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Multi-word lexical units in English and Croatian terminology of electronics

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This paper examines and compares the use of multi-word lexical units (MLUs) in the electronics vocabularies of English and Croatian. Using the terminological database of the *English-Croatian and Croatian-English Dictionary* of Electronics as a source of lexical data, regular patterns of multi-word correspondence in the two languages are analyzed.
The analysis has shown conceptual, syntactic, and lexical differences. We also found that English multi-word lexemes are shorter than Croatian ones and are limited to a considerably lesser number of combinations. The reasons for this are attributed to differences in the basic structural characteristics of the two languages, the metaphorical use of language in the two terminological systems, and the formation process of MLUs. Whereas English multi-word lexemes were formed in the process of primary term formation, most Croatian MLUs were formed as translation equivalents of English lexemes.

Introduction

If we open any technical dictionary we can see that most headwords are multi-word lexical units. These units, which consist of segments of a more or less transformed phrase, condense definition and provide the possibility of stating the basic characteristics of a concept. Makkai (1992:266) finds that »the chief problem with these multi-word units is that since they have an internal grammar of their own,

it is difficult to find the correlations that exist between this internal grammar of the forms themselves and the major outside grammar of the language as a whole«. These lexical units cannot be considered as free word groups – they are more coherent. On the other hand, most of them do not fit the word-formative patterns of compounds.

In Croatian word formation (cf. Barić et al. 1979:232) a compound is a word morphologically related to two words, but written as a single graphic unit.[1] Moreover, it must have only one stress: *vodovod, strujomjer*. If each constituent part keeps its own stress, the structure is no longer considered to be a compound, but a semi-compound and is written with a hyphen between the parts: *spomen-ploča*. Therefore, according to the criteria of Croatian grammar, structures like *ravnotežni most* (*balanced bridge*), *digitalno računalo* (*digital computer*), or *radni napon* (*operating voltage*) cannot be regarded as compounds. To describe such structures Babić (1986:37) uses the term *višečlani nazivi* (*»multi-item terms«*).

The English definition of compounds is based on the same principle: »A compound is a lexical unit consisting of more than one base and functioning both grammatically and semantically as a single word. In principle, any number of bases may be involved, but in English, except for a relatively minor class of items (normally abbreviated), compounds usually comprise two bases only, however internally complex each may be.« (Quirk 1985:1567). However, these compounds can be written:

1. in solid form: *screwdriver, aircraft,*
2. with a hyphen between the parts: *record-player, baby-sitter,* and
3. in open form: *flying machine, power plant.*

Thus compounds in English evidently cover a greater number of structures than in Croatian. However, the rule would hardly cover combinations of words like *binary-to-decimal conversion* or *junction-gate field-effect transistor.* As a result of the staggering development of science in our century, such multi-word lexical units are daily pouring into language and becoming integrated into it. MLUs can today be found not only in specialized dictionaries but, to an ever greater extent, in general dictionaries also. Thus, for example, it is perfectly common to find lexemes such as *centre of gravity, central processing unit, stream of consciousness,* etc. included as entry words in modern dictionaries.

[1] A similar tendency can be observed in French word-formation rules. In the »Introduction au Grand Larousse de la langue Francaise« (1971:IX) L. Guilbert writes: »Traditional lexicology recognizes as compounds the words whose constituent parts are written either as one word or connected with a hyphen; only those words are given in alphabetic order as independent units... Only a recent development, which is reflected in this dictionary, has led to inclusion of *chemin de fer* and *pomme de terre* as separate entries.«

During the last fifty years a number of attempts were made to establish the linguistic status of multi-word lexical units and determine criteria for distinguishing them from free word groups.[2]

In the process of acquiring their linguistic status these units have been referred to as *lexie* (Greimas 1960), *synapsie* (Benveniste 1966), *synthème* (Martinet 1967), *compound lexical item* (Hollymann 1966), etc. Kocourek (1979) speaks of 25 different French terms used to name this concept (*paralexème, mot complexe, groupe lexical,* etc.), and Riggs (1989:102) quotes as many as twenty terms in English (*lexeme, fixed phrase, lexicalized phrase,* etc.). However, term *multi-word lexical unit,* used by Zgusta, seems to be the most frequently used today.

