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THE EFFECTS OF DIGITALIZATION ON TURKISH CARICATURE

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Abstract- *Years of 2000's can be defined as "the digiral century". In this digital century, it is seen that digitalllization creates new concepts and approaches and it even affects our daily lifes. Digitalization will be analyzed with the relationship between art and technology. Changes have seen on different areas of art both on style and contentment with digitalisation. In this study, it is aimed to underline digitalization, to investigate its effects on caricature, humor and the magazines in Turkey and to comment on what digitalization brings. Online books, online articles, online humor magazines are becoming popular. Internet makes caricature achievable freely and with the aid of social networking sites, digital caricatures can reach more people than the published ones.*

Keywords: *art, caricature, digitalization, humor*

1. INTRODUCTION

The fundamental problem of communication is that of reproducing at one point either exactly or approximately a message selected at another point. Frequently the messages have *meaning*; that is they refer to or are correlated according to some system with certain physical or conceptual entities. These semantic aspects of communication are irrelevant to the engineering problem. The significant aspect is that the actual message is one *selected from a set* of possible messages. The system must be designed to operate for each possible selection, not just the one which will actually be chosen since this is unknown at the time of design.

If the number of messages in the set is finite then this number or any monotonic function of this number can be regarded as a measure of the information produced when one message is chosen from the set, all choices being equally likely. As was pointed out by Hartley the most natural choice is the logarithmic function. Although this definition must be generalized considerably when we consider the influence of the statistics of the message and when we have a continuous range of messages, we will in all cases use an essentially logarithmic measure.

The logarithmic measure is more convenient for various reasons:

1. It is practically more useful. Parameters of engineering importance such as time, bandwidth
number of relays, etc., tend to vary linearly with the logarithm of the number of possibilities. For example, adding one relay to a group doubles the number of possible states of the relays. It adds 1 to the base 2 logarithm of this number. Doubling the time roughly squares the number of possible messages, or doubles the logarithm, etc.
2. It is nearer to our intuitive feeling as to the proper measure. This is closely related to (1) since we intuitively measures entities by linear comparison with common standards. One feels, for example, that two punched cards should have twice the capacity of one for information storage, and two identical channels twice the capacity of one for transmitting information[1].
3. It is mathematically more suitable. Many of the limiting operations are simple in terms of the logarithm but would require clumsy restatement in terms of the number of possibilities.

The choice of a logarithmic base corresponds to the choice of a unit for measuring information. If the base 2 is used the resulting

units may be called binary digits, or more briefly *bits*, a word suggested by J. W. Tukey. A device with two stable positions, such as a relay or a flip-flop circuit, can store one bit of information. *N* such devices can store *N* bits, since the total number of possible states is 2*N* and $\log_2 2N = N$.

$$\text{Log}_2\, 2N = N \quad (1)$$

If the base 10 is used the units may be called decimal digits. Since a digit wheel on a desk computing machine has ten stable positions and therefore has a storage capacity of one decimal digit. In analyticalwork where integration and differentiation are involved the base *e* is sometimes useful. The resulting units of information will be called natural units. It consists of essentially five parts:

1. An *information source* which produces a message or sequence of messages to be communicated to the receiving terminal. The message may be of various types:

(a) A sequence of letters as in a telegraph of teletype system; (b) A single function of time *f* (*t*) as in radio or telephony; (c) A function of time and other variables as in black and white television — here the message may be thought of as afunction *f* (*x*;*y*; *t*) of two space coordinates and time, the light intensity at point (*x*;*y*) and time *t* on a pickup tube plate; (d) Two or more functions of time, say *f* (*t*), *g*(*t*), *h*(*t*)—this is the case in "three dimensional" sound transmission or if the system is intended to service several individual channels in multiplex; (e) Several functions of several variables—in color television themessage consists of three functions *f* (*x*;*y*; *t*), *g*(*x*;*y*; *t*), *h*(*x*;*y*; *t*) defined in a three-dimensional continuum—we may also think of these three functions as components of a vector field defined in the region — similarly, several black and white television sources would produce "messages" consisting of a number of functions of three variables; (f) Various combinations also occur, for example in television with an associated audio channel.

2. A *transmitter* which operates on the message in some way to produce a signal suitable for transmission over the channel. In telephony this operation consists merely of changing sound pressure into a proportional electrical current. In telegraphy we have an encoding operation which produces a sequence of dots, dashes and spaces on the channel corresponding to the message. In a multiplex PCM system the different speech functions must be sampled, compressed, quantized and encoded, and finally interleaved properly to construct the signal. Vocoder systems, television and frequency modulation are other examples of complex operations applied to the message to obtain the signal.

