The Voynich manuscript. New approaches to deciphering via a constructed logical language

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ABSTRACT: A new approach to deciphering the Voynich Manuscript is proposed. The whole text of the manuscript is written in a variation of Lojban logical language adapted for beginners. The meaning of several words in the manuscript is determined.

Digitalizing text

The Voynich Manuscript (VM) written in 15th century in an unknown language is a well-known cryptographic problem. For its successful decipherment the first thing one would need is a digital version of its text. There are more than 4 full solutions of this task available, and they differ from each other a lot. This diversity can be mostly explained by subjective approaches to handling the manuscript which has a lot of stuff that makes room for alternative readings.

We digitalized the whole VM once again using European Voynich Alphabet with several modifications. The following problems were dealt with in that process.

The first most obvious obstacle are spaces. Manual transliterating the text into digital form always leads to mistakes when determining borders of words. The person who wrote the manuscript didn't always separated words by spaces of proper length but this can be clearly seen only after analyzing the whole text. That's why in our research we introduced a notion of semi-space. Compared to other transliterations some words that were previously considered as separated by space are separated by a semi-space in our transliteration. In some cases we split one word into two although the space between them is absent in the original VM due to the lack of room in the string.

The second major obstacle are ligatures or merging of neighboring letters into a string. A similar problem can happen when writing in Latin letters, two letters "i" written one after another and without dots on top of them can be mistakenly read as one letter "u". The situation with VM is much more complicated as shown in Table 1.

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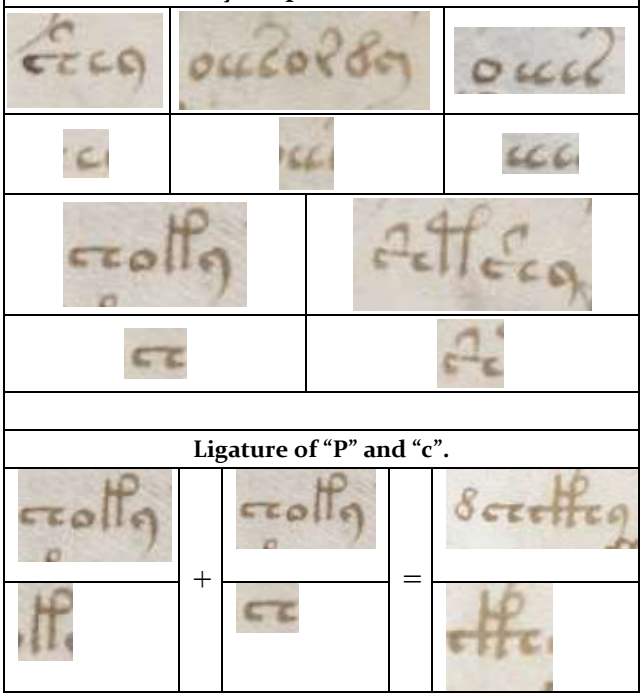
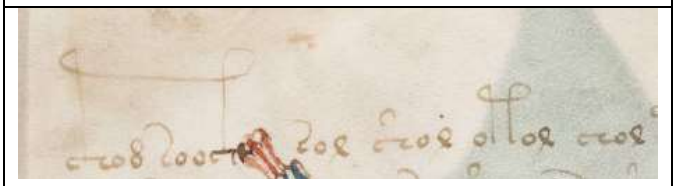
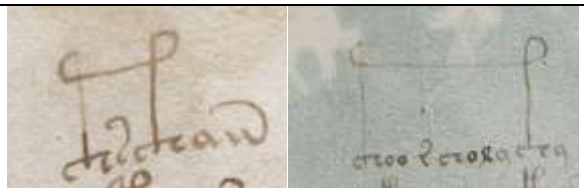
Table 1. Polymorphism of the letter "c".



The third problem is that unlike most known writing systems the text of VM shows clear three-dimensional structure. Not only letters of one word form ligatures but even non-adjacent words can be explicitly connected. This reminds of musical notation rather than of most known languages. The trans-lexeme ligatures are shown in Table 2.

Table 2. Examples of trans-lexeme ligatures.





Analysing text. Entropy.

The low entropy of the text of MV, or otherwise unexpectedly high predictability of the next sequence of letters based on the previous letters clearly shows that the text is not written in a standard human language.

Previous attempts of deciphering

Previous attempts of deciphering the text have been remarkably characterized not only be proposing various languages as the languages VM had been written in but also by groundless mapping individual letters of VM to single phonemes or diphthongs of those languages.

Jan. B. Hurych (Hurych, 2008) performed Zipf analysis of the letters and compared the resulting chart with charts for different other languages. He concluded that VM resembles Latin and English more. However, the author makes a hasty decision to replace most frequent letters of VM with most frequent letters of English. Needless to say that the result is a mess of symbols just as with all previous attempts.

The fact of low entropy of the text has been stated but never been used for the search of other explanations.

Lojban as a possible explanation.