Our work is focused on an analysis of MLUs in the terminological database created for the *English-Croatian and Croatian-English Dictionary of Electronics.*[3]

[2] A few examples of these attempts will be referred to here:

A. J. Greimas (1960:50) remarks that 'the historical practice of the language largely surpasses the morphosyntactic frames of the language, creating lexical units of a different type. 'To denote them, he accepts the term *»lexie«,* used by Pottier in 1955.

E. Benveniste (1966:92) uses the term *»synapsie«* (from greek *synapsis – a union*) for the lexical units which he finds predominantly in technical terminology, »the immense field the linguists have just begun showing interest in.« (Ibid.) He defines the status of these lexical units on the basis of seven principal traits which are predominantly based on the syntactic (and not morphological) relation among the elements and the unique and constant character of the designation.

Hollymann (1966:97) sets similar criteria to distinguish these lexical units:

1. stability of the relation between *signifiant* and *signifié*
2. stability of elements in the sequence
3. frequency of use.

A. Martinet (1967:6) uses the term *'synthème'* which he distinguishes from the 'syntagm' on the basis of 'syntactic behaviour of the whole and absence of separate behaviour of the component elements' (*chaise longue* cannot be *chaise plus* longue).

Zgusta (1971:144–148) uses the term *'multiword lexical unit'* and takes into consideration the following basic criteria:

1. *Substitution* is impossible in an MLU.
2. It is impossible to *add* something to the set combination. For instance the MLU black market can be considered the set counterpart of the free combination illegal market. Now although it is possible to say *illegal steel market*, the only way to express this with the set combination would be *black market in steel.*
3. The MLU may have a *synonym* or a close near-synonym which consists of one word only.
4. A *one-word equivalent* in a foreign language can suggest that we might have an MLU before us.
5. Zgusta also speaks of the *semantic criterion:* 'the meaning of the whole is not derivable from the meaning of the single constituent parts'. However, he considers it important to stress that 'this semantic phenomenon is not the basic criterion of an MLU'.

To the criteria of unique reference and frequency of occurence, McArthur (1992:406) also adds the criterion of perception. He speaks of *'fixed phrases'*, 'common in technical usage: *chemical differentiation, natural selection, spontaneous generation*'. He notes that 'the dividing line between a widely used ordinary phrase and a fixed phrase is not easy to determine. There are degrees of fixedness, depending on frequency of occurence and people's perception. Darwin's phrase *natural selection* did not become fixed in the language at large for many years, but for Darwin, it was probably fixed at the moment of coinage'

[3] Štambuk, A. Pervan, M. Pilković, M. Roje, V. (1991) *Englesko-hrvatski i hrvatsko-engleski rječnik elektronike.* LOGOS, Split. The dictionary database comprises 30,000 entries, 15,000 in each dictionary part. The dictionary corpus was compiled on the basis of frequency of use in professional books and journals in different branches of electronics. Three terminologists and nine specialists in different branches of electronics worked on the dictionary.

Dictionary making itself is based on lexicological research work. However, with the introduction of computers into modern lexicographic work, the process has also been reversed: dictionary databases can be used as a reliable and easy tool for manifold manipulation of lexical data, thus offering the empirical basis for lexicological research.

The analysis of MLUs was performed on a selected segment of the dictionary database covering 1695 entries, i.e. 11.3%, of the English-Croatian section of the dictionary.[4] MLUs make 1230, i.e. 72.6% of entries in the selected dictionary segment, which can also be regarded as an information about the percentage of MLUs in the given data base. Selective lists of dictionary entries were used to discover the structures characteristic of each language and to define their frequency. The selected sample was also used to contrast the two terminological systems, with the aim of discovering regular patterns of similarity and divergence in structural and semantic relations between MLUs in the two languages.

All entries having a multi-word lexical unit either as an entry word or as its correspondent, were analyzed. As we can see from the given definitions, all lexemes consisting of more than one word would be regarded as MLUs according to the rules of Croatian grammar. A part of such word groups might be regarded as compounds in English. However, it is not always easy to determine the dividing line between an MLU and a compound in English. We therefore decided to analyze all the lexical items consisting of more than one word.

We are also aware that it is not always easy to decide when a group of words is fully stabilized and thus constitutes a fixed combination. Some lexical units may be ephemeral lexical creations that are born and fade away as the technological discoveries that motivated them are superseded or lose their importance. Others are considered fixed combinations only within a particular field, while in general language they are considered free combinations of words:

	Meaning in electronics (definitions taken from electronics dictionaries):
excited state	(»the state of the nucleus when protons of less than maximum energy have been emitted from the atom«)
drive control	(»in a TV receiver, the potentiometer used to adjust the ratio of the pulse amplitude to the linear portion of the current wave«).

