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A NEW DIGITAL AGE AND ETHICAL DILEMMAS: ASK.FM – A WEBSITE FOR ENTERTAINMENT OR CYBERBULLYING

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Abstract

Unlike Web 1.0, which was primarily used to gather information, we are today dealing with Web 2.0, which could be perceived as social software as it enables communication and sharing of information between users. Thus, when speaking about the Internet of today, we are referring to a medium that uses social networks, blogs and other virtual communities to connect people, which further emphasize its social dimension in the new digital age. The students of today spend over two thirds of their time online on entertainment and the reason for this lies in Maslow's hierarchy of needs. The study conducted among the students of seventh and eighth grades in a Croatian elementary showed that 69 percent of participants had an active account on the internet social network Ask.fm, which now has 134 million registered users. As a website with all traits of a social network, Ask.fm enables people to ask questions to each other and respond to them whenever they want. The questions can be asked anonymously or with a revealed identity. The study conducted on a sample of 1000 questions and answers showed that 17.3 percent of those questions open up certain ethical dilemmas – from inappropriate words (swearing), sexist terms, denial of positive life values to cyberbullying, and seven fatalities which ended in Ask.fm bullying-related suicides have been recorded among the youths. The study has shown that Ask.fm has no positive traits.

Keywords: Ask.fm, cyberbullying, ethical dilemmas

1. Introduction

Upon its creation, the World Wide Web was described in diametrically opposite terms by different researchers. While some pointed out that it was a new form of socialization which encouraged gregariousness, others talked about its negative effects in terms of social isolation and termination of social relations [1]. This paper will examine whether the Internet in this digital age is used to initiate and maintain social relations and to which extent it is associated with positive effects (deepening of relationships, quality free time, learning), or if it has negative effects as well (deviant behavior), using the example of the website Ask.fm which has attributes of a social network. The purpose of this paper, or rather that the purpose of which is to give a new contribution to this subject matter, is to establish whether Ask.fm has any positive characteristics and which ethical contentions that Internet social network raises.

2. Youth in a new digital age

Where the digital age is concerned, Vilović states the four principles proposed by the Poynter institute which can be applied to the digital age [2]: “the truth and reporting the truth”, “minimizing damage”, “acting independently”, “being trustworthy”.

According to Vilović, anonymous sending messages can be “an abuse of a public, virtual space and psychological mistreatment which deprives another person of their dignity, their honour and even their life”. This ability to play hide-and-seek, where we often do not know who is hiding on the other end, or rather who the interlocutor is, creates the possibility of hate speech and electronic abuse over the Internet (i.e. cyberbullying), the victims of which are largely children. Until recently, this problem was not discussed often, nor was it known to the general public, and the problem of Internet violence has never been so prevalent as today [3].

Today, violence in the broadest sense is understood [4] as application and use of force, and a society of violence implies the existence of a reality and social environment where violence and the use of force are perceived as acceptable, desirable and ultimately legitimate behaviour. The social control mechanism should be most involved in children, considering that they are, on the one hand, the most at-risk group, and on the other hand, because aggressiveness and violence in children can predict aggressiveness and violence in those persons as adults. However, it is not enough for early prevention to be included into the social control mechanism, but the definition of violence must also be specified considering that children spend almost all of their time in cyber-space. Today, the definition of violence must inevitably and explicitly include virtual violence [5] because it is only that it begins to receive the attention it needs (from parents, teachers, the public). In cyber-space, indirect verbal aggression takes place. Since the victim is damaged or injured indirectly, by endangering their social relations, this type of aggression is often called social, affiliative or relational aggression [5] because it includes behaviours such as exclusion from peer groups, termination of friendships, destroying another person's reputation and spreading rumours.

Today, not only are children exposed to inappropriate sexual content on the Internet, but peer violence is more frequent over the Internet. The term cyberbullying includes situations where “a child or a teenager is exposed to assault from another child, teenager or a group of children over the Internet or a mobile phone (cellular phone, chat, forum, blog, social network, Internet in the broadest sense)” [6]. This includes every sort of harassment, attack on the child's privacy, comments with offensive or violent content, group hate, threatening messages, choosing the most unpopular, the ugliest, the fattest or the dumbest (!) person in the school or, as is very often the case, asking somebody to describe and evaluate another person, while the anonymity of the perpetrator of violence, or rather the communicator, gives them a sense of security of getting away unpunished.

Cyberbullying as a form of indirect aggression has more powerful consequences because the victim can re-read everything and experience everything again. Unlike direct aggression, that is the “face-to-face” aggression, with cyberbullying the perpetrator is very often anonymous [7], so the meeting of the victim and the aggressor is very often easily avoided. The victim is thus exposed 24 hours a day and they cannot “escape” as they would in cases of direct

aggression, as is the case in a fight in a nightclub or a football club, where the victim can change their venue, their club or the sports they are involved in. The only course of action with cyberbullying is to turn off the computer and never turn it on again. But is that truly the solution? Aside from this, in cases of electronic peer abuse, the offensive content directed at the victim can be read not just by the victim but by the whole cyber community.

3. Ask.fm and cyberbullying

Ask.fm is an Internet social network which has 134 million registered users today [8]. It was launched on June 16th 2010 by two Russian brothers, Ilya and Mark Terebin, sons of an affluent former Red Army officer. They both graduated from the Faculty of Economics in Riga, the capital of Latvia, where they had grown up. They began their career in the furniture business, but they soon saw that the Internet presented a more lucrative way of earning money. They used the American question-and-answer page Formspring as an idea. Ask.fm was launched and grew so quickly that by 2013 the site already had 80 million users who posted up to 30 million questions and answers per day [8].

Considering the fact that the founders of the Ask.fm social network noted that teenage years are often a journey to self-knowledge, and that Ask.fm makes that journey easier by giving its members the option of anonymity because it encourages uninhibited and spontaneous conversations, it encourages opinions and builds self-esteem, it is possible to conclude that they wanted Ask.fm to help young people mature and develop psychosocial skills. This is supported by the stated core values emphasized by the owners of the social network: “curiosity, anonymity, safety, respect and community” [9]. They explain this by the fact that curiosity, that is, asking questions – as no group of people has more questions than young people, who make up the Ask.fm community – can only encourage human development, and anonymity gives the young the incentive and the self-confidence to ask a question which will answer a challenge in their maturation. Respect and intolerance of inappropriate behavior are the values which are meant to ensure the safety of the Ask.fm community, whose founders envisioned it as a “fun, happy, instructive and life affirming place”.

Ask.fm, as a website with all the characteristics of an Internet social network, enables people to ask and answer each other's questions when they like. The questions can be asked anonymously or with a visible identity, and the owner of a profile decides whether they will receive (and answer) all questions, thus the anonymous ones as well, or only those from a known source. The question is asked by typing the question into the designated field on someone's profile site, and there are also computer generated “random questions” and “questions of the day”. Only the owner of the profile sees the unanswered questions, and as soon as they are answered, the questions and the answers can be viewed on the owner's profile by everyone, including those who are not registered on Ask.fm. It is also worth mentioning that you do not need to have a user account on Ask.fm to ask somebody questions. This gives Ask.fm characteristics of a more open social network than Facebook. The fact that Ask.fm has been translated into 49 languages and that users from 150 countries have so far answered 25 billion questions attests to how open it is [8].

Other than the fact that a user registered on the social network can share a link on their Ask.fm profile (e.g. a link to the profile of the author of this paper is ask.fm/DenisVincek) and on other social networks, like Facebook for example, and thereby invite others to ask them questions, they can also use links to share their answers on other social networks (Facebook, Twitter).

As far as the use itself is concerned, Ask.fm points out in Terms of Use that no one under the age of 13 is allowed to have a user account on the social network and they must follow all laws and regulations of the country in which they live. Text responses, photographs and video clips may be posted on Ask.fm, but there are rules about what is acceptable. It is thus stated that it is not permitted to post or send both in questions and answers [10]:

- Anything mean, bullying towards someone or intended to harass, scare or upset anyone;
- Anything designed to provoke or antagonize people, especially trolling;
- Anything which uses rude words or is intended to upset or embarrass anyone;
- Anything that depicts horrible, shocking or distressing things;
- Anything which is obscene or pornographic, contains any pictures of naked people, is sexually explicit or depicts graphic violence;
- Anything which contains any threat of any kind;
- Anything which is racist or discriminates based on someone's race, religion, age, gender, sexuality, or the color of their skin;
- Anything which encourages people to get involved in anything illegal (e.g. drugs, violence or crime);
- Any lies about another person – whether you know it not to be true or whether you are not sure if it is true (even if you think it might be)
- Anything which constitutes spam, attempts to sell anything to other users or extorting money from other users
- Anything which does not belong to you or can present copyright infringement (e.g. music and films) or a breach of confidence
- Anything which contains any computer virus or other malicious codes designed to attack, damage, divert, take over, disable, overburden, or otherwise impair the Services;
- Anything which attempts to scrape or collect any personal or private information on Ask.fm;
- Anything which you pretend comes from someone other than you, or where you are impersonating someone else;
- Anything which may cause any harm or damage to you or anyone else.

Ask.fm has resources which limit abuse of the social network (filters for rude and offensive words and the removal of such inappropriate content) [11]. But the sentence: "We will attempt to limit the wrongful use of our website" is noticeable. This means that the owners of Ask.fm do not completely guarantee the absence of inappropriate content and are using this sentence to distance themselves from them – both in questions and answers.

Considering this statement and, as was previously said, the option to ask questions anonymously, the cyberbullies are given an opportunity on Ask.fm to attack their victims without, so to the speak, any fear of being discovered when they break any of the 15 previously mentioned “forbidden” rules.

In most cases the bullies are friends with the victim on Facebook, but the bullies often use Ask.fm to display their vicious side by using the option of anonymity on the site. Bullied teenagers are left hurt and in agony, not knowing which of their friends has turned on them [12].

Literature has noted seven unfortunate incidents [13] related to bullying on Ask.fm social network which have ended in suicides of young people. The most cited case is that of Hannah Smith (14), a girl from Lutterworth, Great Britain, who hanged herself after succumbing to brutal cyberbullying on Ask.fm. For months, anonymous users wrote despicable comments such as “Die” or “Get cancer”, Hannah was insulted by malicious users on account of her weight, the death of her uncle and her propensity for self-harm, and they also tried to convince her to drink bleach. It was only two weeks before she hanged herself that Hannah begged her bullies, who hid behind the veil anonymity, to stop the bullying, but they did not stop and it ended in tragedy [14].

Bullying on Ask.fm is also related to a suicide which took place in May 2013 in Croatia [15]. The girl in question was Marta Jureković (15) from the small town of Lobor, who was a first-year student in secondary school. On her Ask.fm profile, insults and exceedingly vulgar sentences were found to have been directed at her. She was called a “moron”, “a stinking two-faced piece of shit”, “a stupid whore”, “fucking ugly”, and she was explicitly told to kill herself. However, it was never proven that the suicide was directly related to the comments written on the Internet social network Ask.fm.

Krmek, Buljan Flander and Hrpka note [16] that there are four areas which have proven to be successful in reducing electronic violence:

- Raising awareness
- School rules
- Supervision
- Programmes

When talking about the prevention of Internet violence, the first place is usually given to raising awareness. Peer violence, online and in general, is neither a joke nor being playful, and in order for the prevention to be successful, the teachers, the parents and the students need to become aware of peer violence in general and then cyberbullying. Individual interviews conducted in the staff room of a Croatian primary school have shown that only two of the teachers knew what Ask.fm was and the dangers this Internet social network brings. The teachers are required to talk about the prevention of electronic violence not only without knowing about the places where electronic bullying takes place but also without being systematically educated on applying said prevention.

The authors point out that it is necessary for every school to devise a plan of prevention intervention on a school-wide level. Such prevention programmes against violence exist in Croatian schools, but the attention given to electronic violence in them is insufficient.