3. The *channel* is merely the medium used to transmit the signal from transmitter to receiver. It may be a pair of wires, a coaxial cable, a band of radio frequencies, a beam of light, etc.

4. The *receiver* ordinarily performs the inverse operation of that done by the transmitter, reconstructing the message from the signal.

5. The *destination* is the person (or thing) for whom the message is intended.

Teletype and telegraphy are two simple examples of a discrete channel for transmitting information. Generally, a discrete channel will mean a system whereby a sequence of choices from a finite set of elementary symbols $S_1,\ldots,$ S_n can be transmitted from one point to another. Each of the symbols S_i is assumed to have a certain duration in time t_i seconds (not necessarily the same for different S_i, for example the dots and dashes in telegraphy). It is not required that all possible sequences of the S_i be capable of transmission on the system; certain sequences only may be allowed. These will be possible signals for the channel [1]. Thus in telegraphy suppose the symbols are:

(1) A dot, consisting of line closure for a unit of time and then line open for a unit of time;

(2) A dash, consisting of three time units of closure and one unit open; (3) A letter space consisting of, say, three units of line open; (4) A word space of six units of line open. We might place the restriction on allowable sequences that no spaces follow each other (for if two letter spaces are adjacent, it is identical with a word space). The question we now consider is how one can measure the capacity of such a channel to transmit information. In the teletype case where all symbols are of the same duration, and any sequence of the 32 symbols is allowed the answer is easy. Each symbol represents five bits of information. If the system transmits *n* symbols per second it is natural to say that the channel has a capacity of 5*n* bits per second. This does not mean that the teletype channel will always be transmitting information at this

rate — this is the maximum possible rate and whether or not the actual rate reaches this maximum depends on the source of information which feeds the channel, as will appear later. In the more general case with different lengths of symbols and constraints on the allowed sequences, we make the following definition:

Definition: The capacity C of a discrete channel is given by

$$C = \lim_{T \to \infty} \frac{\log N(T)}{T} \qquad (2)$$

where $N(T)$ is the number of allowed signals of duration T.

It is easily seen that in the teletype case this reduces to the previous result. It can be shown that the limit

in question will exist as a finite number in most cases of interest. Suppose all sequences of the symbols[1]

S_1 , ... , S_n are allowed and these symbols have durations $t_1, \ldots, t_n$.

If $N(t)$ represents the number of sequences of duration t , we have

$$N(t) = N(t - t_1) + N(t - t_2) + \ldots + N(t - t_n) \qquad (3)$$

The total number is equal to the sum of the numbers of sequences ending in S_1, S_2, … ,S_n and these are

$N(t - t_1)$, $N(t - t_2)$, …., $N(t - t_n)$ (4)

respectively.

According to a well-known result in finite differences, $N(t)$ is asymptotic for large t to X_0^t where X_0 is the largest real solution of the characteristic equation:

$$X^{-t_1} + X^{-t_2} + \cdots + X^{-t_n} = 1 \qquad (5)$$

Mathematical theory of Shannon-Weaver is the first theory that defines communication as science and on mathematical scale. Mathematical Theory is also describing the systems as 1 or 2 due to its logical function ($\log_2 2N = N$) and it is the exact definition of digitalization. Digital systems are based on Shannon-Weaver's mathematical theory.

2. DIGITALIZATION

Digitalization is the convertion of analog information (word, image, letter) to electronic signals that can be stored in the process of individual beats. Digitalization can be considered as the most important technological advancement contributing to many different areas. The integration of information can be possible with the digitalization of sound, image and text forms. Effects of digitalization has exceeded the limits of telecommunications. The ability to use sound, image ve text together provides multimedia applications on computing systems. Communication devices such as music, photography, radio, television and computer are also digitalized [2].

3. DEFINITION AND THE HISTORY OF CARICATURE

A caricature is a simple image showing the features of its subject in a simplified or exaggerated way. In literature, a caricature is a description of a person using exaggeration of some characteristics and oversimplification of others. A caricature is the satirical illustration of a person or a thing, but a cartoon is the satirical illustration of an idea.