Some of the word groups analyzed here may undoubtedly be considered random and incoherent by a lexicologist. However, in the process of contrasting the

[4] We are aware that the analysis could have been statistically more significant if a greater number of MLUs had been observed. However, we believe that even the sample observed here could provide the basis for investigating the main points of interest.

two languages we frequently discovered that an apparently free sequence of words has a one-word correspondent in another language which, according to Zgusta (1971:148) may serve as a proof that the given combination of words is a multi-word lexical unit.

One-word correspondents

Before describing the distribution and the structure of MLUs in English and Croatian, we shall analyze the entries in which an MLU corresponds to a one-element word.[5]

A number of English one-word noun lexemes have multi-word correspondents in Croatian. Some of these correspondents consist of adjective + noun combinations, in which the Croatian noun reflects the general meaning of the English noun, and the Croatian adjective adds a specific semantic content restricting the broader meaning of the noun to the particular field of electronics, e.g.:

band – *frekvencijski pojas (»frequency band«)*[6]

In another case it is the Croatian adjective that reflects the broader semantic content of the English noun, while the Croatian head noun specifies the meaning, restricting it to the particular referent:

carrier – *nosivi val (»carrying wave«)*
driver – *pogonski sklop (»driving circuit«).*

The following Croatian equivalents of English one-word noun lexemes in Croatian can also be found:

– three-element MLUs of type N + (Adj + N)genitive:
babble - šum ukupnog preslušavanja (»the noise of the aggregate crosstalk«)
bearing - nosač rotirajuće osovine (»the support of the rotating shaft«)
– four-element MLUs, of type N + (N + Adj + N)gen:
deck – mehanizam prijenosa magnetske trake (»the mechanism of the transport of the magnetic tape«)

[5] MLUs are analyzed within the selected segment of the dictionary, covering letters *d,* and *m* of the English entries. However, since one-word correspondents comprise only 2.8% of dictionary entries, representative examples for these units were exceptionally taken from the whole of the dictionary data base.

[6] Literal back-translations of Croatian lexemes are in some cases given in brackets to help understand the relation of constituent elements.

The correspondence of Croatian MLUs to English one-word lexemes predominantly occurs with the incidence of metaphorically used English terms (i.e. terms used in a transferred sense like *band, carrier, driver, babble, bearing, deck*). Instead of using metaphor, Croatian reaches out for a multi-word expression, which could be regarded as a difference in metaphorical usage of terminological lexis in the two languages in the given examples.

When we analyze Croatian one-word lexemes with two-element (predominantly N + N) correspondents in English, we find that in several cases the first English element corresponds to the stem of the Croatian noun, while the general meaning of the English head noun, i.e. *»device (appliance, mechanism) for...«*, is reflected in the Croatian suffix:

winding mechanism	–	*namatalica*
soldering iron	–	*lemilo*
television receiver	–	*televizor*
spark gap	–	*iskrište.*

A zero suffix in a Croatian noun may also correspond to the noun in adjective-noun combinations in English:

bistable multivibrator	–	*bistabil* (Note that the adjective would be *bistabilan*),
harmonic component	–	*harmonik.*

The semantic content of the first element in English two-element (e.g. N + N or Adv + N) lexemes may correspond to the prefix in Croatian, and that of the head noun to the stem:

bias power	–	*predsnaga*
through connection	–	*prospajanje*

A number of English two- or three-element MLUs (N + N, Adj + N, Adj + N + N) also correspond to Croatian compounds:

light conduit	–	*svjetlovod*
electrical engineering	–	*elektrotehnika*
acoustic depth finder	–	*dubinomjer.*

We can see from the given examples that one-element Croatian equivalents can often be found for multi-word English entries because elements of an English MLU can be replaced with a prefix or a suffix in Croatian. This is probably due to the fact that Croatian is richer in prefixes and much richer in suffixes than English. According to Bujas (1985:193), the »full inventory of prefixes is some 60 in English and 80 in Croatian«. As for suffixes, the difference is much greater: the list of Croatian noun suffixes only (cf. Babić 1986:50) surpasses 500. These suffixes, some of which have more than one meaning, therefore provide a great possibility of semantic expression, which is reflected in term formation.