Considering that the prevention of electronic violence is something relatively new, the process and the manner of creating an individual way of fighting against cyberbullying and the daily application of established rules are also important in addition from the end result. Covering up abuse or making unreasonable decisions by the people who are completely incompetent in the area is not the solution.

The third area, supervision, refers to checking whether the students are following the accepted rules when using information and communications technology. While this is the parents' task at home, in school it is the teachers and other school staff who must be concerned with that, just like teachers are concerned with the behavior in the halls during breaks.

Programmes can be the most helpful aspect of raising awareness, and Krmek, Buljan Flander and Hrpka emphasizes the importance of those observing the violence and how compassion must be awakened in them so that they inform their teachers, associates, or parents – adults in general – about the violence taking place, and so that they do not silently approve of it.

Stanić [17] also speaks of the need for the observers, but also the victims, to confide in adults. In school, those are the homeroom teachers and the school psychologists engaged in correctional-educational work with students with inclination towards cyberbullying or those that had already engaged in it. Along with them, the counsellors and the librarians need to be included into the prevention activities process, since they are actually the only information experts in the school, apart from the IT teachers.

4. Research methodology

In order to answer the question which specific ethical issues the social network Ask.fm raises, content analysis was selected. Answers to the questions asked were selected as units of analysis. In quantitative content analysis, the purpose is not only to establish the existence or absence of a specific manifestation or characteristic, but also to determine precise quantitative values in which those manifestations or characteristics are represented. In other words, while qualitative content analysis answers the question “what” and, albeit less frequently, “how”, quantitative content analysis, alongside questions “what” and “how” also answers the question “how much”, thereby displaying the frequency and/or volume of the content determined [18].

The advantage of the analysis chosen is that in this case the qualitative properties are expressed through quantitative indicators which are measured and compared by the researcher. Additionally, the advantages are small expenses, the possibility of quicker data analysis and greater objectivity of results. Although we use quantitative content analysis to analyze the contents of a message, or rather of the unit of analysis, or, specifically in this paper, the contents of the questions and answers on the Internet social network Ask.fm, we cannot help but note there is additional value in the analysis in that we will ultimately acquire the characteristics of the senders and receivers of the message, which is to say of those who ask the questions and of those who answer them.

The focus groups [19] were primarily used to answer the question whether or not the social network Ask.fm has any positive characteristics, or rather the second question which this paper has tried to answer.

A deliberate “pattern according to the researcher's decision” [20] has been selected. The main characteristic of this research pattern is the researcher's assessment in which they themselves decide which examinees can give the best information to achieve the goals of the research. Only the units which the researcher feels contain the necessary information and are ready to share it are included in this pattern. The pattern according to the researcher's decision is used in situations where the intention is to describe a phenomenon or investigate something about which little is known. This is the case with the Ask.fm website where the author decided that the pattern which makes up the focus group will contain 17 teenagers who have answered more than 1000 questions on Ask.fm.

Focus groups are used because participants encourage and support each other in their debates, encourage discussions and opposing opinions and talk about different aspects of the topic which they may not even touch upon in private conversations. This manner of group facilitation enables the person conducting the interview, i.e. the moderator, to get more information than they would in the matching number of individual interviews.

The quantitative content analysis was done on 1000 questions by a random pattern selection of questions or answers of one of the members of the focus group.

5. Results and discussion

The research conducted in June 2013 in Franjo Horvat Kiš Primary School in Lobar and the Ante Kovačić Primary School in Zlatar, Croatia has shown that 69 per cent of examinees have an active user account on the Internet social network Ask.fm.

Of the 1000 questions and answers encompassed in the quantitative content analysis, 827 questions and answers contained none of the characteristics expressly listed in the Terms of Use on Ask.fm as something which should not be mentioned in questions and answers. The remaining 173 questions, which is as many as 17.3 per cent, presented some form of an ethical dilemma.

The specific 53 questions which contained no questionable (insulting, unpleasant, offensive etc.) details, were answered YES without being YES/NO type questions, but were questions which demanded descriptive answers, which tells us about the flippant approach to answering questions on the part of the owners of Ask.fm profiles.

A large number of answers were noted to be related to something not appropriate for a young person just in their teen years – specifically, it concerns alcohol and its consumption and going out late at night, the main purpose of which is the consumption of alcohol, and even about consuming alcohol during the educational process. In total, 38 such answers were noted, including: “you drink during practice”, “go out and get pissed”, “come home not sober”, “the whole class shows up for school drunk”, “going out to the pub and coming home in the morning”, “a day with five litres of wine”, “relationship with a glass of jägermeister still going strong“, “no gift like a glass of schnapps”, “happiest at the pub”, “I got

drunk”, „I would take jägermeister with me to Mars”, “if I had to go on a 14-hour flight, I would want a glass of jäger next to me”, “favourite candy – schnapps”, “like I haven't had “a taste” since Saturday”, “how much can you drink – that is a redundant question”, “I'm celebrating New Year's by getting pissed and making a mess at the club”. As an answer to the computer generated question to show the best moment of their summer, an owner of a profile on Ask.fm posted a photograph of himself drinking some hard liquor from a one-litre bottle.

As many as 30 answers contained foul language and swear words. 28 answers contained obscene, pornographic or sexist language. The answers contained seven disturbing messages, i.e. messages containing the denial of positive life values (“dumb school, I hope (school) burns down one day”, “it pays to lie”, “thinking of what to say to the doctor, why I wasn't at school”).

And last, but not least, five answers were noted containing elements of classic electronic abuse, i.e. cyberbullying – whether it was labelling other people, harassing them and making them uncomfortable or classic threats.

On the other hand, when it comes to the questions themselves, out of a 1000 questions there were 12 questions with characteristics of electronic abuse (“... is stupid”, “...is a whore”, “rotten bastard”, “gay”, “you're a gigolo”, “you're an idiot”, “drunk” etc.).

When asked the first question, whether Ask.fm had any positive characteristics and what they were, the members of the focus group answered that they thought that it had them, arguing, albeit somewhat hesitantly, that we can learn things about other people, we can ask them what we want to know but are ashamed to ask publically, we can meet somebody new. On the other hand, we can learn what people think about us, who is against us, and who are our friends who defend us. It appears to be a case of a priori exclusively positive connotations, and not a single person asked associated Ask.fm with anything negative in the beginning of the interview. In this portion of the conversation, no participant spoke out of turn, and their answers were rather short.

So the researcher started to get the participants talking about the site with all the characteristics of a social network from different aspects with additional questions. Most of the participants learned about the existence of Ask.fm through links on Facebook, and only three from their friends. They are young people in their early teens and have been on the social network Ask.fm between half a year and two years. They answer questions every day and they like anonymous questions, and they would be all right, they claim, without Ask.fm. They assert that Ask.fm does not take away from their studying time.

But the participants were divided on the question whether their answers on Ask.fm were honest or if they were meant to be jokes. They agreed that their answers become flippant statements when they are asked offensive questions, but also when they are bored. Also, offensive questions and questions with inappropriate content is, for a half of those asked, the reason they would not want their parents to see their Ask.fm profiles.

Only two examinees in the focus groups had not had any negative experiences, everyone else had received offensive and unpleasant questions. The examinees were divided on the answer to what they do about the offensive questions – they do not answer them, they delete them

or they answer them flippantly, and some even use inappropriate vocabulary. Two participants said that they had reported/blocked those who asked questions with offensive content.

After it had become evident that the participants often used the words “offensive”, “inappropriate”, “flippant”, the researcher suggested that the question about the potential positive characteristics of Ask.fm be reconsidered. It was at this moment that the facilitation of the focus group came to light. The examinees answered the question Why they began to use Ask.fm in the following ways: “out of boredom”, “it seemed interesting”, “everyone had Ask.fm profiles, and I wanted to be included”, “out of curiosity”, “for fun”, “girls fell for it”.

In the end the researcher repeated the question Does Ask.fm have any positive qualities and what are they? The members of the focus group, obviously under the influence of the answer to the previous question, were now almost unanimous in that there were not very many positive characteristics about that website with characteristic of a social network, and for the first time, the exact term cyberbullying was first heard in the focus group – associated as a result of offensive and unpleasant questions.

6. Conclusion

Research has shown that as many as 17.3% of all questions and answers raise some sort of ethical dilemmas. If we analyze those 173 questions and answers, we can see which ethical concerns are in question, how we answered / what we answered to “what” and “how” and about their frequency (in percentiles), or rather the question “how often” they arise in questions and answers on the Internet website Ask.fm. The results of the quantitative analysis of the content are shown in the Figure 1.

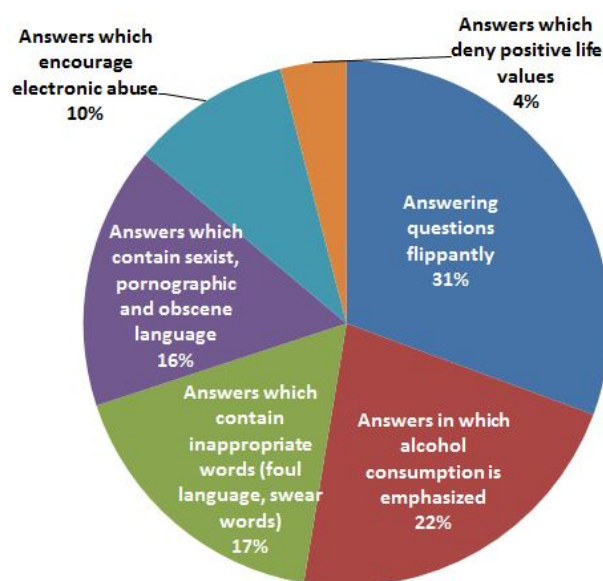


Fig. 1. Ethical dilemmas which arise in questions and answers on the Ask.fm website

The issues mentioned are a list of ethical dilemmas, among which electronic abuse or cyberbullying must be emphasized, which take place every day, as pointed out by Gordana Vilović, professor of ethics of mass communication, and so we can rightfully ask ourselves “does ethics live here” [2]. This refers to the modern age of communication, of which Ask.fm is a part. Obviously the filters for rude and offensive words do not exist and/or do not work, at least not on the Croatian version of the site, because, as this paper has shown, inappropriate content is not removed, and so it never goes further than the mentioned (if even that) attempt to limit misuses of Ask.fm, which gives the participants of the communication absolute freedom to breach ethics. At the same time, the members of the focus group were in the end almost unanimous that Ask.fm has no positive characteristics.

We can conclude that in this case information-communication technology, i.e. computer-mediated communication, enables teenagers to experiment in a social context, but we cannot say that the content, which they come to using the technology, is used as help, or rather a role model in maturing and acquiring psychosocial skills.

The research confirms Vilović’s claim which points out that anonymous messages can present a misuse of cyber space and electronic abuse among the members of generation C.

All this leads us to conclude that Ask.fm, as a new and powerful two sided “one-to-one” medium [21] is actually also an unethical information channel, because it sends ethically contentious messages, which puts into question the intention of the communication participants as they are the producers of these messages.

Although the owners of Ask.fm advise [22] those who have been made to feel uncomfortable by anything they read on the site to talk to their parents, guardians, teachers or good friends – and that they should not in any case keep it to themselves – it should be noted that research has shown that the teachers consider direct aggression to be more serious and are more prepared to react when a student shows direct aggression. Indirect aggression, as Keresteš points out [5], is ignored in schools and it is uncertain how much the teachers about know what Ask.fm is. It is the same with students, who are less likely to reject indirectly aggressive students than those who show direct aggression, which indicates that education of children, parents, and teachers about the consequences of indirect aggression due to cyberbullying, or rather electronic abuse, can only be stopped through prevention and education.