Cenap Sehabettin, the poetry of Servet-i Fünûn , defines caricature as the reality of life. For Semseddin Sami Kamus-ı Turkı, caricature is the modified picture made for entertainment and fun. For Cemil Cem, one of the greatest caricaturists of Ottoman, defines caricature as the most valuable part of art [3-4].

Some of the earliest caricatures are found in the works of Leonardo da Vinci, who actively sought people with deformities to use as models. The point was to offer an impression of the original which was more striking than a portrait. Caricature experienced its first successes in the closed aristocratic circles of France and Italy, where such portraits could be passed about for mutual enjoyment. While the first book on caricature drawing to be published in England was Mary Darly's A Book of Caricaturas (c. 1762), the first known North American caricatures were drawn in 1759 during the battle for Quebec. These caricatures were the work of Brig.-Gen. George Townshend whose caricatures of British General James Wolfe, depicted as "Deformed and crass and hideous" (Snell), were drawn to amuse fellow officers. Elsewhere, two great practitioners of the art of

caricature in 18th-century Britain were Thomas Rowlandson (1756–1827) and James Gillray (1757–1815). Rowlandson was more of an artist and his work took its inspiration mostly from the public at large. Gillray was more concerned with the vicious visual satirisation of political life. They were, however, great friends and caroused together in the pubs of London. See the Tate Gallery's exhibit "James Gillray: The Art of Caricature". In a lecture titled The History and Art of Caricature (September 2007, Queen Mary 2 Lecture theatre), the British caricaturist Ted Harrison said that the caricaturist can choose to either mock or wound the subject with an effective caricature. Drawing caricatures can simply be a form of entertainment and amusement – in which case gentle mockery is in order – or the art can be employed to make a serious social or political point. A caricaturist draws on (1) the natural characteristics of the subject (the big ears, long nose, etc.); (2) the acquired characteristics (stoop, scars, facial lines etc.); and (3) the vanities (choice of hair style, spectacles, clothes, expressions, and mannerisms).

Today, caricature has fans and readers from all over the world and can be sold as books and articles. Shannon-Weaver's mathematical theory can be considered as the starting point of digitalization. With digitalization, the most populer homour articles of Turkey (Uykusuz, Penguen,etc.) have their own official websites, fan pages on social networking sites (facebook, twitter,etc.) and they have formats that can be downloaded from internet. Also, there are completely online articles (Fenamizah, Obur mizah, etc.). Caricature and homour are digitalized in many ways.

4. THE RELATIONSHIP BETWEEN ART AND TECHNOLOGY

Art is to be changed and developed with technology from the period of drawing pictures of animals on cave walls to bronze age, from the ancient Greek and Egyptian period to renaissance, from Leonardo Da Vinci to Andy Warhol. Relationship between art and technology goes back to the paleolithic ages. The first examples of the art of painting, cartoon and caricature may be found in paleolithic ages. With the discovery of fire, the pots and pans were produced and the production of ceramics had started. Metal ores were processed by melting and glass was formed from sand. After human being were able to come over their needs such as food, housing, etc., "aesthetic" and "beauty" concepts became important for them.

One of the best examples of the relationship between art and technology is the industrial revolution and modernism concept affecting our lives even today. Modernism is a result of the industrial revolution in the 18th century. By industrial revolution iron-steel, textile industries were born, mechanization was begun and the agricultural society had converted to industrial society. Labor class and the capitalism were born. Technological advances have changed the social life and art completely.

5. INDUSTRIAL REVOLUTION

The Industrial Revolution was the transition to new manufacturing processes that occurred in the period from about 1760 to some time between 1820 and 1840. This transition included going from hand production methods to machines, new chemical manufacturing and iron production processes, improved efficiency of water power, the increasing use of steam power and development of machine tools. The transition also included the change from wood and other bio-fuels to coal. The Industrial revolution began in Britain and within a few decades spread to Western Europe and the United States [5].

The Industrial Revolution marks a major turning point in history; almost every aspect of daily life was influenced in some way. Most notably, average income and population began to exhibit unprecedented sustained growth. In the words of Nobel Prize winner Robert E. Lucas, Jr., "For the first time in history, the living standards of the masses of ordinary people have begun to undergo sustained growth ... Nothing remotely like this economic behavior has happened before" [6].

Figure 1. William Bell Scott, Iron and Coal, 1855-1860

The period of time covered by the Industrial Revolution varies with different historians. Eric Hobsbawm held that it 'broke out' in Britain in the 1780s and was not fully felt until the 1830s or 1840s, while T. S. Ashton held that it occurred roughly between 1760 and 1830 [7-8].

