Filip Cvitić, magistar dizajna
Grafički fakultet, Getaldićeva 2, Zagreb, Hrvatska
phone: +385-91-559-3064
e-mail: filipcvitic@gmail.com

Jasna Horvat
Ekonomski fakultet u Osijeku, Gajev trg 7, Hrvatska
phone: +385-91-224-402-25
e-mail: jasna.horvat@gmail.com

Nenad Hančić-Matejić
Duesselstr. 30, 40219 Duesseldorf, Njemačka
http://www.nenad.bplaced.net
phone: +49- 17-6 64-62 4-702
e-mail: glagolitic.script@gmail.com

NEW GLAGOLITIC SIGNS IN A DIGITAL AGE

NOVI ZNAKOVI GLAGOLJICE U DIGITALNOM DOBU

ABSTRACT

Human communication is based on messsage transfer and its simplification (Danesi, 2004, 1). With the development of human writing systems ways of written communication have also changed (Cvitić, 2011, 3), new scripts have been developed (such as Glagolitic script – script created in 9th century), as well as new signs in existing scripts. Digital age is accelerating written communication is introducing a large number of new signs (monkey, emotions etc.). Although Glagolitic script is not in official use any more its comeback through projects which popularize cultural heritage (project Fabula Croatica for example) has resulted in designing glagolitic fonts (Epistula Croatica and Misal DPG) available for public use. The existance of glagolitic fonts has led to their use in digital medias what brought about the need for introducing new signs to existing Glagolitic script system. The criteria for introducing new signs into the fund of existing glagolitic fonts was the insurance of transcripting given forms to English language. In accordance with the stated criteria it is decided to add signs representing letters Q, X, Y, W and punctuation marks like monkey, ampersand, question mark, exclamation mark and similar to the existing glagolitic font. The authors of this article have proposed their graphic forms with functionality being their main criteria.
Designed signs have kept the simplicity in their form and as such contribute previously constructed glagolitic fonts as a unique graphical unit with a clear visual rytham, but also insures the visibility and recognizability of new signs in comparison to the exisiting ones. Because of the fact that glagolitic fonts are available online, authors of the new glagolitic signs have offered information about Glagolitic script's exisiting structure of as well as information about the form and function of each glyph.

Key words: *Glagolitic script, fonts, graphic signs, communication, digital age*

SAŽETAK

Ljudska komunikacija temelji se na prenošenju poruka i težnji njihova pojednostavljivanja (Danesi 2004: 1). S razvojem ljudske pismenosti mijenjali su se načini pisane komunikacije, stvarala su se nova pisma (poput glagoljice – pisma koje je nastalo u 9. stoljeću), ali se i unutar postojećih pisama stvaraju novi znakovi. Digitalno doba ubrzava pisanu komunikaciju te se time uvodi veliki broj novih znakova (monkey, osjećajnici itd.). Premda je glagoljica pismo koje se više ne nalazi u službenoj uporabi njezin povratak kroz projekte koji populariziraju kulturnu baštinu (primjer – projekt Fabula Croatica) rezultirao je konstruiranjem računalnih glagoljičkih znakova (Epistula Croatica i Misal DPG) dostupnih za javnu uporabu. Postojanje računalih glagoljičkih znakova dovelo je do njezina korištenja u digitalnom mediju što je nadalje dovelo do potrebe uvođenja novih znakova u postojeći glagoljički sustav pismena.Kriterij za uvođenje novih znakova u fond postojećih glagoljičkih računalnih znakova bilo je osiguravanje transkripcije zadanih forma na engleski jezik. Sukladno navedenom kriteriju utvrđeno je kako je postojeće glagoljičko računalno znakovlje potrebno upotpuniti znakovima koji će reprezentirati slova abecede Q, X, Y, W i interpunkcijske znakove 'monkey', 'ampersand', 'uskličnik', 'upitnik' i sl. Autori ovoga članka predložili su njihova grafička rješenja pri čemu su funkcionalnost postavili za temeljni kriterij. Konstruirano znakovlje težilo je zadržati oblikovnu jednostavnost te doprinositi prethodno konstruiranom glagoljičkom znakovlju kao jedinstvenoj grafičkoj cjelini podržavajući vizualni ritam, ali osiguravajući uočljivost i prepoznatljivost novih znakova u odnosu na postojeće. S obzirom da se računalno znakovlje nalazi na mrežnim stranicama ponuđeno za javnu uporabu, autori novih glagoljičkih znakova uz same znakove ponudili su i informacije o postojećoj strukturi glagoljice te o formi i funkciji grafema.