Number of Elements in MLUs

A total of 72.5% of the dictionary entries analyzed here contained an MLU either in an English headword or a Croatian correspondent. Examination of the number of elements within MLUs showed the following:

English headwords	%	Croatian correspondents	%
2-element lexemes	75		65.4
3-element lexeme	20.2		20.5
4-element lexeme	2		8
5-element lexeme	0		1.4

The remaining units, 2.8% in English and 4.6% in Croatian refer to one-word correspondents discussed above, and to explanations, i.e. definitions of the terms. These explanations only appear in Croatian in cases in which adequate one- or multi-word lexical correspondents to English lexemes could not be found. They predominantly occur in relation to English N + N, Adj + N and N + N +N MLUs, e.g.:

degradation failure – greška zbog pogoršavanja svojstava (starenjem materijala)
minimum access programming – programiranje za najkraće pristupno vrijeme.

It must be noted, however, that it is not always easy to determine the boundaries between MLUs and explanations. In his attempt to describe the distinction between the two, Zgusta speaks of »boundary cases«:

»The difference which we see between what we call the explanatory (or descriptive) equivalent and the explanation is that the former tends to be a lexical unit of the target language, whereas the latter tends to be very similar to a lexicographic definition (or is even identical with it) and usually cannot aspire to become a lexical unit. It is unnecessary to stress that there is a great number of boundary cases.« (Zgusta 1971:325).

We can see that two-element lexemes cover the greatest part of the dictionary MLUs and are more frequently used in English than in Croatian. The number of three-element lexemes is almost identical in both languages, while four-element lexemes predominate in Croatian. Lexemes consisting of more than four elements appear almost only in Croatian (only one example in English). The analysis has therefore shown an evident tendency towards longer MLUs in Croatian.

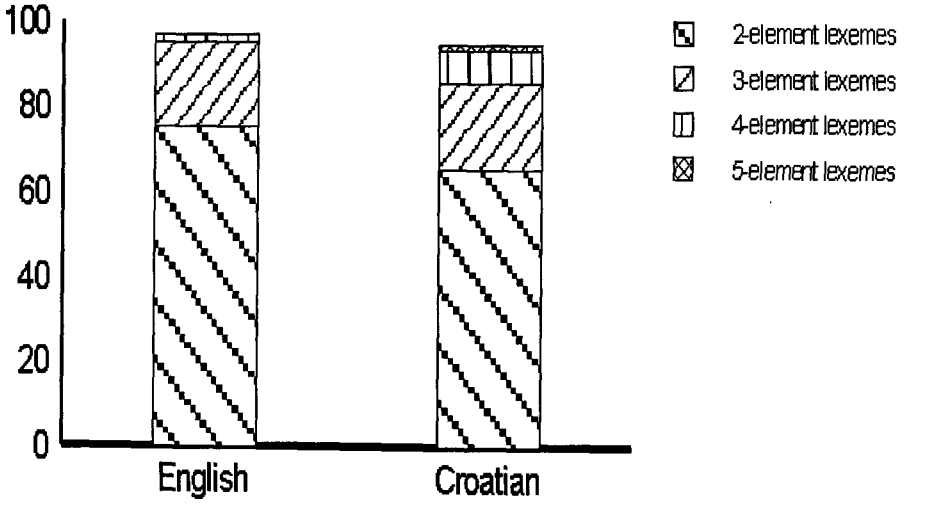

Figure 1: *Number of elements in MLUs*

Structure

If we analyze the structure of MLUs we shall see that English shows a far more ordered pattern than Croatian:

English headwords		%	Croatian correspondents		%
Adj + N	-	45	Adj + N	-	52
N + N	-	29	N + Ngenitive	-	12
Adj + N + N	-	10	Adj + Adj + N	-	7.2
Adj + Adj + N	-	4.4	N with Adj Ninstrumental	-	4.2
N + N + N	-	3.6	N + (Adj + N)gen	-	3.4
Total		92.0	Adj + N + Ngen	-	2.5
			N *for* Nacc	-	2.3
			Adv + Adj + N	-	1.5

	N+ Ngen + Ngen	-	1.2
	N with Ninstr	-	1.1
	N + N	-	0.9
	Adj + N for Nacc	-	0.8
	N for (Adj + N)acc	-	0.8
	Adj + N with (Adj+N)instr	-	0.7
	N + Ninstr	-	0.5
	N for Nacc + Ngen	-	0.5
	Adj + N + (Adj+N)gen	-	0.5
Total			92.1, etc.