Some 20th-century historians such as John Clapham and Nicholas Crafts have argued that the process of economic and social change took place gradually and the term revolution is a misnomer. This is still a subject of debate among historians[9-10] . GDP per capita was broadly stable before the Industrial Revolution and the emergence of the modern capitalist economy [11]. The Industrial Revolution began an era of per-capita economic growth in capitalist economies [12]. Economic historians are in agreement that the onset of the Industrial Revolution is the most important event in the history of humanity since the domestication of animals and plants [13] .

The First Industrial Revolution evolved into the Second Industrial Revolution in the transition years between 1840 and 1870, when technological and economic progress gained momentum with the increasing adoption of steam-powered boats, ships and railways, the large scale manufacture of machine tools and the increasing use of steam powered factories [14-16].

The causes of the Industrial Revolution were complicated and remain a topic for debate, with some historians believing the Revolution was an outgrowth of social and institutional changes brought by the end of feudalism in Britain after the English Civil War in the 17th century. As national border controls became more effective, the spread of disease was lessened, thereby preventing the epidemics common in previous times [17]. The percentage of children who lived past infancy rose significantly, leading to a larger workforce. The Enclosure movement and the British Agricultural Revolution made food production more efficient and less labour-intensive, forcing the surplus population who could no longer find employment in agriculture into cottage industry, for example weaving, and in the longer term into the cities and the newly developed factories.

The colonial expansion of the 17th century with the accompanying development of international trade [18], creation of financial markets and accumulation of capital are also cited as factors, as is the scientific revolution of the 17th century [19].

Until the 1980s, it was universally believed by academic historians that technological innovation was the heart of the Industrial Revolution and the key enabling technology was the invention and improvement of the steam engine [20]. However, recent research into the Marketing Era has challenged the traditional, supply-oriented interpretation of the Industrial Revolution [21].

Lewis Mumford has proposed that the Industrial Revolution had its origins in the Early Middle Ages, much earlier than most estimates [22]. He explains that the model for standardised mass production was the printing press and that "the archetypal model for the industrial era was the clock". He also cites the monastic emphasis on order and time-keeping, as well as the fact that medieval cities had at their centre a church with bell ringing at regular intervals as being necessary precursors to a greater synchronisation necessary for later, more physical, manifestations such as the steam engine.

The presence of a large domestic market should also be considered an important driver of the Industrial Revolution, particularly explaining why it occurred in Britain. In other nations, such as France, markets were split up by local regions, which often imposed tolls and tariffs on goods traded among them [23]. Internal tariffs were abolished by Henry VIII of England, they survived in Russia till 1753, 1789 in France and 1839 in Spain.

Governments' grant of limited monopolies to inventors under a developing patent system

(the Statute of Monopolies 1623) is considered an influential factor. The effects of patents, both good and ill, on the development of industrialisation are clearly illustrated in the history of the steam engine, the key enabling technology. In return for publicly revealing the workings of an invention the patent system rewarded inventors such as James Watt by allowing them to monopolise the production of the first steam engines, thereby rewarding inventors and increasing the pace of technological development. However, monopolies bring with them their own inefficiencies which may counterbalance, or even overbalance, the beneficial effects of publicising ingenuity and rewarding inventors [24]. Watt's monopoly may have prevented other inventors, such as Richard Trevithick, William Murdoch or Jonathan Hornblower, from introducing improved steam engines, thereby retarding the industrial revolution by about 16 years [25].

Industrial revolution brings new terms to art such as modernism. It is a great example of the realitonship between art and technology.

6. MODERNISIM AND POSTMODERNISIM

Modernism, in its broadest definition, is modern thought, character, or practice. More specifically, the term describes the modernist movement in the arts, its set of cultural tendencies and associated cultural movements, originally arising from wide-scale and far-reaching changes to Western society in the late 19th and early 20th centuries. In particular the development of modern industrial societies and the rapid growth of cities, followed then by the horror of World War I, were among the factors that shaped modernism. In art, modernism explicitly rejects the ideology of realismand makes use of the works of the past, through the application of reprise, incorporation, rewriting, recapitulation, revision and parody in new forms. Modernism also rejects the lingering certainty of enlightenment thinking, as well as the idea of a compassionate, all-powerful creator [26].

