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INFLUENCE OF ENGLISH ON CZECH ELECTRICAL ENGINEERING AND ICT TECHNICAL TEXTS.

BACHELOR'S THESIS

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Bakalářská práce

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NÁZEV TÉMATU:

Vliv angličtiny na české odborné texty v elektroinženýrství a informatice

POKYNY PRO VYPRACOVÁNÍ:

Srovnejte české a anglické odborné texty v elektroinženýrsví a informatice a klasifikujte oblasti vlivu angličtiny na češtinu

DOPORUČENÁ LITERATURA:

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Abstract

The bachelor thesis deals with the influence of English on Czech electrical engineering and IT texts. It analyses the globalization of English, its expansion in the world and its influence on society as a whole. In the end, it focuses on the comparison of professional electro engineering and information technology texts and their analysis.

Key words

English, Electro-engineering, IT, Globalization, Language

Abstrakt

Tato bakalářská práce pojednává o vlivu angličtiny na české odborné elektroinženýrské a IT texty. Rozebírá a analyzuje globalizaci angličtiny, její rozšíření ve světě a také její vliv na společnost jako takovou. V závěru se věnuje samotnému porovnávání odborných elektroinženýrských a informačně technologických textů a jejich následné analýze.

Klíčová slova

Angličtina, Elektroinženýrství, IT, Globalizace, Jazyk

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PROHLÁŠENÍ

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Introduction

The aim of this bachelor thesis is to observe the role of English in Czech professional texts and show how English language influences and affects not only the Czech professional society but also the professional Czech language in electrotechnical texts. This work will therefore, seek to confirm the validity of the commonly quoted belief that English has an unprecedented influence on the current Czech society, and that is penetrating more and more into Czech language and slightly changing our national language.

The aim of the first chapter is to investigate the extent to which this language is spread throughout the world, what is the form of today's world of English, and also to confirm or refute whether English has already become a world lingua franca. Since the penetration of English is only part of the socio-cultural changes that have been around the world since the second half of the twentieth century, and which we now commonly call globalization, we need to look at the brief attention also to what globalization actually poses and whether in the case of the spread of English, is more of a benefit or a negative phenomenon.

The aim of the second chapter is to compare specific English technical texts from the field of IT and electrical engineering with their Czech translations and the subsequent analysis of the text itself, expressions in text and phenomenon have taken from English. In these examples, we are going to show in what way English has influenced Czech translations of electrical engineering texts and what is the ratio of English expressions throughout the text versus original Czech terms.

In the third chapter, an analysis will be made, focused on a further examination of professional English texts from the field of Electro engineering. Articles and text from the genre of enriched science texts and from popular science texts are going to be investigated from the several points of view. More specifically, aspects analyzed will be the semantic point of view, pragmatic point of view and from the syntactic point of view. Furthermore, the lexical cohesive chain is going to be depicted and the effects of English original texts to Czech texts will be classified.

The aim of the fourth chapter is going to be similar as in the third chapter, but with the difference, that this chapter will be focused on texts and articles from Information Technology.

1. Globalization

1.1 What is globalization?

One of the leading contemporary sociologists and globalization experts, Anthony Giddens, understands this concept as a growing interdependence between different nations, states and regions around the world. "The world has in many ways become the only social system in which almost all are interconnected and dependent on one another" (Giddens 1999: 549). Thanks to the interconnection and interdependence of different nations, globalization pushes us towards universal monoculture. It is said that the "world is diminishing" which means that world is going to be one big village once. It can be rightly argued that this globalization power has been in existence since the beginning of civilization, but its action has been felt at different stages in human history with varying degrees of intensity. It could be said that just as suddenly and sharply changed the world at the turn of the 15th and 16th centuries together with the discovery of America, it is changing today, along with the development of the media and fast cheap travel. This is partly true, for example, English has been used in various places around the world more than 200 years ago, but that does not mean we could call it a global language. The real number of her speakers was very limited, and so did her influence not far from all civilized territories. How can globalization be more precisely defined and can any of these characteristics be used to assess global English? Giddens says that "globalization comes from the West, it carries a distinct seal of American political and economic power, and in its consequences is very unbalanced. It is not, however, simply the overthrow of the West over the rest of the world; the United States is acting the same way as other countries " (Giddens 2000: 14). This is also evident in English itself. By becoming a global language, it is changing its form. This will be explained more in the section entitled Global Image of English.

Miroslav Petrusek states that ambivalence and ambivalence itself is a defining feature of globalization as a whole as an essential feature of individual globalization processes. "This means that the same process is positive at one end of the spectrum is negative at the other end of the spectrum and vice versa" (Petrusek 2003: 97-98). Here we can see an example of the ambivalence of spreading English. On the one hand, thanks to its global expansion, the communication of speakers who speak different languages is facilitated, which is invaluable,

for example, in science where, thanks to international cooperation, great discoveries have been made, undoubtedly beneficial to all mankind. On the other hand, English may contribute to the extinction of some vulnerable languages, or to their downgrading to a lower language position, as has been the case in the often cited cases of Ireland, Jamaica or New Guinea. For Czech, it seems not to be extinct or descent to a position of inferior language in the foreseeable future. Despite this ambivalence, globalization is often seen as only a negative phenomenon that "destroys local culture, spreads the inequalities in the world, and worsens the burden of impoverished" (Giddens 2000: 27). In particular, its impact on local culture and language is for many people a tragedy of a personal nature because of the loss of their own identity. Petrusek sees the role of identity as a key in the process of globalization and characterizes it as follows: "One has a greater chance of globalizing, the greater the capital economic, social and symbolic is and the more freely he is willing to treat his original identity. Identity is, therefore, an epitome, a slogan, a challenge, a theme and the threat of globalization as a global process in which it collapses, meets and matches the global with the local, identity "local", national identity with "world", transnational " (Petrusek 2003:100). The threat of losing your own identity is, I think, also the most pervasive problem of globalization in English at all.

