions between the application screens.

SelectionVC (selection screen): When this screen is presented to the user, the user can customize the offer he will receive. The three tables contain relevant information in choosing the offer. After selecting all the information, to go to the next screen, the Confirm button can be pressed.

ResultsVC (results campaign screen): A list of the 6 online promotion networks / methods shown above will be displayed on the new screen. Each campaign is created as a button through which to start the process of choosing a tariff plan.

CampaignSetupVC (the screen containing the various offers): When accessing a network / methods different charging plans are displayed. You can select an offer or none. When choosing an offer, the application will redirect to the previous screen.

CampaignResultsVC (screen containing a cost tracker): When the Continue button (on the ResultsVC page) is pressed, then the navigation controller will transition to the last screen. Within it, the user will see the selected offers and can place an order.



6.1 Application flow

CHAPTER 7.

CASE STUDY – IMPLEMENTING THE SOFTWARE SOLUTION WITHIN THE SOFT TO YOU SRL COMPANY

The chapter contains information about the company SOFT TO YOU SRL, making a detailed analysis of it. Numerical data are presented that illustrate the evolution of the company from the moment of establishment until now. In order to have a clear image, the important processes within the company, the software products and the services it offers are described.

The main field of activity held by the company SOFT TO YOU SRL is represented by the CAEN code 6201 - Custom software development activities (customer-oriented software).

SOFT TO YOU imposed itself on both the local and the external market, represented by Europe, due to the quality of the products offered, its diagram being presented in Figure 7.1. The relationship with customers and employees has always been open, offering availability in relation to the requirements and needs that have arisen along the way, understanding and optimal solutions to problems.

A special emphasis was given to increasing the quality of software delivered by their execution by people with high expertise in the field.

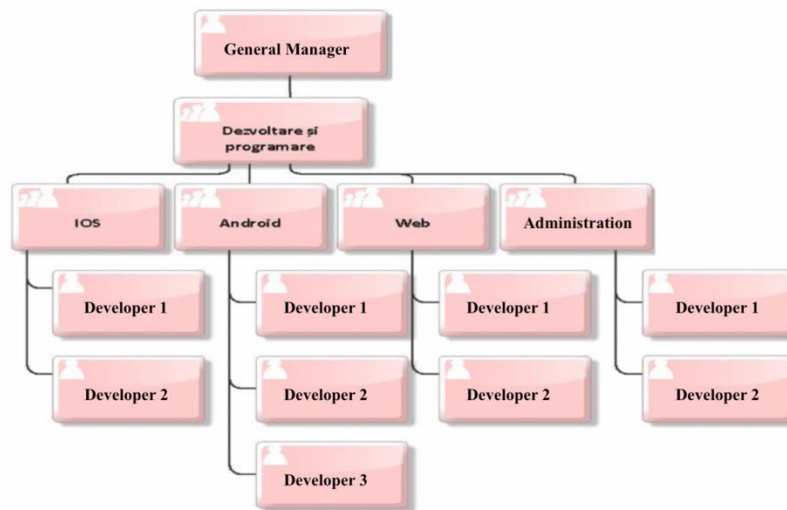


Figure 7.1 Organization chart of SOFT TO YOU SRL

The company SOFT TO YOU SRL had a growing evolution regarding the turnover (Figure 7.2). There is a marked increase in the first two years, in terms of turnover, which remained constant over the next two years.