In general, the term modernism encompasses the activities and output of those who felt the "traditional" forms of art, architecture, literature, religious faith, social organization and daily life were becoming outdated in the new economic, social, and political conditions of an emerging fully industrialized world. The poet Ezra Pound's 1934 injunction to "Make it new!" was paradigmatic of the movement's approach towards the obsolete. Another paradigmatic exhortation was articulated by philosopher and composer Theodor Adorno, who, in the 1940s, challenged conventional surface coherence, and appearance of harmony typical of the rationality of enlightenment thinking. A salient characteristic of modernism is self-consciousness. This self-consciousness often led to experiments with form and work that draws attention to the processes and materials used. The modernist movement, at the beginning of the 20th century, marked the first time that the term *avant-garde*, with which the movement was labeled until the word "modernism" prevailed, was used for the arts.

Postmodernism is a general and wide-ranging term which is applied to literature, art, philosophy, architecture, fiction, and cultural and literary criticism, among others. Postmodernism is largely a reaction to the assumed certainty of scientific, or objective, efforts to explain reality. In essence, it stems from a recognition that reality is not simply mirrored in human understanding of it, but rather, is constructed as the mind tries to understand its own particular and personal reality. For this reason, postmodernism is highly skeptical of explanations which claim to be valid for all groups, cultures, traditions, or races, and instead focuses on the relative truths of each person. In the postmodern understanding, interpretation is everything; reality only comes into being through our interpretations of what the world means to us individually. Postmodernism relies on concrete experience over abstract principles, knowing always that the outcome of one's own experience will necessarily be fallible and relative, rather than certain and universal [27].

Postmodernism is "post" because it is denies the existence of any ultimate principles, and it lacks the optimism of there being a scientific, philosophical, or religious truth which will explain everything for everybody - a characterisitic of the so-called "modern" mind. The paradox of the postmodern position is that, in placing all principles under the scrutiny of its skepticism, it must realize that even its own principles are not beyond

questioning. As the philospher Richard Tarnas states, postmodernism "cannot on its own principles ultimately justify itself any more than can the various metaphysical overviews against which the postmodern mind has defined itself."

7. ANALOG PERIOD OF CARICATURE IN TURKEY

Analog period of caricature in Turkey is starting with the Republican period to 1990s. With the technological advances in 1990s, analog period is almost ended and digital period is shown up. To discuss the history of caricature in Turkey, Teodor Kasap was the first caricaturist who published Diyojen in 1870. Caricature developed lately in Turkey as a result of the monarchic system in Ottoman Empire. It was hard for caricature to develope in a system opposite to criticizm [28] . Caricature is based on the idea of criticizm.Cem, Ramiz, Rıfkı and Münif Ferim were the other caricaturists before the foundation of Republic of Turkey. Cem was the first caricaturist with its criticizing attititude and his caricatures were on a level of international scale. Cemal Nadir was the first proffesional caricaturist that helped caricature to spread around Turkey as a discipline. He drew caricatures in Aksam, newspaper. Orhan Ural, Alexis, Sevki Cankaya, Sedat Nuri İleri were other names of caricature art.

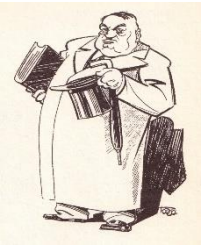

Figure 2. A caricature of Kozma Togo in Republican period.

Ramiz-Cemal Nadir were popular in the Republican period of Turkish caricature. Ramiz as a caricaturist grown in the last years of the empire. He was an art teacher at the village school, while Cemal Nadir was drawing caricatures for the Turkish daily newspaper as an innovation in caricature. By the 1940s, Turkey had started to show progress on caricature. Selma Emoğlu, Mim (Mustafa), Ali Ulvi, Semih Balcıoğlu, Turhan Selçuk were the names of caricaturists that drew for humor magazines. In 1950s, caricaturists were named as "50th Generation" in Turkey. 50th Generation brought new concepts and applications to caricature with improved democracy in Turkey and caricature had found its place as an active expression language. Ferruh Dogan, Suat Flame, Cetin Yalcin, Nehar Tublek, Tonguc Yasar, Bedri Koraman, Oguz Aral were powerful caricaturists of 50th Generation [28].