1.2 The Power of English

What gives English such power in today's world, and what has caused it to be used today as an international communication tool, or lingua franca, is its de facto prestige. It stems from the economic predominance of the English-speaking world, mainly from the power and wealth of the United States, but also from the United Kingdom, whose influence at the end of the 19th century was one quarter of the planet's population and half of the continent's size and today still one of the richest and most influential countries in the world. Great Britain's Great Powers spread through new colonies across the globe through new colonies, but its success today is rather the United States and its economic primacy in the 20th century. "The basis for the success of the language is the strong base of power - mainly political and military, and the economic power" (Crystal 1997: 7). On the other hand, as Crystal points out, the right to cultural ownership of this language is becoming controversial, and more likely to be "global ownership". The success of English today is based on its interconnection with the most

important economic and societal structures operated by large trading companies that originated in most cases in the United States but have gradually spread through the ever-expanding Western society to the rest of the world and today they have a transnational nature. The main areas in which English is dominated and from which its vocabulary is spread in other languages are: international trade, travel, military operations, maritime communication , air communications, education and scientific research, popular music and cinema (Crystal 1997: 100-110). Thus, the term "globalization of English" means the penetration of this language into the territory where it was not previously, and to social structures and institutions in which it has not been used until then. In broader terms, it is about expanding English all over the world. From the language which originally spoken only several countries of the world, most of whom were native speakers, and only about 300 million people spoke in the 1950s, became a language that is now understandable by every fourth inhabitant of the planet, of which the vast majority are native speakers. Global English, however, does not only exist in the form of a universal means of communication, but also in the form of individual sentences, inscriptions, advertising slogans, and individual words that translate into other languages on a large scale. The process of globalization in English must, therefore, be in our interest because it has struck, albeit a bit too late, but undoubtedly also the Czech Republic.

1.3 Number of English users and their distribution

According to estimates, English is the first language for 300-400 million people worldwide. In addition, English has about one and half billion other users. There is probably no need to add that these numbers are just a rough estimate because it is not in human capabilities to calculate how many people in the world understand English and use English. This is because it is extremely difficult in this case to define what "knowledge of English" means. More accurate number of English speakers presents in his book English as a Global language, David Crystal. These are very interesting data that tells us a lot about the history of the spread of English, but also about the political layout of the world, and which do not have in precision a competitor (Crystal is quoted in all professional articles on the Internet). It is not easy to compile exact tables, and it is clear that the figures on the number of speakers are based on relatively accurate demographic data, on the number of inhabitants of each country, and on the rough estimates of local or international institutions. In order to understand the

structure of English users in the world and where the Czech Republic fits into this structure, let's take a look at the following simple graph taken from Kachru:

Expanding circle

Outer circle

Inner circle
e.g. USA,
UK
320–380 million

e.g. India,
Singapore
300–500 million

e.g. China,
Russia
500–1,000 million
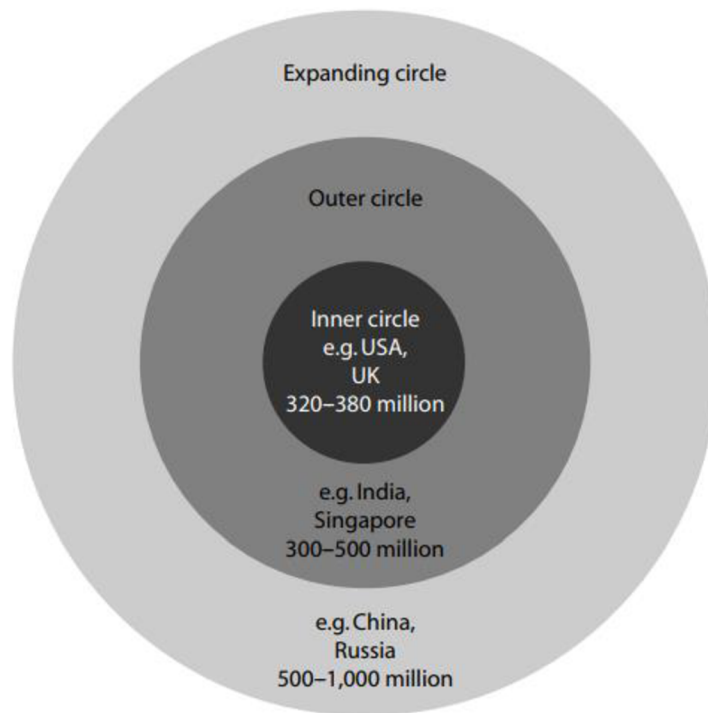
The three 'circles' of English

The target divides the incidence of English in the world into three circuits so that the first, inner circle is the country that historically forms the base of its speakers. These are countries where English is the main language and from where it has spread to the world, of course it is the United Kingdom, but also the United States or Australia. The second circle includes the country where English came before its current expansion and where it has a second language among the various local languages, which is also used by the most important institutions. This includes, in particular, later British colonies. But for understanding the function of English as a global language, the third circle is actually the most important. These are countries which have not been colonized by countries of the inner circle, and where English has no official or special status but is taught in school as a foreign language. As the name suggests, their number is still increasing, yet all the remaining countries of the world cannot automatically be included in this heading, but only those in which English has been promoted as one of the main foreign languages taught and where the number of speakers is showing a significant increase. Although Crystal does not mention the Czech Republic directly, we can certainly count our country in the third circuit, however it is hard to guess how many people really speak English in Czech Republic. Anyway, English is the most

taught foreign language in our country with a steady increase in pupils. Crystal distributes its simple distribution. He comes to the conclusion that native speakers of English are around 400 million in the world, if we also count speakers of various pidgins and creole which are based on English. Since some of these languages are so distant from English that they are no longer understandable to ordinary Britons or Americans, such as the New Guineas Pisin, I would prefer to work with a figure of 329 million, which is based on English as such or its dialects. Adding about 430 million speakers living in countries outside the ring, we get roughly 750 million. This is still 150 million less than the Mandarin Chinese speakers, so it would not be enough to take the lead in English in the number of users. But there is also an expanding circuit. Of course, the number of English users in expanding countries cannot be clearly calculated, so this is therefore a rough estimate based on different, incomparable and unverifiable statistics. Moreover, any statistics are unreliable because it is not possible to define precisely what is the knowledge of English. According to a survey published in 2006, 13% of EU citizens speak English as their native language. Another 38% of EU citizens state that they have sufficient skills in English to have a conversation, so the total reach of English speakers in the EU is 51% [1], but this fact must be strongly questioned by anyone who has tried to speak with English language in Italy, France, Spain or Portugal. Crystal relies on information provided by the British Council, which provides English-language teaching throughout the world and subsequent official exams. The criterion of knowledge is a kind of " medium level of conversational competence " There is again about 750 million, which adds up to 1.5 billion people worldwide who can use English at a good level as a communications tool. So every fourth inhabitant of the planet can speak English. This is certainly a respectable number, but on the other hand, it means that four-fifths of the world's people, or 5.5 billion people, will most likely not understand when you speak to them in English.