Ključne riječi: *glagoljica, računalni znakovi, grafički znakovi, komunikacija, digitalno doba*

1. Introduction

Every nation is defined by its language, script, history and area on which it lives. Language and script are the basic determinants of one nation and its national identity (Bratulić, 1995, 5), but also the basic feature of this civilization which develops its own communication with the use and development of the script. Two scripts have been used for Croatian area – Latin script and Glagolitic script.

Glagolitic script was used on this area for a millennium and has permiated the life of all society and its presence can be found in liturgy, law, science and art. Although there are more theories, the majority of scientists agree that the Glagolitic script is an invention of just one man, Constantine Cyril the Philosopher, and that it has been created before his trip in Moravia, in 863 (Nazor, 2008, 14). After the death of Methodius (brother and follower of Saint Constantine Cyril the Philosopher) and the banishment of students from Moravia (885), Slavic orthodox nations have accepted cyrillic script, whereas Glagolitic script had stayed in active use only by the Croats (Bratulić, 1995, 5). Apart from Glagolitic script's genesis linguistic science studies forms of this complex script. Glagolitic letters have the model in basic Christian symbolism and are constructed from a cross (symbol of Christ's redemption), a triangle (symbol of Trinity) and from a circle (symbol of eternity and God's perfection) (Bratulić, 1995, 12). The script has used all three geometrical shapes for its basic visual element throughout history, and today glagolitic shapes are diveresed visible from trigonous, round and squared Glagolitic script. Glagolitic signs, unlike current letters of the alphabet, communicate on more levels – on the level of words, of numbers and symbols. Furthermore one sign has the ability to simultaniously transfer several meanings. In that manner, for

example, 'az' ('a') has the meaning of an individual, man, christianity while 'buki' ('b') represents God, house, letter, message. The reason why sign 'buki' is extremely important can be found in glagolitic books. In them, God was not written by placing letters in a string which would ufold the word 'God' but instead the name was just marked with the letter B, all in harmony with the commandment "You shall not make wrongful use of the name of the Lord your God" (Biblija, 2003, 146) (Žagar, 2013, 314). Letter 'vidi' represents ('v') knowledge, beauty, 'jest' ('e') represents creation etc. (Horvat, 2009, 188). That kind of Glagolitic's symbolic level in communication sense has determined it as a script which possess the potential of multidimensional coding. Glagolitic script with its structure testifies about scripts' high understanding as a complex system in which many elements, besides the dimension of letters and numbers, contain a symbolic "teological code" (Bratulić, 1995, 11). Croatian Glagolitic script represents Croatian culture and at the same time a communication media for recording Croatian knowledge, moral values, history and culture. Glagolitic script was embedded in lives of people of that time, as a part of their national identity about which numerous documents and memorials have testified (Žagar, 2013) (Fučić, 2009). Considering emotional values which Glagolitic script has had with literate part of the population who used it, it can be concluded how one can define Glagolitic script as sort of a brand in which each sign was a brand in its own (Cvitić, 2012, 34). In that way each letter was possible to send unambiguous, and at the same time a three-unit message (message of letters, numbers and symbols).

Brands communicate complex messages of social, economic and political subjects because brands are capable of transmiting complex messages in a short period of time. Besides that brands encourage assurance and induce certain behaviours, give products additional value, and consumers safety that that brand will deliver certain promises (Skoko, 2009, 129). One of the greates characteristics of a brand is the ability to trigger emotions (positive or negative) to a great number of consumers. Creating a brand demands constant investment and resourses, strategical planning and systematic analysis as well as adjustments to their results. Succesful brands, independet of the company, manufacturer or institution, bind users, but also others who have switched from a user to the furtherest form of loyalty under the name 'fan'. Strong brands own global users / fans and do not need to be introduced (for example - Nike, Apple, Samsung). In 21st century successful brands are those which are closely tied with thoughts and feelings of the consumer, ie. these brands which are build as relationships and not as products. If one sees Glagolitic script as a brand, with access to its origin and genesis, one can percieve that its inventor Saint Constantine Cyril the Philosopher did not accent it as a product but as a relationship. The fact that support this thesis is that the recipients of literacy have also received faith through Glagolitic script, ie. that Christian believers learned to write in such a way that they read symbolic messages in Glagolitic characters closely associated with the Gospel. Glagolitic script in this context has successfully created and built a relationship with its user in which, through reading, the user received belief (and experiences) so that he could share them with others.