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THE SOCIAL ROLE OF PUBLIC LIBRARIES IN THE COMMUNITY

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Abstract

The public library plays a vital role in the communities it serves, being the main institution that provides information and documentation services in various forms and in different contexts. Thus, it contributes to the personal development of its users through formal education, through lifelong learning, through after-school activities, information literacy, leisure, skills development and access to public information. Another aspect covered by a public library is linked to social cohesion, institution space transformed into a meeting place and center for community development. The culture and local identity are problems with a significant impact of belonging to the community which is served by the public library and the imagination and creativity develop people's interest in cultural activities. All these situations are the most convincing evidence that a public library plays a very important social role for the community.

Keywords: public library, community, culture, personal development

1. Introduction

The public library, according to the Romanian Law for Libraries [1], is a library of an encyclopedic type in the service of the local or county community assuring the equality of access to information and to the documents needed for information, permanent education and development of its users' personality, regardless of their social or economic status, age, gender, political, religious beliefs or nationality. At present, in the context of an obvious informational explosion, the public library needs to redefine its mission and responsibilities to positively answer the increasingly diverse demands of its users. Just as in any activity domain, holding and obtaining relevant and updated information has a positive influence on the decisions adopted at any institutional level, information being considered a very important resource along with the classical ones: work, nature, capital. The impact of the new information and communication technologies has led to the creation of modern services, which require high-quality equipment, Internet access and specialized personnel.

Regardless of the kind of services provided by the public library - traditional or modern -, their impact on the personal development of the individual is significant, with consequences on: formal education; lifelong learning; development of information culture skills or access to public information. Being a meeting place, libraries also take on the role of multifunctional cultural and local development center, the community groups being helped to have an equitable access to information and to nourish their interest in aspects related to the local culture and identity, which in turn gives the libraries a special impact on the feeling of belonging to the community. Another aspect worth considering is that at present an

increasing number of libraries provide information services on health or the business environment specific of the local firms. There is an indirect link between the use of public libraries and social inclusion by the development of skills in the information domain, the real area of the library turning into a meeting and leisure space [2].

2. The impact of the public library on personal development

Regarding the domain of personal development, here the role of the library is the most visible, because the immediate results are the easiest to identify. Here, we include, first of all, the aspects concerning the relation with the learning process. The activities proposed to the young public, such as *Story Time*, *Public Readings*, *Tell the Character* etc. are meant to develop the reading skills and the correct language usage among the young, in general, and especially among children. All these aspects involve learning and relaxation techniques, personal understanding, and the activities highlight the importance of reading in the life of the participants and the importance of the public library in support of this activity.

At present, one can hear more and more often about the development of the information culture skills, which the professionals from any library should be able to share to its users. They, in their turn, shall be able to recognize the need for information, to localize the informational sources, to intervene critically on the information and to manage to integrate it in the basic knowledge to be able to use it efficiently in order to realize the activity they had in view. The aim of information culture is to give every individual a minimum knowledge allowing him to use information, to have diverse skills, in a context requiring informational resources. All these skills that a library user can acquire lead towards an increased motivation for learning, increased self-esteem and also the acquisition of independence from an informational perspective. Yet, one cannot obtain special results without the existence of high quality informational sources, without an adequate environment and well-qualified personnel. At the same time, efficient partnerships are necessary between libraries, schools, health institutions, in order to intermediate and facilitate the learning process.

The direct and indirect impact can be noticed looking at the access on the labor market, because the library can provide data on the labor force and on the GDP/GNP. Libraries need to publicize their access to electronic information, need to know to present the services they provide. At the same time, the gathering of unofficial data of an economic nature, supported by surveys applied to the users may lead to the initiation of entrepreneurship services and services with added value for the local enterprises, chambers of commerce etc. Consequently, the unemployed can find jobs using the library resources, thanks to the skills obtained by means of an information literacy course. We shall keep in mind that some firms are attracted to such a location due to certain factors such as: the facilities provided by the local library; existence of a qualified labor force (which labor force can be influenced by their use of the library resources). The research in the public libraries has combined qualitative and quantitative methods to evaluate the impact of its activity in the community, and during the last few years, a series of studies have been carried out

concerning the extent and the nature of the services provided, especially in point of social inclusion and community development.

The activities organized by the library have a major impact major in relation to the social goals of the authorities, bringing benefits to the community. These benefits can be direct: in the sense of the number of the active users; in the sense of the development of the collections, so as to cover a very large array of the users' reading and research options; by the investment in the modernization of the library areas and last but not least, by the provision of diverse and smart services attracting an important number of users. Out of the indirect benefits, we can mention: the contribution to education, to understanding democracy, to employment or the participation to cultural life etc., the library being a living and active institution of the community. At the same time, we need to take into account the potential users as well, those for whom the library has the value of an "emergency department", knowing that if they need a piece of information, they can find it there whenever they need it. No wonder that, under these circumstances, people need to become aware that they can go to the public library when they have to solve a personal problem of any type: administrative, public, sanitary, educational or related to the spending of their holiday etc. It is sure that the public library of the future will rely more on the citizens' information needs, yet, in order for this tendency to become viable, the authorities of the central administration need to allocate consistent funds for technological development, for the development of inter-sectorial projects, elaborating at the same time regional information management strategies. The pieces of information produced in the public administration are of key importance for the citizens. For this reason, one of the principal tasks of the public libraries consists in making this information accessible to everybody, which involves a redefinition of the principle of basic information and the determination of the conditions in which it can be accessible to the users.

Concerning the cultural impact, it can be noticed in terms of the increase of the quality of life. For instance, in terms of reading and literacy, the libraries contribute to supporting the development of children's reading skills, but also to the improvement of these skills among the adults. To economically inactive people, the library offers leisure activities, as an information and socialization source. We are aware that the public library is a service of great value for the community and losing it would have a negative impact on literacy, intellectual development, imagination and the education level. For this reason, all the efforts should focus on the development of this public service of such a great use for the community.

The most convincing evidence on its impact is from the domain of personal development, because the immediate results are easier to identify and are less questionable in point of the cause-effect relations. These results are expressed in terms of personal satisfaction, acquisition of new skills, trying new experiences, increased trust and self-respect, creativity development, cultural awareness, increased communication skills through linguistic development etc.

3. The provision of specific services in the public libraries

During the last few years, the public library has taken important steps towards very different services and activities compared to its aspect as an institution in the past, making efforts to open itself towards an increasingly diverse public. It is true that some people talk increasingly often about a disneylization of the library, about its decline as a public area in favor of entertainment and under the influence of the marketing principles of the private sector. The problem should not be perceived in this way, but as an opening in the context in which competition in the informational environment is increasingly intense.

The creation of a new library service involves the analysis of the needs of the community it serves, based on sociological studies, to avoid a wrong use of the financial and human resources available at a certain moment in the respective institution. Based on these studies, one can draw certain conclusions leading to information on the community profile, possible partners of the library, user demands etc. Any newly created service needs to be monitored and evaluated in order to be made sustainable, checking its impact on the users, the results obtained during a certain period of time, the efficiency of the activities etc.

The access to ICT in libraries has been very appreciated by all the categories of beneficiaries, as it results from the numerous studies carried out regarding the perception on this public institution, only 1 % of the respondents considering them useless. The new technologies support a large array of activities, from individual study to the finding of a job and the construction and maintaining of social networks using the internet.

Auditions of classical or modern music, accompanied by presentations of books or art albums represent another service provided by the art or multimedia sections of the libraries. The beneficiaries of these activities are people educated in this sense and who come with propositions of specific events or users who want to find out as much as possible about a composer, an artist or become familiarized with the respective domain. Usually, these activities are organized in partnership with artists, painters, musicians, music or drawing teachers who can provide important and new information regarding the aspects presented.

The presentation of a movie - accompanied by the presentation of the book it was made after -, the presentation of an author or of an epoch are programs that have enjoyed a real success and which have led to a growing interest in reading among the young public.

Public readings aim to increase the interest in reading especially among the young users, because at present reading has moved into a shadowy area if we compare it to the offers of the online environment, particularly the virtual one. For the contemporary society, in which diversity, culture and adequate language still represent social values, reading represents so far the most adequate way of attaining these desiderata.

The organization of courses for users according to their demands is a relatively new service in the Romanian libraries. To the community members, libraries offer areas where they continue to learn, developing their basic skills necessary to their participation in the social, cultural and economic life of the community. This supposes the development of the general culture, studying languages, developing reading skills, developing technological skills etc. By activities organized in a differentiated way for different categories of users, libraries

stimulate ideas, discussions, a culture of dialogue and implicitly creativity. In Romania, by means of the Biblionet project, the perspective on public libraries has changed and a consequence of it was the training of an impressive number of librarians as trainers, the immediate result being the holding of diverse courses in an organized environment.

The activities based on volunteering have developed increasingly intensively lately, because very many of the library activities can be organized using volunteers. They need to be recruited, trained and coordinated in agreement to the Law no. 78/2014 concerning the regulation of the volunteering activity in Romania.

The technological evolution has allowed the public libraries to develop a series of special services for visually impaired people. In this sense, libraries have bought books in a Daisy (Digital Accessible Information System) format, by means of the Foundation “Cartea Călătoare” (The Travelling Book), consisting in the reproduction of the content of a document from a printed format into a digital format, accessible to blind and visually impaired people.

The services oriented towards target groups win more and more supporters in the libraries that have become aware that it is more efficient to address a target public in particular and to create services adapted to particular needs than to act in a general way. For example, by means of the Biblionet programme, national partnerships have been implemented, such as the one between the Agency of Payments and Intervention for Agriculture (Agentia de Plăți și Interventie pentru Agricultură - A.P.I.A.) and the local libraries, the target group being represented by farmers, who can use the IT equipment in the public libraries to apply online for subventions, and financial support for the plot of land they have. [3] Another target group considered by the libraries is that of the unemployed people, who are helped to find a job by means of the services provided by the library.

4. Conclusions

At present, all the decision factors need to be aware that the public library is an institution of strategic importance, being the most important civil service storing and spreading information in a community. Investing in a public library is maintaining a civilizing institution with a great impact in the cultivation and information of a people. Local and national authorities need to elaborate a strategy in the domain of the libraries and of information in agreement to the international norms concerning this aspect.

In this sense, one has to create a management unit for libraries and for information in the central administration availing itself of qualified personnel resources, sufficient to cover the needs of the knowledge society. A library is an institution enriching the life of many people, enriching their chances of living - via education and job opportunities -, promoting social cohesion, all these being community landmarks that reinforce the identity of the population. Public libraries have a special contribution to the creation of social capital, because they assure social inclusion [4], bring people together, promoting tolerance and an understanding of cultural diversity.

Libraries represent the binder between the community and the government, a connection materialized on different levels of responsibilities. By offering governmental information and contents, libraries promote a friendlier appearance of governance. For many users, libraries are or will be in the near future the first contact point with the e-governance. With the appearance of an increasing volume of online governmental information and services, libraries become the most important place where people can access services, while librarians can offer them the necessary assistance in order to use these services.

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ROMANIAN LIBRARIES AND SOCIAL MEDIA: USES AND GRATIFICATIONS – CASE STUDY: LBUS LIBRARY

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Abstract

Due to the continuous rising of social media and their implications in everyday life, it is difficult to ignore their role in the life of communities. New media is important for every day communication, but has also an important role in PR strategies. PR campaigns in politics and advertising have to be presented on Facebook or other social networks. Romanian libraries have registered an important growth in promoting themselves in online communities. The aim of this paper is to analyze the importance of this new method among other classical types of PR for libraries, especially for the LBUS Library..

Keywords: social media, PR strategies, Romanian libraries

1. Premises

The specialists agree upon the fact that nowadays the number of internet users is exponentially growing, determining its development from a *one to many* media into a *many to many* media, then to a change in the consumer behavior of users. It is shown that all of this implied transformations of strategy and communication instruments in the last years for most of international brands[1].