1.4 Global form of English language

From the above-described estimates of English users, we can make one important conclusion. English is the language that can be spoken fluently, without errors, at a level close to the native speaker, only by a very small number of people. English is, in fact, only in its essentially simplified or pidginized form, and this form is far from uniform. In each country, English is a slightly adapted to the local language, and it is not only just by pronunciations. For example, most people in the Czech Republic tend to use Czech word order in the creation

of English sentences, which is wrong word order in English and also not to differentiate a different future or past times. Worldwide, therefore, specific forms of English are created, with established names. Czech English is called in slang Czenglish, Chinese is Chinglish and so on. Many people think they can speak English because they are able to communicate with people abroad without any problem. Is it really true, or is it because it is really easier to speak English in a civilized world? Globalization causes you to come anywhere, find similar products, food, and beverage names, and most importantly a salesperson who will say the few words instead of you. Thanks to the television and internet today, potential travelers have an adequate idea of what it looks like in a foreign country they can also read how to behave in the tour guide, and the rest they can think out. Computer systems and the Internet play an increasingly important role in international trade, communication, and everyday life. With this comes also simplifying and unifying of all these systems. Software developers and marketers understood a long time ago that it pays off to translate their software into local languages because users are intent on understanding their systems and doing business quickly and smoothly. Even though computers and the Internet originated in the United States, and their language has always been primarily English, this situation is changing today. Czech people today can fully use basically all Internet services without having to learn English and also the orientation on the English websites, which are used to sell various goods, is easier to understand because they are similar to Czech sites. Buttons and icons will be in the same place on the screen and you do not have to look too much at what is written on these buttons. Still, it is true that at least the basics of English will help you in all the situations described, and that English can be used in international contact with more and more often than any other foreign language.

The Oxford Dictionary of English boasts a vocabulary of over 400,000 words. Although it is typical for the global English language that a large number of speakers manage only a few hundred words and that is enough for them to understand each other. Even the complete English grammar is certainly not easy, but average English speaker does not handle everything. In addition, because English does not have timing, inflection, or nobility, it can be taught on its basics more quickly, rather than other languages. This language torso-of pidginized English "cut to the bone" is in most cases today's worldwide English. The native speakers had to get used to it, but it does not seem to matter to them either. They can speak to others without any problem, which is convenient not only for traveling but also for business meetings. Moreover, here as elsewhere, "one-eyed is among the blind king".

2. Comparing of English texts to their Czech translations

2.1 Electro-engineering text comparison

<u>**English text**</u>

*The **magnetic** field is concentrated through the **magnetic** circuit into a defined area. The **magnetic** circuit is frequently interrupted by an air gap. If the time-variable flux is to be enclosed due to it, the **magnetic** circuit is made from a composite **ferromagnetic** material (cast iron, cast steel, carbon steel with addition of **manganese**, tungsten or **chrome**). In a composite **material**, the time-variable **magnetic** flux would cause considerable eddy-current losses. The unfavourable effects of eddy currents are limited by increasing the **ohmic** resistance of the **magnetic material** and making the magnetic circuit from sheets that are insulated one from another so that the cross-section of the **magnetic** circuit covers small flat spots in a plane perpendicular to the direction of **magnetic induction**. In addition to the eddy-current losses, the magnetic circuit features **hysteresis** losses. Their magnitude mainly depends on the **magnetizing** curve area of the used **material**, **frequency** of supply voltage, and amount of **saturation**. The requirement for minimal **hysteresis** losses is satisfied by using soft **magnetic** material. An increase in specific resistance of iron can be achieved by addition of silicon (about 4%). The greater silicon content enhances the sheet's hardness and brittleness. The losses are greatly influenced by sheet rolling. The losses are as much as 14% less in the direction of rolling. The **permeability** of the sheets is also greater in the direction of rolling.* (Ondrůšek 2013:24)

<u>**Czech text**</u>

*__Magnetickým__ obvodem se **magnetické** pole soustřeďuje do vymezeného prostoru. **Magnetický** obvod bývá často přerušen vzduchovou mezerou. Uzavírá-li se jím časově proměnný tok, je **magnetický** obvod z plného **feromagnetického materiálu** (litina, ocelolitina, uhlíkaté oceli s přísadami **manganu**, wolframu nebo **chrómu**). Časově proměnný **magnetický** tok by způsobil v plném **materiálu** značné ztráty vířivými proudy. Nepříznivé účinky vířivých proudů omezujeme zvětšením **ohmického** odporu **magnetického materiálu** a složením **magnetického** obvodu z navzájem izolovaných plechů tak, aby průřez magnetického obvodu v rovině kolmé ke směru **magnetické indukce** byl rozdělen na malé plošky. Kromě ztrát vířivými*

*proudy existují v magnetickém obvodu také ztráty **hysterezní**. Jejich velikost závisí především na ploše **magnetizační** křivky použitého **materiálu**, **frekvenci** napájecího napětí a velikosti **saturace**. Požadavku minimálních **hysterezních** ztrát odpovídá **magnetický** měkký **materiál**. Zvýšením měrného odporu železa se dosáhne přidáním křemíku (asi 4%). Větší obsah křemíku zvětšuje tvrdost a křehkost plechů. Na ztráty má značný vliv válcování plechů. Ve směru válcování jsou ztráty menší až o 14%. **Permeabilita** plechů ve směru válcování je rovněž větší.*
(Ondrůšek 2013:1)