2. Glagolitic fonts

Although the Glagolitic script is a script that is no longer in official use its comeback through projects which popularize cultural heritage (example - project Fabula Croatica) resulted in constructing glagolitic fonts (FC Epistula Croatica and Missal DPG) available for public use.

2.1. Epistula Croatica – fonts created based on authentic model

Project Fabula Croatica is a project which aim is to modernize parts of Croatian cultural heritage, to present it appropriately and introduce it to the wider local and global community using all means of visual communication and design. In the first phase of the project Fabula Croatica called Epistula Croatica (publicly presented in Matica Hrvatska in 2009) promotes Glagolitic script which was approached in the project as a resource which fundamental content is going to be modernized and brought to the public of digital age. The name Epistula Croatica means "Croatian script" and is kept in its Latin version because of the international character of the project and highlights the fact that Latin was one of the languages used by the Croats. In the first phase of the project Fabula Croatica the wish was to investigate public reactions for digital presentation of cultural heritage, intrigue and inform the local public about the project's content and inform the global community about the cultural richness of Croatia. The complexity of project's information is related to the complexity of Glagolitic script and the need to create transparent and understandable guides through the script's complicated genesis, its nomenclature and characteristics of script's graphic forms. Designing a Glagolitic font is an applicative part of the project which presents a direct and interactive digital product, available for public[1] and thus attractive for direct introduction to the public of the script with a thousand years of tradition (Figure 1). Because of a faithful connection with the original Glagolitic symbols the font was designed having in mind an authentic model, the first printed book (Missale Romanum Glagolitice from 1483).

Figure 1 Glagolic font Epistula Croatica

In order for the project Fabula Croatica to be interesting to the general public, especially younger age groups, besides creating Glagolitic font Epistula Croatica the project is supported by a specially designed multimedia website[2] and a promo movie - which have already resulted in public echoes[3] in 2010. The font Epistula Croatica has gained experienced and applications

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[1] By the end of 2009

[2] Web page designed by Filip Cvitić i Darko Žubrinić (www.croatianhistory.net/glagoljica/ec, pristupljeno 12. 4. 2015.)

[3] Filip Cvitic created Epistula Croatica font for Croatian Glagolitic Script in Croatian World Network (www.croatia.org/crown/articles/10010/1/ accessed 11. 4. 2015.)
(http://www.culturenet.hr/default.aspx?id=33054, accessed 12. 4. 2015.)
(https://www.sites.google.com/site/novoslovienskij/youtube, accessed 12. 4. 2015.)

in related design projects through media echoes[4] where project Salamander[5] stands out (a computer application available for public on the Internet which uses Epistulu Croatica for the transcription of Latin letters to Glagolitic signs), and is applied in magazine design Bašćina[6] - a magazine from Društvo prijatelja glagoljice (Figure 2) as well as Slovo rogovsko - a magazine from Udruga glagoljaša Zadar.

Figure 2 Design of magazine Bašćina – a magazine from Društvo prijatelja glagoljice (issue 11, 12 and 13)

2.2. Glagolica Missal DPG from the author Nenad Hančić-Matejić

At the beginning of 2011 the font Glagolitic Missal DPG was completed equipped with Unicode's Glagolitic codes. The characteristic of this font is that it is made on the basis of two models. Lowercase letters from Glagolica Missal DPG font are made according to "Missale Romanum Glagolitice" from 1483, and uppercase letters according to "Legend of Saint Jerome" from 1508. In May of the same year an application *Transliterator* has been programmed which enables direct writing with Glagolitic script on the Internet via web browser Mozilla Firefox.

3. Innovative signs as the achievement of communication processes

The need to create new characters came with a public use of Glagolitic font Epistula Croatica. The users have tried to use the font for writing sentences in English language and have frequently written warnings of how certain words in English can not be conveyed to a Glagolitic sign system because the signs Q, X, Y, W in Glagolitic script have not been created yet. Equally so automated transcription of sentences which in their Latin version have punctuation (semicolon ';', quotation marks '" "', question mark '?', exclamation mark '!'