In 1960s, Turkish caricature entered a period of stagnation. The interest of readers decreased to caricature. Newspapers and magazines started to publish the caricatures of international caricaturists and only the famous caricaturists in Turkey. Young artists could not find enough chance and opportunity. One of the factor that caused stagnation in the level of caricature was graphic art, the expression became more complex with transmit symbols and new drawing techniques. Caricaturists were unable to find ideas to draw, caricaturists strated to illustrate the daily news. The idea of caricature for entertainment replaced with the caricature for the idea of philosophy. As a result, humor magazines had less number of readers. By 1970s, caricature became popular again. Semih Balcıoğlu, Turhan Selçuk and Ferti Ongoren established The Cartoonists Association. In the process of self-renewal in the early 1970s cartoon, young artists had the chance to publish their caricatures in different magazines. In 1975, Turkey's first Cartoon Museum was founded in Istanbul. In 1980 to 1990, political events and economical crisis had affects on Turkish caricature. In 1980, Gırgır, one of the most demanded magazine of Turkey was closed. By 1990s, libertarian atmosphere is formed politically and caricature occured as an important communication tool.

8. DIGITAL PERIOD OF CARICATURE IN TURKEY

The starting point of digital period of caricature in Turkey can be considered as 1990s with the development of technology especially computing systems. Digital period is started with 1990s and affecting today's caricature perceptions. Due to Jean Baudrillard's simulation theory, computer

technology refers to the changing perception of reality. Even the political processes in the world can be explained by simulation theory. In 1990s, the presence of computer technology affected Turkish caricature with changes in the formal and contextual. As it is defined in the mathematical theory of Shannon-Weaver as in Eqn.1, systems can be expressed with binary digital codes. The effectiveness of the digitalization is increased in the 2000s.

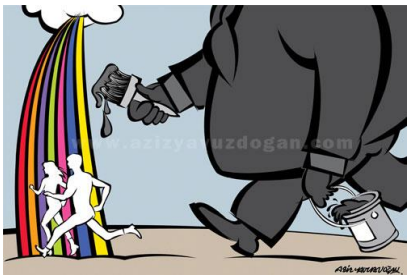

Figure 3. A caricature of Aziz Yavuzdogan in Digital period [29].

Figure 4. A caricature of Bahadir Ucan in Digital period.

In the 2000s, the popular humor magazines such as Uykusuz, Penguen, Gırgır and Leman have digital formats both on internet as officical websites and both on social networking sites as new media products, Then, magazines had the opportunity to a reach higher number of readers with digital formats than published, analog formats. In addition, the caricatures have been occured as interactive communication tools that readers have the chance to comment on them. Online magazines are available such as Fenamizah, Obur mizah in Turkey that can be read freely. 21th century is the century of information and communication. The digitalization have become part of people's daily lifes. More and cheaper devices, mobile phones, computers, tablets, 3D televisions are produced. Also with the adventage of social networking sites, as well as the digitization of technological convenience mission, socializing on issues such as human relations have become a platform utilized and has become indispensable. All of these innovations and rapidly digitalized world, has its effects on humor and caricatures. Carticatures become one of the most demanded sharing units on social networking sites. With the emergence of e-magazines and new drawing techniques, humor and caricature had serious changes.

9. NEW DRAWING TECHNIQUES ON CARICATURE

Turkish caricature is affected by the process of digitalization as an art discipline.
With digitalization, caricature is started to be presented on computers. In Turkey, before 1980s the useage of computers were limited and especially on the Republican period, caricatures were hand-craft products and not colored. Crayons or guache paints were used for coloring but colorless works were preferable on the Republican period.
In 2000s, revolutionary changes are obtained in Turkish caricature. With the introduction of digitalization in our lives, the caricaturists began to transfer their works to computers or tablets either then manual ways. Drawing and animation programs such as photoshop, illustrator are being used to take the advantages of technology and near-perfect digital coloring is chosen rather than coloring manually. With computers and programs, caricaturists have the opportunity to fix the errors of classical methods. In addition, with animation programs caricaturists and graphic designers strat to model 2d or 3d characters with computing systems. Characters of caricatures have the chance to be animated for films, commercials, etc. New sectoral formations occur as a result of technological advances and digitalization.

10. INTERNET AND E-MAGAZINES ON CARICATURE AND HOMOUR

In the digitalized world, in humor and caricature contextual and formal changes have taken place. Political and social events of the 2000s, advances in technology and

informatics, the ease of accessing to information have altered people's sense of humor that led caricature and humor to modification in terms of content. To examine the changes in substance and in forms, with digitalization the period of new media and e-magazines have begun. Published caricatures on the internet and the shared caricatures on the social networking sites met the millions. In this sense, social media has created a free market for caricatures and comics. When the numbers of readers of published Penguen, Uykusuz, Gırgır, Leman compared with their digitalized formats, digitalized Uykusuz, Penguen, Gırgır and Leman can reach much more people. Internet provides access to caricatures freely and widely.