Analysis

As you can see in the examples above, the highlighted words are technical terms in electrical engineering. All these words are taken from English. Some of these words are already fully taken over into the Czech language, such as hysteresis, permeability or saturation. Despite the fact that these terms are even inflected in the text, they are, by their very nature, taken as foreign words. Looking at this electro-engineering technical text, it is clear that a person without a professional education in the given field cannot understand the problems presented. The text itself is very implicit and emphasizes the professional knowledge of the reader, who is able to conjecture on the basis of previously acquired knowledge understand the text as a whole. It follows that the reader analyses and interprets the meaning of the written text not only on the basis of linguistic means but also tries to understand the text due to the pragmatic meaning of the whole text. Thus, it is obvious that thanks to the knowledge of professional expressions taken over from English to Czech, a Czech specialist can benefit mainly from a good understanding of English technical texts. The knowledge of professional terminology in the same or similar form in both languages and professional knowledge in the specific science field and also experience are important elements supporting the comprehensibility of the English expert texts for the Czech specialist in the field. In the end how we can see, English plays, in this case, a role of a versatile language - lingua franca, even in the case of Czech professional texts. (Krhutová 2009)

2.2 Information Technology text comparison

English text

Network **topology** *describes the layout of interconnections between devices and network* **segments**. *At the data link layer and physical layer, a wide variety of* **LAN topologies** *have been used, including* **ring**, **bus**, **mesh** *and* **star**. *At the higher layers,* **NetBEUI**, **IPX/SPX**, **AppleTalk** *and others were once common, but the Internet Protocol Suite (***TCP/IP***) has prevailed as a standard of choice. Simple* **LAN***s generally consist of cabling and one or more* **switches**. *A* **switch** *can be connected to a* **router**, *cable* **modem**, *or* **ADSL** *modem for* **Internet** *access. A* **LAN** *can include a wide variety of other network devices such as* **firewalls**, *load balancers, and network intrusion detection.* **LAN***s can maintain connections with other* **LAN***s via leased lines, leased services, or across the Internet using virtual private network (***VPN***) technologies. Depending on how the connections are established and secured, and the distance involved, such linked* **LAN***s may also be classified as a metropolitan area network (***MAN***) or a wide area network (***WAN***).* [2]

Czech text

Topologie *sítě popisuje uspořádání propojení mezi zařízeními a jednotlivými* **segmenty** *sítě. Ve vrstvě datového spojení a také ve fyzické vrstvě byla použita široká škála* **LAN topologií**, *včetně topologie* **ring**, **bus**, **mesh** *a* **star**. *Ve vyšších vrstvách byly kdysi běžné protokoly* **NetBEUI**, **IPX / SPX**, **AppleTalk** *a další, ale jako standard dnes ve výběru převládala aplikace Internet Protocol Suite (***TCP / IP***). Jednoduché sítě* **LAN** *se obvykle skládají z kabeláže a jednoho nebo více* **switchů**. **Switch** *lze připojit k* **routeru**, *kabelovému* **modemu** *nebo* **ADSL** *modemu pro přístup k internetu.* **LAN** *můžou obsahovat celou řadu dalších síťových zařízení, jako jsou brány* **firewall**, *balancery zatížení a detekci narušení sítě.* **LAN** *mohou udržovat spojení s jinými sítěmi* **LAN** *prostřednictvím pronajatých linek, pronajatých služeb nebo prostřednictvím Internetu pomocí technologie virtuálních privátních sítí (***VPN***). V závislosti na tom, jak jsou připojení vytvořena a zajištěna a na jaké vzdálenosti jsou tyto propojené sítě* **LAN** *řešeny mohou být také klasifikovány jako sítě metropolitní oblasti (***MAN***) nebo širokopásmová síť (***WAN***).* [2]

<u>Analysis</u>

The above text is about LAN networks, a typical example of a technical text for the IT sphere. Here again, we have examples of words that the Czech language has accepted for its own, such as topology, segments, router, switch and so on. I have already dealt with this issue in the previous subchapter, and therefore I would like to analyze the function of abbreviations in specialized IT texts. As we can see, there are technical abbreviations such as LAN, WAN, ADSL that were created by a shortening of the original English term, and now are commonly used by the Czech IT community. Thanks to these abbreviations, which are originally in English, the reader's knowledge is expanded and they are then ready to understand similar texts also in English. Precisely these abbreviations that the reader will already know will wake up in him associations to other professional contexts and, as a result, will facilitate the understanding of the technical text in general. These abbreviations are specific to individual IT disciplines, and their interpretation is quite unambiguous because they are defined by a specific field and by a common knowledge of the subject.

However, this terminology can only serve properly if it is standardized and the meaning of the term is final because it defines only one specific element. Especially in technical sciences, inaccuracies and non-standard terminology could cause dramatic and dangerous practical consequences. Maybe this is the reason why the English terms are taken in their exact unchanged form because translating them into another language would greatly suffer the accuracy of the meaning of the term. (Krhutová 2009)

3. Further analysis of Electro-engineering texts

In this chapter, I am going to analyze several technical texts and their Czech translations from semantic point of view, pragmatic point of view and from the syntactic point of view. Furthermore, I will depict the cohesive chains of analyzed texts and eventually, the comparison of English text against Czech will be done. More specifically, I will try to discover and classify the effects of English on Czech translation.

This chapter will be divided into two subchapters, enriched science texts and popular science texts. The reason for this division is obvious, to better see the difference between purely technical professional English texts and English for general public society.

3.1 Enriched science texts

3.1.1 The Transistor

Original English text

Transistors are three terminal active devices made from different semiconductor materials that can act as either an insulator or a conductor by the application of a small signal voltage. The transistor's ability to change between these two states enables it to have two basic functions: "switching" (digital electronics) or "amplification" (analogue electronics). Then bipolar transistors have the ability to operate within three different regions: Active Region, Saturation and cut-off. The word Transistor is a combination of the two words Transfer Varistor which describes their mode of operation way back in their early days of electronics development. [3]

Czech translation

Tranzistory jsou tří terminálová aktivní zařízení, která jsou vyrobená z různých polovodičových materiálů. Tyto materiály se při aplikaci malého signálového napětí, mohou chovat buďto jako izolátor nebo vodič. Schopnost tranzistoru měnit mezi těmito dvěma stavy umožňuje i zároveň mít dvě základní funkce: "přepínání" (digitální elektronika) nebo

"zesílení" (analogová elektronika). Dále také mají bipolární tranzistory schopnost pracovat ve třech různých oblastech: v aktivní oblasti, saturaci a v odpojení. Slovo "tranzistor" je kombinací dvou slov "Transfer Varistor", která popisuje jejich způsob používání v počátcích vývoje elektroniky.