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[4] (http://web1.uct.usm.maine.edu/~smax/languages/glagolitic.htm, accessed 11. 4. 2015.)
(http://www.synaxis.info/azbuka/4_računalno znakovljes/01_ustav.html, accessed 10. 4. 2015.)
[5] (http://glagoljica.salamander-studios.com, accessed 12. 4. 2015.)
[6] Bašćina – a magazine Društva prijatelja glagoljice using computer characters Epistule Croatice in design issue: 11.,12.,13.,14.,15. (http://www.fabula-croatica.com/bascina/Vizija, accessed 12. 4. 2015.)

ampersand '&', et '@' and similar) has been determined untenable. The lack of punctuation characters and previously mentioned letters (Q, X, Y, W,) has resulted in an incomplete compatibility of the Glagolitic font with computer characters in Latin which indicates the impossibility of its implementation in the global environment of the digital age.

Human communication is based on message transmissions and aspirations of their simplification (Danesi, 2004, 1). With the development of human literacy ways of communication have evolved and with them new characters which, although of the same design, were used for a variety of purposes. The numbers and letters have evolved historically as a result of searching for a set of shapes enough simple to write them easily, to perceive them and remember them, and yet to make them distinguishable as much as possible from one another (Rukavina, 2009, 573).

According to Danesi (2004) when creating new characters, the newly created forms, in addition to simplicity, should contribute to communication's integrity of the script as a whole in graphical sense. The primary commitment is to maintain a complete visual rhythm when introducing new letters / characters (eg. in the alphabet), but at the same time it is important that the newly introduced letters / characters are sufficiently different from existing ones to ensure their visibility and recognition. Recognizing signs and their parts can be achieved when constructing the letters / characters by using diverse forms. However, as applied forms as simpler, their recognition is easier.

By analyzing the Glagolitic signs it is noticeable that the creator of the Glagolitic script was thinking exactly in a previously mentioned manner. Glagolitic signs used for the role of letters (ie, in text) were arranged in the parchment area so that their forms are emphasized near the x-height line. By observing that composition one gets the impression as if the letters are hanging from a thread (Bratulić, 1995, 40) (Čunčić, 2008 , 276) (Figure 3).

***Figure 3** Glagolitic signs shown in the typographic grid*

In Latin 'baseline' is the main line where the letters are but in Glagolitic script x-height has taken that role. When constructing new Glagolitic signs the x-height line became the guiding principle on which the newly built constructions leaned on. In addition to the x-height line rule, Glagolitic sign system possesses the rule of ligatures as well, ie, the way in which adjacent characters are connected. A ligature is created by merging adjacent letters (Čunčić, 2008, 278) and there are two basic types of ligatures in Glagolitic script: adequate and inadequate ligature. Adequate ligatures are created by merging adjacent letters of equal parts while inadequate ligatures are created by merging adjacent letters of unequal parts (Figure 4). Ligatures in Glagolitic script are built horizontally or vertically (Bratulić, 1995, 110).

Figure 4 *Example of adequate and inadequate ligature*

Since the punctuation signs 'monkey', 'ampersand', 'question mark', 'exclamation mark' are subsequently created from the Latin alphabet, the same visuals are taken as a model for their construction within the Glagolitic fonts (example Epistula Croatica). The functions of the newly created (punctuation) signs in Epistula Croatica, are identical to the ones taken from the signs in Latin. The remainder of this paper will describe the formation of new signs within the Glagolitic font Epistula Croatica.

4. New characters in existing Glagolitic fonts

Glagolitic font Epistula Croatica has been supplemented with new signs – specific punctuation signs and letters that originate from Anglo-Saxon speaking countries, which Croatian Latin system does not have but use them only for specific needs related to a particular profession. The process and elements of building new Glagolitic signs were led by the rule of respecting the main line (x-height) and the rule of determining certain adequate ligatures.

4.1. Orlo (swan)

Although an ampersand '&' is actually the letter 'i' in Croatian language, in order to preserve the visual character of familiar words and logos in Latin script, in Epistula Croatica new sign is created based on the Latin ampersand. Given the character of the sign ampersand '&' its curved lines the same was implemented in the new sign in order to achieve the highest resemblance possible to its model (Figure 5).

**Figure 5** *Comparison of Latin and new Glagolitic ampersand*

As the Latin ampersand originated from letters e and T so is the new Glagolitic sign created by merging Glagolitic letters jest and tvrdo that in Epistula Croatica font create a new ligature. Since the sign resembles a swan the name orlo was chosen which in Latin denotes a swan.

4.2 Auris (ear)

Auris is a sign introduced instead of the Latin sign monkey (et or @). Auris was introduced with the intention for Epistula Croatica to have the same purpose as in the Latin writing system, but with a different name. As 'monkey' is reminiscent of an animal monkey (wrapped tail), the name 'Auris' was chosen because this Glagolitic sign resembles an ear (Figure 6).