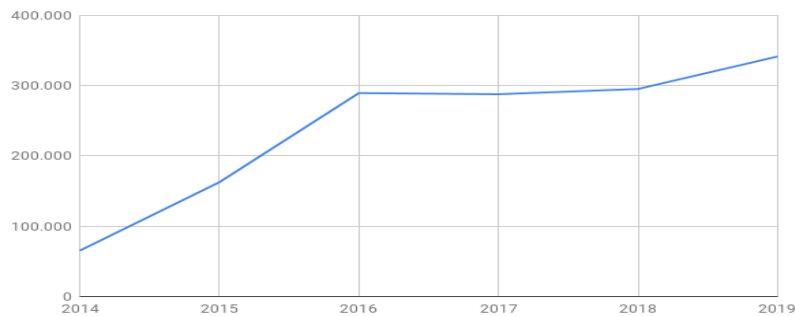


Figure 7.2 Five years evolution of the turnover of SOFT TO YOU SRL

The application was developed due to the need, but also the importance of companies in the field of IT-type SMEs to make themselves known in the virtual environment. Promoting them is difficult due to limited resources, but the lack of online promotion can have a negative impact on potential customers / employees who want to verify the veracity of information orally. Thus, the presented application wanted to indicate based on some key factors which are the most suitable social networks and online promotion methods for the company.

The application is currently being developed as a "proof of concept", which means that it has not yet been launched and distributed to the general public.

The goal was to channel the company's resources only to those networks and channels that can bring positive results. The developed application was used for the company SOFT TO YOU and indicated conducting an online promotion campaign on Facebook and LinkedIn. Below are the statistical results for the last year, namely the time interval August 2019 - June 2020, for the two social networks. The analysis was performed for a certain period, namely August 2019 - June 2020, to be considered relevant.

Most of the traffic on the LinkedIn social network, related to the company's SOFT TO YOU page, is mostly from desktop sources. However, it is also viewed from the mobile phone. Compared to the social network LinkedIn, dedicated to the business environment, the company's presence can attract new employees and customers (Figure 7.3).

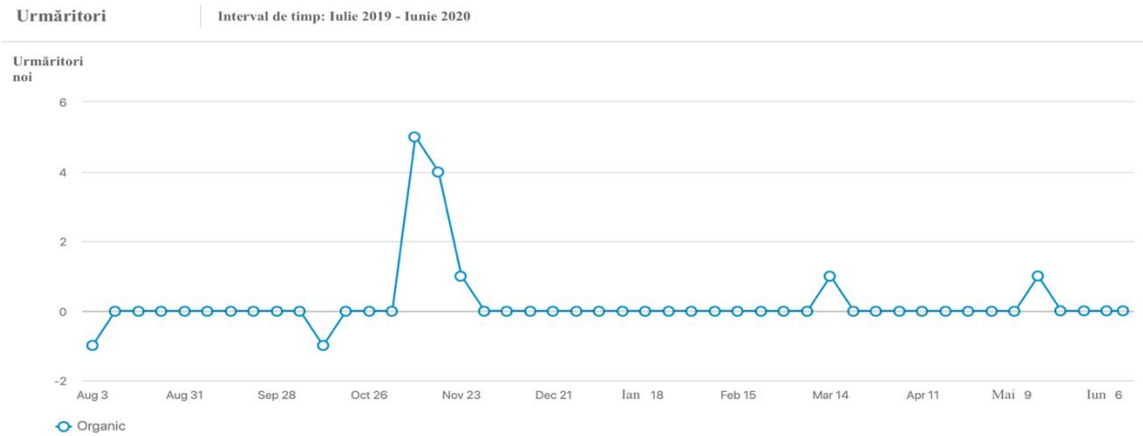


Figure 7.3 The evolution of the number of followers SOFT TO YOU 2019 – 2020, LinkedIn

The evolution of the number of people who gave „Like” is presented, i.e. they appreciated the Facebook page of the company SOFT TO YOU (Figure 7.4).