<u>**Analysis**</u>

"**The Transistor**" is a text about the purpose of transistors and about their working principle. The above text is an article taken from the website *Electronics tutorials,* which is a website focused on specialized parts from the electro-technics field. Already by its name, we can deduce that this site deals with electro-technics and with explanations of working principles in the electronics field. This article has purely educative character and is intended to professional society because it relies on the fact that the person who reads this article already has experience and knowledge from the field of electronics.

From the semantic point of view, it can be said, that this text is interpretation because the meaning of an expression is assigned exactly without vagueness, subjectivity and thus without emotional coloring. Terms like *semiconductor, saturation, varistor* are unambiguous and thus interpretative. If we look at this text from the pragmatic point of view we will find out that intention of the author was to explain transistor problematic in the most sophisticated way as possible without any hidden meaning in context. The context given in these cases is essentially focused on situations related to electronic part operation yet its use as a way to utter more hidden meaning is in this example rather absent. If we look at the article from a syntactic point of view we can say that the sentences are mostly in form of long compound sentences and using mainly technical terms.

The lexical cohesive chain is the following:

Transistors → active devices → semiconductor materials → insulator → conductor → the transistor's → two states → two basic functions → bipolar transistors → three different region → transistor → transfer varistor

The effects of English original on Czech translation can be seen, again, primarily in form of professional terms, which are similar to their English original. Terms like *"Transistors, Application, Active region, Saturation…"* are basically in the same form only bend by Czech spelling rules. Sentence constructions and word order are slightly different due to a better understanding for Czech reader.

3.1.2 Operational Amplifier

Original English text

An Operational Amplifier, or op-amp for short, is fundamentally a voltage amplifying device designed to be used with external feedback components such as resistors and capacitors between its output and input terminals. These feedback components determine the resulting function or "operation" of the amplifier and by virtue of the different feedback configurations whether resistive, capacitive or both, the amplifier can perform a variety of different operations, giving rise to its name of "Operational Amplifier".[4]

Czech translation

Operační zesilovač, zkráceně op-amp, je ve své podstatě zařízení pro zesilování napětí, které je navrženo pro použití s externími zpětnovazebními komponentami, jako jsou rezistory a kondenzátory a na zesílení mezi jejich vstupními a výstupními svorkami. Tyto komponenty zpětné vazby určují výslednou funkci nebo "operaci" zesilovače. Díky různým konfiguracím zpětné vazby, ať už díky odporové konfiguraci, kapacitní konfiguraci nebo díky obojímu, může zesilovač provádět řadu různých operací, čímž také vznikl jeho název "Operační zesilovač".

Analysis

"An Operational amplifier" is text taken again from website *Electronic tutorials*. The main information is to explain what the operational amplifier is and also from what parts are assembled. The information is delivered by the great amount of terms from electronics field, which means, again, that the person who is reading the article has to be familiar with the electronics issues and with mentioned terms.

As for the semantic point of view, I believe that we are witnessing again interpretative semantics, logically, because the analyzed text is the same nature as the previous professional text. From the pragmatic point of view, it can be said that is no hidden meaning in context. Syntactic point of view tells us that the article consists of few compound sentences, more specifically from two and the density of electro-technology terms is very high. This means that this text, fulfil the conditions of enriched science texts.

The lexical cohesive chain is the following:

An Operational Amplifier → device → feedback components → resistors → capacitors → feedback components → function → perform → operations

When we compare English original text with its Czech translation we can notice that the terminology is again in most cases similar and thus taken over from English. The term like Feedback is translated as *"zpětná vazba"* but nowadays is also usual to use word feedback in Czech technical texts and for professional Czech society is understandable without any problems. In terms of sentence construction, we can notice that Czech is using lightly different compound sentences, for example, whether in English is using the long compound sentence, Czech divides the compound sentences into few shorter sentences in order to better interpret the whole idea of the text.

3.1.3 The Voltage Transformer

Original English text

The Voltage Transformer can be thought of as an electrical component rather than an electronic component. A transformer basically is very simple static (or stationary) electromagnetic passive electrical device that works on the principle of Faraday's law of induction by converting electrical energy from one value to another. The transformer does this by linking together two or more electrical circuits using a common oscillating magnetic circuit which is produced by the transformer itself. A transformer operates on the principals of "electromagnetic induction", in the form of Mutual Induction. [5]

Czech translation

Napěťový transformátor lze považovat spíše za elektrickou součást než za elektronickou součástku. Transformátor je v podstatě velmi jednoduché statické (nebo stacionární) elektromagnetické pasivní elektrické zařízení, které pracuje na principu Faradayova indukčního zákona a to tak, že přeměňuje elektrickou energii z jedné hodnoty na druhou. Transformátor tuto operaci provede spojením dvou nebo více elektrických obvodů pomocí společného kmitavého magnetického obvodu, který je vytvářen samotným transformátorem. Transformátor pracuje na principu "elektromagnetické indukce" a to ve formě vzájemné indukce.

Analysis

The last text from category Enriched science texts in electro-technical engineering is article referring to the working principle of The Voltage transformer. Once more this article is taken from website *Electronics tutorials*, which has proven itself to be the most useful when it comes to searching electro-technics materials for professional use.

There is no need to re-analyze the text from the semantic and pragmatic point of view due to similarity with the previous texts. Whereas the text has same prerequisites as the previous ones, the analysis would be then quite similar in its nature. From the syntactic point of view, the text is again folded together from a few compound sentences. As we have already noticed before, these are typical characters of technical text, long compound sentences joined together with professional terminology.

The lexical cohesive chain is the following:

The voltage transformer → electrical component → transformer → device → principle → Faraday's law → magnetic circuit → itself → operates → electromagnetic induction

Czech translation, in this case, preserves the syntax roughly similar as in the original English text. The reason for this is quite simple because specifically in this case the changed word order would not do a great change. The density of professional terminology similar to Czech is likewise more or less the same as in previous texts.