The combinations Adj + N and N + N make up as many as 74% of English MLUs, and if the structures Adj + N + N, Adj + Adj + N and N + N + N are added, almost 92% of all English MLUs in the dictionary are covered. On the Croatian side, however, we have a rather different pattern. The Adj + N combination covers more than half of all MLUs (52%) and the N + Ngen set combination represents 12% of all MLUs. Other combinations, however, are represented in a much lower number. In Croatian, therefore, the first seven combinations cover 84% of all MLUs. After that, the number of examples of a particular MLU structure decreases considerably, and in order to reach 92% of all Croatian MLUs, the percentage which, as stated, is covered by only five set combinations in English, as many as seventeen Croatian combinations will have to be included. This survey covers 92% of English and 92.1% of Croatian MLUs. The full number of lexical combinations found in the corpus, however, is 24 in English headwords corresponding to 38 in Croatian correspondents. Most of the structures not included in the survey are represented by 1-3 examples. However, all the lexical combinations found in the analyzed sample of the dictionary data base are shown in the Table of MLU Structures, given in the Appendix to this paper. The table includes data showing the frequency of use and the patterns of mutual correspondence of MLUs in the two terminological systems analyzed here.

Longer MLUs and the greater number of set combinations in Croatian are caused by several factors. One reason is the fact that English MLUs were formed in the process of primary term formation (cf. Sager 1990:80), whereas most Croatian lexemes were formed as translation equivalents of the English terms. Another reason lies in the basic syntactic characteristics of the two languages and their respective possibilities for the formation of this type of lexical units. Being an inflectional language, Croatian has not the possibility of composing noun groups by

juxtaposing nouns into MLUs without specifically stating the relations among them. These relations have to be expressed either by means of a case form or by a prepositional phrase. The prepositional combinations, however, which comprise 12.5% of Croatian MLUs, are practically nonexistent in English. [7]

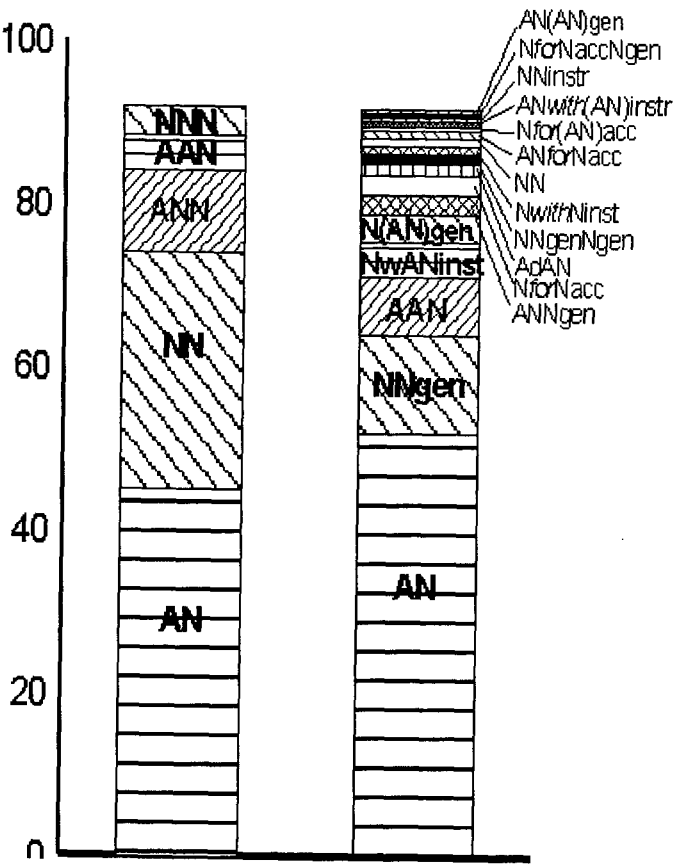

Figure 2: *Structure of MLUs in English and Croatian*

[7] Our findings are to a certain extent influenced from the fact that we have studied an English-Croatian dictionary rather than a Croatian-English one. We opted for this approach in the first place since a great number of Croatian terms have been created as translation equivalents of the English terms. We are aware that a two-directional analysis would provide a deeper insight into contrastive patterns thus offering interesting material for further analysis.