2. Definitions and delimitations

In the book named after the literary translation of *Facebook* network, *The Book of Faces*, the author, Alexandru-Brăduț Ulmanu, shows that under the term social media one can understand “everything that allows the active consume of interactive and amusement content, the interaction and collaboration between the users”[4]. Ulmanu enumerates as being part of this concept the programs that allow the users to work together, from different computers, at the same time, in the same document, such as *Google Docs*, *wiki* sites as Wikipedia, which facilitates collective contributions to various projects, blogs and platforms as *WordPress* or *Drupal*, social networks as *Facebook*, microblogging services as *Twitter*, video sites as *YouTube* or *Trilulilu*, photography sites as *Flickr*, but also many other sites

where users share their personal experiences and opinions about the services and commercial products, including virtual games where hundreds of thousand people interact simultaneously[4].

He shows that on the Internet one can find everywhere examples of socialization of services, and any site becomes social because “it incorporates the connection with a social network”. [4]

3. Typology

The researchers classify *social media* into six categories [4]: collaboration projects, blogs, content production communities, social networks, virtual worlds and virtual societies.

Collaboration projects are about platforms that allow users to intervene on a web page and to change it as they wish, the so-called *wiki*'s. The most known is Wikipedia, popular encyclopedia, that reached 18 million articles and 365 million users in 2011 [4]. Another popular example is WikiLeaks, a platform originally created to allow anonymous publication of secret documents, the aim being to increase the transparency of governments and organizations.

Another category is represented by blogs, which can be the author or collective, generalist or specialized (journalists or politicians blogs, blogs of companies, blogs integrated into news sites, blogs dedicated to events).

Examples for dedicated community content production are those sites where users can produce and distribute various types of media as Flickr, *YouTube*.

Among the most popular social networking sites is the one created by Mark Zuckerberg - Facebook. In Romania, the 2011 data show that there are more than 3.1 million accounts, representing nearly half of Internet users and 14% of the population. Brăduț Ulmeanu believes that this type of service is remarkable that “many of them encourage users to go online with real names and identity”[4] which marks a paradigm shift, given that the Internet is a place where anyone can be anything. The last two types of *social media* are virtual worlds (games) and virtual societies, in which users can borrow identities, avatars that interact with other users in order to build a virtual character with which to live in a fictional manner.

In addition, in the social media category, we can also integrate the *Yahoo Messenger* service that enables even faster service exchange of information between colleagues, chatroom services, very popular in the 90s, and even the email itself. An information technology expert, Paul Jones told the author of the book cited above that “it sounds strange, but the email is still on of the online communications medium most commonly used “. [4]

4. Internet communication features

Anne Gregory, referring to communication on the Internet, specifies the unique characteristics of the Internet [3]:

- First, once the message is sent, the transmitter loses control, considering that there is not a neutral communication channel;
- It is interesting that it is so transitory, because some things can be erased immediately (the reply to an email, etc.) and permanently virtual (web pages that can remain unchanged for years);
- It is not bound by time, the response to a message can be sent / received anytime;
- The author believes that the Internet provides a unique environment where communities and community groups can form, reform, transform and dissolve;
- It is not tied to a specific space, access being as easy for anyone in close proximity, but also at hundreds and thousands of miles away;
- It requires no costs once it has been installed;
- Enables communication from one individual to another, but also from one group to another, respectively of all the combinations, all at the same time;
- The speed and amount of information that can be accessed are without precedent;
- One last feature mentioned by the author is interesting and important. She notes that Internet users have different views they hold the power, because that can group and regroup in different communities with high speed.

5. Internet use in public relations

Experts find that among Internet implications in communication we can include the fact that in a positive way public relations are a source of information that provides transparent access[3]. A change is that the audiences should be seen as a collection of "problems" rather than as uniform blocks as the customers.

Anne Gregory shows that problems remain on the website, and the timing for reaction is up to the audience that can occur at any time even years later, when different groups of people gather around a problem and form a "new" public. The Internet is considered ideal for active publics and approved for public who searches for information.

Potentially, the members of this public are the best friends of an organization, but also they represent the biggest "problems". Experts warn that the idea of getting a continuum of actions required of those who communicate within the organization can be strengthened or destroyed by users accessing alternative information sources, many of which may be unknown to the organization, and this number will be determined continuously time.

A serious potential problem is the lack of information from organizations as alternative sources that can be accessed are available, but not all provide support. Anne Gregory [3] underlines that the Internet changes the power relations between networks of audiences involved, as lower interest groups present their case as well as larger organizations and interact directly with other stakeholders. Therefore, individual opinions have equal weight, no more or less important and traditional opinion trainers, for example outside the Internet media are less influential. Communication is more direct, without the mediation of journalists and forced transmission opportunities (ads) are limited.

6. Promotion through social networks

The principle that makes *Facebook* work is simple [1]: each user has a profile page where he can upload photos and videos. You can view the recent activities of the user that can be commented on by his friends. Each network user can make friends with other users, with more or less access to their data

The network offers other facilities such as games, contests, chat, possibility of becoming a member of various groups, send messages etc. *Facebook* can be used in marketing, and the company has the opportunity to reach their target audience.

Researchers [1] show that the four elements can be used:

1. Profile: Each user shapes a profile which "is a page that is designed to convert visitors into friends. They would inquire into certain areas of the identity of the person concerned.
2. Groups: these offer the possibility to create a community around a brand, it creates a space for customers, colleagues and friends, so that they can participate in discussions about trademark. There is a possibility for discussion forums, uploading photos, videos and links, and news and updates can be sent to group members.
3. Facebook Pages: researchers show that differs from groups that are more easily adapted than groups
4. Events on Facebook: through this possibility, marketing events may be promoted, the emergence on the market of products or any events of interest to the company.

It is believed that Facebook is currently the world's largest online social network that allows forms of promotion (some brands like Nuella, Pizza, Coca Cola, and personalities like Barack Obama or Mr. Bean). Experts believe that Facebook remains a platform for the presentation of self and own PR, but there is controversy regarding the effectiveness of marketing on Facebook. It is considered that in terms of share of accesses, corporate investment in Facebook is not profitable, much less on brand positioning. [1]

7. The Uses and Gratification (UGT) theory

UGT discusses how users deliberately choose media that will satisfy given needs and allow one to enhance knowledge, relaxation, social interactions/companionship, diversion, or escape.

UGT focuses on the consumer rather than focusing on the message, is about “what people do with media?” [5] rather than “what media does for people?”. Gratifications are sources of pleasure or satisfaction . UGT holds that audiences are responsible for choosing media to meet their desires and needs to achieve gratification.

Facebook rewards engaging content. In the study “How to Connect and Communicate with Customers” [6], David Lee King proposes ten tips for turning the library social media in something appealing for users:

1. be relevant
2. be consistent
3. pay attention to different tools and different rules
4. share your library’s story
5. be human
6. type like you talk
7. be helpful
8. think short
9. be visual
10. encourage audience participation.

8. Romanian Libraries and *Facebook*

Romanian libraries have registered an important growth in promoting themselves in online communities. Next, we analyze the impact and specific online communication for several major libraries in Romania.

There are an increasing number of institutions that have developed in recent years pages in the Facebook network to promote and achieve a measurable impact from users.

Besides the most popular promotion method of websites, we encounter the official page of the institution which is used for personalized communication.

In postings we meet promotion of events, status updates, photo sharing. Also, creating groups on professional affiliations is another component of communication on *Facebook* (ABR group, ANPBR).

Administrators of the pages may see a number of important statistics such as the number of users who viewed a post, number of likes, number of distributions, audiences accessing a post etc.

Of the number of pages analyzed, only part of them have links from the website on the *Facebook* page, which shows that they function as independent means of promotion:

The Library	Web site	Facebook page	Fb button on site
"Lucian Blaga" Central University Library Cluj -Napoca	yes	yes	yes
National Library of Romania	yes	yes	no
Metropolitan Library Bucharest	yes	yes	no
Central University Library "Carol I" Bucharest	yes	yes	yes
UMF - Carol Davila Library Bucharest	yes	yes	no
UPB Central Library Bucharest	yes	yes	no
University Library of Craiova	yes	yes	no
"Mihai Eminescu" Central University Library Iasi	yes	yes	yes
UP Timișoara University Library	yes	yes	yes
University Library Danubius Constanta	yes	yes	no
University Library of Oradea	yes	yes	no
University Library "Dunarea de Jos" of Galati	yes	yes	no
University Library "1 Decembrie 1918" of Alba Iulia	yes	yes	no
University Library "Lucian Blaga" of Sibiu	yes	yes	no
Romanian Academy Library of Bucharest	yes	yes	no

University Library "Lucian Blaga" of Sibiu has its own Facebook page since 2011. The number of likes increased at 513 in 2015.

The page is used for promoting library events, projects and communicating with users. Judging by the impact of the posts, the most accessed are the cultural and artistic events as the *Cultural Café* and *The Night of the Library*, Inauguration of Spanish Corner.

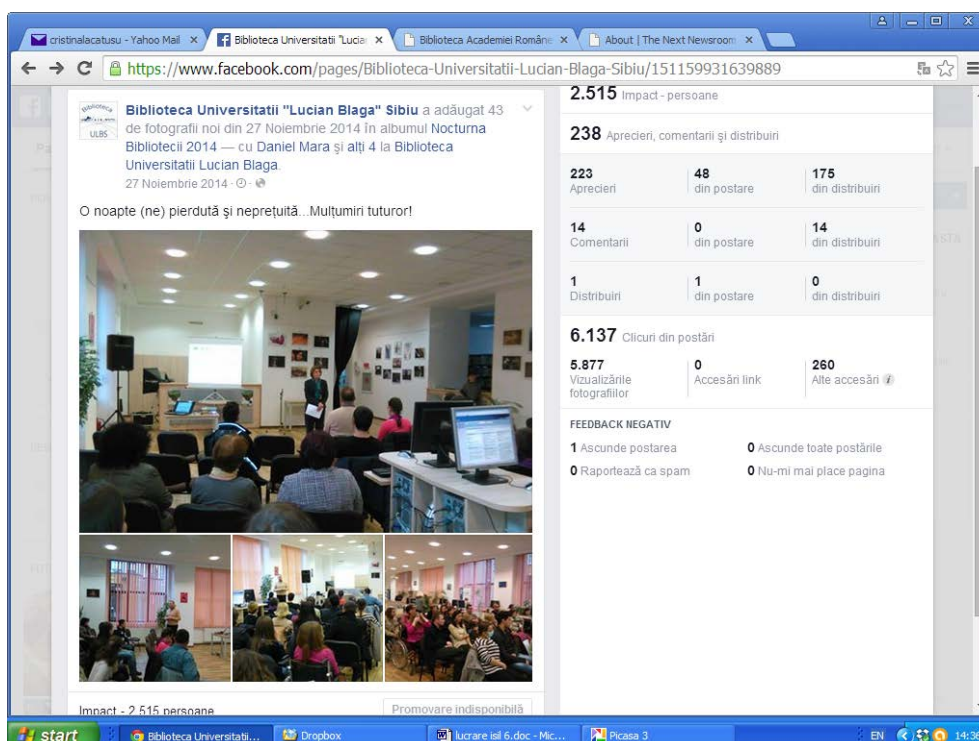


Fig.1. LBUS Facebook page [7]

9. Conclusions

Tyler Cowen believes that "the Internet encourages us to seek identities and alliances based on specific and definite extreme interest" [2]. We could say that choosing the best PR strategy remains in the area of communication, because "the way in which you decide how to communicate is a fundamental choice in creating the most prosperous economy that life can give you." [2]

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LIBRARY – A NEW PUBLIC SPACE

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Abstract

In the present society libraries are not only an active component of the process of acquiring, processing, communication, preservation and archiving of information resources. Developments in information technology and communications turns library into a public space for communication. In the information society development of library led to the establishment and redefining its roles: information, enlightenment and socialization are the main features of contemporary library. Library become an educational, cultural and social center and also a tool for promoting research experiences and a means by which community members can participate in the social life. One of the fundamental issues that need to consider when talking about the role of public space of communication and library must assume is the understanding that the user needs have changed. Moreover, increasing and diversifying social needs manifests itself as a service request, and, to this end, one important characteristic of contemporary library should represent the increasing complexity of services offered to users. The library becomes an integrator public space where librarians must come to meet users both physical and virtual means. The library becomes a public space endowed with information resources in all areas and all genres.