3.2 Popular science texts

3.2.1 The Transistor

Original English text

Transistors are tiny switches that can be triggered by electric signals. They are the basic building blocks of microchips, and roughly define the difference between electric and electronic devices. They permeate so many facets of our daily lives, in everything from milk cartons to laptops, illustrating just how useful they are. A traditional mechanical switch either enables or disables the flow of electricity by physically connecting (or disconnecting) two ends of wire. In a transistor, a signal tells the device to either conduct or insulate, thereby enabling or disabling the flow of electricity. [6]

Czech translation

Tranzistory jsou malé spínače, které mohou být spuštěny elektrickými signály. Jedná se o základní stavební prvky mikročipů a zhruba definují rozdíly mezi elektrickými a elektronickými zařízeními. Protínají tolik aspektů našeho každodenního života, počínaje od krabiček na mléko konče notebooky, čímž nám ilustrují, jak užitečné jsou. Tradiční mechanický spínač buďto umožňuje nebo zakazuje tok elektrické energie fyzickým připojením (nebo odpojením) dvou konců drátu. V tranzistoru nám signál říká, že zařízení buďto vede nebo izoluje elektrický signál, čímž umožňuje nebo znemožňuje tok elektrické energie.

Analysis

"The Transistor" is an article that defines what the transistor is. This text is taken from website *Livescience* which is a website focused on the explanation of phenomena from a wide range of scientific disciplines in reader–friendly way. I already analyzed text which was defining what transistor is, but this time the article is written in popular science English. We can say straight away that this article fits in the definition of popular science texts because the density of technical expressions is lowest than in previous examples. Technical expressions such as microchips or laptops are known by the general public for a long time.

As for the semantic point of view, it can be said, that this text is in interpretative form. From the pragmatic point of view, we can observe intention of the author to help at most as possible to reader understand the given problematic by given the transistor in context with things which are common to use in everyday life. If we look at the text from the syntactic point of view, we can notice that the sentences are mostly short which is good for better orientation in the text.

The lexical cohesive chain is as follows:

Transistor → switches → electrical signals → microchips → devices → permeate → useful → they → mechanical switch → connecting → transistor → conduct → insulate → flow

What about the impact of English language on Czech in this case? We can notice that the sentences are in same order as in English, trying to maintain brevity and simplicity of its English original. This is, of course, in order to maintain a better orientation in the text also for the Czech reader. This translation is not an exception, and Czech has taken some of the expressions from English as its own. For example term, *Microchip* is commonly used by Czech society or the term Laptop is also normally used by Czech speaker.

3.2.2 Why do we use high voltages?

Original English text

As electricity flows down a metal wire, the electrons that carry its energy jiggle through the metal structure, bashing and crashing about and generally wasting energy like unruly schoolchildren running down a corridor. That's why wires get hot when electricity flows through them (something that's very useful in electric toasters and other appliances that use heating elements). It turns out that the higher the voltage electricity you use, and the lower the current, the less energy is wasted in this way. So the electricity that comes from power plants is sent down the wires at extremely high voltages to save energy. [7]

Czech translation

Jak elektřina protéká dolů kovovým drátem, elektrony, které nesou energii, se hromadí přes kovovou strukturu, bouchají se, hroutí se a obecně ztrácejí energii, jako neposlušní

školáci kteří nevychovaně běhají po chodbě. To je důvod, proč se dráty zahřívají, když jimi protéká elektřina (tento jev může být i velmi užitečný v elektrických toasterech a jiných zařízeních, které používají topné články). Ukazuje se, že čím vyšší je napětí a čím nižší je proud který používáte, tím méně energie je ztraceno. Takže elektřina, která se vyrábí v elektrárnách, je přenášena vodiči na extrémně vysokém napětí, aby se šetřila energie.

Analysis

"Why do we use high voltages?" is an article, taken from the website called *explain that stuff,* and already by its name we can determine that this site is for inexperienced readers in the field of electro technics. By using the word stuff, which is informal, we can deduce that this site is nothing for professionals. This article focuses on explaining why we use high voltages, which is closely linked to the transformers, which we dealt with in the previous subchapter. Concerning the density of technical terms, which is rather lower, we can also deduce the text categorization in public science texts.

From the semantic point of view, the article is connotative, due to the ambiguity of some phrases used. For the example, *bashing and crashing* are ambiguous expressions and the recipient could imagine a slightly different situation under these expressions. As far as the pragmatic point of view, the situation is quite similar to the previous article. The author is trying to give an easier explanation, by comparison, the flowing electricity to schoolchildren running down a corridor. Furthermore, the syntactic point of view, in this case, compound sentences are a bit longer than in the previous example but you can still orient very well in the text itself. The density of strictly technical terms is low.

The cohesive chain is following:

Electricity → electrons → wasting energy → wires → hot → electricity flows → voltage → current → less → wasted → electricity → power plants → extremely → voltages

In this case, the density of English words taken over by the Czech language is not so high as in previous scenarios. It is caused by lack of the professional words and terms and therefore the Czech language uses its own words and terms. This condition is caused, due to the nature of the whole article, which belongs to popular science texts.

4. Further analysis of texts from Information Technology

The aim of this chapter will be similar to the previous chapter, but with the difference that the semantic, pragmatic and syntactic analysis will be omitted.

4.1 Enriched science texts

4.1.1 The Database

Original English text

The database, also called electronic database, any collection of data, or information, that is specially organized for rapid search and retrieval by a computer. Databases are structured to facilitate the storage, retrieval, modification, and deletion of data in conjunction with various data-processing operations. A database management system (DBMS) extracts information from the database in response to queries. [8]

Czech translation

Databáze, nazývaná též elektronická databáze, je jakákoli sbírka dat nebo informací, která je speciálně uspořádána pro rychlé vyhledávání a znovuzískání počítačem. Databáze jsou strukturovány tak, aby usnadňovaly ukládání, vyhledávání, modifikaci a vymazávání dat ve spojení s různými operacemi zpracování dat. Systém správy databází (DBMS) extrahuje informace z databáze jako odpověď na dotazy.