5. Contrastive patterns

Comparing the correspondent multi-word lexemes in the two languages, we shall find some highly regular patterns in certain set combinations. We will analyze the five most frequently used English set combinations (covering 92% of all English MLUs) and their most frequent correspondents in Croatian.

In practically all English MLUs the head noun is placed at the end of the set combinations of words. In Croatian, however, we can find a more varied pattern. The main distinction can be drawn between 1. non-prepositional and 2. prepositional Croatian MLUs. Non-prepositional MLUs can further be divided into three groups: a) those in which the head noun is premodified by an adjective or adverb, or their combination; b) MLUs in which the head noun is postmodified, usually by noun(s) genitive, but also by noun instrumental or noun dative, which are sometimes preceded by an adjective, and c) MLUs in which the head noun is both premodified (by an adjective) and postmodified (by genitive noun(s)).

5.1. Non-prepositional Croatian MLUs

5.1.1. MLUs with head noun premodified

The five most frequently used English set combinations find their Croatian correspondents predominantly in non-prepositional MLUs (63.4%). Thus the English adjective + noun mainly corresponds to Croatian adjective + noun (83%), retaining the same semantic content:

destructive testing	–	*razorno ispitivanje*
direct address	–	*izravna adresa*
magnetic wave	–	*magnetski val.*

English noun + noun combinations also find their correspondents in Croatian Adj + N (46%). Since the N + N combination is not normally used in Croatian, the Croatian denominal adjective here takes over the semantic content of the English attributive noun, e.g.:

deflection coil	–	*otklonska zavojnica*
diode switch	–	*diodni prekidač*
measurement device	–	*mjerna naprava.*

The adjective + noun + noun English combination also corresponds to the Croatian Adj + Adj + N (in 24% of the cases). The order of elements in the MLU is preserved; but the Croatian adjective takes over the function of the English attributive noun:

manual test equipment – *ručna ispitna oprema.*

English adjective + adjective + noun MLUs in 45% of cases correspond to the same Croatian combination (Adj + Adj + N) with predominantly equal semantic content on both sides, e.g.:

direct inductive coupling - *izravna indukcijska sprega*
multiple printed pattern - *višestruki tiskani lik.*

When Croatian Adj + Adj + N MLUs correspond to English N + N + N combinations, adjectives take the semantic value of the English attributive nouns:

diode ring modulator – *diodni prstenasti modulator*
matrix sound system – *matrični zvučni sustav*

A small number (2.3%) of English Adj + N combinations also correspond to Croatian Adj + Adj + N:

magnetic track – *magnetni tonski trag.*

We can conclude that English adjectives also have adjectival correspondents in Croatian. On the other hand, a great number of English attributive nouns correspond to adjectives in Croatian, particularly those in the N + N English combination, thus making Croatian Adj + N and Adj + Adj + N set combinations the most frequently used MLUs, covering as many as 60% of all Croatian MLUs.

5.1.2. MLUs with head noun postmodified

In cases when the adjective + noun combination cannot be formed in Croatian due to semantic or grammatical reasons, English noun + noun combinations often find noun + genitive noun correspondents in Croatian (31%). The second element (head noun) of the English lexeme corresponds to the head noun in the Croatian lexeme, modified by the genitive form of what was the attributive noun in English. This Croatian set combination also corresponds, in very few cases (2%), to Adj + N in English.

Reflecting different semantic relations between the elements of the given MLU, the genitive in the Croatian N + Ngen combinations analyzed was of several types: a. possessive genitive, b. partitive genitive, c. objective genitive d. subjective genitive.

The meaning expressed by the genitive can best be shown by phrasal analogues of the given examples.

The most frequently encountered relationship is that of the possessive genitive, covering 60% of all noun + genitive noun Croatian MLUs corresponding to N + N English combinations:

device code – kod uredjaja (The device has (a certain) code.)
data address – adresa podataka (The data have (a certain) address.)

The objective genitive is found in 32% of the cases:

data converter – pretvarač podataka ((...) converts data.)

device test – provjera uredjaja ((...) tests the device.)

In all lexemes containing the objective genitive the head noun (in English the second element, in Croatian the first one) is formed from a verb, whether by suffix: processor, equalizer, transmission, or by conversion: *test, check, control* (in Croatian *provjera, rezanje, ispis, etc.*).