Keywords: contemporary library, public space for communication, information resources

1. Introduction

The problem of redefining the concept of "library" was released in Europe for the first time in April 2005 at the initiative of the European Commission the question of regulation of digital libraries. In this context, in Romania, the Government Ordinance no. 26/2006 (published in Official Gazette no. 85 of 30 January 2006) are made major changes to the law libraries in Romania. The library is expanded notion of "institution, department or specialized structure whose primary goal is to establish, organize, process, develop and preserve collections of books, publications, and other specific documents and databases to facilitate their use for information, research, education and recreation", as was defined in 2002, to the institution in charge of "initiation, organization and development of cultural projects and programs, including partnerships with public authorities and institutions, with similar institutions or public-private partnership" [10]. For the first time the question of the need of a department of marketing and public relations, on the one hand to have the role to inform the user about the existence and benefits of library resources and services, and on the other hand to help the institution to continuously improving the services offered so as to meet the needs and expectations. For, once with developments in technology, the library will have to overcome their role and informal educational environment and to expand its scope of activities in the field of culture and social, which really means the institution adaptability to the needs and requirements of its users. In this respect, the main provisions set out in the Romanian Government's legislative program for 2014 was considered the Draft Law amending the Law 334/2002 on libraries [13]. Among the regulations of this bill

include: redefining public libraries, with the starting point that these multiple roles to meet: local information center, cultural center, education center, center of information technology, change that recognizes the different functions it performs public library and recognizing different functions it performs public library. These provisions are proof that it was realized that the libraries in Romania must become flexible and to adapt to the new roles assumed by European libraries.

2. Libraries - part of e-culture

The concept of "library" in today's society has changed fundamentally. The traditional role of space knowledge and educational space is added to the roles of cultural space and social space, the contemporary library offering hybrid image library in which, alongside traditional resources meet digital resources (materials in electronic format, video and multimedia) and integrated digital resources (related to virtual communication) [7]. Thus, internationally, have been identified the following roles of modern libraries: educational center for education, social center, a general information center and local center for information technology. In this context, the library becomes a community space suitable for satisfying relationship needs of its users.

Among the most current ways of networking include the development of virtual communities. For more striking and imposing development tools library globalization transforms library into what is called "Library 2.0", concept of increasingly addressed and promoted in the specialty literature. By making a comparison between traditional library and library 2.0, Dediu identifies the following characteristics [6]:

Table 1: Library 1.0 versus Library 2.0

Collections closed	Open Collections
Centered on bringing the library	Centered on finding users
Mission focused on output	Mission focused on value-added
Applications type "monolithic"	Flexible and modular applications
Information obtained easily	Information provided through dialogue / conversation
Services with limited options	Extension great options
Newsletter printed, mailed	Blog by a team
Catalog "Read-only"	Catalog with commenting functions, Amazon style
Services provided only in the presence of users	Global Services available
Integrated library system (ILS) per employee	User tagging
ILS is the core operational	Services for the user is the focus

In this context, the most used phrases to define the concept of Library 2.0 include: library is everywhere; library has no limits; library invites participation; library uses the most flexible and easy systems; library is a human-centered organization [6].

"Library 2.0" is based on the orientation of librarian attention to the needs of users, in order to stimulate participation of users in creating services they want. Tim O'Reilly brought into focus the idea of exploiting the collective intelligence of those who use a product [11]. This, in the online environment, will take the form of feedback and comments on social networks. In this regard, user participation to develop value products, on sites like Amazon, Flickr, My Space, Facebook and Wikipedia, plays a major role. Also, achieving professional blogs and discussion forums have an important role in this respect.

Blogs created for professional libraries have an important role in terms of providing news and information for users and librarians, comment and recommend some resources available in the Internet, the presentation of data or new reviews about the newer books in collections, user training on information retrieval in certain databases [5]. Blogs offer two major advantages when it comes to interaction with library users, namely: update rate and chronological ordering of messages. This may be very useful in situations such as: library provides users with new services and new resource, the library organizes cultural, scientific or other events that require a punctual and quick communication, library doing some timetable changes. All this is easier perceived when using blog tool compared to using the library Web site, where the information current can be "hidden", or electronic mail, which can be bored recipients [5].

Regarding blogs for professionals in the field, they provide expert information on librarianship and information science in general. Librarians have worked just to list including the requirements that should be met by a professional who works in a library and this took the form of "Librarian 2.0 Manifesto". The author of the first version of "The Librarian 2.0 Manifesto" was Laura B. Cohen [4], Web Support Librarian at the University of Albany, SUNY. The most important aspects mentioned in the "Manifesto librarian 2.0" were included in the code of ethics for librarians. Among the provisions that manifesto meet the following: "I will create open Web sites that allow users to join with librarians to contribute content to enhance the learning experience and to assist colleagues"; "I will lobby for an open catalog that offers customized and interactive features that users expect environments online information"; "I encourage members of library administration to keep online journals "; "I guarantee, through my actions, the vital role of the librarian in any type of culture evolving information" [6]. All these provisions demonstrate that the librarian, aware of the impact of information technology development, aims to adapt to new user requirements and to meet their needs. Likewise, Lancaster observed that the expression "to consult a librarian" will become synonymous with "contact a specialist in information". The librarian will become a consultant with extensive competencies.

3. Library – Center of Information and Communication

The value of information resources offered through various channels is the key feature to understanding the evolution of the idea of the current library. Among them one of the most

important roles is to understand the library as an information and communication center. Beyond the traditional aspects of the idea of information, such as: on-the place of traditional documents (books, magazines, brochures, flyers), copy and print information, Internet access, access to their own databases using catalogs, and, more recently, the use of hyper-catalogs (hyper-catalogs involve integrating links to more information on a document to a full text, to an audio or video, links that allow extending the search of similar documents and annexation of information that add value document original [8]), newer libraries provide community information services.

Community information centers consist of providing citizens of diverse information from various fields, such as: education, culture, law, minority issues, different aspects of NGOs or international organizations, statistical studies, aspects of economic or tourism, aspects of public administration, health care and social assistance [6]. Thus, a library may identify one or more areas that are of interest to the community it serves and perform specialized databases with information relevant to the target group. In providing information to citizens can appeal to modern means of communication (email, blogs specialized, subscriptions to specialized programs) and the traditional means, such as telephone, fax or mail.

Another fundamental aspect that we must carefully when we understand the library as public space is that of meeting space, especially for users who for various reasons can't use regular library services. In this respect we talk about special services that any library should have their attention. These include: external services; information technology services for the blind and people with visual or hearing disabilities; information technology services for people with neuromuscular disabilities and guidance services and user training, conducted by target groups.

External services are services provided by public libraries outside the central or subsidiaries. Making mobile libraries, libraries-bus, libraries-boats or other forms of transport used to serve those living in remote areas [6]; services offered in prisons, hospitals, homes for children and the elderly are examples of this. With regard to information technology services for the blind and people with visual or hearing disabilities, libraries must take care to purchase equipment and special technical means for people with physical disabilities (hearing or vision) such as large monitors and contrast functions increased or displays that convert information into Braille and programs that convert the text spoken by the user into text written. Information technology based services for people with neuromuscular disabilities requires the purchase of special equipment for people with learning difficulties: readable documents, audio tapes, CDs [6], keyboards with few keys or devices that replace the mouse and allow for special orders. As for the guidance and training of users, conducted by target groups, depending on their interests, imply the involvement of users in different social or cultural programs, conducted in different physical spaces designed for this purpose or virtual environment, within communities involved management issues that concern them at a time. In this respect, the librarian is to provide essential information and landmarks users and the actions they propose.

Where is achieved strong relationship between the library and its citizens that it serves, the library should provide resources for maintenance of networking. In this respect, we talk

about dedicated staff and representative of each area of interest, specialized departments, specialized collections and special relationships with organizations and people representative of the areas of interest of the citizens. In addition, libraries can create tourist areas in compartments structure for providing community information, tourist information centers [6]. They have their own premises, staff and equipment dedicated and specialized activities. Examples are: Tourist Information Center "Gheorghe Iacomi", compartment structure of County Library "G. T. Kirileanu" from Piatra Neamț [14]; Tourist Information Centre from Botoșani County, created in a European Project and developed in partnership with the County Library from Botoșani [14]; Tourist Information Centre Măcin, developed near City Library from Măcin [15].

In terms of understanding the library as a center of communication must be taken into consideration that, beyond the role that it plays in informing its users for a better and effective networking with them, the library must assume the role of organizer host events or events organized by other institutions or groups of people in the community it serves. In this regard, in addition to traditional services, we talk about new services included in library activities. Renting space library for social or business events; creating and sustaining support groups; creating spaces to achieve all kinds of debates; establishment of clubs with specific activity (such as chess club or photographers); organizing specialized courses; organization of competitions to stimulate interest in certain areas and to develop a spirit of competitiveness are examples of this.

Another basic role of the public library is to support that it can bring to the citizens we serve in terms of needs that they have in relation to leisure or purchase of various materials in a variety of formed on entertainment topics [6]. Through such involvement library contribute to the preservation of their culture, of history and traditions of the local community, to promote them and encourage citizens to participate in cultural life. In this regard, referring to the mission that the institution should have the library, the manager of the Central University Library "Mihai Eminescu" from Iași, Alexandru Călinescu, stated: "library building was conceived as a multifunctional space where cultural activities had share at least a proper library ", stressing the need to open to the public library collections, not only documents but also by configuring it as an important cultural center [2].

Also, contemporary library should offer users access to application programs and various operating systems. The category also includes application programs online, programs accessible via the Internet, which includes and blogs, discussion forums, social applications for discussion and information exchange. In a study conducted in 1995, C. B. Lowry brings attention to the fact that, following the development of technology, libraries will survive if they focus on building a "virtual library infrastructure" [9]. Thus the library of the future will become a center of intermediation in a network environment by subsidizing access to information for the community it serves and providing technological support in this regard [9], and the librarian will become "access point" [9] and itinerant in virtual space for users of information.

4. Conclusion

During the last period libraries began to turn into important formal and informal social centers, due to technological, intellectual and social changes to which they were subjected. Libraries becomes a new public space that offers various services to citizens: from tourist information to provide services to people with special needs, from organizing activities that encourage artistic and cultural life at providing support from Virtual communication in virtual communities profile. Contemporary users have expectations and demands very different from traditional users. To accommodate them and maintain utility libraries, and therefore staff they must change their attitude, thinking and working. In addition, library services and specific techniques are constantly expanding, aiming to cover the ever-changing needs of users.

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INFORMATION LITERACY IN THE DOCUMENTATION AND INFORMATION CENTRE (DIC) SPECIFIC ACTIVITIES DESIGNED INTO THE DIC FOR INFO- DOCUMENTARY SKILLS TRAINING OF STUDENTS: CASE STUDY AT DIC - C.T. CIBINIUM SIBIU

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Abstract

Info-documentary skills are part of the key-skills of students and missions of the Documentation and Information Center (DIC). The paper refers to the eight info-documentary skills mentioned in the organization and functioning Regulation of school libraries and of Documentation and Information Centers and illustrates with a case study the specific activities designed into the DIC for the information literacy training of students. The study conclusion reveals the complex and the extensive character, also the results of the info-documentary activities of the DIC.