Analysis

"**The Database**" is an article taken from the website encyclopaedia Britannica. The headline The Database is self-explanatory and we can deduce from the title that it will most probably be an explanation of the term database. Above text is an example of enriched science text in the field of Informational Technology. The density of special terms is high, due to nature of this article. The information is provided in logical compound sentences and thus the article acts fluently. Professional terminology is left without any further explanation because the author relies on the fact that reader is experienced in the given field.

The cohesive chain is as follows:

Database → collection of data → organized → rapid search → computer → databases → facilitate → retrieval → modification → deletion → data-processing operations → DBMS → response → queries

As in all previous texts from enriched science field, we can notice similar terminology in Czech translation due to overtaking of words from English. Terms like *database, data, management* and etc. were taken over and they were accepted by Czech professional community. Sentence arrangement remains the same in Czech translation because for better understanding, there was no need to rewrite the sentences.

4.1.2 The Mainframe Computer

Original English text

The mainframe computer is a data processing system employed mainly in large organizations for various applications, including bulk data processing, process control, industry and consumer statistics, enterprise resource planning, and financial transaction processing. Mainframes use proprietary operating systems, most of which are based on Unix, and a growing number on Linux. Over the years they have evolved from being room-sized to networked configurations of workstations and servers that are an extremely competitive and cost effective platforms for e-commerce development and hosting.[9]

Czech translation

Sálový počítač je systém pro zpracování dat, který se používá především ve velkých organizacích pro různé aplikace například pro hromadné zpracování dat, řízení procesů, statistiky průmyslu a spotřebitelů, plánování podnikových zdrojů a zpracování finančních transakcí. Sálové počítače používají proprietární operační systémy, z nichž většina je založena na Unixu a ty zbývající na Linuxu. V průběhu let se vyvinuli z prostorově objemných konfigurací sestávajících z pracovních stanic a serverů, do extrémně konkurenceschopných a nákladově efektivnějších platforem, které slouží pro vývoj a hosting e-commerce.

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<u>**Analysis**</u>

"The mainframe computer" has been excerpted from the website *business dictionary*, which is web page specialized on special terms from a wide range of disciplines although it does not look at it for the first sight. The article deals with explanation of what the mainframe computer is and further describes what the mainframe computer is good for. The text itself consists of two long compound sentences and from one short sentence. The density of special terms is relatively high and the article again meets the conditions for us to call it enriched scientific text.

The lexical cohesive chain is the following:

The mainframe computer → data processing system → various applications → bulk data processing → process control → consumer statistics → resource planning → Mainframes → unix → Linux → evolved → servers

In this text is again a great amount of terminology which has been taken by the Czech language by its own. Namely terms like *operating system, servers, platforms, e-commerce, hosting and etc.* bent by Czech spelling rules and Czech terminology and they are ready to use in Czech professional texts. In Czech translation, sentences are roughly the same length as those in the English original. An interesting element which is typical for the Czech language is using of a reversible pronoun, while the sentence in English is *"Over the years they have evolved"* in Czech is the sentence, with the use of the reversible pronoun *"V průběhu let <u>se</u> vyvinuli"* instead of machine-folded *"V průběhu let oni vyvinuli"*. Reason for using a reversible pronoun in Czech is for better specifying and understanding of written text.

4.1.3 A Hard disk

<u>**Original English text**</u>

Hard disk is a magnetic storage medium for a microcomputer. Hard disks are flat, circular plates made of aluminium or glass and coated with a magnetic material. Hard disks for personal computers can store up to several gigabytes (billions of bytes) of information. Data are stored on their surfaces in concentric tracks. A small electromagnet, called a magnetic head, writes a binary digit (1 or 0) by magnetizing tiny spots on the spinning disk in different directions and reads digits by detecting the magnetization direction of the spots. [10]

Czech translation

Pevný disk je magnetické pamäťové médium pro mikropočítač. Pevné disky jsou ploché, kruhové desky z hliníku nebo skla pokryté magnetickým materiálem. Pevné disky pro osobní počítače mohou uložit až několik gigabajtů (miliard bajtů) informací. Data jsou uložena na jejich povrchu v soustředných kolejích. Malý elektromagnet, který se nazývá magnetická hlava, zapisuje binární číslici (1 nebo 0) pomocí zmagnetizování drobných bodů na rotujícím disku v různých směrech, čtení číslice se provádí zjištěním směru magnetizace bodů.

Analysis

Last text from the category of enriched science texts is an article about "**a Hard disk**". The article is once more taken from the website *encyclopaedia Britannica* which serves well as a useful source of materials from Information technology field. The above text describes what is it made of and how the hard drive works. As in all previous articles in the field of professional texts, this one is not an exception when it comes to the density of special terms. Special terminology is again represented with a great amount of words. The article is short but explains well and briefly the basic principle of how hard drive works.

The lexical cohesive chain is as follows:

Hard disk → storage → microcomputer → hard disk → circular plates → magnetic material → store up → gigabytes → stored → concentric tracks → magnetic head → binary digits → magnetizing → spots → reads → detecting the magnetization

Once more, we are witnessing taking over of English words to the Czech language. Words such as *disk, magnetics, gigabytes* are terms which are already fully accepted by the Czech language. Compound sentences are transferred to the Czech translation without any big changes.

4.2 Popular science texts

4.2.1 The server

Original English text

In a technical sense, a server is an instance of a computer program that accepts and responds to requests made by another program, known as a client. Less formally, any device that runs server software could be considered a server as well. Servers are used to manage network resources. For example, a user may setup a server to control access to a network, send/receive e-mail, manage print jobs, or host a website. [11]

Czech translation

V technickém slova smyslu je server jakousi instancí počítačového programu, který přijímá a reaguje na požadavky jiného programu, známého jako klient. Méně formálně, každé zařízení, které má spuštěný nějaký serverový software, může být považováno za server. Servery se používají ke správě síťových zdrojů. Například uživatel může nastavit server pro ovládání přístupu k síti, odesílání / přijímání e-mailů, správu tiskových úloh nebo hostování webových stránek.