The partitive genitive is found in eight (6%) Croatian lexemes corresponding to noun + noun in English:

data stack – slog podataka (The stack consists of data.)
disk pack – paket diskova (The packet consists of disks.)

The subjective genitive is represented by only one example:

directive gain (syn. antenna gain) – dobitak antene (Antenna gains...)

A part of English Adj + N + N multi-word lexical units find their correspondents in N + (Adj + N)gen Croatian combination. Here the head noun precedes the adjective + noun genitive structure:

magnetic head core – jezgra magnetne glave (»the core of the magnetic head«)

Croatian noun + noun instrumental MLUs appear as correspondents of several N + N English MLUs. The premodifier in the English MLU becomes a postmodifier in Croatian, and the case form expresses the semantic notion of »by means of«:

microwave heating – zagrijavanje mikrovalovima
dip coating – oblaganje uranjanjem.

5.1.3. MLUs with head noun between modifiers

The third group of Croatian MLUs, in which the head noun is both pre- and postmodified, corresponds to only 4% of the English MLUs observed. Among them we could mention Croatian Adj+ N + Ngen, which appears in relation to English Adj + N + N, reversing the order of the two English nouns:

direct data processing – izravna obrada podataka (»direct processing of data«)

TABLE OF MLU STRUCTURES

English		AN	NN	ANN	AAN	NNN	N	NAN	AdAN	NofN	VN	AANN	ANNN	NofNN	AofAN	NNNN	PN	ANofN	NPN	VP	NVN	VNN	NNofN	ANofAN	NofAN	AdN
Croatian	No																									
AN	638	457	163	1	1	1	15																			
AAN	89	13	4	31	25	10	2	2	2																	
AdAN	19	1			9	1		2	2						3					1						
AAAN	2			1								1														
AdAAN	2			1								1														
ANNgen	31	5	4	11	1	7					1							1	1							
ANANgen	6	1				3							1													
ANNgenNgen	3	1	1	1																				1		
NN	12	9		1			1	1																		
NAN	1					1																				
NNgen:	146	11	110	2		1	7			8	6						1									
Poss gen.	86	7	67	2			1			4	4						1									
Obj. gen.	49	2	35			1	5			4	2		1													
Part. gen.	9	1	8										1													
Subj. gen.	2	1					1																			
NANgen	42	4	8	22		3	1							3												
NNgenNgen	15	5	3			3	1									1									1	
NNinst	7		5	2																		1	1			
NVNinst	2				1																1					
NAANgen	1	1																								
NAdANgen	1		1																							
NNgenNinst	1					1																				
NNdat	1		1																							
N*s(a)*ANinst	52	11		34	5		1	1																		
N*s(a)*Ninst	14	2	11														1									
AN*s(a)*ANinst	9	1		1	3	1							2			1										
N*s(a)*AANinst	2		1									1														
AN*s(a)*ANgen	1		1																							
N*za*Nacc	29	9	18				2																			
AN*za*Nacc	10	1	1	6	2																					
N*za*ANacc	9	1		2	3	2	1																			
N*za*NaccNgen	7	3	2			1	1																			
AN*za*NaccNgen	2	1	1																							
N*za* NaccANgen	1	1																								
N*s(a)*Ninst*za*Nacc	1					1																				
N*na*Nloc	3		2	1																						
N*na*ANloc	3			3																						
N*na*ANacc	2			2																						
N*na*Nacc	1		1																							
N*u*Nloc	5	1	3				1																			
N*u*ANloc	2	1				1																				
N*u*AANloc	1	1																								
Total	1173	541	341	122	50	37	33	6	4	8	7	3	3	3	3	2	2	1	1	1	1	1	1	1	1	
Definitions	57	12	14	7	5	8	2						2			5										2
Total with definit.	1230	555	355	129	55	45	35	6	4	8	7	3	5	3	3	7	2	1	1	1	1	1	1	1	1	2

N - noun, A - adjective, Ad - adverb, *V* - verb, P - preposition
Cr.*s(a)* = Eng. *with*, Cr.*za* = Eng.*for*, Cr.*na* = Eng.*on*, Cr.*u* = Eng.*in*

It also corresponds to the English N + N + N set combination. The Croatian head noun is preceded by an adjective reflecting the semantic content of the second element, and is followed by the genitive noun which reflects the semantic content of the first element in the English MLU:

memory address register – adresni registar memorije (»address register of the memory«).