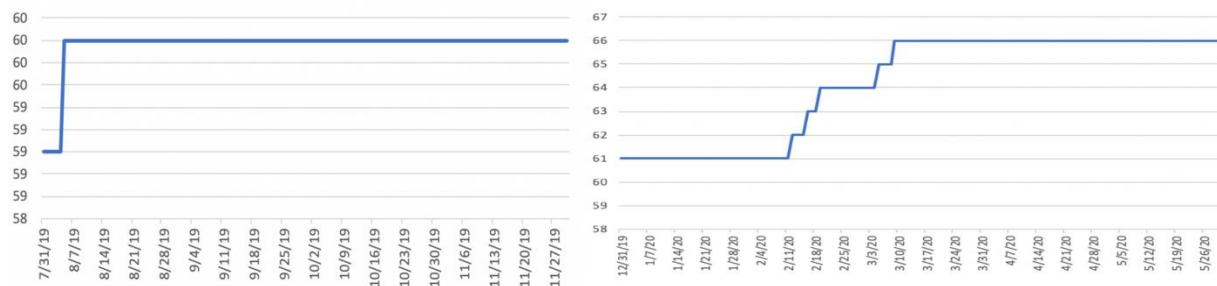


Figure 7.4 The evolution of the number of people who liked the Facebook page SOFT TO YOU 2019-2020

One can see the major positive impact of the proposed application that promoted the online environment of the company SOFT TO YOU, which was materialized in increasing the number of views, which led to a greater number of projects, including locally. This increase in the demand for software products for both smart mobile devices and applications for various fields has implicitly led to a significant increase in turnover and brand consolidation. The online promotion through the social networks proposed by the application and the performance according to the indications resulted in the development of the brand (brand awareness) and obtaining a good position of the company SOFT TO YOU SRL among the organizations in the field of information technology.

Conclusions.

This doctoral thesis started from a need identified on the market, namely the low promotion of information technology companies in the online environment.

In the first part of the thesis the profile of an IT organization was outlined, considering elements such as the flexibility of the program and the place where the activity takes place, the main applications used, the methodologies used for software development. There is an evolution of the field due to the benefits offered to the employee and the market demand for products / services, with a positive impact on the national economy.

The main methods used in online promotion by organizations are brought to the forefront and aspects prior to subsequent research are determined, highlighting, through graphs, the importance of social networks in the purchase decision.

Next, an individual presentation of each social network was developed, following a comparative analysis of them based on a set of indicators. These differences were organized into categories and played the promotion channel that is the leader for each.

A quantitative research was conducted based on a questionnaire that was distributed among SME companies in the field of information technology in 2018. It was found that most respondents know the methods of online promotion and much of the budget allocated to online promotion it is aimed at building the website and social networks, which has a positive impact on the visibility of businesses.

Modeling the process diagrams showed how to carry out a promotion campaign, step by step, for each social network, digital method.

The end of the thesis is the elaboration of a software product that is based on the common indicators established previously, based on which, the application generates which are the methods and channels that best fit the company. The implementation of the application was carried out within the IT company, SOFT TO YOU SRL. The promotion through the social networks, Facebook and LinkedIn, during the period August 2019 - June 2020 obtained positive results, presented in the form of graphs, which outlined the evolution of turnover and increasing the visibility of SMEs in the online environment.

Contributions.

The elaboration of the doctoral thesis represented a process in which the following personal contributions were made:

1. Bibliographic research on the conceptual elements corresponding to the field of information technology and the determination of the profile of an organization belonging to the field of IT
2. Identifying the main methods of online promotion used by organizations
3. Comparison of online promotion channels based on a set of established common indicators
4. Designing a qualitative and quantitative research through a questionnaire to determine the use of online promotion methods, their budget and the impact they have had on the visibility of SMEs in the IT field in the online environment
5. Modeling the process diagrams that show the flow of each promotion campaign in the online environment
6. Development of a mobile application that contributes to the purpose of the research, namely the choice of channels and methods for online promotion of companies in the field of information technology
7. Implementation of the software product within the company SOFT TO YOU SRL and presentation of the results brought using online promotion

Future goals.

Although this doctoral thesis aims to mark a period of research, the actions taken in it have not been completed.

The first part that can be improved is the development of the mobile application for Android operating systems. Thus, it will serve the general public without imposing requirements and limiting its access to only a part of phone users.

We want to conduct a qualitative research to validate the positive effects that online promotion has for SME companies. Also, based on the reviews given by the study participants, the functionalities of the application can be extended. We want to collaborate with organizations specialized in online promotion to deal with the promotion of promotion campaigns for companies such as SMEs in the field of information technology.