Keywords: Documentation and Information Center (DIC), info-documentary skills, education for information, information literacy, regulation

1. Preliminaries

As part of the key-skills training of students, particularly of that to learn how to learn and to use the new digital technologies as a tool for learning and knowledge, they are plotted info-documentary skills, representing the education for information and so, the information literacy training, which are found elements in the National Education Law. [1]

Also, information literacy training and development, respectively info-documentary skills of students constitute the mission of the Documentation and Information Center (DIC), which is a modern structure, a multidisciplinary and multimedia resource center, implemented in Romanian undergraduate system since 2000 whose activity is provided by the current organization and functioning Regulation of school libraries and of Documentation and Information Centers. [2]

The presentation of info-documentary skills (on domains and subdomains in Annex 2 of the Regulation) which pupils should develop by the end of compulsory education, states that the work was performed in order to orientate the activities from DIC for the students training in the education and information domain. There are mentioned the following eight areas of information and documentation skills of students:

1. Knowledge of info-documentary structures
 2. Knowledge of different types of documents
 3. Knowledge and use of tools to access information
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4. Defining the research subject and its issues
5. Selection of appropriate documentation to research subject
6. Gathering and processing the relevant information to communicate
7. Communication of the information in various forms
8. Evaluation of the information, of the research approach and of the research product

2. Information literacy of students by acquiring info-documentary skills

Design frame structure of info-documentary activities:

- Setting of the skill area
- Defining of the specific skills
- Denominating of the activities
- Fastening of the operational objectives
- Giving of the contents and sequences: theoretical and practical
- Listing of the used resources: procedural, material and human
- Evaluating of the expected results
- The designed specific activities in DIC for info-documentary skills training of the students

2.1 Knowing of the info-documentary structures: The Documentation and Information Centre (DIC)



- The activity: general presentation of DIC: 9th class: planned access
- The sequences / contents
 - Updating of the knowledge about info-documentary library type structures arranging
 - Analogy presenting by the school library and the DIC, emphasizing distinctions of DIC: modular space, flexible, multifunctional, more attractive, more diversified and various resources
 - Reading of the internal Regulation of DIC in short analysis

- Seeking and finding demonstration of one document on the shelf: a title of school bibliography

2.2 Knowing different types of the documents

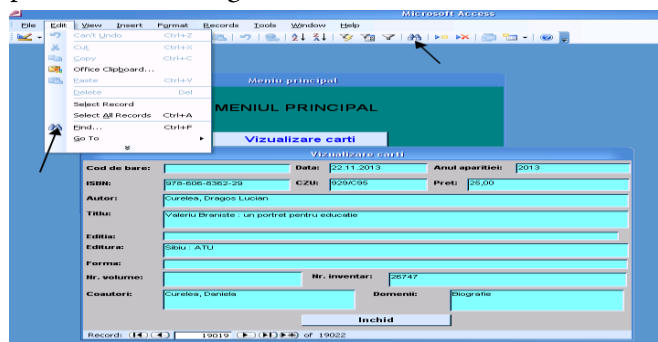


- The activity: communicating of the documentary typology: bibliographic and webographic documents
- The sequences / contents
 - Evoking of the known documentary types of frequented info-documentary structures (libraries, museums, archives etc.)
 - Establishing of the library documents:
 - specific (books, periodicals, audio-visual and electronic documents)
 - nonspecific (coins, medals and decorations, artwork, archival documents etc.)
 - Determining the characteristics of a bibliographic document
 - The multiple criteria for the classification of documents, as bibliographic and documentary information resources (about grouping collections, material support, provided information, the manner of appearance, the way of information transmission)
 - Mentioning of the information and documentation resources through Web / Internet
 - Task: test

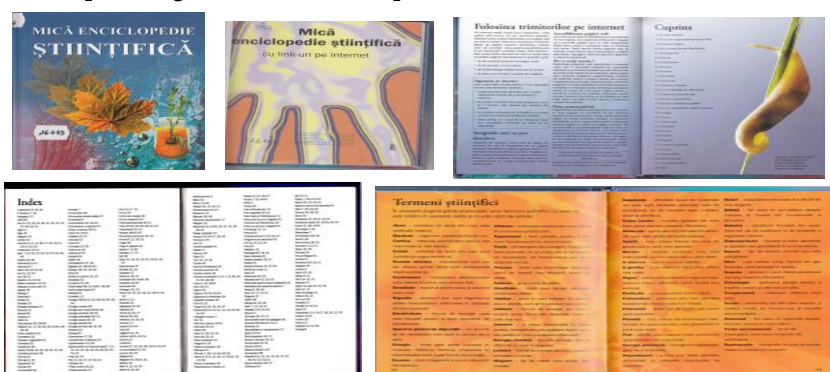
2.3 Knowing and using of the access tools to information

- The activity: Systematization and using of the access tools to information from DIC
- The sequences / contents
 - Highlighting of the facilitating function to information access of the information tools from DIC
 - Open access shelf – fast direct information
 - Reference fund – consultation and information in DIC space

- Reference works: monographic documents and periodicals (encyclopedias, lexicons, dictionaries, guides, atlases, magazines, reports, newsletters etc.)
- The system of catalogues (traditional - alphabetical, systematic etc.; computerized)
- The bibliographies made on the documentary fund
- Using of the computerized catalogue of the book fund from DIC: important facilitating tool of the local access to information in DIC



- The access tools to information inside of the document (book type) depending on the editorial presentation



- The web search engines
- Application: distributed tasks into the groups according to the specific skills

2.4 The stages of a documentary research: from defining of the subject to evaluating of the research product

- Activity: carrying of a documentary research
 - Theme exemplifying: The book's history

2.4.1. Defining of the research subject and its problems

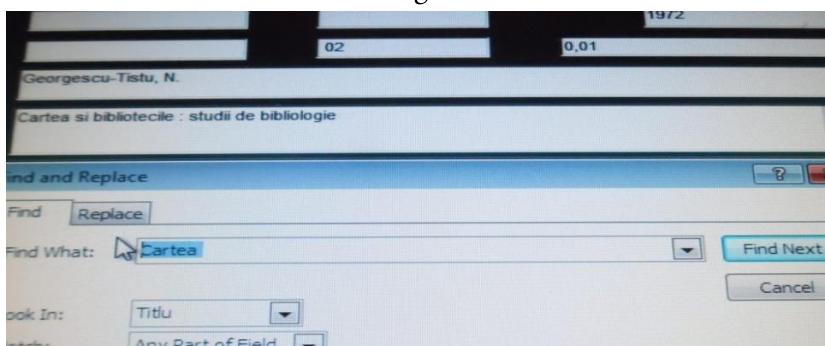
- The sequences / contents
 - Drafting of the research subject by key-words
 - Calling of the previous knowledge about the research theme
 - Defining of the subject by editing of a documentary research plan

○ Task: test

- a. Find at least three keywords for the concept of the book.
- b. Define the writing in your own vision.
- c. Assign a representative element of the book to each historical great stage.
- d. List at least three representative books, stating their space-time belonging.
- e. Indicate a title of useful bibliography in the documentary research of the subject / defined theme

2.4.2. Selecting of the appropriate documents to the research subject

- The sequences / contents
 - Identifying of the documentary resources: orientating bibliography
 - Book type documents of paper
 - On-line documents / webography
 - Using of the access tools to information
 - The electronic catalogue of the book fund from DIC



- The on-line search engines for web documents
 - The open access shelf
 - Writing of the bibliography references of the chosen documents for the research subject
 - Systematization of bibliographic references according to the types of the accessed documents: overall (independent entities: monographs and serials) or analytic (parts / contributions from independent publications - book chapters, magazine / newspaper articles)
 - Respecting of some international / standard rules and conventions in wording of the bibliographic note about of: identity elements, rendering order, used punctuation
 - Practicing of some different styles / systems of bibliographic description by prestigious institutions (APA, MLA, ISO etc.), especially of punctuation.

- Adopting of an authorized / standardized system for respecting of the bibliographic uniformity principle in the description of the documents
- Presenting of some patterns according to the existing rules for different types of documents, overall accessed (entities) or analytic (parts / contributions from independent publications)

- Task: Application

- A. Based on the guiding bibliography, find other useful resources in documentary research, including: two on paper and two on-line.
- B. Use, for documentary resources finding , the following access tools to information:
 - a. The open access shelf
 - b. Computerized catalogue of the book fund DIC
 - c. On-line research engines
- C. Write the bibliographic reference for each found resources according to the recommended model, having in sight the characteristics of document

2.4.3. The collection and processing of relevant information to communicate



- The sequences / contents
 - Consultation (selective) of the recommended bibliography of at least three resources, as well as those identified in the personal approach
 - Testing of the relevant information by corroborating with developed plan (stage I) for defining the research subject
 - Using of the reading
 - as information and documentation tool
 - in creative purpose (documentary research products: abstract, summary, essay etc.)
 - by the forms: analytic (from overall to part); synthetic (from part to overall)
 - for taking of the notes, using: condensation techniques message (Diagrams, sketches, keywords) and written text processing methods (analytical and synthetic)
 - Reformulating the information in a personal manner

- Personal reflection (concentrating of the intellect; reflexive thinking; critical spirit; cognitive autonomy)
- Making of connections (relationship between information and between documentary sources; association, as appropriate: examples, arguments, texts, images)
- Structuring of the information for answering to the research subject:
 - Ordering of the processing information
 - Systematization of the extracted dates in synthetic manner (of analytic processing)
 - Customizing in the structuring of dates according to the research product
- Identifying and respecting of the using information and of the copyright by:
 - Indicating of the sources for quotes or inserted documents
 - Completing of the bibliography
- Achieving of the final product
 - Sectioning of the final product according to:
 - requirements in defining the subject (stage I)
 - established communication mode: direct, remote, oral, written
 - basic rules in making different types of products (abstract, paper, essay, graphic organizer, PP presentation)
- Task: Application:

Based on bibliographical documents, arrange for collection, processing and organizing information in order to achieve the final product, according to the following requirements:

- a. Approach the research subject in its complexity
- b. Use the analytical method of information processing (from the whole to part)
- c. Use the synthetic method (from part to whole) for systematizing and ordering of processed information in analytical step
- d. Edit the bibliographic references of the used / exploited documents in the research approach

2.4.4. Communication of the information in various forms



- The sequences / contents

- Organizing of the manner and of the presentation framework (Establishing of the student groups according to the type of the made product)
- Communication techniques of the students' products
 - Oral / direct: presenting of the each product type on student organized groups
 - Written / remote: transmission in writing (on paper or electronically) of individual products
- Respecting of the basic rules in making of the various kinds of products, from the set out requirements in the defining step of the research subject
- Presenting of the final product (Individually and in the organized teams)
- Task: Communicating of the documentation research products

2.4.5. Evaluating of the information, of the research approach and of the research product

- The sequences / contents
 - Establishment:
 - The type of evaluating: product (the agreed products of pupils at the end stages of the documentary research: abstract, summary, essays, graphic organizers, power point presentations.)
 - The tool of evaluating: checklist (requirements of: content, form, communication, presentation, level of the achievement)
 - The date of evaluating (the end of the documentation research activity)
 - Communication of the evaluating tool: the checklist
 - Self-evaluating and the each other evaluating of the students' final products
 - Based on the checklist:
 - Self-evaluating of the students for their products
 - Each other evaluating of the products in the co-operation activity
 - Writing and obtaining an individual score of the two types of evaluation
 - Highlighting of the achievements and knowing of limits in conducting of the documentation research
 - Successful results (fulfillment of the requirements on the checklist)
 - Limits (noticed minuses in fulfillment of the requirements for appropriate achievement of product)
 - Task: application of the checklist: individually and reciprocally

- a. Based on the checklist, make the own evaluation of the made product, choosing the fulfillment level which you consider appropriate
- b. On the same criteria make reciprocal evaluation of your products
- c. Quantify the results of the two types of evaluation.