Lojban is a constructed logical language that was created in 1987 by The Logical Language Group out of two previously known languages Láadan and Loglan (also constructred).

The language is based on predicate logic and allows numerous styles, some of which are convenient to use by humans in ordinary speech but some share several features with programming languages.

Lojban is a syntactically unambiguous and because of that it was proposed as a metalanguage in machine translation, machine learning.

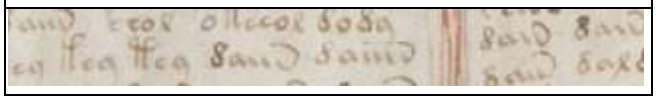
It is no doubt that in future improvements to this language will be widely used in human-machine interaction.

One of the features of this language that to separate certain constructs in a given discourse it can use circumpositions, i.e. both a prefix and a suffix before and after the construct.

For example, a sentence “The dog that jumped to the wooden house belonged to Tom” can be translated to Lojban as {lo gerku poi pu plipe lo dinju poi pu se zbasu fi lo mudri ku ku ku cu se ralte la tom}. Notice that {ku ku ku} fragment. Although, it can be omitted in human speech the syntactical parser that analyses such text would automatically restore this fragment. In fact each {ku} is a right bracket that shows the end of one of the constructs in this sentence, namely, “wood”, “house” and “dog” respectively. Such style with right brackets can be useful for teaching the syntactical structure of Lojban to beginners, though.

This sequences of words giving no additional information, lowering entropy of text, superfluous for ordinary speakers but useful for students remarkably remind of the page 76 of VM where one word is repeated three times one after another (Table 3).

Table 3. VM. Page 76.



The same can be said about trans-lexeme ligatures that probably show syntactical trees of sentences.

The time of creation

It is generally agreed that VM was created in the beginning of 15th century in Italy. We can’t ignore the fact that the only identified picture in VM shows a building only known in Italy. Thus we have to assume that the philosophy behind the document reflects the European philosophy of Mediaeval Europe. Although previous studies denied the existence of images of males in the manuscript we believe that this is not true. Here are the images of a female and a male person from VM (Table 4).

Table 4

	
The female person. The text says “darseBar” and “olkses”.	The male person. The text says: “soral” and “dotedy”.

The next picture (Table 5) depicts not a cecal appendage as proposed in earlier studies but a penis which can be seen better if we rotate the picture 90 degrees.

Table 5

	
Penis. The title says “sororal”	Same, rotated 90 degrees counterclockwise

As we can see in Table 4 and Table 5 depicting a male is accompanied by word with the same root: "soral" and "sororal" respectively.

Another confirmation that Table 5 depicts not an appendage is that on the same page there are three more pictures (Table 6).

Table 6

The first picture is clearly intestines. And there is something green coming out of it. Green is associated with the Element Earth across the manuscript. These 4 pictures are interconnected and describe four classical elements. The next picture describes water and air. And the position of substances assumes mouth and nose. All in all, the complex of 4 pictures shows 4 organs or excreting elements:

“olkses” - intestines – earth

“otedy” - mouth – water

“otol” - nose – air

“dsedy” - penis - fire

Thus, we can prove that the picture of the appendage actually shows a penis. Also it has a title with the male affix “sor”: “soral” and “sororal”.

We can check this once again. In the next picture we can see an arc showing a flow of some substance going only one way (Table 7).

Table 7

The two words below the central text say:

“soroldal” and “darolsy”.

Note the flow is going from “soroldal” to “darolsy”!

Let’s recall male words from the previous pictures: “soral” and “sororal”. And here we have “soroldal”.

The common affix is “sor”. A flow from male to female? Could it be that “darolsy” denotes something female? Let’s look at the image of a female from Table 4. The two words around her are: “darseBar” and “olkses”. “darolsy” and “darseBar” have the same root. Thus “dar” denotes feminine.

Thus we already have the meanings for 4 words: earth, air, fire, water and the meanings for 2 roots: male and female.

And we also know a verb suffix.

The author

We agree that VM is bound to 15th century Italy due to a building resembling Italian buildings of that time, names of months in the astronomical section and finally the words deciphered in this study on the basis of Mediaeval philosophy. We made a conclusion that the manuscript was written in a logical language, unavailable at that time from past inventions. Thus we can assume that this document was related by the interaction of 15 century Italy with knowledge that could come only from future. Certainly such interaction couldn’t be left unnoticed in history of Italy. Thus searching for any strange phenomena of people acting at that time

would be a clue to who was the author. Luckily, the search won't be hard.

Leonardo da Vinci, an Italian Renaissance polymath, was born on April 15, 1452 in the Republic of Florence (modern Italy). His breakthrough discoveries were not a coincidence in history and definitely were due to his connections with time travelers from the future.

The appearance of the Voynich Manuscript can be clearly connected with his efforts to teach a newer language (Lojban) to people around him. The possibility of completely altering the history because of these time travels could have driven him away from this challenge. Thus the manuscript remained the only document written in a future language.

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