Figure 6 The appearance of the sign Auris (sign that represents et in Glagolitic script)
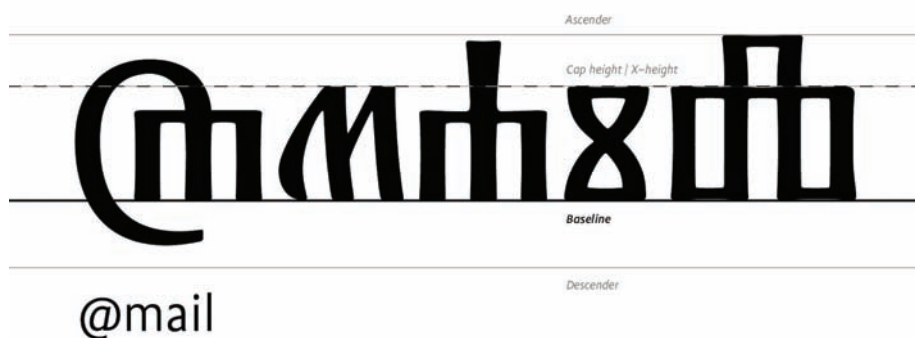
The sign graphically consists of letter a as it is with the @ , around which a semicircle was drawn. In order for the sign to look harmoniously with other Glagolitic signs, the semicircle was adjusted to the size of other signs, and the contrast between the horizontal and vertical elements harmonized in order for the semicircle's thickness to become equally wide as other Glagolitic letters. With it the semicircle of auris looks like a part of the sign a and all together acts as a singular unit. The height of the semicircle is set lower than the baseline and higher than the x-height line of the Epistula Croatica's typographic grid in order for it to become immediately apparent. The letter auris is built enough different from other letters of the Glagolitic alphabet, and thus has gained visibility and has kept similarity to sign monkey' (et) from the Latin alphabet.

Because the sign auris does not look identical to monkey but only resembles it, it was decided to change the name of the sign. The same was also changed because of its appearance is similar to the human ear on an association level. Since after creating and aligning elements of this sign, the semicircle visually looks like a man's ear, the sign was given the Latin name auris which means ear in English. So sign which has the function of displaying e-mail, in Glagolitic script has the name auris or ear. The new name was assigned to the sign of a different graphic appearance from its Latin models, but the same function was maintained.

4.3 Q, X, Y, W

After some time a discussion has been established on forum.hr website *About the Glagolitic script in Glagolitic script*. That is when the idea of Croatian Wikipedia in two scripts has emerged, but also the first discussion on the problems that occur with direct transfer from

Latin script to Glagolitic script and vice versa. As contemporary Croatian language foreign words are written originally, and are not adjusted according to Croatian pronunciation, it is extremely difficult to programm such algorithms that would transfer the text from Latin script to Glagolitic script and return the same composition of letters in the Latin script. With Glagolitic script the following words for example could be written in their original form only phonological: *W*ashington (Vašington), *Q*ueen (Kvin), Lad*y* (Lejdi), Firefo*x* (Fajerfoks). In that context, it is proposed to use glagolitic signs for Latin script glyphs Q, W, X, Y that are no longer in Croatian's Glagolitic document use. For example ZELO for X, OT for W and triangular A for Q. It is noticeable that such a solution still creates problems in spelling words and that within this solution the word Queen would be pronounced "triangular A-UK-JEST-JEST-NAŠ", for which there is no real basis. Sound value of Glagolitic letter ZELO was originally a form of DZ, and later in Croatian Glagolitic script only Z, which reflects the name of that letter in Croatian Glagolitic script (original name is DZELO). The phonetic value of Glagolitic letter OT is O, which made it to Glagolitic script through the Greek letter Ω (Omega). The difference from the letter ON lies only in the length of the pronunciation of that sound. Triangular A is located on the Bašćanska table and its sound value is a long spoken A.

The sound value of these Glagolitic letters were accepted in the world of Slavic languages and therefore it is estimated that it would not be appropriate to change their sound values. There would be difficulties if in one text in contemporary Croatian language, written in Glagolitic script, a discussion about the Old Slavic texts would be made. In that case, the reader of the text would not be able to recognize if he needs to read some letters by a traditional sound value or by a new one. For that reason, new glyphs for Latin letters Q, W and X are used. Darko Žubrinić and Nenad Hančić-Matejić have initiated the idea about new Glagolitic signs Q, X, Y, W used in English language.