5.2. Prepositional Croatian MLUs

Croatian prepositional combinations cover 12.5% of the English combinations observed. The most frequently used one is N with (Adj + N)inst, which corresponds predominantly (in 26% cases) to English Adj + N + N. The elements of the English MLUs are preserved in Croatian, where we also find an adjective and two nouns, but their order is changed, and they are tied by a preposition, thus expressing the instrumental semantic relation. The head noun becomes the first element in the Croatian MLU, modified by the prepositional instrumental phrase consisting of the preposition with (sa) + adjective + noun:

magnetic bubble memory – memorija s magnetskim mjehurićima (»memory with magnetic bubbles«),
dielectric lens antenna – antena s dielektričnom lećom (»antenna with dielectric lens«).

In 5% of cases the relation between nouns in the English N + N lexeme is expressed by the Croatian prepositional construction N for Nacc, denoting purpose:

maintenance equipment – oprema za održavanje (»equipment for maintenance«).

The set combinations analyzed here certainly do not cover all the forms of multi-word lexical units in the English and Croatian vocabulary of electronics. However, they include five English combinations covering 92% of MLUs in the analyzed sample of the dictionary data base and their most frequent correspondents in Croatian, thus giving a survey of most frequently used forms and their mutual relations.

Conclusion

Our analysis has shown that the greatest part of longer-than-word lexemes in the dictionary database are two-element lexemes, while fewer three- and four-element lexemes appear. Next, English MLUs are shorter than Croatian ones (75% vs.

65% of two-element lexemes; and 2% vs. 8% of four-element lexemes, while five-element lexemes appear only in Croatian, covering 1.3%of all MLUs).

English MLUs are also limited to a considerably lower number of combinations (24 English vs 38 Croatian). This difference in length and in number of set combinations in the two languages can mainly be attributed to the different syntactic characteristics of the two languages.

Analysis of structural patterns of MLUs in the two languages has shown that English adjective and noun premodifiers most frequently correspond to adjective premodifiers in Croatian MLUs, and if adjectives cannot be used in Croatian due to semantic or phonetic reasons, their role is taken over by noun genitive postmodifiers as bearers of several semantic values (possessive, partitive, subjective, objective).

Different relations between the constituent parts of English MLUs are also reflected in various types of prepositional MLUs in Croatian, containing prepositions with, for, on, in, followed by the corresponding case form, and expressing the relation of instrument, place, purpose, etc.

We also found that differences in metaphorical use of the language in the two terminological systems can result in multi-word correspondents to a one-word term used in a transferred sense. In addition, the semantic content of a particular element of an English MLU can be reflected in a suffix or a prefix of a one-word Croatian correspondent.

We could conclude that although MLUs present an abundance of forms that look rather fuzzy at first sight, closer examination shows that a great number of these units can be classified within relatively few structural and semantic patterns, both when observed from the point of view of one language, or when contrasted with another. Insight into these patterns may help us to understand the relations among the elements of multi-word lexemes and to classify them into specific lexical categories characteristic of the field in which they occur, thus facilitating future formation.

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VIŠEČLANI NAZIVI U ENGLESKOM I HRVATSKOM ELEKTRONIČKOM NAZIVLJU

U radu se ispituju i uspoređuju višečlani nazivi u elektroničkom nazivlju engleskog i hrvatskoj jezika. Na temelju baze podataka Englesko-hrvatskog i hrvatsko-engleskog rječnika elektroničkog nazivlja kao izvora leksičkih podataka, ispituju se pravilnosti međusobnih odnosa navedenih naziva u dva jezika.

Analiza je ukazala na postojanje razlika na konceptualnoj, sintaktičkoj i leksičkoj razini. Također smo ustanovili da su engleski višečlani nazivi kraći od hrvatskih, te da su ograničeni na znatno manji broj leksičkih kombinacija. Navedene razlike posljedica su različitih strukturnih karakteristika dvaju jezika, različite uporabe metaforičkih jezičnih sredstava, te različitog tvorbenog procesa u dvama terminološkim sustavima. Dok su engleski višečlani nazivi uglavnom nastali postupkom primarne tvorbe, hrvatski su nazivi pretežno tvoreni kao prijevodni ekvivalenti engleskih leksema.