Figure 5. E-magazines Fenamizah [30] and Puhuu Magazine [31]

11. DIGITALIZATION ON COMICS

Digitalization is supported with Eqn. 1. Also Eqn. 3 and 4 are the definitions of digitalization on electronics. On the side of art, comic heroes are major elements of the digitalized world. Comic heroes are on posters, books, magazines, computer games, movies, television and both on every printed or digital production and gain serious place in the world of cartoons. The developments in 3D technology, holograms result with more realistic visuals of animation.

Comics is an artistic medium in which images incorporate text or other visual forms of information in order to express a narrative or idea. Comics frequently takes the form of juxtaposed sequences of panels of images. Textual devices such as speech balloons, captions, and sound effects (onomatopoeia) are often used to indicate dialogue and other information. Elements such as the size and placement of panels control the pacing of the narrative. Cartooning and similar forms of illustration are the most common means of image-making in comics, while fumetti is a form which uses photographs. Common forms of comics include comic books, comic strips, editorial and gag cartoons, graphic novels and webcomics.

The history of comics has followed divergent paths in different cultures. American comics emerged as a mass medium in the early 20th century with the advent of newspaper comic strips; magazine-style comic books followed in the 1930s. By the mid-20th century, comics became popular in periodical and book form, especially in the US, western Europe (particularly France and Belgium), and Japan. Since the late 20th century, bound volumes such as graphic novels and comics albums have become increasingly common. Comics has had a lowbrow reputation for much of its history, but towards the end of the 20th century began to find greater acceptance with the public and within academia.

The English term comics derives from the humorous or comic work which predominated in early American newspaper comic strips, though usage of the term has become standard for non-humorous works as well. It is common in English to refer to the comics of different cultures by the terms used in their original languages, such as manga for Japanese comics, or bandes dessinées for French-language comics. There is no consensus among theorists and historians on a definition of comics, with some emphasizing the combination of images and text, some sequentiality, and others historical aspects such as mass reproduction or the existence of recurring characters [32].

12. PROBLEM OF HAVING LIMITED COMIC HEROES IN TURKEY

There are not sufficient numbers of comic heroes in Turkey and as a result, sectoral development on animation cannot be achieved with insufficient numbers of television and cinema products of animation. In this sense, there can be obtained some examples of comic heroes such as Peppee, Keloglan in recent years but those examples are unable to meet the expectations. There can be said that Turkey has a problem of having limited heroes. There are some examples of tv animation channels in Turkey such as TRT Cocuk, D Cocuk contributing to Turkish

animation. Even though, it is not possible to notice sectoral development and advance in Turkey. Other reasons can be listed as high investment costs, hardness on establishing team work, rivalry between caricaturists and animators and the needed time to produce a cinema film. In the digitalized world, Turkey is not able to put international samples of animations and export animation films.

13. CONCLUSION

Communication can be defined with mathematics and binary codes with mathematical theory of communication. It can be considered as the starting point of digitalization period. As a communication language and also as a discipline of art, caricature is also digitalized with 1990s. After 1990s, computing systems are developed and affected on different areas such as art, society and even on politics. As it is mentioned in the simulation theory of Shannon-Weaver, reality concept has changed and simulations take place of physical realities.

Digitalization becomes as one of the most important concepts of the 21th century. Digitalization causes significant improvements on science, art and technology and also on our daily lives. Considering the impact of digitalization in the world of comic, cartoon drawing techniques have altered, social media and e-magazines are occured and comic heroes of cartoons become important actors in digital world. Digitalization on caricature and humour decreases the sales of published magazines with increasing the number of readers of e-magazines, caricatures on internet and social media. In the following years, it is predicted that people will be adaopted to digital versions of caricature and humour and the classical reading habits will be modified to visual culture and digital systems in Turkey. Turkey is a country that is open to innovations with its young population. However, Turkey is not an active player in animation with limited numbers of comic heroes. With some channels such as TRT Cocuk, some activities have started to be shown but there is not sectoral development on animation. Animations are mostly used for commercials not for televisions or cinemas. On that point, Turkey should be on the side of one of the most effective countries with its potential.

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