In October 2011, in Zagreb, Darko Žubrinić, Nenad Hančić-Matejić and Filip Cvitić defined the appearance of these new Glagolitic signs, in order to harmonize them into Croatian

Figure 7 New signs in Glagolitic script for X, Y, W, Q

An agreement was reached that it is not necessary to create with a new letter for a sign Y because IŽE could be used for that sign instead. For sign W a ligature is taken from two letters VIDI, in the same way how that sign was created in Latin. Since Q is visually shaped like an O with a line on the right side, it was decided to use the following combination for the new Glagolitic sign, ON with a line shaped like the Glagolitic sign JER. For sign X upper part

of Glagolitic 'I' is used, with an opening on its lower part, as two vertical pillars on which the whole signs standas sign. For now there is a possibility for using these new signs in printed publications (eg. newspapers and letters via MS-Word), but they can not be used on the Internet as they do not have their own Unicode. In order for the Unicode-Consortium to include new signs in their tables it is necessary to prove that these signs are applicable in practice (Figure 8) after which a request can be sent for assigning a separate code for these signs in the Unicode system. If it is possible to achieve the inclusion of these signs to the Unicode's system great possibilities could be opened for Glagolitic script in modern electronic age. That would contribute not only further popularization of Glagolitic script in Croatia, but globally as well – to all interested in the old scripts and Croatian cultural identity based on Glagolitic script.

Figure 8 ZTE smartphone with Android operating system (Photo: Pavle Močilac)
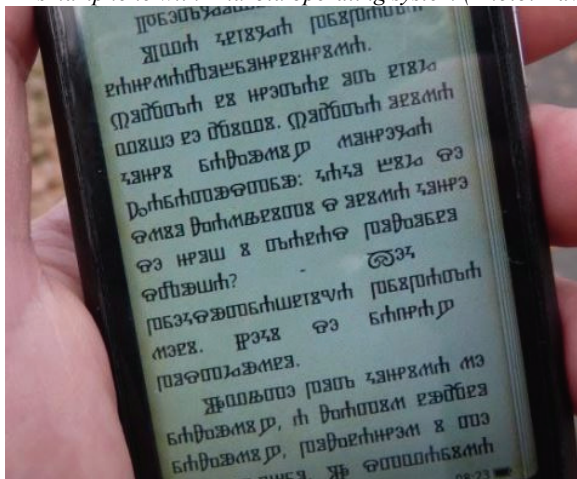
5. Conclusion

Companies are creating new signs in response to the challenges which are brought by new technologies and new forms of communication (Danesi, 2004). Because of this tendency and the phenomena of a growing number of signs, the research work of George Kingsley Zipf resulted in Zipf's law. According to Zipf's law human species has an appeal for decreasing effort (to perform certain activities) and simultaneous pursuit for form condensation. Given the growing number of meanings embedded in letters of the alphabet, there is a possibility that the current alphabet system will develop into a more complex system in which letters won't be just an abstract representation of the sound, as in Glagolitic script, for example, but will represent more meanings and will develop from the domain of letters to the domain of symbols. In addition, it is anticipated that the alphabet will take symbolic meanings adapted to the modern age, which will be used and modified by consumers depending on her / his need (Cvitić et al., 2014, 21). Creating new Glagolitic signs also confirms the assumption that forms and new meanings are needed for existing forms in the new age new, all caused by new ways of communication. Thus, by partially changing existing signs slightly changed forms are created with new meanings necessary for consumer's expression in new forms of

communication, especially those developed for digital social networks (Facebook, Twitter, Viber, etc.).

Glagolitic script is a traditional script which has been under the protection of the Decision from Ministry of Culture at the beginning of 2014 as an intangible cultural heritage of Croatia. The script is also a visual element of Croatian's national identity which has the potential for use in a variety of products and the potential for promoting Croatian cultural identity. No matter that the concept of heritage implies inheritance created by our predecessors, it is necessary to expand this script and upgrad it with new values.

By creating new signs within the current system of Glagolitic signs contribution is made to promoting Glagolitic script, and with its implementation in publicly available fonts Glagolitic script is further popularized. By actively using Glagolitic script the creation of new cultural products is enabled (clothing, paintings, interior design...) which gives glagolitc fonts additional value. Written information that accompanies all Glagolitic projects informs users of Glagolitic signs about the foundations on which the Glagolitic script arose as well as the cultural heritage of Croatian territory.

Such approach to the project contributes further popularisation of Glagolitic script and its modernization for use in the digital age, but also offers new reflections on sign communication and improves communication processes on a theoretical and practical level.

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