Analysis

"The server" has been taken from web page *Computer hope*, which presents itself as a website where you can find the help in the field of Information technology. When looking at the article, we can verify that this statement is true. The article itself is a short column and explains well and briefly what the server means. The author of this article succeeded in expressing a technically specialized message in a logical and easy way, by using formulations as *"less formally"* where he is trying to explain the given information in a less formal way. The author also gives examples of how to use the server in order to a reader can see what the server actually does.

The lexical cohesive chain is the following:

Server → computer program → respond to requests → made → client → any device → server software → server → manage network resources → access to a network → e-mail → print → host

The density of professional terms is also reflecting in Czech translation. Once more, words as *server, program, client, e-mail* are already adopted by the Czech public society and they can then orientate in the text without any problem. Structure of sentences remains the same.

4.2.2 The CPU

Original English text

The CPU stands for "Central Processing Unit." The CPU is the primary component of a computer that processes instructions. It runs the operating system and applications, constantly receiving input from the user or active software programs. It processes the data and produces output, which may stored by an application or displayed on the screen. The CPU contains at least one processor, which is the actual chip inside the CPU that performs calculations. For many years, most CPUs only had one processor, but now it is common for a single CPU to have at least two processors or "processing cores." [12]

Czech translation

Centrální procesní jednotka nebo-li CPU je hlavní součástí počítače, která zpracovává pokyny. Spouští operační systém a aplikace, nepřetržitě přijímá pokyny od uživatele nebo od aktivních softwarových programů. Tyto data zpracovává a vytváří výstup, který může být uložen aplikacemi nebo zobrazen na obrazovce. CPU obsahuje alespoň jeden procesor, což je ve skutečnosti čip uvnitř CPU, který provádí všechny výpočty. Po mnoho let měla většina procesorů pouze jeden procesor, ale nyní už je běžné, že jediný procesor má alespoň dva procesory nebo-li "procesní jádra".

Analysis

Last but not least, article about **"The CPU"** taken from *techterms* website. This text is trying to explain how the central processing unit works. Targeting on non-professionals is obvious, the article is written with help of short logically divided sentences and directly on the website is also a meter which shows you the level of expertise what you have to have in terms to understand the content of this article. Specifically, this article is rated by three points out of

ten, which means you do not have to be exactly a professional in the field of Information technology.

The lexical cohesive chain is the following:

The CPU → component → processes instructions → receiving input → produces output → displayed → The CPU → one processor → chip → perform calculations → processing cores

The same situation over and over again, most of the terminology in this article is also very well understandable for Czech reader. The terms taken over are as follows *component, processes, chip calculations and etc.*

4.2.3 An Operating system

<u>Original English text</u>

An operating system is the most important software that runs on a computer. It manages the computer's memory and processes, as well as all of its software and hardware. It also allows you to communicate with the computer without knowing how to speak the computer's language. Without an operating system, a computer is simply useless. Your computer's operating system (OS) manages all of the software and hardware on the computer. Most of the time, there are several different computer programs running at the same time, and they all need to access your computer's central processing unit (CPU), memory, and storage. The operating system coordinates all of this to make sure each program gets what it needs. [13]

<u>Czech translation</u>

Operační systém je nejdůležitější software, který běží na počítači. Stará se o paměti a procesy počítače, stejně jako o veškerý software a hardware. Umožňuje také komunikovat s počítačem, aniž byste věděli jak mluvit jazykem počítače. Bez operačního systému je počítač jednoduše zbytečný. Operační systém (OS) počítače spravuje veškerý software a hardware v

počítači. Většinou běží současně několik počítačových programů a všechny potřebují přístup k centrální procesorové jednotce (CPU) počítače, paměti a úložišti. Operační systém koordinuje všechny tyto operace, aby zajistil že každý program dostane to, co potřebuje.

Analysis

The last article from the field of popular science texts in information technology is text referring to an explanation of what is an operating system. The author is explaining the main purpose of the operating system, also why the operating system is needed on the computer and what resources operating system needs to have in order to run properly. The text is including some technical terms but most of them are already adopted by the public as common everyday expressions. The author is trying to shed the importance of the Operating system for the reader by using the expression *"Without an operating system, a computer is simply useless"* and thus emphasize the importance of an operating system. The article was taken from website *GFC learn free* and this webpage aims to bring the individual expressions from Informational Technology to the wider audience.

The lexical cohesive chain is the following:

An operating system → software → computer → manages → processes → software and hardware → communicate → computer → Without → an operating system → useless → computer programs → central processing unit → memory → storage → the operating system → program → needs

Regarding the classification of the effect of English on Czech translation, as in most of the previous texts, the most significant aspect is the taken over terminology. Specifically in this text is a large number of terms which the Czech language has taken over, for example, *software, processes, hardware, communicate and etc.*

5. Conclusion

In conclusion, it can be seen, that the global English language penetrates to a large extent, mainly in the form of vocabulary. It can also be said that English is and will increasingly be a global language that will affect all spheres of our lives. English has been through the Internet and the media in recent years, spreading everywhere and uncontrollably to all disciplines and spheres of our lives. Today, we do not even realise how much we use English unconsciously because we have taken most of English words for ours. Therefore it is true that English is beginning to be the right lingua franca, especially in the field of electro-engineering and information technology.

The aim of the thesis was to compare English and Czech technical texts in the field of electrical engineering and IT. In the second, third and fourth chapter I focused on comparing specific texts from electrical engineering and Information Technology, from which it was possible to notice that English influences Czech translations. Most professional terms are taken over from English and most of the professional abbreviations come from English as well. I am considering that this is due to the prevalence of the development of electronic components predominantly in the English-speaking world. However, all of the above mentioned leads to a better understanding of the professional texts and professional topics.

It can be said, with exaggeration, that a specialist in the field of Electro engineering in the Czech Republic is able to understand English professional texts, even if he does not speaks English very well, due to a lot of taken over English terminology which we are using in professional Czech texts. However with this phenomenon, we could count, because it is based on the fact that only dead languages, systemic, artificially created languages are staying unchanged. Therefore, if we have a lively language like Czech and if we are actively using this language in a living world then we have to bear in mind that some changes in language will come up and linkage with other languages is therefore inevitable.

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