3. Conclusions

3.1 The formation and development of the info-documentary skills - complex and extensive activity

- Info-documentary activity
 - By itself (elective course: Education for information / Information literacy)
 - Lesson - activity
 - Integrated in the various school subjects (disciplinary projects / partnerships with teachers):
 - Integrated documentation sequence in the frame of the lesson
- Educational activity differently framed
 - school / ex-school; free / planned; educational / cultural / communicational
 - collective / individual

3.2 The results of the info-documentary activity

- Practicing of the investigative approach (thinking, adaptation)
- Development of:
 - critical sense, of autonomy in the information activity, of the intellectual curiosity
 - a set of knowledge of info-documentary activity, of some skills, capabilities
 - autonomy in searching, selecting, processing and communicating information for personal, academic, professional purpose
- School success of the students, their social and professional integration

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DOCUMENT CLASSIFICATION USING NAIVE BAYES

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Abstract

Document classification is the problem of classifying text documents into a set of predefined classes. After a preprocessing step the documents are represented as huge sparse vectors. Therefore, we have to apply some feature selection methods to reduce the dimensionality of the document-representation vector before applying the core classification algorithm. In this paper, we use Information Gain as feature selection method (that was proven in our previous paper to be the best) and we evaluate a simpler and faster classifier algorithm - Naïve Bayes. Because of the high computation requirements of the previously tested Support Vector Machine classifier, we evaluate now the accuracy lost and the time consumption improvement for the Naïve Bayes classifier. As we might expect experimental results are not of the same quality (on average the accuracy is 9% lower), but the classification time decreases from about 4 minutes for SVM to 7 seconds for Naïve Bayes. Therefore, Naive Bayes can be a good option when computation restrictions are important.

Keywords: Document Classification, Information Gain, Naive Bayes, Weka framework.

1. Introduction

While more and more textual information is available online, effective retrieval is difficult without good indexing and summarization of document content. Document categorization is one solution to this problem. In recent years, a growing number of categorization methods and machine learning techniques have been developed and applied in different contexts. In the last period, research in this area focuses more on the document representation and selection of the best features in representation in order to obtain well results in a quickly time from an information retrieval (IR) system.

In text categorization, feature selection is typically performed by assigning a score or a weight to each term (word from document) and keeping some number of terms with the highest scores while discarding the rest. After selecting, the features the experiments continue with evaluate the effects that feature selection has on both the classification performance and the response time of the system. Numerous feature-scoring measures have been proposed and evaluated: Odds Ration [5], Information Gain, Mutual Information [2], Document Frequency, Term Strength [3], Support Vector Machine [4].

In this paper we focus on the attributes selection (feature selection) step. This is a preprocessing step and it is important because, in this step, the data are prepared for better knowledge extraction and therefore the quality of learning process can be improved using better data and can be made faster. Idea of this paper is to evaluate a learning algorithm based on Naïve Bayes for different number of feature extracted from text documents. We evaluate from classification accuracy point of view and

from the training / testing time needed for working with this numbers of features. The experiments have been described and implemented using the Weka framework [10].

The section 2 presents some theoretical aspects important to the paper. In the section 3 we present the Naïve Bayes classifier, the kernel of this paper. The section 4 presents the experiments performed using the WEKA framework. Section 5 presents the experimental results and followed by conclusions and further work of this paper.

2. Theoretical Aspects

2.1 Data representation and transformation

Documents are typically represented as vectors in a words space, called also bag-of-words representation. Each word in the vocabulary represents a dimension in this space, named also feature space. The number of occurrences of a word in a document represents de value of the corresponding component in the document's vector.

After representing the documents from the dataset as vector of word frequencies (called attributes), the attributes are in different value domains and need to be transformed into the same domain. Therefore, we have applied some normalization methods. The common normalization methods (described also in [6]) are Binary representation, Nominal representation, Min-max representation and Z-mean normalization. As normalization method, we have used in our experiments only the Nominal representation.

In the Nominal representation, the values from the vector are weighted using the formula from equation 1:

$$TF(d, t) = \frac{n(d, t)}{\max_{\tau} n(d, \tau)} \quad (1)$$

where $n(d, t)$ is the number of times that term t (word) occurs in document d , and the denominator represents the value of term that mostly occurs in document d , and $TF(d, t)$ is the term frequency. The weight from the vector after normalization can take values between 0 and 1.

1.1 Information Gain as Feature selection method

Usually after extracting all words form entire all documents that are in the dataset obtain a huge numbers of features and representing the documents in this huge space need more computation power and computation time. In addition, there are a lot of features that bring no useful information in an information retrieval system quite the contrary can introduce a disturbing noise for the system. So that before applying a learning algorithm need to be applied some features selection methods.

In one of our previous paper [8] we have tested three different feature selection methods (OneRAttribute Selection, Information Gain and Gain Ratio) in the Weka framework [10] and prove the Information Gain gives best results. Therefore, we will use only that method in this current research.

The Information Gain feature selection method is based on Entropy and computing the gain in information [5] which is obtained when using that attribute in representing

the document. This are functions of the probability distribution that underlie the communication theory. The entropy is a measure of uncertainty of a random variable. Based on entropy, for features selection a measure called “Information Gain” is defined. This represents the expected reduction in Entropy caused by partitioning the samples according to this attribute. The Information Gain of an attribute relative to a collection of samples S , is defined as:

$$Gain(S, A) \equiv Entropy(S) - \sum_{v \in Values(A)} \frac{|S_v|}{|S|} Entropy(S_v) \quad (2)$$

where $Values(A)$ is the set of all possible values for attribute A , and S_v is the subset of S for which attribute A is equal to v .

Forman in [1] reported that Information Gain failed to produce good results on an industrial text classification problem, as Reuter’s database. The author attributed this to the property of many feature-scoring methods to ignore or to remove features needed to discriminate difficult classes. In our previous paper [8] we have revalidate this in our dataset context.

1.2 Basic Measures for evaluating Text Mining systems

If we consider an information retrieval system, which works with text documents and select the documents from the dataset that match with the current query, for system evaluation there usually are used in the literature two metrics Precision and Recall.

Let $[Relevant]$ be the set of documents relevant to a query and $[Retrieved]$ be the set of documents retrieved by the system. The set of documents that are both relevant and retrieved is denoted by $[Relevant] \cap [Retrieved]$. There are two basic measures for assessing the quality of text retrieval:

- *Precision*: is the percentage of retrieved documents that are in fact relevant to a query. It is defined as follows:

$$precision = \frac{|[Relevant] \cap [Retrieved]|}{|[Retrieved]|} \quad (3)$$

- *Recall*: is the percentage of documents that are relevant to the query and were in fact retrieved.

$$recall = \frac{|[Relevant] \cap [Retrieved]|}{|[Relevant]|} \quad (4)$$

- *F-measure* is defined as harmonic mean between Precision and Recall

$$F - measure = \frac{recall \times precision}{(recall + precision) / 2} \quad (5)$$

- *Accuracy*: is the percent of documents correctly classified in the classes based on the document target (label).

Precision ranges from 1 (all retrieved documents are relevant) to 0 (none of relevant document is retrieved). *Recall* range from 1 (all relevant documents are retrieved) to 0 (none of retrieved document is relevant). In fact *precision* represents a quantitative

measure of the information retrieval system while *recall* represents a qualitative measure of this system.

3. Naïve Bayes classifier

We have used the Naïve Bayes Classifier first in [7] and reevaluate it here because it is a fast algorithm even if not so powerful. The Bayes classifier use the Bayes Theorem that computes prior probabilities for a given class based on the probability for a given term to belong to the specified class. Thus, the classifier computes the probability for a document to be into a given class.

Bayesian theory works as a framework for making decision under uncertainty - a probabilistic approach to inference [4] and it is particularly suited when the dimensionality of the inputs data is high. Bayes theorized that the probability of future events could be calculated by determining their earlier frequency.

The Naive Bayes classifier is based on the simplifying assumption that the attribute values are conditionally independent given target value. In other words the assumption is that, given the target value of the instance, the probability of observing the conjunction y_1, y_2, \dots, y_n is just the product of the probabilities for the individual attributes:

$$c_{map} = \arg \max_{1 \leq j \leq m} \bar{P}(Y_j | X) = \arg \max_{1 \leq j \leq m} \bar{P}(Y_j) \prod_{i=1}^n \bar{P}(x_i | Y_j) \quad (6)$$

We used the notation \bar{P} for P because we don't know exactly the values of the parameters $P(X_i)$ and $P(y_j | X_i)$. These values can be estimated based on the training set.

We can compute $\bar{P}(X_i) = \frac{|D_i|}{|D|}$, where D is the set of documents and D_i is a subset of D for each category X_i contained in the category set X .

For training the classifier we consider V as the words vocabulary from documents contained in D , and for any category $X_i \in X$ there is a subset of documents contained in D that belongs to X_i category.

Let Y_i a vector that contains all words extracted from documents from D_i set and n_i numbers of all words occurrence from Y_i . Thus for each word $y_i \in V$ we noted with n_{ij} the total number of word occurrence y_i in Y_i . We can write:

$$\bar{P}(y_j | X_i) = \frac{(n_{ij} + 1)}{(n_i + |V|)} \quad (7)$$

So, basically, the Naive Bayes classifier ignores the possible dependencies, correlations, among the inputs and reduces a multivariate problem to a group of simple independent problems. It is noticed that in a Naive Bayes classifier the number of distinct $P(y_j | X_i)$ terms that must be estimated from the training data is just the number of distinct attribute values multiplied by the number of distinct target values. Therefore it represents a much smaller number than if we would estimate all the $P(y_1, y_2, \dots, y_n | X_j)$ terms that are needed for Bayesian theory.

4. Experimental Framework

4.2 The Dataset

Our experiments were performed on the Reuters-2000 dataset [9], which has 984 Mb of newspapers articles in a compressed format. The collection includes 806,791 documents. Documents are pre-classified according to 3 categories: by the Region the article refers to, by Industry Codes and by Topics proposed by Reuters (126 topics, 23 of them contain no articles). Due to the huge dimensionality of the database we will present here, results obtained using a subset of data. From all documents, we have selected the documents for which the industry code value is equal to “System software”. We obtained 7083 documents that are represented using 19038 features and 68 topics. After applying a stop-word filter (from a standard set of 510 stop-words) and extracting the word stem [1, 3] we have represented a document as a vector of words. From these 68 topics, we have eliminated those topics that are poorly or excessively represented. Also for each document, we have considered only the first topic, as label by Reuters (each document is classified in only one category). After reducing the set we have obtained 16 different topics and 7053 documents, that were split randomly in a training set (4702 samples) and a testing set (2351 samples). In the feature extraction phase, we have taken into consideration both the article and the title of the article. In the feature selection phase, we have selected a different number of features, from 200 to 5500.

4.3 Weka framework

For the feature selection and classification steps, we have used the WEKA Knowledge Flow Environment [10]. The project flowchart that was used in Weka is presented in Figure 1.

From the Weka, we used in this project the following components. The component *Reuters Load File* is a component that permit to read an Arff file. We save the obtained Reuters dataset into a file that respect the arff conventions. In the file, the last column represents the target (the class or category in that the document was

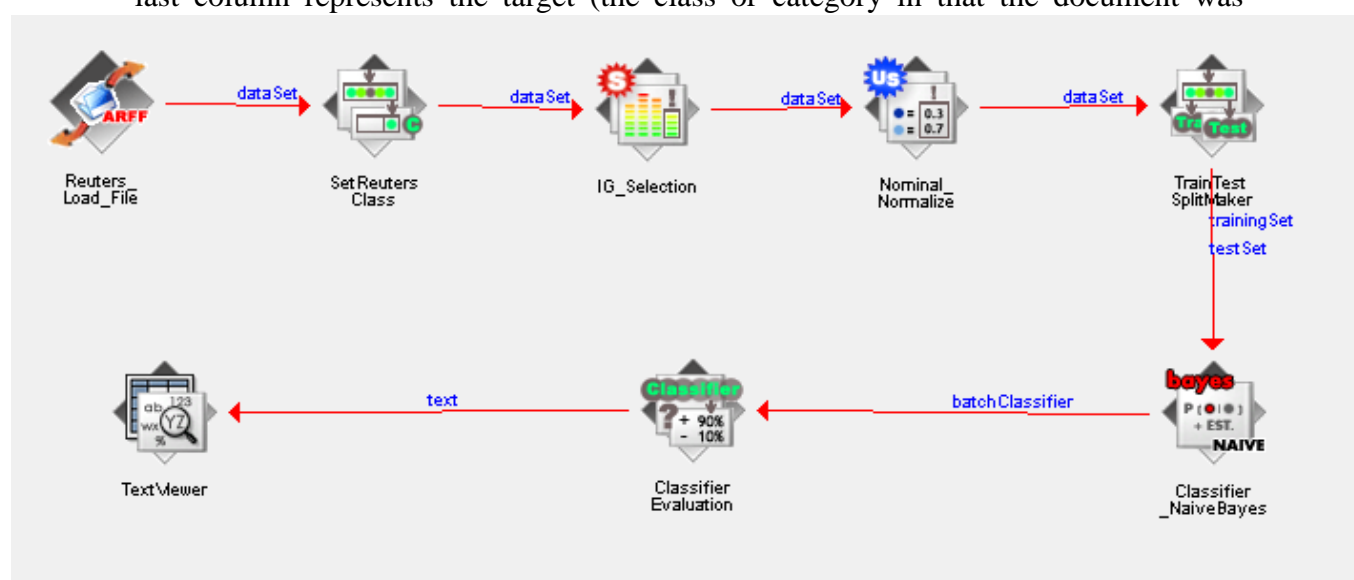


Figure 1. Weka Framework

classified by Reuters. In the *SetReutersClass* component, we specified the position of the class target in the file. The next component is a Feature Selection Component and here we select to use the Information Gain Method as feature selection method. This supervised attribute filter can be used to select attributes. After compute for each attribute the information gain, we apply a Ranker for selecting the best specified attributes. The used ranked is also in this component and for the ranker we modify the number of selected feature from 200 until 5500. After these steps we use a normalization component where we specified to use the nominal normalization, and a splitter component that split randomly the dataset into two disjointed sets the training set and the testing set. Based on the training set we have train the learning algorithm, in this case the Naïve Bayes that it is specified using *Classifier_NaiveBayes* component. After training, we make a validation method specified in the *ClassifierEvaluation* component for evaluating the learning algorithm. The last component permits to show the experiment results in different format. Here the experiment results are the values for accuracy, precision, recall and f-measure obtained by the learning algorithm for the number of specified features. We chose to show those results in text format, from that we make obtained values and presented them into the next section.

5. Experimental Results

The experimental results have been done in the WEKA framework as described previously. In the Ranker component we have used a parameter that represents the number of features that we want to be retained. In Table 1 we present the results obtained for a number of features between 200 and 5500 by the learning algorithm. We have evaluated the following measures: Precision, Recall, F-measure and Accuracy. For comparison reasons we present also the Accuracy obtained with the Information Gain feature selection method and Support Vector Machine classifier,

Table 1. Experimental Results

No of features	Naïve Bayes				SVM
	Precision	Recall	F-Measure	Accuracy (%)	Accuracy (%)
200	0.839	0.830	0.829	82.98	92.45
300	0.846	0.840	0.839	84.02	92.87
400	0.846	0.842	0.842	84.23	93.37
500	0.838	0.836	0.835	83.56	92.99
600	0.836	0.834	0.834	83.40	93.12
700	0.840	0.839	0.839	83.90	92.74
800	0.844	0.843	0.843	84.32	93.24
900	0.844	0.844	0.843	84.36	93.45
1000	0.843	0.842	0.842	84.23	93.16
1100	0.844	0.843	0.843	84.32	93.49
1600	0.843	0.843	0.843	84.32	93.29
1700	0.843	0.843	0.843	84.27	93.33
1800	0.843	0.842	0.842	84.23	93.54
1900	0.843	0.843	0.843	84.32	93.58
2000	0.843	0.843	0.843	84.27	93.29
2500	0.843	0.843	0.843	84.32	92.62
3000	0.843	0.843	0.843	84.32	92.70
3500	0.843	0.843	0.843	84.32	92.95
4000	0.841	0.841	0.841	84.07	92.37
4500	0.840	0.840	0.840	83.98	92.41

results taken from our previous paper [8].

In Figure 2 we present the Precision, Recall and F-measure results for the Naïve

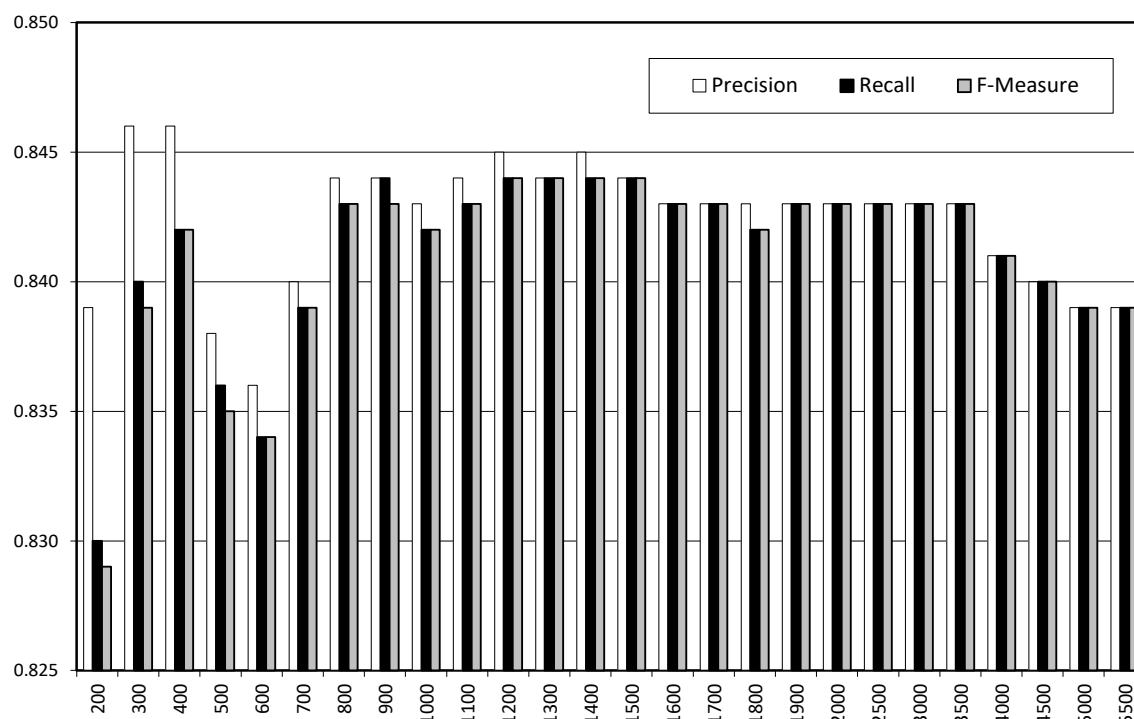


Figure 2 Precision, recall and f-measure results obtained for different number of features

Bayes classifier. We notice that, for the number of features kept in the 800-3500 range, the results are good and approximatively the same (in the range 0.842-0.845 only). This means that for a reasonable small number of features can be obtained good results into a small learning time. If the number of feature increase the accuracy of classification decrease because occurs a lot of noise in features.

In Figure 3 we present the Accuracy results both for the evaluated Naïve Bayes classifier and for the previously evaluated SVM classifier. For the Naïve Bayes classifier we notice that the best results are obtained for 1400 features and the results are again relatively the same for the number of features in the 800-3500 range. For the SVM classifier the best results are obtained for 1900 features and the results are close to the maximum in a narrower range. Therefore we can conclude that the Naive Bayes performances are not as sensitive to the number of features as the SVM performances are.

As we might expect experimental results for Naïve Bayes classifier are not of the same quality but the Naïve Bayes classifier has the advantage of a reduced computing time. For the case of 1900 features (where the SVM gives best results) the training times is 264 seconds for the SVM algorithm and is of only 7 seconds for Naïve Bayes algorithm.

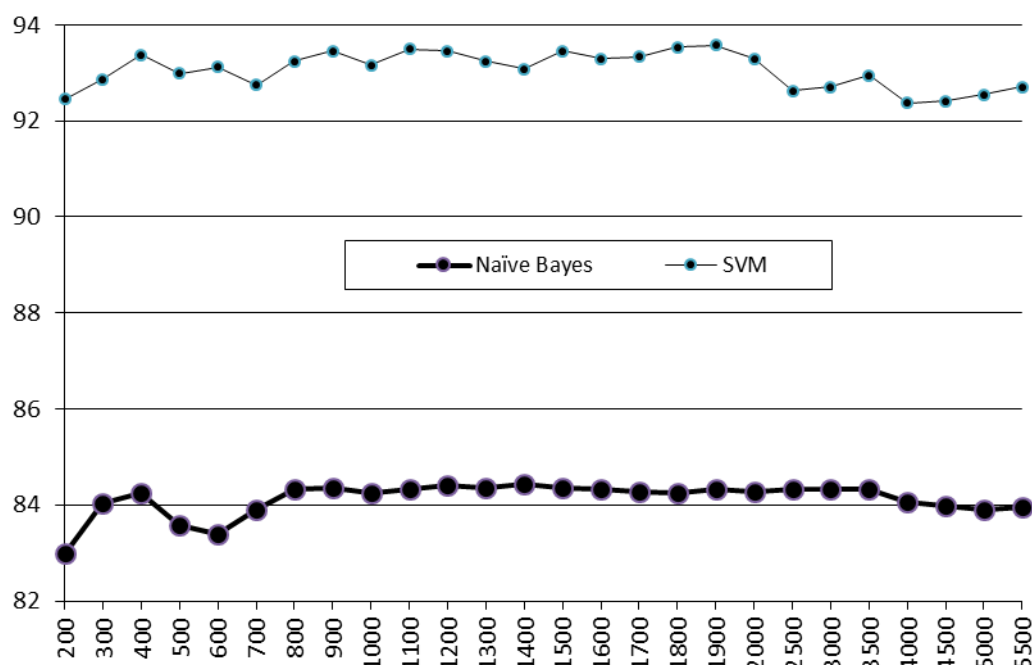


Figure 3 Accuracy results (%) for Naïve Bayes and for SVM classifiers for different number of features

The average Naïve Bayes accuracy result is only 84.12 compared with the SVM average result of 93.05 (on average the accuracy is 8.93% lower), but the classification time decreases from 264 second (more than 4 minutes) for SVM to 7 seconds for Naïve Bayes. The results for other numbers of features in the range tested (results not presented here) follows the same speed-up.

Because of this remarkable speed-up, Naive Bayes can be a good option when computation restrictions and computational time are important.

6. Conclusions

In this paper we use Information Gain as feature selection method (that was proven in our previous paper to be the best) and we evaluate a simpler and faster classifier algorithm - Naïve Bayes. Because of the high computation requirements of the previously tested Support Vector Machine classifier, we evaluate now the accuracy loss and the time consumption improvement for the Naïve Bayes classifier.

As we might expect experimental results are not of the same quality (on average the accuracy is 9% lower), but the classification time decreases from about 4 minutes for SVM to 7 seconds for Naïve Bayes. Therefore, Naive Bayes can be a good option when computation restrictions are important.

As further work we propose to use classify large text data sets (the complete Reuters dataset) in order to see the comportment of Information Gain feature selection method and the learning algorithm in an industrial text classification problem. We try to make the representation and classification into two steps, in first step make a pre-classification of all documents, obtain fewer representative samples and after that we'll use only the obtained samples as input vectors for a information retrieval system.

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